Poverty, Inequality and Living Standards in Rural China 1978-90:

A Comparative Study of Anhui and Yunnan.

Marion Elizabeth Jones

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Abstract

This dissertation is concerned with trends in poverty, inequality and living standards among the counties and villages of Anhui and Yunnan since 1978. Trends in absolute poverty, measured by both income- and nutrition-based poverty lines, show only a small decline during the 1980s. Based on province-specific poverty lines, there is a substantial increase in the incidence of poverty during the late 1980s, over the incidence based on a national poverty line. The overall trend in living standards is of increasing dispersion, for Anhui and Yunnan relative to the national average, and between the counties of the two provinces. Living standards show little change for the counties of Yunnan, with declines outnumbering increases. In Anhui, the large increase in mortality between the 1982 and 1990 censuses contribute to declines in absolute living standards as well. Increases in spatial inequality are apparent from the output data; differentials in the rate of economic growth fuelling this increase in the 1980s. In essence counties thrive or languish based on the performance of their agricultural sector. Rapid improvements in yields for basic food stuffs, and expanding cash crop production in many regions, together cause income levels to rise, and therefore living standards, based on commodities, to increase as well. Where this is not the case, there is a lack of investment funds for the establishment of private and collective rural enterprises, and a lack of consumer demand. The low level of income, and the small size and slow growth in the xiangzhen qiye sector in disadvantaged areas also means that local governments are short of revenue, and therefore the costs of health care and education are left to the individuals requiring these services, exacerbating the gap between rich and poor in terms of achieved functioning. The question of how to increase the profitability of the agricultural sector in poor areas of China remains unsolved. Without a source of investment funds and increasing incomes to foster modern sector enlargement growth in rural areas, it is difficult to imagine an increase in either commodity or non-commodity based functioning in the poor regions of rural China in the near future.

To my parents...

and to the memory of Dr. E.T. Pryor.

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Abbreviations and Glossary of Terms

Term	Definition
BCDH	Baochan Daohu - Contracting a limited portion of cultivating tasks to households
BCDZ	Baochan Daozu - Contracting a limited portion of cultivating tasks to work groups
BGDH	Baogan Daohu - Contracting all cropping tasks to the household
BGDZ	Baogan Daozu - Contracting all cropping tasks to the work team
CDR	Crude Death Rate - deaths per thousand population
δ NDMP	The Change in NDMP over time (1985-90)
GMP	Gross Material Product
Growth Rate	All growth rates are compound annual, unless they are specifically said to be OLS
GVAO	Gross Value of Agricultural Output
GVIO	Gross Value of Industrial Output
GVSO	Gross Value of Social Output
NDMP	Net Domestic Material Product
NVAO	Net Value of Agricultural Output
NVIO	Net Value of Industrial Output
OLG	Office of the Leading Group of Economic Development in Poor Areas Under the State Council (Government of China)
'Services'	The service sector, made up of construction, transportation and commerce net value added
Sex Ratios	Number of females per hundred males
SLI	Standard of Living Index
'third front'	The Maoist policy to base strategic industries in the interior, away from the threat of U.S. or U.S.S.R. attack
'xia fang'	The Maoist policy of sending urban youths down to the countryside
XZGY	Xiangzhen Gongye - industrial sector of XZQY
XZQY	Xiangzhen Qiye - Township and village enterprises

Chapter 1 - Introduction

This chapter is divided into two sections. The first presents the questions that are central to the dissertation, the context into which the dissertation fits relative to the literature, and the contributions made by the dissertation. Also included in this section is an outline of the structure of the dissertation, and a summary of the conclusions resulting from this research. The second section outlines why Anhui and Yunnan were chosen for this study, and a summary of conditions in the two provinces, and the reform process in both provinces.

1. Questions, Context, Contributions and Conclusions

a. Overview

The period from 1978 to 1990 saw dramatic changes in institutions and economic organization in rural China. These changes have given rise to a wealth of literature on all aspects of the rural economy in China. The most inconclusive topic under investigation is living standards in China, with attendant debates on the related topics of poverty and inequality, debates which themselves remain unsolved. Part of the ambiguity results from the limited quantity and quality of the statistical data on China necessary for such as this study; particularly for the late Maoist period, and from 1976 to 1983. However, the study of poverty, inequality and living standards has not been limited to the China field, or even to development economics, but belongs to a long standing tradition in economics, dating back to Adam Smith (1776) and extending to the recent reports by Goodman and Webb (1994) and Jenkins (1994). Included in this literature are such names as Ricardo, Engel, Kuznets and Sen, the latter

two making contributions to both the theoretical and the applied literature.

This dissertation presents a detailed inquiry into poverty, inequality and living standards during a period of rapid economic growth and dramatic institutional change in two of China's poorer provinces.[1] The question central to the dissertation is: What has happened to poverty, inequality and living standards during the 1978-90 period in rural Anhui and Yunnan? This examination is conducted in a Chinese context, where trends and values for Anhui and Yunnan are compared to the national average, and at the county level, reference is also made to the provincial averages. In the process of answering this question, an examination of how best to evaluate poverty, inequality and living standards, at both a theoretical level, and in the Chinese context was necessary. Resulting from this analysis, subsidiary questions concerning the correlates and causal factors associated with this life quality troika during a time of rapid economic growth are also discussed briefly.

The issues addressed by this dissertation are in line with the return in development economics to a study of economic growth (Landes, 1990: 1-13; Ehrlich, 1990: S1-S11). Chapters six and seven include an analysis of the causes underlying differential growth rates between counties in Anhui and Yunnan, and their different 'levels of development'. The relevance of this topic is not solely limited to developing countries, but is also of importance in OECD economies, as exemplified by the recent reports on poverty, inequality and economic growth in Britain.[2] More directly this dissertation is contributing directly to the literature on these issues in

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[1] A full discussion of the relevance of Anhui and Yunnan to such as study, and also of the experience of the two provinces during decollectivization, appears in the second section below.

[2] See for example: Goodman and Webb, 1994; and Jenkins, 1994, or the numerous studies on poverty and regional inequality by Statistics Canada and the Canadian Government.

rural China.

b. Structure, Contributions and Conclusions by Chapter

The second chapter contains the examination of trends in poverty in Anhui and Yunnan. This begins by establishing the relevance of an examination of poverty in rural China for the 1978-90 period. This is followed by discussion of the theoretical literature on defining and measuring poverty. The general conclusion of this section is that a capability-based approach to the measurement and definition of poverty is superior, for two reasons. First because it helps to resolve many of the difficulties regarding more traditional poverty measures, such as intra-family allocation of resources, and individual choice which might result in an individual having an entitlement that could preclude their being considered poor, but who chooses not to deploy these resources to meet the poverty criteria. Second, it accounts for interpersonal variations in the ability to transform capability in to achieved functioning, due to differentials in age, gender, race, class or disability, a factor neglected by utilitarian analysis.

The discussion then turns to defining and measuring poverty in the China context, presenting both the limitations to poverty analysis in China, and also the literature on poverty in China. This is followed by the analysis of the incidence of poverty in Anhui and Yunnan. There are two trends apparent in the 1978-90 period in China, and these are replicated in Anhui and Yunnan. First, the incidence of poverty declined significantly in China from 1978 to 1984, and the same was true of poverty in Anhui and Yunnan. This was the period when the terms of trade shifted in agriculture's favour, and the increases in the purchase prices for many agricultural goods boosted incomes and consumption in rural China (cf.

Kueh, 1993). From 1985 to 1990, poverty increased, with the most rapid increases coming during the period of economic retrenchment in 1989-90. There are two significant contributions in this chapter, first the production of province-specific income based poverty lines, which are adjusted for the differential rates of inflation in Anhui and Yunnan compared to the national average. The deflator series for Anhui, Yunnan and China are presented in an appendix to the chapter, and along with the methodology for their derivation, which is also a contribution. The second contribution is the construction of grain availability data, for use in conjunction with a calories-from-grain poverty line, for Anhui and Yunnan, 1978-90.

The discussion on poverty is followed by two chapters on the standard of living. Chapter three focuses on the theoretical issues in measuring living standards, and an examination of the trends in absolute and relative living standards across a wide range of indicators during the 1980s in Anhui and Yunnan. The fourth chapter presents the construction of, and results from, a composite standard of living index, based on per capita net output data (as a proxy for income), illiteracy rates and death rates. The chapter also includes a brief discussion of other indices of living standards, such as Morris's Physical Quality of Life Index (1979), and the UNDP Human Development Index (1990).

The theoretical section of chapter three is largely focused on functioning and capability analysis, and its advantages over more narrow, and utilitarian, means of measuring living standards. This discussion also contributes to clearing up some of the misconceptions regarding capability analysis, including an appendix outlining the principal terms associated with such an analysis and their inter-relationships. The discussion then turns to the literature on living standards in China, and the analysis of

living standards in Anhui and Yunnan for 1978-90. A broad range of achieved functioning variables is considered in this analysis, including indicators on income, output, ownership of consumer durables and per capita living space; mortality and longevity; health care professionals and hospital beds; literacy and educational attainment; and personal and cultural freedoms and self-determination. Trends are examined both in absolute terms, and relative to the national average. Two trends were apparent. For the majority of indicators, there was an absolute improvement in living standards in Anhui and Yunnan, while relative to the national average, living standards fell during the 1980s. This was not true for mortality. Life expectancy at birth rose in China for males (65.4 to 66.4 years), but fell for females (67.5 to 67.0 years) over the intercensal period 1982-90. Infant mortality rose for both males and females over the intercensal period (38.0 to 38.7 and 36.0 to 37.5 per thousand live births respectively). While nationally, the crude death rate (CDR) rose for men and women, both separately and combined, 6.3 to 6.6 per thousand population for males and females, 1981 to 1990. Mortality increased dramatically in Anhui during the reform period, with a large increase in the mean value for rural residents (the CDR virtually doubled from 5.7 to 9.7 per thousand population), while in Yunnan, the rate of decline was modest, and mortality rates remained very high in Yunnan compared to the national average (CDR of 9.1 in 1981 and 7.7 in 1990). In both cases, this represented a significant short-fall in living standards in the two provinces during the 1980s. This analysis represents an extension of Banister's authoritative work on mortality in China to the county level. As no such systematic analysis on a province has been conducted before, this represents a contribution to the literature, as does much of the work contained in this chapter dealing with data problems, and

compiling an internally consistent data set.

Chapter four presents the first inter-temporal comparison of living standards at the county level in China. The index presented is of the human development type, although methodologically the index draws heavily on the life quality index produced for all counties of China by Aschmoneit (1990) from the 1982 population census data. Methodologically and theoretically, there is a brief discussion of the components of such a index, considering the propositions put forward by Morris (1979) and Dasgupta's Borda ranking-based index (1993b), as well as the two indices mentioned previously. The index is comprised of three factors: per capita real NVAIO, the crude death rate, and the incidence of illiteracy and semi-literacy. The index showed increased dispersion among the counties of Anhui and Yunnan in terms of the standards of living. There is also a strong direct relationship between the crude death rate and per capita NVAIO, suggesting that more rapid rates of output growth are accompanied by rising mortality, while areas where mortality was high based on the 1982 census - particularly the periphery of Yunnan - then the mortality rate continued to decline, although here again the relationship with NVAIO is positive, because the rates of economic growth are low, and occasionally negative. It is the mortality rate that is driving the trends in living standards, in all counties except those with the highest rates of output growth. The importance of mortality cannot be over emphasised, particularly in light of the very negative performance of this indicator in the two provinces over the intercensal period. The Anhui mortality data, in particular, uphold Sen's assertion that per capita income or output is a poor proxy for living standards, and that mortality, at least, should also be examined.

The fifth, sixth and seventh chapters are all related. They deal

with spatial inequality and the causes of differential economic growth rates. Chapter five provides the framework upon which chapters six and seven are based, and also examines the extent of spatial inequality in Anhui and Yunnan for the 1978-90 period, based on per capita real NDMP and per capita real NVAIO.[3] Chapter six examines the factors that contributed to the rapid economic growth in the richest and most dynamic counties in Anhui and Yunnan. The one common factor was found to be growth of agricultural net value added, and particularly, growth in the yields for staple crops such as food grains and oil seeds. Poor counties, and those with particularly slow growth rates were discussed in chapter seven. Here again, it was stagnation in the agricultural sector that united these counties.

For both groups of counties, rapid growth in the agricultural sector, and one may assume by extension in incomes from agricultural activities, is necessary, but not sufficient for rapid economic growth. For the counties in Anhui, it was the 'service' sector (defined as construction, transportation and commerce), and, in particular, the free enterprise industrial sector, that provided the sustained rapid growth rates in NDMP in the late 1980s, while agriculture was instrumental in the first half of the 1980s. In Yunnan it was the combination of dynamism in the state industrial sector married with rapid improvements in yields and agricultural output that resulted in the highest rates of grow, with the exception of a few trading and tropical produce based counties in the extreme south and west. In sum, it is the regions with balanced growth, that is, growth in all sectors of NDMP that achieve the highest rates of NDMP growth.

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[3] This analysis was the foundation for the section on spatial inequality in Bramall and Jones (1993), and the analysis in chapters six and seven grew out of a wish to understand the processes underlying the differential growth rates that were apparent in the analysis on spatial inequality.

The conclusion examines the broader implications of the findings of this dissertation for poverty alleviation policies, and future trends in living standards and inequality, given the institutional structure of rural China.[4] Perhaps one of the most important conclusion drawn from this work on Anhui and Yunnan is that it is dangerous to generalize about conditions and trends in China as a whole, given the great diversity of China. However, at the peril of ignoring this advice, some generalizations follow.

Before significant improvements in the incidence of poverty, the living standards and the extent of income inequality can be achieved in rural China, the removal of several structural impediments is necessary. These factors prevent both the acceleration of economic growth in the most backwards regions, and rapid economic growth in other areas from providing any assurance of poverty alleviation and the achievement of higher living standards. The first change that is necessary, is in the return of a rural social welfare system. This system needs to fulfil at least three functions. First, it needs to provide affordable, prevention-oriented health care, preferably on an insurance basis, to reverse the recent increases in infant and child mortality. Second, parallel changes are necessary in the provision of educational services, to decrease the perceived opportunity costs of education and increase perceived returns to educational attainment at all levels. Otherwise, the progress made by the provision of universal primary education is lost, with its attendant implications for factors ranging from labour force skill levels to population growth rates. Finally, the social welfare system needs to provide some guarantee to households, allowing them to trade cultivation of fragmented plots of land for non-farm incomes. This would allow the

[4] The conclusion also presents areas for further investigation that arise out of the dissertation. This discussion is reserved for the conclusion, and only the broader implications of this work are summarized here.

development of a secondary market in land use rights, permitting those remaining in farming to agglomerate land holdings, increasing yields and returns to labour and permitting agricultural modernization. This would also depend upon the ability of the non-farm sector to generate employment quickly enough to permit the transfer of labour off the farm.

A second, and parallel impediment to increased economic growth, poverty alleviation and increased living standards is agricultural modernization. The key to rural economic growth in China is a household's access to cash income. In regions where households essentially remain part of the subsistence economy, and cash incomes are negligible, economic growth rates and living standards are low, while the incidence of poverty is high. The lack of cash income limits the ability of households (or individuals in these regions) to purchase agricultural inputs, such as chemical fertilizer, high yielding varieties of seeds, or new and improved had tools, all of which might increase yields or output, in turn raising the possibility of the generation of cash income. At a regional level, areas do not have the resources to invest in infrastructure, such as electricity generation, irrigation systems, the transportation network. This becomes a self-perpetuating vicious cycle. By contrast, a region, or household, with some cash income has the possibility to embark on a virtuous cycle of improved agricultural yields, or output, leading to funds for investment in sidelines, infrastructure or the non-farm sector, in turn generating higher cash incomes. These two scenarios, taken at both the household and county levels provide the basis for increased income inequality and differential rates of economic growth. This makes cash income a key indicator in the examination of prospects for economic growth and development in rural China, an indicator for which there are very limited data.

Municipalities, Provinces and Autonomous Regions of China

2. Anhui and Yunnan[5]

a. Physical Geography, History and Infrastructure

Anhui and Yunnan were chosen as the focus for this study because between them they represent an interesting cross-section of the experiences of the poor provinces of rural China during the 1980s. This is not to argue that either Anhui or Yunnan represents a microcosm of China itself; rather, Anhui is of interest because it, along with Sichuan, was at the vanguard of pioneering the responsibility system, and more specifically the household-based system that holds sway in much of China today. As a result, the reforms came early to Anhui compared to Yunnan, and much of the rest of rural China. Yunnan, which decollectivized only in 1981-3, provides a contrast to the Anhui experiences and is representative of late decollectivizing regions. Second, Anhui is close to the middle of the Chinese provincial spectrum, in terms of industrial output and income levels, and therefore is representative of the provinces at the upper end of the poor province scale. Yunnan, by contrast, remains one of the poorest provinces in China. Third, Anhui although land locked, is well served by navigable waterways on the Huai and Changjiang rivers, as well as the rail and road links with major industrial centres such as Shanghai, Nanjing, Hangzhou, Tianjin and Beijing. Yunnan forms the southwest corner of China, bordering Burma, Laos and Vietnam. Despite a very high proportion of Asia's major rivers passing through its borders, and becoming large rivers in the Yunnan catchment area[6], it remains severely limited in its road, rail and river transport. The fast-running rivers flowing

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[5] Please see the map of China on the previous page for the location of Anhui and Yunnan, and appendix 1.1 for the maps and lists of prefectures and counties in Anhui and Yunnan

[6] The number of rivers that transform into the great rivers of Asia in Yunnan has prompted Barnett to dub Yunnan 'the Mother of Rivers' to the Tibetan plateau being the 'roof of the world' (1993: 488). These rivers include the Salween, the Mekong, the Changjiang (know as the Jinsha Jiang in Yunnan), the Red river, and the Black river.

through Yunnan's rugged mountain valleys are more of a hinderance to transportation than a contribution to it. It is only in the south of Yunnan (Xishuang Banna) than the Mekong is navigable, and the Changjiang only becomes navigable in the far east of Yunnan, where it forms the border with Sichuan. Finally, Yunnan has the largest number of different national minorities of any province in China, with 33% of the population being of non-Han origins. There are 25 minorities with more than 4,000 members, and several with less than 4,000, the vast majority of which are unique to Yunnan. Despite the domination of the Han Chinese in Yunnan, and much of the southwest of China, this region has been deemed to be backwards due to the lack of entrepreneurial spirit among the non-Han population, by the Chinese government (cf. Wang and Bai, 1991). Anhui is virtually entirely Han Chinese, with a small number of Hui (the moslem minority) living in the province. Thus, again the two provinces represent both ends of the Chinese spectrum.

Table 1.1 - National Minorities in Yunnan, 1990

Name	Population (thousands)	% of Prov. Minority Pop.
Yi	4054.2	32.8%
Bai	1339.1	10.8%
Hani	1248.1	10.1%
Dai	1014.3	8.2%
Zhuang	1003.9	8.1%
Miao	896.7	7.3%
Lisu	557.1	4.5%
Hui	522.0	4.2%
Lahu	408.2	3.3%
Wa	347.7	2.8%
Naxi	265.7	2.2%
Other a	668.9	5.4%
Other b	17.6	0.1%

Note: Other a stands for the 14 other national minorities with populations over 4,000, and other b, stands for an unspecified number of minorities with populations under 4,000.
Source: YNTJNJ, 1991: 805-7.

The climate in Anhui is not severe, with the average air temperature remaining above freezing throughout the three winter months. During the

five summer months, May to September, the temperature averages 20 to 28 degrees celsius. This gives Anhui a long growing season, although careful water management is necessary, because the vast majority of the rainfall comes during the summer monsoons. Sunshine is also plentiful in Anhui throughout the year, adding to the favourable growing conditions. This allows the planting of spring or summer rice, and winter wheat in the grain growing regions of the province. Much of the south and west of the province is mountainous, and is given over to forestry, animal husbandry, tea production and mineral extraction. In the mountainous areas, staple grain production continues wherever possible.

Yunnan, being in the far southwest of the country, with highly mountainous terrain, has a wide variety of climates ranging from tropical to alpine conditions on the edge of the Tibetan plateau, where the mountains range up to 6000 meters, and the valleys average 2000 to 3000 meters. In Xishuang banna, bordering Burma, genuinely tropical agriculture takes place, with some triple crop rice production, rubber plantations, and the production of tropical fruit such as pineapples and bananas. Bananas and coconut palms are widely propagated in Yunnan, not only in the south, but also in sheltered spots in the more northern valleys. The high altitudes in Yunnan have helped Kunming, the provincial capita, earn its name of 'perpetual spring', because temperature are very even and pleasant year round. On the small plains in the south and east, where water is plentiful, wet field rice cultivation is carried out. Where water is less plentiful, to the north and west, dry field cultivation predominates, with rotations of wheat, corn, tubers and tobacco. Precipitation in Yunnan is concentrated in the monsoon season in the summer, while in the winters, sunshine is plentiful.

To put the two provinces in some perspective, Anhui is 139.2 thousand

square kilometres, or a little bigger than Greece, with a population virtually equivalent to that of France, 56.6 million people. This yields a population density of 406.6 people per square kilometre, which is high even by Chinese standards for rural areas. Yunnan is a much larger province, virtually equivalent in size to a united Germany, or 393 thousand square kilometres. Its population is small at 37.3 million people, in the Chinese context, with a population density of 94.9 people per square kilometre. The physical geography of the province dictates this lower population density in Yunnan.

b. Population and Vital Statistics

In 1949, the population of Anhui province was just under thirty million people, while that of Yunnan was about 16 million. The populations of both provinces grew steadily from 1950 to 1957, to just under thirty-four million people in 1958 for Anhui and almost nineteen million in Yunnan in 1957, at a growth rate of 2.2% per annum in both provinces. Anhui suffered severely during the Great Leap period (1958-61), as can be gleaned from the rate of natural increase of the population which reached a low of -57.2 per thousand population in 1960. The impact of the famine on Yunnan was small compared to that in Anhui, with the rate of natural increase depressed to just above or just below zero for 1958-60, but more severe than the China average. It was not until 1968 that the Anhui population surpassed its previous peak in 1958, while the Yunnan population recovered more quickly, surpassing its 1958 peak in 1962. Estimates of the net demographic loss in Anhui from 1959 to 1961 range from 4 to 6.4 million people, or 12% to 19% of the population, while in Yunnan the estimates

range from 1.5 (7.8%) to 2.7 million (14.1%).[7] The net demographic loss for China is estimated to be as high as 30 million people (Ashton et al, 1984: 618), or 4.5% of the population.

After the famine years, the rate of natural increase of the population in both Anhui and yunnan exploded to its highest level, 45 per thousand population in 1962 in Anhui, and 31 per thousand in 1965 in Yunnan. Just as the famine was more severe in Anhui and Yunnan than the national average, so the rebound in the rate of natural increase was larger in both provinces. This resulted from a rapid decline in the death rate, and a surge in the birth rate.[8] The rate of natural increase remained high from the mid-1960s - falling to around 34 per thousand in Anhui and 28 per thousand in Yunnan - right through the Cultural Revolution (1966-9), to decline quite precipitously towards the end of the Maoist period. This pattern mirrors the shift from pro-natalist to anti-natalist policies.

Between 1972 and 1974 the rate of natural increase of the Anhui population fell by ten points from 28.6 to 18.6, and declined further to 13 per thousand between 1974 and 1976. This was the result of a dramatic and sustained decline in the birth rate over this period. By the late 1970s, the declining birth rate was the result not only of anti-natalist policies on the part of the government, but also reflected the very small cohorts of women reaching their peak fertility, a ripple effect from the Great Leap period. There is evidence that a large increase in female child mortality occurred during the famine in Anhui; as under famine conditions the family gave greater priority to the survival of male children. The sex ratios for these cohorts bear witness to discrimination against females (cf. Kane, 1988: 101; and appendix 1.1). For most of the period between

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[7] A detailed account of the estimation of net demographic loss during the Great Leap period in Anhui and Yunnan, please consult appendix 1.1.

[8] The reasons for this rapid decline are discussed in detail in appendix 1.1.

1965 and 1978, the population growth rate remained high, and resulted in the Anhui population numbering just over 47 million people in 1978, at a growth rate of 2% per annum. The rate of natural increase fell much later in Yunnan than it did in Anhui, showing only a small decline in the late Maoist period, followed by rapid reductions in 1977-80. By 1978 the Yunnan population had grown to 31 million , at an annual growth rate of 2.8% from 1965 to 1978.

Table 1.2A - Population and Vital Statistics for Anhui

	Year	Crude Birth Rate (per thousand	Crude Death Rate	Rate of Natural Increase population)	Population (millions)
	1949	18.1	7.0	11.1	27.9
	1952	18.3	7.0	11.2	29.7
	1957	29.8	9.1	20.7	33.4
	1958	23.8	12.4	11.5	33.9
	1959	19.9	16.7	3.2	34.3
	1960	11.4	68.6	-57.2	30.4
	1961	12.3	8.1	4.2	29.9
	1962	53.3	8.2	45.1	31.3
	1963	50.7	7.9	42.8	31.8
	1964	39.9	8.6	31.3	32.3
	1965	41.8	7.2	34.6	32.9
	1970	37.2	6.5	30.7	39.4
	1975	22.1	5.7	16.5	44.9
	1978	18.6	4.8	13.8	47.1
	1979	18.4	4.7	13.7	48.0
	1980	15.4	4.6	10.5	48.9
	1981	18.7	5.2	13.5	49.6
	1982	18.4	5.8	12.6	50.2
	1983	16.8	5.8	10.9	50.6
	1984	16.2	5.5	10.7	51.0
	1985	15.6	5.4	10.2	51.6
	1986	17.9	6.6	11.3	52.2
	1987	18.9	5.9	13.0	52.9
	1988	20.8	5.6	15.2	53.8
	1989	23.6	5.9	17.7	54.7
	1990	24.5	6.3	18.2	56.6
Growth	1949-90	0.7%	-0.2%	1.2%	1.7%
Rate	1961-90	2.4%	-0.9%	5.2%	2.2%
Per	1970-90	-2.1%	-0.1%	-2.6%	1.8%
Annum	1978-90	2.3%	2.3%	2.3%	1.5%

Sources: LSTJ, 1990: 405; AHTJNJ, 1991: 58.

These growth rates offer a contrast to those for 1978-83, when the

'One Child Policy' was at its height. In 1983 the Anhui population was 50.4 million, having grown at a rate of 1.5% per annum between 1978 and 1983. Through much of the reform decade, the rate of natural increase in Yunnan fluctuated around a mean of about 15 per thousand population, illustrating the greater leniency afforded border and ethnic minority regions in the country under the one child policy. Through the latter half of the 1980s, the population growth rate picked up momentum in both Anhui and Yunnan.

The population of Anhui increased to 53.6 million in 1988, and 56.6 million in 1990 according to the fourth population census. This represents an annual growth rate of only 1.2% for 1983-8, but 2.8% for 1988-90. This surge in the population growth rates resulted partly from the large cohort of women born in the post-famine baby-boom reaching their peak fertility in the late 1980s, and the postponement of fertility during the years of strict application of the one child policy. This was also partly a function of the under count of the population produced by the household registration data compared to the more accurate census data, and the discovery of a number of 'missing baby girls' in the 1990 census, reducing estimates of the extent of female infanticide from 1982 to 1990, although only marginally so.

In 1988 the population of Yunnan had grown to almost 36 million people, and continued to grow to 37.3 million in 1990, according to the census. This represented an annual growth rate of only 1.5% for the Yunnan population from 1983 to 1988, while that for 1988-90 was 1.9%, showing a smaller resurgence in the fertility rate in the late 1980s in Yunnan. This was the result of the less extreme age structure of the population born during the period 1958-65, and due to fewer postponed births as a result of the more lenient application of the one child policy in the province.

Tables 1.2A and Y present the crude birth rate, crude death rate, the rate of natural increase and population for selected years for both provinces, providing a more detailed look at the trends over the period.[9]

Table 1.2Y - Population and Vital Statistics for Yunnan

Year	Crude Birth Rate (per	Crude Death Rate thousand	Rate of Natural Increase population)	Population (millions)
1952	33.7	16.2	17.5	17.0
1957	36.3	16.3	20.0	19.0
1959	20.9	18.0	3.0	19.1
1960	24.2	26.3	- 2.1	19.0
1961	19.4	11.8	7.6	19.0
1962	39.7	10.9	28.9	19.6
1965	44.0	13.0	31.0	21.6
1970	28.5	8.2	20.4	25.0
1975	31.7	8.7	23.0	28.8
1978	28.4	6.9	21.4	30.9
1980	20.9	7.4	13.6	31.7
1981	25.4	8.6	16.8	32.2
1982	23.8	9.9	13.9	32.8
1983	23.6	9.2	14.4	33.3
1984	20.3	7.9	12.4	33.7
1985	21.6	8.0	13.5	34.2
1986	26.0	7.9	18.2	34.8
1987	24.0	8.4	15.6	35.3
1988	24.0	7.1	16.9	35.9
1989	23.1	8.1	15.0	36.5
1990	23.6	7.9	15.7	37.3
Growth 1952-90	-0.9%	-1.9%	-0.3%	2.1%
Rate 1961-90	6.8%	-1.4%	2.5%	2.4%
Per 1970-90	-0.9%	-2.9%	-1.3%	2.0%
Annum 1978-90	-1.5%	1.1%	-2.6%	1.6%

Sources: LSTJ, 1990: 751; YNTJNJ, 1991: 95-7.

Another factor to consider is the age structure of the populations of Anhui and Yunnan relative to that of China.[10] The age structure of the Anhui population in 1982 was almost identical to the national average, and

[9] The data presented in tables 1.1A and Y are the household registration data, and represent a significant under count on the mortality rate. More reliable mortality data, from the 1974 cancer survey, and the 1982 and 1990 censuses are presented in chapter three along with a discussion of trends in mortality over this period.

[10] The populations for these two provinces are not yet available by age group for 1990, so the analysis will focus on the differences in age structure in 1982. However, it would be very surprising if either of these populations had aged more quickly that the Chinese population as a whole over the intervening eight years; in fact they would be expected to age more slowly, so the general conclusions should remain unchanged.

thus does not help to explain much, except to lend plausibility to the low CDR in Anhui. However, the higher CDR in Yunnan can be explained in terms of the higher proportion of its population in both the younger and older age groups. Both China and Anhui had 36% of their populations in the 0-14 age group, compared to 39% for Yunnan. As infant mortality remains a very important determinant of the levels of overall mortality in China, this helps to explain the higher death rates in Yunnan compared to China. China and Anhui both had 60% of their population in the 15-64, low mortality age group, while Yunnan had only 56% in this group. Finally, Yunnan had 5% of its population in the 65+ age group, also with high mortality compared to only 4% for Anhui and the national average. This does help to explain the relative levels of mortality in Anhui and Yunnan in 1982, but it does not help to unravel the mystery about the causes of the increases in the death rate over the 1978-90 period. For China in 1990, significant population aging had taken place, with 68% of the population in the 'working age' group, 27% in the 0-14 age group, and 5% in the 65+ age group.

c. Agricultural Production

i. Grain Outputs, Yields and Procurements

Yunnan experienced rapid growth in grain output from 1979 to 1990, 2.4% per annum, ahead of population growth, which was 1.5% per annum over the same period. This masks the divergent experience of the early and late 1980s: 1979-84 4.2% per annum, 1984-90 0.9% per annum. This is set against a background of declining sown area over the reform period, -0.3% for 1979-90, -1.7% for 1979-84, 0.9% for 1984-90. There was little change in the composition of grain output and sown area for grain from 1980 to 1990. There was a modest shift towards tubers and soya beans in terms of both

sown area and output, reflecting the comparative advantage Yunnan holds in the production of these crops. The cultivation of coarse grains also increased somewhat between 1980 and 1990. This might be attributable to the growing demand for coarse grains as livestock feed, being fuelled by the increased demand and prices for animal protein. Rice accounted for just under 30% of all sown area throughout the 1980s, and continued to account for virtually 50% of all food grain output. Gaoliang and maize lost shares in sown area and total output during the 1980s, while wheat lost some of its share in sown area, but increased its share of food grain output, largely due to productivity gains from the introduction of high yielding varieties (HYV) of seed in 1982-3 (SPXZ 1989: 290 ff.). Yields for food grains as a whole grew rapidly from 1979 to 1984, and regained 1984 levels only in 1990. This masks the significant and sustained gains made in rice yields throughout the 1980s, when rice yields grew at 3.8% per annum for 1979-84, and 1.9% for 1984-90. The remarkable impact of the introduction of HYV in 1982-3 on wheat yields is readily apparent, with an 11.7% per annum growth rate in yields for 1979-84, followed by virtual stagnation in wheat yields from 1984-90, 0.78% per annum. Maize had a similar growth profile for yields, of a smaller order of magnitude, while tubers and coarse grains posted rapid gains in yields for 1979-84, only for yields to decline somewhat between 1984 and 1990.[11] Indeed there was an absolute decline in the yields of coarse grains from 1979 to 1990, which can be divided into a steep decline from 1979-84, and a limited recovery for 1984-90. For soya beans, the apparent stagnation in yields from 1979

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11 1984 is a questionable choice as a mid-point year. The growth rates on yields look significantly different if 1985 is taken as the midpoint for the 1980s. This reinforces Hinton's arguments regarding the 'bumper' harvest of 1984, where in point of fact, some proportion of the grain output attributed to 1984 is in fact grain from commune emergency stores which found its way onto the market as households attempted to turn this asset in kind from the decollectivization settlement in to cash. (cf. Hinton, 1990: 22-3) There would have been strong incentives to add this to their good harvest in 1984 to allow them to sell the grain at either above quota or negotiated prices, maximizing their earning potential from the state.

to 1990, masks the increase that occurred from 1979 to 1984 in yields, with the peak occurring in 1984 through the exploitation of HYV, only to return to 1979 levels in 1990.

Grain output grew quite smoothly to its initial peak in 1984 from 1978, and again from 1985 to its most recent peak in 1990. Historically gross procurements declined from a high of 20% on the eve of the Great Leap, to a low of 13% upon Mao's death in 1976. From 1978 to 1981, procurement in Yunnan fluctuated between 8% and 15% of total output, declining to 8% in 1979, which was a particularly bad year for grain production. Procurement then increased steadily from 1982 to 1984, peaking at 23% of total output in 1984 as total output also increased. Sceptics might argue that much of this increase in procurements in 1984 represents nothing more than grain received from one official as part of the decollectivization settlement being exchanged for cash through sales to a second government official - a laundering of grain through peasant households. Grain procurements fell back to 15% of output in 1986, as output itself fell, increasing to 18% of output in 1990. This reflects a very low rate of commoditization of grain production in the province, supporting the hypothesis of a high-level equilibrium trap in agricultural production based on low technology in Yunnan.

From 1952 to 1975, Yunnan was a net recipient of grain, equal to 0.1% to 2.2% of total grain output in the province. 2.2% was the peak in grain inflows to Yunnan that occurred in the wake of the Great Leap famine. In 1976 the tide turned, and Yunnan was a net exporter of grain, the volume equivalent to 0.2% of total output volume. From 1977 to 1980, net transfers of grain out of Yunnan increased to a localized peak of 8.8% of output in 1980, which was a reasonable year for agriculture in Yunnan, but a bad year for much of the grain growing regions in east China. From 1981

to 1984, net grain transfers fell back to the 1-4% range, increasing to 5% in 1985, and subsequently rising to 10% in 1986, and 16% in 1987. High inflation curbed net grain transfers out of the province to 10% of output in 1988, and the ensuing recession resulted in net grain exports of only 5% in 1990, despite steadily increasing grain output from 1987 to 1990. Marketable surplus in grain remained largely within the province, providing only a very limited source of investible surplus within the Yunnan economy. Indeed, the limited outflows of agricultural and primary products put Yunnan at an increasing disadvantage in its trade with the rest of China due to the widening of the scissors gap, making primary products a poor exchange for intermediate and finished goods. Thus throughout the 1980s Yunnan was struggling to commoditize agricultural production to provide a source of investible surplus, the bottleneck constraints are discussed in the following section.

ii. Agricultural Infrastructure: Fertilizer and Irrigation

It is very difficult to interpret chemical fertilizer use in absolute terms. Therefore it is necessary to look at trends in chemical fertilizer use in Yunnan and Anhui from 1980 to 1990, and also fertilizer use relative to the amounts employed elsewhere in China. Anhui and Yunnan both had rapid growth in total fertilizer use between 1980 and 1984, 16.5% and 9.1% per annum respectively. In both instances, this is higher than the average for the provinces of China, excluding the municipalities, 8.6%. Anhui's use of chemical fertilizer was greater than that for China as a whole, by a widening margin throughout the 1980s, while that for Yunnan remained below the China average during the same period.

The ratio of actual fertilizer use to effective fertilizer use provides an indication of the nutritional content of the fertilizer, the

lower the ratio, the higher the quality of the fertilizer. As all of the data presented in table 1.3 are on an effective basis, this has no implications for the use measurements in the table, however, the ratio does suggest that the fertilizer used in Yunnan was of a high quality, given the lower value of the ratios in the final column of the table. From this data we can conclude that a large province such as Yunnan, with an agricultural and resource-based economy, this relative short-fall in chemical fertilizer use would be expected to have a negative impact on the potential for growth in agricultural production. Nutrient availability limits the scope for double cropping, and the effective use of HYV seeds.

Table 1.3 Chemical Fertilizer Use (Effective)

Anhui, Yunnan and China, 1980-90

	(Use in K.Tonnes)			Anhui:	Yunnan:	(Actual:Effective)		
Year	China	Anhui	Yunnan	China	China	China	Anhui	Yunnan
1980	456	549	273	1.20	0.60	4.61	4.48	4.19
1984	633	1012	387	1.60	0.61	4.28	4.89	3.80
1988	781	1266	451	1.62	0.58	4.15	4.94	4.08
1990	942	1445	555	1.53	0.59	4.07	4.96	3.97
80-84	8.6%	16.5%	9.1%			-1.8%	2.2%	-2.4%
84-90	6.8%	6.1%	6.2%			-0.8%	0.2%	0.7%

Sources: ZGTJNJ 1981: 64-66; 1985: 220-223; 1989: 344-347; 1991: 425-426.

If the use of chemical fertilizer posed a bottle neck constraint on growth in agricultural production, lack of irrigation, and lack of mechanization in the irrigation systems that do exist posed a second constraint in Yunnan. Table 1.4 shows the area of farm land under irrigation, and what portion of that was power assisted for Anhui, Yunnan and China, excluding the municipalities. The relatively low proportion of power assisted irrigation in Yunnan might not pose a severe handicap due to the high potential for gravity fed irrigation in this mountainous province. However, if there is no water up high in the mountains, then the need for power assisted irrigation becomes greater, and gravity fed

irrigation is highly labour intensive in its construction and maintenance. The data in the table show that irrigation is highly developed in Anhui compared to rural China on average, and is in fact on par with wealthy and advanced provinces such as Jiangsu, representing 60% of cultivated area in 1990. For rural China, the incidence of irrigated land represented 49% of the cultivated area, while in Yunnan the proportion was only 37% in 1990.

Table 1.4 - Effective Irrigated Area 1983-90 in Anhui, Yunnan and China

	Area in K. Hectares			% Power Assisted		
Year	Anhui	Yunnan	China	Anhui	Yunnan	China
1983	2228	959	1614	na.	na.	na.
1984	2161	962	1668	71%	13%	53%
1988	2215	989	1606	71%	14%	58%
1990	2633	1054	1719	80%	16%	64%

Sources: ZGNYNJ, 1985: 218; 1989: 342; 1991: 423.

Irrigated area and fertilizer use are important because the effective exploitation of HYV strains is dependant on high levels of water availability and soil nutrient content. Similarly a lack of irrigation and a low level of fertilizer use restricts the scope for cultivating more than one crop on a plot of land in the same year. The number of frost-free days in most of Anhui and Yunnan is sufficient to allow extensive double cropping in most areas, and triple cropping in some. However, the low level of irrigation and fertilizer use contributes to the low double cropping index in Yunnan. The double cropping index is the ratio of sown area to cultivated area, reflecting the proportion of cultivated land used for more than a single crop. The data in table 1.5 show that for Yunnan the index was only 1.58 in 1990, increased from 1.51 in 1978. This was well below the level of the index in adjacent provinces with similar climates and terrains, such as: Sichuan 1.98; Guizhou 1.93; and Guangxi 1.98. Yunnan's double cropping index was marginally above the rural China average of 1.55 in 1990, but only rose above the rural China average in

1989. Anhui had a high double cropping index, 1.89 in 1990, but has a relatively low index value when compared to neighbouring provinces such as: Zhejiang 2.54; and Fujian 2.22: although somewhat higher than Jiangsu, 1.81 in 1990. To be fair to Anhui, Zhejiang and Fujian being both coastal and to the south of Anhui do have a climatic advantage.

Table 1.5 - Double Cropping Index 1949-90
Selected Provinces and China

Year	China	Jiangsu	Zhejiang	Anhui	Sichuan	Guizhou	Yunnan
1978							1.51
1987	1.51	1.85	2.51	1.90	1.89	1.75	1.46
1989	1.53	1.83	2.49	1.88	1.95	1.87	1.54
1990	1.55	1.81	2.54	1.89	1.98	1.93	1.58
1991	1.56	1.78	2.55	1.88	2.03	2.05	1.61

Sources: ZGTJNJ 1988: 224, 243; 1990: 332, 358; 1991: 314, 341; 1992: 326, 353. YNTJNJ 1990: 211-2.

iii. Cash Crops

Compared to the national average, Anhui was an important producer of edible oil crops, bast fibres and tea. Production for these products exceeded the national average by substantial margins, up to three times the national average for bast fibres. For Yunnan, ta production was also important, as was tobacco and sugar cane cultivation, and yields for rubber production was also high in Yunnan, by Chinese standards. The data presented in table 1.6 shows that not only were Anhui and Yunnan significant producers of these products, but growth in output exceeded the national average as well. Much of this specialization is the product of climatic and soil conditions in Anhui and Yunnan, as with banana, coconut and pineapple production in Yunnan, as soft fruit production in both provinces - the latter being uniformly below the national average.

Table 1.6 - Cash Crop Production, China, Anhui and Yunnan

Year	Edible Oil (kg p.c.) China	Anhui	Yunnan	Bast Fibres(kg p.c.) China	Anhui	Yunnan	Tea (kg per k pop.) China	Anhui	Yunnan
1980	7.8	10.2	2.0	1.1	3.3	0.0	307.7	654.0	564.1
1984	11.5	19.0	3.7	1.6	5.5	0.1	290.6	844.6	836.3
1988	12.0	16.4	3.3	1.7	5.4	0.1	419.6	1024.7	1163.0
1990	14.1	22.8	3.6	1.0	3.1	0.1	na.	na.	1201.5
80-90	6.1%	8.4%	6.1%	-0.9%	-0.6%		4.0%	5.8%	7.9%

Sources: as per table 2.6.

Year	Sugar Cane (kg p.c.) China	Anhui	Yunnan	Tobacco (kg p.c.) China	Anhui	Yunnan	Rubber (1988) China	Yunnan	
1980	23.1	0.2	57.8	0.9	0.5	3.5	286.0	46.0	Area
1984	36.1	0.7	112.0	1.6	1.5	8.5	239.8	52.0	Output
1988	44.8	1.7	162.4	2.5	1.8	14.4	0.8	1.1	Yield
1990	50.4	1.5	177.4	2.3	1.4	12.0			
80-90	7.8%		22.3%	11.9%		9.8%	10.8%	13.1%	

Notes: For rubber production, area is in thousands of hectares, output is in thousands of tonnes, and yields is in tonnes per hectare.
Sources: as per table 2.6.

iv. Animal Husbandry

Animal husbandry appeared to be below the national average on a per capita basis, except in the production of draught animals in Yunnan. This produces something of a misconception, because the herdsmen of Inner Mongolia, Ningxia and Gansu skew the national figures, particularly for mutton and beef. Yunnan was a significant producer of pork, while beef production was important in Anhui, growing very rapidly. As will be demonstrated in chapter two, the food balance sheets for Yunnan suffer considerably due to the grain lost to animal consumption from human consumption. Also, the data on milk production for Yunnan omit two important factors: the first is sheep and goats milk, and the second is the cheese and yoghurt that are produced, and widely consumed in the province, increasing the access to animal protein and calcium of the Yunnan population considerably.

Table 1.7 - Animal Husbandry in China, Anhui and Yunnan

Year	Pork (kg p.c.) China	Anhui	Yunnan	Beef (kg p.c.) China	Anhui	Yunnan	Mutton (kg p.c.) China	Anhui	Yunnan
1980	11.5	10.1	9.2	0.3	0.1	0.3	0.5	0.4	0.2
1984	13.9	10.7	14.8	0.4	0.3	0.6	0.6	0.4	0.2
1988	18.4	14.4	16.9	0.9	1.3	0.8	0.7	0.5	0.3
1990	19.9	14.9	19.0	1.1	1.7	0.7	0.9	0.5	0.3
80-90	5.6%	3.2%	7.5%	13.9%	32.8%	8.8%	6.1%	2.3%	4.1%

Sources: as per table 2.6.

Year	Draught Animals (#/ k pop.) China	Anhui	Yunnan	Cows Milk (kg p.c.) China	Anhui	Yunnan
1980	96.4	59.3	214.3	1.2	na.	na.
1984	104.3	81.1	244.9	2.1	0.3	1.1
1988	114.4	96.7	256.0	3.3	0.5	1.7
1990	113.9	94.7	249.2	3.6	0.4	1.8
80-90	1.7%	4.8%	1.5%	11.2%	4.9%	8.6%

Sources: as per table 2.6.

d. Industrial Production

The data on industrial output in table 1.8, present a summary of trends for selected industrial products, building materials, manufactured goods, and sources of energy. There are two trends apparent in this table. First, that the recession (1989-90) had a strong impact on most sectors of industrial output in Anhui and Yunnan, as for the national average. Second, Anhui and Yunnan are less industrialized than the national average, and third, that for most sectors, industrial growth was above the national average in Anhui and Yunnan. This was particularly true of coal and electricity generation in Yunnan, while timber production was high in Yunnan - reflecting the natural resource-based nature of the Yunnan economy, although the growth of light manufacture was very rapid in Yunnan, but from a very small base. For Anhui it was construction material such as cement, and light industrial goods that grew most rapidly, exceeding the national average by a wide margin. Tractor output was particularly

buoyant, which might be in response to increased demand as a result of the rapid growth in agricultural output, fuelling demand for mechanization, and more importantly, for transportation purposes.

Table 1.8 - Industrial Output, China, Anhui and Yunnan

Year	Coal (kg p.c.)			Timber (kg/ k pop.)			Cement (kg p.c.)		
	China	Anhui	Yunnan	China	Anhui	Yunnan	China	Anhui	Yunnan
1980	621.2	480.7	369.2	49.4	7.3	62.0	82.8	49.0	49.8
1984	830.4	563.4	479.2	62.0	12.0	98.0	138.9	107.3	90.0
1988	893.9	592.0	571.6	56.7	7.9	92.3	191.7	179.7	123.3
1990	944.6	563.9	596.9	48.7	8.9	65.6	183.4	156.1	126.2
80-90	4.3%	1.6%	4.9%	-0.1%	2.0%	0.6%	8.3%	12.3%	9.7%

Sources: ZGTJNJ, 1981: 235-41; 1986: 303-13; 1989: 306-17; 1991: 432-9.

Year	Electricity (kilowatt hrs p.c.)			Bicycles (per thousand pop.)			Tractors (per million pop.)		
	China	Anhui	Yunnan	China	Anhui	Yunnan	China	Anhui	Yunnan
1980	309.1	196.0	185.1	17.5	4.4	1.6	52.8	18.5	2.3
1984	391.0	261.6	220.7	30.7	17.5	7.3	825.8	642.0	345.2
1988	497.4	345.0	384.5	37.8	24.6	14.1	1261.6	1151.0	513.7
1990	543.3	342.2	337.1	27.5	12.4	9.1	997.8	1561.2	495.9
80-90	5.8%	5.7%	6.2%	4.6%	10.9%	19.0%	34.2%	55.8%	71.1%

Sources: ZGTJNJ, 1981: 235-41; 1986: 303-13; 1989: 306-17; 1991: 432-9.

e. Reform Process in Anhui and Yunnan

There are numerous descriptions of the agricultural reforms during the 1978-90 period in general, making one here redundant.[12] Instead a brief discussion of the reforms as they were manifested in Anhui and Yunnan follows.

Anhui was at the forefront of pioneering the *baogan* system of reforms that now hold sway in much of China. *Baogan daohu* is the system where all production activities are contracted to the household, as opposed to *baochan daozu* where only a limited portion of post-planting crop production tasks are contracted to the production team. Contracting to the household

12 See for example: Ash (1988: 529-55); Potter and Potter (1990); Wang et al, (1985); Watson (1983); Unger (1985-6); Kelliher (1992); and Bramall (forthcoming). The piece by Bramall is particularly good for a discussion of the development of *baochan* and *baogan*, a distinction neglected in much of the literature.

has resulted in the severe fragmentation of cultivatable land in both provinces. For example, in Anhui, the average household had "9.7 plots of land, in order to divide good, medium and poor soil equally and within reasonable proximity to the household" (NMRB, May 9, 1985).

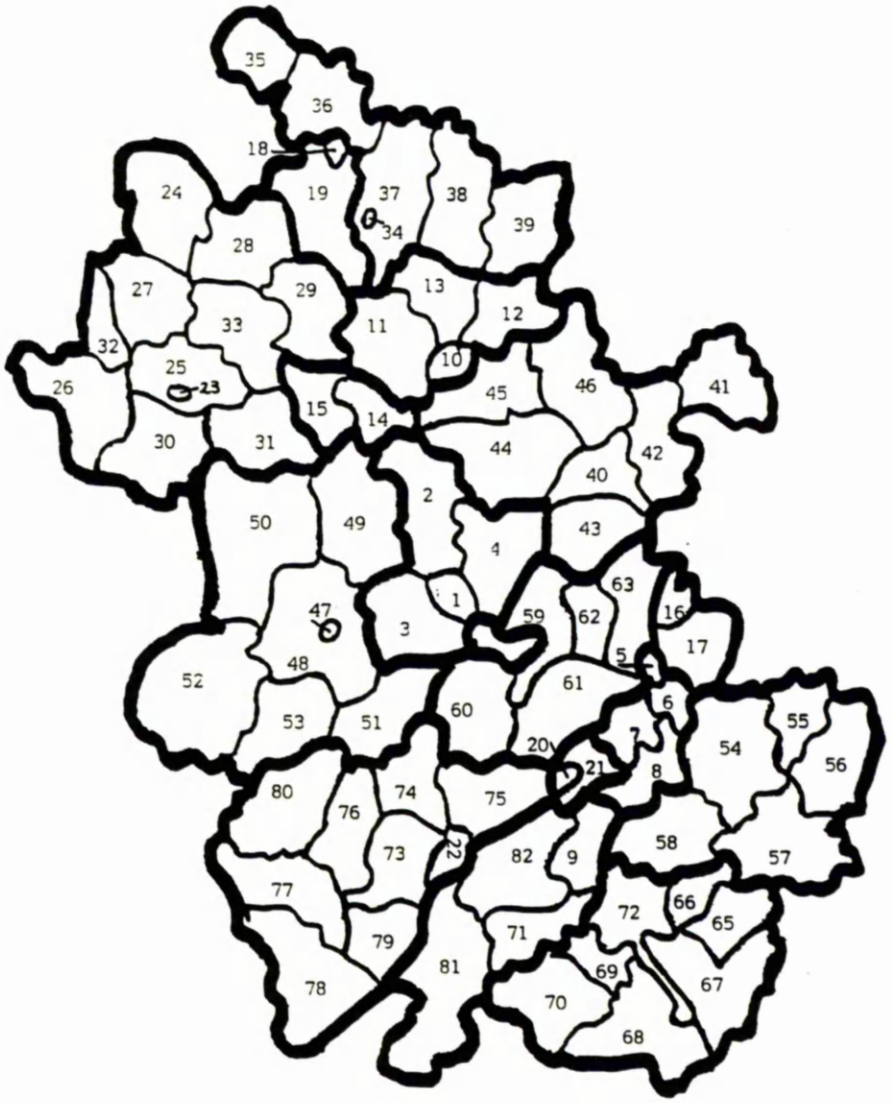
Perhaps the best account of the development of the household responsibility system comes from an article translated by the JPRS entitled Mao's Legacy in Anhui: Rural Reform 1978-80. This report draws parallels between the agricultural crisis that resulted from the drought of 1978 with that of the Great Leap in Anhui, and then compares the experiments with household contracts in Feixi county with the "Responsibility Fields" from 1961, which were the temporary solution to the famine-induced crisis in the early 1960s. The Feixi experiments were highly successful, and more counties entered responsibility contracts with the peasant households. For example, in Lai'an county in Chuxian prefecture, in March 1979, 56.2% of production teams engaged in *baochan daozu*, while 2.6% used *baochan daohu*, and 2.7% engaged in *baogan daohu*. In 1980, 85% of production teams engaged in *baogan daohu*, and 7% in *baogan daozu*. By 1981, all production teams were engaged in *baogan daohu* (LAXZ, 1990: 97-101). This, despite Lai'an not being one of the thirteen counties that pioneered the responsibility system in Anhui.[13] There was a very rapid progression of towards the decollectivization of crop production in Anhui. The successes of counties such as Feixi and Lai'an meant that by 1982 all counties in the province had switched from collective production to *baogan daohu* (cf. JPRS, 1989). By contrast, Yunnan decollectivized late, primarily due to legislation, in 1981-83, although decollectivization in Yunnan met with little protest (YNSQ, 1985), as it did in areas such as Long Bow village for example (cf.

[13] The thirteen counties that pioneered the reform movement in Anhui were: Feixi, Shucheng, Lujiang, Zhao, Wuhu, Xuancheng, Dangtu, Fengyang, Jiashan, Huoqiu, Huoshan, Chaohu, Jinzhai Liu'an and Shou (ZGNYNJ, 1981: 310-313).

Hinton, 1990). For this reason, Anhui and Yunnan provide a good contrast.

Map of Counties and Prefectures for Anhui

(1988 boundaries)



Anhui Counties by Municipalities and Prefecture, with Code Numbers
(1988 Boundaries)

Hefei Mun.
1 Hefei
2 Changfeng
3 Feixi
4 Feidong

Wuhu Mun.
5 Wuhu C.
6 Wuhu Co.
7 Fanchang
8 Nanling

Bengbu Mun.
10 Bengbu
11 Hauiyuan
12 Wuhe
13 Guzhen

Huainan Mun.
14 Huainan
15 Fengtai

Ma'anshan Mun.
16 Ma'anshan
17 Dangtu

Huaibei Mun.
18 Huaibei
19 Suixi

Tongling Mun.
20 Tongling C.
21 Tongling Co.

Anqing Pr.
22 Anqing
73 Huaining
74 Tongcheng
75 Zongyang
76 Qianshan
77 Taihu
78 Susong
79 Wangjiang
80 Yuexi

Fuyang Pr.
23 Fuyang C.
24 Bo
25 Fuyang Co.
26 Linquan
27 Taihe
28 Guoyang
29 Mengcheng
30 Funan
31 Yingshang
32 Jieshou
33 Lixin

Suxian Pr.
34 Suzhou
35 Dongshan
36 Xiao
37 Sui
38 Lingbi
39 Si

Chuxian Pr.
40 Chuzhou
41 Tianchang
42 Lai'an
43 Quanjiao
44 Dingyuan
45 Fengyang
46 Jiashan

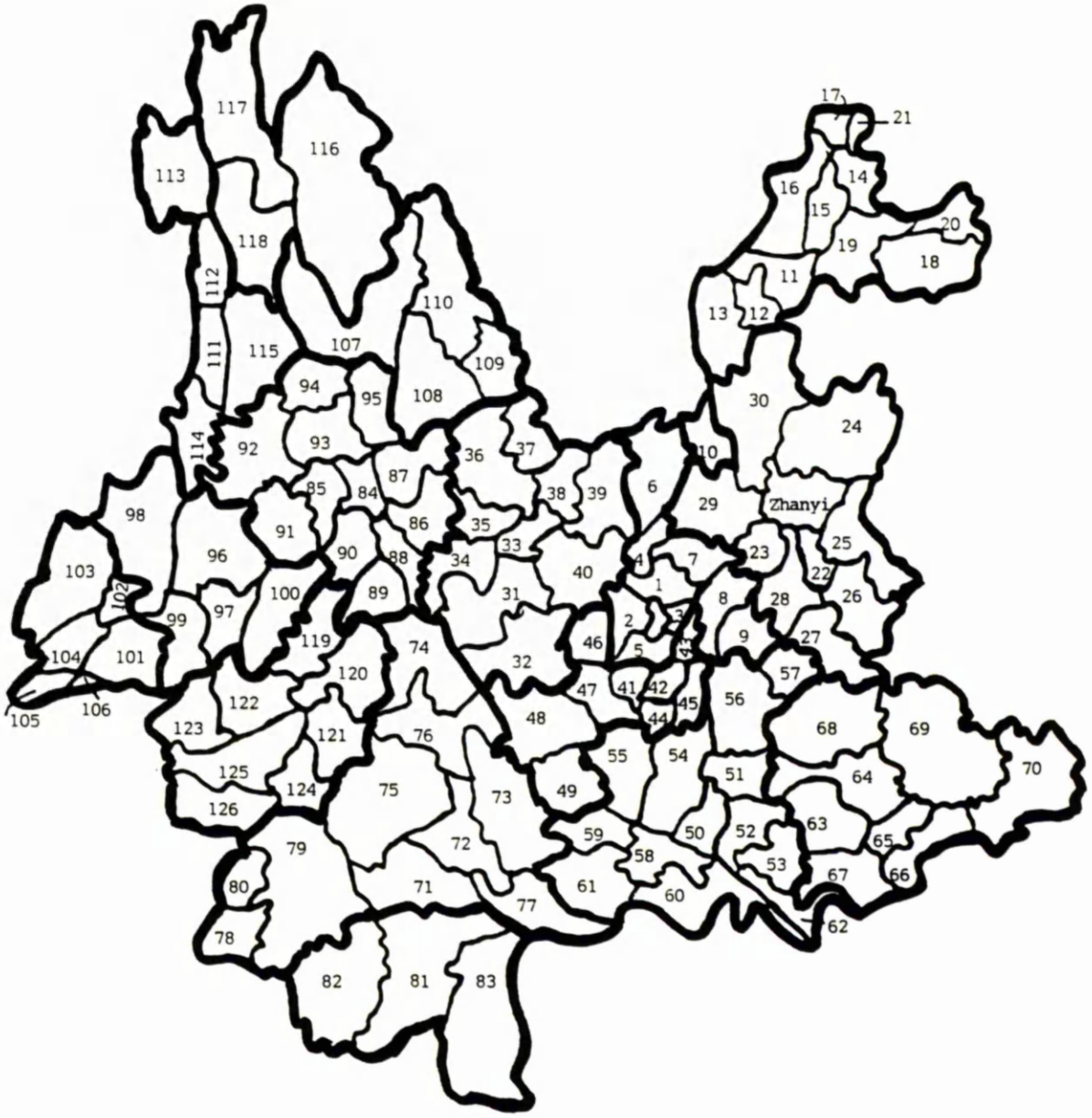
Liu'an Pr.
47 Liu'an C.
48 Liu'an Co.
49 Shou
50 Huoqiu
51 Shucheng
52 Jinzhai
53 Huoshan

Xuancheng Pr.
54 Xuancheng
55 Langxi
56 Guangde
57 Ningguo
58 Jing
65 Jixi
66 Jingde

Chaohu Pr.
59 Chaohu
60 Lujiang
61 Wuwei
62 Hanshan
63 He

Huangshan Pr.
67 She
68 Xiuning
69 Yi
70 Qimen
72 Huangshan

Chizhou Pr.
9 Qingyang
71 Shitai
81 Dongzhi
82 Guichi



Map of Counties and Prefectures for Yunnan

Yunnan Counties by Prefecture, with Code Numbers

Kunming Pr.
1 Kunming
2 Anning
3 Chenggong
4 Fumin
5 Jinning
6 Luquan
7 Songming
8 Yiliang
9 Lunan

Dongchuan City
10 Dongchuan

Zhaotong Pr.
11 Zhaotong
12 Ludian
13 Qiaojia
14 Yanjin
15 Daguan
16 Yongshan
17 Suijiang
18 Zhenxiong
19 Yiliang
20 Weixin
21 Shuifu

Qujing Pr.
22 Qujing
23 Malong
24 Xuanwei
25 Fuyuan
26 Luoping
27 Shizong
28 Luliang
29 Xundian
30 Huize

Chuxiong Pr.
31 Chuxiong
32 Shuangbai
33 Mouding
34 Nanhua
35 Yaoan
36 Dayao
37 Yongren
38 Yuanmou
39 Wuding
40 Lufeng

Yuxi Pr.
41 Yuxi
42 Jiangchuan
43 Chengjiang
44 Tonghai
45 Huaning
46 Yimen
47 Eshan
48 Xinping
49 Yuanjiang

Xishuang Banna
81 Jinghong
82 Menghai
83 Mengla

Honghe Pr.
50 Gejiu
51 Kaiyuan
52 Mengzi
53 Pingbian
54 Jianshui
55 Shiping
56 Mile
57 Luxi
58 Yunyang
59 Honghe
60 Jinping
61 Luchun
62 Hekou

Wenshan Pr.
63 Wenshan
64 Yanshan
65 Xichou
66 Malipo
67 Maguan
68 Qiubei
69 Guangnan
70 Funing

Simao Pr.
71 Simao
72 Pu'er
73 Mojiang
74 Jingdong
75 Jinggu
76 Zhenyuan
77 Jiangcheng
78 Menglian
79 Lancang
80 Ximeng

Dali Pr.
84 Dali
85 Yangbi
86 Xiangyun
87 Binchuan
88 Midu
89 Nanjian
90 Weishan
91 Yongping
92 Yunlong
93 Eryuan
94 Jianchuan
95 Heqing

Baoshan Pr.
96 Baoshan
97 Shidian
98 Tengchong
99 Longling
100 Changning

Dehong Pr.
101 Luxi
102 Lianghe
103 Yingjiang
104 Longchuan
105 Ruili
106 Wanding

Lijiang Pr.
107 Lijiang
108 Yongsheng
109 Huaping
110 Ninglang

Nujiang Pr.
111 Bijiang
112 Fugong
113 Gongshan
114 Lushui
115 Lanping

Deqen Pr.
116 Zhongdian
117 Deqen
118 Weixi

Lincang Pr.
119 Fengqing
120 Yun
121 Lincang
122 Yongde
123 Zhenkang
124 Shuangjiang
125 Gengma
126 Cangyuan

Appendix A1.2

The Affects of the Great Leap Forward in Anhui and Yunnan

There were severe famines in Anhui, and to a lesser extent in Yunnan, during the Great Leap Period[1]. This resulted in significant declines in the absolute population, a large number of out-migrants for Anhui, and an even larger 'demographic loss' either through lost or postponed fertility and pre-mature deaths. There is also evidence that exports of grain by the province during several of the famine years were excessive. The net shipments of grain did turn in Anhui's favour in 1961, but only marginally so. The inflow of grain only became significant during the 1978 drought. There is evidence on net grain shipments for Anhui as a whole, as well as for Dingyuan county, a grain base bordering Jiangsu. In broad outline, Anhui's experience was similar to that of rural Sichuan, where the famine was accompanied by large, but declining, exports of grain out of the province. These shipments of grain were associated with the repayment of the Chinese debt to the Soviet Union. (cf. Bramall, 1989: 185-6) In this appendix comparisons are often drawn between Anhui and Sichuan, as there were the two most severely affected provinces, although their experiences differ substantially. Further, Bramall (1989: 185-6) contains a detailed analysis of the famine period in Sichuan, one of the few detailed provincial studies.

There are several methods of estimating the numbers of excess deaths, and lost fertility during the famine period. Some are very limited in their scope. For example, Kane (1988: 89) simply takes the actual population for the key famine years 1959-61, and applies both the official Chinese CDR and an interpolated CDR based on an average of the official

[1] The Great Leap Forward can be defined as the period from 1958-60, in narrow terms; or in broad terms as the second five year plan period. For the purposes of this dissertation the broad definition applies, from 1958 to 1962. Reference is also made to the recovery period following the Great Leap, 1963-65.

death rates in 1956-58 and 1962-63. This yields a quite low estimate of the excess deaths. Further, it ignores the children who were never born, and the problems with the official death rate statistics.

Peng (1987) has measured excess deaths and fertility lost and postponed for the period from 1958 to 1962 in two separate tables. He does not present the information in a combined form for either Anhui or Yunnan, and therefore no measure of net demographic loss resulting from the crisis was made for either province by Peng. His measure of total fertility loss shows that during the famine years, Anhui was the province most severely affected, losing the equivalent of almost two years of fertility (Peng, 1987: 642). Sichuan was close behind in terms of total fertility lost (186.5% fertility loss), and Sichuan and Anhui were the two provinces most severely affected when judged in these terms. The main difference between the two was that fertility rebounded to a very high level in rural Anhui in 1962, 1963 and 1965, which greatly redressed the loss in the earlier period. There was a smaller jump in the fertility rates for Sichuan in the post-famine period. These two factors combined resulted in a net fertility loss of 1.2 years in Anhui and 1.6 years in Sichuan. Yunnan by contrast lost 'only' 105% of fertility during the famine itself, and .9 years of fertility when increased fertility after 1961 is included (Peng, 1987: 642).

The crisis in Anhui was very single peaked, as can be seen from Table 1.2A in the text. The official CDR in 1958 was 12.4 per thousand population. By 1959, this had increased to 16.7, followed by a jump to 68.6 per thousand population in 1960. This was the highest CDR in China during the Great Leap period. In 1961, the CDR had fallen back to only 8.10 per thousand population. It must be stressed that there are severe problems with the mortality data for China throughout the Great Leap

period, estimates derived from the 1982 census and the fertility survey data, show that official Chinese crude death rates during the Great Leap period, 1957-63, were underestimated by between 40 and 75%, with an average rate of underestimation of 58% for the period as whole (Banister, 1984: 254). As a result, it is necessary to correct the official CDR data upwards for these years.

It is very difficult to determine the cause, or possible causes, of this very sharp increase, and then decrease in mortality in Anhui. One possibility is that the whole registration system had broken down, so that either deaths that did not really belong in 1960 were attributed to 1960, or there are numerous deaths that occurred in 1961 that were not registered. Credence is lent to this hypothesis, by the administrative chaos that was associated with the rapid movement from agricultural producer cooperatives to the large communes during the Leap (Spence, 1990: 578-83). In Anhui this chaos was exacerbated by the movement directly to large communes from what was essentially family farming, without the higher level producer cooperatives that formed a transitional stage elsewhere in China (cf. Hinton, 1990: 51 and LAXZ, 1990: 101-109). This non-registration may be particularly true of infants, where neither the birth nor the death were registered. It was not until 1962 that the birth rate made a significant recovery, a point made by both Banister (1987: 284) and Kane (1988: 96). Another theory is that some of the difference comes from the population counts being based on mid-year populations, while birth and death rates were year-end figures, causing the declines in the total population not to match the death rates as they are reported.

A good indication of the impact of the famine years on the size of the population can be gleaned from the population counts in single year cohorts from the 1982 census. The cohorts are people by age as of July 1,

1982. Those in any given age group were, therefore, born either in the first half of one year or the latter half of the preceding year. It is obvious from the table A1.3.1, that there is indeed a precipitous drop in the cohort size in the years 1958 to 1961 in Anhui. At the height of the famine, the cohort that was born in 1960-61 was only about 33% of the size of the 1952-3 cohort. All of the cohorts born in the years 1958-59, 1959-60, and 1960-61 are significantly smaller than the cohorts in adjoining years. Anhui's return to relative "normality" in 1961-62 is also clear in this table; by then, the index stood at 94.3, where 1952-3=100. The ensuing baby boom in 1963-65, where much of the fertility that appeared to be lost during the famine became merely postponed, is also evident in the table.

Yunnan's experience was very different from that of Anhui. There is obviously a problem in the years 1958-61 for Yunnan, as shown by the smaller cohorts born in these years, with the cohort at the peak of the crisis representing 71.1% of the control cohort size in 1952-3. This is perhaps a little misleading because the cohort in 1954-5 is much bigger than the control cohort. If the series is rebased to 1954-5, then the 1960-1 cohort is only 60% of the pre-famine peak. Relative to provinces that suffered severely during the Leap, the population of Yunnan was little affected by the famine.

From 1956 to 1960, when the rural areas were hardest hit, women suffered most heavily in Anhui, while the opposite is true during the recovery period, where there are more women than men born and surviving. The sex ratio fell for all cohorts born during the famine period in Yunnan. Whether this was because of a difference in attitude towards women in the largely national minority areas in Yunnan, where there were, and still are, numerous matriarchal communities (such as in Xishuang Banna, and among the

Bai and Naxi minorities of N.W. Yunnan), or simply due to the relative severity of the crisis in the two provinces, is difficult to tell.

Table A1.2.1
Size of Cohorts Born 1952-65 from 1982 Census
For Anhui and Yunnan

Year Born	Anhui Population(Thous.) Total	Males	Females	Yunnan Population(Thous.) Total	Males	Females
1952-3	859	441.4	417.2	465	237.7	226.9
1953-4	854	442.7	411.1	520	265.1	254.6
1954-5	873	459.6	413.5	553	283.2	270.1
1955-6	731	381.5	350.2	520	265.3	255.1
1956-7	791	421.9	369.5	507	257.0	249.8
1957-8	693	376.6	316.4	518	264.7	253.5
1958-9	395	219.6	176.1	344	173.2	170.3
1959-6	310	165.7	144.2	434	220.4	213.5
1960-1	280	139.2	141.2	330	163.3	166.9
1961-2	809	403.7	405.8	551	272.7	278.3
1962-3	1528	774.6	753.8	793	395.2	398.1
1963-4	1199	616.8	582.8	768	384.9	382.9
1964-5	1225	634.3	591.4	832	422.1	410.1
Mean	804	416.9	386.8	564	283.7	280.4
St.Dev.	416	209.8	206.6	180	90.5	89.6
C.Var.	.517	.503	.534	.319	.319	.319[2]

Year Born	Anhui Pop.(1952-3=100) Total	Males	Females	Sex Ratio	Yunnan Pop(1952-3=100) Total	Males	Females	Sex Ratio
1952-3	100.0	100.0	100.0	105.8	100.0	100.0	100.0	104.7
1953-4	99.4	100.3	98.5	107.7	111.9	111.5	112.2	104.1
1954-5	101.7	104.1	99.1	111.1	119.1	119.1	119.0	104.9
1955-6	85.2	86.4	83.9	109.0	112.0	111.6	112.4	104.0
1956-7	92.2	95.6	88.6	114.2	109.1	108.1	110.1	102.9
1957-8	80.7	85.3	75.8	119.0	111.5	111.4	111.7	104.4
1958-9	46.1	49.8	42.2	124.7	73.9	72.9	75.0	101.7
1959-60	36.1	37.5	34.6	114.9	93.4	92.7	94.1	103.2
1960-1	32.7	31.5	33.8	98.6	71.1	68.7	73.5	97.9
1961-2	94.3	91.5	97.3	99.5	118.6	114.7	122.6	98.0
1962-3	178.0	175.5	180.7	102.8	170.7	166.3	175.4	99.3
1963-4	139.7	139.7	139.7	105.8	165.3	162.0	168.7	100.5
1964-5	142.7	143.7	141.7	107.3	179.1	177.6	180.7	102.9

Source: ZGRKNJ 1985, (1986), p.730, 774.

To estimate the total shortfall of the population during the famine

[2] This compares to a coefficient of variation of .285 for China as a whole (ZGRKNJ 1985, p.604) and .452 for Sichuan (Bramall, 1989, p.164). The coefficient of variation shows how great the trough to peak variation was in Anhui during and just after the famine years relative to other regions, and China as a whole. The coefficient of variation for Anhui is almost twice as large as the value for China. Yunnan has a smaller coefficient of variation than either Anhui or Sichuan for survivor cohort size, but it is larger than the China average value, which shows that Yunnan was affected by the famines.

years compared to the expected population size, it is necessary to take into account the effects of the famine on both death rates and birth rates. This is accomplished by examining the number of deaths that exceeded the values expected based on the pre- and post-famine CDR; and the net loss of fertility as measured by the expected CBR based on the values of the CBR before and after the famine, relative to the actual values of the CBR. It is of the utmost importance to correct for the vast underestimate of the official CDR during the famine period, based on the 1982 census reconstructions. As there was a great resurgence in the CBR in Anhui in the years after the famine, the author has calculated the net demographic loss as a result of the famine from 1958 to 1963 in both Anhui and Yunnan, in tables A1.2.2 to A1.2.6 below.

The methodology is as follows. The beginning and end points for the estimates of birth rates and death rates are based on the average CBR and CDR for 1955-57 and 1964-66 respectively. These average values were applied to 1958 and 1963 respectively, and the differences between beginning and end points were shared equally between the remaining years 1959-62. This rather crude estimate is conservative because of the short time period it is applied to, ignoring the long-run impacts of famine and malnutrition on the population. The application of the national level ratios to correct for the underestimates of CDR will also yield a conservative estimate, as those for Anhui and Yunnan could both be expected to be larger during the famine period.

The results show that from 1958 to 1963 there were approximately 1.7 million pre-mature or excess deaths in Anhui province, and approximately 2.1 million lost births. This equals an estimated net demographic loss of 3.83 million lives as a result of the famine, based on official Chinese death rates. Further, the difference between the estimated population in

1964 and the actual population provides an estimate of the number of emigrants from Anhui over the period, plus net demographic loss. The total difference between the actual and estimated populations of Anhui in 1964 is approximately 7.7 million people. Eight million people represents more than one fifth of the pre-famine population of Anhui. This divides into approximately 3.83 million in net demographic loss and about 3.85 million migrants from 1958 to 1964.

Table A1.2.2
Estimation of Net Demographic Loss in Anhui 1958-63

	Population		No. Births		No. Deaths		A-E	
Yr	Actual	Expect	Actual	Expected	Actual	Expected	Births	Deaths
58	33940		808.8	1013.4	419.5	397.7	-204.7	21.8
59	34270	34555.8	682.0	1108.2	572.3	381.0	-426.2	191.3
60	30430	35283.0	346.9	1209.5	2087.5	364.6	-862.6	1722.9
61	29880	36127.9	367.5	1318.3	242.0	348.4	-950.8	-106.4
62	31340	37097.8	1669.2	1435.7	257.9	332.1	233.5	- 74.1
63	32320	38201.4	1638.3	1562.8	256.0	315.5	75.5	- 59.6
64	31810	39448.7				TOTAL	-2135.3	1695.9

Note: All numbers are in thousands of people.

Year	Est. No. Lives Lost(Surplus)	Estimates based on: CBR	CDR	R.Nat'l Incr.
1958	226.5	29.9	11.7	18.2
1959	617.5	32.1	11.0	21.1
1960	2585.5	34.3	10.3	24.0
1961	844.4	36.5	9.6	26.9
1962	(307.6)	38.7	9.0	29.7
1963	(135.1)	40.9	8.3	32.6
Ttl	3831.2			

Source: LSTJ: 1990: 405.

There are no official statistics on the number of migrants from Anhui during the famine period. The accounts usually just refer to large numbers of emigrants, the large numbers fleeing to Shanxi caused one district of the province to be named "the area for people relying on friends and relatives" (ZGRK AHFC, 1987: 168-9). It is impossible to tell what proportion of emigrants from Anhui fleeing famine at home became victims of the famine elsewhere, or what proportion returned at the end of the

crisis. What is obvious from this exercise, is that the number of excess deaths and lost fertility is very large, even when based on the official Chinese CDR, representing perhaps as much as eleven percent of the province's pre-famine population.

The above analysis is, however, dependent on the official Chinese registration statistics for the CDR. There are many problems with the registration data, as has been argued by Banister (1984: 254) and (1987: 352); and Ashton et al. (1984: 618), that came to light as a result of the 1982 census and the fertility survey. Banister, and Ashton et al. both provide different alternative values for the CDR during the Great Leap period. This results largely from the shortcomings of the infant and child death statistics. The fertility survey data showed that only about 30% of the infant and child deaths were properly recorded during the Leap period, while for adults close to 80% of all deaths, apparent in the census and the fertility survey data, were registered. As a result of these inconsistencies, the estimates for the crude death rates by Banister and Ashton et al. are shown in table A1.2.3.

Table A1.2.3
Estimates of Crude Death Rates in China 1958-63

Year	Official Reg.	Official Syst. CDR	Banister CDR/Off.RS	Ashton et al. CDR	Ashton et al. CDR/Off.RS
1958	12.0	20.7	1.725	19.1	1.592
1959	14.6	20.7	1.51	24.4	1.671
1960	25.6	44.6	1.76	32.8	1.291
1961	14.2	23.0	1.62	29.5	2.077
1962	10.0	14.0	1.40	21.2	2.120
1963	10.0	13.8	1.38	15.1	1.510
Mean	13.9	25.1	1.58	23.7	1.71
St.Dev.	5.0	5.7	0.14	6.0	0.298
C.Var.	.362	.228	.089	.255	0.174

Note: All numbers are per thousand population.
Note: The Ashton et al. estimates are based on mid-year calculations, so 1958 stands for 1957-58, and so on.
Sources: LSTJ, 1990: 4; Banister, 1987: 352; Ashton et al., 1984: 618.

Banister's reconstructions of mortality in China from the 1982 census is the standard by which other estimates are judged, so it is her estimates

of the shortfall in the official CDR that have been applied to the estimates of net demographic loss for Anhui and Yunnan, as set out in tables A1.2.4 and A1.2.6. As has been already stated, Anhui and Yunnan both suffered from the famine more severely than the China average, based on the analysis of the coefficient of variation for the cohorts of survivors of the Great Leap period from the 1982 census. Therefore the Banister estimates of the CDR for China will err on the conservative side.

Table A1.2.4
Estimation of Net Demographic Loss in Anhui 1958-63
Based on Banister (1987)

	Population		No. Births		No. Deaths		A-E	
Yr	Actual	Expect	Actual	Expected	Actual	Expected	Births	Deaths
58	33940		808.8	1013.4	723.6	397.7	-204.7	326.0
59	34270	34555.8	682.0	1108.2	864.2	381.0	-426.2	483.2
60	30430	35283.0	346.9	1209.5	3674.0	364.6	-862.6	3309.4
61	29880	36127.9	367.5	1318.3	392.1	348.4	-950.8	43.7
62	31340	37097.8	1669.2	1435.7	361.1	332.1	233.5	29.0
63	32320	38201.4	1638.3	1562.8	363.3	315.5	75.5	47.7
64	31810	39448.7						
TOTAL							2135.3	4239.0

Note: All numbers are in thousands of people.

Year	Est. No. Lives Lost(Surplus)	Estimates based on: CBR	CDR	R.Nat.In.	Banister Based-CDR
1958	530.7	29.9	11.7	18.2	21.3
1959	909.4	32.1	11.0	21.1	25.2
1960	4172.0	34.3	10.3	24.0	120.7
1961	994.5	36.5	9.6	26.9	13.1
1962	(204.5)	38.7	9.0	29.7	11.5
1963	(27.8)	40.9	8.3	32.6	10.9
Ttl	6374.3				

Source: LSTJ, 1990: 405.

It is clear from table A1.2.4, that the underestimation of the CDR during this period has a very large impact on the size of the estimated net demographic loss during the Great Leap period. The estimate based on the official data yields a net demographic loss of approximately 3.83 million people, while the estimates based on the Banister adjustment of the CDR yields a net demographic loss of approximately 6.4 million people, or 1.67

times as many people. This, in turn, affects the balance between the estimated number persons who are in the net demographic loss category and those in the migrants category. From the official CDR, the estimate of migrants is 3.85 million people, approximately, while the Banister based estimate is only 1.28 million migrants, approximately. These numbers are based on the difference between the projected size of the population in 1964 compared to the actual size of the population in the same year.

Table A1.2.5
Estimation of Net Demographic Loss in Yunnan 1958-63

	Population		No. Births		No. Deaths		A-E	
Yr	Actual	Expect	Actual	Expected	Actual	Expected	Births	Deaths
58	19140		451.9	659.9	413.8	288.6	-208.0	125.2
59	19120	19511.3	566.2	705.5	343.2	286.1	-139.3	57.1
60	18950	19930.7	458.4	754.1	497.6	283.9	-295.7	213.7
61	19000	20400.9	368.6	806.2	225.0	282.2	-437.6	- 57.2
62	19640	20925.0	779.9	862.1	213.1	280.7	- 82.2	- 67.6
63	20210	21506.4	872.1	922.2	285.8	279.6	- 50.1	6.2
64	20880	22149.0						
TOTAL							-1212.9	277.4

Note: All numbers are thousands of people.

Year	Est. No. Lives Lost(Surplus)	Estimates based on CBR	CDR	R.Nat'l Incr.
1958	333.2	34.5	15.1	19.4
1959	196.4	36.2	14.7	21.5
1960	509.4	37.8	14.2	23.6
1961	380.4	39.5	13.8	25.7
1962	14.6	41.2	13.4	17.8
1963	56.3	42.9	13.0	29.9
Ttl	1490.3			

Source: LSTJ, 1990: 751. (derived)

Yunnan suffered less severely during the Great Leap Forward than did many other provinces such as Anhui, Sichuan and Gansu, but more so than the national average. Based on the methodology outlined above, the impact of the famine on the population of Yunnan has been estimated. The results show that there were approximately 277.5 thousand excess or premature deaths in the province from 1958 to 1963, and approximately 1.2 million in fewer births. The net demographic loss for the period as a whole totals

just under 1.5 million. The evidence on migration comes from the 1982 census volume on Yunnan, which mentions immigration from Hunan of about 150 thousand people in 1959-60 (ZGRK YNFC, 1989: 207-8). This is apparent in the difference in the estimated and actual population in 1964. Table A1.2.5 shows a difference of 1.27 million people between the expected population in 1964, and the actual population size in 1964. However, the estimate of demographic loss for the period from 1958 to 1964 is 1.49 million, leaving approximately 220 thousand immigrants to Yunnan over the famine period, whose presence diminished the net effect of the famine on the population totals. This difference might just as easily be accounted for by exaggerations in the birth and death rates used in the estimates, and thus, the findings should only be treated as approximations.

Table A1.2.6
Estimation of Net Demographic Loss in Yunnan 1958-63
Based on the Banister Estimates

	Population		No. Births		No. Deaths		A-E	
Yr	Actual	Expect	Actual	Expected	Actual	Expected	Births	Deaths
58	19140		451.9	659.9	713.8	288.6	-208.0	425.3
59	19120	19511.3	566.2	705.5	518.2	286.1	-139.3	232.2
60	18950	19930.7	458.4	754.1	875.8	283.9	-295.7	591.9
61	19000	20400.9	368.6	806.2	364.4	282.2	-437.6	82.3
62	19640	20925.0	779.9	862.1	298.3	280.7	- 82.2	17.6
63	20210	21506.4	872.1	922.2	394.4	279.6	- 50.1	144.8
64	20880	22149.0						
TOTAL							-1212.9	1494.1

Note: All numbers are thousands of people.

Year	Est. No. Lives Lost(Surplus)	Estimates based on: CBR	CDR	R.Nat.In.	Banister based-CDR
1958	633.3	34.5	15.1	19.4	37.3
1959	371.5	36.2	14.7	21.5	27.1
1960	887.6	37.8	14.2	23.6	46.2
1961	519.9	39.5	13.8	25.7	19.2
1962	99.8	41.2	13.4	17.8	15.2
1963	194.9	42.9	13.0	29.9	19.5
Ttl	2707.0				

Source: LSTJ, 1990: 751. (derived)

The net demographic loss for Yunnan represents almost 8% of the pre-famine

population. Although this was smaller than for many other provinces, it is hardly trivial. This relatively small impact can also be attributed to the volatile nature of the CDR in the pre-famine period; where the population was regularly weeded out by natural disasters, resulting in a greater resistance to famine conditions among the survivors.

Table A1.2.6 clearly shows the impact of the adjusted CDR figures on the estimate of net demographic loss. Based on the official data on CDR, the net demographic loss was estimated to be about 1.5 million people, while the Banister based estimates of CDR result in an estimate of net demographic loss of almost 2.7 million people, or just under twice as many.

Before entering into a discussion of the grain output an availability data for the Great Leap period, it must be made clear that, although the demographic data for the period are problematic, they are comprehensive, consistent and unambiguous by comparison with the data on grain. The estimated per capita grain availability illustrates the rapid and severe decline in food availability in both Anhui and Sichuan during the famine years, most notably in rural areas. Yunnan suffers a less marked decline in grain availability, but as this total amount of grain includes grain for all uses, including fodder and seed grain, the impact on the numerous people whose livelihood is dependent on raising oxen, yak and water buffalo in Yunnan is underestimated in these figures. The herding population is particularly difficult to make estimates for, since data on the number of head of cattle, and the calories derived from consumption of a much higher amount of protein must be factored into the analysis. Further, the data on livestock ownership is very problematic due partly to the different treatment of privately owned cattle under the push to collectivise agriculture in different regions. The average grain availability in 1956-7 for the whole of rural China was between 190 and 205 kilograms of husked

or trade grain, which is equivalent to bare subsistence (cf. Peng, 1987: 657).

Table A1.2.7 Estimated Per Capita Grain Availability for Agricultural and Non-Agricultural Populations Anhui, Yunnan, Sichuan, 1958-63.

Year	Anhui Rural	Anhui Urban	Yunnan Rural	Yunnan Urban	Sichuan Rural	Sichuan Urban
1956-7	229.0	309.4	250.2	377.3	204.0	221.7
1958	186.5	313.4	222.3	441.6	211.7	274.6
1959	155.6	236.0	190.2	297.5	133.0	286.1
1960	166.4	174.6	208.7	273.4	137.1	253.4
1961	171.2	182.9	203.0	261.7	134.6	216.5
1962	174.3	174.3	214.8	267.9	167.6	220.0
1963	176.9	163.3	212.5	270.4	190.7	219.5
Mean	180.0	222.0	219.1	312.8	168.4	241.7
St.Dev.	21.9	60.6	14.2	64.3	31.7	27.2
Coef.Var.	.121	.273	.065	.206	.188	.113

Note: Amounts are in kg of Trade Grain (Husked = .83*Unhusked)
Source: Peng, 1987: 658.

The gap in grain availability between rural and urban areas was particularly pronounced in the earlier, and peak, famine years. Procurements, including rural resales, from the most severely affected areas were cut back as awareness of the crisis spread. This caused a shortfall for urban consumers in some areas. However, the high procurement in the earlier period exacerbated the impact of the famine on the rural areas. These two distinct phases were clearly evident in urban and rural Anhui from 1958 to 1963, where urban grain availability actually continued to decline through 1963, while those in rural Anhui reached their lowest point in 1959, and increased very modestly thereafter. The experience of Anhui hardly compares with that of Sichuan in terms of the rural shortfall in grain availability. At its lowest, rural per capita grain availability fell to 133 kg in rural Sichuan. In 1959 in Sichuan, rural grain availability fell 37% over 1958, while the grain availability for urban dwellers increased by 4%. In Anhui, the decline in rural grain availability was 18.6% between 1957 and 1958, and 16.6% from 1958 to 1959.

For urban Anhui, the grain availability increased by 1.3% from 1957 to 1958, and then fell by 24.7% from 1958 to 1959, and continued to fall to below subsistence level in 1960. Yunnan appears to have experienced only a very limited grain availability shortfall in 1959-61. This helps to explain the relatively small impact of the famine years in Yunnan on the total population, but does nothing to measure the costs in terms of future livelihood due to lost livestock.

Table A1.2.8 below shows the Peng estimates converted to unhusked grain, and the per capita grain output for Anhui and Yunnan, as well as the per capita output for China as a whole. Throughout the famine period, the per capita grain output values for Yunnan remain above the China average, and above a notional subsistence level of between 270 kg to 309 kg of unhusked grain (Walker, 1984: 3). Per capita grain output in Anhui fell below the subsistence level in 1958 and remained there through 1963.

Table A3.1.8 Estimated Per Capita Grain Availability and Output for Agricultural and Non-Agricultural Populations Relative to Reference Levels: Anhui, Yunnan, and China 1958-63.

	Anhui			Yunnan			China
	Est. p.c. Grain Avail.		p.c. Grain	Est. p.c. Grain Avail.		p.c. Grain	p.c. Grain
Year	Rural	Urban	Output	Rural	Urban	Output	Output
1956-7	275.9	372.3	294.6	301.2	454.4	316.8	304.0
1958	224.1	377.1	260.6	267.5	532.5	284.2	303.1
1959	188.0	284.3	204.6	228.9	359.0	265.2	252.9
1960	200.0	210.8	221.7	251.8	328.9	258.2	216.7
1961	206.0	220.5	210.5	244.6	316.9	263.2	224.0
1962	209.6	209.6	214.0	259.0	322.9	272.1	237.8
1963	213.3	196.4	215.9	255.4	322.9	265.8	245.8
Mean	216.7	267.3	213.7	258.3	376.8	275.1	254.9
St.D.	26.3	72.8	30.8	20.8	77.7	18.7	32.8
C.Var.	.121	.272	.132	.081	.206	.068	.129

Note: Amounts are in kg of Unhusked Grain
Sources: Peng,1987: 658 & LSTJ, 1990: 12, 416, 762.

The low levels of grain availability in both rural and urban areas in Anhui in 1960 and 1962-3 relative to the per capita output values

suggests that there were net outflows of grain from Anhui in these years. This is corroborated by the data in table A3.1.9 showing the patterns of change in grain reserves and net shipments of grain out of Anhui for 1953-83. The same is true of the data on Dingyuan county, Tables A1.2.10-11. This county in particular had large outflows of grain during several famine years, while between the two censuses 1953-64, the population of Dingyuan fell by 33%. Anhui's per capita grain output is below the China average by a large margin for 1956-1959. 1960 shows a reversal of this pattern, largely due to the very rapid rate of population decline in Anhui during this period, as well as the first year of relatively favourable weather since 1957. Anhui continued to be a net exporter of grain products through 1963, at a time when rural grain availability remained below the subsistence level, and urban grain availability continued to fall.

From the patterns of grain shipments and reserves for Anhui province in Table A1.2.9, it is clear that there were severe problems with grain production and procurement. Anhui shipped only a marginally smaller amount of grain to the rest of the country in 1958 compared to 1957 (721.5 million kilograms, which represents 8% of total output). At the same time, the reserves were drawn down sharply, by 895.5 million kilograms or just over 10% of the year's output, an amount in excess of the total exports of grain from the province. The situation continued to deteriorate in 1959, when exports of grain fell by more than a third to 7% of the 1959 output, and reserves fell another 130 million kilograms to only 2% of the 1959 total output. By 1960, grain reserves in the province were down to 132 million kilograms or below 2% of output in 1960 which in turn was down 24% on the pre-famine period. In 1960, the crude death rate was 68 per thousand, and exports of grain out of the province remained at 260 million kilograms, or nearly 4% of the total output.

The data on grain and oil production, procurements and shipments for Dingyuan county provide some interesting detail on flows of grain, and output volumes, in tables A1.2.10-12 below. These data appear to exclude potatoes and pulses, although there is no indication one way or the other in the text. The final four columns are of the greatest interest. These four columns show the total quantity of transfers within the county and total shipments out of the county, the total output for the county, and the percentage shares of each the total transfers and shipments as a percentage of total output. There are large fluctuations in the quantities and percentages of transfers within the county, and shipments out of the county throughout the whole period. What is of the greatest interest is the relatively high proportion of total output that the transfers and shipments represent during the famine years.

Before the crisis began, in 1957, 16% of total output was transferred within the county, and a further 19% were exported out of the county. From 1957 to 1958, total output of grains and oil fell by 20%, while the transfers within the county more than doubled, and exports out of the county declined by 19%. This resulted in the percentage of total output transferred within the county rising to 45%, while exports out of the county increased to 20%. 1958 was the first year of the famine, with drought greatly reducing the grain and oil outputs in the county, and yet procurements (transfers within the county - for reserves and resale to urban and rural residents) increased, leaving much less grain for own consumption by the peasants of Dingyuan. Procurements increased as a proportion of total output, although they did decline in absolute terms, but at a slower rate than the decline in total output, in 1959. There were net imports of grain and oil from the rest of China in 1959. The net effect was that 69% of output was procured in 1959, with an inflow of grain

and oil equal to 15% of total output for the year. Similarly, grain and oil procurements and exports increased to account for 67% of total output in 1960, with procurements alone accounting for nearly 60% of the output figure.

The size of procurements and exports had a significant impact on the grain availability for the peasants of Dingyuan, because the proportion of resales to peasants compared to urban dwellers was no higher than 70% for peasants and 30% for urbanites at the height of the famine. For 1958-63 as a whole, the average proportion of total sales in rural areas was 57%, with a standard deviation of 11%. Given that more than 80% of the population of Dingyuan was rural at this time, this imbalance was significant. Further, during the famine years, the proportion of total output represented by resales of grain was 60% as a maximum, with an average value of 20% for 1958-63 as a whole, and a standard deviation of 11%. The remaining portion of total output was either exported from the county, added to the reserves, or retained for own consumption by the producers. The percentages for 1959 look rather strange due to the drawing down of reserves, and the import of 11 million kilograms of grain and oil. This resulted in the grain availability in this one year to exceed total output. However, the additions of grain from the reserves and the inflows from the rest of China in 1959 only resulted in limiting the shortfall over the previous year, equivalent to a 27% decline on the output in 1958. The data shows that there were problems during the first two years of the famine with the amount of grain available to the peasants in Dingyuan, a county that is traditionally a net exporter of grain. This is confirmed by the large drop in the size of the population between the first and second population censuses, either through net demographic loss or migration.

The natural disaster statistics, tables A1.2.13 and 14, provide some insight into the causes of the agricultural crisis during the famine years. 1959 was a year of very severe drought in Anhui, following a year of less severe drought in 1958. Although the 1959 drought in turn was less severe than that in 1978, it was more widespread. The chief problem with the natural disaster statistics is that they only provide the area of land affected, and do not give any indication of the relative severity of the disaster. To put it in relative terms, in 1959 there was very little rain from March through September over the majority of the grain-growing regions of Anhui, the north and the eastern central region; while the north experienced flooding in the early part of the year as well. In 1978, there was no rain in northern Anhui, and also in some of eastern central Anhui, from January to September. This resulted in the mass slaughter of farm animals, the rapid spread of endemic disease, and the trucking in of water from less severely affected areas. In 1959, the northern part of the province accounted for 72.9% of all area affected by flooding in the province and 49.6% of all area affected by drought. Eastern central Anhui accounted for a further 43.3% of the provincial area affected by drought in 1959. Agricultural conditions improved in 1960, and the grain reserves of the province actually increased to 314.5 million kilograms in this year. The situation was assisted by a modest inflow of grain, 37 million kilograms. It was not until 1968 that both the cultivated area affected by natural disasters and the shipments and reserves of grain had returned to pre-famine levels.

In conclusion, there were numerous factors, both natural and man-made, that brought about the demographic shortfall resulting from the Great Leap period in Anhui. Drought in conjunction with administrative reorganization and its attendant chaos, and the need to be seen to be

succeeding with the new collective agriculture and industrialization drive, together resulted in the procurements of grain being higher than they should sensibly have been. This famine resulted from grain availability sinking well below the subsistence level, particularly in the rural regions. Anhui continued to export grain even when the rural population was living below the subsistence level. This brought about the demographic loss, and migration. The single peaked nature of the crisis in Anhui, virtually limited to 1960, is rather more difficult to explain. It is most likely a combination of the fact that the method of accounting for births and deaths differs in timing to that of the population count, the administrative chaos, and the widespread drought and poor harvests, followed by a good harvest of autumn grain in 1960 which led to the amelioration in 1961.

The famine had a smaller impact in Yunnan, partly due to more favourable meterological factors, and partly because Yunnan was not a net exporter of grain, but was seen as largely grain self-sufficient. This meant that the entitlement failure that occurred among the population of rural Anhui, from cadres unwilling to report a poor harvest and thereby lower procurements and exports, was not a significant factor in Yunnan. Finally, the population of Yunnan had high and widely fluctuating values of CBR and CDR, and a slow rate of natural increase in the pre-famine period. As such, the famine of 1958-60 appeared to be little more than a rather more severe manifestation of the normal cycle of boom and bust in subsistence agriculture.

Table A1.2.9 - Anhui 1953-65
Net Shipments, Reserves, Procurements and Purchases of Grain
(Thousands of Tonnes)

Year	(X-M)	Reserv.	Procure.	Purch.	As a % of Total Output (X-M)	Reserv.	Procure.	Purch.
1953	658.5	704.0	2754.5	1762.5	7.2	7.8	30.3	19.4
1954	-530.5	494.5	2397.5	208.5	-6.8	6.4	30.8	2.7
1955	669.0	1382.0	3589.0	2570.0	5.8	12.0	31.2	22.3
1956	52.0	749.5	2659.0	682.5	0.6	8.2	29.4	7.5
1957	773.0	1178.5	3847.5	2500.0	7.5	11.5	37.5	24.5
1958	721.5	283.0	3484.0	1710.5	8.2	3.2	39.4	19.3
1959	462.5	150.0	3545.5	2089.5	6.6	2.1	50.6	29.8
1960	260.0	132.0	2487.0	1518.5	3.9	2.0	36.9	22.5
1961	-37.0	314.5	1604.0	1222.0	-0.6	5.0	25.5	19.4
1962	212.0	285.0	1582.0	1123.5	3.2	4.2	23.6	16.8
1963	100.0	292.5	1777.0	730.5	1.4	4.2	25.5	10.5
1964	364.5	442.5	2343.5	1543.5	4.5	5.4	29.9	19.0
1965	333.5	650.0	2318.0	1549.0	3.5	6.7	23.9	16.0

Source: AHSQ vol.1, 1985: 612-3, 620-2.

Table A1.2.10 Net Shipments of Grain and Edible Oils, Dingyuan 1953-85, (Thousands of k

Year	Transf's Within County	Total Shipm's (X-M)	Within Prov. (X-M)	Out of Prov. (X-M)	Pop. K	Total Transf.& Shipm's	Total Output	Transf. As % of Output	Shipm's As % of Output
1953	19025	-2545	-3220	675	591	16480	146650	13.0%	-1.7%
1954	37640	28860	1900	26960		66500	216885	17.4%	13.3%
1955	56475	45845	23705	22140		102320	229290	24.6%	20.0%
1956	47800	-26993	2735	-7210		20807	197020	24.3%	-13.7%
1957	36710	43550	26450	17100	536	80260	225070	16.3%	19.3%
1958	80535	35645	25470	10175		116180	179435	44.9%	19.9%
1959	48965	-10495	550	-11045		38470	71160	68.8%	-14.7%
1960	55235	7145	3985	632		62380	93095	59.3%	7.7%
1961	19310	2890	2175	715		22200	83015	23.3%	3.5%
1962	13450	4380	3560	820		17830	99260	13.6%	4.4%
1963	26700	7385	8085	-700		34085	118815	22.5%	6.2%
1964	39350	-5095	-45	-5050	401	34255	113400	34.7%	-4.5%
1965	36990	-4245	-3670	-575	396	32745	147440	25.1%	-2.9%
1966	18850	-31980	-15495	-16485		-13130	107015	17.6%	-29.9%
1967	41010	-645	-445	-200		40365	124320	33.0%	-0.5%
1968	29605	3475	2015	1460		33080	155730	19.0%	2.2%
1969	2470	23465	16535	6930		25935	128155	1.9%	18.3%
1970	21850	12965	5900	7065		34815	178490	12.2%	7.3%
1971	40250	2050	1505	545		42300	177605	22.7%	1.2%
1972	22500	6060	3450	2610		28560	220460	10.2%	2.7%
1973	27175	11645	9195	2450		38820	248970	10.9%	4.7%
1974	84995	11410	6435	4975		96405	238055	35.7%	4.8%
1975	46750	11855	8305	3550		58605	243245	19.2%	4.9%
1976	49730	5275	5465	-190		55005	277880	17.9%	1.9%
1977	53980	18795	16870	1925		72775	296660	18.2%	6.3%
1978	63210	-73145	-52640	-20505	629	-9935	161915	39.0%	-45.2%
1979	42050	60	-1205	1265		42110	274650	15.3%	0.0%
1980	53915	20175	17305	2870		74090	334715	16.1%	6.0%
1981	70790	32475	27815	4660		103265	410850	17.2%	7.9%
1982	118570	83340	36725	46615	695	201910	437210	27.1%	19.1%
1983	143080	56490	36695	19795	656	199570	496185	28.8%	11.4%
1984	107715	66125	44765	21360	660	173840	407900	26.4%	16.2%
1985	162820	134340	64125	70215	646	297160	554370	29.4%	24.2%
Mean	52106	10326	6971	3999	558	57066	207505	24.2%	2.6%
STD	35890	27445	16219	12395	111	48439	103120	13.9%	13.6%
CV	0.69	2.66	2.33	3.10	0.20	0.85	0.50	0.57	5.29

Source: DYXLSZ, 1991: 90-4, 97.

Table A1.2.11 Grain Output and Procurements, Dingyuan 1953-85, (Thousands of KG)

Year	Total Area (Ha)	Total Output	Output/ Unit Area (Kg/Ha)	Total Reserv.	Total Procurem	Total Sales	To Urban Res.	To Rural Res.	Other Sales
1953	181616	138455	762	47285	47285	35700	22335	13365	0
1954	210136	208690	993	80005	80005	45745	28925	16820	0
1955	207028	217520	1051	71280	71280	34450	20425	14025	0
1956	247997	188825	761	56205	56205	57650	20860	35790	0
1957	220255	216875	985	82625	82625	36715	15820	20895	0
1958	202793	178300	879	74565	74565	49695	24920	24775	0
1959	160921	70025	435	36175	36175	42090	14425	27665	0
1960	142902	92845	650	45850	45850	30870	9250	21620	0
1961	153460	81880	534	17830	17830	16390	10080	6310	0
1962	148484	98125	661	21860	21860	16685	8285	8400	0
1963	153929	115755	752	31805	24350	23225	7750	15035	440
1964	155032	110340	712	37195	34335	37445	7735	28510	1200
1965	153451	144380	941	28645	36805	26805	9060	26110	1635
1966	147798	102695	695	11305	9485	40035	9905	28955	1175
1967	141713	120000	847	16420	13770	13945	9265	4200	480
1968	146024	151410	1037	29465	27855	14445	9190	4920	335
1969	154628	123835	801	34025	31500	12570	9360	3210	0
1970	149586	174170	1164	29790	27245	19960	11075	8885	0
1971	143775	170750	1188	20245	18345	25570	11915	13655	0
1972	145435	213605	1469	31780	29630	17055	11120	5935	0
1973	154045	242115	1572	36655	34450	18695	11875	6810	10
1974	156794	231200	1475	32875	29750	20155	11100	8970	85
1975	151926	236390	1556	40660	36985	32640	13620	18940	80
1976	154355	271025	1756	41195	36475	27940	11365	16575	0
1977	156698	289805	1849	42950	44535	22030	10625	11405	0
1978	140544	153625	1093	10230	7355	78280	12410	65875	0
1979	144683	240000	1659	32310	28905	26895	12810	14085	0
1980	135612	300065	2213	44380	41490	28095	14845	13250	0
1981	135930	376200	2768	77160	72990	28055	17140	10915	0
1982	134889	402560	2984	99865	92440	27830	17170	10660	0
1983	138112	461535	3342	163435	155615	28020	19495	8525	0
1984	135201	373250	2761	154785	153485	31735	18930	12805	0
1985	133729	485540	3631	134420	125110	29345	15950	13395	0
Mean	158772	211569	1393	51978	49897	30205	13910	16403	165
STD	27285	107348	835	38004	36971	13449	5210	11830	395
CV	0.17	0.51	0.60	0.73	0.74	0.45	0.37	0.72	2.40

Source: DYXLSZ, 1991: 90-4, 97.

Table A1.2.12 Grain Output and Procurements, Dingyuan 1953-85, (Thousands of KG)

	As a % of Total Grain Output			As a % of Total Grain Sales		
Year	Total Reserves	Total Procurem	Total Sales	To Urban Residents	To Rural Residents	Other Sales
1953	34.2%	34.2%	25.8%	62.6%	37.4%	0.0%
1954	38.3%	38.3%	21.9%	63.2%	36.8%	0.0%
1955	32.8%	32.8%	15.8%	59.3%	40.7%	0.0%
1956	29.8%	29.8%	30.5%	36.2%	62.1%	0.0%
1957	38.1%	38.1%	16.9%	43.1%	56.9%	0.0%
1958	41.8%	41.8%	27.9%	50.1%	49.9%	0.0%
1959	51.7%	51.7%	60.1%	34.3%	65.7%	0.0%
1960	49.4%	49.4%	33.2%	30.0%	70.0%	0.0%
1961	21.8%	21.8%	20.0%	61.5%	38.5%	0.0%
1962	22.3%	22.3%	17.0%	49.7%	50.3%	0.0%
1963	27.5%	21.0%	20.1%	33.4%	64.7%	1.9%
1964	33.7%	31.1%	33.9%	20.7%	76.1%	3.2%
1965	19.8%	25.5%	18.6%	33.8%	97.4%	6.1%
1966	11.0%	9.2%	39.0%	24.7%	72.3%	2.9%
1967	13.7%	11.5%	11.6%	66.4%	30.1%	3.4%
1968	19.5%	18.4%	9.5%	63.6%	34.1%	2.3%
1969	27.5%	25.4%	10.2%	74.5%	25.5%	0.0%
1970	17.1%	15.6%	11.5%	55.5%	44.5%	0.0%
1971	11.9%	10.7%	15.0%	46.6%	53.4%	0.0%
1972	14.9%	13.9%	8.0%	65.2%	34.8%	0.0%
1973	15.1%	14.2%	7.7%	63.5%	36.4%	0.1%
1974	14.2%	12.9%	8.7%	55.1%	44.5%	0.4%
1975	17.2%	15.6%	13.8%	41.7%	58.0%	0.2%
1976	15.2%	13.5%	10.3%	40.7%	59.3%	0.0%
1977	14.8%	15.4%	7.6%	48.2%	51.8%	0.0%
1978	6.7%	4.8%	51.0%	15.9%	84.2%	0.0%
1979	13.5%	12.0%	11.2%	47.6%	52.4%	0.0%
1980	14.8%	13.8%	9.4%	52.8%	47.2%	0.0%
1981	20.5%	19.4%	7.5%	61.1%	38.9%	0.0%
1982	24.8%	23.0%	6.9%	61.7%	38.3%	0.0%
1983	35.4%	33.7%	6.1%	69.6%	30.4%	0.0%
1984	41.5%	41.1%	8.5%	59.7%	40.3%	0.0%
1985	27.7%	25.8%	6.0%	54.4%	45.6%	0.0%
Mean	24.8%	23.9%	18.2%	49.9%	50.6%	0.6%
STD	11.5%	11.9%	13.0%	14.7%	16.4%	1.4%
CV	0.46	0.50	0.71	0.29	0.32	2.23

Sources: DYXLSZ, 1991: 90-4, 97.

Table A1.2.13 Area Affected by Natural Disasters, Anhui 1949-83, (Thousands of Ha.)

	Anhui		Huaibei Plain		E. Central Anhui		SW.Mountains		River Dykes Area	
Year	Flooding	Drought	Flooding	Drought	Flooding	Drought	Floodin	Drought	Flooding	Drought
1949	717.3	96.0	359.3	29.3	43.3	30.0	11.4	36.7	303.3	0.0
1950	1592.7	229.3	1368.7	38.0	160.0	93.3	2.7	98.0	62.0	0.0
1951	362.7	211.3	189.3	77.3	50.0	92.0	20.6	42.0	102.7	0.0
1952	723.3	337.3	634.7	209.3	48.0	88.0	8.0	40.0	32.7	0.0
1953	228.7	1200.7	56.7	778.7	20.7	297.3	24.0	124.7	141.3	0.0
1954	2351.3	243.3	1462.0	72.7	279.3	159.3	36.7	11.4	573.3	0.0
1955	305.3	147.3	223.3	1.3	14.0	122.7	6.0	25.4	62.0	0.0
1956	1772.7	60.7	1438.0	8.7	128.0	31.3	20.0	20.6	186.7	0.0
1957	412.0	222.0	278.0	117.3	34.7	76.0	16.7	28.7	82.7	0.0
1958	129.3	1222.0	118.7	316.0	0.0	712.7	1.3	178.0	9.3	15.3
1959	39.3	2285.3	28.7	1134.7	0.0	990.7	4.0	158.7	6.7	1.3
1960	370.0	550.7	168.7	176.7	63.3	313.3	8.7	60.7	63.3	0.0
1961	284.0	1216.7	230.0	398.7	16.0	648.0	18.7	169.3	19.3	0.7
1962	996.7	776.0	711.3	670.7	115.3	94.7	4.0	10.7	166.0	0.0
1963	2584.0	130.7	2284.7	29.3	248.0	80.0	9.3	21.3	42.0	0.0
1964	992.7	572.0	774.7	266.0	108.0	268.0	9.4	38.0	100.7	0.0
1965	803.3	370.7	712.7	61.3	68.7	284.0	6.0	25.3	16.0	0.0
1966	75.3	930.0	49.3	402.7	8.7	451.3	8.7	74.6	8.7	1.3
1967	144.0	445.3	106.0	26.0	24.7	384.7	6.7	44.7	6.7	0.0
1968	290.0	233.3	169.3	20.7	87.3	189.3	8.7	23.4	24.7	0.0
1969	700.7	67.3	210.7	24.0	112.0	26.0	62.7	17.3	315.3	0.0
1970	272.7	74.0	110.7	8.7	68.7	56.0	12.0	9.3	81.3	0.0
1971	346.7	156.0	247.3	3.3	66.7	103.3	2.0	49.3	30.7	0.0
1972	693.3	81.3	559.3	63.3	108.0	0.7	4.0	17.3	22.0	0.0
1973	316.0	438.7	172.0	297.3	41.3	92.0	29.3	49.4	73.3	0.0
1974	371.3	243.3	260.0	210.7	57.3	26.0	5.3	6.6	48.7	0.0
1975	727.3	50.7	466.0	44.0	129.3	5.3	21.3	1.3	110.7	0.0
1976	44.7	765.3	18.7	506.0	8.0	222.0	5.3	34.0	16.0	0.0
1977	238.0	722.0	78.0	659.3	16.7	54.7	27.4	8.0	116.0	0.0
1978	28.0	1720.0	25.3	880.7	2.7	561.3	0.0	278.0	0.0	0.0
1979	1012.0	446.0	954.7	132.7	25.3	272.7	4.0	40.6	28.0	0.0
1980	1060.0	26.7	606.7	22.0	144.7	3.3	56.0	0.7	252.7	0.0
1981	88.7	155.3	23.3	87.3	18.0	33.3	18.0	20.0	29.3	14.7
1982	1000.7	115.3	728.0	105.3	164.7	8.7	34.0	1.4	74.0	0.0
1983	899.3	80.7	284.0	29.3	103.3	12.0	76.7	39.3	434.7	0.0
Mean	656.4	475.0	460.2	226.0	73.8	196.7	16.8	51.6	104.1	1.0
STD	614.5	512.9	506.5	282.8	66.9	229.1	17.7	60.1	127.5	3.5
CV	0.94	1.08	1.10	1.25	0.91	1.16	1.05	1.17	1.22	3.65

Source: AHSQ vol.1, 1985: 73-6.

Table A1.2.14 Area Affected by Natural Disasters, Anhui 1949-83, (% Total Affected Area)

	Huaibei Plain		E. Central Anhui		SW.Mountains		River Dykes Area	
Year	Flooding	Drought	Flooding	Drought	Flooding	Drought	Flooding	Drought
1949	50.1%	30.6%	6.0%	31.3%	1.6%	38.2%	42.3%	0.0%
1950	85.9%	16.6%	10.0%	40.7%	0.2%	42.7%	3.9%	0.0%
1951	52.2%	36.6%	13.8%	43.5%	5.7%	19.9%	28.3%	0.0%
1952	87.7%	62.1%	6.6%	26.1%	1.1%	11.9%	4.5%	0.0%
1953	24.8%	64.9%	9.0%	24.8%	10.5%	10.4%	61.8%	0.0%
1954	62.2%	29.9%	11.9%	65.5%	1.6%	4.7%	24.4%	0.0%
1955	73.1%	0.9%	4.6%	83.3%	2.0%	17.2%	20.3%	0.0%
1956	81.1%	14.3%	7.2%	51.6%	1.1%	34.0%	10.5%	0.0%
1957	67.5%	52.9%	8.4%	34.2%	4.1%	12.9%	20.1%	0.0%
1958	91.8%	25.9%	0.0%	58.3%	1.0%	14.6%	7.2%	1.3%
1959	72.9%	49.6%	0.0%	43.3%	10.2%	6.9%	16.9%	0.1%
1960	45.6%	32.1%	17.1%	56.9%	2.4%	11.0%	17.1%	0.0%
1961	81.0%	32.8%	5.6%	53.3%	6.6%	13.9%	6.8%	0.1%
1962	71.4%	86.4%	11.6%	12.2%	0.4%	1.4%	16.7%	0.0%
1963	88.4%	22.4%	9.6%	61.2%	0.4%	16.3%	1.6%	0.0%
1964	78.0%	46.5%	10.9%	46.9%	0.9%	6.6%	10.1%	0.0%
1965	88.7%	16.5%	8.5%	76.6%	0.7%	6.8%	2.0%	0.0%
1966	65.5%	43.3%	11.5%	48.5%	11.5%	8.0%	11.5%	0.1%
1967	73.6%	5.8%	17.1%	86.4%	4.7%	10.0%	4.6%	0.0%
1968	58.4%	8.9%	30.1%	81.1%	3.0%	10.0%	8.5%	0.0%
1969	30.1%	35.6%	16.0%	38.6%	8.9%	25.7%	45.0%	0.0%
1970	40.6%	11.7%	25.2%	75.7%	4.4%	12.6%	29.8%	0.0%
1971	71.3%	2.1%	19.2%	66.2%	0.6%	31.6%	8.8%	0.0%
1972	80.7%	77.9%	15.6%	0.8%	0.6%	21.3%	3.2%	0.0%
1973	54.4%	67.8%	13.1%	21.0%	9.3%	11.3%	23.2%	0.0%
1974	70.0%	86.6%	15.4%	10.7%	1.4%	2.7%	13.1%	0.0%
1975	64.1%	86.8%	17.8%	10.5%	2.9%	2.6%	15.2%	0.0%
1976	41.8%	66.1%	17.9%	29.0%	11.9%	4.4%	35.8%	0.0%
1977	32.8%	91.3%	7.0%	7.6%	11.5%	1.1%	48.7%	0.0%
1978	90.5%	51.2%	9.5%	32.6%	0.0%	16.2%	0.0%	0.0%
1979	94.3%	29.7%	2.5%	61.1%	0.4%	9.1%	2.8%	0.0%
1980	57.2%	82.5%	13.6%	12.5%	5.3%	2.6%	23.8%	0.0%
1981	26.3%	56.2%	20.3%	21.5%	20.3%	12.9%	33.1%	9.4%
1982	72.8%	91.3%	16.5%	7.5%	3.4%	1.2%	7.4%	0.0%
1983	31.6%	36.4%	11.5%	14.9%	8.5%	48.7%	48.3%	0.0%
Mean	64.5%	44.3%	12.0%	41.0%	4.5%	14.3%	18.8%	0.3%
STD	20.1%	27.4%	6.4%	24.2%	4.7%	11.8%	15.6%	1.6%
CV	0.312	0.618	0.535	0.591	1.028	0.826	0.833	5.047

Source: AHSQ vol.1, 1985: 73-6.

Table A1.2.15 Crude Death Rates per Thousand Population for China, 1949-64.

Unit	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
China	20.0	18.0	17.8	17.0	14.0	13.2	12.3	11.4	10.8	12.0	14.6
Anhui	7.0	7.1	7.0	7.0	7.2	16.6	11.8	14.3	9.1	12.3	16.7
Yunnan		17.9	16.7	16.2	15.6	16.7	13.7	15.2	16.3	21.6	18.0
Beijing	11.9	14.6	15.3	10.9	10.5	8.6	9.5	7.7	8.2	8.1	9.7
Tianjin	10.2	12.0	12.5	10.7	10.2	9.3	9.9	8.8	9.4	8.7	9.9
Hebei	12.7	12.4	12.3	12.1	11.5	12.1	11.6	11.3	11.3	10.9	12.3
Shanxi	13.7	13.5	12.8	12.2	11.4	14.7	12.9	11.6	12.7	11.7	12.8
Nei Mongol						20.9	11.4	7.9	10.5	7.9	11.0
Liaoning						8.6	9.4	6.6	9.4	8.8	11.8
Jilin	12.9	12.4	11.8	11.5	10.9	10.4	9.9	7.5	9.1	9.1	13.4
Heilongjiang						11.1	11.3	10.1	10.5	9.2	12.8
Shanghai		8.5	14.1	8.8	8.8	7.1	8.1	6.8	6.0	5.9	6.9
Jiangsu	16.5	15.1	15.9	15.7	13.6	12.2	11.8	13.0	10.3	9.4	14.6
Zhejiang	14.9	15.4	13.5	14.0	13.6	13.4	12.6	9.5	9.3	9.2	10.8
Fujian		13.9	14.8	13.4	12.6	10.9	8.9	8.4	7.9	7.5	7.9
Jiangxi						14.2	16.2	12.5	11.5	11.3	13.0
Shandong	12.2	12.2	12.2	12.2	12.1	11.7	13.7	12.1	12.1	12.8	18.2
Henan						13.3	11.8	14.0	11.8	12.7	14.1
Hubei						15.9	11.6	10.8	9.6	9.6	14.5
Hunan		20.0	19.0	19.0	17.0	17.5	16.4	11.5	10.4	11.7	13.0
Guangdong	15.0	14.1	13.1	12.6	12.4	11.2	10.6	11.1	8.4	9.2	11.1
Guangxi						15.2	14.6	12.5	12.4	11.7	17.5
Sichuan		21.8	20.1	18.2	17.0	8.4	9.2	10.4	12.1	25.2	47.0
Guizhou	7.2	8.2	9.3	7.8	9.3	8.8	8.1	7.5	8.8	13.7	16.2
Shaanxi						11.0	10.5	9.9	10.3	11.0	12.7
Gansu	11.1	11.0	11.0	11.0	11.0	11.6	11.9	10.8	11.3	21.1	17.4
Qinghai						13.3	14.1	9.4	10.4	13.0	16.6
Ningxia		20.6	19.2	22.4	19.4	13.1	10.2	10.6	11.1	15.0	15.8
Xinjiang	20.8	19.9	19.4	18.8	17.8	16.8	14.4	14.2	14.0	13.0	18.8
Mean	13.3	14.4	14.4	13.6	12.8	12.7	11.7	10.6	10.5	11.8	14.8
STD	3.9	4.1	3.5	4.0	3.1	3.2	2.2	2.3	2.0	4.2	6.8
CV	0.29	0.29	0.24	0.29	0.25	0.25	0.19	0.22	0.19	0.36	0.46
Sources: LSTJ, 1990: passim.											

Table A1.2.15 Crude Death Rates per Thousand Population for China, 1949-64.

Unit	1960	1961	1962	1963	1964	Mean	STD
China	25.4	14.2	10.0	10.0	11.5	14.5	4.1
Anhui	68.6	8.1	8.2	7.9	8.6	13.6	14.6
Yunnan	26.3	11.8	10.9	14.1	15.2	16.4	3.6
Beijing	9.1	10.8	8.8	8.1	8.3	10.0	2.2
Tianjin	10.3	9.9	7.4	7.3	7.8	9.6	1.4
Hebei	15.8	13.6	9.1	11.2	10.9	12.0	1.4
Shanxi	14.2	12.2	11.3	11.4	14.0	12.7	1.1
Nei Mongol	9.4	8.8	9.0	8.5	11.8	10.6	3.5
Liaoning	11.5	17.5	8.5	7.9	9.3	9.9	2.8
Jilin	10.1	12.0	10.0	9.4	12.6	10.8	1.6
Heilongjiang	10.6	11.1	8.6	8.6	11.5	10.5	1.2
Shanghai	6.8	7.7	7.3	7.0	6.1	7.7	1.9
Jiangsu	18.4	13.4	10.4	9.0	10.1	13.1	2.7
Zhejiang	11.9	9.8	8.6	7.9	9.2	11.5	2.4
Fujian	15.3	11.9	8.3	7.4	8.6	10.5	2.8
Jiangxi	16.1	11.5	11.0	9.8	10.9	12.5	2.0
Shandong	23.6	18.4	12.4	11.8	12.0	13.7	3.3
Henan	39.6	10.2	8.0	9.4	10.6	14.1	8.2
Hubei	21.2	9.1	8.8	9.8	10.9	12.0	3.6
Hunan	29.4	17.5	10.2	10.3	12.9	15.7	5.0
Guangdong	15.2	10.8	9.4	7.6	8.3	11.3	2.3
Guangxi	29.5	19.5	10.3	10.1	10.6	14.9	5.4
Sichuan	54.0	29.4	14.6	12.8	13.9	20.9	13.0
Guizhou	45.4	17.7	10.4	9.4	10.5	12.4	9.0
Shaanxi	12.3	8.8	9.4	10.6	15.6	11.1	1.8
Gansu	41.2	11.5	8.3	10.4	15.6	14.1	7.6
Qinghai	40.7	11.7	5.4	8.4	15.5	14.4	8.9
Ningxia	13.9	10.7	8.5	10.2	13.4	14.3	4.2
Xinjiang	15.7	11.7	9.7	9.4	16.3	15.7	3.4
Mean	22.8	12.8	9.4	9.5	11.5		
STD	15.0	4.4	1.7	1.7	2.6		
CV	0.66	0.34	0.18	0.18	0.23		
Sources: LSTJ,							

Chapter 2 - Poverty

1. Introduction

The literature on China has been relatively neglectful of poverty in the recent past, when compared with the attention paid to income inequality and living standards. Partly this was a function of the great strides that appear to have been made in reducing absolute poverty in rural China. Sources as diverse as the Beijing Review (1991) and the World Bank (1992b) asserted that absolute poverty in rural China declined dramatically from 260 million people in 1978 to 98 million in 1990 (World Bank, 1992b: ix), and Riskin's estimate for 1988 was 105 million persons, only 37% of whom were in designated poverty areas (Riskin, 1993: 152, 163).[1] Many have taken this reduction in the incidence of absolute poverty as evidence that "trickle-down" is working in rural China, and that in the fullness of time, all poverty will be alleviated. However relative poverty has increased in rural China during the 1980s, as part of the increased divergence in economic conditions resulting from the economic reforms. Further, Riskin showed that only a small proportion of individuals in poverty live in the targeted poverty areas, and therefore are largely excluded from the poverty alleviation programmes sponsored by central and provincial governments, and foreign aid agencies. Therefore the impact of the economic reforms on the incidence of poverty among the rural population in two poor provinces remains a question of some importance.

Trickle-down is a concept in the development literature which comforts those who shy away from poverty alleviation policies requiring

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[1] Official Chinese estimates published in the Beijing Review put the number in absolute poverty at 70 million people in 1990 (1991: 8). More recent figures from the Chinese government referred to 80 million living in poverty (SWB, 1994: 1). These numbers are limited to individuals living in counties that have been designated as poverty areas. The Chinese perceive poverty as solely a spatial problem, which Riskin has shown not to be the case. A list of the counties designates as poverty areas by the central government, and the provincial governments of Anhui and Yunnan appears in appendix 2.2 at the end of the chapter.

institutional change or a redistribution of productive assets. It states that poverty alleviation will occur in the fullness of time when there are rapid rates of economic growth, themselves producing improvements in employment and income inequality, and therefore reducing poverty. For trickle-down to reduce poverty in a given economy, it requires "... not only that trickle-down mechanisms exist, but also that agricultural growth has been sufficiently rapid for income levels per head to rise over time" (Ahluwalia, 1985: 69-70). The evidence on trickle-down in India (the richest seam in this literature) is mixed, while Fields found evidence for a link between poverty alleviation and rapid economic growth when the latter was accompanied by increased employment in the modern sector and improvements in income inequality. By contrast, Sachs' analysis of poverty in Brazil showed no evidence of trickle-down during a period of rapid economic growth.[2] This suggests that rapid economic growth is a necessary, but not sufficient condition for poverty alleviation resulting from trickle-down, as asserted by Ahluwalia above. The evidence from China is mixed. Rapid growth in the agricultural sector was accompanied by some modern sector employment growth and rapid increases in incomes. However, income inequality also increased most rapidly in precisely those regions where these positive changes were largest. Therefore it is unclear whether or not the mechanisms for trickle-down were genuinely in place in rural China. In other words, is this a Taiwanese scenario or a Brazilian one? The evidence presented here suggests that absolute poverty declines have been modest relative to the increases in average incomes, suggesting that the increases in income inequality are hampering the trickle-down process.

Apart from the factors associated with trickle-down, there are

[2] See for example: Ahluwalia, 1985: 59-75; Bardhan, 1985: 76-94; Fields, 1984: 74-83; Sachs, 1991: 93-118; and Tyler et al., 1993: 358-64 for empirical studies on trickle-down, economic growth and poverty alleviation.

several other key players in the rural poverty alleviation process. One of the most important of these is price, both the relative prices used when evaluating self-consumed agricultural produce in estimating household income (Jamal, 1990: 833-44; Mellor and Desai, 1985: 203-5), and the inter-sectoral terms of trade (Mellor, 1985: 21-39). The first of these two price factors was addressed by Riskin (1993) by producing new poverty estimates of income levels and the poverty line adjusting the prices for both self-consumed and marketed output to reflect the contract and market prices for grain. The World Bank also acknowledged the importance of the question of prices by producing both "planned" and "procurements" prices based poverty lines (1992b: 137-41). To what extent these captured higher market prices relative to the extent of grain commoditization is not clear. Despite the importance of these adjustments of income and poverty lines for different price sets in China, this is not the issue regarding prices that is most crucial in the wider development literature. Here it is the links between food prices and poverty among landless labourers in developing countries that are crucial, but this is not a problem in the Chinese context.

The inter-sectoral terms of trade are very important in the China context, because there were three reversals of the terms of trade in China over the 1978-90 period. The period from 1979-84 saw a significant improvement in the prices of agricultural output relative to industrial goods, virtually the first such shift since 1957. This corresponded to the period of rapidly rising peasant incomes and the rapid declines in rural poverty. 1985 saw the introduction of the short-lived "contract-system" which simultaneously reversed relative prices to the benefit of industrial goods (cf. Kueh, 1993). From 1986 to 1989, prices again shifted back in agriculture's favour, but only recovering the ground lost to industrial

prices in 1985. However, this was eroded by increasing inflation and the subsequent period of economic retrenchment, as the incidence of poverty increased in the late 1980s, as will be demonstrated below.

Relative prices are an important means of exacerbating or alleviating rural poverty, depending on the balance between input prices, such as those for chemical fertilizer and farm tools and machinery which are industrial outputs, and the prices for agricultural products. Riskin points out that in 1988 the balance in both the relative price set, and in taxation policy was tilted heavily in favour of industry and urban residents, continuing the extraction of surplus from rural China that has been vilified in the Dengist reassessment of collective agriculture.

Other factors discussed in the literature in conjunction with agricultural growth and poverty alleviation are: population growth, rural-urban migration, Green Revolution technology and land distribution (cf. Mellor and Desai, 1985: 203-5; Mellor, 1985: 21-39). Population growth was low in China throughout the 1978-90 period, providing a positive setting for poverty alleviation. If low population growth assisted poverty alleviation, then the constraints on rural-urban migration, and on migration from poverty areas to the more dynamic coastal areas hindered it. Modern sector enlargement growth has only had limited success in replacing migration, as its development has been greatest in areas with the most dynamic economic growth. Green Revolution technology, in terms of irrigation and chemical fertilizer, was in place before the beginning of the 1978-90 period, while the introduction of HYV seeds took place largely in the early part of the Dengist period.[3] Therefore, Green Revolution technology would have continued to play an important role in agricultural

[3] For more information on the introduction of the Green Revolution troika of water, fertilizer and seeds, see the section on agricultural production in chapter 1, and Bramall, forthcoming.

output growth throughout the 1980s, although evidence on the degradation of irrigation networks since decollectivization may have posed a constraint from the late 1980s. Finally, the transition from collective agricultural production to family farming did nothing to alter the number of landless labourers, and therefore has had no impact on poverty from this source, so prevalent in other Asian countries. However, the fragmentation and small size of holdings will certainly pose problems for agricultural modernization, and perhaps limit the potential for future growth in yields.

Table 2.1 - Grain Output and Population Growth Rates

	Grain Output			Population		
Year	China	Anhui	Yunnan	China	Anhui	Yunnan
1975-90	2.4%	2.9%	1.6%	1.4%	1.6%	1.7%
1978-90	2.5%	3.1%	1.7%	1.4%	1.6%	1.6%
1978-85	2.7%	2.9%	1.8%	1.4%	1.3%	1.4%
1985-90	2.8%	3.5%	1.8%	1.6%	1.9%	1.8%

Note: Growth rates for grain output are OLS calculations, based on regression lines presented in the figures in appendix 2.1 at the end of the chapter. Growth rates for the population are compound growth rates based on the household registration data.
Sources: LSTJ, 1990: 405, 416, 751, 762; ZGTJNJ, 1991: 79, 81, 346, 350.

At the national level, grain output growth outpaced population growth by a small margin, particularly in the late 1980s. Grain output in Anhui exceeded population growth by a larger margin from 1975 to 1990 when compared with the national average. Far from being positive, this rate of growth is absolutely essential because Anhui is one of the major grain exporting provinces of East China. In Yunnan, by the late 1980s, the population growth rate equalled the growth rate for grain output, grain output having exceeded population growth by the narrowest of margins in 1978-85, in a province where small grain imports are balanced against a significant export of meat products.[4] Given that the claims on grain production from increased population in China and increased non-staple food grain uses, such as the animal feed required to support the increased

[4] A more detailed examination of per capita grain availability appears in section four.

consumption of animal protein and dairy products, the potential for entitlement failure in poor rural communities remains in China. Therefore, the question of absolute poverty also remains relevant.[5]

The second section of this chapter presents a discussion of some of the extensive literature on defining and measuring poverty. The third section discusses previous works examining and estimating the extent of poverty in China. This is followed by the analysis of trends in the incidence of absolute poverty in Anhui and Yunnan, and how trends in income and grain availability in the two provinces compare to the national average. This is followed by a conclusion, drawing together the strands of the analysis.

2. Defining and Measuring Poverty[6]

To provide a complete assessment of both the numbers living below a poverty line, and the quality of the life that those below the poverty line are forced to live, requires analysis of three facets of poverty and the social system within which they exist. First a quantitative analysis of the incidence of poverty, and the correlates of poverty is necessary. This entails a narrow assessment of the number living below the poverty line (the head count ratio), and the distance by which they are below the poverty line (the poverty gap index). This should be accompanied by an assessment of factors directly related to the incidence of poverty , such as employment opportunities, access to credit, and tenancy and land ownership patterns. In other words, it is not sufficient to look at the numbers in poverty, if we are interested in measuring poverty and the

[5] See for example Croll's (1993) description of life in villages in Funing or Guangnan counties.

[6] There is a vast literature on measuring and defining poverty in the Indian sub-continent alone, and scholars from those countries are at the forefront of theoretical developments in the poverty field as well. Of necessity only a narrow range of this literature is discussed in this chapter.

causes of poverty with a view to policy formulation and poverty alleviation. If this is the ultimate goal, then an examination of the socio-economic climate, and the changes in that climate over time is also necessary to understand the dynamics of poverty. Finally, the relationship between the state and those in the lowest social strata is also important, not merely in terms of services provided by the state, such as education, sanitation, health care, subsidies and transfer payments; but also the political power held by those in poverty to determine policies. If these individuals are essentially disenfranchised or alienated from the political process, the likelihood of poverty alleviation policies being high on the political agenda are slim.

Much of the general literature on poverty in rural Asia has focused on measuring or approximating long-run average earnings to distinguish those who are chronically poor (about 20%) from those who are only temporarily poor (about 67.5%), based on data from rural India. Much of this analysis has examined land ownership, tenancy patterns, ownership of draught animals, and access to credit to assess average wages in the agricultural sector, which in turn have implications for non-farm sector employment and earnings (cf. Srinivasan, 1993: 112-7). For China, the problems are somewhat different in trying to identify temporary versus chronic poverty. First, during the period of collective agriculture from 1957 to 1982, varying proportions of land were held for collective and private cultivation. The private land was primarily distributed based on household size, and therefore relatively equally distributed,[7] while earnings from participation in collective farming usually had both an

[7] Some households were able to expand their private plots through salvaging waste or marginal land for use as private plots.

quantitative or qualitative, and a welfare component.[8] As a result, land ownership and tenancy patterns that are so important to the analysis of poverty elsewhere in Asia are irrelevant in China, and life-cycle variations in poverty are only relevant to the extent that young children and elderly dependants are a drain on family resources and the potential to earn collective work points. This served to mitigate the ability of young middle-aged workers to earn increased work points at the height of their physical strength and skill development.

After decollectivization, land was distributed, and periodically redistributed, on a per capita or household basis; which again meant that land tenancy and ownership issues were of only limited importance in determining long-run earnings potential after decollectivization. For the purposes of poverty analysis, a much more important effect of decollectivization was the distribution of the non-land productive assets, such as draught animals and tractors for cultivation and transportation; and the loss to many peasants of the rural social security system. With household level data, it is possible to account for the differences in current income resulting from command over non-land productive assets, but the impact of the change in rural institutions on an individual's well-being is very difficult to measure and is doubtless of importance in any analysis of poverty in China in the 1980s. Similarly, differentials in access to credit also plays an important role in fostering, or limiting, an individual's capacity for expansion into agricultural sidelines and non-farm employment and investment. The same is true of draught animals, for ploughing services, transportation services and barnyard manure, and tractors for ploughing services and transportation, particularly for the

[8] There were two types of work that earned work points, one for a fixed value of work points, for activities that were considered "odd jobs", while the principle crop work earned variable rate, determined by the nature of the work (physical effort) and the quality or quantity of the work (cf. He, 1993).

generation of cash income for the household.

Cash income is a vital component in determining the extent of poverty in China, as demonstrated by Vogel (1989), Croll (1993) and He (1993), because households without cash income remain part of the subsistence economy. As such they are unable to pay for supplementary grain, medicines and medical services, salt, soap, chemical fertilizers and hybrid seeds, or school fees; preventing them meeting even the most basic of needs. Unfortunately little information on cash incomes is available for China. Procurements, quotas, and the prices paid to poor households for grain, as well as the agricultural tax paid by poor households, all play a vital role in the determination of cash income, and systematic data on each of these factors would be necessary to produce any meaningful estimates of cash income.

As with the study of the standard of living, the definition and examination of poverty has traditionally been based on income or consumption norms.[9] Most frequently there are income-based poverty lines which represent a certain subsistence package of basic needs, mainly in terms of food consumption. The nutritional underpinnings of such a definition and analysis of poverty have become increasingly sophisticated in their approach to assessing what individuals need in terms of subsistence nutritional intake, and have begun to address the implications of genetic differences, and personal nutrition histories for this calculus (Behrmann in Psacharopoulos, 1991: 79-170). "However, it is doubtful whether a minimum nutritional standard for a country's population can be clearly defined since individual food requirements vary enormously and no single calorific measure can be taken to define the minimum food

[9] As much of the theoretical literature, and many of the applications, on capability analysis focuses on the standard of living, and not the measurement of poverty, a more thorough discussion of capability analysis, and the short-comings of traditional social-welfare analysis is presented in the second section of chapter three.

requirements before malnutrition sets in." (Lal, 1983: 94). Little attention has been paid, however, to international differences in the types of food consumed as the staple carbohydrates, fats and proteins, ignoring the freedom or choice element captured in capability-based assessments of well-being. Capability analysis has obvious advantages for interregional or international comparisons of well-being, because it does not easily fall prey to social variations as measures based on the consumption of fixed commodity bundles or income level do. It therefore allows a movement towards a consensus on the importance of a set of general or 'basic' functioning.[10] Intuitively it is apparent that the life expectancy at birth of a population is a more reliable standard for international or inter-regional comparison of well-being than the level of income necessary to provide consumption of x, y and z calories of carbohydrate, protein and fat respectively from specified sources. The latter is subject to cultural and social variations in the staple food items consumed (for example: rice, wheat, millet, maize, or sorghum) but also variations in both absolute and relative prices at the local, national or international level, depending on which price set is used to cost these items.[11]

Just as social factors limit the relevance of income-based definitions of poverty at the international or regional level, functioning and capability become important at the interpersonal level where the ability of an individual to transform income into the sources of well-being is important. The arguments here regarding the importance of factors such as age, gender, class and disability, to name but a few, apply as much to

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10 For a more detailed discussion of a fundamental capability set, please see the discussion of Desai (1990) in chapter three, section two.

11 Two solutions to the nutrition based poverty line problem, are: the use of data on child height and weight, and the use of the body mass index. There are two problems with child height and weight data. First, what norms are used against which to judge height and weight - such criteria often suffer from biggism -. Second, there is evidence that children can catch up in later years nutritional short-falls from earlier in life in terms of physical size, and there is no conclusive evidence on nutritional short-falls in childhood and reduced mental capacity. The body mass index, if height and weight are available, is a good measure of long-run nutritional adequacy, measuring an individual's nutritional stock.

the definition of poverty as to that of the standard of living itself - their more traditional application, which is discussed in chapter three. A given level of income may be necessary, but is not sufficient to ensure that an individual attains a given level of well-being. "Income inadequacy to escape poverty varies parametrically with personal characteristic and circumstances." (Sen, 1992: 111) The need to examine capabilities derives from the fact that the incidence of poverty for individuals can often be reinforced or exacerbated by gender, age, class or disability; meaning that their difficulty or disadvantage in attaining a given level of income also results in difficulties in transforming their income into capability or well-being. An individual's capability set must be considered when determining the extent of income inadequacy in generating a specified level of well-being. Such an analysis cannot solely rely on the poverty gap relative to some arbitrarily determined fixed poverty line measuring achieved outcomes.

Throughout an analysis of either absolute poverty (the head count index) or relative poverty (the poverty gap) we must be conscious that income is only the unit of measure for poverty evaluation, and is often linked only indirectly to the prime motivation behind the examination of poverty itself. In other words, a concern for the well-being and quality of life attainable by individuals must also be included in an analysis of poverty; as Sen eloquently puts it, an examination of "the limitation of the *lives* that some people are force to live." (Sen, 1992: 116 - original emphasis).

Sen, in his book Inequality Reexamined (1992), argues the case for measuring interpersonal inequality of capability in examining poverty, inequality and the standard of living (in other words, well-being). Such an analysis is a robust means of measuring well-being, because it includes

command over commodities and resource entitlement in the capability set, along with factors such as literacy, life expectancy, personal characteristics, and personal freedoms or self-determination. It therefore represents a superior means of examining and defining poverty.

Before the discussion shifts to the problems associated with defining and measuring poverty in the China context, it is worth briefly examining the limitations of poverty line measures. First, there are two types of measures that can be taken relative to the poverty line, the head count ratio based on those below the poverty line, and the poverty gap index, which measures both the number below the poverty line and the distance that they are below the poverty line.[12]

The first difficulty in establishing a poverty line for use in conjunction with the head-count ratio or the poverty gap index is the criteria by which an individual is judged to be below or above the poverty line. Are they to reflect some 'fundamental' set of basic needs - as with nutrition-based and some income-based poverty lines - or are they to reflect a given standard relative to social norms, but above basic subsistence? Into this metric also goes an individual's self-definition regarding poverty. This is very important in measuring poverty over time, with changes in employment and changes in the degree of self-determination. If a person falls into poverty (measured based on non-fulfilment of basic needs) through losing a job for which she is highly skilled, and subsequently escapes poverty through a low skilled, low paid job that meets basic needs, she may continue to consider herself to be poor. For example, it is easy to imagine a skilled manufacturing worker feeling this way about earning a subsistence wage in part-time service sector employment due to

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12 The Sen index and the Foster-Greer-Thorbecke index both represent improvements on the poverty gap index, because they are sensitive to distributional elements in changes in poverty over time. The Foster-Greer-Thorbecke index is also decomposable, into the proportion of poverty alleviation resulting from economic growth, and that resulting from redistribution. (cf. Srinivasan, 1993: 109).

structural change in the economy.

The second difficulty is centred on two differential inter-temporal considerations. First, there is the life-cycle aspect of poverty, where it is necessary to separate out those who are chronically poor, (those who even when income is averaged over the course of their life-time will not have the means to escape poverty) and those who are temporarily poor due to having a large number of dependants (young children and elderly parents) or through temporary unemployment. To assess whether a person is chronically poor, it is necessary to have access to long-run average earnings, a measure of their wealth, or their body-mass index.[13] The second inter-temporal factor, particularly important in measuring changes in living standards over time within a society or in cross-national studies of countries at different stages of development, is the change in social norms that determine the poverty line.[14] Both of these difficulties highlight the superiority of the consumption approach to measuring poverty, as it helps to adjust for life-cycle poverty, intra-extended family transfers, and changes over time in the consumption patterns within society.

Next, problems arise in defining poverty dependant on the researcher's stance on welfarism. There is one school of thought, championed by Sen (see in particular Sen, 1981) which stresses an interest in assessing poverty based on opportunities, or in the Senian lexicon entitlement and capability.[15] This can be summarized as wishing to assess only whether or not an individual commands the means to meet the poverty

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13 The body mass index is an indicator of persistent malnourishment.

14 The World Bank poverty line presented below is adjusted modestly for this, although inflation is responsible for the lion's share of the year on year increases in the poverty line. The Chinese government poverty lines are only adjusted to account for inflation.

15 See appendix 3.1 for a set of definitions of the terminology used in discussing well-being, capability and functioning.

criteria, and not whether the individual chooses to use these resources to fulfil these criteria. The opposing view, represented by Atkinson (1989) holds that it is achieved functioning that matters, and that we should be concerned with whether or not the outcome, as opposed to the opportunity, meets the poverty criteria. This is in essence a matter of philosophical and ethical judgements. There are two useful examples which crystallise this debate that are widely employed in the literature. First, how does one categorize an individual who is starving because he chooses to fast despite having the means to feed himself adequately (cf. Sen, 1992)? Under Sen's criteria, he would be above a basic-needs poverty line, while by Atkinson's criteria he would be below it. The second example deals with placing an individual who has sufficient means to command a commodity bundle that would put her above a basic needs poverty line, but through taste or other factors such as trying to 'keep up appearances', she fails to fulfil these basic needs. Again in Sen's estimation she would be above the poverty line, while in Atkinson's she would be below. Theoretically and morally, Sen makes a strong case; the severe limitation of capability analysis lies not in the theory, but in its application. The data by which we generally measure poverty is geared towards the measurement of outcomes, and a statistical revolution is needed to permit the adequate measurement of opportunities to permit a genuine capability-based analysis.

Finally, the level of the analysis is very important. Are we working at a household level or an individual level in trying to identify those below the poverty line? The first point to consider is who is included in the group or society that we are examining, thereby defining who makes up the parent population which dictates the 'norms' against which poverty will be assessed. Whether data are gathered at a household level or an individual level, information on bargaining positions within the household,

or intra-household welfare functions, and also on the extent of inter-extended family transfers, will have a strong impact on the number living below the poverty line. For example, if the household head has his basic needs met, at the expense of the basic needs of other household members, and he is the one reporting information on behalf of the household, is the household above or below the poverty line? The situation is also not transparent when, for example, the resources are allocated to male members of the household before female members for the fulfilment of basic needs, or the needs of pregnant or lactating women are given priority over those of other family members resulting in intra-household differences in basic needs fulfilment. This is where a capability approach is again proved to be superior, as it would assess simply whether a household, or an individual, has the means to meet the poverty criteria, assuming that outcomes will be determined within the family based on their choice, be it rational or discriminatory, without any assumptions regarding welfare maximization.

Once the difficulties with establishing the poverty line itself have been dealt with, then the choice of poverty measure must be addressed. There are three basic criteria by which measures of poverty are assessed.

1. Monotonicity: Does a decrease in the income of individual *i*, who is below the poverty line, increase the index?

2. Transfer: Does a transfer of income from individual *1* to individual *2* increase the index if the income of individual *1* is lower than the income for individual *2*, both below the poverty line?

3. Transfer Sensitivity: If the transfer criterion is fulfilled, does the index change positively or negatively with higher incomes for *1* and *2* - is the transfer large enough for *2* to escape poverty at *1*'s expense, and if so, how does this affect the value of the index?

It is obvious that the head count ratio fulfils none of these criteria, because it is sensitive neither to the ranking of individuals, nor to the

distribution of 'poverty' among individuals. The poverty gap measure is somewhat better in that it is interested in rankings (monotonicity), and is sensitive to transfers, but not to distribution. Either the Sen index, or an index like the Foster-Greer-Thorbecke index is required to fulfil all three criteria for the assessment of poverty. The Foster-Greer-Thorbecke index also has the advantage of decomposability, assessing the contribution of distribution and growth of average incomes in poverty alleviation (Datt and Ravillion, 1992: 275-95), although both the Sen index and the Foster et al index are very demanding in terms of the data inputs required for their calculation, which despite their obvious superiority as determinants of the incidence of poverty, makes them difficult to employ. Therefore data considerations limit the analysis presented here to the production of the head count proportions.

An income-based examination of poverty in rural China is severely hampered by a lack of reliable data. There are several problems with the State Statistical Bureau (SSB) panel survey of rural and urban incomes and expenditure. The problems centres upon sample design and survey methodology, compounded by the treatment of subsidies and self-consumption in calculating the urban and rural per capita income data.[16]

Another difficulty with the household survey data was that not all counties in China were part of the sample.[17] Also the sample expanded enormously over the course of the reform period.[18] For Yunnan, not

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16 For a thorough discussion of rural income inequality since 1978 and the data problems, see Bramall and Jones, 1993; and Griffin and Zhao eds. (1993) for re-estimates of Gini co-efficient based on SSB data, but with amendments to the treatment of subsidies and self-consumption.

17 The incomplete nature of the survey data has two effects. First, this limits representativeness, as discussed in Bramall and Jones (1993), and because there was not even one county from each prefecture included in the sample in the early 1980s in Yunnan. Second, this precludes the calculation of data at a rural level consistent with the other data presented in the dissertation, as more urban and peri-urban residents are excluded by the survey than by the criteria used throughout the rest of the thesis.

18 The expansion was from only 6095 households in 1978 to 67186 households in 1988, declining to 66478 households by 1990. From 1978 to 1980 the number of households sampled increased 2.5 fold from 6095 to 15914, and then increased four fold between 1984 and 1985 from 15914 to 66642 (ZGTJNJ, 1988: 822; ZGTJNJ, 1991: 294).

every county was included in the rural survey, and as a result the data were only presented at a prefectural level, precluding the use of income data in the analysis of conditions in Yunnan. The survey appeared to cover every county in Anhui, but for 1978 and 1980, the data presented as per capita net peasant income in the 1985 AHJJNJ were actually collective distributed income, making up no more than 70% of real net peasant income in 1978, a share that declined as the reforms progressed. For 1981-3 the data were a combination of collective distributed income and net peasant income, varying from one county to the next. It was only in 1984 that these data were what they purported to be, net peasant income, reflecting the turmoil in the data collection system during the decollectivization process. Finally, these data through 1984 were actually the Ministry of Agriculture data and not from the SSB survey. Ministry of Agriculture data were problematic due to the narrowness of the definition of income.[19] Therefore per capita NVAIO data are used as a proxy for income, where reliable and consistent income data are not available.[20]

This analysis of poverty, unlike the analysis in the rest of the dissertation, focuses on provincial-level data, because of the dearth of individual or household level income data or reliable county level income or disaggregated grain output data. There are two choices of income data for the assessment of the incidence of poverty in China. First, there is a set of comprehensive county level data from the Ministry of Agriculture, providing average income levels, permitting an estimate of the number of people living in poor counties. The second set of data are the SSB survey data permitting an examination of the provincial incidence of poverty based

19 More details on the problems with income data appear in Bramall and Jones (1993), and the World Bank (1992b: 39-40, or Griffin and Zhao eds, 1993) contained a good summary of the differences in definition between the Ministry of Agriculture data and the household survey data.

20 For example, the use of these income data without adjustment for the inconsistency results in a significant inflation of the growth rate over the 1978-90 period.

on the population by income group. Therefore, without conducting an independent survey to gather individual or household level data, it is impossible to carry out an analysis of differences and trends in interpersonal well-being. However, despite the apparent inadequacies of the survey income data as a measure of poverty in rural China, these inadequacies are consistent between the data themselves, and the poverty lines established on the income data. Therefore, they have been of some use in judging trends in poverty during the 1980s.

3. Poverty in China

Much of the literature deals with poverty in a descriptive fashion, such as in Croll (1993) and Vogel (1989), while also examining other aspects of the economic reforms since 1978. Others were essentially prescriptive, assessing the extent of poverty and outlining policies for poverty alleviation. The Office of the Leading Group (OLG) (1989), Wang and Bai (1991) and the World Bank (1992b) are the most important elements of this group. Finally, Kueh (1988) and Riskin (1993) provided the best analyses of poverty - both in terms of income and nutrition-based criteria. Kueh focused on Engel ratios and changes in food consumption resulting from increased incomes.[21] Riskin provided a re-estimate of the number living in absolute poverty in 1988 based on improved SSB survey data. This number was somewhat higher than the World Bank estimates, and significantly higher than the Chinese government's estimates. Riskin's two important contributions came first from his analysis of rural-urban transfers of

[21] Much of the discussion of Kueh's work is reserved for the discussion on living standards in rural China in chapter three, as it deals not only with poverty, but with relative living standards, as illustrated not only in food consumption, but in the consumption of other goods, such as housing. Engel ratios are prey to the very strange nature of Chinese relative prices, which themselves changed significantly over the course of the 1980s, limiting both the relevance of an analysis of nominal consumption and income data, and posing difficulties in creating a constant price series. It also limits the scope for international comparisons, or the use of internationally established norms for what any given value of Engel ratio means in terms of poverty or living standards.

wealth, through an examination of the tax system and the inter-sectoral terms of trade. His policy prescriptions for poverty alleviation based on this analysis, through a change in the institutional structures that entrench rural poverty, deserves expansion and further study. Furthermore, the scale of the transfers required to eliminate rural poverty set out by Riskin are remarkably small.[22] Second, Riskin asserted that more than 60% of all people living in poverty in rural China live in non-designated poverty counties. As all of the Chinese government's poverty alleviation strategies, and those proposed by the World Bank, are focused on designated poverty areas, these policies are reaching only 37% of the poor (Riskin, 1993: 152).

Vogel (1989) found that "trickle-down" played a significant role in poverty alleviation in poor mountainous communities in Guangdong. However, this amounted primarily to a decline in absolute poverty, with relative poverty and the gap between living standards in the Pearl River delta and mountainous counties widening.[23] Consumption and capability data were also employed by Vogel in his examination of poverty. The sources of reduced absolute poverty were twofold. First, an increase in income derived from farm and non-farm production by households. On the agricultural side, this came primarily from specialization in non-staple food crops, such as fruit production, animal husbandry, hemp, and silk worms. Non-agricultural sources of income came primarily from the building materials trade, especially the quarrying of marble for decorative facing in the Delta and Hong Kong (cf. Vogel, 1989: 264). The experiences of the

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22 "Given our definition of poverty, the measured poverty gap is small relative to total income and to the incomes of the non-poor population. An average tax rate of only 1.6 per cent on the rural non-poor or 2.4 per cent of the substantially richer urban population, net of the costs of administering the tax and resulting expenditure program, would be sufficient to eliminate defined poverty." (Riskin, 1993: 163)

23 There are many parallels to be drawn between the conditions of the mountainous counties of Guangdong and the mountainous regions of Yunnan, particularly in the severe limitations of infrastructure in both regions, and the topographic barriers to development. The chief difference between mountainous counties in Yunnan and Guangdong is that the height of the mountains, and the greater distances involved in Yunnan.

marble quarrying regions in Guangdong parallel those in the marble producing regions of northwestern Yunnan, although in the latter, marble production was integrated with the domestic and foreign tourist trade, through local 'handicraft' production of furniture and souvenirs. At the marble quarry at the entrance to Tiger Leap Gorge (in Yunnan), for example, the pagoda-shaped cores of marble were stacked up like cord wood, awaiting shipment to the workshops.

The second source of increased income (and one should emphasize not just increased total income but the massive increase in cash income; as previous gains in income under Mao were primarily in kind) was remittances from young unskilled workers, who travelled to the Delta as members of construction teams. Virtually every eighth family in mountainous communities had a son working on a construction crew at any one time (Vogel, 1989: 266). A typical construction worker remitted 100 *yuan* per month to his family (ibid.: 266) at a time when the average Chinese per capita net peasant income was 400 *yuan* per annum. The inflow of cash into these communities benefitted the community as a whole through the multiplier effect, and also because some construction workers became crew bosses for future crews from their villages, and others returned with some knowledge of entrepreneurship as well as cash for start-up funds. Due to data constraints, Vogel's study contains limited systematic county level data, hampering direct comparisons between his work and the findings of this dissertation. However, the importance of the proximity of these communities to the Delta, Hong Kong and the export processing zones, and perhaps also their distance from Beijing, cannot be discounted in assessing their performance during the reform period.[24] Advantages shared by

[24] Guangdong has benefitted from its long distance from Beijing and its linguistic ties to Hong Kong, which have granted it a degree of administrative freedom and independence not enjoyed by most other provinces in China.

neither Anhui nor Yunnan.

Croll (1993: 81-8, 275-9) provided a description of conditions in a village in southeastern Yunnan. The data were descriptive in nature and for a single year, thus prohibiting a systematic analysis of trends based on the eight households that made up the sample. Nevertheless, her analysis reveals that the forces of economic development that accompanied 'trickle-down' in Guangdong were not active in this back water. Croll rightly identifies the lack of cash incomes and the subsistence nature of agriculture, and indeed of life in general, in this village as a barrier to further economic development and poverty alleviation. All households were labour-poor due to a lack of infrastructure, where carrying water alone was a fulltime occupation for one adult member of each family.[25]

In 1989, the Office of the Leading Group on Economic Development in Poor Areas published its report, Outlines of Economic Development in China's Poor Areas. This group was set up in 1986, answering directly to the State Council, to address and implement policies for economic development in China's poor areas. This is the prime, but not the sole, agency in the Chinese government for alleviating poverty. The Chinese government sees poverty as an entirely regional phenomenon, tidily contained in a finite number of backwards and environmentally- and geographically-challenged counties, primarily in central and western China. Policies are designed more to try and root out the causes of rural poverty and to foster economic growth than to alleviate poverty with transfer payments and income or material support for these areas. Counties were judged to be designated poverty areas if the average per capita net peasant income in 1985 was below 150 *yuan*. This criterion was set against the

25 A longer discussion of Croll's finding appears in chapter seven, where these two counties are discussed in detail.

comprehensive, but narrow in the definition of income, data from the Ministry of Agriculture. This was necessary because the SSB survey data were not comprehensive, and themselves represent a narrow definition of income[26] and in the sample design and survey methodology which called the representativeness of the sample into question[27].

As the Ministry of Agriculture data were perceived to be less than perfectly reliable, there was considerable massaging of the data set before counties were declared poverty areas by criteria that are less than transparent. For Yunnan, the poverty line was dropped to 120 *yuan*, although whether this was because of systematic under-reporting of income in Yunnan, or that too many Yunnan counties would have been classified as poor is not clear.[28] Further, these criteria were flexibly implemented, so that in national minority areas and revolutionary bases, the poverty line was raised to 200 *yuan*, or further to 300 *yuan* if the area was one of the above and had "special problems" or had made "great contributions" (ibid.), providing political flexibility. Since 1986, the poverty line for the country was increased to 200 *yuan* in 1987, and was up to 300 *yuan* in 1992.[29]

In 1986 the Group produced a list of 273 counties that met the "150 *yuan*" criterion, an additional 27 pastoral or semi-pastoral counties below 300 *yuan*, and an additional 28 counties in Gansu and Ningxia with average annual precipitation below 400 mm (OLG, 1989: 76-81). Provincial governments also have designate counties as poverty areas, based on their

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26 For a discussion of the limitations of the definition of income in the SSB survey, see Griffin and Zhao eds., 1993: 26-33. Details on the Ministry of Agriculture Data relative to the SSB data come from the World Bank, 1992b: 39-41, and from personal correspondence with Lee Travers in 1992.

27 For a discussion of the problems with the coverage of the SSB sample, its design and implementation, please see Bramall and Jones, 1993: 42-47.

28 Personal correspondence with L. Travers, 1992.

29 Personal correspondence, N. Menzies, 1992.

own criteria. In Yunnan the provincial poverty line was 150 *yuan* in 1985 (Travers, op.cit.), and that in Anhui appears to have been 200 *yuan*. Many of the counties included in the provincial poverty list for Anhui are grain producing counties that were hard-hit by poor weather, low grain prices and the new "contract" system in 1985, after doing very well in 1983-4. In total there are an additional 370 counties designated as poverty areas by their provinces, eight from Anhui and fifteen from Yunnan (OLG, 1989: 82-6).[30]

Angel Knox provided a translation of Wang and Bai's (1991) research into the persistence of poverty in the resource-rich southwest of China. In fact the book is largely a collection of Han racial prejudices, where these ethnic minority areas remain backward because the people there are ill-educated, and lack entrepreneurial spirit. "In comparison with developed regions, the rural inhabitants of backward regions are clearly characterised by a general lack of entrepreneurial spirit and an excessive adherence to old ways." (Wang and Bai,1991: 38) Wang and Bai themselves appeared to be particularly obtuse, by ignoring the infrastructural and geographic difficulties in these large, mountainous, and outside the Sichuan Basin, sparsely populated provinces. Children in the southwest continue to be educationally disadvantaged compared to those in coastal provinces, and the government maintains policies that prohibit interprovincial migration. Also, the ravages of the Cultural Revolution were particularly severe and long-lived in rural Yunnan, according to the accounts of He Liyi (1993), where entrepreneurial spirit in national minority areas was squashed by the Han-led Cultural Revolution.[31]

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30 Appendix 2.2 contains a list of all so designate counties in Anhui and Yunnan.

31 It was not until the after the defeat of the "Gang of Four" that the oppression of the Cultural Revolution was relieved in rural Yunnan, and not until the ascendancy of Deng that entrepreneurial activities resumed.

Subsequently these regions have suffered from brain drain, where the best and the brightest from these communities are educated at universities in the provincial capital, Beijing or Shanghai, and often obtain employment in those places. Further, the volume ignores the problems of the subsistence-based agricultural economy in these areas, where a lack of cash income or an investible surplus hinder attempts to engage in entrepreneurial activities, and sideline production, points made by both Croll and He. The book does contain some interesting data. First, the provincial data on Tibet was useful, as such data are rare; although they are presented in comparison with Jiangsu, thereby representing more a barometer of attitudes in Beijing towards the periphery of China, than an examination of rural poverty. Second, the survey data on educational attainment and entrepreneurial activities was the one redeeming feature of Wang and Bai's study. They showed a positive relationship between the educational attainment and entrepreneurship; although these findings are somewhat in opposition to Vogel's findings on entrepreneurial activities in the mountainous regions of Guangdong.

The World Bank report (1992b) found that absolute poverty declined significantly in the 1980s although less so than the Chinese government would have us to believe. These findings on the incidence of poverty perhaps underestimate its extent, because they are not based on household data, and therefore designated prosperous people in poor regions as poor, and excluded poor people in prosperous regions as not poor.[32] Finally, the province-based poverty lines showed that, in 1989, Anhui's cost of living was higher than the national average, 268 versus 262 *yuan* and Yunnan's was lower, 258 *yuan* (World Bank, 1992b: 142). These are grain-

[32] The policy prescriptions presented by the World Bank follow the existing Chinese model, concentrating on the designated poor counties, which, as noted earlier, Riskin showed reaches less than 40% of the target population. Further, the World Bank does not discuss the institutional structures in the economy that serve to reinforce rural poverty, most notably the regressive tax system and the skewed inter-sectoral terms of trade.

based poverty lines, and therefore are more a reflection of the higher proportion of refined grain - wheat and rice - in the Anhui diet than in the Yunnan diet. Coarse grains have lower market prices than fine grains, and with the exception of tubers, a lower caloric content, the former being reflected in the lower poverty line. This does not accurately reflect the desire on the part of the population of Yunnan to eat more fine grain, and the poverty that they feel as a result of the limited scope for rice cultivation in much of the province. First, virtually 40% of all grain output in Anhui is traded (gross procurement plus net exports), while only 20% of grain is commoditized in Yunnan, showing that Yunnan is closer to subsistence farming than Anhui, and the grain markets there are more active in the latter. Second, the opportunity costs of attaining a subsistence living in Yunnan are significantly higher that the national average or those in Anhui. This is a product of the poor agricultural conditions in Yunnan, the lack of infrastructure, the high costs of transportation, and limited access to medical care.[33] I would therefore challenge this lower poverty line for Yunnan, and an inflation adjusted poverty line for Yunnan is presented in table 2.2 below.

4. Poverty in Anhui and Yunnan

This section examines the trends in income data and grain availability for Anhui and Yunnan relative to the national average, 1978-90.[34] As a result, data are presented for the period 1978 to 1990. First average income data are presented for Anhui and Yunnan relative to the national average. This is followed by an estimation of the proportion of

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33 However, lower demand in Yunnan, due to lower income, implies lower prices.

34 Ideally data on the late Maoist period would also be presented; however, they are not available at a sub-provincial level, and therefore could not be presented for the rural population alone.

the population in Anhui and Yunnan in poverty, based on the poverty lines put forward by the World Bank (1992b: 140) and the Chinese government. This analysis presents two contrasting methods of estimating poverty. First, one which is based on the percentage of the population by income group, and second by the population living in counties with average income levels below the poverty line. Such an approach is necessary for two reasons. First, the income data are survey data, and are not perfectly reliable for reasons outlined below, and second, because the Chinese government treat poverty as solely a spatial or regional problem, thereby ignoring the majority of those living in poverty. This is followed by a brief discussion of the trends in, and composition of, consumption among rural households and their Engel ratios. Finally, grain availability is estimated for Anhui and Yunnan, and compared to nutrition-based poverty lines to round out the assessment of poverty. The vast majority of this discussion centres on conditions in poor counties, and a discussion of the counties designated as poor by the central and provincial governments.

Three year moving averages are used in many places to compensate for the quite violent fluctuations in income levels due to the impact of natural diasters on agricultural output in any given year. Where it is not possible to employ three year moving averages, then growth rates are either calculated based on averaged end-points, or using OLS. This largely eliminates the distortions from annual fluctuations in income and output in rural China. This does not remove from the data the differential rates of inflation, where consumer price inflation was higher in Anhui and Yunnan than the national average from 1986, or the relative severity of the recession in these two provinces. The highest rates of consumer price inflation and the most severe economic down turn in 1989-90 would be expected in the dynamic coastal provinces. However, consumer price

inflation in Anhui was only very marginally lower than that in Guangdong.[35] This suggests that the availability of goods and services in Anhui did not keep pace with income growth, leading to forced savings, fuelling consumer price inflation.

Figure 2.1 shows the trends in real average per capita net peasant income for Anhui, Yunnan and China. In 1978-80, both Anhui and Yunnan were below the national average. Per capita income grew more quickly in Anhui that the national average in the early 1980s, surpassing the national average for 1979-81 to 1981-83. Growth rates for per capita income were fastest from 1978-80 to 1983-5 for Yunnan and the national average. Growth rates continued to decline during the late 1980s, although the national average was least affected, while Yunnan's growth rate slowed to virtual stagnation from 1986, and in Anhui, real income levels declined from 1986 to 1990. The OLS growth rates were 5.9% per annum for the national average, 5.4% for Yunnan, and 4.3% for Anhui, for 1978 to 1990, showing the importance of the decline in income in the late 1980s on overall growth during the Dengist era. One possible explanation for the earlier transition in growth rates for per capita net peasant income in Anhui compared to the national average, is that decollectivization occurred early in Anhui, and corresponded to the period of large changes in the prices for agricultural products, making the incentive effects and the benefits gained large. However, if the benefits of decollectivization accrued early to the population of Anhui, then so did its shortcomings, with stagnation and decline in income from the mid-1980s, accompanied by very high consumer

35 Details on the various series of deflators derived for China and many of the provinces including Anhui and Yunnan, appear in appendix 2.3.

price inflation.[36] The CPI in Yunnan was also above the national average for 1985-90, although by a slimmer margin than for Anhui. Figures 3.1 and 3.2, in chapter three, on income and expenditure in Anhui and Yunnan show the gap between income and consumption at its peak in the mid-1980s, where slower expansion in the availability of consumer goods fuelled price increases and resulted in forced savings.[37]

To examine what these trends in income signified in absolute terms, it is necessary to examine the proportion of the population living below an arbitrary poverty line. Setting poverty lines is very difficult, and requires much detailed price and nutrition data. It involves calculating the monetary value of a subsistence package of food, clothing, housing and medical care - to name but a few criteria. Each of these items themselves is difficult to calculate. Questions such as: how many calories per day; made up of what mixture of staple starches, proteins, oils, and vegetables; at what prices must be answered. As much of the detailed information necessary to produce such an estimate are not available outside the World Bank or the Chinese Government, the author chooses to rely upon the poverty lines employed by those institutions. An estimation of a poverty line based on grain availability is presented after the analysis on income levels.

Table 2.2 shows the World Bank poverty lines (1992b: 140), and the Chinese government poverty lines for 1978-90. The Chinese government

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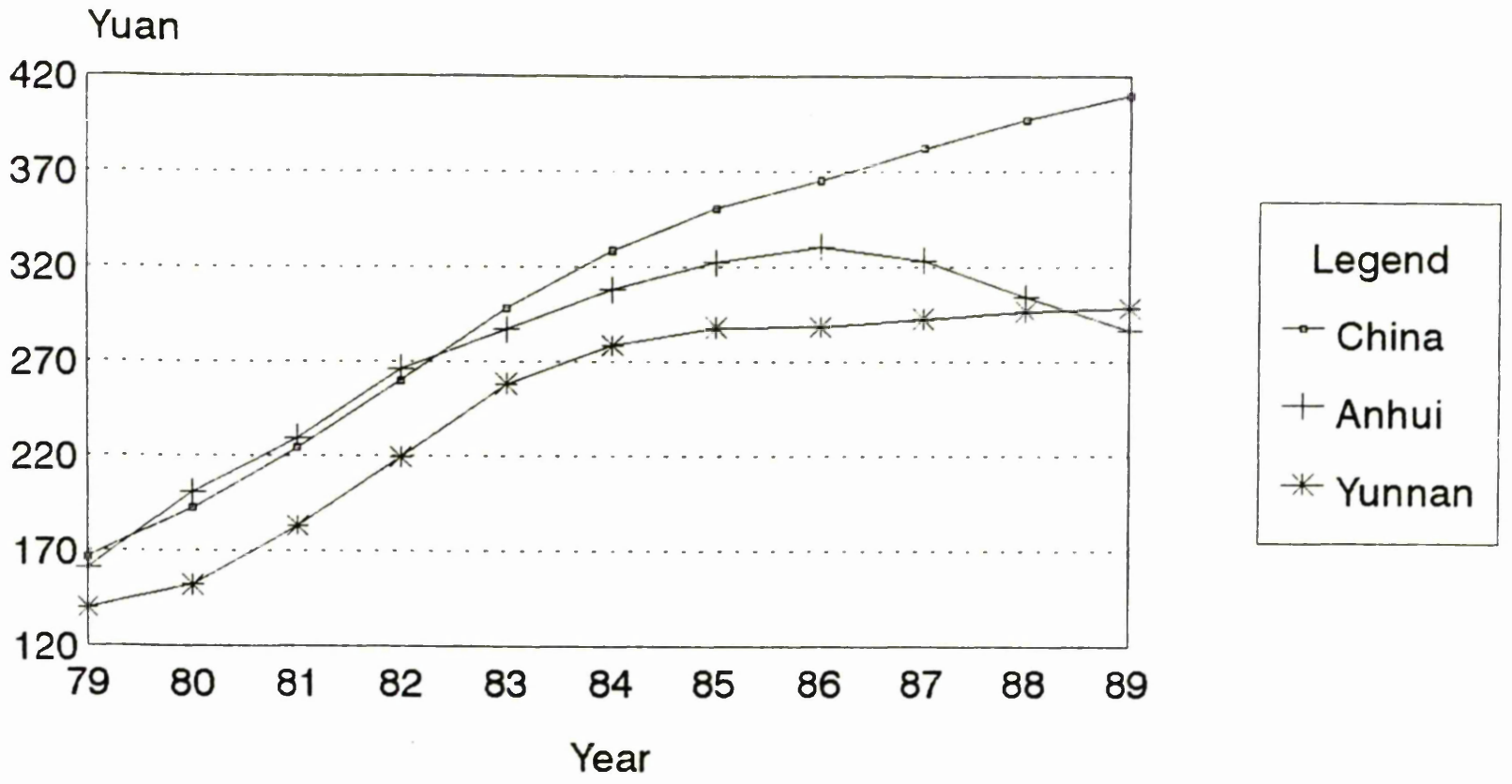
36 Anhui was particularly fortunate in the quotas set for its grain production at the beginning of the responsibility system, because poor weather and a poor performance under collective agriculture meant that quotas were set very low compared to the potential output for the land. This meant that for 1980-84, Anhui's peasants benefitted disproportionately from increases in grain output compared to those in other regions. (cf. Hinton, 1990). From 1985, when contracts were introduced, the peasants of Anhui lost this early advantage, as contract amounts were raised based on output in the early 1980s, and at the same time, purchase prices for output fell dramatically, while input prices rose, shifting the terms of trade heavily in favour of industry one more.

37 The extent of savings in Anhui and Yunnan look to be quite small during the 1980s, but the size of savings is difficult to determine in rural China due to the underdevelopment of a formal banking system. One expression of these savings might be the explosion in house construction, particularly in Anhui where there was a brief time lag after the start of the rapid increase in incomes in the early 1980s.

Figure 2.1a - Real per capita Net Peasant Income 1978-90

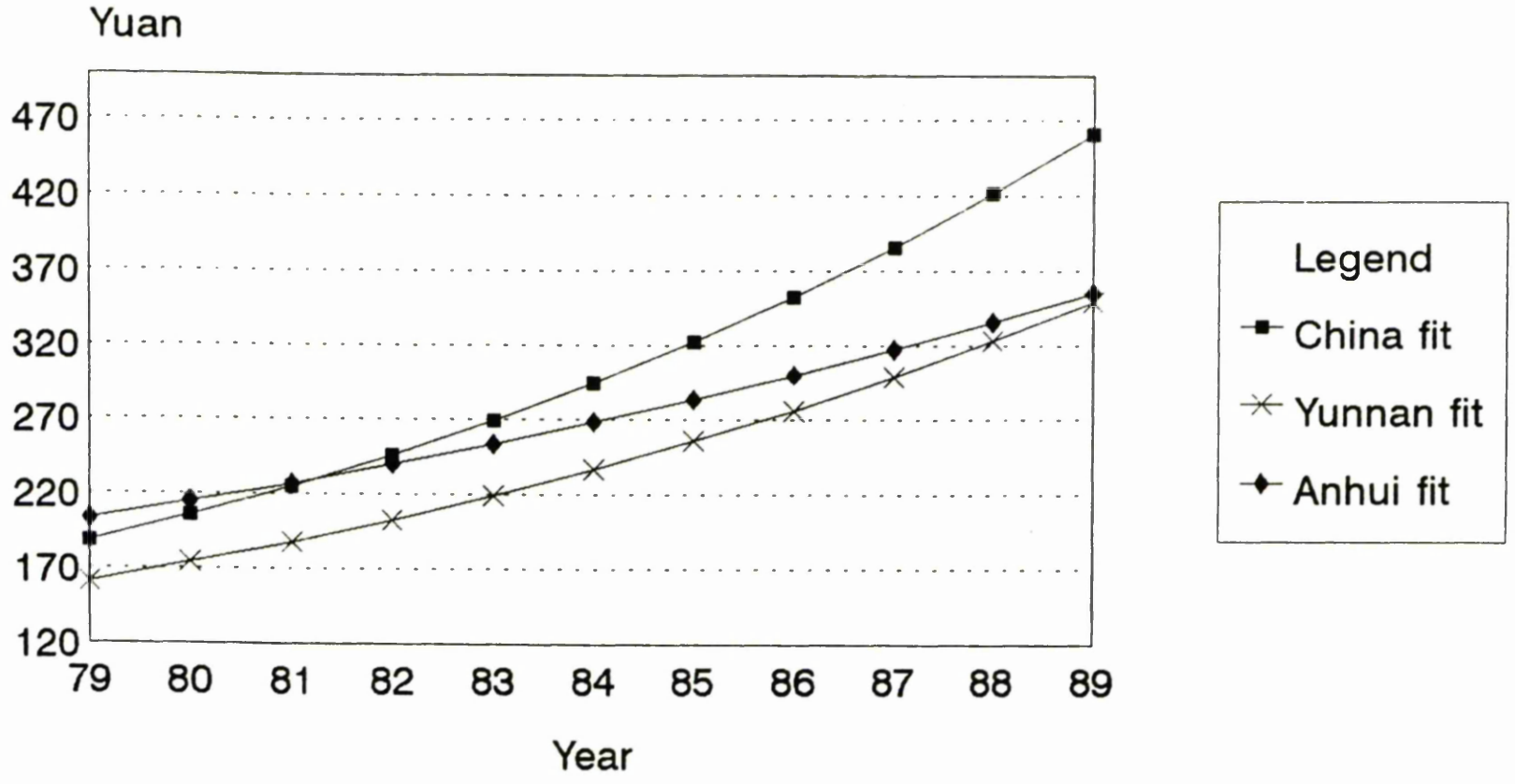
(in Yuan, based on three year moving averages)



Note: At 1980 constant prices, based on the CPI.
Note: Year shown is the mid-point of the three year average, so that 79 stands for 1978-80.
Sources: LSTJ, 1990: 35, 432, 781; ZGTJNJ, 1991: 296.

Figure 2.1b - Real per capita Net Peasant Income 1978-90

(in Yuan, Regressions based on three year moving averages)



Note: At 1980 constant prices, based on the CPI.
Note: Year shown is the mid-point of the three year average, so that 79 stands for 1978-80.
Sources: LSTJ, 1990: 35, 432, 750; ZGTJNJ, 1991: 296.

poverty lines were established in 1990 (Beijing Review, 1991, 34(17): 7-8), and were reverse projected to 1978, using the CPI to deflate the data.[38]

Table 2.2 - Poverty Lines for China 1978-90
(in *yuan*, at current prices)

	Official		World Bank		
Year	Lower	Upper	China	Anhui	Yunnan
1978	120	216	99	99	99
1980	127	228	135	135	135
1981	129	232	160	160	159
1982	131	235	170	169	170
1983	132	238	175	174	174
1984	134	242	178	178	179
1985	142	257	193	194	196
1986	148	266	206	210	210
1987	154	278	222	237	227
1988	171	308	249	293	264
1989	187	337	292	367	319
1990	200	350	301	378	329

The "World Bank" poverty lines set for Anhui and Yunnan were derived from the China line presented in the table, deflated using the Chinese CPI, and reflated using the CPI deflators for Anhui and Yunnan respectively. The World Bank China line presented here is the poverty line based on "procurement" prices and not "planned" prices, which is preferable for reasons outlined in the report (World Bank, 1992b: 137-41).
Sources: Beijing Review, 1991, 34(17): 7-8; World Bank, 1992b: 140.

Comparing the poverty lines in table 2.2 with the income data in figure 2.1, the average income values for Anhui, Yunnan, and the national average were above the poverty lines throughout the 1978-90 period, with the exception of the upper Chinese government poverty line for 1978-80 for Anhui and the national average, and for 1978-81 in Yunnan. It would be very odd indeed if average incomes were below the poverty line, as the 1985 designation of poverty counties was based on 40% of the population in a county with per capita net peasant income below 40% of the national average, or below 150 *yuan* out of 375 *yuan* (OLG, 1989: 38), well below the average income level. The investigation presented here therefore focuses on the proportion of the population living below the poverty line, based on both income strata and by county.

38 Details on the various series of deflators, derived for China, and many of the provinces including Anhui and Yunnan, appear in Appendix 2.3.

Table 2.3 - Proportion of the Population in Poor Counties

Year	% pop. NVAIO poor Co. Anhui	Yunnan	% pop. designated poor Co. Anhui	Yunnan
1978	11.5	10.8	27.5	31.4
1980	27.4	41.3	27.6	31.7
1981	23.8	na.		
1982	22.8	na.		
1983	28.1	na.		
1984	6.6	na.		
1985	2.8	24.1	27.6	31.7
1986	5.4	na.		
1987	2.8	27.8		
1988	5.3	23.9		
1989	10.5	26.1		
1990	8.3	25.0	26.3	31.3

Note: The percentage population in poor counties was based on per capita NVAIO, which is used throughout this dissertation as a proxy for income.
Sources: AHJJNJ, 1985: 152; AHTJNJ, 1991: 613; YNTJNJ, 1990: 609; YNTJNJ, 1991: 544; ZGTJNJ, 1986: 673; ZGNYNJ, 1981: 69-70; 1986: 276-9; 1987: 353-5; 1988: 394-7; 1989: 449-52; 1990: 415-7.

The proportion of the population living below the poverty line based on these various criteria are presented in tables 2.3, 2.4 and 2.5. This analysis is based on nominal data, which puts a downward bias on the incidence of poverty in Anhui and Yunnan in the late 1980s, because of the higher inflation in Anhui, in particular, and Yunnan to a lesser extent from 1986 to 1990.[39] As a result, three sets of estimates for the proportion of the population living in poverty are presented, based on the China-wide poverty lines established by the World Bank and the Chinese government, a second showing the proportion of the population in counties with per capita net peasant income below the poverty line, and a third showing the proportion of the population in Anhui and Yunnan below a province-specific poverty line, adjusting for differentials in the inflation rate.

[39] The data on income, output and expenditure in Anhui and Yunnan presented in chapter 3, showed a considerable gap in the mid-1980s when income grew much more rapidly than output or consumption. This situation was particularly severe in Anhui, where decollectivization occurred early, and historic yields were low, resulting in very high profit rates, and therefore rapid increases in income. This appears to have fuelled inflation, through demand exceeding supply. However, deflators and price sets for China and its provinces are highly problematic, and it is also possible that some of the higher rate of inflation in Anhui is the product of statistical methodology. As a result the poverty estimates presented here are based both on the national poverty line, and one accounting for the differentials in inflation. They are meant to be largely illustrative.

The proportion of the population in designated poverty counties in Anhui and Yunnan were also calculated, and presented in table 2.3 along with the proportion living in counties with average per capita NVAIO below the poverty line. The former remained remarkably stable, at 28 to 26% in Anhui and 31-32% in Yunnan for 1978-90. This provides evidence that large-scale migration out of poverty regions has not occurred, and such immigration is not part of the government's poverty alleviation strategy. By contrast, an examination of counties by per capita NVAIO reveals that there were large fluctuations in the number of counties, and the proportion of the population, below the poverty line during the 1978-90 period. For both Yunnan and Anhui there was an increase in the incidence of poor counties for the 1978-80 period, and poverty only declined after the 'bumper harvest' of 1983-4, only to rise again during the period of high inflation and recession in 1988-90. The analysis presented in chapters six and seven helps to explain this trend. It will be shown that the naissant economic dynamism in many poor counties was reversed as a result of the recession in both Anhui and Yunnan, while rich counties, with better established industrial and 'service' sectors weathered the recession with only modest attenuation in economic growth rates. Therefore it is not surprising that a small number of counties, marginally above the poverty line in 1987-8, should have fallen below the poverty line, increasing the proportion of the population in poverty, as a result of the economic decline in 1989-90. However, such an analysis is merely replicating the Chinese government's error of emphasizing the spatial aspect of poverty, and ignoring distribution.

Table 2.4 presents data on the proportion of the population below the poverty line based on data by income strata, not average income or its proxy. Unfortunately these data are only available at a provincial level,

so nothing can be said of the spatial distribution of these people, just as the county-level data presented an examination of income distributions within counties. However, as Riskin's study for 1988 showed, they provide a more accurate picture of the incidence of poverty in these two provinces.

Table 2.4 - Incidence of Poverty Based on Income Strata

	World Bank			Upper Chinese Government		
Year	China	Yunnan	Anhui	China	Yunnan	Anhui
1978	33%	25%	na.	85%	91%	na.
1980	27%	25%	90%	69%	83%	100%
1981	24%	na.	na.	54%	na.	na.
1982	17%	na.	na.	40%	na.	na.
1983	14%	na.	14%	33%	na.	38%
1984	15%	21%	13%	26%	42%	35%
1985	15%	19%	5%	32%	36%	26%
1986	13%	19%	4%	29%	36%	18%
1987	13%	20%	5%	24%	35%	16%
1988	12%	20%	12%	22%	32%	26%
1989	14%	25%	11%	22%	33%	18%
1990	11%	17%	9%	19%	26%	17%

Note: These estimates are based on the assumption that individuals are distributed evenly through each income stratum in the grouped data. This assumption explains the small variations in the national estimates of the incidence of poverty over those produced by the World Bank, but the differences are small, usually 0.1 or 0.2%.
Sources: As per table 2.3.

Based on the China-wide poverty lines from both the World Bank and the upper of the two Chinese government poverty lines, the incidence of poverty in Anhui started the Dengist period above the national average, and in Yunnan it was marginally below. As early as 1983 Anhui's incidence of poverty had fallen to below the national average, and that in Yunnan was above the national average. The incidence of poverty in Anhui declined very rapidly in the early 1980s, in line with its very rapid rate of per capita income growth over this period, while in Yunnan the incidence of poverty declined more slowly, allowing it to change to above the national average, due to a growth rate in per capita net peasant income that was below the national average throughout the 1980s. In the late 1980s, the impact of inflation and recession caused the incidence of poverty to increase in both provinces, and in China on average, with little difference

between Anhui and the national average, while the gap between the incidence of poverty in Yunnan and the national average widened.

A rather different pattern is evident if provincial inflation rates are used to adjust the World Bank poverty line for use in Anhui and Yunnan. These data are presented in table 2.5. The higher rates of inflation in Anhui and Yunnan from 1985 and 1986, respectively, meant that the China-wide poverty line led to a significant under-estimate of the incidence of poverty in these two provinces. In Anhui, the incidence of poverty in 1990 was three times the level based on the national poverty line, when differentials in inflation are factored in, putting Anhui well above the national average. For Yunnan the difference was less marked, because inflation was only above the national average by a small margin, but the incidence of poverty was 30% greater once the poverty line was adjusted for Yunnanese inflation.

Table 2.5 - Incidence of Poverty, Anhui and Yunnan Specific Poverty Lines

		World Bank		Province Specific	
Year	China	Yunnan	Anhui	Yunnan	Anhui
1978	33%	25%	na.	25%	na.
1980	27%	25%	90%	25%	90%
1981	24%	na.	na.	na.	na.
1982	17%	na.	na.	na.	na.
1983	14%	na.	14%	na.	13%
1984	15%	21%	13%	21%	13%
1985	15%	19%	5%	19%	5%
1986	13%	19%	4%	20%	5%
1987	13%	20%	5%	21%	8%
1988	12%	20%	12%	23%	22%
1989	14%	25%	11%	30%	30%
1990	11%	17%	9%	22%	28%

Note: These estimates are based on the assumption that individuals are distributed evenly through each income stratum in the grouped data.
Sources: As per table 2.3.

Regardless of the method of estimation of the incidence of poverty in Anhui and Yunnan, two trends are evident. First, during the 1978-90 period as a whole, there was a modest decline in the incidence of absolute

poverty, based on a head-count measure. This decline appears to have been quite significant when based on China-wide norms. Second, there was a large decline in the incidence of poverty from 1978 to 1985/6 in both Anhui and Yunnan, while the economic climate in the late 1980s resulted in the erosion of a considerable proportion of the earlier progress, although some progress has clearly been made.

Reliable survey data on food consumption in Anhui and Yunnan are not available. As a result it is necessary to estimate grain consumption from grain output data.[40] The output data for Anhui and Yunnan represent a significant overestimate of the grain available for human consumption. This is partly a function of the fact that a portion of the harvest is retained for seed for the following year, ranging from 2% to 12% for the different food grains. Second there is wastage and spoilage of the crop in the process of harvesting and storage. Wastage for food grain was assumed to be 3%. Thirdly, output data were presented as unprocessed grain, and must be converted into grain ready for human consumption. Extraction rates are presented in appendix 2.4, 33% of rice is lost in milling, while between 27% and 0% is lost for the other grains (sources in the appendix).

Grain was also used as animal feed, and this was estimated from the volume of pork, beef and milk production, and the numbers draught animals in the two provinces based Aubert's methods, as outlined in appendix 2.4. As a result, it was estimated that grain used to feed animals increased from 24.5 kg per person per annum in 1979 to 38.1 kg in 1990 for Anhui. The much greater extent of animal husbandry in Yunnan was reflected in the

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40 The estimation of grain availability presented here is at best an approximation, that should be taken as largely illustrative. This is primarily due to the lack of detail on calories from other sources, a difficulty that plagues more all embracing estimates of total food availability in China. However, any distortions that result from the method of estimation are consistent through the series of data, and therefore trends can at least be regarded as being accurate. The analysis in this section owes much to the work of Piazza (1983 and 1986) and Aubert (1992). A detailed account of the estimation procedure is presented in appendix 2.4 at the end of the chapter.

grain used for animal feed - 48.9 kg per capita per annum in 1979 increasing to 75.2 kg in 1990. The increase in the food grain used for animal feed increased steadily during the 1980s, with only small fluctuations reflecting variations in grain output from year to year. Feed itself was assumed to be divided proportionately among the various coarse grains, rice and wheat being too precious for animal feed, although the wheat and rice bran from milling and broken rice are also used as feed, but these leakages are already accommodated in the food grain balance sheet.

Finally, the net flow of grain from interprovincial trade and reserves must be accounted for. With the exception of 1990, Yunnan was a net recipient of grain, increasing its food availability, and reserves were also drawn on occasionally to supplement food availability. Anhui was a net exporter of food grain, and contributed to increased reserves in most years, limiting food availability in the province. As is outlined in appendix 2.4, reserves and trade in grain were assumed to be in the fine grains, wheat and rice.

All of these factors were subtracted from the raw output data, to yield per capita grain availability by type of grain. This can then be aggregated to represent the total volume of grain available to each person on an annual basis, or multiplied by the number of kilocalories (calories) for each specific grain type, divided by the number of days per year (365/6), and then aggregated to yield the per capita daily supply of calories available from grain. Both are presented in table 2.6 and in figures 2.2 and 2.3. Total grain output per capita was lower in Yunnan than in Anhui, and more heavily reliant on coarse grain. This combined with the higher levels of animal husbandry in Yunnan meant that grain availability was very low.

Table 2.6 - Per Capita Grain Availability, Anhui and Yunnan 1979-90

	Year	Anhui kg/annum	Anhui kcal/day	Yunnan kg/annum	Yunnan kcal/day
	1979	200	2065	152	1540
	1980	187	1945	171	1757
	1981	219	2281	162	1650
	1982	171	1767	165	1673
	1983	247	2557	154	1557
	1984	266	2733	159	1605
	1985	250	2542	140	1422
	1986	274	2826	122	1246
	1987	278	2860	131	1327
	1988	256	2633	126	1267
	1989	264	2717	135	1366
	1990	257	2640	137	1385
OLS	1979-90	2.8%	2.7%	-2.3%	-2.4%

Note: Changes in grain reserves were only included in the estimates for 1979-83 for Anhui, and 1978-84 for Yunnan, as these were the only years for which data were available. The situation regarding grain reserves after 1983 is ambiguous, as the collectives that held these reserves ceased to exists in 1983. This results in a modest upward bias in the grain availability in Anhui of probably no more than 2-3% on average, and an underestimate in Yunnan, of an indeterminate magnitude, assuming that there are reserves to increase grain availability for human consumption. The calorie data for 1980, 1984 and 1988 are based on 366 days in a year, and the OLS growth rates were derived from the regression lines in figure 2.4.
Sources: LSTJ, 1990: 2, 405, 751; ZGTJNJ, 1991: 82; ZGNMYYJJZL, 1986: 32-41, 72-5; 1987: 38-59; ZGNYNJ, 1981: 23-31, 47-9; 1982: 56-9; 1983: 56-9; 1985: 146-9; 1986: 209-11; 1988: 278-9; 1989: 213-9, 250-7; 1991: 298, 336-9; ZGNYJJZL, 1987: 106-21; 1988: 46-67, 118-43; 1990: 68-83, 140-169; 1991: 76-89, 142-171.

The poverty-lines based on grain consumption in China usually range from 85 to 90% of total calories derived from grain. Survey data from Anhui showed that 90% of calories were grain based, and 80-85% in Yunnan were derived from grain (Riskin, 1993: 141-3, Piazza, 1986: 117). Meat consumption in Yunnan was high by Chinese standards (derived from ZGNYNJ, 1989: 353-5, using Kueh's estimates for the conversion of food into calories (1988: 656-7)). Consumption of sugar, fruit and dairy products were all above the national average in Yunnan, although omitted from the survey mentioned above, and as a result, grain is perhaps responsible for as little as 75 or 80% of total caloric consumption, but it is impossible to be precise.[41] Therefore a range of calorie based poverty-lines are

41 There appears to be a serious omission in the Yunnan diet from the lack of data on yoghurt and cheese consumption, which appears to be large in the province - fried goats cheese being a local specialty - and also the omission of calories derived from the consumption of fruit and honey, both of which are particularly plentiful in the province, and much less expensive than elsewhere in the country. For example, bananas in Xishuang Banna were only 40% of their price in Kunming and only 20% of their price in Beijing in 1991, and were of course a much superior product. Fried bananas were a Dai specialty in Xishuang Banna, and crepes with bananas and honey was a specialty in the Bai and Naxi regions. Finally, the consumption of coconut is omitted, coconut figures large in the diet of the Dai, as do other products, such as larvae, which are not captured in the official data, but are a rich source of calories,

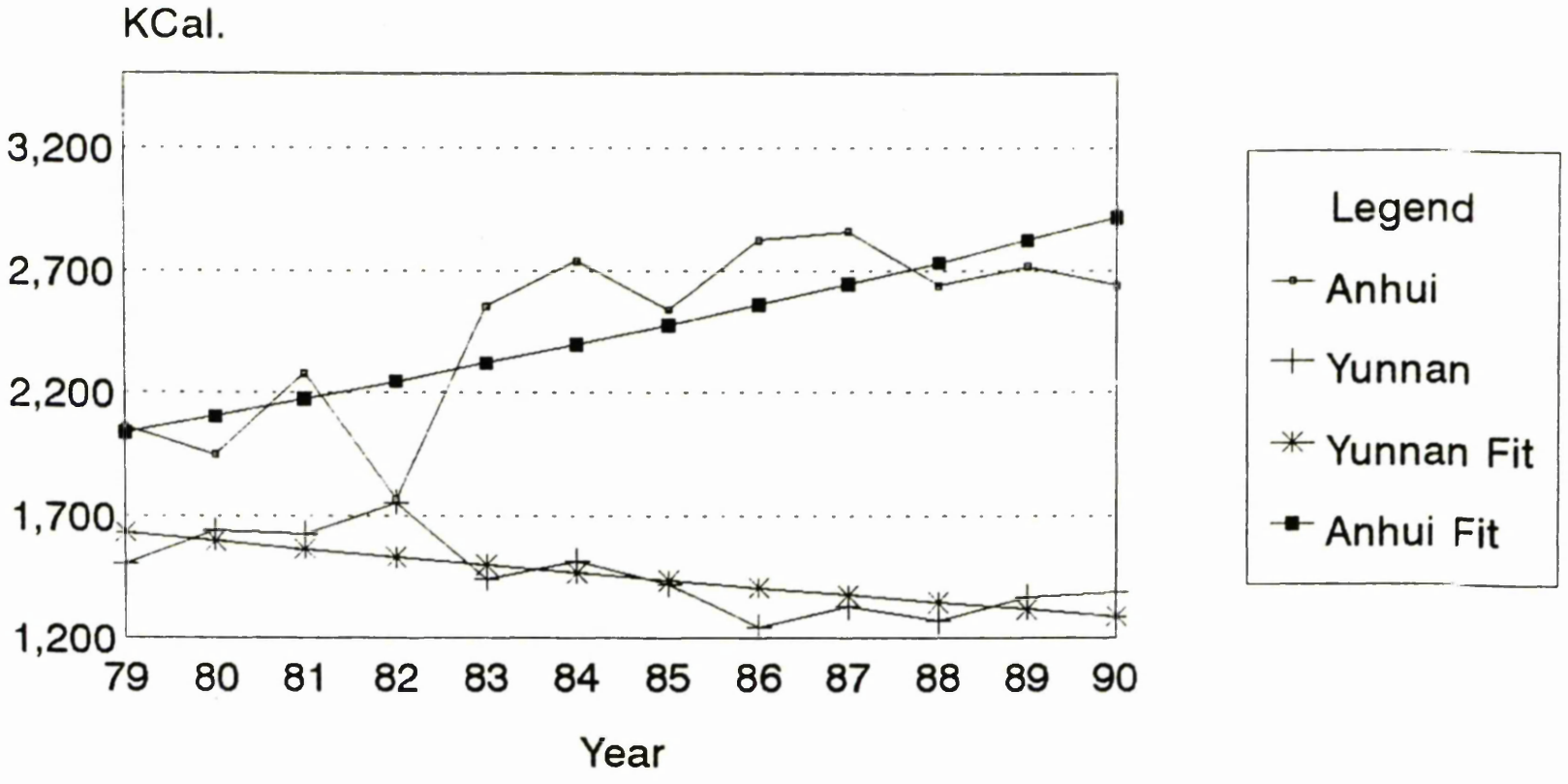
presented, to cover the broad possibilities. In point of fact, grain availability in Yunnan was so low that even the most generous of poverty lines exceeded the level of availability in the province.

Subsistence is usually defined as 190 to 205 KG of grain per person, per annum, or about 2000 calories per day (Riskin, 1993: 141-3), based on a 90% share of grain in total calories, or 1650 for 75%, 1760 for 80%, and 1870 for 85%. Total subsistence calories being 2200 calories per day. By these standards, Anhui was marginal to poor in 1979, while Yunnan was genuinely poor by all standards in 1979. Conditions in both provinces improved during the early to mid-1980s , so that by both criteria Anhui was no longer poor, while Yunnan remained below the lowest grain-based poverty line, but only marginally so in 1983. From the mid-1980s peak, there was a decline in grain availability in both provinces, so that between 1979 and 1990, per capita grain availability grew by 2.7% in Anhui, and fell by 2.4% in Yunnan. The county level analysis in chapter six and seven show that differentials in agricultural productivity growth between the counties of Yunnan and Anhui partly explain this disparity in the growth of grain availability. In 1990, Yunnan remained well below the lower poverty line of 1650 calories, and Anhui was marginally below the upper poverty line of 2430 calories, but above the 2000 calorie mark, which was its lower grain-based poverty line.

protein and fat. For these reasons it is very difficult to consider the low caloric availability from grain as indicative of poverty in Yunnan.

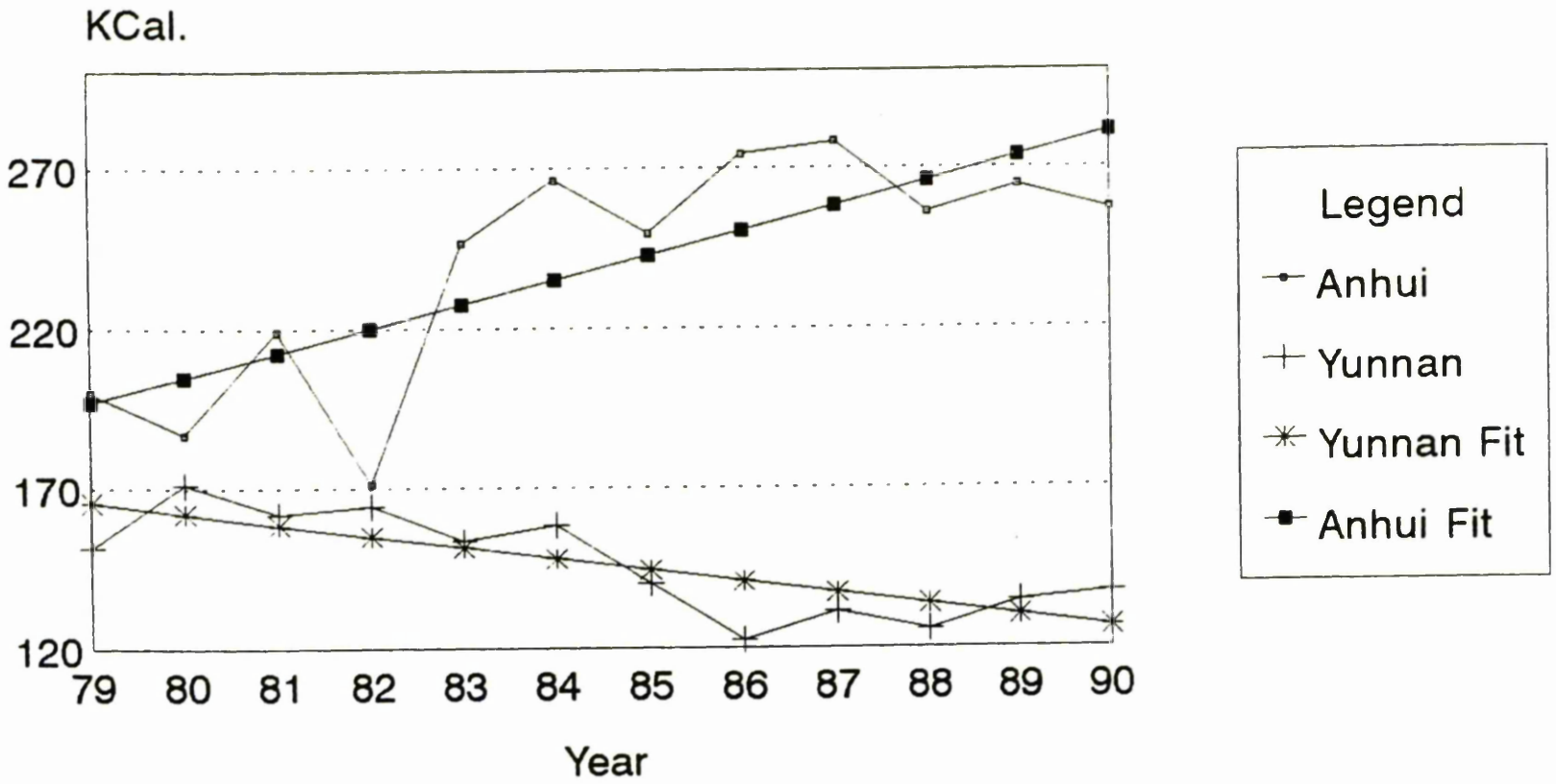
Figure 2.2 - Calories Derived from Grain in Anhui and Yunnan 1979-90

(Calories per Day)



Note: No provision for grain reserves after 1983 in Anhui
Note: No provision for grain reserves after 1984 in Yunnan
Sources: As per Table 2.6.

Figure 2.3 - Grain available for Human Consumption in Anhui and Yunnan 1979-90
(Kilograms per Year)



Note: No provision for grain reserves after 1983 in Anhui
Note: No provision for grain reserves after 1984 in Yunnan
Sources: As per Table 2.6.

5. Conclusion

Based on the detailed local evidence in Croll and Vogel, as well as the more general analysis by the World Bank and Riskin, it appears that there is further room for a detailed study of poverty in rural China. This analysis should take the form of household or individual level data, using a definition of poverty which embraces the twin concepts of capability and functioning.[42] It is not only the incidence of absolute poverty that needs further investigation, based on provincial norms not national ones, but also an examination of the trends in relative poverty over time. The analysis on living standards, spatial inequality and differentials in growth rates all point to increased divergence, not convergence, during the reform period. Also, the information presented above on Anhui and Yunnan calls into question the assumption that poverty alleviation has been an experience shared across provinces. Therefore, an investigation into whether or not this decline in the incidence of absolute poverty at a national level in China has been accompanied by a narrowing of the poverty gap for those who remain in poverty is necessary.

The superficial analysis presented here suggests that divergence has taken place, and that by both grain-based and income-based poverty lines, the situation in Yunnan has improved little, and the improvements in Anhui have not been overwhelming.[43] Perhaps more importantly, there was a trend increase in the incidence of poverty since the mid-1980s, after the initial gains from the changes in the price structure and decollectivization had taken place, paralleling the change in the terms of trade and relative prices, and with perhaps the short-comings of fragmented family farming bearing some responsibility for this trend.

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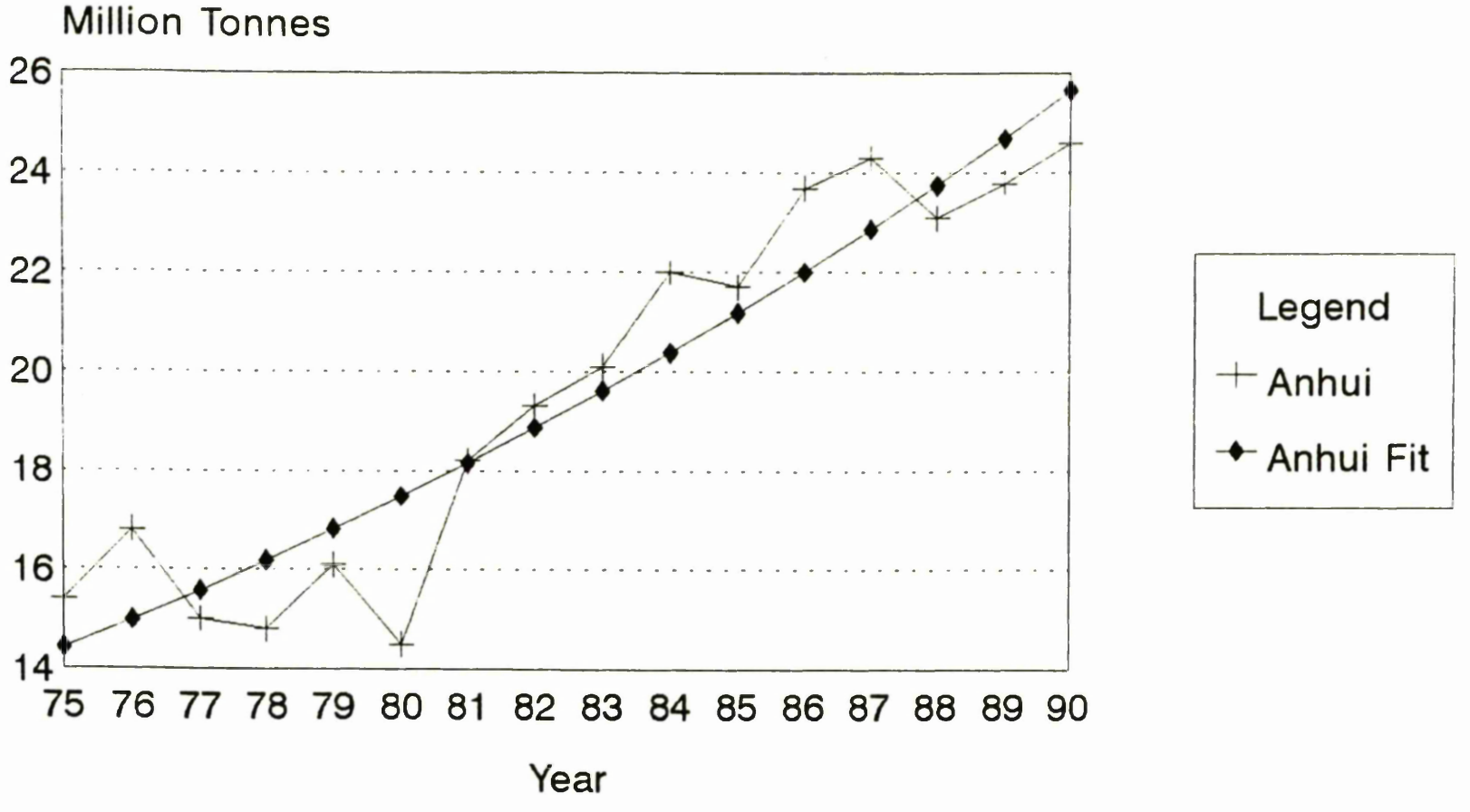
42 See for example Desai (1990), and the discussion of his work, and capability and functioning in chapter 3 on the standard of living.

43 The potential for exaggeration of the shortfall in calories in Yunnan is large.

Figure A2.1A - Aggregate Grain Output in Anhui, 1975-90

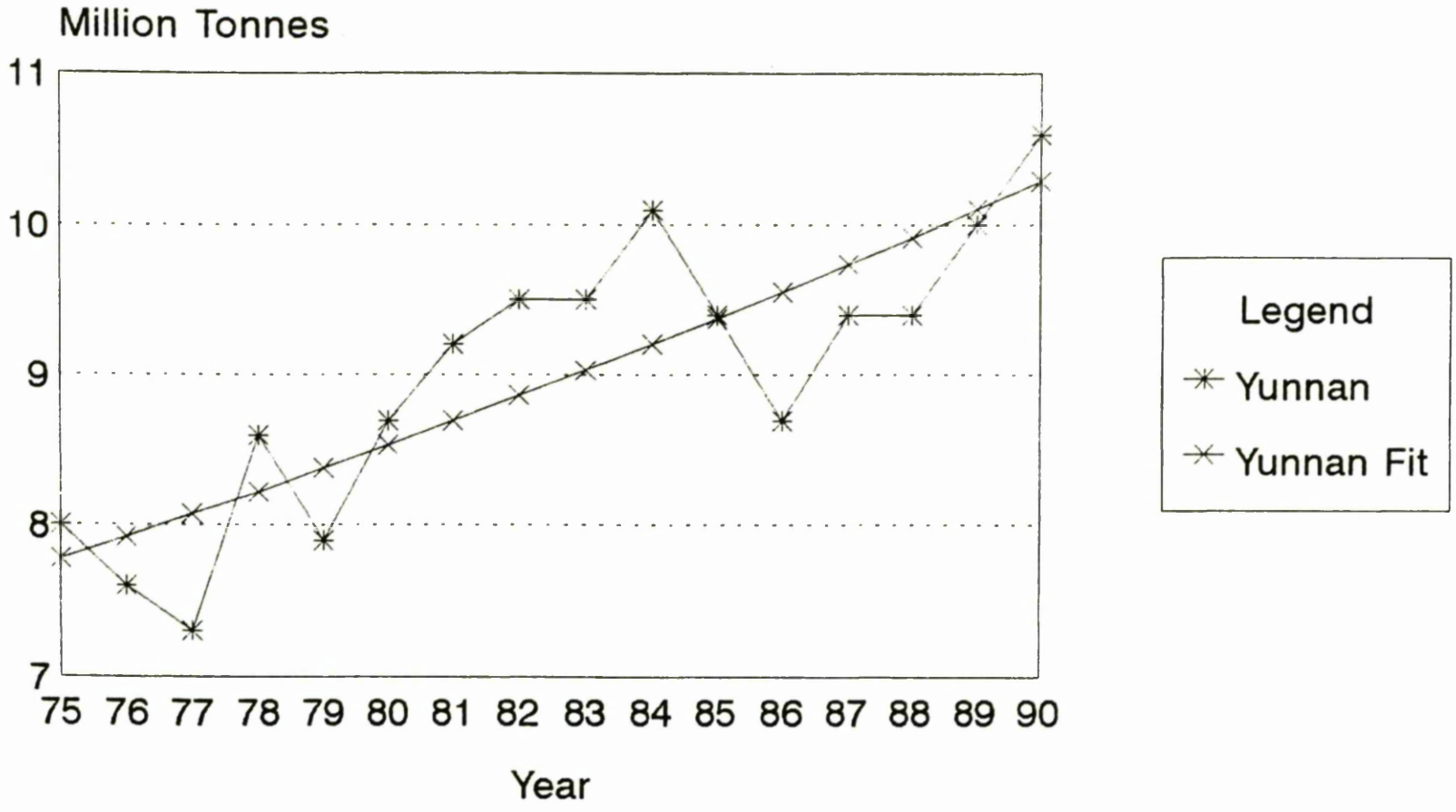
(in millions of tonnes)



Sources: LSTJ, 1990: 416, 762; ZGTJNJ, 1991: 346, 350;

Figure A2.1Y - Aggregate Grain Output in Yunnan, 1975-90

(in millions of tonnes)



Sources: LSTJ, 1990: 416, 762; ZGTJNJ, 1991: 346, 350;

Appendix 2.2 - Designated Poverty Counties

Central Government Assisted, Yunnan

Kunming Pr.	Zhaotong Pr.	Chuxiong Pr.	Honghe Pr.
6 Luquan	13 Qiaojia	39 Wuding	53 Pingbian
	18 Zhenxiong		58 Yunyang
	19 Yiliang		59 Honghe
			61 Luchun

Wenshan Pr.	Simao Pr.	Dali Pr.	Lijiang Pr.
65 Xichou	73 Mojiang	85 Yangbi	110 Ninglang
66 Malipo	77 Jiangcheng	89 Nanjian	
69 Guangnan	80 Ximeng		
70 Funing			

Nujiang Pr.	Deqen Pr.	Lincang Pr.
112 Fugong	117 Deqen	121 Lincang
113 Gongshan	118 Weixi	124 Shuangjiang
		126 Cangyuan

Provincial Government Assisted, Yunnan

Zhaotong Pr.	Qujing Pr.	Chuxiong Pr.	Wenshan Pr.
12 Ludian	23 Malong	32 Shuangbai	67 Maguan
16 Yongshan	29 Xundian		

Simao Pr.	Dali Pr.	Baoshan Pr.	Nujiang Pr.
76 Zhenyuan	92 Yunlong	99 Longling	114 Lushui
	94 Jianchuan		115 Lanping

Deqen Pr.	Lincang Pr.
116 Zhongdian	120 Yun
	123 Zhenkang

Central Government Assisted, Anhui
(1988 Boundaries)

Anqing Pr.	Fuyang Pr.	Liu'an Pr.
76 Qianshan	31 Yingshang	48 Liu'an Co.
77 Taihu		49 Shou
80 Yuexi		50 Huoqiu
		52 Jinzhai
		53 Huoshan

Provincial Government Assisted, Anhui
(1988 Boundaries)

Huainan Mun.	Anqing Pr.	Fuyang Pr.	Xuancheng Pr.
15 Fengtai	75 Zongyang	26 Linquan	55 Langxi
		30 Funan	58 Jing
			65 Jixi

Huangshan Pr.
67 She

Appendix A2.3

Deflator Series for China and Selected Provinces, 1949-90

Virtually all of the data used in deriving these deflator series come from the Compendium of Chinese Historical Statistics 1949-89 (LSTJ, 1990). This source presents the data for most of the principle indicators in two forms. The first is in comparable prices. The second is indexed to 1950 in 1950 constant prices. To derive the deflators for NDMP, GVSO, GVAO, and GVIO; it was necessary to first index both series to 1980, a common and desirable base year, and then the deflator series is the ratio of the two. This results in a new deflator series for the indicator which is indexed to 1980. This methodology was sufficiently accurate for the production of deflator series for GVAO and GVIO. The deflator series for NDMP and GVSO were more labour intensive to compile. The procedure outlined above had to be performed on each individual component of NDMP or GVSO, the components were then converted into 1980 constant prices, and then aggregated to form a 1980 constant price NDMP. The ratio between this series and the nominal series, both based to 1980 produced the 1980 constant price series.

The methodology for deriving the series of CPI deflators is rather different. This was done using the data on 'year-on-year' inflationary price movements. The data are expressed in the form 'any given year relative to the previous year, where the previous year equals one hundred'. This enables the researcher to add the 'year-on-year' increases in inflation into a series based in the initial year of the series. This can then be rebased to the desired base year, in this case 1980. So for example, the CPI for China is a sum of the 'year-on-year' inflationary movements based initially in 1950, and then rebased to 1980 to yield the series presented below. The methodology is the same for all provinces,

although the initial base year varies from 1949 to the mid- to late 1970's. The 1990 value for the CPI deflator series are derived from the ZGTJNJ (1991: 244) in the same manner.

NDMP included net agricultural and industrial output values, as well as the net value added from construction, transportation and commerce. The GVSO contained the same components, but the data are gross. It is believed that the series on agriculture and industry are internally consistent, with industries administered at the township or lower level included in industry throughout.

The tables for all other provinces except Anhui and Yunnan represent only comparable price series for NDMP and GVSO, while the GVAO and GVIO series are constant price series. All series for Anhui, Yunnan and China are constant price series.

Table A2.3.1 China Deflators Series, 1952-90

Year	NDMP Deflator 1980=100	GVSO Deflator 1980=100	GVAO Deflator 1980=100	GVIO Deflator 1980=100	CPI Deflator 1980=100
1952	60.2	78.3	52.2	133.6	79.3
1953	67.7	85.0	56.1	132.2	81.8
1954	68.4	86.0	56.9	130.0	83.4
1955	67.0	84.7	56.8	157.1	84.0
1956	67.8	85.9	57.4	119.8	84.0
1957	66.9	79.6	48.8	117.8	85.2
1958	70.6	83.5	50.2	117.1	85.3
1959	76.2	89.2	51.0	117.8	85.9
1960	79.8	92.0	53.7	116.9	88.1
1961	85.4	97.0	67.3	122.9	99.6
1962	83.8	96.4	66.2	127.6	102.3
1963	82.3	94.9	65.2	126.9	98.1
1964	82.5	93.5	64.4	124.4	95.5
1965	83.0	93.3	68.8	118.5	93.6
1966	83.9	92.7	69.2	113.5	93.4
1967	84.0	91.7	69.2	112.1	92.8
1968	84.0	91.5	71.2	109.7	92.9
1969	83.5	91.9	72.0	105.9	92.2
1970	85.8	91.2	73.3	101.5	92.0
1971	86.6	91.5	74.3	100.9	91.5
1972	87.0	92.0	75.6	100.3	91.4
1973	87.3	92.4	76.2	99.8	82.3
1974	87.3	92.2	76.2	99.1	92.2
1975	86.8	92.1	76.6	98.6	92.3
1976	87.1	92.5	76.8	98.4	92.5
1977	87.6	92.6	76.8	97.6	94.0
1978	90.4	93.5	79.2	97.7	94.4
1979	96.3	97.4	89.6	99.2	95.8
1980	100.0	100.0	100.0	100.0	100.0
1981	103.5	102.9	107.2	100.5	101.7
1982	104.0	103.4	109.7	100.3	103.1
1983	105.4	104.5	112.7	100.3	104.2
1984	108.0	106.7	117.3	101.7	106.1
1985	112.4	112.0	127.8	106.8	112.4
1986	115.1	116.0	137.0	110.2	116.6
1987	121.3	121.5	151.0	115.6	121.8
1988	128.7	131.9	182.1	126.2	134.9
1989	131.4	139.0	196.8	140.5	147.6
1990	127.1	137.3			150.8
Mean	90.2	97.7	84.6	113.1	98.3
St.Dev.	17.8	14.2	34.9	14.1	16.3
Coef.Var.	0.197	0.145	0.413	0.124	0.165

Source: LSTJ, 1990: 5-32; ZGTJNJ, 1991: 32-3, 244.

Table A2.3.2 Anhui Deflators Series, 1952-90

Year	NDMP Deflator 1980=100	GVSO Deflator 1980=100	GVAO Deflator 1980=100	GVIO Deflator 1980=100	CPI Deflator 1980=100
1952	51.1	61.6	49.3	76.9	NA
1953	51.4	51.8	57.6	80.6	NA
1954	51.1	46.0	56.6	81.9	NA
1955	52.1	55.8	60.8	84.5	NA
1956	57.0	53.7	65.0	86.3	NA
1957	56.7	60.2	60.8	83.7	NA
1958	71.7	83.8	69.1	81.5	NA
1959	85.6	100.2	77.3	95.1	NA
1960	97.1	115.6	85.6	94.8	NA
1961	84.4	81.6	94.0	97.4	NA
1962	69.2	68.6	105.0	97.6	NA
1963	69.4	65.1	75.7	99.5	NA
1964	68.9	64.1	68.2	100.8	NA
1965	69.5	68.0	67.4	100.5	NA
1966	72.7	70.3	72.8	102.8	NA
1967	65.3	61.2	72.4	100.5	NA
1968	64.2	63.7	72.9	97.5	NA
1969	71.4	66.4	73.1	99.3	NA
1970	73.8	73.1	73.1	96.5	NA
1971	78.0	78.3	75.8	96.6	NA
1972	78.4	79.1	78.5	97.0	93.4
1973	80.5	84.5	81.0	96.9	94.0
1974	77.5	82.2	81.0	97.4	94.1
1975	84.2	88.9	82.0	94.9	94.1
1976	81.7	92.7	83.8	97.7	94.0
1977	86.8	98.0	86.5	97.8	94.0
1978	94.1	99.6	90.2	97.7	94.0
1979	94.6	103.4	92.7	98.5	96.7
1980	100.0	100.0	100.0	100.0	100.0
1981	97.9	86.4	113.7	98.5	101.7
1982	100.4	98.7	114.8	99.1	102.7
1983	105.3	99.3	120.0	101.3	103.8
1984	108.1	102.2	135.3	102.4	105.9
1985	114.3	107.2	137.8	107.1	112.7
1986	119.7	110.3	142.1	109.2	118.6
1987	121.8	112.5	163.6	116.2	130.1
1988	129.7	113.3	203.2	127.5	158.4
1989	129.0	114.7	215.3	140.4	185.5
1990					189.0
Mean	83.3	83.2	93.5	98.3	113.8
St.Dev.	21.7	20.0	37.3	11.6	29.7
Coef.Var.	0.260	0.240	0.399	0.118	0.261

Sources: LSTJ, 1990: 408-431; AHTJNJ, 1991: 445; ZGTJNJ, 1991: 244.

Table A2.3.3 Yunnan Deflators Series, 1952-90

Year	NDMP Deflator 1980=100	GVSO Deflator 1980=100	GVAO Deflator 1980=100	GVIO Deflator 1980=100	CPI Deflator 1980=100
1952	59.1	64.0	50.0	103.2	96.0
1953	63.0	69.1	53.3	103.4	99.2
1954	63.1	69.8	52.6	105.9	99.6
1955	62.6	69.4	51.4	107.0	99.4
1956	63.2	68.9	51.6	96.6	97.6
1957	67.7	73.7	56.8	98.6	98.8
1958	68.0	77.7	53.6	94.0	97.2
1959	74.1	80.4	55.3	90.2	96.8
1960	77.6	84.9	57.9	97.2	95.9
1961	76.1	82.0	63.6	99.3	106.7
1962	80.5	85.7	71.2	106.9	104.8
1963	81.4	85.8	71.9	106.5	99.3
1964	80.8	85.7	71.6	105.9	93.8
1965	81.7	87.8	71.6	104.0	93.1
1966	81.3	87.1	71.6	98.6	NA
1967	80.9	87.5	71.6	104.1	NA
1968	77.2	81.9	71.6	103.6	NA
1969	80.8	87.9	71.6	104.1	NA
1970	82.2	87.6	72.8	96.1	NA
1971	86.8	90.3	79.2	96.8	93.2
1972	88.0	91.0	81.0	96.8	93.5
1973	88.2	91.1	81.2	96.7	93.6
1974	87.4	90.5	79.0	96.7	94.0
1975	86.6	90.1	78.4	96.8	94.0
1976	86.0	89.5	78.4	96.8	94.0
1977	87.9	90.7	78.7	96.8	94.0
1978	90.2	91.8	83.7	93.9	94.0
1979	99.1	98.7	99.1	97.8	94.7
1980	100.0	100.0	100.0	100.0	100.0
1981	103.8	103.1	105.1	103.1	101.1
1982	105.3	104.7	106.4	106.0	102.9
1983	106.0	105.6	107.1	107.3	103.8
1984	107.9	107.3	109.5	109.7	106.3
1985	113.6	112.3	118.2	115.2	113.8
1986	118.3	115.3	130.8	114.7	118.5
1987	125.4	121.6	142.8	121.5	124.6
1988	138.5	134.1	163.0	138.6	142.9
1989	153.5	149.4	178.7	161.7	160.9
1990	176.8	166.3			164.4
Mean	91.0	93.8	84.0	104.5	109.2
St.Dev.	24.8	20.9	30.3	12.8	21.8
Coef.Var.	0.272	0.223	0.361	0.122	0.200

Source: LSTJ, 1990: 754-778; YNTJNJ, 1991: 25; ZGTJNJ 1991: 244.

Appendix 2.4 - Estimates of Grain Availability

The estimates of grain availability based on grain output data employed in this chapter are produced based on the methodology outlined by Piazza (1983, 1986). For the most part, his estimates of leakages from grain output for seed, wastage, milling, and non-food manufacturing purposes are used. Estimates of the net effect of trade and reserves on grain availability come from YNSQ and AHSQ, vol.1 and the statistical yearbooks for both provinces, and are detailed below. Finally, the leakages of grain for animal feed are based on Aubert (1992), and the data on animal husbandry in the Agricultural Yearbooks.[1]

Table a2.4.1 - Rates of Food Disappearance from Grain Output

Source	Rice	Wheat	Corn	Tubers	Soya Beans	Other Coarse Grains
Seed, Feed[2]	2.4%	10.0%	2.5%	2.0%	12.0%	2.5% / 2.0%
Manuf.	0.2%	0.1%	4.0%	0.0%	0.0%	0.0%
Waste	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Trade						
Reserves						
Subtotal	Sum of all previous rows subtracted from the p.c. grain output					
Milling	33.0%	15.0%	9.0%	0.0%	27.0%	20.0%
Total kg	Subtotal - losses for milling					
kcal./kg	3660	3500	3620	5140	4000	3550
pc.kcal.	Total kg * kcal./kg / days in year (365 or 366)					

Note: The milling factor for soya beans comes from Riskin.
Sources: Piazza, 1983: 7, 94; Riskin, 1993: 141-3.

The percentages in the table represent the proportion of total output that is lost for human consumption for each various reason. These losses are taken from total per capita grain output before adjustments for milling. These are then turned from unrefined grain figures to refined grain figures, as outlined in the table. Finally, the data on per capita

[1] The data sources for grain output and animal husbandry were given at the bottom of table 2.6 in the text.

[2] Method for the derivation for grain used for feed, traded grain and grain reserves discussed below, and shown in table a2.4.2.

annual grain availability are turned into kilocalories per day by multiplying the number of kilos of grain by the energy content of the grain, and dividing by the number of days in a year. The following table outlines the flows of grain for animal feed, trade and reserves for each province.

Table a2.4.2
Grain Leakages and Inflows from Animal Feed, Trade and Reserves

Year	Anhui Animal Feed kg per capita	Trade %	Reserves %	Yunnan Animal Feed kg per capita	Trade %	Reserves %
1979	24.5	5.9	0.4	48.9	-12.5	3.8%
1980	24.8	2.5	-2.0	49.6	- 9.3	11.6%
1981	24.6	3.1	2.7	52.4	- 4.1	2.1%
1982	26.2	6.3	0.8	56.8	- 6.3	-7.3%
1983	27.1	4.2	9.3	61.0	- 3.5	9.5%
1984	29.1	4.2	0.0	65.2	- 1.8	7.4%
1985	34.4	5.0	0.0	68.1	- 4.0	0.0%
1986	35.9	5.0	0.0	69.1	- 4.0	0.0%
1987	36.3	5.0	0.0	70.6	- 3.0	0.0%
1988	39.1	5.0	0.0	73.1	- 2.0	0.0%
1989	38.0	5.0	0.0	73.0	- 1.0	0.0%
1990	38.1	5.0	0.0	75.2	1.0	0.0%

Note: Data on reserves were not available after 1983 in Anhui and after 1984 in Yunnan. As it was impossible to interpolate changes in reserves, they were given a zero value in the estimation.
Sources: As per Table 2.6, and AHSQ vol.1, 1985: 612-3, 620-2; YNSQ, 1986: 863.

The calculations for animal feed were derived in the following manner. The principal components are fine grain for pig feed, beef cattle feed, draught animal feed and dairy cattle feed. Data on egg output are not available, and therefore grain leakages for egg and poultry production do not figure in these estimates. Grain feed for draught animals was taken to be 0.14 tons per animal per year (Aubert, 1992: 117). Milk production required 0.33 kg of grain for each kg of cow's milk produced (ibid.). Fine feed per kg of pork was taken to be 1.61 kg in Anhui and 2.03 kg in Yunnan (Aubert, 1992: 120). The fine grain feed for beef production was taken to be 0.14 tons per animal per year, as with draught animals. There were no figures in Aubert for grain per kg of beef produced, so this approximation was employed instead. Aubert's estimates were for 1987, and are assumed

to hold throughout the 1979-90 period. This may provide and over-estimate of grain used for animal feed at the beginning of the period. However, the shifting composition of animal feed was marginal compared to the massive increase in animal husbandry in both provinces, and the estimates presented in table 2.6 are felt to be reasonable approximations. Once the total number of tonnes of food grain needed for animal feed in each province had been determined using the rates outline above and the output volume and animal numbers data from the agricultural yearbooks, this was divided by the population, to produce a per capita estimate grain consumption foregone due to animal feed. These data are presented in table a2.4.2. This amount was then divided among the coarse grains - tubers, corn and other coarse grains (millet, gaoliang etc.) based on their percentage share of coarse grain output, as per Piazza's methodology.

Chapter 3

The Standard of Living

1. Introduction

The magnitude and direction of the change, and the measurement of living standards in China during the 1980s has been hotly debated in the recent literature, with no consensus having been reached. There are three key contributions to the literature on the standard of living in China. Sen (1989), and Nolan and Sender (1992) have debated the magnitude and direction of changes in living standards in post-Mao China, and the importance of these changes relative to the rapid rate of economic growth. Aschmoneit (1990 and unpublished) contributed a life quality index for all the cities and counties of China based on data from the 1982 census. Chapters three and four of this thesis represent a further contribution to this literature. This chapter contains an examination of the Sen, Nolan and Sender debate, and the theoretical literature on living standards. This is followed by an examination of the trends in achieved functioning for Anhui and Yunnan provinces, placed in a China context. Chapter four contains a discussion of Aschmoneit's life quality index for 1982, and presents a standard of living index for Anhui and Yunnan for both 1982 and 1990, examining trends in living standards at the county level.

A.K. Sen (1989), and Nolan and Sender (1992) both examined consumption and capabilities data in making their pronouncements on living standards in post-Mao China. They reached different conclusions.

Sen used the Gross Value of Agricultural Output (GVAO) as a proxy for increased availability of grain. This is a poor measure, for both real per capita Net Value of Agricultural Output (NVAO), and the per capita grain

output figures are available. In this dissertation emphasis is placed on NVAIO, as output is the better income proxy. Provincial per capita grain consumption data were available by household size and income level. Nolan and Sender used grain output data to demonstrate that grain output and availability increased between 1973-75 and 1984, and by 1990 had recovered from the post-1984 slump. However, the grain availability data for Anhui and Yunnan presented in chapter two suggest that there is no room for complacency over grain output during the 1980s, particularly in Yunnan.

Sen argued that life expectancy at birth fell between 1978 and 1986, and remained below the early reform peak. This was one of the key premises of his argument that economic growth does not necessarily result in an increase in welfare.[1] Sen's own data showed that this crucial premise does not hold because life expectancy was 69 years in 1985 (1989: 773-4), making the entire argument of dubious value, although data from the 1990 census confirm Sen's assertions. In this dissertation, crude death rates have been employed, because there were few life expectancy or child mortality figures available, particularly, at the county level, which are necessary for an examination of rural trends.

Sen used an index of national and rural death rates in his analysis. This index was rather misleading, because it exaggerated the fluctuations in the death rate, which were very small numbers, although the trend increase in mortality between 1978-80 is undeniable. These fluctuations in the death rate represented 3,102,286 "above normal" deaths from 1980 to 1986, if the 1979 death rate is considered "normal"[2]. The trend increase

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[1] Figure 1 (1989: 774) showed a peak in life expectancy at birth of approximately 64 years in 1977 or 1978, it thereafter declined to approximately 62 years in 1980 where the chart ends. However, in both Table 1 (1989: 773) and Table 2 (1989: 774) life expectancy at birth in 1985 was shown to be 69 years of age.

[2] These "above normal" deaths are calculated on the deviation of the death rate in any given year, compared to the base year, 1979. They are merely indicative of the relatively small impact on the total number of deaths compared with the entitlement failure deaths that Sen refers to for India.

in mortality was the result of three factors: the aging of the Chinese population, the privatization of the health service, and an increase in infant mortality. The Chinese population aged during the 1980s. The proportion of people in the youngest age groups fell, while the proportions in the working age and elderly groups increased. This change in the age structure of the population between 1974 and 1990, combined with improvements in immunisation against childhood diseases and control of endemic diseases led to declining child mortality. By contrast, infant mortality stagnated for males, and increased for females, while population aging led to a rise in the absolute number of deaths among the elderly, due to both natural causes and the chronic diseases of those fifty and over (Banister, 1992: 8-10; World Bank, 1992c: 1-8).[3] 1983 was a significant year, as this was the height of the enforcement of the one-child policy, particularly in rural areas, which is taken as a contributor to the rising death rates in that year (cf. Banister, 1987: 220-1). This premise was reinforced by Banister's analysis of 1990 census data, showing that female infant morality increased over the intercensal period (Banister, 1992: 8-10).

Table 3.1 - Death Rates for China, and the Sen Death Rate Index

Year	Sen DR Index China	Sen DR Index Rural	CDR per K China	CDR per K Rural	Excess Deaths Over'79	Excess Deaths % Pop
1979	100	100	6.2	6.4	0	0.0
1980	102	101	6.3	6.5	98,705	0.01
1981	102	102	6.4	6.5	200,144	0.02
1982	106	110	6.6	7.0	406,360	0.04
1983	114	120	7.1	7.7	924,876	0.09
1984	108	105	6.7	6.7	519,380	0.05
1985	106	104	6.6	6.7	420,176	0.04
1986	108	105	6.7	6.7	532,645	0.05

Note: These data are registration data, and not the more reliable census data.
Sources: Sen, 1989: 776; ZGTJNJ, 1990: 90; ZGTJNJ, 1988: 97.

[3] An examination of death rates by province and by age and sex would help to explain these increases in the death rate for China as a whole as will be seen for the counties of Anhui and Yunnan.

The data in table 3.1 are themselves problematic because they are the registration data. Banister's reconstruction of mortality from the 1973-5 cancer survey and from the 1982 and 1990 population censuses are much more reliable indicators of mortality since the late Maoist period. These data show that mortality continued to decline from 1974 to 1981, showing improvements in living standards through the initial stages of decollectivization, and up to the eve of the dissolution of the rural collective health service. Mortality rose between 1981 and 1990, as per table 3.2. This poses important questions about the causes of increased mortality, and although nothing concrete on determinants can be offered here, the twin policies of decollectivization and the one-child policy doubtless played some part in the increases in infant mortality in particular, and mortality in general.

Table 3.2 - Mortality and Life Expectancy Data for China 1974 - 1990.

Year	Life Expectancy Male	Female	Infant Mortality Male	Female	Crude Death Rate Male	Female	M+F
1974	62.3	64.4	52.6	52.4	na.	na.	7.3
1981	65.4	67.5	38.0	36.0	6.4	6.1	6.3
1990	66.4	67.0	38.7	37.5	7.0	6.3	6.6

Sources: ZGRKTJNJ, 1988: 464, 483; 1992: 60-1, 156-7; Banister, 1987: 116; Banister, 1992: 4-8.

Thus the data in table 3.2, which is more reliable, support Sen's assertions regarding trends in mortality and life expectancy during the reform period, and refute the assertions made by Nolan and Sender. Nolan and Sender (1992: 1294-8) demonstrated that not only for China as a whole, but also for the provinces, there was a trend decline in death rates from 7.1 per 1000 population in 1973 to 6.5 per 1000 population in 1989, with a high value of 7.1 per 1000 population in 1983, and a low value of 6.2 per 1000 population in 1979 (ZGTJNJ, 1990: 90). The corresponding figures for rural China were 7.3 per 1000 population in 1973, and 6.7 per 1000

population in 1989, with a peak in 1983 of 7.7 per 1000 population. The overall trend, from 1973 to 1990, was undeniably downward, and modest year on year fluctuations no greater than the historical norm.

These two contrasting views are easily resolved. First, Nolan and Sender did not have the 1990 census figures, and were reliant on the household registration data which are recognized as underestimating mortality. Second, Nolan and Sender use 1973-5 as their base period for late-Mao China, while Sen used 1979. For an examination of the economic reform period as a whole, 1979 or 1978 is the best base year, because it was in the autumn of 1978 when institutional reforms were initiated in Anhui and Sichuan, and 1979 when the price structure for agricultural products and the terms of trade shifted in agriculture's favour - continuing to do so through 1984. If an examination of the impact of decollectivization on mortality and life expectancy itself is of interest, then 1982 is the best base year, because 1983 saw the formal dissolution of the communes, and the end of medical care provided by, or subsidised by, the rural social security system. Therefore, the trends in mortality from 1974 to 1981 essentially show the progress made in the late Maoist period, before decollectivization, while the trend for 1981 to 1990 effectively reflects the trends since the introduction of decollectivization and the one-child policy.

Sen concentrated on the decline in the number of barefoot doctors as an indication of the declining state of medical care in China, particularly in rural areas. Nolan and Sender argued that the decline in the number of barefoot doctors took place as part of a shift to more modern, and western-style, health care. They offered data on various measures of health care provision in China, such as: hospital beds per thousand population; professional health care workers per thousand population; and numbers of

health care personnel, separating out rural personnel and number of doctors. While barefoot doctors left the state payroll during the 1980s, many continued to practise on a free-enterprise basis. As health care provision in the state sector changed to a cash-up-front basis in the wake of decollectivization, their move to private practise had few welfare implications.[4] However, the change in access and provision renders such a discussion largely an irrelevance, ignoring the shift in emphasis from preventative to curative medicine as a result of privatisation. An examination of access to medical care and mortality appears in section three below.

The majority of the literature on China presents either a macro-level analysis of trends for China, sometimes including provincial level data, or micro-level village studies. The former often presented distorted pictures of national trends because most Chinese provinces are equivalent to large European countries and themselves have vast regional differences; while the latter often present useful detailed analysis of local trends, but to assume that they are representative of China as a whole requires a large leap of faith, due to sample size and design. For a robust analysis of capability and functioning as put forward by Sen, a survey of interpersonal and interregional variations in capability, based on a representative sample, would be required. Such a survey is beyond the scope of an individual conducting research for a PhD. dissertation. As a result of the unreliable nature of the SSB panel survey data (Bramall and Jones, 1993) a household or interpersonal analysis of capability has been rejected in favour of a county level analysis of functioning. This is an improvement on earlier macro-level studies, and is more representative, at

[4] The most famous free-enterprise doctors in Yunnan, Chinese traditional medicine practitioners largely, set up shops in their villages, while former barefoot doctors offered their services in the markets on a periodic basis, and were also available for house calls in emergencies (cf. author's field notes, 1991).

least of the range of conditions in Anhui and Yunnan, than anthropological micro-level studies. Where possible, this analysis has been supplemented by village level data. First, a discussion of the theoretical developments in measuring living standards is necessary.

2. Theoretical Background[5]

In the 1960s, the standard of living was measured in terms of income or output values, such as per capita gross national product (GNP) or gross domestic product (GDP) from national income accounts. Subsequently per capita net (or gross) rural (or urban) income from survey data on income and expenditure were employed and provided improved measures of material well-being.[6] Sen (1979) criticised the short-comings of national income accounts-based measures of the standard of living on numerous counts.

One of the criticisms was the fact that income accounts data are, at best, an indirect measure of well-being. The short-comings of this method of measuring the consumption of a population are obvious if one considers an economy where the rate of investment in producer goods is high. This investment merely reflects an improvement in the future potential standard of living, and does nothing to increase current living standards, despite a significant increase in the value of per capita GNP or GDP. A second objection is that the national incomes approach measures utility in terms of commodity ownership, and assumes that all individuals derive equal utility from a given commodity bundle. The problems of utilitarianism are discussed in detail below, but there are problems with defining well-being solely in terms of commodity ownership, ignoring factors such as longevity

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[5] This section is heavily based on the collected works of A.K. Sen (1976), (1979), (1981), (1982), (1985a), (1985b), (1987a), (1987b), (1988), (1992), Dreze and Sen (1989), (1991), and Sen and Williams (1982).

[6] Adelman and Morris (1973) was the first instance of cross-national examination of a wide range of functioning, although functioning did not yet exist as a concept.

and personal security, and with no regard for interpersonal differences in utility. Third, not all goods with a market value are beneficial to society. Goods such as cigarettes and pornography are counted in the national income accounts, but that they contribute to a nation's collective well-being is debatable. Also, to what extent does national defense spending "legitimately" contribute to increased well-being in a country such as North Korea or Rwanda?

Finally, there are problems with the price weights given to commodities under the national accounts system, and for international comparative purposes, with the deflator series, the exchange rate and the relative price set employed to produce comparable data. The national accounts system has a set of chosen price weights which can themselves produce a bias. For a country like China this becomes evident if grain output is examined. It is the different prices paid to producers and paid by consumers for grain that cause the problems. First, a considerable amount of the grain output is retained by the rural population for self-consumption, and some of the remaining grain is sold to the state at a low, contract price or turned over to the state as payment in kind of the agricultural tax. Above this amount, the remainder is either sold to the state at a premium price, or sold on the free market. Some grain is then sold to urban residence at a subsidized price with ration coupons, and the remainder at market prices[7]. Which price should be used as the weight for grain output in the national income accounts, and how has the system changed to reflect the changes in relative prices as a result of price reform through the 1980s? Both question are eliminated by using a 1980 constant price set for the valuation of NDMP and NVAIO. At an

[7] From January 1993, virtually all grain rationing systems had been abolished, and grain was only available on the free market.

international level, it is the exchange rate used, and the relative price set employed, adjusting for purchasing power parity, that make enormous differences in the level of per capita GNP for different countries. For example; China ranked 62nd in terms of 1987 real per capita GNP at purchasing power parity, and only 22nd in terms of real per capita GNP in the same year (UNDP, 1990: 128-9).

As a result of these short-comings, numerous scholars turned to consumption to measure the standard of living directly. These studies covered a vast range of consumption, from the basic necessities, such as staple food grains, to more detailed studies of the composition of caloric intake, and even the consumption patterns for consumer durables such as watches, clocks, electric fans, refrigerators, televisions, radios, or furniture. These more direct measures of consumption have been criticised in turn for their utilitarian approach, and the assumption that all people derive the same quantity of utility for the same level of consumption. Further, this ignores factors such as access to medical care, personal safety, access to education, and the freedom to live a long life, which must surely be amongst the most basic requirements for a high standard of living. This last group of measures of the standard of living has been championed by Sen, and belong to a class dubbed functioning and capability by him.

A good illustration of how very different conclusions can be reached about a country's standard of living can be seen from data on per capita GNP, life expectancy at birth and female illiteracy rates for countries such as China and Sri Lanka compared to Senegal, Nigeria, Poland, Brazil, and Saudi Arabia. By looking only at per capita GNP, as in table 3.3, the standard of living in Saudi Arabia would be assumed to be many times that in Nigeria, China or Sri Lanka. However, based on life expectancy, Poland

and Sri Lanka topped the list in terms of standard of living, and China was close behind. Finally, adult illiteracy among females was much lower in Sri Lanka and Brazil than in any of the other countries in the sample, with wealthy Saudi Arabia falling to third from the bottom. This merely illustrates the problems involved in determining the standard of living in any given country, which measures should be used, and what weight should be given to each factor in determining the standard of living. A discussion of human development-type indices appears in chapter four.

Table 3.3 - Summary Data, Selected Countries

Country	GNP per capita 1990 ($US)	Life Expect. at Birth 1990 (years)	Female Adult Illiteracy 1990 (%)
Nigeria	290	52	61
China	370	70	38
Sri Lanka	470	71	17
Senegal	710	47	75
Poland	1,690	71	na.
Brazil	2,680	66	20
Saudi Arabia	7,050	64	52

Source: World Bank (1992a) World Development Report 1992: 218-9.

The level of inequality of the income distribution in any given country can have an important impact on the standard of living of that country's population. Sri Lanka experienced a slow rate of economic growth with strongly equitable government policies promoting widely available and affordable health care and education.[8] As is evident from the data on Sri Lanka in table 3.3, such policies can do much to raise living standards among those ostensibly living in poverty. Sri Lanka is often contrasted with Brazil because of their different experiences with rates of economic growth and income inequality. Income inequality in Brazil was among the highest in the world, with a Gini coefficient of 0.63 in 1970 compared to

[8] In point of fact there has been a lively debate over the impact of government intervention in Sri Lanka, with Glewwe and Bhalla opposing Isenman, and Sen. Conclusive evidence of the positive impact of government intervention of living standards in Sri Lanka is presented by Anand and Kanbur (1991).

0.35 in Sri Lanka in 1973. In 1970, the ratio of the income share of the bottom 40% of the population relative to the top 20% was 0.097 in Brazil, by 1983 this had increased to 0.129. For Sri Lanka, the change in the same ratio was 0.378 to 0.237, for 1970-1985/6. (Fields, 1988: 464-5 and World Bank, 1992a: 276-7) Greater inequality in the Brazilian income distribution may be linked to life expectancy at birth being five years lower than in Sri Lanka, despite a per capita GNP 5.7 times as large. Rapid economic growth can play a significant role in poverty reduction, but is neither necessary nor sufficient for poverty alleviation or increasing living standards, as discussed in chapter two.

a. The Limitations of Utilitarianism and Social Welfare Analysis

When development economists first measured the standard of living, they concentrated on aggregate output measures and relied on social welfare analysis. There are several serious objections to such a utilitarian approach.

Firstly, it is assumed that all individuals will derive the same level of utility from the same amount of income, or the same commodity bundle. This ignores inter-personal variation due to genetic differences,[9] but also differences between individuals as a result of gender, age, race, class or disability, each of which affects an individual's ability to translate income or commodity consumption into utility. A parallel limitation to the utilitarian approach is that people living in conditions of deprivation tend to adjust their expectations, and the sources of utility, to correspond to their plight. Thus, the level of utility derived from a given bundle of consumption would yield a higher

[9] This was discovered by those working on the nutritional status of individuals, where an individual's metabolic rate and their nutritional history are important influences on the nutrition status of that individual. See for example Behrmann in Psacharopoulos, 1991: 79-170.

level of utility for a person suffering deprivation than for one who is not.[10]

Secondly, social welfare analysis is only an indirect measure of the contribution to well-being of other factors, through the metric of a mental measure of utility such as happiness, pleasure or desire. As a result it ignores the intrinsic value of these items themselves. This disenfranchisement of factors such as income, consumption, longevity or literacy results in these factors being measured only to the extent that they contribute to pleasure or utility, and ignores completely the benefits derived from freedom of choice. As a result, the link between utility measures and well-being is tenuous at best. For example, the utility derived from inoculation against childhood diseases by an infant, in this case defined as the infant's perception of inoculations, might be very low, or even negative; but the strongly positive impact of this event on the life expectancy and freedom from disease that such inoculations imply for the infant are strongly positive in the metric of well-being.

Finally, there is the issue of the distribution of utility. Traditional social welfare measures have only been concerned with efficiency conditions, such as Pareto optimality, which maximizes utility for society as a whole in a manner that does not differentiate between different distributional outcomes. It is possible for a highly unequal distribution of incomes, such as one with a Gini coefficient of 0.6, to fulfil the conditions of Pareto optimality in the short-run, but at the same time have great disparities of well-being.[11] Further, the traditional measures of income inequality are themselves dependent on the

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10 This results from a shift downwards in their utility expectations, to reflect what is possible, not what is desirable, as part of their psychological survival mechanism. "...Desires are reduced to 'realistic' proportions." (Sen, 1992: 55)

11 It should be noted that in the long run such a situation might permit a Pareto improvement in resource allocation that would result in improved incentives and increased growth rate, thereby benefitting both rich and poor alike, see the discussion of Desai (1990) below.

underlying assumptions regarding utility and the social welfare functions on which they are based. As such, they are more accurately described as measures of "distributional badness" rather than measures of inequality itself. Sen provides a good example of this in his analysis of the Atkinson index of income inequality:

> The Atkinson index of inequality can move in the opposite direction to the actual inequality of individual utilities, as we take less and less 'concave' utility functions, i.e. take marginal utility to diminish more slowly with increased income. ... With a *given* configuration of personal incomes (and thus, in one obvious sense, a *given* inequality of distribution), a less concave utility function can make the Atkinson index go *down* - precisely when different persons' utilities move further apart and the inequality of *utilities* goes up. (Sen, 1992: 98-9 - original emphasis)

All of these objections to the traditional approaches of measuring social welfare resulted in a quest for alternate measures of well-being which more accurately reflect non-income and non-commodity ownership aspects of well-being, free from the mental metric of utility. Sen has long been one of the innovators in this field,[12] and his twin concepts of functioning and capability are at the centre of these non-utilitarian measures, or what has been dubbed Senian economics.

b. Functioning and Capability[13]

Functioning and capability are determined by the same set of indicators, or 'focal variables' as Sen calls them. Capability represents the set of all possible attainments, based on a given set of focal variables, while a functioning represents the capability package chosen by the individual. Thus,

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12 See for example Adelman and Morris (1973) and Morris (1979), for others making use of this approach before it was identified as capability and functioning.

13 There have been a number of critiques of Sen's capability approach to poverty, inequality and living standards. There are those who dispute his views on moral, philosophical and social justice (or Rawlsian) grounds. See for example: Cohen, 1993: 9-29; Korsgaard, 1993: 54-61; and Gore, 1993: 429-60. As important as these arguments are to the application of capability to a society, particularly as this related to entitlement and equality of opportunity, do not directly affect an ex post measurement of functioning in China during the 1980s, and therefore are not discussed here. As functioning is being measured, and not capability, the ex post analysis removes the difficulties posed by uncertainty as outlined by Kanbur (1987), despite their accommodation strengthening the argument in favour of capability over utility in measuring living standards.

capability is a broad measure of well-being which can be defined to include longevity, access to health care and eduction, level of personal security, income and consumption as well as the freedom of the individual to determine her attainment of well-being. Functioning measures the achieved well-being from all of the above including the freedom to choose a particular functioning, which adds to or detracts from well-being itself. Sen provides a good illustration of the importance of this approach relative to more traditional measures: " In examining a starving person's achieved well-being, it is of direct interest to know whether he is fasting or simply does not have the means to get enough food." (Sen, 1992: 52). Thus, measuring the freedom to choose is a fundamental part of examining well-being as capability.

Although theoretically the list of potential entitlements can be endless, Desai makes a strong case for a limited and comprehensive list of capabilities. How one measures ex ante entitlement, the commodity space manifestation of capability, or ex post functioning, reflecting an individual's achievement based on their capability set, is the chief difficulty with applications of capability and functioning to poverty and living standard analyses.[14] Measurement considerations aside,[15] Desai's useful list of all embracing capabilities is:

1. Capability to stay alive / enjoy prolonged life
2. Capability to ensure (biological) reproduction
3. Capability for healthy living
4. Capability for social interaction
5. Capability to have knowledge, freedom of expression and thought

(Desai, 1990: 16)

Desai (1990: 7-8, 44) proceeds to outline a flow model of society for determining an individual's entitlement relative to a social norm. If the

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[14] Desai himself made Nolan's (1993) mistake of confusing entitlements and basic needs, by seeing basic needs as the commodity space manifestation of capability instead of entitlement, severely hampering the value of much of his analysis. Despite this his list of capability is interesting and useful.

[15] For a discussion of measurement problems associated with the capability approach to poverty and living standards, see for example: Desai, 1989; Desai, 1990; Dasgupta, 1993b; and Gaertner, 1993.

individual commands a resources, environment and human capital set which permits fulfilment of the social norms, then he is deemed to be above the capability-based poverty line and his entitlement is translated into achieved functioning which in turn permits the measurement of his living standard - which is an ex post measurement of functioning in Desai's model, as is the measurement of living standards presented in this dissertation -. If the individual's entitlement and human capital fall short of the criteria set out in the capability-based poverty line, then resource allocation needs to be changed within society to permit the individual's (and hopefully if resources in the society permit, all individuals') entitlements to meet the poverty criteria, and therefore capability can be translated into functioning and living standards can then be measured against a social norm.

In further developing his assessment of the incidence of poverty, Desai presents a figure (number 4, 1990: 44) marrying his five capabilities with basic needs. The difficulty with Desai's figure 4, is the use of needs instead of entitlement in translating capability into measurable items, and therefore mainly commodities.[16] Capability implies the ability to command a variety of commodity, environment, human capital and self-determination bundles, each one of which may or may not meet basic needs. So that what should be measured is an individual's ability to command food; medical care; clean water; adequate housing, clothing and shelter; personal and public security; education; mobility; leisure; and information, and not what an individual requires for survival of these items. To this end, Desai's analysis is flawed, because measuring whether or not and individual has the

16 Superficially Desai appears to be measuring essentially the same factors that Dasgupta (1993) included in his Borda ranking-based index of international living standards in poor counties, although Desai does not mention political and civil rights explicitly. However, there is a fundamental difference, because Desai is measuring inputs, and basic needs in place of entitlement, while Dasgupta is measuring outputs, or "well-being" as functioning. Dasgupta's measurement of achieved living standards, although a considerable improvement on more narrow indices, neglects the choice element and thereby capability. The inclusion of measurements of political and civil rights in such an index do not reflect choice, but are merely another aspect of functioning. A further discussion of Dasgupta's index appears in chapter 4.

inputs necessary to achieve a minimum subsistence living standard is concentrating on the input stream of functioning, and not on capability at all.

As this is an abstract concept, perhaps an example would be useful, let us consider education. To measure a person's capability vis-a-vis educational attainment, we would need information on access to educational institutions at various levels, and the quality of these institutions for the society to which the individual belongs. We would then also need information on the characteristics of this individual relative to the society, such as: age, gender, race and disability, all of which might limit or enhance the entitlement of this individual to education. Other factors such as the distance from the individual's home to school, the transportation infrastructure, the system of tuition fees and household income would also influence entitlement. Some knowledge of the value placed on educational entitlement, both by the society and the individual, will have an impact on educational attainment as well, partly dictating the extent of enthusiasm for educational attainment by the individual. Finally, the individual's aptitude for learning must be taken into account. For capability-based poverty lines or living standards, the individual's vector of all these factors would be compared to the norms for the individual's society.

By contrast, a needs-based approach would examine solely access to education - ie. public and private provision of educational services - and determine whether or not this met social criteria, or an output-based approach would look at levels of educational attainment or the incidence of literacy relative to the level deemed appropriate to that society. In rural China, the World Bank (1992b) has shown that basic literacy skills, equivalent to 5 or 6 years primary education is the water-shed for improved earnings potential and greater assurance for escaping poverty. Therefore literate/illiterate

becomes the judgement for functioning in terms of education.

Despite the measurement and conceptualization problems involved, Desai's assertion that the fulfilment of these 'capability'-based poverty criteria by the population of a society benefits all members of the population remains valid. Therefore resource allocation within members of the society would not violate the conditions of Pareto optimality, as the new allocation could yield benefits to non-poor and poor alike, because when an individual's capability set meets the social norms, this creates a positive externality, which acts as a public good.

> To have people not in poverty is a gain to the non-poor as well as the poor. Want breeds waste and inefficiency if not crime and violence. No one is safe in the knowledge that some may have to steal, rob or mug to feed themselves. Even with the best provision of policing, street safety is guaranteed more by a well fed population than anything else. Thus it is possible to regard the guaranteeing of other people's capability itself as a public good which enters my expenditure function. (Desai, 1990: 36)

Theoretically and intuitively this assertion is appealing, but there are two difficulties, the first is with the confusion of capability and basic needs, thus merely adding a further complication to measuring and individual's well-being. Second, the public good aspect of the adequacy of other's capability must function at the well-being level, because Sen limits interpersonal relations and other external influences to well-being, and does not include them in a capability-based evaluation of living standards (Sen, 1987: 26-9). As a result, an analysis of poverty or living standards in terms of capability need not examine positive or negative externalities resulting from the adequacy or inadequacy of the capability set of others.[17]

In conclusion, it is important that capability, and not merely

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17 It is in the various relationships between well-being, capability, functioning, entitlement, utility, and basic needs that poses so many difficulties for those writing on these topics. Nolan (1993) and Nolan and Sender (1992) have criticized Sen at length, much of which was based on the confusion of the relationship between entitlement, capability, and basic needs. This confusion has similarly led Desai astray in his analysis, while Dasgupta's analysis suffers from his portrayal of utility dominating well-being. To create a picture of the relationships between these various elements of Sen's writings, requires considerable detective work, and in many respects it is not clear that earlier definitions hold in later writings. An attempt to clarify some of the definitions of, and interrelationships between, these concepts appears in appendix 3.2.

functioning, be used when measuring poverty or living standards at an interpersonal level,[18] because we are fundamentally interested in their ability to achieve a minimum standard of living, relative to social norms, and not in the specific life they choose to lead when designing poverty alleviation programmes or in measuring living standards and working for their improvement. Despite capability-based analyses being a first-best approach, methodological difficulties in the application of such an approach often means that an examination of the achieved functioning is all that is possible. Data availability and quality are the chief villains limiting capability analysis. As a result, analysis elsewhere (Nolan and Sender, 1992; Sen, 1989; Dasgupta, 1993b; Desai, 1990; UNDP, 1990) and in this dissertation focus on achieved functioning, across a wide range of indicators, at the interpersonal to international levels. Some have employed composite indices to measure living standards (Dasgupta, 1993b; UNDP, 1990) or in setting poverty lines (Desai, 1990), and have often improved significantly upon earlier more narrow definitions of poverty or living standards. However, true capability analysis remains a grail beyond our reach, as a superior means of accounting for age, gender, class and racial differences in possible attainments than does utilitarian analysis, or functioning, both at an interpersonal and international level.

3. The Standard of Living in Anhui and Yunnan

When economists first turned their attention to the measurement of living standards, they relied on utilitarian measures. Some were more enlightened than others about the utility that they chose to measure. Adam Smith, in The Wealth of Nations (1776: 691), asserted that the standard of

[18] It would also be preferable at an international level, but all levels above the individual, such an analysis is both conceptually and methodologically difficult.

living should not merely be measured in terms of subsistence, but also must include items without which it is impossible to be fully accepted as a member of society. The examples he provided were a pair of leather shoes and a linen shirt. Apart from Smith, and his analysis of functioning which included shoes and shirts, standard of living analysis remained highly dependent on subsistence-based utilitarian analysis and income measures to determine the standard of living until the 1970s. From the plethora of measures now promoted by various scholars, we turn our attention to the factors most relevant to an analysis of the standard of living in post-Mao China.

a. Functioning as per capita Output and Consumption

The component of achieved functioning measuring well-being derived from income and consumption should be based on indicators of income, nutritional status, per capita living space, access to heating and/or cooling dependent on the climate, availability of running water and indoor plumbing, and the incidence of ownership of consumer durables. Heating, running water, indoor plumbing, and nutritional status can all be seen to be contributors to the health status of the individual as well as being components of their well-being derived from commodities.

Both the 1982 and 1990 census forms did collect information on virtually all of the factors listed above. Some provincial averages are presented on the incidence of running water and indoor plumbing, (both of which are rare outside urban areas). Per capita living space is also collected by the census, these data are presented in table 3.4[19]. These data showed that living space per capita in Yunnan was below the national average at both end points. The growth rate was marginally above the national average, which

[19] Per capita living space is usually quite large in rural areas compared to urban areas. Rural values are inflated by the inclusion of the sheltered or semi-sheltered work spaces, that are part of most modern farm houses, in the calculation.

resulted in the gap closing a little. In Anhui, living space was high by national standards, but grew slowly during the 1980s, resulting in a decline in living space relative to the national average, despite a virtual doubling in living space between 1978 and 1989. In absolute terms these data represent a significant increase in living standards in both Anhui and Yunnan as measured by living space, despite the fact that relative living standards remain low in these provinces relative to the national average according to this indicator, and by a widening margin in Anhui.

Table 3.4 - Per Capita Living Space for Rural Residents, 1978-90

Year	(meters square p.c.) China	Anhui	Yunnan	As % of China Value Anhui	Yunnan
1978	8.1	8.5	7.7	104.4	95.1
1980	9.4	9.2	9.0	98.2	95.7
1985	14.7	13.2	14.9	89.7	101.4
1990	17.2	15.6	16.6	90.9	96.5
% gr. 1978-90	7.1	5.7	7.2		

Source: LSTJ, 1990: 432, 781; ZGTJNJ, 1992: 318.

Data on the ownership of consumer durables were presented on a per hundred household, or population, basis for the "eight big" consumer durables.[20] Such information is available in the statistical yearbooks at a provincial level, but much less readily available at a county level. County level data on the ownership of consumer durables are available for Anhui for 1984 only, while only prefectural data exist for Yunnan throughout the reform period. In both cases the data suffered from inconsistencies in presentation, a mixture of per hundred population and households.

Summary data on consumer durable ownership are presented in table 3.5. The data show that, for all three commodities, households in Yunnan were materially disadvantaged. The incidence of the ownership of bicycles was only

20 The eight big consumer goods (*zhuyao naiyong feipin*) were: bicycles, sewing machines, radios, televisions, clocks, wristwatches, cassette players, and electric fans. To this list cameras, motorbikes, washing machines and refrigerators were added in the past several years, and the distinction is now made between black and white, and colour television sets. These changes themselves reflecting the changing pattern of availability of such items throughout China.

a quarter of the national average in 1978, increasing to just over 50% in 1990. Bicycles, like draught animals are a very important means of transportation in Yunnan, where roads and public transport provision remain severely limited. Sewing machines were equally rare in Yunnan when compared to the national average, particularly in the early 1980s when tailor shops and ready-made clothing were also rare. However, the gap between sewing machine ownership in Yunnan and the national average closed during the 1980s, from virtually one third in 1978 to almost 65% in 1990. Garment making is an important entrepreneurial activity in much of Yunnan, often closely related to the domestic and foreign tourist trade.[21] Perhaps most importantly in terms of living standards, television ownership in Yunnan was low compared to the national average, with ownership under half the national average in 1990.[22] In the remote and scattered communities of the north and south west of China, television can be an important learning tool in the absence of access to colleges and universities. Similarly television, radio and newspapers are all used in China to provide information on new developments in farming and animal husbandry (Wang and Bai, 1991: 50-1). Therefore material well-being in Yunnan, as measured by ownership of consumer durables, increased during the 1980s, but living standards remained low.

For all three consumer goods, Anhui had a smaller gap in the incidence of ownership than Yunnan relative to the national average. This leads to the conclusion that material well-being was low in Anhui, but lower still in Yunnan. The rate of growth in the ownership of consumer durables was very low in Anhui compared to both the national average, and Yunnan's. As a result,

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21 For example, there is a flourishing garment and textile trade in Dali, catering to domestic and foreign tourists alike, producing tailor made cotton and silk clothing from locally produced batik and tie dyed fabrics with minority designs. These products have proved so popular that they are now mass produced in factories and exported around the country, and are even available in London.

22 The inconsistent nature of electricity supplies in Yunnan makes the ownership of electronic goods of dubious value. During fieldwork in Xishuang Banna power outages lasting several hours were virtually a nightly occurrence.

the gap between the national incidence of ownership and that in Anhui widened throughout the 1980s, compared to a narrowing gap in Yunnan. Material living standards in Anhui, as measured by the ownership of consumer durables, fell far behind those in her coastal neighbours: Jiangsu, Shanghai and Zhejiang.

Table 3.5 - Ownership of Consumer Durables per 100 households, 1978-90

	Bicycles			Sewing Machines			Televisions		
Year	Anhui	Yunnan	China	Anhui	Yunnan	China	Anhui	Yunnan	China
1978	na.	7.5	30.7	na.	7.0	19.8	na.	na.	na.
1980	na.	8.2	36.9	na.	8.2	23.3	na.	0.5	0.4
1983	49.7	25.5	78.9	33.8	17.2	38.1	1.7	1.9	8.3
1985	53.7	29.3	80.6	29.6	19.9	43.2	4.1	4.0	11.7
1988	87.8	49.1	107.5	42.0	29.8	52.5	22.3	13.6	31.4
1990	98.1	62.0	118.3	43.2	35.4	55.2	36.4	21.0	44.4
% gr. '78-90	10.2%	19.0%	11.9%	3.6%	14.5%	8.9%	24.8%	45.3%	60.2%

Note: Growth rates for Anhui are for 1983-90, and for televisions for China and Yunnan, for 1980-90.
Sources: ZGTJNJ, 1987: 708; ZGTJNJ, 1988: 834-5; ZGTJNJ, 1989: 754-5; ZGTJNJ, 1992: 315-6. YNTJNJ, 1990: 613; YNTJNJ, 1991: 548; AHSQ vol.1, 1985: 747-8; AHTJNJ, 1991: 613.

Nutritional status should not only examine the total number of calories that an individual attains on a daily basis, but also the composition of those calories. This is because certain quantities of protein and fat are necessary for a healthy diet, in addition to carbohydrates. Nutritional status is a very important factor in determining the interpersonal differences in the standard of living, but is equally difficult to interpret, because of the importance of an individual's metabolism and nutrition history in determining nutritional requirements. The science of evaluating life quality though nutritional status is far beyond the scope of a non-medical dissertation, both due to the detailed disaggregation of nutritional data that is necessary, and due to the need for individual-based data, rather than county averages. It is not possible to calculate a comprehensive set of grain availability data for the counties of Anhui and Yunnan 1978-90, let alone the nutritional status

of their inhabitants.[23] The omission of data on nutritional status in these provinces is not serious, since there was no evidence of demographic loss due to entitlement failure during natural disasters in the last 15 years[24]. Although nutritional status could be further improved through increased access to a wider variety of fruit, vegetables, and protein, life-threatening shortages of food were not a problem in either province.

There are severe problems with the county level per capita net peasant income data for both Anhui and Yunnan (Bramall and Jones, 1993).[25] The best proxy for income data is per capita net domestic material product (NDMP), itself the best approximation to per capita GNP that exists for China. Per capita NDMP data are problematic, because they are only available on a systematic basis for Anhui from 1983 onwards, and from 1985 for Yunnan. More information on per capita NDMP is presented in chapters five to seven on spatial inequality. This leaves per capita NVAIO as the best available proxy for income. The per capita NVAIO data available for Anhui and Yunnan are an internally consistent and comprehensive series.[26]

The first objection to using NVAIO as a measure of well-being (or as a proxy for income) results from its omission of the growing share of the commercial and service sectors in the Chinese economy. However, such distortions are limited, first because the service sector share in NDMP was quite stable during the 1978-90 period, as shown in tables 3.6 A, Y, and C,

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23 In Anhui and Yunnan, there were quite broad regional and ethnic variations in diet. There were also wide variations in the prices of staple goods, and the proportion of agricultural output reserved for own consumption. Data on grain production and availability were presented in the discussion on poverty in chapter two.

24 There was only a very limited loss of life during the widespread and severe flooding in Anhui in the summer of 1991. These were due to accidents and not to shortages of food availability and the spread of endemic disease. However, corrupt local officials in Yang village near Bengbu have been charged with misappropriating relief supplies, which led to at least one fatality (Wong, 1994b: A1, A8).

25 All output data are at 1980 constant prices for 1978-90 and for 1952-77. Deflator series for Anhui, Yunnan and China are presented in appendix 2.3. The discussion on income data is reserved for the chapters on poverty (2) and inequality (5).

26 NVAIO data were derived from GVAO and GVIO data at a county level for both provinces. The provincial ratio between gross and net output values for agriculture and industry for each year in the series were applied to the gross values for agriculture and industry output values for each county, and then the NVAO and NVIO data were added to obtain NVAIO. All raw GVAO and GVIO data were in 1980 constant prices in the source material.

and second the differences in growth rates for GDP, NDMP and NVAIO for China were quite small for 1978-90 at current prices were 14.7%, 14.6% and 14.0% per annum respectively - based on three year averages at the end points - (ZGTJNJ, 1991: 31, 32).

If the exclusion of the commercial and service sector output from NVAIO provides an underestimate of income and income growth, then the inclusion of investment funds in NVAIO produces an overestimate of income. This is disadvantageous in terms of measuring well-being, because at best it represents the potential for increased future consumption or sustained in the long run. However, in rural China a large portion of the investment has been in house-building,[27] which contributes directly to increased material well-being. There was an overestimate of per capita income based on per capita NVAIO in the early reform years, signalling a greater overestimate due to investment than an underestimate from the exclusion of the commercial and service sectors. The situation was the same at the end of the 1980s, where the contribution of investment in NVAIO more than compensated for the omission of the commercial and service sectors, although the gap between output value and income at both ends of the time period was very narrow. For much of the 1980s, income values were above the per capita NVAIO values, reflecting the faster growth in incomes as a result of changes in the price structure and highly equitable land reform, relative to output values. In summary, the problems with output data as a proxy for income are small, and therefore output data are included in the analysis of living standard as achieved functioning.

Defining the standard of living simply in terms of material achievements, then the higher the level of real per capita NDMP, or GNP, then

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27 Expenditure on house building was particularly high in Anhui by national standards.

the higher the standard of living in that region. It also follows that higher rates of real per capita NDMP growth should yield more rapid increases in functioning in terms of material achievement. Finally, an economy is usually seen as having reached a higher level of development, and therefore a higher living standard, if the sectoral shares of NDMP have shifted towards industry, and away from the predominance of agriculture. By these criteria the data in tables 3.6 A, Y and C show that Anhui and Yunnan both had lower levels of development and commodity-space functioning than the national average. As China is generally typified as being a country with a low standard of living by OECD or G7 standards, then the populations of Anhui and Yunnan had living standards that were lower still.

Table 3.6A - Anhui Output Data 1952-1989

		Real Per Capita (in *Yuan*)				
	Year	NDMP	NVAIO	NVAO	NVIO	'Services'
	1952-57	110	92	80	12	18
	1978-81	253	209	130	79	44
	1986-88	484	403	230	173	81
	1987-89	480	402	221	180	79
% Comp.	1952-78	3.2	3.2	1.9	7.5	3.4
Growth	1952-88	4.4	4.4	3.2	8.2	4.4
Rate	1952-89	4.3	4.3	2.9	8.1	4.2
Per	1978-88	8.4	8.6	7.4	10.4	7.7
Annum	1978-89	7.4	7.5	6.1	9.6	6.6

Note: Township and village industry is in industrial output, GNP data exist only for post-1978, therefore omitted from long run comparison, and apparently LSTJ presents a 1952-89 growth rate for GNP in Yunnan, but is omitted here because its consistency is questionable.

Percentage Share of Real Per Capita NDMP					
Year	NDMP	NVAIO	NVAO	NVIO	'Services'
1952-57	100.0%	83.8%	72.6%	10.8%	16.7%
1978-81	100.0%	82.5%	51.4%	31.1%	17.5%
1986-88	100.0%	83.4%	47.6%	35.8%	16.6%
1987-89	100.0%	83.6%	46.1%	37.5%	16.4%

Note: Service Sector is used in the Chinese sense of the word, meaning the sum of the commercial, construction and transportation and communications sectors, and this does not capture the whole of what western economists mean when discussing the service sector.
Sources: 1949-78: AHSQ vol.2, 1986: passim.
1978-85: AHJJNJ, 1985: passim. (NVAIO, NVIO, NVAO).
1986-87: AHNJ, 1988: passim. (NVAIO, NVIO, NVAO).
1988: AHNJ, 1989: passim. (NVAIO, NVIO, NVAO).
1989: AHNJ, 1990: passim. (NVAIO, NVIO, NVAO).
1980-89: ZGFX, 1988, 1989, 1990: passim. (NDMP, % service sector).
1949-89: LSTJ, 1990: 407-412 (NDMP, % service sector).

In 1952-57, Yunnan's per capita NDMP was 59% of the national average,

and Anhui's was 80%. By 1987-89, little had changed. Yunnan continued to have a very low living standard, with real per capita NDMP equalling 59% of the average for China, while Anhui's living standard fell in relative terms, to only 66% of the national average. The relative living standard in Yunnan rose over the course of the Maoist period to 64% of the national average, only to return to 59% during the Dengist decade. In Anhui there was a decline in relative living standards over the Maoist period, which continued through the Dengist era. The rate of decline in Anhui accelerated during the period of high inflation and recession 1987-89, based on per capita NDMP for the province relative to the values for China.

Table 3.6Y - Yunnan Output Data 1952-1989

		Real Per Capita (in *Yuan*)				
	Year	NDMP	NVAIO	NVAO	NVIO	'Services'
	1952-57	81	65	52	13	16
	1978-81	221	178	105	73	43
	1986-88	396	325	174	151	71
	1987-89	428	356	181	175	72
% Comp	1952-78	3.9	3.8	2.7	6.7	3.9
Growth	1952-88	4.5	4.6	3.4	7.0	4.2
Rate	1952-89	4.6	4.7	3.4	7.2	4.1
Per	1978-88	6.0	6.2	5.2	7.6	5.1
Annum	1978-89	6.2	6.5	5.1	8.3	4.8

	Percentage Share of Real Per Capita NDMP				
Year	NDMP	NVAIO	NVAO	NVIO	'Services'
1952-57	100.0%	80.3%	63.8%	16.5%	19.7%
1978-81	100.0%	80.5%	47.6%	32.9%	19.5%
1986-88	100.0%	82.1%	43.9%	38.2%	17.9%
1987-89	100.0%	83.2%	42.3%	40.9%	16.8%

Note: Service Sector is used in the Chinese sense of the term, meaning the commercial, construction, and transportation and communications sectors, and this does not capture the whole of what western economists mean when discussing the service sector.
Sources: 1949-89: LSTJ, 1990: 754, 781.

These trends in real per capita NDMP in the two provinces relative to the national average imply that the growth rates for real per capita NDMP in Anhui were below those for China, by a small margin for 1952 to 1978, a somewhat larger margin for 1978 to 1988, and significantly so during the recession in 1989. For Yunnan, real per capita NDMP growth rates were above

the national average for the Maoist period, and fell below the average during the 1980s.

Anhui and Yunnan also had below average levels of development and living standards based on the composition of NDMP. For both provinces agriculture remained the dominant sector in NDMP, although the share fell below 50% in the early 1980s. For China agriculture was the dominant sector in 1952-7, but only by a small margin. By the end of the Maoist period industry dominated NDMP, accounting for just under 50% of NDMP throughout the Dengist period. The share of 'services' fell in both Yunnan and China as a whole, and the size of the 'service' sector in Yunnan was below average. In Anhui the 'service' sector was small and represented a virtually constant share of NDMP.[28] The size of value-added from 'services' was small in both provinces. In Anhui it ranged from 55% of the national average in 1952-7, to 52% in 1987-9, while in Yunnan it was 48% in 1952-7 and 1987-9. In both cases this disguised the large rise in 'services' relative to the national average at the end of the Maoist period. This was a function of the heavy investment in infrastructure construction undertaken in both provinces during the Cultural Revolution and through to the end of the Maoist period.[29]

For the Maoist period, agricultural growth marginally exceeded population growth in both Anhui and China. Anhui experienced poor growth of agricultural output under collective agricultural production due to the rapid movement from family farming directly to large communes in 1957-8 (cf. Hinton, 1990: 50; LAXZ, 1990: 97-101) and only just outpaced population growth.[30]

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28 The Chinese experience on the share of 'services' in NDMP conforms to the development experience of most economies, despite the lack of domestic servants since 1949 (cf. Rowthorn and Wells, 1987: 7-8).

29 The extent of investment in railway and road construction in Yunnan was particularly evident, from the signs on bridges and railway tunnels commemorating their completion during the mid- to late 1960s. This included the construction of the Chengdu-Kunming railway which is virtually 50% tunnels.

30 Population growth itself was low in Anhui as a result of the net demographic loss that occurred during the Great Leap famine, as outlined in chapter one.

Compared to the national growth rates for agricultural output, Anhui's growth was slow, although 7.4% per annum for 1978-88 was well above the 1.3% growth of population over the same period. In Yunnan, during the Maoist period, agricultural output grew at a rate above the national average, and virtually half a percent above its rate of population growth, which was also higher than the national average. By contrast, agricultural output grew more slowly in Yunnan during the 1980s than in Anhui, and was below the national average. However, the 6.5% growth was well above the 1.5% per annum population growth rate for 1978-88 in Yunnan. The implications of these low growth rates in agricultural output during the 1980s will be discussed at greater length in chapters six and seven, where it will be shown that the close link between rapid gains in agricultural output and productivity were important for rapid economic growth and improvements in material well-being.

Table 3.6C - China Output Data 1952-1989

		Real Per Capita (in *Yuan*)				
	Year	NDMP	NVAIO	NVAO	NVIO	'Services'
	1952-57	139	105	72	34	33
	1978-81	342	289	123	166	54
	1986-88	672	533	226	308	138
	1987-89	724	574	237	337	149
% Comp	1952-78	3.7	4.0	2.1	6.3	1.9
Growth	1952-88	4.5	4.6	3.2	6.3	4.0
Rate	1952-89	4.6	4.7	3.3	6.4	4.1
Per	1978-88	7.0	6.3	6.2	6.4	9.9
Annum	1978-89	7.0	6.4	6.1	6.7	9.8

	Percentage Share of Real Per Capita NDMP				
Year	NDMP	NVAIO	NVAO	NVIO	'Services'
1952-57	100.0%	76.0%	51.6%	24.5%	24.0%
1978-81	100.0%	84.4%	36.0%	48.4%	15.6%
1986-88	100.0%	79.5%	33.6%	45.8%	20.5%
1987-89	100.0%	79.4%	32.8%	46.5%	20.6%

Note: Service Sector is used in the Chinese sense of the term, meaning the sum of commercial, construction and transportation and communications sectors, and this does not capture the whole of what western economists mean when discussing the service sector.
Sources: 1949-89: LSTJ, 1990: 5, 8.

For both Anhui and Yunnan industrial output grew rapidly from a very small base, with growth rates exceeding the national average for both the

Maoist and Dengist periods. In Anhui this meant that NVIO grew from only 35% of the national average in 1952-7, to 54% in 1987-89, with Anhui closing the gap in the extent of economic diversification relative to the national average. Yunnan showed similar trends, with industrial value-added increasing from 40% of the national average in 1952-7, to 52% in 1987-9.[31] Anhui and Yunnan were both recipients of strategic 'third front' industrial investment, where some of the heavy industry was moved from Shanghai to Anhui, enhancing the Ma'anshan - Anqing industrial corridor along the Changjiang in the 1960s.[32] As shall be demonstrated in chapters six and seven, state-owned industry continued to be the engine of economic growth in much of Yunnan during the 1980s, while in Anhui collectively-owned industrial enterprises were much more important for rapid economic growth.

These patterns of growth were evident in the sectoral contributions to NDMP growth for both the Maoist and Dengist periods. Where the continued dominance of agriculture in total NDMP meant that even at relatively slow rates of value-added growth, agriculture was an important contributor to overall NDMP growth under both Mao and Deng in Anhui and Yunnan. This trend was not as prominent for China on average, again reflecting the relative backwardness of these two provinces. For all three regions, agriculture contributed a larger share of NDMP growth during the 1980s than under Mao. For China and Anhui, industrial value-added accounted for a smaller share of NDMP growth during the 1980s than between 1952-7 and 1978, while in Yunnan the share increased. Agriculture's increased share in NDMP growth over the Dengist period may be a reflection of the move towards more balanced economic growth during the 1979-82 period, when the terms of trade shifted in

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31 Yunnan's current price rate of NVIO growth between 1975-8 and 1988-91 was exceeded only by Zhejiang and Fujian, faster than in Guangdong or Jiangsu (ZGTJNJ, 1991: 32).

32 Evidence on 'third front' development came from the 1985 survey of industry in China. Volume two contains information on establishment of industrial enterprises (ZGGYPC 1985, 1989: passim.)

agriculture's favour. This prompted the rapid growth of agricultural output as a result of price incentives. Over the 1979-82 period there were also shifts in the relative price structure for agricultural products giving further incentives for increased agricultural production of basic crops (cf. Bramall, forthcoming).

There are two sets of tables on per capita expenditure for rural China, tables 3.13A, Y and C presented at the end of the chapter; and tables 3.7A, Y and C and compared with income and output in graphs 3.1 and 3.2 at the end of the section.[33] Such an examination of expenditure relative to income is problematic, because it must be conducted at nominal prices. This can result in two distortions. First the distortion from differential rates of inflation for retail prices for consumer goods compared to wages and agricultural purchase prices that determine rural income. Second, from changes in relative prices for consumer goods and services, including essentials such as food and housing. For example, to what extent did the surge in textile production since 1978 explain the fall in the share of expenditure on clothing through lower retail prices? Such considerations make the trends in expenditure are very difficult to analyze, and certainly the artificial nature of prices for some goods, such as housing, limits the usefulness of international standards, such as those employed by the Engel ratios presented below.

It is apparent that the peasants of Anhui and Yunnan saved little, and required the vast majority of their income for expenditure. They saved less than the Chinese peasantry did on average. For Yunnan, Anhui and China, expenditure as a percentage of net peasant income was in excess of 85% of income in both provinces and China in 1978-80. This was followed by a decline in the early to mid-1980's, when expenditure was no less than 79% of income,

33 Tables 3.13 A, Y and C show three year moving averages 1978-90, for total expenditure, expenditure on consumer goods, and consumer goods broken down into food, clothing, housing, and fuel and other daily necessities. Tables 3.7A, Y and C present the same data as a percentage of per capita net income.

with the trough for China and Anhui occurring in 1983-5, and the trough for Yunnan occurring in 1980-2. This mid-80's trough may be associated with Hinton's (1990: 24) assertion that the 'peak' in grain output in 1984 was partly due to the distribution to households of reserve grain that had been held by the communes, which was duly converted into cash by the households. This might help to explain the large gap between income and expenditure, and income and per capita NVAIO during 1983-85 in both Anhui, and China as a whole. The pre-decollectivization peak in the gap between income and expenditure in Yunnan is harder to explain. It appears that farmers in Yunnan had high marginal and average savings propensities for 1978-80, largely as a result of forced savings, a product of consumer good scarcity.

Table 3.7C - Expenditure p.c., Rural China (as a % of p.c. Net Peasant Income, nominal)

Expenditure	1978-80	1983-85	1988-90	% Growth 1978-90
Total Annual	85.1%	79.0%	87.3%	0.3%
Consumer Goods	82.8%	77.0%	81.5%	-0.2%
Food	54.6%	46.3%	47.2%	-1.4%
Clothing	10.8%	8.2%	7.4%	-3.8%
Housing	4.9%	9.3%	12.3%	9.5%
Fuel and Other	12.4%	13.2%	14.7%	1.7%

Sources: ZGTJNJ, 1981-91: passim.; LSTJ, 1990: 35.

Expenditure on consumer goods also accounted for the vast majority of income. In the late 1970s and early 1980s there was a difference of a few *yuan* between total expenditure and expenditure on consumer goods, that being spent on cultural activities and services. In absolute terms expenditure on services increased throughout the 1980s, but in relative terms, expenditure on consumer goods as a percentage of peasant income increased in Anhui and Yunnan, against a marginal decline (1.3%) in China. As virtually all of these consumer items were necessities, the growth in consumer spending in Anhui and Yunnan was not indicative of increased living standards, although the changes were very small, and as such were largely inconclusive.

The data on expenditure on food, table 3.7A, Y and C, show that in 1978-80, more than 50% of per capita net peasant income was spent on food. This represents a very high proportion of net income spent on food. According to Engel's Law, the higher the proportion of income spent on food, the poorer an area, or person, is. As rural food consumption remained heavily staple grain based in China (Y.Y.Kueh, 1988: 653) this could not be accounted for by an increase in the purchase of non-staple food stuffs. There was a trend decline in the proportion of income spent on food for both provinces and the national average between 1978-90. Normally this decline would be seen as evidence of an increase in living standards, because as real incomes rise, the proportion of income spent on food tends to fall, food being an inferior good. However, due to the very odd nature of Chinese relative prices, rising fuel and house prices may have caused substitution of expenditure away from food without any improvement in living standards. By 1988-90, the proportion of rural incomes spent on food in Anhui and Yunnan still exceeded 50%, while the percentage expenditure on food for China was just under 50%. This continued high percentage of expenditure on food might be interpreted as the continued relative poverty of rural China.

Table 3.7A - Expenditure p.c., Rural Anhui (as a % of p.c. Net Peasant Income, nominal)

Expenditure	1978-80	1983-85	1988-90	% Growth 1978-90
Total Annual	87.6%	82.4%	95.5%	0.3%
Consumer Goods	85.0%	80.1%	89.7%	0.5%
Food	56.9%	48.7%	52.6%	-0.8%
Clothing	9.6%	8.1%	7.4%	-2.5%
Housing	6.9%	9.8%	14.6%	7.8%
Fuel and Other	11.7%	13.4%	15.1%	2.6%

Sources: AHSQ vol.1, 1985: 736; AHJJNJ, 1985: 184; LSTJ, 1990: 432.

The high expenditure on food also illustrated the artificially low cost of housing in rural China. Expenditure on housing, tables 3.7A, Y and C, increased greatly between 1978-90 in rural China. Much of this was associated

with the great boom in the construction of private homes in rural China. Growth in this expenditure was very fast in Yunnan, and slower in Anhui by contrast, although the growth was from a much larger base in Anhui. There was no obvious explanation for the relatively high expenditure on housing by peasants in Anhui, while per capita living space remained below the China average. One possible explanation was that the peasants considered housing a relatively safe investment for profits extracted from agricultural production under BGDH, one that would weather any changes in the political climate.[34]

Table 3.7Y - Expenditure p.c., Rural Yunnan (as a % of p.c. Net Peasant Income, nominal)

Expenditure	1978-80	1983-85	1988-90	% Growth 1978-90
Total Annual	86.3%	83.2%	91.6%	0.6%
Consumer Goods	84.3%	81.8%	87.3%	0.4%
Food	62.2%	53.4%	56.2%	-1.0%
Clothing	8.4%	8.4%	7.1%	-1.8%
Housing	3.3%	7.9%	11.1%	12.8%
Fuel and Other	10.3%	12.0%	13.0%	2.3%

Sources: YNSSN, 1990: 309; YNTJNJ, 1990: 611; LSTJ, 1990: 750.

There was a gradual and steady increase in the amount spent on clothing in China, Anhui and Yunnan from 1978 to 1990, but this growth was slower than the growth of per capita net peasant income. Thus expenditure on clothing accounted for a small and declining share of consumer spending throughout the Dengist period.[35] The rate of growth of expenditure in Yunnan was much faster than that for Anhui. Spending on clothing by Yunnan peasants virtually doubled from 1978-80 to 1988-90. Finally, there was a modest expansion in the share of income represented by expenditure on fuel and other necessities,

34 According to Kueh (1988: 653 ff.) this investment in housing had its roots in traditional Chinese culture, and had more to do with face, and evidence of prosperity, than a shrewd investment choice on the part of the peasantry; particularly since housing was confiscated in the land reform movement of the 1950s. Both factors were probably at work.

35 The growth in the textile industry since 1978 has meant that the increased volume of output resulted in the increased consumption in the per capita consumption of cloth, accompanied by a fall in prices for cloth.

although it was necessities that contributed most to this growth. The low and constant expenditure on fuel was a function of the low share of purchased energy sources, most fuel being derived from stalks and tree branches, and the low and constant subsidized price for energy during the 1980s, and the rationing system that prevented increases in discretionary fuel consumption.

In 1978-80, China and Anhui were both well in the absolute poverty category. By 1983-5 both were only marginally above the absolute poverty / marginal living standard boundary. Living standards improved more slowly in the late 1980s in both Anhui and China, but were sufficient to see both Anhui and the national average in the upper half of the moderate range for Engel ratios. This furthers the assertion that absolute levels of material well-being have improved significantly in the post-Mao period in both Anhui and Yunnan, but remain low. Both provinces continued to lag behind the national average, although in the case of Engel ratios by a constant margin, instead of the increasing margin demonstrated for the majority of the other indicators.

Table 3.8 - Engel Ratios for China, Anhui and Yunnan, 1978-90
(based on three year moving averages)

Year	China	Anhui	Yunnan
1978-80	66.0%	66.9%	73.9%
1983-85	60.1%	60.8%	65.3%
1988-90	57.9%	58.7%	64.4%

Note: Absolute Poverty applies to Engel ratio above 60.1%, moderate to values between 60.0 - 50.1%, and fair to moderate for 50.0% - 40.1%
Sources: AHSQ vol.1, 1985: 736; AHJJNJ, 1985: 184; YNSSN, 1990: 309; YNTJNJ, 1990: 611; ZGTJNJ, 1981-91: passim.

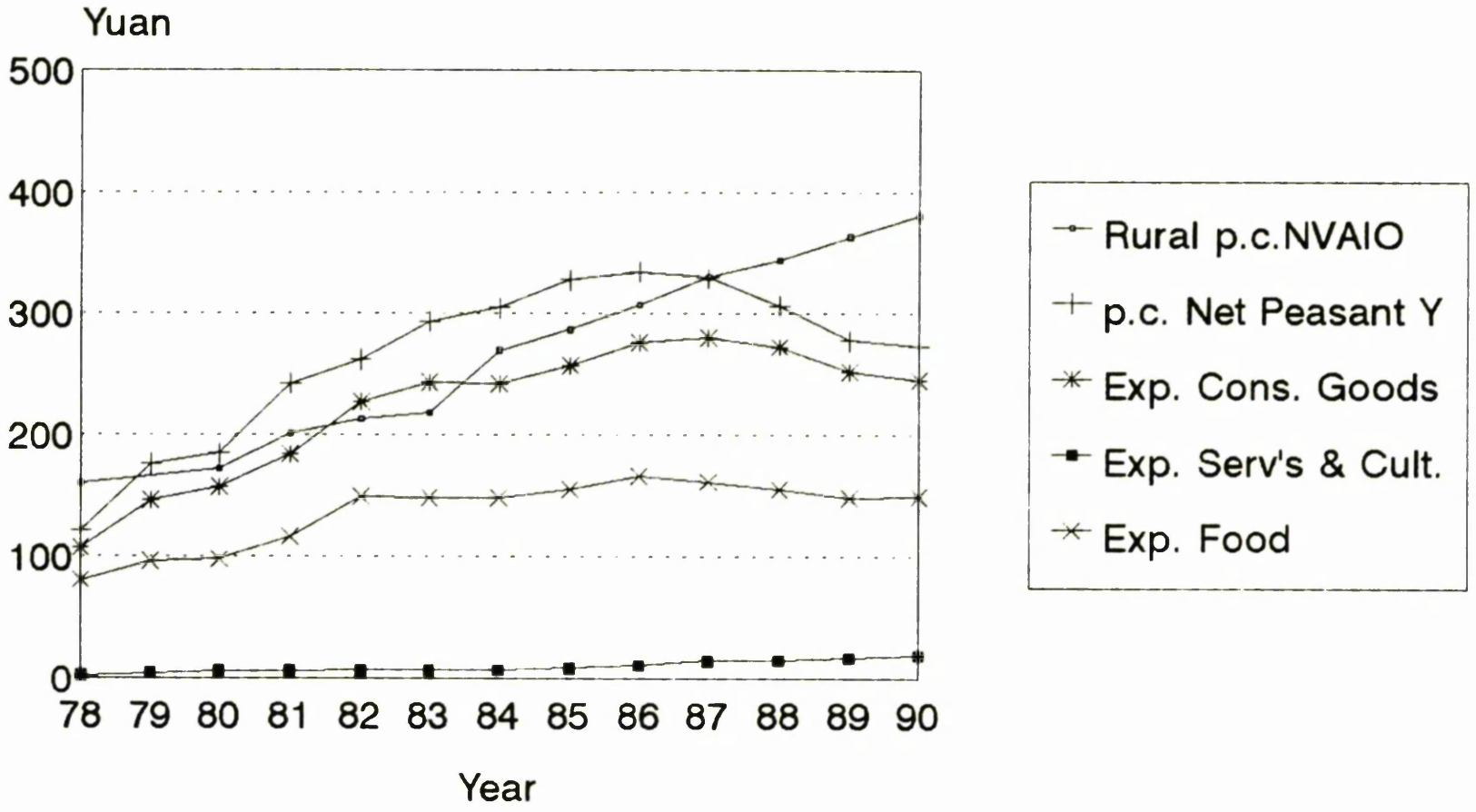
The two charts presented at the end of this section show the changes over time in rural NVAIO, net peasant income, expenditure on consumer goods, services and food for Anhui and Yunnan from 1978-90. There is a very strong correlation between the level of income and expenditure on consumer goods, and a somewhat less strong relation between expenditure on food and income, particularly the relatively small increase in expenditure on food relative to

the increase in income in the mid-80s. The steady increase in expenditure on the service sector is evident, and this expenditure included spending on health care which became the peasant's responsibility upon decollectivization. The gap between consumption and income is widest at the point where NVAIO values started to increase rapidly, showing some correlation between the savings rate, and increased production, through investment, with a two to three year time lag. This meant that increased savings in 1981 in Anhui corresponded to the increase in the rate of growth of output value in 1983-84. For Yunnan, the increase in savings occurred in 1985, and the increase in the growth rate of output occurred in 1986-87.

There were some clear improvements in expenditure on food consumption, consumer durable ownership, and expansion in NDMP over this long decade 1978-90. As a result it is difficult to be particularly positive or negative about trends in functioning in terms of output and consumption. In absolute terms the trends from the 1950s were overwhelmingly positive and those from 1978 somewhat less so, but the trends for living standards in these two provinces relative to the national average were negative.

Figure 3.1 - Income and Expenditure in Anhui 1978-90

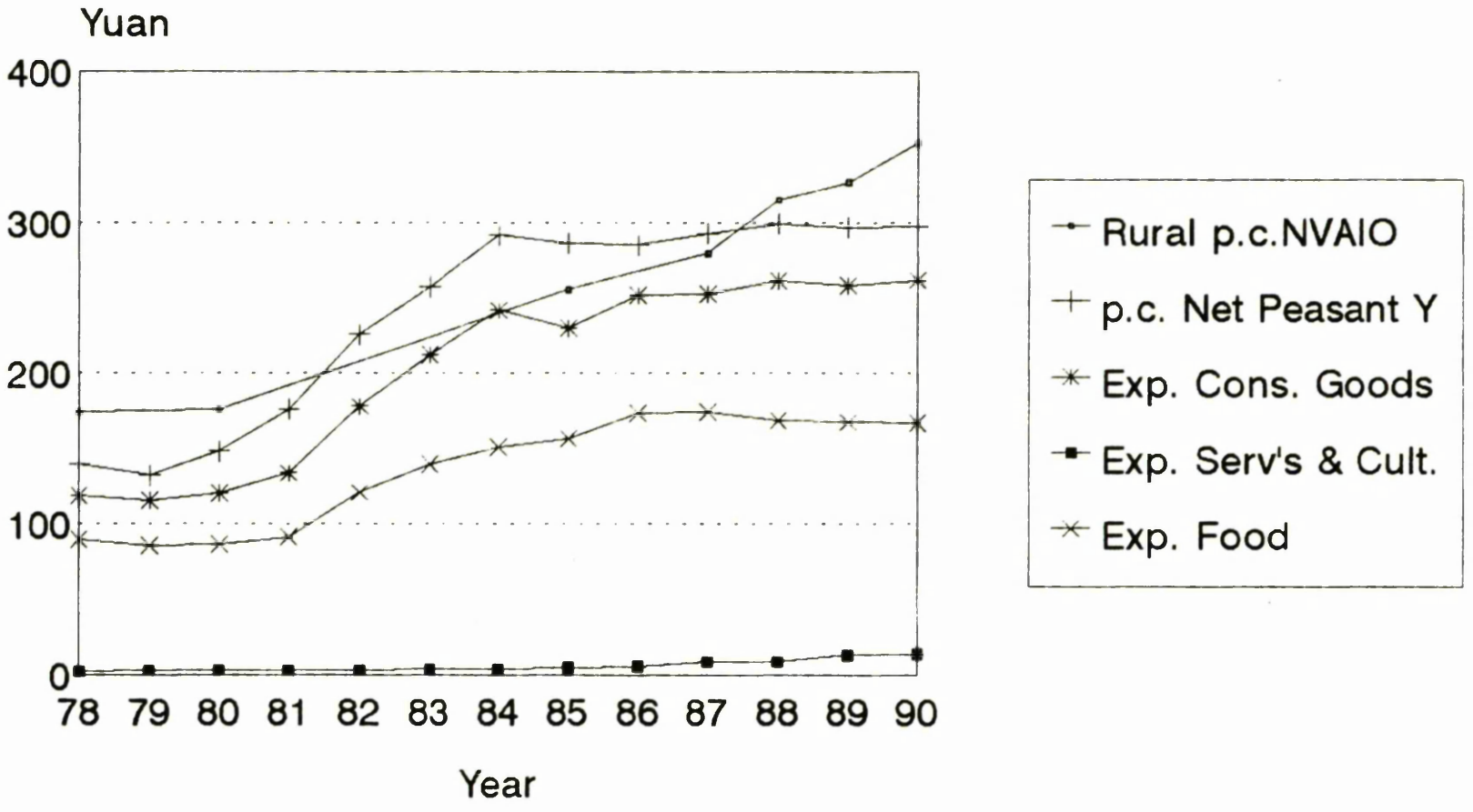
All Data in Yuan, Output and Income at 1980 Constant Prices



Sources: ZGTJNJ, 1981-91; LSTJ, 1990: 432; AHSQ vol.1, 1985: 736; AHJJNJ, 1985: 184.

Figure 3.2 - Income and Expenditure in Yunnan 1978-90

All Data in Yuan, Output and Income at 1980 Constant Prices



Sources: ZGTJNJ, 1981-91; LSTJ, 1990: 432; YNSSN, 1990: 309; YNTJNJ, 1990: 611.

b. Functioning as Longevity

The most fundamental measure of well-being has to be the freedom to live a long life, free from the fear of an untimely death. The most obvious measure of functioning as longevity is therefore life expectancy at birth. Other indicators that are of relevance to longevity are: death rates, the incidence of infectious diseases, access to and quality of medical care, and the proportion of children inoculated against childhood diseases. Life expectancy at birth is considered the best possible measure of longevity (Sen, 1992; Dasgupta, 1993a; Banister, 1987; UNDP, 1990). However, life expectancy data for the counties of China are very rare, and there are no comprehensive data from either the third or fourth population censuses. There are, however, comprehensive data on crude death rates for the counties of both of these provinces.[36] As a result, the crude death rate is employed as the chief measure of longevity. This is not as poor an indicator as might at first be thought, since at the margin poor health care delivery systems, and poor nutritional status will contribute to a higher death rate.[37]

Table 3.9 - Crude Death Rates for China, Anhui and Yunnan 1974-90 (deaths per thousand population)

Year	Total Pop. M+F China	Anhui	Yunnan	Rural Pop. M+F Anhui	Yunnan
1974	7.3	5.8	9.0	na.	na.
1981	6.4	5.2	8.6	5.7	9.1
1990	6.6	6.1	7.9	9.7	7.7

Note: Total population crude death rates have been adjusted upwards to account for under-reporting of deaths by Banister, or following her methods from Chinese data. This was not possible for the rural population only, and therefore these data represent an underestimate (of about 10% on average) of mortality.
Source: Total Population: Banister, 1987: 116,283, 287; Banister, 1992: 4-7; ZGRKTJNJ, 1992: 60-1, 156-7; ZGRKTJNJ, 1988: 464, 483. Rural Population: ZGRKTJNJ, 1988: 598-603, 666-75; AHS DSC RKPC, 1991: 4-1 - 4-309; ZGTJNJ, 1991: 801-4.

The lower the death rate, the higher the level of achieved functioning since there is a strong inverse link between death rates and life expectancy.

36 Some data are available for 1982, for some counties of Yunnan, and are presented where relevant in chapter seven.

37 Data on vital statistics are presented in the second section of chapter one.

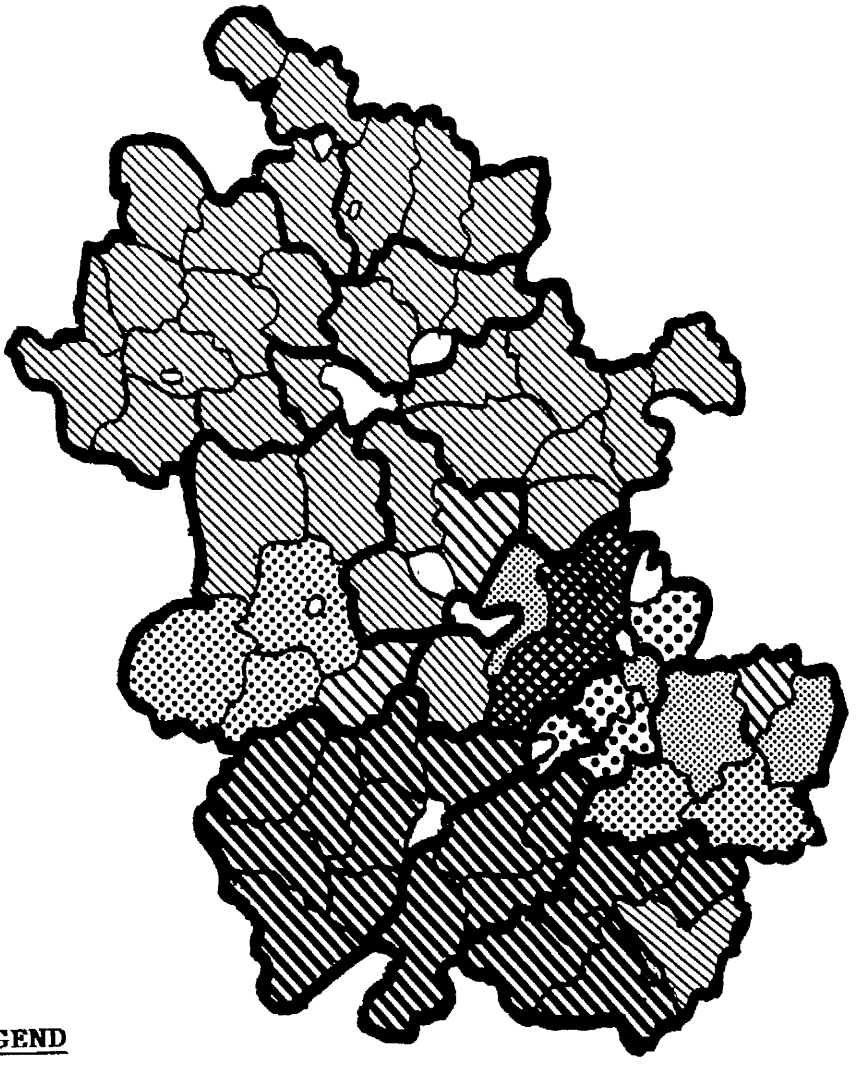
The data in table 3.9 show that the trends discussed in the first section of this chapter for China also held true for Anhui. There was a decline in mortality in China, Anhui and Yunnan between 1974 and 1981 during the late Maoist period, and before the dissolution of collective social security institutions. Between 1981 and 1990, the crude death rate (CDR) increased modestly for China on average. For this period, the CDR increased dramatically in Anhui to above the 1974 figure for the total population. Among rural residents in Anhui, the CDR virtually doubled over the intercensal period. This shows a remarkable deterioration in absolute living standards in Anhui. Part of this increase in mortality may not solely be a function of individual's finding health care more expensive after decollectivization; but also resulted from the shift in health care provision. Health care provision has gone from an emphasis on preventative medicine, a public good which was instrumental in the impressive declines in Chinese mortality before 1981, to curative medicine, a private good which neglects preventative measures such as inoculations and disease control, as a result of the privatisation of the health care system (cf. World Bank, 1992c).

In Yunnan, the trend decline in mortality continued during the intercensal period, and the decline for rural residents was particularly large. This contributed to improved living standards in absolute terms, although mortality remains high in rural Yunnan compared to the national average. The explanation for the divergent trend in mortality in Yunnan compared with Anhui and the national average comes from two distinct sources. First, the one-child policy was more leniently applied in the border regions and national minority areas in Yunnan than in China on average, or in Anhui - Banister discussed the very high infant mortality in Anhui (Banister, 1987: 221) - as is reflected in the higher population growth rate and birth rate for Yunnan compared with Anhui and the national average. Second, there is

considerable evidence that the collective health insurance scheme was not extensive in rural Yunnan up to 1983. "By 1971, 76% of China's rural production brigades had established a co-operative health service. Coverage peaked in 1977, when it reached 90%." (Banister, 1987: 71) However, in his accounts of life in rural Yunnan, He made it clear that there was little or no collective health service in rural Yunnan (particularly in the northwest and north of the province) even during the late 1970s, and that health care expenses posed an enormous problem for cash-poor rural households, medicine being provided on a cash-up-front basis (1993: 167 ff.).

Further detail of trends in mortality are provided in the maps for the counties of Anhui and Yunnan. These maps show the broad regions in the two provinces where mortality increased or decreased over the intercensal period, based on their CDR's in 1982 and 1990. The map for Anhui shows some convergence towards a higher mean CDR, where the mean death rate for the rural counties of the province was 5.7 deaths per thousand population in 1982, and 9.7 in 1990. The coefficient of variation increased marginally from 0.24 in 1982 to 0.28 in 1990, showing little increase in dispersion despite the large increase in the mean. Only four counties had death rates that increased from above the mean in 1982 to further above the higher mean in 1990. For the counties of Yunnan, there was some convergence on a lower mean value for death rates over the intercensal period. Several counties in central Yunnan, had modest increases in the death rate, and therefore experienced declines in achieved functioning. The vast majority of the counties on the periphery in Yunnan had declining mortality during the 1980s, and therefore increased non-material well-being. There were six counties which did have increased mortality from a high base. This had a highly unfavourable impact on the living standard in these counties. These data on county level mortality form

Anhui: Mortality 1982-90



LEGEND

% gr. 1982-90 7.1+ %, CDR 1982 ≤6.0, CDR 1990 9.67+

% gr. 1982-90 7.1+ %, CDR 1982 ≤5.66, CDR 1990 ≤9.66

% gr. 1982-90 0.1 - 7.0%, CDR 1982 ≤5.66, CDR 1990 ≤9.66

% gr. 1982-90 0.1 - 7.0%, CDR 1982 5.67+, CDR 1990 ≤9.66

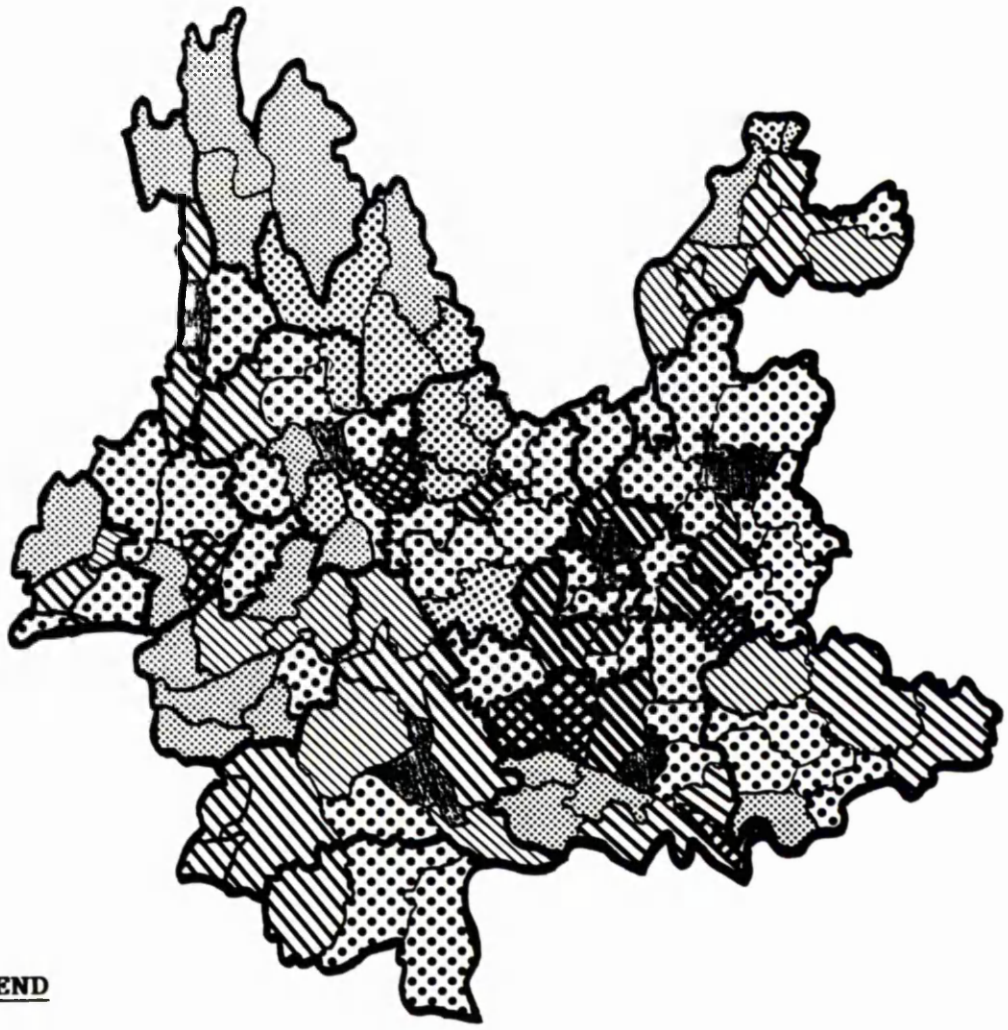
% gr. 1982-90 0.1 - 7.0%, CDR 1982 5.67+, CDR 1990 9.67+

% gr. 1982-90 ≤0.0%, CDR 1982 ≤5.66, CDR 1990 ≤9.66

% gr. 1982-90 ≤0.0%, CDR 1982 5.67+, CDR 1990 ≤9.66

Omitted Urban Areas

Yunnan: Mortality 1982-90



LEGEND

% gr. 1982-90 ≤ -3.0%, CDR 1982 9.01+, CDR 1990 ≤ 7.65

% gr. 1982-90 ≤ -3.0%, CDR 1982 9.01+, CDR 1990 7.65+

% gr. 1982-90 0.0 - -2.9%, CDR 1982 ≤ 9.0, CDR 1990 7.65+

% gr. 1982-90 0.0 - -2.9%, CDR 1982 ≤ 9.0, CDR 1990 ≤ 7.65

% gr. 1982-90 0.0 - -2.9%, CDR 1982 ≤ 9.0, CDR 1990 7.65+

% gr. 1982-90 0.1 - 2.5%, CDR 1982 ≤ 9.0, CDR 1990 7.65+

% gr. 1982-90 0.1 - 2.5%, CDR 1982 ≤ 9.0, CDR 1990 ≤ 7.65

Omitted Urban Areas, Counties with Missing Data, and Lake Dian

part of the standard of living index presented in chapter four.[38]

c Functioning as Health Care Provision

From epidemiological data it is possible to assess the level of advancement of medical care and sanitation in a community, and the breadth of coverage of those services. The causes of infant and child deaths in particular are highly indicative of the quality of life in a country. Unfortunately such data are not available at a county level for either Anhui or Yunnan. There are some very interesting data available at a county level on the rates of inoculation against childhood diseases in Yunnan in 1987, from a survey carried out by the U.N.. This survey also included some epidemiological data for child deaths, and under-5 mortality itself, but the survey did not cover every county of the province.[39]

There are two problems in interpreting the data on the number of health care professionals and hospital beds per thousand population. First, the true size of the health care sector was not transparent, due to the large number of health workers active outside the state medical system. These private sector care givers were omitted from the official data, and were predominantly

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38 Correlations between different aspects of functioning are also presented in chapter four.

39 In 1987 UNICEF conducted a survey of living standards in several provinces of China, it contained no time series data. The data therefore provide only a snap shot of spatial inequalities in children's living standards in ten counties of Yunnan. The ten counties covered were: Qujing and Yuxi representing urban areas, Luliang and Menghai representing non-mountainous rural counties; and six mountainous counties: Suijiang, Xuanwei, Mile, Jingdong, Huaping and Yun. These counties and cities belonged to eight different prefectures and were quite widely scattered about the province. These data do shed some light on several issues central to this discussion of living standards, such as: differential access to education and health care, enrolment rates and drop out rates, as well as the incidence of inoculation against childhood diseases, and epidemiological data on child deaths. Spatially there were few surprises, urban areas had higher incidence of inoculation, lower drop out rates, more children in day care or pre-school, and fewer drop outs for both primary and lower middle school education than any of the rural areas included in the study. Mountainous areas were most severely disadvantaged. The epidemiological data reinforced these conclusions, with the majority of child deaths from preventable diseases occurring in the mountainous counties. Finally, mountainous villages and rural counties had poorer health care provision than urban areas, with 32% of mountainous villages having no health care provision what so ever, and 68% of rural villages and 38% of mountainous villages had only a health care professional, with no clinic or hospital. In both cases a third of villages had a distance in excess of 9 km to travel to the nearest source of medical care. The data on access to education showed similar trends, and virtually half of the children in these areas had to travel more than 4 km to school. (Data from ZG 1987 ETQK YNFC, 1989: passim.)

semi-skilled medical professionals,[40] the former barefoot doctors. This resulted from the removal of the barefoot doctors from the state payroll in a drive to improve the quality of health care provision during the late 1970s and early 1980s and then due to the privatisation of health care from 1983. A shift away from beds in unequipped wards, towards an increased numbers of beds in wards with hospital equipment that would be more familiar to most residents of OECD economies, accompanied this change.

Second, health care is now provided on a cash-up-front basis for all non-government employees in rural China, unless the local government provides an insurance scheme. The latter tends only to be the case when the local government has high tax revenues and income from the profits of locally run enterprises, which allows them to provide these services to their residents. High local government revenues accrue to rich and rapid growth areas, with high shares of local and collective industry and services in total rural output, as shall be demonstrated in chapters 6 and 7. As Anhui and Yunnan contain few such rich counties, the majority of the rural population in Anhui and Yunnan receive medical treatment on a cash-up-front basis, having lost both the benefits of health insurance, and the heavy government subsidy of medical expenses, that existed under the commune system.[41] Under the collective, there was rarely a delay before medical treatment began while the bill was settled. Nor did people avoid seeking medical attention for fear of the cost. Both of these now appear to be the case in rural China. Even very

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40 Private sector health care givers were not universally semi-skilled practitioners, as there were some fully qualified, and famous, medical professionals who opted out of the state system. For example in Lijiang there was a qigong specialist and an acupuncturist who were both in this category.

41 Under the commune system, patients bore only 30% of the cost of their treatment, the rest being paid for by the state, the collective and the work unit. Further, the collective paid for the treatment initially, and a patient repaid his 30% after having received the treatment, instead of the situation since decollectivization where full payment is required before treatment begins. In some of the wealthier regions of China, where there is a large amount of township industry employing large proportions of the rural population, health insurance schemes are provided for the population, but this is not universally true. As a result there are problems with the demographically adjusted data on medical care, because of this change in the billing of patients, and all data on this topic were analyzed with this caveat. As mentioned earlier, even at its height in 1977 this system only applied to 90% of production brigades in rural China (Banister, 1987: 71) and that among the 10% were many of the poorer brigades in northwest of Yunnan (He, 1993: 167 ff.)

minor treatment is expensive relative to peasant incomes in poor areas, and major surgery is beyond the means of even wealthier peasants. There are no systematic data available on the costs of medical and dental care, nor on the numbers of people who avoided or postponed treatment due to the expense.[42] The following information came from the author's own experience in November 1991, and is solely illustrative.

The charge for six sutures, local anaesthetic, the removal of the six sutures and a three day supply of Japanese antibiotics obtained in the casualty ward of a rural hospital in Dali county, Yunnan, cost 20 *yuan*. This amount was the Chinese price, and was paid in RMB and not FEC. The average per capita net peasant income in the area at the time was approximately 50 *yuan* a month (YNTJNJ, 1991: 545), so that this treatment would have cost 40% of the monthly average per capita income. In conversations with people in rural areas on the subject of the cost of living, and changes during the reform period, the expense of health care was an oft-voiced concern. The author was introduced to one person who lost part of an arm due to an untreated wound that led to amputation in Anhui's Shou county. There was another young man in Xishuang Banna who lost sight in one eye because treatment of an infection was left too long for fear of the expense.

The Chinese government has recognized the problem of affordable health care for peasants in poor areas, and according to the recent World Bank report on the subject, is looking to reconstitute heavily subsidized rural health care systems for these areas, in a return to the pre-1983 style system. (cf. World Bank, 1992b: xii) Such a programme, which is also to apply to the provision of education in poor areas, should greatly improve the educational and medical entitlements of the poor in these areas, raising living standards.

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42 Survey data from 1987 showed that 5% of those with cooperative health care provision gave economic reasons for not seeing a doctor, and 6% for not seeking hospitalization. By contrast, 27% of those reliant on private means to pay for health care cited economic reasons for not seeing a doctor and 19% for not being hospitalized (Shao, 1988: 17-18).

However, given that this applies to only 9 counties in Anhui and 17 counties in Yunnan (where the average provincial per capita net peasant incomes are 38.8 *yuan* and 40.8 *yuan* per month respectively) there will still remain large portions of the population in these provinces with severe financial difficulties when faced with medical emergencies and educating their children. These people will be condemned to having very low living standards.[43]

If one examines the number of fully trained health care professionals and the number of beds in fully equipped wards, then the trend in living standards was clearly and impressively upwards starting in the 1950s. Figure 3.3 shows the trends in the number of health care professionals for China, Yunnan and Anhui from 1952 to 1990. The data are presented as the number of health care professionals per thousand population.[44] The figure excludes all medical personnel without various professional qualifications in either western or Chinese medicine. Traditionally both Anhui and Yunnan were far behind the national average in the provision of health care, and continue to be so. This gap widened significantly in Anhui from 1970, and from its nadir in 1975 in Yunnan.

There was a decline in peoples' access to health care professionals during the high tide of the Cultural Revolution, 1966-69. The Cultural Revolution was, however, less disruptive to medical services in Anhui than in other parts of China, such as Shanghai and Beijing or Yunnan; as a result the gap between access to health care in Anhui compared to China all but vanished. This resulted from the close proximity of Anhui to Shanghai and southern Jiangsu, where Anhui was the target destination for many of those

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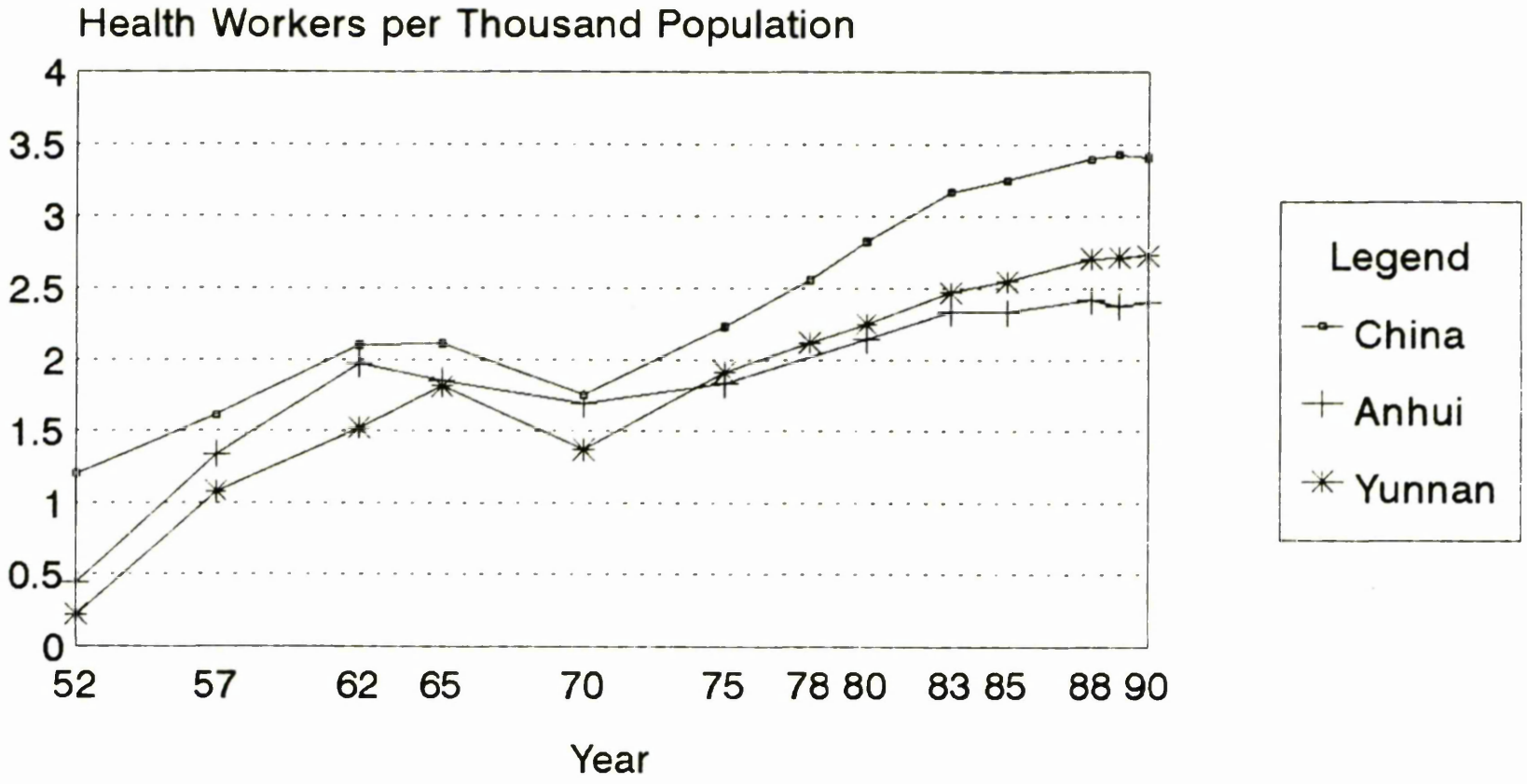
43 According to Riskin (1993: 152), in 1988 only 37% of poor households were located in designated poverty counties.

44 In China much of the reliance for nursing care while a patient is in hospital still falls on family members. As a result, health care professionals includes primarily fully trained doctors in either western or Chinese medicine, and medical technicians, such as: X-ray technicians, people trained to administer radiation or chemotherapy treatments, or run family planning clinics. In large urban hospitals, more is being done to provide professional nursing care and nutritional support (hospital meals), but this is a very new trend and is limited to urban areas.

Figure 3.3 - Health Care Professionals for China, Anhui and Yunnan, 1952-90



Sources: China, Anhui and Yunnan, 1952-89: LSTJ, 1990: 2, 44, 405, 432, 751, 781.
China, Anhui and Yunnan, 1990: ZGTJNJ, 1991: 81, 774.
Yunnan, 1957, 1962, 1970, 1975, 1983: YNTJNJ, 1990: 637.

'sent down'[45] to the countryside, while in Yunnan there were fewer transfers of qualified personnel due to its isolated location. However, the gap increased as the health service returned to "normal" in the wake of the Cultural Revolution in Anhui, but improved in Yunnan, although in absolute terms the populations of Anhui and China, on average, both had greater access to health care professionals for 1970-76 than Yunnan. It was not until five years after the end of the Cultural Revolution that the number of health care professionals relative to the population to surpass their pre-Cultural Revolution levels in Yunnan, and China, while in Anhui the recovery was slower, taking ten years. The very low growth rate for the period from 1965 to 1975 in the number of health care professionals per thousand population in Anhui clearly illustrates the slower rate of recovery from the disruptions of the late 1960s, and some out-migration of professionals back to Shanghai and southern Jiangsu.

The growth rate in the number of health care professionals per thousand population for the Maoist period as a whole (1952-75) was 2.7% for China, 9.9% in Yunnan, and 6.4% for Anhui. This difference in the growth rates of health care provision during the Maoist period was important, vis-a-vis an improved entitlement for the population in poorer areas. If an improvement was apparent for the period before 1978, then the opposite was true thereafter. The annual growth rates for the number of health care professionals per thousand population from 1980 to 1990 showed that both Yunnan and Anhui fell further behind the national average in the availability of health care professionals. The position of Anhui relative to the national average, in access to health care professionals, was best in 1970, between 1975 and 1989 this gap steadily widened. For Yunnan, the nadir in the gap between health

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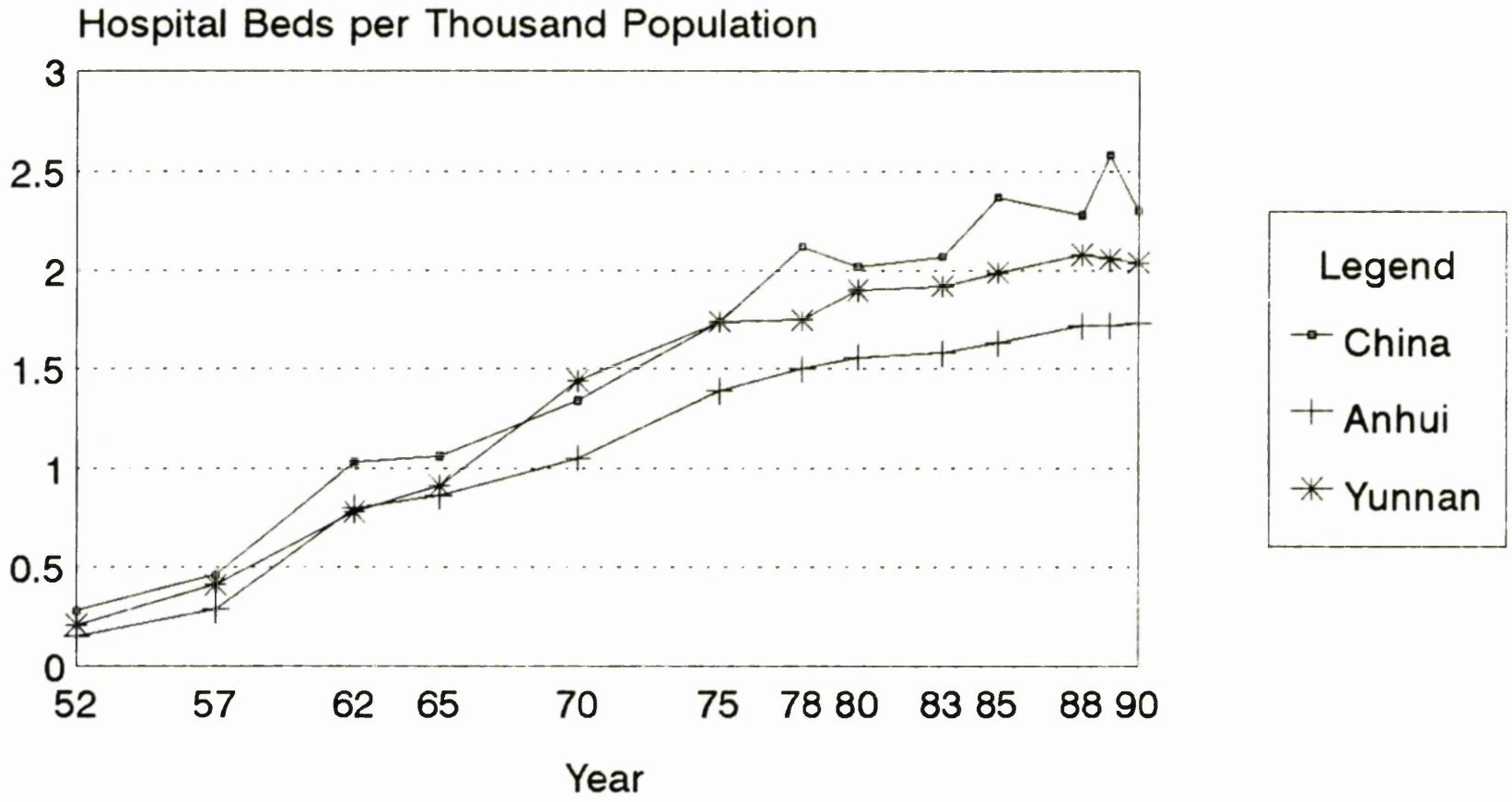
45 The *xiafang* policy was devised to relieve the pressure on demand for jobs in urban areas, and also the pressures on expanding food requirements of the growing urban population. Urban youths were "sent down" to the countryside to learn from the peasants, or such was the propaganda, in reality they were sent to growth their own food (Selden, 1993: 174, 215).

Figure 3.4 - Hospital Beds for China, Anhui and Yunnan, 1952-90



Sources: C, A & Y, 1952-89: LSTJ, 1990: 2, 44, 405, 432, 751, 781.
C, A & Y, 1990: ZGTJNJ, 1991: 81, 774; C & A, 1962, 1970, 1975: AHSQ, vol.1, 1985: 824.
Y, 1957, 1962, 1970, 1975, 1983: YNTJNJ, 1990: 637; C & A: ZGSHTJZL, 1985: 211; ZGSHTJLZ, 1990: 213.

care provision in the province and the national average occurred in 1975, increasing much more modestly during the late 1970s and 1980s than in Anhui, and therefore having a smaller negative impact on the relative standard of living. In sum, the evidence on access to health workers shows a decline in relative functioning in Anhui and Yunnan during the 1980s, while absolute functioning improved in both provinces between 1952 and 1990, although the rate of improvement slowed significantly in the post-Mao period.

Unfortunately the positive trends in absolute living standard in Anhui and Yunnan have not prevented both provinces from falling further behind the national level of health care provision. As with the number of health care professionals relative to the population, the ratio in the number of beds[46] relative to the population between Anhui, Yunnan and China was largest just before and during the Cultural Revolution period, see figure 3.4. The ratio of access to hospital beds in Anhui relative to China peaked in 1965, and in 1970 for Yunnan. Yunnan remained on par with China through to 1975, and subsequently declined to 88.6% of the Chinese level of hospital bed provision. This indicated that in access to hospital beds, Anhui and Yunnan remain behind the average for China by a considerable margin, although the fluctuations were such that it was hard to identify whether there was a trend decline or merely stagnation. But irrespective of the precise path of hospital bed availability, in this respect relative living standards have not improved over the late Maoist period in Anhui and Yunnan.

In summary there are two main trends observable in the medical data. First it is clear that, from the early 1950s, there was a marked improvement in both the quality and quantity of health care provided to the population of Anhui and Yunnan. Absolute living standards, as measured by health care

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46 For the sake of simplicity, the term hospital bed stands for beds in fully equipped wards, unless otherwise specified.

provision, increased rapidly from 1952 to 1965. The rate of increase slowed during the Cultural Revolution, but the trend continued to be upward through to the end of the Maoist period. In the post-Mao period, the growth rates in the provision of health care in Anhui and Yunnan virtually stagnated, falling close to, or below the percentage increase for China over the same period. This analysis is severely limited by the privatisation of health care in rural China from 1983, when access for 90% of the rural population was significantly reduced. The increased gap between access to health care services in Anhui and Yunnan relative to the national average during the 1980s meant that relative living standards in the two provinces had been declining since the end of the Cultural Revolution, particularly relative to the dynamic, highly urbanized and industrialized coastal regions.

d Functioning as Educational Attainment

Educational attainment is an important contributor to living standards for two reasons. First, education is good of itself, because it permits the fulfilment of capability relating to information processing, communication and social interaction. Second, education is a means of increasing an individual's earning power and productivity, which could lead to increased command over commodities, and a means of increasing economic growth rates when improvements are widespread among the population. Numerous indicators were suggested in the literature[47] as measures of access to and quality of

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47 The literature on living standards and educational attainment is extensive, ranging from Adelman and Morris (1973) to Dasgupta (1993b) who employed literacy and educational attainment in cross national studies of living standards, inequality and economic growth. There are two main issues regarding the importance of educational attainment; first, the evidence on the contributions to increased welfare resulting from either basic and universal or elitist and specialized education and economic development (also increased living standards and poverty alleviation). The second issue is the impact of female education on fertility and child health. The evidence from East Asia appears to be in favour of the universal provision of basic education, initially primary education and basic literacy skills, and as economic prosperity increases secondary and then further education. The importance of universal basic education is reinforced by the findings of Psacharopoulos (1985), where the highest rates of social return on education came at the primary level, not just in Asia, but in Africa and Latin America as well. In this respect, the educational provision in Hong Kong, South Korea, Singapore, Sri Lanka and China are often contrast with that of India. All but India being examples of countries that are considered economic successes, either in terms of rates of economic growth, or in terms of increased life expectancy. See for example: Morris and Adelman, 1987; Chenery, Robinson and Syrquin, 1986; Anand and Kanbur, 1991; Dasgupta, 1993b; World Bank, 1990; World Bank, 1992a; World Bank, 1992b; World Bank, 1993; UNDP, 1990. The importance of female education on both fertility rates and infant mortality has long been

education, and even more dealt with cultural and personal freedoms. The population by level of educational attainment was one factor, as was the literacy rate[48], and enrolment rates by level of education make the analysis of access to education complete. In terms of measuring quality of education, factors such as numbers of Nobel prize winners, and other academic or intellectual awards are considered when ranking the intellectual achievements of different nations and their educational systems among OECD countries. However, given the very small numbers of non-OECD academics and intellectuals that actually win such awards, this was hardly of relevance to Anhui and Yunnan. Therefore, the quality of the education provided is difficult to ascertain. One of the best methods for the China context, given the national examination system and qualifications for entrance to higher middle schools and university, is the proportion of graduates from one level of education that proceed to the next level of education. Such data are available for the provinces as a whole, but they were not disaggregated at a county level, and are summarized below.

As with virtually all the indicators of the standard of living examined in this chapter, the data presented in table 3.10 on illiteracy show two different trends. First, in terms of absolute living standards, illiteracy declined in Anhui and Yunnan, contributing to improved living standards. Illiteracy in China as a whole also declined rapidly over the intercensal

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shown. See for example: Birdsall, 1974; Janowitz, 1976; Bagozzi and Van Loo, 1978; Butz and Ward, 1978; Easterlin and Crimmins, 1985; Cleland and Rodriguez, 1988; Lavely et al, 1990; and World Bank, 1992a. The impact of female education on child health and nutrition status is discussed in Dasgupta, 1993b and Anand and Kanbur, 1991.

48 Chinese data on illiteracy included both those who were illiterate, and those who were only semi-literate. Illiteracy was defined as being unable to read or write at all, on the 1982 census. Semi-literacy was defined as being unable to read popular books or magazines, equivalent to a knowledge of 1,500 characters, or less than five years education (cf. Population Atlas of China, 1987: 86). There was no change in the definition between the 1982 and 1990 censuses. The World Bank found that there was a strong correlation between primary level education and future earnings, where literacy skills appeared to be the watershed between being income-advantaged or income-disadvantaged. The level of educational attainment necessary for success and advancement in urban areas was higher, and as the Chinese economy develops and the rural labour force is increasingly employed in the non-farm sector, the need for higher educational attainment is expected to increase. This is reinforced by the recently published Chinese government policy on education and its importance for economic development (Beijing Review, 1993, 36(22): 13-18). However, for an examination of trends in well-being from 1978 to 1990, illiteracy is a useful and reliable measure, and therefor employed in this dissertation.

period. The aging of the Chinese population contributed to falling illiteracy rates. In 1990, a far larger proportion of the population had been born after liberation, and the provision of universal basic education, than in 1982, raising the educational attainment of the population. Further evidence of this is apparent in tables 3.11A and Y, which show the very large numbers of people with primary education. As a result, illiteracy would have fallen in any case over the 1982-90 period simply due to demographic factors in the absence of a significant change in education policy.

Table 3.10 - Illiteracy in Yunnan, Anhui and China

Year	China	Anhui	Yunnan[49]
1982	22.9%	31.8%	31.5%
1990	16.0%	24.4%	25.4%

Note: Illiteracy means those fifteen years and over who were illiterate or semi-literate as a proportion of the population aged fifteen and over.
Source: ZGRKTJNJ, 1992: 296-427.

The second trend was that living standards in Anhui and Yunnan, as measured by illiteracy, declined relative to the national average. Illiteracy and semi-literacy declined less rapidly in Anhui and Yunnan than they did in China as a whole over the intercensal period. Within the two provinces there were also significant regional variations in the incidence of illiteracy, which generally corresponded to economic conditions, although the relationship was not simply the inverse that might be expected.[50] In 1982, illiteracy was nearly 1.4 times the national average in Anhui and Yunnan. By 1990 the gap between the provincial and national averages had increased to 1.53 for Anhui and 1.59 for Yunnan, which was indicative of the slower rate of increase in

49 Literacy was more difficult for 35% of the Yunnan population belonging to national minority groups to attain than for the Han population. This is because mandarin is the principle language of instruction, but the mother tongue and home language of the minority student is a minority language. Despite this disadvantage, there are large numbers of trilingual minority women in Dali, Lijiang and Xishuang Banna who ply their trades in English, Mandarin and minority language with great success while a number of their Han counterparts in the same regions are functionally illiterate (cf. Author's field notes, 1991). The data on illiteracy in Yunnan are problematic because it is not obvious how people who are literate in their own language, but illiterate in Mandarin, are treated in the census. As the definitions refer to 1,500 Chinese characters it is probably safe to assume that such people are considered illiterate or semi-literate, thereby inflating the illiteracy figures for Yunnan, although the extent of this inflation is not easily quantified.

50 A more complete analysis of the relationship between trends in commodity and non-commodity functioning in Anhui and Yunnan is contained in chapter four.

educational provision and attainment, and therefore, worsening relative living standards.

Table 3.11A
Anhui Population by Level of Educational Attainment 1982-90

Level of Educ.	K Population 1982	K Population 1990	% Population (10 years +) 1982	% Population (10 years +) 1990	% An. Growth Rate 1982-90 (K Pop.)	% An. Growth Rate 1982-90 (% Pop.)
Univ.	203	496	0.5%	1.0%	11.8%	10.0%
U.Mid.	1975	2828	5.0%	5.9%	4.6%	3.0%
L.Mid.	7071	11218	17.8%	23.5%	5.9%	4.3%
Prim.	14759	19486	37.1%	40.8%	3.5%	2.0%
Illit.	15792	13726	39.7%	28.7%	-1.7%	-3.2%
<9 yrs.	9867	8427	na.	na.	-2.0%	-3.5%
Total	49667	56181	100.0%	100.0%	1.6%	

Note: These data are for people with at least some of each level of education, and are not necessarily graduates from each level of education.
Source: AHS DSC RKPC, 1991: 1-125.

The increased number of people attaining every level of education combined with the corresponding decrease in the proportion of illiterate and semi-literate people, is, on the surface, very encouraging, and provides evidence of the continued commitment to education and combating illiteracy during the post-Mao period. However, one concern at this juncture is the relatively low rate of expansion in higher levels of education as a percentage of total population. By 1990, 93% of the population (10 years and over) of Anhui had attained at best only basic literacy skills (lower middle school education at best), and at worst remained illiterate. As with Anhui, 6% of the Yunnan population (ten years and over) could be regarded as skilled or highly skilled, while another 17% had only the most rudimentary literacy skills. The remaining 77% were either illiterate or semi-literate. The trend in educational attainment was positive, but the rapid rate of growth was based on a very small pool of literate and skilled people. This can hardly augur well for the future, as more workers with higher levels of skill and training will be required to maintain or expand the pace of rural modern sector

enlargement growth,[51] which in turn is necessary for increased incomes and improvements in well-being.

The data on the proportion of the population with secondary education for Anhui are indicative of the relatively low value placed on higher secondary eduction during the 1980s. It was widely reported in the press during the 1980s that young people in China preferred factory employment or sideline production from the age of fifteen to continuing in education (cf. Thogerson, 1990: 66-7). The Chinese government recently announced a directive promoting at least nine years education for the entire population, and promoting greatly expanded numbers of upper secondary graduates, as it has recognized the importance of increasing the skill level of their labour force, both for the future economic growth of the economy as a whole, and for improving the potential for higher living standards among the population (cf. Beijing Review, 36(22) 1993: 13-7).

Table 3.11Y
Yunnan Population by Level of Educational Attainment 1982-90

Level of Educ.	K Population 1982	K Population 1990	% Population (10 years +) 1982	% Population (10 years +) 1990	% An. Growth Rate 1982-90 (K Pop.)	% An. Growth Rate 1982-90 (% Pop.)
Univ.	108	298	0.4%	1.0%	13.5%	11.8%
U.Mid.	909	1514	3.8%	5.0%	6.6%	4.9%
L.Mid.	3328	5100	13.8%	16.8%	5.5%	3.8%
Prim.	9540	14014	35.4%	46.2%	4.9%	3.3%
Illit.15	10251	9406	42.5%	31.0%	-1.1%	-2.6%
<10 yrs.	8418	6640	na.	na.	-2.9%	-4.5%
Total	32554	36973	100.0%	100.0%	1.6%	

Note: These data are for people with at least some of each level of education, and are not necessarily graduates from each level of education.
Source: YNS DSC RKPC, 1991: 118-9, 126-7.

In Yunnan, by contrast, the growth rate for the proportion of the population with upper secondary education was higher than that for junior high school education, which augurs well for the future skill level of the labour

51 Modern sector enlargement growth is a term coined by Fields (1990) to describe growth in Lewis's (1954) non-agricultural sector in his dual sector model. Rural is added to Fields' term in this context, because the dual sectors are both within the countryside, and we are not concerned with mass migration of the rural surplus labour sector, but merely from the farm to the non-farm sector within rural areas. This is largely a product of restrictions on rural-urban migration in China, that continue to exist, but are slowly becoming less stringent.

force. This also represents a broadening of the capability set and future potential living standards for these individuals, and for the population of the province on average. Surveys carried out in China showed that upper-middle school and higher education graduates made better entrepreneurs than those with lower educational attainments (cf. Wang and Bai, 1991: 50-1). The low educational attainment of the Anhui population implies difficulties in meeting future demands for skilled labour in the rural economy, and also in terms of the limited potential for future material and non-material well-being. As growth rates for upper-secondary education were considerably higher in Yunnan, the trend in educational attainment was positive, but the total proportion of the population with low educational attainment, and therefore limited capability sets, and the lack of skilled labour may pose a bottleneck constraint for future economic development. Universal primary and secondary education was one of the key factors in the rapid economic growth of the NIC's that China would so like to emulate.[52]

Table 3.12 - Enrolment Rates for Anhui and Yunnan

Year	Anhui: Primary	Secondary	Higher	Yunnan: Primary	Secondary	Higher
1965	na.	6.2%	1.3%	106.9%	5.8%	0.8%
1978	91.2%	44.2%	1.5%	83.6%	31.3%	0.9%
1980	93.2%	31.3%	2.7%	77.1%	20.1%	1.1%
1983	94.1%	23.5%	2.7%	84.8%	16.7%	0.7%
1985	95.8%	26.1%	1.1%	97.8%	19.0%	1.0%
1988	95.6%	32.4%	1.0%	101.8%	22.1%	1.3%
1990	91.2%	33.7%	0.9%	98.2%	22.3%	1.3%

Note: The data in this table are estimates based on forward and back projections of age specific population data from the 1982 and 1990 censuses. There are meant to be indicative as instead of definitive. The data on the numbers of students by level of education contained no indication of whether or not mature students are included in the data. It is assumed that such students are included, because of the over 100% enrolment for Yunnan primary students.
Sources: AHSQ vol.2, 1986: passim.; AHTJNJ, 1991: 551; YNTJNJ, 1990: 618-9; YNTJNJ, 1991: 554-5.
Population data: ZGRKNJ, 1985: 774-5; ZGRKTJNJ, 1988: 509; ZGRKTJNJ, 1992: 116-7.

Enrolment rates could not be calculated accurately for counties in China, because little or no age-specific population data are available, preventing the calculation of enrolment rates from the data on the number of

52 See for example: Pepper, 1990: 75-92; World Bank, 1990; World Bank, 1993.

students by county. There are further problems with the interpretation of any such enrolment rates, because of the problems of access, parental responsibility for school fees and equipment costs, and the rates of non-attendance and drop-out.[53] Often students are on the books at a school, but their rate of attendance is poor because they are needed to work on the farm or in family enterprises. This means that students in poor rural areas rarely received the necessary five to six years of primary education to ensure any level of literacy (World Bank, 1992b: 83). By contrast, the data on literacy from the third and fourth population censuses are comprehensive, and free from any such problems of interpretation, and are therefore relied upon as a measure of the educational attainment of the population at a county level.

The fluctuations in enrolment rates in Anhui and Yunnan, exhibited in table 3.12, are the result of two distinct influences. The first influence is the perceived high opportunity cost for education, which is discussed below. The second is the age structure of the population. A very large cohort was born in the wake of the Great Leap famine, and high natality continued through the early years of the Cultural Revolution in both provinces. The low enrolment rate for primary students in 1978-80 in Anhui and Yunnan are a direct consequence of this very large cohort being of primary school age, without adequate expansion in the number of school places to accommodate this large cohort of students. The same is true of the low point in secondary enrolment rates for 1983-5 in both provinces, although here the opportunity costs associated with education exacerbated the downward effect. The Cultural Revolution "babyboomers" experienced severe limits on educational

53 Since decollectivization, townships and individual families have born the costs of educating children. The balance between local government expenditures on education and the fees that parents pay is largely dependant on the wealth of the region, and the earnings potential of the local government sector, both from tax revenues and from the profits of township and village enterprises). This results in the paradox that parents in backwards areas are far more likely to pay a high proportion of the costs of educating their children than those in advanced, coastal areas because of the relative poverty of their local government (cf. World Bank, 1992b: 82-3). This results in lower enrolment rates and higher drop out rates in poor regions than in wealthy ones.

provision, as school places and staff did not expand sufficiently to provide universal access to basic education. In the early 1980s, at secondary and higher levels of education, this large cohort also had to compete for places with the 'lost generation', those whose education was disrupted by the Cultural Revolution (Pepper, 1980a: 847-890; Pepper, 1980b: 1-65). This cohort had their capability set, and their potential for achieving increased future commodity and non-commodity functioning, curtailed by this lack of educational provision.

The limited data that are available on rates of progression between levels of education confirm both of these trends. The rates of advancement from primary to standard middle school education declined during the Cultural Revolution, and then again in the late 1970s and early 1980s, as the large cohort passed from the primary to the secondary education age groups, and subsequently stagnated due to the increased opportunity costs for education.[54] The trends for progression from lower to upper middle school are equally pronounced, although by the late 1980s it was the perceived opportunity cost of education, and not demography, that depressed rates of advancement. The rates of advancement was very low, 26%, for lower to upper secondary in Yunnan in 1981-2, as was the national average, 32%.[55] Advancement in Yunnan was low by both absolute and relative standards. Subsequently rates of progression between levels of secondary education increased between 1982 and 1985 (39% in China, 36% in Yunnan) only to return to low levels by the end of the 1980s - 23% for Yunnan and 35% for the

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54 Data from LSTJ, 1990: 40; ZGRK AHFC, 1987: 369; YNTJNJ, 1990: 618-9; YNTJNJ, 1991: 554-5. Data for Anhui are only available for the period up to the 1982 census, and as a result, Anhui is largely excluded from this analysis.

55 Two factors may have contributed to the sharp increase in rates of progression for 1982-85. First, decollectivization became universal in 1983, and was completed in that year with the dismantling of the collective social welfare system. As a result, private costs of education could be expected to be low during this period, compared to the late 1980s. Second this was the period of the fastest growth in agricultural income, and as a result, the opportunity costs associated with education for families may have seemed small relative to increasing incomes. Once the terms of trade shifted against farming families with the introduction of "contracts" in 1985, then the opportunity costs of education may have become more onerous.

national average.

Data on advancement to higher education are only available for Yunnan. These data showed that rates of advancement increased rapidly in the early Dengist period, 7% in 1981 to 35% in 1984, only to decline to 27% in 1988 and 22% in 1990. The depressed values for 1989-90 in advancement from upper secondary to higher education were the direct result of central government policy in the wake of Tian'anmen, which strictly limited university enrolments (Hayhoe, 1993: 291-309). These low rates of progression to non-basic levels of education are a cause for concern, both in terms of the skilled labour that will be necessary for continued economic modernization in rural China, and also in terms of the constraints on future improvements in living standards in both provinces.

The educational entitlement failure in poor regions was a function of the much higher opportunity costs for educating children, through the loss to the household of labour power and income as well as the higher school fees. Many disadvantaged households are labour poor as a result of high dependency ratios,[56] making this lost labour of great importance. In wealthy regions, there the opportunity cost from the lost labour power and income foregone is a factor, but the local government pays much of the school fees for the students, reducing that aspect of the opportunity cost. At the margin, wealthy families faced much lower opportunity costs for child education than poor families, due to higher dependency ratios and higher opportunity cost of school fees. There were also wide differences in the quality of education provided in regions of different levels of affluence, because poor and remote areas have difficulty in attracting qualified staff, resulting in students

[56] See for example, Bramall and Jones (1993) and the discussion of Croll's data (1993) in chapter seven on the link between dependency ratios and household income levels. In poor rural areas lacking in infrastructure and on marginal agricultural land, even large households were labour poor because of the high time demands of basic activities such as: carrying water, which can occupy one adult member of a household for an entire day, or gathering fodder for animal husbandry, fuel for cooking and light, or collecting wild mushrooms and herbs to raise the cash for supplementary grain. These latter tasks often fall to young or elderly members of a household.

being disadvantaged in terms of the potential for their advancement to higher levels of education.[57]

e **Functioning as Personal and Cultural Freedoms**

The extent of cultural freedom is difficult to measure. Some have suggested using the incidence of democratic elections, which in China occur for the election of local officials, but not at a provincial or national level, where the CCP retains its political monopoly. Other factors that might be examined are access to entertainment, such as: movies, live theatre, opera, ballet and acrobatics, and publications such as: magazines and newspapers. It is possible, at a provincial level at least, to measure the increase in the number of titles of magazines and newspapers, and to look at the number of cinemas and theatres. Such data, however, say nothing about circulation statistics for newspapers and periodicals, nor does it say anything about the content of the above mentioned, which in the author's experience remain highly propagandist. The same is true of the content of movies and theatre productions, the tickets for which are usually sold out well in advance. Further, to what extent does the showing of a fifteen hour epic on Mao's life, released in 1991, and shown in cycles of three successive days for five hours per session, represent cultural freedom, if this is virtually the only film that runs in a village in a given year?

Personal freedoms include factors such as: a sense of personal security, that is a freedom from the fear of robbery or physical harm or political persecution, and the freedom of movement. Long distance travel within China remained severely restricted, particularly for those who did not have access to foreign exchange certificates (FEC) during the 1980s, and international

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57 As a result of the devolution of government control over the placement of graduates to local governments, it is difficult for poor areas to attract teachers, let alone talented ones. See for example: He, 1993 and Beijing Review, 1992, 35(34): 8-18.

travel even more so.[58] Migration to urban centres remained difficult, despite an ending of the staple foods rationing system in most urban centres by 1993. This resulted from the restrictions on housing and the expense of food, which prevented all but the most wealthy or desperate from migrating (Mallee, 1994: 8-16). Given the preeminence of security bars and grills on the windows and doors of shops and houses in rural areas, most new homes were akin to modest fortifications or medium security prisons, so that the sense of personal security was apparently not great. Further, the problems of corruption among local officials was another factor that limited individual freedom.[59] Conversations with villagers in Anhui and Yunnan led the author to conclude that the sense of personal security, particularly in terms of access to medical care, and social security systems such as provision for old age, as well as corruption of officials and criminal activity, was not very high in rural China, and in many respects has probably declined[60]. However, there were no systematic means of measuring an individual's feelings of personal security without conducting a survey to gather such data.

With the return to family farming, rural individuals now have much more control over their own activities, and play a greater role in determining their own income levels. This increase in self-determination has come at a cost, as health care and education costs have devolved to the individual, and other social safety-nets once provided by the communes, such as emergency

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58 During the 1980s travel restrictions were gradually eased. Bus travel had the freest access, while rail travel was available to Chinese people with RMB, but often required a travel permit to purchase a ticket, and demand regularly exceeds supply, with places such as Guangzhou becoming infamous as transportation black-holes, with thousands of people waiting outside the station for last-minute tickets. Air travel continues to be the most restricted form of transportation in China, with official permission necessary to obtain tickets at the RMB Chinese price, or FEC for the foreign price without it. The elimination of FEC as currency in January 1994 has meant that now it is only price differentials, and not access to convertible currency that rations air travel.

59 See for example the articles on the 300,000 officials in Anhui charged with corrupt activities. This represents one in five of all officials in the province. (Wong, J., 1994a: A10). There are also accounts of embezzlement (Beijing Review, 1993, 36(43): 6) and the involvement of officials in drug trafficking in Yunnan (Wong, 1992a: A1 and A6; 1992b, A6; 1992c: A6), and numerous accounts of the government's campaign against corruption in the Chinese and western press (Beijing Review, 1993, 36(41): 5-6 and 36(45): 5-6).

60 For evidence on the opinions of peasants in Anhui and Yunnan on corruption and the dictatorial nature of local officials as a result of the increase in the power of local officials, see Wong, 1994a: A1 and A7, and Wong, 1994b: A1 and A8.

grain reserves (Hinton, 1990: 24), have now disappeared. Rural residents in Anhui and Yunnan were emphatic that the new found economic and individual freedoms that have resulted from the reform process would not be relinquished lightly, although the return of a social welfare state is eagerly awaited, and urgently needed for individuals living in poverty. The costs in terms of corrupt officials appear to be high in some areas, where rebellion is threatened if there is no improvement in the situation, and the party structure appears to reinforce the situation (as in Yang village, Bengbu - Wong, 1994a and 1994b). This suggests that on balance there has been an improvement in functioning resulting from the freedom of self-determination, but which has been diminished by a reduced sense of personal security and in some locations severely limited by the despotic powers of corrupt officials.

4. Conclusion:

This chapter outlined the debate in the literature concerned with living standards in post-Mao China. The debate is on-going, with no consensus on the trend in living standards, although those on both sides of the debate employed an analysis of functioning in measuring the standard of living in the Chinese context.[61] The discussion then turned to theoretical developments and issues in the measurement of living standards. With the capability approach being favoured over more traditional per capita income or output measures due to both the problems associated with those measures themselves, and the assumptions that accompany utilitarianism and social welfare analysis.

Finally the discussion focused on defining, and measuring, the trends in functioning in rural Anhui and Yunnan during the 1980s. Functioning was measured by indicators in five broad categories. First, functioning as

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61 Despite the use of some measures of achieved functioning in terms of mortality and cultural freedoms by Nolan and Sender (1992), this was more a function of trying to beat Sen at his own game than a fervent belief by those authors in the value of such an analysis. Nolan in particular has stated that it is material well-being and trends in absolute poverty that are of primary importance (cf. Cambridge seminars, 1989-90).

measured by composite output indicators, per capita living space, the ownership of consumer durables, and the composition of expenditure. The second and third categories measured longevity and mortality, and medical care, while the fourth was functioning as educational attainment, and the fifth, examined cultural and personal freedoms. For all categories of indicators, two trends were apparent. First, absolute living standards in Anhui and Yunnan have improved significantly since the founding of the People's Republic. For some indicators, such as NVAIO, the rate of increase in living standards was more rapid during the Dengist era than during the Maoist period, although it could be argued that the increase in the growth rate was based on the foundation of higher rates of investment in capital formation and infrastructure during the Maoist period, and would have been impossible without it.[62] The second trend was declining living standards relative to the national average. Both Yunnan and Anhui continued to be materially disadvantaged by Chinese and global standards.

Functioning as measured by the death rate and life expectancy worsened in China over the intercensal period, although the increases and declines, respectively, were small. However, when contrasted with the strong improvements in mortality and longevity for 1974-81 in the country, this reversal is very important. The mortality data for Anhui followed the national trend, and the increases here were much larger. The CDR in rural Anhui virtually doubled over the intercensal period to exceed the 1974 rate in 1990. The mortality rate for Yunnan continued to decline in the post-Mao period, but mortality remained high in Yunnan compared to the national average, and was largely a function of the relative poverty of the province.

There are two explanations for the increase in mortality in China, and

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62 See Bramall (1993: 271-95) for a discussion of the relative impact of price reform and institutional reform on agricultural output and economic growth in rural China, 1978-90.

Anhui, both of which also help to explain the continued decline in mortality in Yunnan. First, increases in infant and child morality were responsible for the increase in mortality in Anhui, age specific mortality rates being stagnant or decreasing for all other age groups (AHTJNJ, 1992: 35). Two factors are likely to have contributed to such an increase, first the introduction, and stringent application, of the one-child policy. Banister provides evidence on particularly high infant mortality in Anhui in conjunction with the one-child policy (1987: 221), however, in minority and border regions, the policy was much less stringently enforced, which applies to much of Yunnan. Therefore, one of the causes of increased mortality in Anhui was much less important in Yunnan, and contributed to the continued decline in mortality in that province. Second, the privatisation of health care provision had two effects which had an impact on infant and child mortality in particular, and on mortality more generally. The first effect is the limiting of access to medical care due to the expense and the need to make payment before treatment commences. The second effect is that there has been a shift from preventative medicine, which has been particularly successful at eradicating infectious diseases to which the young are most vulnerable, to curative medicine, which is a private good, and a much more expensive way of trying to achieve the same ends. Here again, the impact of health care privatisation was much larger in Anhui than in Yunnan, as there is evidence that suggests that the coverage of collective health services was much less extensive in rural Yunnan than in rural Anhui, partially explaining the different trends in mortality in the two provinces over the intercensal period. As a result the factors that might contribute to increased mortality were strongly evident in Anhui, where mortality rose rapidly from 1981 to 1990, and of only limited importance in Yunnan, where mortality continued to decline - particularly in remoter rural regions - , but remained high relative

to the national average. Therefore living standards fell dramatically in Anhui in absolute terms during the 1980s, while relative living standards improved somewhat, but remained low, in Yunnan.

In general, the remaining measures of functioning displayed a mixture of rising trends or stagnation in absolute living standards, and declining living standards relative to the national average. This was certainly the case for both health care provision and educational attainment, although the problems of changes in access to educational and health care services, and the quality of these services, during the Dengist period make the interpretation of such data difficult. Finally, greater economic freedom and self-determination has been accompanied by increased corruption and little improvement in political and civil liberties, while the net trend for these factors is not transparent and measurement extremely difficult. As with the chapter on poverty, and as will be demonstrated in the chapters on spatial inequality and economic growth, there is little evidence of great benefit accruing to the rural populations of Anhui and Yunnan from rapid economic growth. The trends demonstrated here showed increased differentials at the interprovincial level, and this is followed by evidence of increased spatial inequality within Anhui and Yunnan as well.

Table 3.13Y - per capita Expenditure, Rural Yunnan
(3 year moving averages, in Yuan at 1980 constant prices)

Expenditure	1978-80	1983-85	1988-90	% Growth 1978-90
Total Annual	120.6	231.8	273.0	8.5%
Consumer Goods	117.8	227.7	260.4	8.3%
Food	87.0	148.8	167.6	6.8%
Clothing	11.8	23.5	21.1	6.0%
Housing	4.6	21.9	33.0	21.7%
Fuel and Other	14.5	33.5	38.8	10.4%

Sources: YNSSN, 1990: 309; YNTJNJ, 1990: 611; ZGTJNJ, 1981-91: passim.

Table 3.13A - per capita Expenditure, Rural Anhui
(3 year moving averages, in Yuan at 1980 constant prices)

Expenditure	1978-80	1983-85	1988-90	% Growth 1978-90
Total Annual	140.6	254.3	273.3	6.9%
Consumer Goods	136.5	247.2	256.6	6.5%
Food	91.3	150.4	150.5	5.1%
Clothing	15.3	25.2	21.2	3.3%
Housing	11.1	30.3	41.8	14.2%
Fuel and Other	18.8	41.4	43.2	8.7%

Sources: AHSQ vol.1, 1985: 736; AHJJNJ, 1985: 184; ZGTJNJ, 1981-91: passim.

Table 3.13C - per capita Expenditure, Rural China
(3 year moving averages, in Yuan at 1980 constant prices)

Expenditure	1978-80	1983-85	1988-90	% Growth 1978-90
Total Annual	141.9	259.6	357.6	9.7%
Consumer Goods	138.0	253.1	334.0	9.2%
Food	91.1	152.2	193.5	7.8%
Clothing	18.0	27.0	30.2	5.3%
Housing	8.2	30.6	50.3	19.8%
Fuel and Other	20.7	43.2	60.1	11.2%

Sources: ZGTJNJ, 1981-91: passim.

Appendix 3.1

Definitions Associated with Capability and Functioning

1. Agency Achievement: "A person's agency achievement refers to the realization of goals and values she has reason to pursue, whether or not they are connected with her own well-being." (Sen, 1992: 56) "If, for example, a person fights successfully for a cause, making great personal sacrifice (even perhaps giving his or her life for it), then this may be a big agency achievement without being a corresponding achievement of personal well-being." (Sen, 1987: 28).

2. Well-being: Well-being represents the addition of external influences such as feelings and sympathies or antipathies to the standard of living. If, for example, someone holds a grudge against a second person, then this sentiment has a negative impact on the person's well-being, but does not affect their living standard. "The well-being of a person can be seen in terms of the quality (the 'well-ness', as it were) of the person's being. ... The claim is that functionings are *constitutive* of a person's being, and an evaluation of well-being has to take the form of an assessment of these constituent elements." (Sen, 1992: 39)

3. Standard of Living: An evaluation of either the life that an individual may live (*ex ante* evaluation of capability), or the life that they choose to live (*ex post* evaluation of functioning). The analysis of living standards is fraught with different interpretations, some of which are competing, such as utility versus opulence, and some of which are pluralistic, such as commodity-based versus physical life quality in examining achieved functioning.

4. Capability: Capability can be seen as either an object of value, or as a method of valuation. Regardless of its function, capability includes aspects of pleasure, desire fulfilment and choice. It represents the set of entitlements and characteristics belonging to an individual, which dictate the parameters for the types of life that the person might choose to live.

5. Entitlement: This is the commodity-space manifestation of capability, and reflects the range of an individual's command over commodity bundles made up of goods and services.

6. Functioning: The actual achieved (*ex post*) existence that an individual has chosen to live, including: feasting or fasting, level of educational attainment, etc., choosing to limit life expectancy by smoking. The level of functioning is determined by the extent of an individual's capability set, and may or may not fulfil basic needs.

It is possible to portray the capability set as containing a number

of discrete vectors of possible functioning, for example: a_i, b_i, ..., z_i, where individual *i* chooses one element of this set, say x_i, as her functioning. This, if conceptually useful, is too simplistic a representation of capability, as each individual has a *range* of capability over each means of defining capability, and assembles a functioning by choosing a level of capability based on a variety of factors, and these are often interrelated factors, so that there are trade-offs. For example, there is the trade-off between the quantity of life expectancy foregone because one chooses to smoke two packs of cigarettes per day, compared to smoking four cigarettes per day, or none at all, and again associated with the strength of the brand, and whether or not they are filtered, etc.

Appendix A3.2

The Change in Definition of GVAO and GVIO in 1984

According to the definitions in the 1988 Statistical Yearbook for China, there was a significant change in the definitions of GVAO and GVIO in 1984. The change can be summarized as follows: "Starting in 1984, industrial output value from village and sub-village level run enterprises was included in industrial output value, not agricultural output value as it had been before 1984." (ZGTJNJ, 1988: 296.) The result is that the majority of the provincial and national level statistics have been released as a consistent series, based on the new definition, but much of the county level data remain split series. This appendix endeavours to provide a measure of the impact of this change.

Its general impact is to make the growth rates for agricultural output smaller than they are for a consistent series, and those for industry seem artificially large. For example: In Anhui in 1984, the new definition value of GVAO in 1980 constant *yuan* was 13607 million, while the GVAO value for 1984 was 15457 million *yuan* based on the old definition, a difference of 2396 million *yuan* or 15.5% (all figures at 1980 constant prices). The difference for GVAO in Yunnan is less pronounced, with the new definition yielding a GVAO equal to 7450 million *yuan* in 1984, 601 million *yuan* less than the old definition value of 8051 million *yuan*, equal to 7.5%. (ZGTJNJ 1985, 1985, p.242-3.) This results in the growth rate in GVAO for Anhui being underestimated by 2.7%, and the GVIO overestimated by 3% as per table A3.2.1. The growth rates for Yunnan are also provided below.

Table A3.2.1
Effects of definition change on growth rates from 1984-89

Data Type	Units	Anhui	Yunnan

Old GVAO '84	Bill. Yuan	15.5	8.0		
New GVAO '84	Bill. Yuan	13.6		7.5	
New GVAO '89	Bill. Yuan	16.7		9.0	
New % GR	an. 1984-89	4.2		3.9	
Old % GR	an. 1984-89	1.5		2.3	
New-Old	%CGR an.84-89		2.7		1.6
Old GVIO '84	Bill. Yuan	18.0		10.3	
New GVIO '84	Bill. Yuan	20.4		10.9	
New GVIO '89	Bill. Yuan	43.9		18.8	
New % GR	an. 1984-89	16.6		11.6	
Old % GR	an. 1984-89	19.6		12.9	
New-Old	%CGR an.84-89		-3.0		-1.3

Sources: ZGTJNJ 1985, 1985, pp.242-3; LSTJZLHB, 1990, p.414, 757.

The problem is particularly severe for counties with a dynamic rural industrial sector. Where this is the case, an inspection of the GVAO and GVIO data around 1984 usually makes it obvious, and a note to that effect can be made regarding the data for those counties. As the data on the rural industrial sector (which is not the same as sideline production) are not available for all counties, there is little that can be done to correct this shortcoming, except to note the fact, and to provide growth rates for the period from 1978 to 1989 divided into two groups, 1978-83 and 1984-89. This problem with the data is not as severe as it may at first seem, because the change in definition does not affect the industrial and agricultural data when aggregated into a single indicator, which provides a consistent series. Per capita NVIAO is one of the more important output measures employed in this thesis.

Chapter 4

The Standard of Living Index

1. Introduction

This chapter introduces the county level analysis, which is the focus of the remainder of the dissertation. The second section sets out the theoretical and methodological basis for the human development-type index which is employed in this chapter. The index was based on measures of income, longevity and literacy for both provinces from the 1982 and 1990 censuses. This serves as an introduction to the trends in spatial inequality and differential economic growth rates in Anhui and Yunnan in chapters five through seven. The third section sets out the findings from the analysis of the standard of living index, the spatial patterns, and factors underlying the changes in living standards during the 1980s. The fourth section is the conclusion, providing a synthesis and a summary of the results.

2. Standard of Living Index

A standard of living index (SLI) has been calculated for both Anhui and Yunnan based on a variety of measures. This work was inspired by the Human Development Index produced by the UNDP and also more directly by the work of Aschmoneit (1990 & unpublished), who created a similar index for all the counties and cities of China based on the 1982 census data. In assembling such an index, it was deemed necessary to include factors which provided information on income, or commodity-space functioning, in addition to indicators of longevity and health care, and measures which reflect cultural factors such as educational attainment and personal freedoms and security. All of the indicators included in the analysis in chapter three

were initially considered for inclusion in the index.

This index shares its general format with virtually all other indices of this type. Achmoneit's (1990, and unpublished) index measured various indicators in the three broad categories outlined above. The UNDP (1990) makes use of per capita GNP, life expectancy at birth and adult literacy in its index, and these three elements were common to Dasgupta's index (1993b), which also included infant mortality (which is double counted in his index) and political and civil rights in his cross national comparison of living standards. The one index that did not conform to this general pattern was Morris's (1979) Physical Quality of Life Index (PQLI), which examined adult literacy, life expectancy at age one, and infant mortality. Morris made a compelling case for his index, both in terms of methodology and composition. For example, this is the only such index that can account for inter-temporal changes in the absolute values of the indicators. This is because the index is based on scales determined by absolute maxima and minima values for the indicators, and not on the means. These maxima and minima are established not relative to the range of the indicators as they exist, but based on fixed standards, such as 0% literacy to 100% literacy, or 40 to 80 years life expectancy, which therefore means that the index is also independent of social norms as well. The only drawback with Morris's approach is that it is not easily adapted to include a measure of per capita income or output. This is the product of two factors. First there would be the difficulty of setting the maximum and minimum values for per capita GNP (or its proxies), a scale ranging from zero to infinity is hardly useful. Second, once the maximum and minimum values had been set, some careful scaling would be needed, regarding the different levels of per capita income, both due to the nature of the relationship between improved life quality and increased incomes which is not linear, and also due to the

very large implicit weight that it would take in determining the initial placement of the country (or individual) in the index, and the limited scope for movement up the index as a result of income growth, because one point on the index scale equals a vastly larger amount of income than of life expectancy or literacy, for example. For this reason, the methodology outlined below follows the UNDP and Aschmoneit methodologies more closely than Morris's.

a. Methodology

The index is comprised of three indicators: first, per capita NVAIO in *yuan* at 1980 constant prices for averaged end points - 1981-3 and 1988-90, as a proxy for income and consumption; second, the crude death rate per thousand population for 1981 and 1990 from the population censuses, as a measure of longevity; and finally, the proportion of the population 15 and over that is illiterate or only semi-literate as of July 1, 1982 and 1990, as a measure of educational attainment. It is not possible to aggregate values of each of these indicators to create an index because of the different units. Accordingly what is measured, and combined, is the deviation from the weighted mean for the province on each indicator for each county to create unit-free elements for the index.[1] To calculate the weighted mean, for example, the death rate for each county is multiplied by that county's population. These weighted values for each county are then aggregated to yield a provincial total and subsequently divided by the population of the province to yield a mean value weighted by population. The initial, unweighted value for the death rate for each county then has the provincial weighted mean subtracted, to yield the deviation from the

[1] The deviations from the weighted mean was the preferred methodology, because the UNDP methodology was based on deviations based on maximum and minimum values which was very sensitive to outliers. This was important, because the distribution for most indicators included in this index for rural China looked like long-tailed chi-squared distributions.

mean. The same procedure is followed for each of the three indicators in the index. The three are then combined to form the index itself.[2]

In combining the factors, attention must be paid to the meaning of positive and negative deviations. For example, with per capita NVAIO, if the deviation from the mean has a positive value, this means a higher than average level of output, which would be expected to contribute positively to the standard of living of individuals in the county; while for the crude death rate, a positive deviation means that the value for an individual county is above the weighted provincial average, which would have a negative impact on the standard of living in that county. As a result, per capita NVAIO had a positive weight in the index, while the death rate and the incidence of illiteracy would both had negative weights.

The next step was to decide what weights to give each of the indicators within the index. The weights for such as index are going to be arbitrary. Therefore it is best to keep the weighting system as simple and transparent as possible. An equal weight was assigned to each element of the composite index because there is no reason to treat any indicator as more important than another. Equal weights were also used by Morris (1979), Dasgupta (1993b) and the UNDP (1990). Equal weights were aptly justified by Morris "... the results measured by the PQLI are the summation of complex social interrelationships for which there is as yet no theoretical explanation the imposes (or even suggests) any other set of weights" (1979: 47). Little has changed in the fifteen years since Morris made this assertion, and therefore, equal weights remain most appropriate to the SLI presented here. Equal weights were also necessary to facilitate the decomposition analysis of the leading contributors to changes in the

[2] Dasgupta (1993b) used Borda ranking in his index, ranking each country for each indicator, and then aggregating the rankings across indicators for form a composite index for countries. As this methodology did not eliminate the difficulty with inter-temporal comparisons, it was not employed in producing the index presented here.

SLI presented below. To avoid having to produce an index to more than four decimal places, the deviations for each of the indicators has been multiplied by a factor of two, yielding an index with the following computational form:

SLI= 2(dev. pc NVAIO) - 2(dev. CDR) - 2(dev. % ILLITERACY).

Where 'dev. pc NVAIO' was the deviation from the weighted mean for per capita NVAIO, 'dev. CDR' was the deviation from the weighted mean for the crude death rate, and 'dev. % ILLITERACY' was the deviation from the weighted mean for the percentage of the population that was illiterate or semi-literate.

Care needs to be taken when examining changes in the SLI over time. The index is based on variations about the mean, and therefore ignores time trends in the mean values themselves. As a result, the index is at best a reflection of changing patterns in relative living standards, and cannot be interpreted as an indication of trends in absolute living standards over time. To provide a sense of the time trends in absolute living standards, the means, standards deviations and coefficients of variation for each component of the index are presented below alongside the analysis of SLI values during the 1980s. These problems are not solved by the UNDP or Dasgupta methodologies for creating composite indices, instead they remain equally large.

b. The Literature

Remaking Peasant China(1990) contained an appendix and wall chart showing a life-quality index produced by W. Aschmoneit and J. Kuchler based on the 1982 census data from the Population Atlas of China (Oxford: Oxford University Press, 1987). The index was a weighted summation of deviations about weighted mean values for a variety of indicators. The indicators

used and their weights were:

p.c.GVAIO (+)(2)
employment in industry (+)(1)
employment rate by total population (+)(1)
rate of illiteracy/half-literacy (-)(2)
middle school graduates (+)(1)
university graduates (+)(1)
child mortality rate (-)(2)
death rate (-)(1)

Anhui, although below the China average, was in a favourable position. Almost 60% of Anhui's counties were in the -2 to -4 category, with a further 18% in the -4 to -6 category, together they accounted for more than 75% of all counties in Anhui. This reflected the relatively equitable income distribution in Anhui, with Gini coefficients that were significantly lower than those for China as a whole. Anhui had no counties with index values below -8, and all but two of Anhui's cities fell into the 4 or higher categories. This showed graphically the split in living standards between rural and urban Anhui. The two remaining cities were in the -2 to -4 range, and accurately reflected living standards in these areas.

Table 4.1 - Life-Quality Index 1982

Index Range	#Counties China	%Counties China	#Counties Anhui	%Counties Anhui	#Counties Yunnan	%Counties Yunnan
>12	85	3.6	3	3.7	1	0.8
6-12	112	4.7	6	7.3	1	0.8
4-6	53	2.2	3	3.7	1	0.8
2-4	64	2.7	0	0.0	2	1.5
0-2	253	10.6	2	2.4	1	0.8
0--2	542	22.7	3	3.7	5	3.8
-2--4	625	26.2	47	57.3	12	9.2
-4--6	261	10.9	15	18.3	29	22.3
-6--8	150	6.3	3	3.7	34	26.2
-8--12	130	6.3	0	0.0	38	29.2
-12--16	92	3.9	0	0.0	6	4.6
<-16	11	0.5	0	0.0	0	0.0
Total	2387	100.0	82	3.4	130	5.4

Source: W.Aschmoneit, 1990: 204-210 and map.

Yunnan, by contrast, had only one county and five cities in the

categories above zero. The one county was Anning, an industrial "suburb" of Kunming, examined in chapter six. It had an abundance of heavy industry and natural resources processing facilities. Almost 50% of Yunnan counties were in the -6 to -12 range, although there were very few counties in the -12 to -16 range, and none below -16. This distribution represented a lower quality of life in Yunnan than the national average, and lower also than that in Anhui. 49% of all Chinese counties and cities were in the 0 to -4 groupings. 70% of all Chinese cities and counties were in the 2 to -6 range, showing a low, but relatively compact grouping of counties. That the majority of Chinese cities and counties were below zero - the mean value for the index - indicates that despite taking averages weighted by population, there were enough very wealthy cities and counties in China to ensure that the mean value of the index was significantly higher than the median value. The dispersion in the index above zero was also much greater than that below zero. The range of values was from 86.353 to -21.905.

There are several grounds on which to criticise the Aschmoneit Life Quality Index (LQI), factors which limit its comparability with the SLI presented here. First, the index was used to target poverty areas in rural China for three European NGOs. However, the index included urban areas, producing a strong upward bias in the index, which distorted the true distribution of rural areas based on these criteria. The SLI presented as part of this dissertation examines rural areas only, defined as those areas with less than 30% urban and industrial workers based on the 1982 census. The SLI is calculated for Anhui and Yunnan, based on weighted means for each province separately. As a result, the SLI values for Anhui and Yunnan for 1982 are not directly comparable with those from Aschmoneit, which are based on a national mean. The inclusion of urban areas in the LQI for 1982 meant that Aschmoneit's data highlighted the urban-rural gap in living

standards, while data from the SLI for 1982 and 1990, concentrate on intra-rural differentials in living standards.

Several factors included in the Aschmoneit index were altered for use in, or excluded from, the SLI presented here, because these indicators were suitable only for inclusion in an index based on data for a single year, and would introduce distortions into a time series analysis. First, Aschmoneit used real per capita GVAIO (at 1980 constant prices) in his measures of material well-being. In this study real per capita NVAIO is employed instead, to eliminate the distortions that would result from the high inflation in the late 1980s, and also to eliminate the distortions from the growth of the value of inputs, as opposed to value-added growth. NVAIO would have been preferable to GVAIO in the Aschmoneit index, as there are large spatial variations in agricultural and industrial output composition, and in the balance between agriculture and industry in GVAIO. This is important because the ratio between value-added and inputs is much lower for industry than it is for agriculture. Thus the use of GVAIO instead of NVAIO produces a bias in favour of urban areas where industry dominates agriculture, and heavy industry has a larger share than light industry, the former having a higher value-added inputs ratio. The indicator on industrial employment also produces an urban bias in the Achmoneit index.

Second, the number of middle school and university graduates would also distort a time series analysis, due to the aging of the Chinese population. To eliminate the demographic effects, enrolment rates and drop out rates are needed to measure of educational provision and attainment. However, as is discussed in chapter three, in the absence of age specific population data at a county level, it is impossible to estimate enrolment rates at the county level. To avoid the distortions resulting from

population aging, middle school and university graduates are eliminated from the SLI in this dissertation, while the incidence of illiteracy and semi-literacy is retained.

Finally, the weighting factors in the Aschmoneit index under-represent mortality, with a three weight compared to a four weight for the measures of output and employment, and educational attainment. As longevity has to be one of the most fundamental measure of living standards, this under-weighting of mortality is another short-coming of Aschmoneit's index. In this context, a strong argument could be made for assigning a -2 weight to both child mortality and the crude death rate, to achieve a balance between the three groups of measures. The SLI presented in this chapter assigns equal weights to the three categories of indicators.

Despite the differences between Aschmoneit's LQI and the SLI presented here, there are no large disparities in the pattern of SLI values in Anhui and Yunnan in 1982 and those produced by Aschmoneit. The poorest counties in both cases correspond closely, as do the most highest ranking non-urban areas from Achmoneit's analysis, and those with high values in the SLI.

3. Findings from the Standard of Living Index

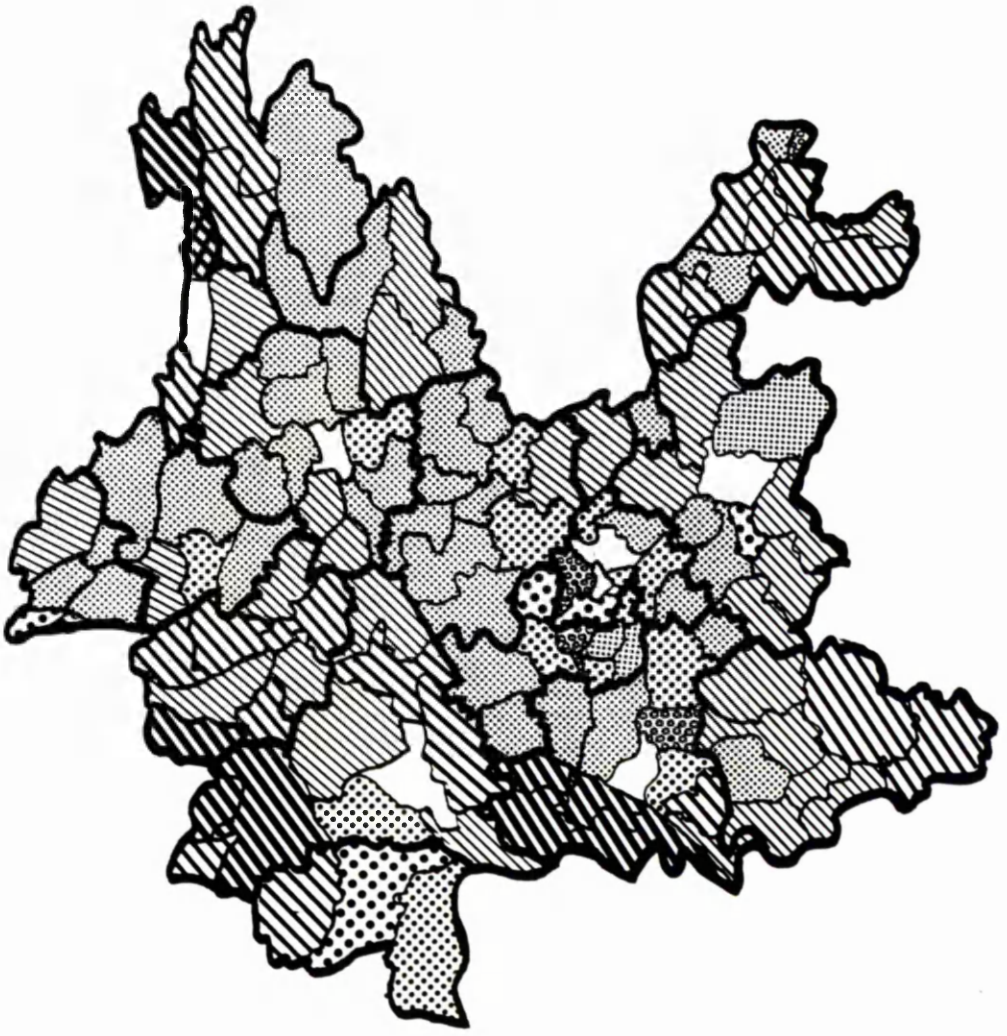
a. Living Standards in Yunnan

This analysis first considers spatial patterns in the standard of living index in 1982 and 1990. It then considers the dynamic changes in living standards over the intercensal period, and examines the factors responsible for these changes. The first two maps show the standard of living in Yunnan in 1982 and 1990 respectively. The maps show that in both

1982 and 1990, counties were grouped around the mean, with more than half the counties just above or just below zero. In 1982, virtually 30% of counties were in the second categories above and below zero, by 1990 this had fallen to just under a quarter of all counties. Spatial dispersion in the standard of living index increased significantly between 1982 and 1990, with the coefficient of variation increasing from 19.7 in 1982 to 58.9 in 1990. This was due to both an increase in the standard deviation, and a decrease in the mean value of the index over the intercensal period. A shift in counties from the two categories immediately above and below zero to the 2.001 - 4.0 categories during the 1980s is primarily responsible for increased spatial inequality, so that by 1990 the share of counties in this category increase to 17% from 12% in 1982. 4% of counties are in the categories with the most extreme values of the SLI throughout the 1980s.

As will be shown in the analysis on spatial inequality and the causes of differential growth rates in chapters five through seven, the spatial pattern of living standards in Yunnan largely divided along core-periphery lines. The highest living standards occurred in the Kunming-Yuxi growth pole area. There is a secondary growth pole around Gejiu city in Honghe prefecture, and Kaiyuan, Mengzi and Hekou all belonged to this group. Hekou additionally benefitted from tropical fruit production and trade with Vietnam, as is the case with Jinghong and Mengla, through fruit and rubber production, tourism, and trade with Burma and Laos, while both legitimate trade, and that in narcotics, influences living standards in Ruili and Wanding as a result of the Burma road. Shuifu is a particular exception, with a high living standard achieved through the strategic investment in heavy industry, with its industrially dominated labour force being advantaged both in terms of wages and benefits such as access to medical care, quality housing and educational provision for their children. The

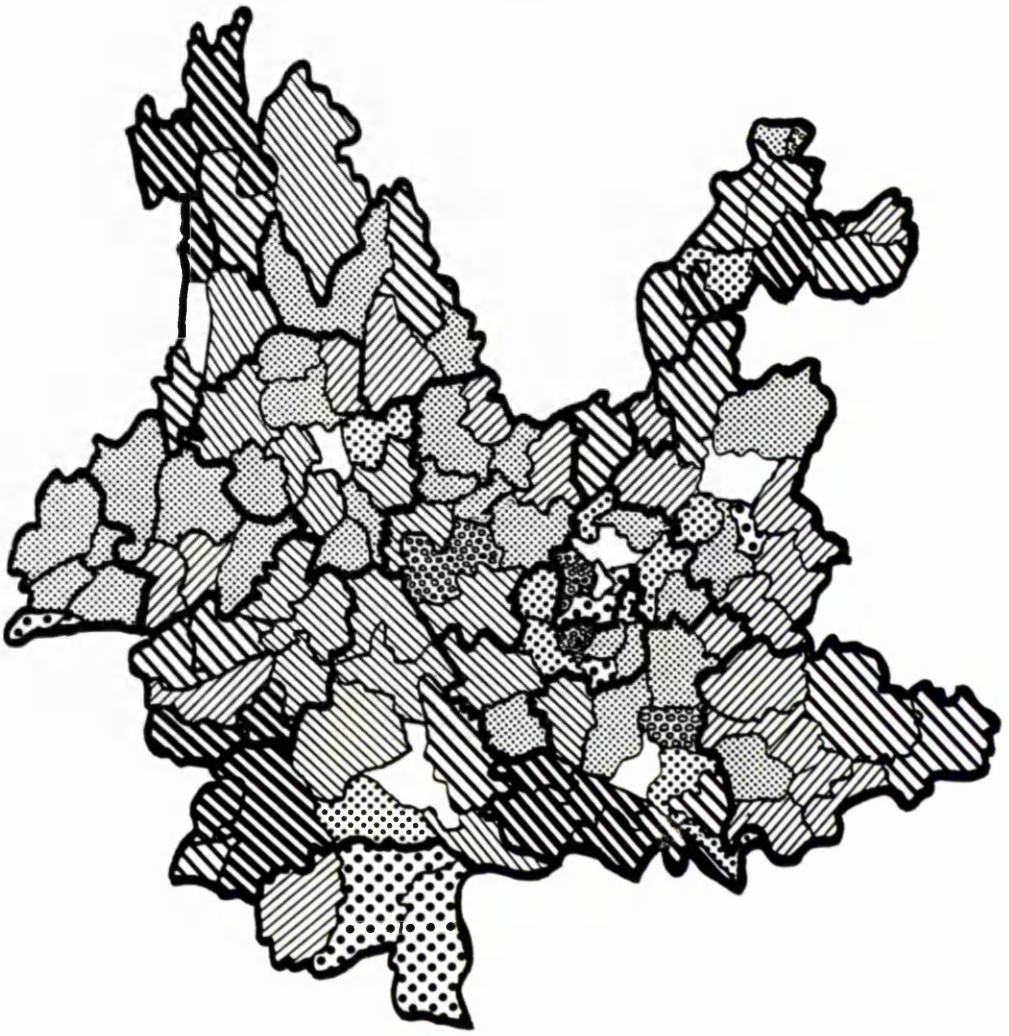
Yunnan: Standard of Living Index 1982



Legend

Above Average		Below Average
	0 - 1.0	
	1.001 - 2.0	
	2.001 - 4.0	
	4.001+	
	Omitted Areas	

Yunnan: Standard of Living Index 1990



Legend

Above Average		Below Average
	0 - 1.0	
	1.001 - 2.0	
	2.001 - 4.0	
	4.001+	
	Omitted Areas	

final exceptions to the core-periphery rule are certain prefectural capitals, Qujing, Zhaotong and Chuxiong being the most important elements of this subset. These exceptions apart, the remaining counties tend to have lower living standards the greater the distance from the Kunming-Yuxi area. The north-west and north-east corners of Yunnan, along with the southeastern tip, and the south and western parts of the province all have the lowest living standards throughout the 1980s. The downward mobility that is apparent during the 1980s leads to a further divergence in living standards, with increases centred on those counties adjacent to, or comprising, the growth areas, and the periphery becoming more uniformly between one and three steps below zero.

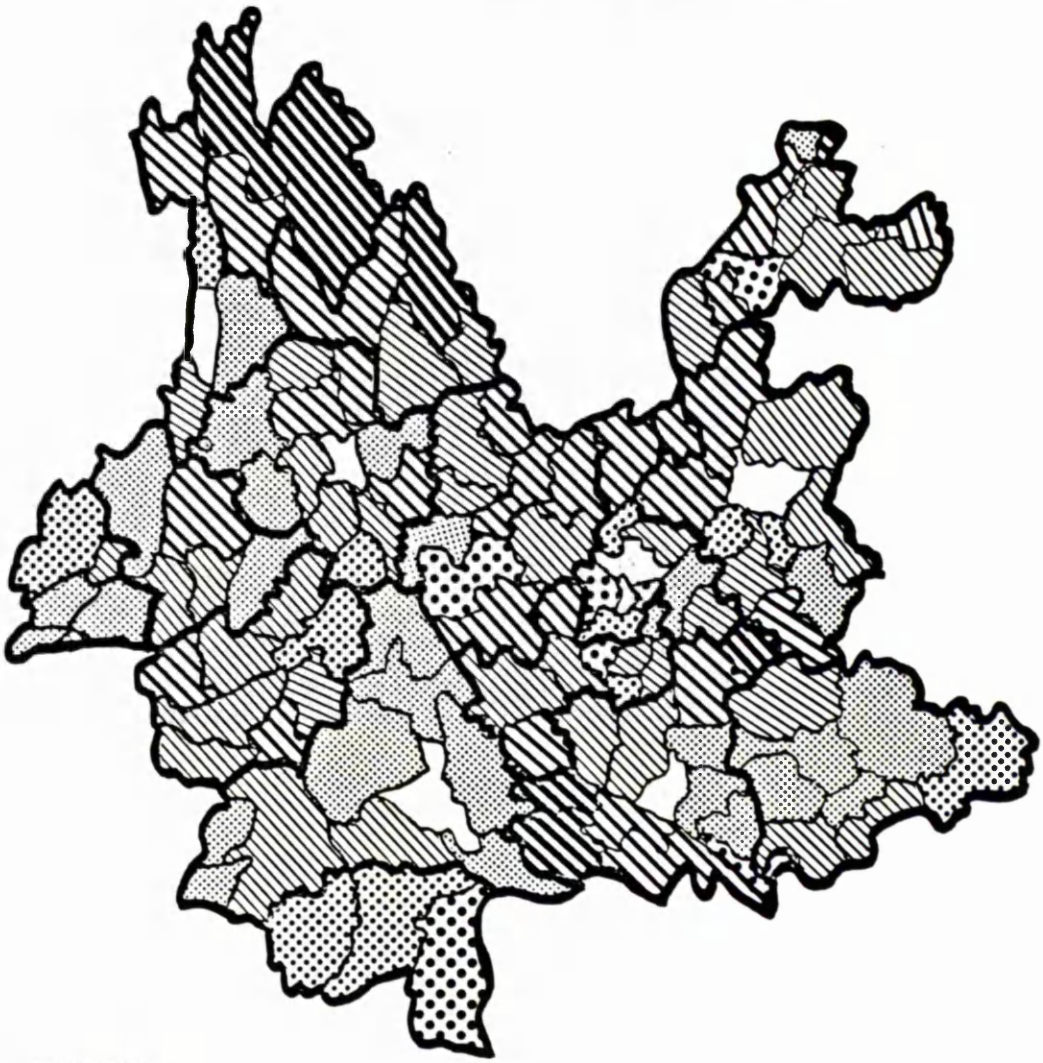
This, however, says little about the dynamics of living standards during the 1980s. For the most part there is little movement between categories by counties, with 86 of 121 counties in the same category in both 1982 and 1990. Of those counties which did experience a change, 20 moved down one or more categories, while 15 moved upwards. This means that while in 1982 51% of counties are in the categories above the mean, only 45% are above zero in 1990, and the remaining 55% are below the mean. As a result, living standards fell or stagnated in the vast majority of counties in Yunnan, and only two counties, Chuxiong and Hekou, experienced large increases in living standards between 1982 and 1990, from 0.921 to 4.264, and from -0.463 to 1.046 respectively, which was equivalent to moving up three and two categories respectively. This 'social mobility' type analysis, based on movement between categories, is misleading because of the width of the bands relative to the size of changes in the SLI. This means that a county like Shuifu could remain in the top band, with a very high living standards, despite a drop in its index value from 9.08 in 1982 to 6.05 in 1990. As a result, the main analysis on the dynamics of living

standards turns to magnitudes and direction of change in the index, and the factors that produced these changes.

The third map on living standards in Yunnan shows the magnitude and direction of change in living standards during the 1980s. Again the Kunming-Yuxi growth pole region, the prefectural capitals, and the trader counties bordering Burma, Laos and Vietnam all have the largest increases in living standards. The exceptions to this rule tend to be counties such as: Funing, Nanjian, Menghai, Yun, Yingjiang, and Fugong where the moderate increase in living standards it the result of declines in illiteracy or the death rate. This in turn is caused by aid from the provincial or central government, or from external agencies such as the U.N. or the Red Cross, for health care or education provision in these poor, minority areas. As a result of this special assistance, these counties have larger increases in living standards than neighbouring counties that are not so favoured.

The counties with moderate to large decreases in living standards over the intercensal period were also spatially concentrated. The northwest - including counties from Deqen, Lijiang, Dali and Nujiang prefectures - and north central Yunnan - including Dongchuan, Luquan and counties from Chuxiong, Qujing and Zhaotong prefectures along the border with Sichuan and the Jinsha Jiang - were all affected. In the south, the area around Luxi and Mile in northeastern Honghe prefecture saw declines in living standards, as did the southwest of Honghe prefecture, including Yunyang, Honghe, Jinping and Luchun counties. Shuangbai and Yimen also had moderate declines in living standards, due to declining NVAIO in the former, and increased mortality in the latter, which ran counter to the trend in the surrounding counties. This is a good illustration of the lack of trickle down between the growth poles and their hinterland, or the dynamic prefectural capitals and their neighbouring counties, and is a

Yunnan: Changes in the SLI 1982-90



LEGEND

Increased SLI		Decreased SLI	
	0.0 - 0.399		0.0 - 0.399
	0.4 - 0.999		0.4 - 0.999
	1.0+		1.0+

function of the composition of NDMP and the topographical and infrastructural constraints in these counties. Differential growth rates is a theme taken up in chapters six and seven.

What are the underlying causes of these changes in living standards? The final three maps for this section show the counties of Yunnan by principal cause of change in living standards. First, a discussion of the trends between 1982 and 1990 in the three components of the SLI is necessary to put the time series analysis of the SLI in context. The mean death rate in Yunnan fell between the two censuses, as did the standard deviation. This led to a decline in the coefficient of variation, resulting in the conclusion that longevity improved considerably over the intercensal period in Yunnan, with a large degree of spatial convergence on the lower mean. The convergence in mortality is a function of large improvements in mortality in peripheral, poor counties, which are responsible for the improved living standards in these regions, or for mitigating the declines in living standards resulting from declining NVAIO or increased illiteracy. Examples of this come from Fugong, Menghai and Funing for mortality led increases in SLI, and Deqen, Weixi and Luoping for counteracting the effects of declining NVAIO and increased illiteracy.

Illiteracy also declined over the intercensal period, with the mean falling from 32.6% to 26.5%, although the standard deviation and the coefficient of variation rose over this period, showing increases in spatial variations. This means that illiteracy in general contributes to higher living standards in Yunnan, but at the same time adds to increased spatial variation, unlike mortality. Illiteracy works in conjunction with mortality, whether increasing or decreasing, and in opposition to NVAIO, in most cases as is reflected in the correlation coefficients presented in table 4.2. This is particularly true for NVAIO and Illiteracy at the

margin.

Finally, average NVAIO increased over the intercensal period, also contributing to improved living standards. However, the standard deviation and the coefficient of variation both increased, reflecting the increase in spatial divergence in the province. This resulted in NVAIO being an important factor in increased living standards in the counties with large increases, but also important in counties with moderate to large decreases in living standards.

Table 4.2 - Correlation Coefficients for the Components of the SLI, Yunnan 1982-90

Indicators	1982	1990	Change 1982-90
NVAIO & CDR	-0.345	-0.405	0.302
NVAIO & Illiteracy	-0.450	-0.426	-0.158
CDR & Illiteracy	0.677	0.646	-0.265
SLI & NVAIO	0.089	0.026	0.780
SLI & CDR	-0.703	-0.657	-0.062
SLI & Illiteracy	-0.733	-0.702	-0.354

Source: derived from data in appendix 4.1

These findings correspond to the correlation coefficients presented in table 4.2 are discussed. First, the correlation coefficients for the three components of the SLI. The very low and insignificant correlation coefficients for the change in one indicator against the change in another for 1982-90 indicate that for the standard of living as a whole, it is usually one factor in conjunction with a second working in opposition to the third factor. For example: increases in living standards result from a decline in mortality and illiteracy despite declining NVAIO, or increased NVAIO and declining illiteracy prevail over increases in mortality, remembering that the increases and decreases are in the change in the deviations and not the change in the absolute values of the indicators. The good to moderate correlation coefficients for illiteracy and mortality indicate that illiteracy works in conjunction with mortality in more

Yunnan: Large to Medium Increases in SLI by Cause 1982-90

LEGEND

C	CDR leading factor in SLI increase
N	NVAIO leading factor in SLI increase
I	Illiteracy leading factor in SLI increase
N+I	NVAIO and Illiteracy joint leading factors
C+I	CDR and Illiteracy joint leading factors
C+N	CDR and NVAIO joint leading factors

Yunnan: Medium to Large Decreases in SLI by Cause 1982-90

LEGEND

C	CDR leading factor in SLI changes
N	NVAIO leading factor in SLI changes
I	Illiteracy leading factor in SLI changes
N+I	NVAIO and Illiteracy joint leading factors
C+I	CDR and Illiteracy joint leading factors
C+N	CDR and NVAIO joint leading factors

counties than with NVAIO in determining levels of living standards in 1982 and 1990.

For all three correlation coefficients for 1982 and 1990, the signs accompanying the coefficients are all as would be expected. By contrast the signs for the changes in NVAIO and CDR, and the changes in CDR and illiteracy are the opposite of that which would be expected. This means that mortality tends to decrease where NVAIO decreases, highlighting the conflict between CDR and NVAIO in determining living standards. This in turn suggests that either the areas with high levels of output already have relatively low levels of mortality in the early 1980s, leaving them little scope for gains in longevity, or that the institutional structures that give rise to high levels of output also lead to increases in mortality, in relative terms, or less rapid rates of decline in mortality. Given the relatively high death rates in the counties with high rates of economic growth in Yunnan compared to the national average, the first explanation seems unfounded. Similarly the trend for the changes in mortality and illiteracy is inverse, not direct, also suggesting that in numerous cases the change in illiteracy and the change in mortality are in opposition.

The lower half of table 4.2 shows correlation coefficients between the SLI and each of the components of the index. The high correlation coefficient for the changes in SLI and NVAIO suggests that NVAIO is the most important factor in determining the change in SLI for 1982-90, while the change in CDR is insignificant, and the change in illiteracy makes only a modest contribution. CDR and illiteracy are both quite strongly related to the SLI values for 1982 and 1990, while the relationship with NVAIO is insignificant. This situation results from the change in NVAIO being an important determinant of changes in the SLI, where they are large, while CDR and illiteracy dominated where they are small, and this is the majority

of counties in Yunnan. As a result we can conclude that where living standards changed significantly over the intercensal period, NVAIO is the leading determinant of these changes, but illiteracy and mortality are more important in determining the actual level of SLI in 1982 and 1990, which was more important where the changes in living standards are small. These findings are corroborated by the data in table 4.3, and the corresponding maps on primary cause of changes in living standards.

In forty-nine of the 121 counties (40%) NVAIO is the most important factor in determining the level of, and change in the SLI between 1982 and 1990.[3] While the CDR is the most important factor in changes in living standards in 26% of counties, and in 17% of counties, illiteracy is deterministic. The remaining counties have combinations of factors that influenced their changes in living standards, due to the failure of any one factor to have primacy.[4] There are very few counties with factors holding joint primacy, and the vast majority of these are in counties where only a small increase or decrease occurred. As the trends here are not very clear due to the small size of the changes, they are omitted from the decomposition analysis. 11% of the counties have NVAIO and illiteracy as the dominant factors, 4% have the change in mortality and output as the most important factors in the change in the SLI, and the remaining 2% have the change in SLI dominated by mortality and illiteracy. In the last two cases, all instances are in counties with small increases or decreases in

[3] This was determined by examining the size of the change in each indicator individually, and comparing across the three indicators. Primacy occurred when the largest factor was greater than the sum of the remaining two factors (regardless of sign). In the vast majority of cases, the largest factor was twice the size of the next largest factor. For example: in Chuxiong the change in SLI was dominated by the change in NVAIO, where NVAIO increased by 1.5, while illiteracy fell by 0.2 and the death rate rose by 0.07 between 1982 and 1990 detracting from the increase in living standards. The contribution of NVAIO was 7.5 times that of illiteracy, the second largest factor, leading to the conclusion that NVAIO was the foremost contributor to the increase in the SLI in Chuxiong over the intercensal period.

[4] In a situation where the rules of primacy outlined above did not hold, then the two largest factors were counted as dominant, as long as together they more than exceeded the third, opposing factor. For example: in Zhenyuan the death rate declined by 0.16 and illiteracy declined by 0.11 between 1982 and 1990, contributing to increased living standards in the county. However, NVAIO also fell over the period by 0.08, meaning that although mortality had the largest single effect, it was not dominant due to being smaller than the sum of the changes in illiteracy and NVAIO. Therefore, CDR and illiteracy were taken as the dominant pair.

living standards, with one exception.

Table 4.3 - Changes in SLI by source, Yunnan 1982-90

Source	Total: # Co.	Total: % Pop.	Mod. - Large Increase # Co.	Mod. - Large Increase % Pop.	Small Incr./Decr. # Co.	Small Incr./Decr. % Pop.	Mod. - Large Decrease # Co.	Mod. - Large Decrease % Pop.
NVAIO	49	43.8%	13	72.2%	17	27.4%	19	62.6%
CDR	31	27.7%	4	20.3%	23	34.2%	4	11.7%
Illit.	21	16.1%	2	7.5%	12	17.4%	7	18.1%
N & I	13	9.0%	0	0.0%	10	13.0%	3	5.7%
C & N	5	2.5%	0	0.0%	4	3.5%	1	1.9%
C & I	2	0.9%	0	0.0%	2	1.3%	0	0.0%
Total	121	100.0%	19	100.0%	68	100.0%	34	100.0%
% Total	100%	100.0%	15.7%	15.8%	56.2%	57.6%	28.1%	26.5%

Source: Derived from data in appendix 4.1.

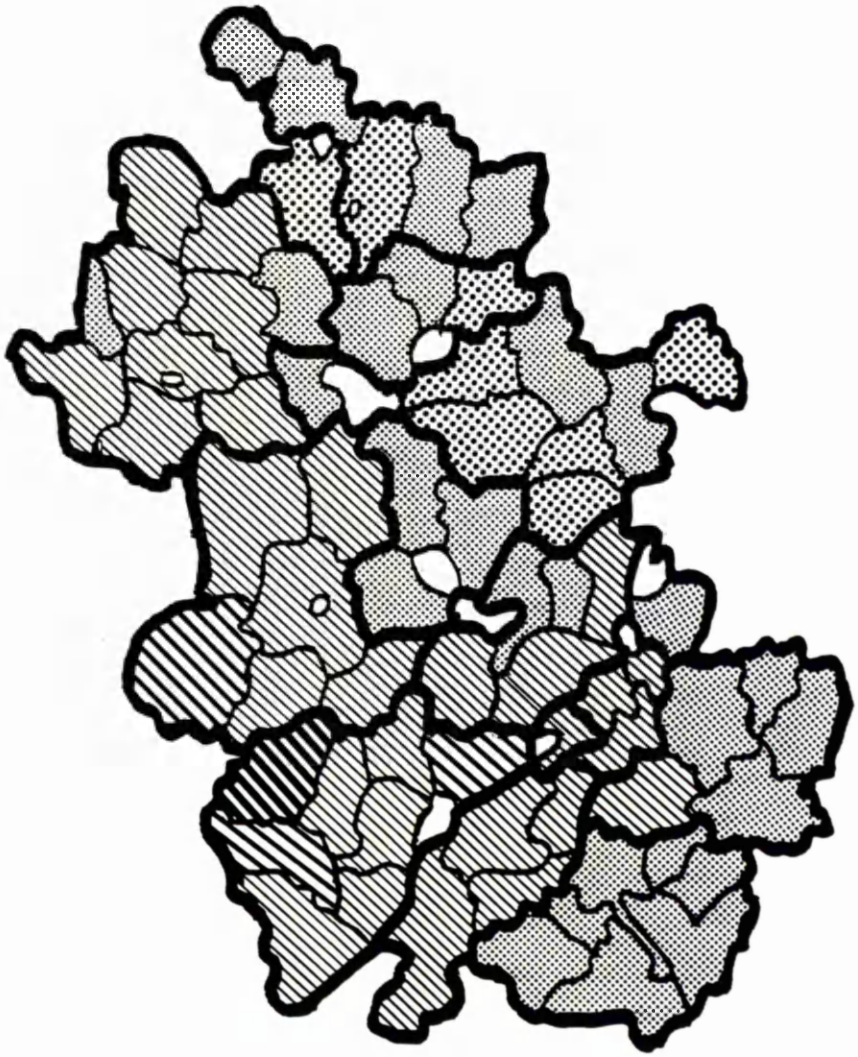
For counties with larger increases in the SLI, NVAIO is the dominant factor in SLI growth over the intercensal period. Similarly NVAIO is the dominant factor in half the counties with moderate growth in the SLI, and accounted for 72% of the population in these counties, or 11% of the Yunnan population. On average, NVAIO and CDR are the cause of changes in living standards in the large population counties, while other causes are prevalent in smaller population counties[5]. Large population counties tended to have only small increases and decreases in living standards, while those with moderate to large increases tended to be average in population size, and those with modest to large decreases in the SLI are low population counties, accurately reflecting the core-periphery distribution of these counties.

b. Living Standards in Anhui

As with the analysis for Yunnan, this analysis commences with an examination of spatial trends in living standards in 1982 and 1990. The first two maps present the distribution of counties by value of the SLI in

[5] Population here stands for absolute population, although there is a close correlation between absolute population size and population density for the counties of Yunnan.

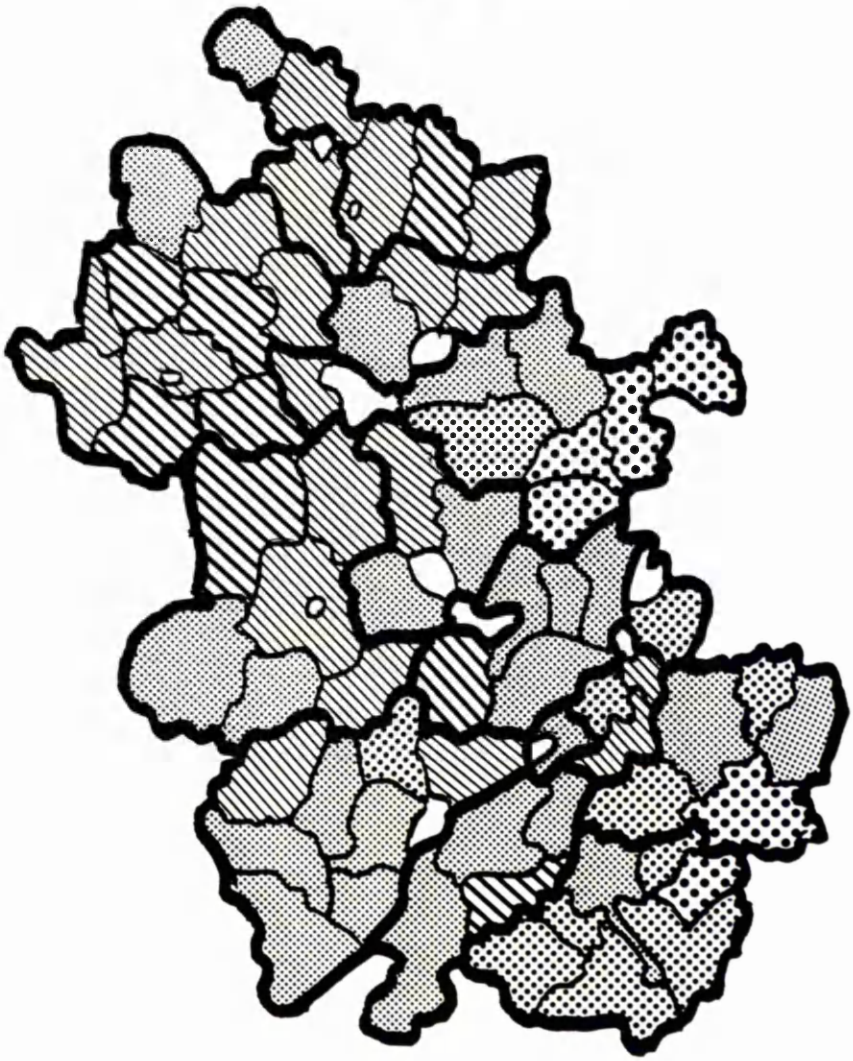
Anhui: Standard of Living Index 1982



Legend

Above Average		Below Average
	0 - 1.0	
	1.001 - 2.0	
	2.001 - 4.0	
	4.001+	
	Omitted Areas	

Anhui: Standard of Living Index 1990

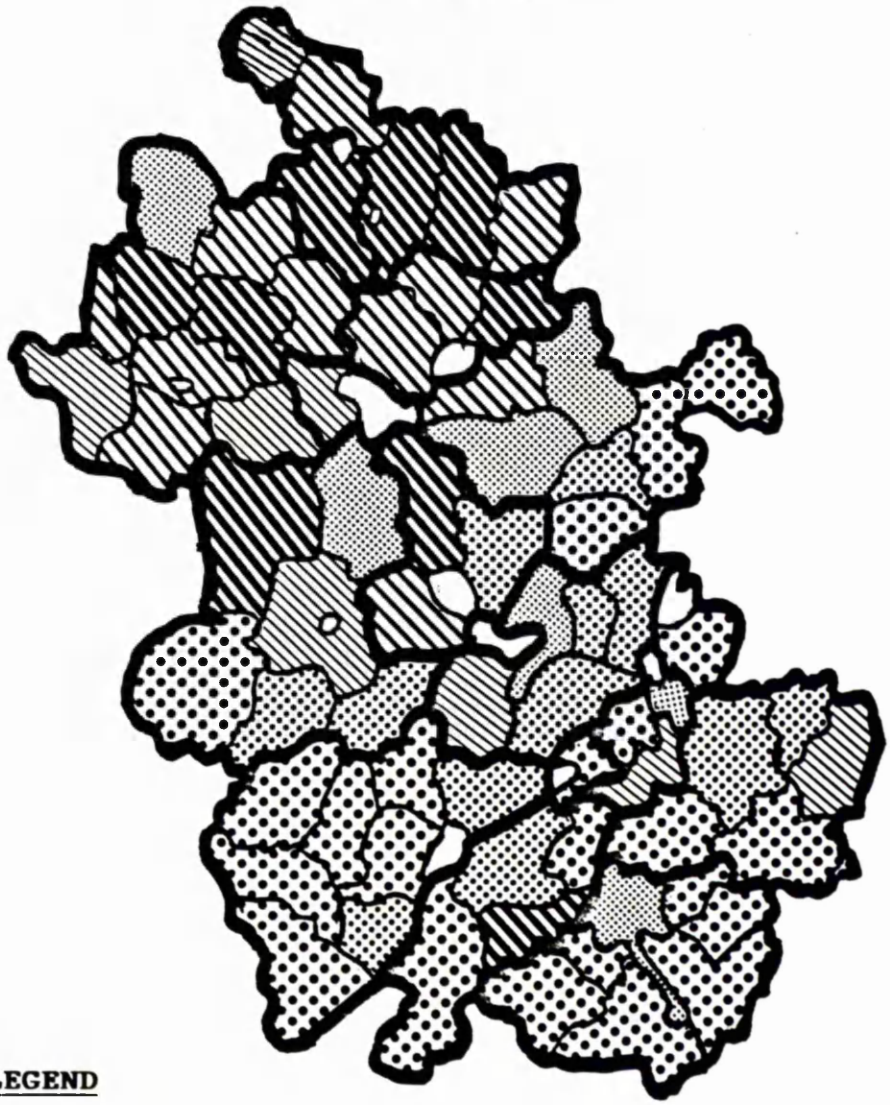


Legend

Above Average		Below Average
	0 - 1.0	
	1.001 - 2.0	
	2.001 - 4.0	
	4.001+	
	Omitted Areas	

the two census years. In 1982, counties are highly concentrated in the bands closest to the mean, just above and just below zero, with only eight of the seventy counties in the 1.001 to 2.0 band above zero, and four in the two categories immediately below -1.0. There is a marked split in the province between those counties with above average living standards in the south and east, and those in the north and west with below average SLI values. In 1982, 51% of counties are above zero, and 49% are below. Fengyang and the other counties of Chuxian prefecture stand out as having high living standards in an Anhui context, despite the accounts of great poverty in Fengyang at the end of the Maoist period (Hinton, 1990: 48; Bao, 1989: 48-61) By 1990, further north-south polarization in living standards had occurred, with the counties of Chuxian prefecture, bordering Sunan, and Xuancheng and Huangshan prefectures bordering Zhejiang showing the highest living standards, and the largest increases over the intercensal period. This dominance is not limited to living standards, but extended to economic growth, as will be discussed in chapters five and six. For the province as a whole, living standards increased between 1982 and 1990. In 1982 51% of counties had above average living standards, in 1990 this had increased to 60%. This was accompanied by increased dispersion, with six counties in the 2.001 - 4.0 category, eleven in the 1.001 - 2.0 category, and eight in the -1.001 - -2.0 category. There was some downward mobility among counties as well as upward mobility. The direction and magnitude of the change in the SLI corresponded closely to those for mortality presented in chapter three. Unlike Yunnan, only a small proportion of counties had no change in their standard of living index values over the intercensal period in Anhui. Despite this, a social mobility-type analysis for Anhui is equally misleading as one for Yunnan, and the examination of dynamic changes in living standards is reserved for

Anhui: Changes in the SLI 1982-90



LEGEND

Increased SLI

- 0.0 - 0.399
- 0.4 - 0.999
- 1.0+

Decreased SLI

- 0.0 - 0.399
- 0.4 - 0.999
- 1.0+

the discussion on magnitudes and direction of change.

The third map on living standards in Anhui shows the magnitudes and directions of change in living standards over the intercensal period. Again the north-south divide is obvious, and again corresponds closely to the trends in changing level of mortality during the 1980s. Also, the number of counties with only small increases or decreases in living standards is very small, fifteen of seventy, by comparison with the situation in Yunnan, where the majority of counties are in this category. The predominance of large increases in living standards is apparent. Half of all counties have large (23) or moderate (12) increases in living standards, compared to nine with large, and eleven with moderate, declines in the SLI between 1982 and 1990. Shitai in the south is a notable exception to this general pattern of changing living standards in Anhui, as is Bo county[6] in the north. The declines in mortality in Shitai are unable to overcome the increases in illiteracy and the massive decline in NVAIO during the 1980s. In Bo county, the rapid growth of NVAIO outpaced the increase in mortality to result in a small net increase in living standards, despite the strong downward trend in the SLI in the rest of Fuyang prefecture. Another interesting factor is the lack of prosperity in the counties associated with the large urban centres in the central and northern parts of Anhui, especially the counties attached to Huainan, Huaibei, and Bengbu, as well as two of the counties attached to Hefei and two attached to Wuhu. Despite the high levels of industrialization and the superior infrastructure in these counties, trickle-down of economic growth was not sufficient to counterbalance the large declines in living standards resulting from increases in mortality. The counties attached to the urban centres in the Changjiang industrial corridor between Ma'anshan and Anqing

[6] Bo county was designated a city (shi) in 1988.

by contrast experienced increases in SLI. At the east end of this axis, NVAIO was the most influential factor in increased living standards, while at the western end declining mortality led to the increase in living standards.

Among the three components of the SLI, NVAIO contributed to increased living standards, as the mean value for rural Anhui increased from 213 *yuan* in 1982 to 374 *yuan* in 1990. Over this period spatial dispersion also increased, as the standard deviation and coefficient of variation for NVAIO rose significantly over the intercensal period, from 52.9 to 155.6 for the standard deviation, and from 0.249 to 0.416 for the coefficient of variation. So that NVAIO was an important contributor to increased living standards, and also increased spatial inequality of living standards during the 1980s. Illiteracy also had a positive effect on living standards in Anhui, on average, with the incidence of illiteracy and semi-literacy in the population fifteen years and over falling from 32.4% to 24.5% over the intercensal period. There was a modest increase in standard deviation, 0.042 to 0.05, and in the coefficient of variation, 0.131 to 0.205, for illiteracy, contributing to increased spatial differentials.

As was discussed in chapter three, mortality increased in Anhui over the intercensal period, from a mean of 5.66 deaths per thousand population in 1982 to 9.66 in 1990. The standard deviation doubled over this period, from 1.36 to 2.72, and the coefficient of variation increased marginally from 0.24 to 0.28. This increase in mortality had a severe negative effect on living standards in Anhui - longevity being the most fundamental measure of living standards - during the 1980s, although it appeared to have little impact on spatial inequality. This concealed the two highly divergent trends for mortality among counties with increased and decreased living standards during the 1980s.

Table 4.4 - Changes in SLI by Source, Anhui 1982-90

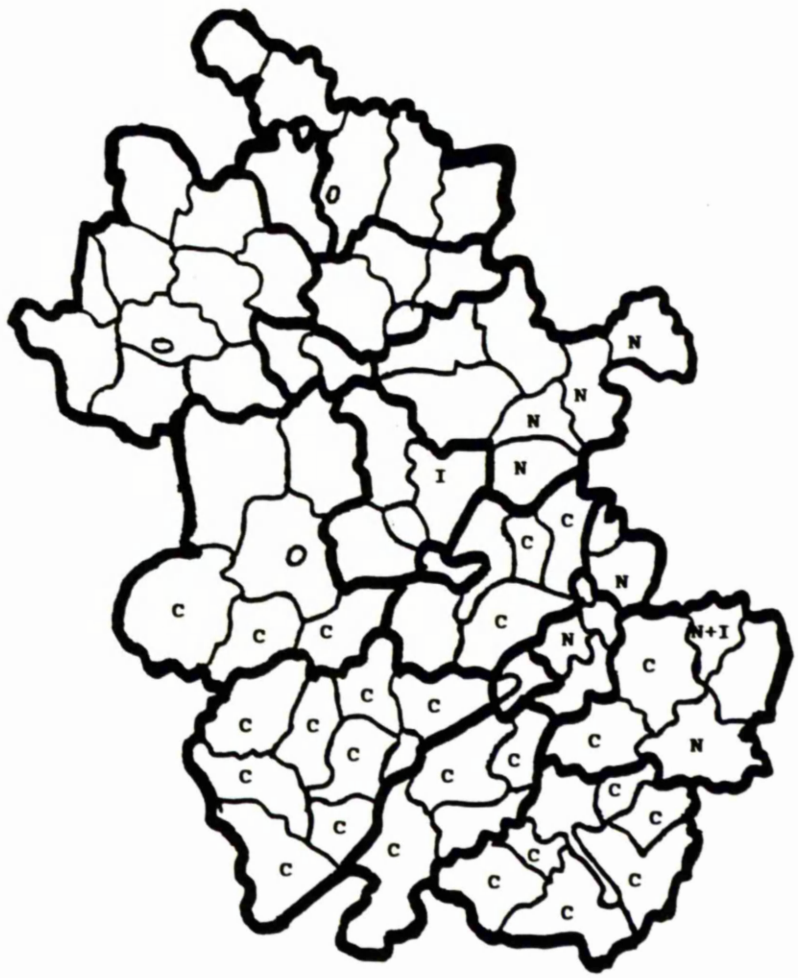
Source	Total: # Co.	Total: % Pop.	Mod. - Large Increase # Co.	Mod. - Large Increase % Pop.	Small Incr./Decr. # Co.	Small Incr./Decr. % Pop.	Mod. - Large Decrease # Co.	Mod. - Large Decrease % Pop.
NVAIO	11	10.5%	7	17.8%	2	8.0%	2	5.3%
CDR	46	65.6%	26	74.8%	4	21.8%	16	83.2%
Illit.	2	4.3%	1	5.6%	1	8.8%	0	0.0%
N & I	5	8.2%	1	1.7%	4	29.3%	0	0.0%
C & N	4	4.2%	0	0.0%	2	15.3%	2	11.5%
C & I	2	3.1%	0	0.0%	2	11.8%	0	0.0%
Total	70	100.0%	35	100.0%	15	100.0%	20	100.0%
% Total	100%	100.0%	50.0%	35.9%	21.0%	26.0%	29.0%	38.1%

Source: Derived from data in appendix 4.1.

For counties with increased SLI during the 1980s, mortality rose from a low level of 6.33 to 8.23 between the censuses, and the standard deviation virtually doubled. By contrast, those with declining SLI over the intercensal period saw a 2.5 fold increase in mortality, from 4.64 in 1982 to 11.8 per thousand population in 1990, having a strongly negative effect on living standards in these counties. The CDR increased more slowly in counties with increased SLI than in counties with decreased SLI during the 1980s. This apparent contradiction in the change in the standard of living index and the change in mortality is a product of the index's inability to accommodate changes in the mean values of the indicators over time. Because counties with increased SLI values continued to have relatively low mortality (below the mean) compared to other counties in the province, the deviation for CDR contributed positively to the apparent increase in living standards.

The same conventions regarding the contribution of the three components of the SLI to changes in SLI values that are employed for the counties of Yunnan, are applied here and the results are summarized in table 4.4. The dominance of CDR as the single most influential factor in changes in living standards is evident in table 4.4. Forty-six of seventy counties (66%) have CDR as the leading factor in increased or decreased

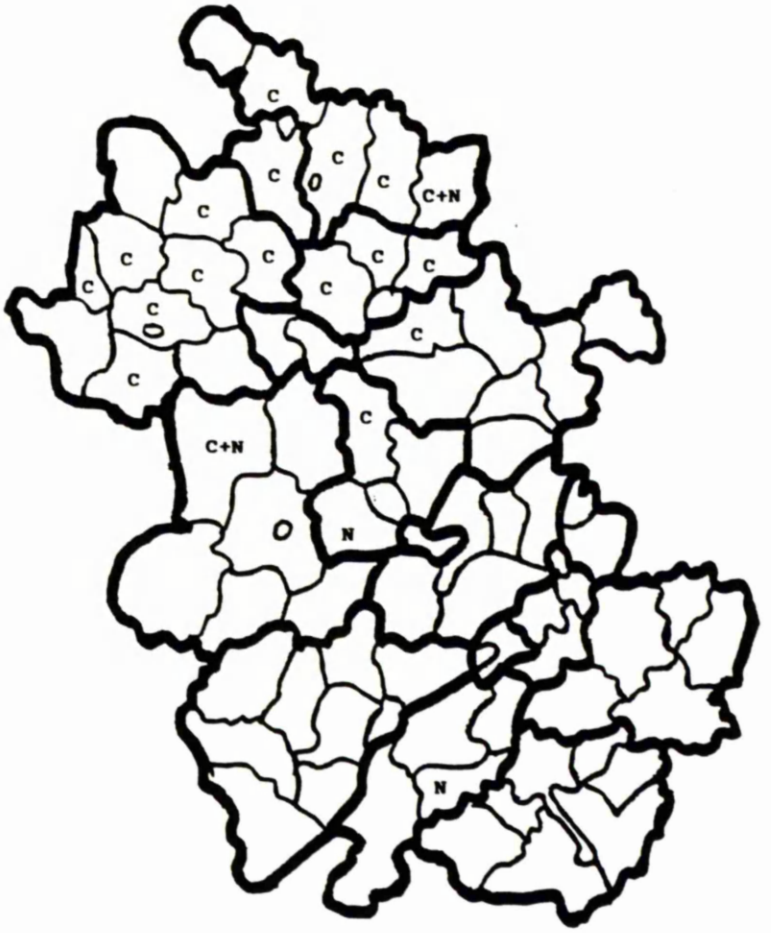
Anhui: Large to Medium Increases in SLI by Cause 1982-90



LEGEND

C	CDR leading factor in SLI changes
N	NVAIO leading factor in SLI changes
I	Illiteracy leading factor in SLI changes
N+I	NVAIO and Illiteracy joint leading factors
C+I	CDR and Illiteracy joint leading factors
C+N	CDR and NVAIO joint leading factors

Anhui: Medium to Large Decreases in SLI by Cause 1982-90



LEGEND

C	CDR leading factor in SLI changes
N	NVAIO leading factor in SLI changes
I	Illiteracy leading factor in SLI changes
N+I	NVAIO and Illiteracy joint leading factors
C+I	CDR and Illiteracy joint leading factors
C+N	CDR and NVAIO joint leading factors

living standards. This is in direct contrast to the importance of NVAIO in Yunnan, although in Anhui NVAIO is the second most factor in determining changes in the SLI, while CDR is second most important in Yunnan. Also in contrast with Yunnan, the counties where NVAIO is important tend to be lower population counties, those with CDR (or CDR and illiteracy) as the dominant factors are average in terms of total population, and the remaining eleven counties are high population counties. Counties with large to moderate increases in SLI during the 1980s have smaller populations, while those with small increases or decreases, and those with moderate to large decreases are large population counties.[7]

There are two maps which correspond to the data presented in table 4.4, data on the counties with only small changes in SLI values are omitted due to the ambiguity of the findings. They show that CDR dominates the groups where increases or decreases are large. NVAIO is an important factor in the highly dynamic counties adjoining southern Jiangsu, and along the road link with Hangzhou to the southeast. Table 4.5 presents the correlation coefficients for the components of the SLI in Anhui. The results from this analysis are more ambiguous than those for Yunnan, largely as a result of two conflicting trends among counties with increased and decreased living standards during the 1980s, and the high degree of polarization among Anhui's counties. For this reason, correlation coefficients are also presented for the 42 counties with increased SLI and the 28 with decreased SLI separately.

The correlation coefficients in table 4.5 are dealt with as two separate halves, first the top half of the table dealing with the relationships between the three factors comprising the SLI, and second the

[7] Population here stands for total population, and not population density, although the trends hold true for population density as well among CDR dominated counties.

bottom half dealing with the relationship of each indicator and the SLI itself. For all Anhui counties taken together, the correlation coefficients in the top half of the table show that they are only weakly related to one another. This is at least in part a function of the conflicting trends in NVAIO and CDR in Anhui during the 1980s. Where NVAIO rose, death rates rose; where NVAIO fell, mortality rose, although in numerous cases, the increase in mortality was modest where NVAIO fell, resulting in an apparent decline in the deviation on CDR for these counties, and occasionally leading to increased SLI.[8] Therefore, these findings support the Senian hypothesis that the link between per capita GDP or income and mortality is tenuous at best, making per capita income or output a poor proxy for living standards.

For the two groups of counties treated separately, there is a moderately close relationship between CDR and NVAIO in 1990, having increased from a modest level in 1982, while the other two relations remain insignificant. By contrast, if the change in values of the indicators are considered for 1982-90, then all three have varying degrees of interrelatedness, ranging from modest for NVAIO and illiteracy, and CDR and illiteracy, to good for CDR and NVAIO. In both cases these correlation coefficients are positive, showing that the changes in CDR and NVAIO are in the same direction. In terms of the composition of the SLI, they both moved in the same direction relative to their weighted means - in other words the deviations are either uniformly positive or negative. From this section of the analysis it is possible to conclude that CDR and NVAIO are the most closely related factors, and their conflict directly influences

[8] The key here is that the absolute value of an indicator can move in one direction, as with increased mortality, but the index values can move in another, because the deviation from the mean for this same value moves in the opposite direction. This is clearest where mortality in a county increases, but more slowly than the provincial average, so that there is actually a relative improvement in living standards as measured by the deviation of this higher mortality in the county from the much higher provincial mean, while in absolute terms, living standards have declined in both the province and this individual county.

living standards in the province.

Table 4.5 - Correlation Coefficients for the Components of the SLI, Anhui 1982-90

	Total			Increased SLI			Decreased SLI		
Indicators	1982	1990	Change 1982-90	1982	1990	Change 1982-90	1982	1990	Change 1982-90
NVAIO&CDR	-0.04	0.20	0.23	-0.36	0.58	0.71	0.19	0.58	0.64
NVAIO&Illit.	-0.14	-0.29	-0.41	-0.03	-0.18	-0.40	-0.29	-0.28	-0.43
CDR&Illit.	-0.21	-0.09	-0.33	-0.37	-0.21	-0.59	-0.17	-0.03	-0.46
SLI&NVAIO	0.80	0.82	0.47	0.87	0.99	0.39	0.82	0.73	0.24
SLI&CDR	-0.60	-0.36	-0.72	-0.76	-0.20	-0.22	-0.42	-0.07	-0.54
SLI&Illit.	-0.15	-0.62	-0.21	-0.14	-0.69	-0.27	-0.42	-0.71	-0.20

Source: derived from data in appendix 4.1

Our attention now turns to the relationship between living standards and its three constituent parts. For all counties take together, NVAIO is the factor most closely related to the value of the SLI in 1982 and 1990, with high to very high correlation coefficients for both census years. By contrast, there is only a moderately close relationship between the change in NVAIO and the change in the SLI between the two censuses. This general pattern holds when the two groups of counties are treated separately, although relationships are stronger for counties with increased SLI than with decreased SLI, as would be expected from the data in table 4.4.

At the margin the death rate is most closely related to changes in the SLI for all counties combined, and for all counties with decreased SLI for 1982-90. The relationship is quite close for all counties combined, but only moderate for those with declining SLI. Mortality runs counter to the general trend in living standards in Anhui during the 1980s, and therefore the decline in correlation coefficients is expected between 1982 and 1990, although mortality remains important at the margin. For the most part the correlation coefficients reflect the duel between CDR and NVAIO for predominance in living standards, and illiteracy sometimes holds the

balance of power, working in conjunction with mortality in some counties, and with NVAIO in others. The correlation coefficients for SLI and illiteracy increase between 1982 and 1990, because illiteracy is increasingly associated with NVAIO against the CDR, leading to the higher correlation coefficients for 1990. This is also reflected in the trends in the correlation coefficients for illiteracy and NVAIO and illiteracy and mortality at the top of table 4.5. However, at the margin, illiteracy was not closely related to the change in living standards, signalling its third place status, behind NVAIO and CDR, in influencing living standards in Anhui.

In Anhui, like Yunnan, output and mortality are the key determinants of living standards in the SLI, although they tended to have conflicting influences on living standards and competed for dominance. At the margin, mortality is of the greatest importance, and NVAIO and illiteracy tend to counterbalance movements in mortality, and dampen the effect on living standards.

4. Conclusion

This chapter started by outlining the methodology involved in constructing the SLI, which was the focus of this chapter. It also placed the index in its context, comparing its construction and the findings with the index produced by Aschmoneit for 1982. Several modifications were needed to permit a time series analysis of living standards in the two provinces. Further, although the general spatial distribution of counties in Anhui and Yunnan from the SLI agreed with Aschmoneit's analysis for 1982, and Skinner's as well for 1982 (1994, and forthcoming), the two indices were not directly comparable for two reasons. Achmoneit's index was based on deviations from a national mean and included urban areas. As

a result, the magnitudes of the LQI for any given county in Anhui or Yunnan were not comparable to those from the SLI presented here. Second, due to the inclusion of urban areas, and the wide differentials in living standards between urban and rural areas, the Aschmoneit index measures primarily urban-rural differentials, which masks the high degree of spatial variation that existed within rural China.

The findings from the SLI showed that mortality and output were the most accurate indicators of living standards, with illiteracy coming a distant third. Both provinces experienced a large increase in the dispersion of living standards between 1982 and 1990, showing that rural China did indeed move away from the egalitarianism of Maoist China under Deng. However, far from being a good thing, this increase in spatial inequality resulted in stagnation and decline in living standards in the majority of counties in Yunnan, and an increase in mortality in Anhui across the province as a whole, with increases of up to 300% in some counties. In Anhui large increases in mortality occurred where economic growth was fastest (and the reforms implemented earliest), resulting in a trade-off between commodity and non-commodity functioning. However, increased mortality appears to affect the vast majority of the population, while the benefits of increased commodity-space functioning are not as equally distributed (cf. Riskin, 1993; Bramall and Jones, 1993). This leads to the conclusion that at an individual level, a small minority have gained in terms of commodity-space functioning at the expense of the non-commodity-space functioning of the vast majority, thus failing to fulfil the strictures of even Pareto optimality, let alone more enlightened efficiency criteria. As a result it is difficult to be anything but pessimistic about future trends in living standards in rural Anhui and Yunnan. When the analysis from chapter three, showing that spatial

inequality between provinces also rose during the 1980s leaving the residents of these relatively backward provinces still further behind their coastal cousins and the national average, is considered, this pessimism is reinforced.

ANHUI Standard of Living index, 2-2-2, 1982-90.

ADMIN.UNIT	P.C. NVIAO YUAN (1980 CONST.PR.)		% POP 15+ ILLIT.&SEMI-LIT.		CDR PER K POP.		SLI, 2-2-2	
NAME	1982	1990	1982	1990	1981	1989	1982	1990
CHANGFENG	0.165	0.003	0.002	0.073	-0.089	0.296	0.503	-0.733
FEIXI	0.214	0.038	-0.057	-0.008	0.006	0.013	0.531	0.065
FEIDONG	0.161	0.034	0.158	-0.140	-0.108	-0.204	0.224	0.754
WUHU	-0.026	0.070	0.071	0.286	0.120	-0.126	-0.434	-0.182
FANCHANG	0.053	0.587	-0.027	-0.136	0.157	-0.031	-0.153	1.508
NANLING	0.080	-0.167	-0.048	0.069	0.176	-0.118	-0.095	-0.236
QINGYANG	0.094	-0.113	-0.066	-0.248	0.461	-0.301	-0.602	0.873
HUAIYUAN	0.237	0.228	0.023	-0.062	-0.127	0.373	0.681	-0.166
WUHE	0.336	0.287	0.137	-0.097	-0.184	0.288	0.767	0.193
GUZHEN	0.476	0.030	-0.033	-0.105	-0.298	0.399	1.615	-0.527
FENGTAI	0.026	0.052	0.098	-0.140	-0.089	0.328	0.034	-0.273
DONGTU	0.453	0.833	0.092	-0.090	0.176	-0.039	0.369	1.923
SUIXI	0.190	-0.012	-0.060	-0.016	-0.374	0.212	1.249	-0.417
TONGLING	-0.073	0.059	0.044	-0.124	0.252	-0.026	-0.740	0.420
BOXIAN(ZHOU)	-0.132	0.189	0.047	-0.039	-0.127	0.222	-0.104	0.012
FUYANG	-0.285	-0.254	0.014	0.151	-0.222	0.082	-0.154	-0.973
LINQUAN	-0.485	-0.477	0.050	-0.202	-0.431	-0.015	-0.209	-0.521
TAIHE	-0.303	-0.345	-0.004	0.096	-0.298	0.240	-0.004	-1.363
GUOYANG	-0.088	0.044	0.122	0.286	-0.184	0.175	-0.051	-0.834
MENGCHENG	0.064	0.003	0.044	0.046	-0.146	0.146	0.332	-0.378
FUNAN	-0.341	-0.478	0.035	0.135	-0.108	0.127	-0.537	-1.480
YINGSHANG	-0.400	-0.352	0.083	0.193	-0.165	-0.033	-0.636	-1.024
JIESHOU	-0.228	-0.020	-0.057	-0.097	-0.222	0.296	0.102	-0.436
LIXIN	-0.244	-0.386	0.107	0.232	-0.127	0.173	-0.447	-1.582
DONGSHAN	-0.014	-0.065	-0.039	-0.202	-0.260	0.005	0.570	0.263
XIAOXIAN	-0.038	-0.028	0.005	-0.074	-0.298	0.077	0.510	-0.062
SUXIAN	0.248	0.092	-0.105	-0.078	-0.260	0.385	1.227	-0.430
LINGBI	0.056	-0.083	0.086	0.050	-0.070	0.509	0.080	-1.284
SIXIAN	0.147	-0.063	0.134	0.151	-0.051	0.203	0.129	-0.835
CHUZHOU	0.622	1.348	-0.203	-0.198	-0.146	0.094	1.943	2.905
TIANCHANG	0.953	1.516	0.035	-0.086	0.063	0.090	1.710	3.023
LAIAN	0.373	0.910	0.032	-0.318	0.006	0.173	0.669	2.112
QUANJIAO	0.724	1.700	0.047	-0.264	-0.032	0.029	1.417	3.871
DINGYUAN	0.326	0.588	0.017	-0.233	-0.203	0.194	1.023	1.253
FENGYANG	0.415	0.645	0.020	0.042	-0.165	0.260	1.119	0.686
JIASHAN	0.137	0.517	0.011	0.015	-0.013	0.190	0.278	0.624
LUAN	-0.148	-0.275	0.005	0.182	0.082	-0.074	-0.471	-0.764
SHOUXIAN	-0.063	-0.125	0.098	-0.078	-0.013	0.000	-0.294	-0.092
HUOQIU	-0.159	-0.356	-0.013	0.085	-0.108	0.135	-0.076	-1.152
SHUCHENG	-0.163	-0.132	0.047	-0.016	0.044	-0.070	-0.508	-0.092
JINZHAI	-0.391	-0.305	-0.042	-0.144	0.328	-0.177	-1.354	0.032
HUOSHAN	-0.104	-0.159	-0.111	-0.132	0.271	-0.101	-0.528	0.147
XUANCHENG	0.062	0.166	-0.039	-0.113	-0.013	-0.164	0.229	0.885
LANGXI	0.043	0.185	-0.087	-0.221	0.006	-0.100	0.249	1.013
GUANGDE	0.239	-0.086	-0.224	-0.303	0.025	-0.184	0.878	0.801
NINGGUO	0.018	0.600	-0.206	-0.365	0.157	-0.112	0.135	2.153
JINGXIAN	0.183	0.208	-0.102	-0.175	0.385	-0.145	-0.200	1.056

SOURCES: AHJJNJ, 1985: passim.; AHNJ, 1988: passim.; AHNJ 1989: passim.; AHSQ vol

ANHUI Standard of Living index, 2-2-2, 1982-90.

ADMIN.UNIT	P.C. NYIAO YUAN (1980 CONST.PR.)		% POP 15+ ILLIT.&SEMI-LIT.		CDR PER K POP.		SLI, 2-2-2	
NAME	1982	1990	1982	1990	1981	1989	1982	1990
CHAOHU	-0.021	0.090	-0.138	-0.039	0.044	-0.121	0.147	0.500
LUJIANG	-0.060	-0.198	0.068	0.186	0.214	0.138	-0.686	-1.042
WUWEI	-0.046	-0.054	0.086	0.352	0.063	-0.487	-0.388	0.161
HANSHAN	0.123	0.175	0.077	0.337	0.025	-0.538	0.042	0.752
HEXIAN	0.185	0.245	0.161	0.403	0.025	-0.495	-0.001	0.675
JIXI	-0.038	0.131	-0.463	-0.500	0.214	-0.420	0.422	2.102
JINGDE	0.206	0.020	-0.123	-0.213	0.252	-0.370	0.153	1.207
SHEXIAN	0.137	-0.102	-0.326	-0.392	0.385	-0.289	0.156	1.157
XIUNING	0.143	0.072	-0.248	-0.330	0.271	-0.407	0.239	1.616
YIXIAN	0.156	-0.026	-0.347	-0.310	0.442	-0.360	0.121	1.288
QIMEN	0.326	0.176	-0.284	-0.241	0.366	-0.364	0.487	1.561
SHITAI	0.181	-0.894	-0.108	0.073	0.423	-0.267	-0.268	-1.400
HUANGSHAN	0.407	-0.538	-0.320	-0.337	0.328	-0.622	0.797	0.842
HUAINING	-0.117	-0.076	-0.114	-0.035	0.309	-0.419	-0.625	0.757
TONGCHENG	0.001	0.402	-0.159	-0.210	0.404	-0.341	-0.490	1.905
ZONGYANG	-0.336	-0.480	0.047	0.321	0.328	-0.390	-1.422	-0.823
QIANSHAN	0.025	-0.123	-0.078	-0.151	0.499	-0.268	-0.793	0.592
TAIHU	-0.228	-0.300	0.017	-0.086	0.537	-0.269	-1.564	0.109
SUSONG	-0.081	-0.213	-0.108	-0.117	0.233	-0.407	-0.413	0.622
WANGJIANG	0.055	-0.162	0.032	0.209	0.385	-0.455	-0.724	0.169
YUEXI	-0.399	-0.454	-0.093	-0.093	0.822	-0.093	-2.255	-0.535
DONGZHI	0.255	-0.002	-0.018	-0.097	0.594	-0.273	-0.641	0.737
GUICHI	0.032	0.182	-0.054	0.158	0.176	-0.365	-0.181	0.777
AVERAGE	0.06	0.06	-0.03	-0.05	0.07	-0.06	0.04	0.35
STAND.DEV.	0.26	0.44	0.13	0.19	0.26	0.27	0.75	1.12
COEF.VAR.	4.284	6.852	-3.760	-3.873	3.532	-4.429	16.936	3.213

SOURCES: AHJJNJ, 1985: passim.; AHNJ, 1988: passim.; AHNJ 1989: passim.; AHSQ vol

YUNNAN STANDARD OF LIVING INDEX 1982, 1990.

ADMIN.UNIT	CDR DEVIATIONS		ILLITERACY DEV'S		NVAIO DEVIATIONS		SLI, 2-2-2	
NAME	1982	1990	1982	1990	1982	1990	1982	1990
ANNING	-0.266	-0.264	-0.420	-0.460	2.508	3.295	6.389	8.039
CHENGGONG	-0.233	-0.156	-0.331	-0.419	0.351	0.959	1.830	3.068
FUMIN	-0.266	-0.083	-0.233	-0.302	0.072	0.493	1.143	1.755
JINNING	-0.289	-0.151	-0.181	-0.223	0.891	1.441	2.722	3.629
LUQUAN	-0.142	-0.141	0.113	0.245	-0.367	-0.433	-0.677	-1.075
SONGMING	-0.210	-0.033	-0.172	-0.208	-0.004	0.015	0.755	0.510
YILIANG	-0.233	-0.132	-0.273	-0.332	0.235	0.287	1.481	1.502
LUNAN	-0.323	-0.156	-0.153	-0.200	0.012	0.063	0.976	0.838
DONGCHUAN	-0.165	-0.188	-0.049	0.136	0.174	-0.060	0.776	-0.015
ZHAOTONG	-0.029	-0.125	0.074	0.230	0.080	0.715	0.072	1.220
LUDIAN	0.242	0.029	0.135	0.336	-0.353	-0.671	-1.459	-2.073
QIAOJIA	0.253	-0.031	0.132	0.389	-0.435	-0.597	-1.640	-1.908
YANJIN	0.400	0.203	0.043	0.125	-0.285	-0.463	-1.454	-1.581
DAGUAN	0.309	0.160	0.132	0.219	-0.311	-0.475	-1.504	-1.708
YONGSHAN	0.050	0.102	0.080	0.181	-0.372	-0.535	-1.002	-1.637
SUIJIANG	0.016	0.099	-0.230	-0.302	-0.115	-0.092	0.198	0.224
ZHENXIONG	0.230	0.004	0.120	0.185	-0.362	-0.537	-1.423	-1.451
YILIANG	0.309	0.113	0.126	0.317	-0.372	-0.583	-1.614	-2.026
WEIXIN	-0.007	0.012	0.113	0.151	-0.055	-0.278	-0.323	-0.882
SHUIFU	0.072	0.034	-0.218	-0.230	4.394	2.831	9.080	6.054
QUJING	-0.266	-0.124	-0.012	-0.128	0.761	1.119	2.079	2.741
MALONG	-0.210	-0.135	-0.012	0.057	0.127	0.714	0.699	1.586
XUANWEI	-0.221	-0.228	-0.055	-0.015	0.076	-0.156	0.704	0.174
FUYUAN	-0.142	-0.030	0.028	0.026	-0.173	-0.120	-0.116	-0.234
LUOPING	-0.063	0.011	0.018	0.094	-0.128	0.086	-0.167	-0.038
SHIZONG	-0.063	-0.026	0.092	0.242	-0.086	-0.268	-0.229	-0.966
LULIANG	-0.278	-0.096	0.037	0.015	0.129	0.085	0.740	0.333
XUNDIAN	-0.176	-0.149	0.049	0.094	-0.209	-0.408	-0.163	-0.706
HUIZE	-0.007	-0.021	0.138	0.257	-0.100	-0.332	-0.463	-1.135
CHUXIONG	-0.187	-0.121	-0.098	-0.309	0.175	1.701	0.921	4.264
SHUANGBAI	-0.120	0.036	0.055	-0.008	-0.007	-0.240	0.114	-0.538
MOUDING	-0.153	0.020	-0.233	-0.317	0.042	-0.139	0.858	0.316
NANHUA	-0.041	-0.096	-0.015	-0.196	-0.096	-0.317	-0.080	-0.050
YAOAN	0.005	0.030	-0.101	-0.283	0.106	-0.160	0.405	0.187
DAYAO	-0.007	0.066	-0.120	-0.260	-0.061	-0.138	0.130	0.114
YONGREN	-0.007	0.132	-0.144	-0.143	0.157	-0.173	0.616	-0.322
YUANMOU	-0.165	-0.030	-0.206	-0.226	0.185	-0.116	1.110	0.281
WUDING	0.005	0.010	-0.009	0.008	-0.024	-0.254	-0.038	-0.542
LUFENG	-0.199	-0.068	-0.178	-0.238	0.149	0.050	1.051	0.710
YUXI	-0.368	-0.214	-0.233	-0.355	3.151	5.417	7.505	11.972
JIANGCHUAN	-0.357	-0.154	-0.018	-0.102	0.078	0.062	0.906	0.635
CHENGJIANG	-0.300	-0.212	-0.064	-0.140	0.168	0.199	1.065	1.101
TONGHAI	-0.244	-0.149	-0.147	-0.204	0.440	0.854	1.661	2.413
HUANING	-0.244	-0.147	-0.104	-0.140	0.003	-0.015	0.703	0.543
YIMEN	-0.368	-0.161	-0.276	-0.313	0.643	0.478	2.574	1.904
ESHAN	-0.300	-0.125	-0.187	-0.328	0.486	0.424	1.947	1.755
XINPING	-0.142	0.019	0.074	0.075	-0.025	-0.043	0.087	-0.274

SOURCES: YNTJNJ, 1990: 170-4, 245-9; YNTJNJ, 1991: 636-40, 676-80, 793-6, 801-4

YUNNAN STANDARD OF LIVING INDEX 1982, 1990.

ADMIN.UNIT	CDR DEVIATIONS		ILLITERACY DEV'S		NVAIO DEVIATIONS		SLI, 2-2-2	
NAME	1982	1990	1982	1990	1982	1990	1982	1990
YUANJIANG	-0.187	0.048	0.046	-0.015	0.211	0.083	0.705	0.102
KAIYUAN	-0.312	-0.206	-0.261	-0.343	1.461	1.625	4.066	4.348
MENGZI	-0.108	-0.029	-0.141	-0.208	0.272	0.340	1.042	1.153
PINGBIAN	0.264	0.047	0.040	0.106	-0.364	-0.474	-1.336	-1.255
JIANSHUI	-0.176	-0.009	-0.209	-0.309	-0.140	-0.108	0.489	0.420
SHIPING	-0.108	0.068	-0.227	-0.219	-0.275	-0.188	0.121	-0.075
MILE	-0.187	-0.078	-0.184	-0.200	0.292	0.047	1.327	0.649
LUXI	-0.278	0.038	0.018	0.072	-0.178	-0.313	0.162	-0.845
YUNYANG	0.591	0.530	0.368	0.792	-0.456	-0.573	-2.831	-3.791
HONGHE	0.242	0.395	0.322	0.615	-0.496	-0.595	-2.119	-3.210
JINPING	0.535	0.276	0.316	0.675	-0.313	-0.484	-2.328	-2.871
LUCHUN	0.242	0.356	0.356	0.747	-0.469	-0.564	-2.132	-3.334
HEKOU	-0.176	0.114	-0.175	-0.087	-0.563	0.550	-0.423	1.046
WENSHAN	-0.142	-0.124	-0.086	-0.242	-0.156	-0.238	0.145	0.256
YANSHAN	0.027	-0.017	0.061	-0.030	-0.366	-0.440	-0.909	-0.786
XICHOU	-0.086	-0.052	-0.144	-0.226	-0.378	-0.334	-0.295	-0.110
MALIPO	-0.007	0.003	0.064	-0.008	-0.317	-0.423	-0.750	-0.836
MAGUAN	0.095	0.047	-0.061	-0.064	-0.291	-0.456	-0.649	-0.878
QIUBEI	0.038	-0.067	0.052	0.038	-0.244	-0.447	-0.669	-0.837
GUANGNAN	0.445	0.163	0.163	0.245	-0.350	-0.464	-1.914	-1.746
FUNING	0.332	0.046	0.252	0.219	-0.397	-0.442	-1.960	-1.414
SIMAO	-0.334	-0.363	-0.270	-0.404	0.380	0.158	1.969	1.849
MOJIANG	0.264	0.072	0.025	0.030	-0.369	-0.516	-1.315	-1.236
JINGDONG	0.129	-0.046	0.012	-0.140	-0.205	-0.356	-0.692	-0.342
JINGGU	0.095	-0.005	0.144	0.019	-0.075	-0.161	-0.628	-0.349
ZHENYUAN	0.242	0.081	0.150	0.038	-0.254	-0.333	-1.292	-0.904
JIANGCHENG	-0.108	-0.173	-0.021	-0.113	-0.334	-0.317	-0.409	-0.061
MENGLIAN	0.400	0.310	0.374	0.430	-0.156	-0.070	-1.859	-1.620
LANCANG	0.704	0.507	0.408	0.638	-0.393	-0.499	-3.010	-3.288
XIMENG	0.862	0.568	0.245	0.321	-0.306	-0.469	-2.828	-2.716
JINGHONG	-0.312	-0.259	-0.067	-0.128	1.039	1.322	2.837	3.418
MENGHAI	0.603	0.279	0.129	0.140	0.126	0.182	-1.212	-0.474
MENGLA	-0.120	-0.172	-0.095	-0.098	0.366	1.220	1.162	2.980
YANGBI	0.061	0.063	-0.156	-0.181	-0.050	-0.255	0.091	-0.275
XIANGYUN	-0.199	0.036	0.052	-0.030	-0.108	-0.232	0.076	-0.475
BINCHUAN	-0.255	-0.194	-0.242	-0.313	0.140	0.265	1.274	1.546
MIDU	-0.176	-0.016	-0.221	-0.268	-0.082	-0.106	0.630	0.356
NANJIAN	0.117	0.066	-0.135	-0.475	-0.203	-0.188	-0.370	0.445
WEISHAN	-0.074	0.044	-0.169	-0.275	-0.247	-0.310	-0.008	-0.158
YONGPING	-0.029	-0.075	-0.172	-0.306	-0.181	-0.188	0.040	0.386
YUNLONG	0.242	0.043	-0.083	-0.068	-0.270	-0.365	-0.857	-0.680
ERYUAN	-0.007	0.016	-0.196	-0.147	0.087	-0.119	0.580	0.025
JIANCHUAN	-0.097	-0.039	-0.267	-0.268	-0.092	-0.104	0.545	0.408
HEQING	-0.041	0.035	-0.153	-0.196	0.014	-0.255	0.415	-0.188
BAOSHAN	-0.233	-0.088	0.046	-0.113	0.123	-0.154	0.618	0.094
SHIDIAN	-0.221	0.028	0.025	-0.226	-0.128	-0.270	0.137	-0.144
TENGCHONG	0.005	0.018	-0.196	-0.457	-0.021	-0.173	0.342	0.531

SOURCES: YNTJNJ, 1990: 170-4, 245-9; YNTJNJ, 1991: 636-40, 676-80, 793-6, 801-4

YUNNAN STANDARD OF LIVING INDEX 1982, 1990.

ADMIN.UNIT	CDR DEVIATIONS		ILLITERACY DEV'S		NVAIO DEVIATIONS		SLI, 2-2-2	
NAME	1982	1990	1982	1990	1982	1990	1982	1990
LONGLING	0.038	0.045	0.086	-0.019	-0.155	-0.271	-0.558	-0.595
CHANGNING	-0.052	-0.074	-0.110	-0.272	0.070	-0.013	0.465	0.665
LUXI	-0.120	-0.164	0.083	-0.042	0.204	0.262	0.481	0.936
LIANGHE	-0.052	-0.124	-0.141	-0.192	-0.011	-0.181	0.363	0.270
YINGJIANG	0.185	0.111	0.052	-0.075	0.054	0.123	-0.367	0.174
LONGCHUAN	0.196	0.043	0.037	0.015	0.455	0.399	0.444	0.682
RUILI	-0.187	-0.158	-0.077	-0.242	0.774	0.815	2.076	2.430
WANDING	-0.221	-0.017	-0.328	-0.358	0.907	0.683	2.913	2.116
LIJIANG	-0.097	0.037	-0.202	-0.264	0.198	-0.046	0.996	0.361
YONGSHENG	-0.018	0.039	-0.034	-0.030	-0.170	-0.295	-0.235	-0.608
HUAPING	-0.041	0.056	0.015	-0.079	0.052	0.051	0.154	0.149
NINGLANG	0.174	0.141	0.230	0.464	0.002	-0.317	-0.803	-1.845
FUGONG	1.472	0.591	0.248	0.419	-0.467	-0.565	-4.375	-3.149
GONGSHAN	0.569	0.565	0.120	0.298	-0.465	-0.529	-2.306	-2.785
LUSHUI	0.388	0.105	0.163	0.411	-0.134	-0.239	-1.370	-1.511
LANPING	0.038	0.016	0.184	0.294	-0.024	0.122	-0.493	-0.377
ZHONGDIAN	0.219	0.159	0.037	0.166	0.711	-0.027	0.911	-0.704
DEQEN	0.445	0.453	0.374	0.638	0.106	-0.335	-1.426	-2.853
WEIXI	0.411	0.396	0.055	0.181	-0.183	-0.337	-1.298	-1.829
FENGQING	0.129	0.145	-0.009	-0.125	-0.149	-0.381	-0.537	-0.802
YUN	0.185	-0.004	0.101	-0.072	-0.334	-0.422	-1.240	-0.691
LINCANG	-0.052	0.010	0.006	-0.049	-0.271	-0.391	-0.451	-0.703
YONGDE	0.072	-0.115	0.248	0.362	-0.308	-0.431	-1.258	-1.356
ZHENKANG	0.084	0.124	0.294	0.419	-0.183	-0.357	-1.123	-1.801
SHUANGJIANG	0.332	0.340	0.209	0.400	-0.203	-0.357	-1.487	-2.193
GENGMA	0.298	0.218	0.215	0.381	0.140	0.155	-0.746	-0.888
CANGYUAN	0.907	0.813	0.126	0.181	-0.235	-0.289	-2.536	-2.566
MEAN	0.024	0.028	-0.010	-0.010	0.060	0.036	0.092	0.036
ST.DEV.	0.295	0.194	0.175	0.279	0.636	0.791	1.809	2.116
COEFF.VAR.	12.03	6.96	-17.65	-27.61	10.51	22.16	19.70	58.87

SOURCES: YNTJNJ, 1990: 170-4, 245-9; YNTJNJ, 1991: 636-40, 676-80, 793-6, 801-4

Chapter 5

Spatial Inequality[1]

1. Introduction

This chapter sets out the framework for the county level analysis which is the focus of the remainder of the dissertation. The introduction is followed by a section covering a brief discussion of the theory and methodologies employed in measuring inequality. This is followed by a section examining the trends in rural spatial inequality in both Anhui and Yunnan. The fourth section of the chapter explains the methodology used to determine the groupings for further study, and presents the groups of counties themselves. Those groups of counties included in the discussion of the causal factors underlying the differential rates of economic growth and the standard of living in these two provinces since 1978 are indicated in the fourth section, and the counties themselves are listed in appendix 5.1. The final section briefly outlines the analysis that follows in chapters six and seven.

Further to the discussion of the trickle-down processes in an economy in chapter two, and its role in poverty alleviation, and improving living standards, our attention turns to inequality. Fields (1984) found that rapid economic growth in conjunction with declining income inequality and increasing modern sector employment, were necessary for the poor to receive benefits from economic growth. Therefore, to round out this examination of poverty and living standards in rural China, in a time of institutional change and rapid economic growth, we also need to investigate the trends in inequality and differentials in rates of economic growth. Due to the

[1] This section, and chapters six and seven that follow are the presentation of the research on spatial inequality summarized in Bramall and Jones (1993). Much of the general discussion of trends in income inequality in China is left to this article, and omitted here due to the constraints of space. Instead, this presents supplementary material on Anhui and Yunnan in particular.

limitations of the data available a detailed examination of interpersonal income inequality is not possible at a county level in Anhui and Yunnan. Therefore, the analysis presented here focuses on trends in spatial inequality, and in particular on the increase in spatial dispersion among the counties of Anhui and Yunnan.

2. Theory and Methodology

a. Income Inequality

There are numerous ways of measuring income inequality. Two of the most commonly used are the ratio of the income share of the bottom 40% of the population relative to the income share of the top 20% of the population, and the Gini coefficient. The Gini coefficient can be derived from the Lorenz curve, and is represented as the ratio of the area between the Lorenz curve and the line showing perfect income equality, divided by the area below the perfect income equality line. Thus the smaller the Gini coefficient, the more equitable the income distribution. The ratio of income shares concentrates on the lowest income groups relative to the highest income groups, while the Gini coefficient emphasize the middle income groups. The Gini coefficient is favoured due to its ease of computation, and its adaptability to grouped data. The Gini coefficient can also be decomposed to distinguish income inequality by income source and their contributions to total income inequality.

Other indices of income inequality include: the Theil coefficient; the Atkinson index; and the analysis of variance. The Theil coefficient concentrates on the income distribution among the rich, while the other measures place greater emphasis on the distribution among the poor. This is achieved in the Atkinson index through the discretionary setting of the value of the term ϵ to reflect inequality aversion. Analysis of variance

includes two other statistics, first the coefficient of variation (the variance divided by the mean) and log variance, which is derived in the same manner as the coefficient of variation, but is based on the natural logarithms of the incomes. Analysis of variance itself is useful in the decomposition of the sources of inequality but is reliant on non-grouped data. The Theil coefficient and the Atkinson index are both calculable from grouped data, and can be decomposed to show income inequality by source. The qualities of these various measures of inequality are discussed thoroughly in Fields (1980: 101-22).

Income inequality, and its role in exacerbating relative poverty, are important for measuring the degree to which the poor have effective money votes in an economy, and the extent of their poverty, and what means are necessary for them to escape poverty. The income distribution can have a significant impact on product mix in GNP. If the income distribution is highly skewed towards the rich, then the much greater purchasing power of rich consumers results in their money votes creating a high demand for 'luxury' goods, while the supply of necessities as a result can be insufficient. In some developing countries rich people can also create problems for the balance of payments, using up precious foreign currency reserves or export earnings to pay for imported luxury goods.[2] Thus, income inequality can have a significant influence on the composition of GNP.

Income inequality can also have a significant influence on the rate of reduction of poverty during a period of economic growth. If the gains from economic growth accrue almost exclusively to the rich, the owners of the means of production, then the rate of decrease in the incidence of

[2] For example, this was identified as one of the factors contributing to the debt crisis in Latin America, because loans were used for conspicuous consumption, and not for investment in imported producer goods to increase productive capacity in the long run.

poverty will be slow despite rapid rates of economic growth.[3] Conversely, with a highly equitable distribution of the benefits from economic growth, or when these benefits are targeted at the poor, a rapid decline in the incidence of poverty is likely to result.

In direct opposition to the argument above regarding equity and the alleviation of poverty, there is the hypothesis that says that inequality will increase initially, before economic growth (particularly enlargement of the modern sector) and the trickle-down process will result in a decrease in income inequality and the incidence of poverty. This is the essence of Kuznets' inverse u-shaped hypothesis, drawing also on Lewis's dual sector model. In post-Mao China, income inequality has been sacrificed on the altar of market socialism, with 'take the lead in getting rich' the new catechism. The Chinese government is firmly of the belief that the high income equality of Maoist China was preventing rapid economic growth, and that a greater degree of income inequality was necessary to promote rapid economic growth (cf. Zhao Renwei, 1990: 193). However, the case for trickle-down in China appears very weak as local and regional disparities are exacerbated once the initially beneficial effects of the equitable land reform wears off. Part of the problem in China lies in the great lack of power on the part of the central government to facilitate interregional transfers of wealth, as much of their power was decentralized to the provinces or localities over the course of the reform period. Thus the state is enfeebled and prevented from pursuing policies beneficial to reducing poverty and regional, if not income, inequality.

b. Spatial Inequality

The measurement of spatial inequality is rather different from the

[3] See for example Sachs (1985) analysis of income inequality in Brazil.

measurement of interpersonal income distribution outlined above. It is possible to calculate a Gini coefficient for Anhui and Yunnan, based on intercounty differences in income (treating counties like individuals). However, such a calculation would be highly unusual, as would be quintile ratios based on county level data. The more usual measure of dispersion is the coefficient of variation (the variance divided by the mean). Unlike the Gini coefficient, the coefficient of variation has no fixed range of values, and so it is only of use to look at trends in dispersion over time, and not the absolute value of the coefficient of variation in any given year. As a result, it is the trend in the coefficient of variation for per capita NVAIO and per capita NDMP in Anhui and Yunnan from 1978 to 1990 that is presented in the following section.

3. Spatial Inequality in Anhui and Yunnan

One of the most effective methods of measuring the changes in the standard of living in these two provinces over the reform period, is to examine the trends in spatial inequality. This allows for the identification of groups of counties that should be examined at greater length, so that the factors responsible for the dynamics of living standards can be determined. This chapter dwells on trends in spatial inequality, and the identification of the counties at the top and bottom of the distribution, and those that have had the most (and least) rapid growth over the reform period. These groups can be expected to provide the clearest contrast in the causal factors underlying economic growth or stagnation, and rising or falling living standards.

As was discussed in chapter 3, there are severe problems with the SSB income data in general, and for both of these provinces in particular. For

Yunnan, there are no comprehensive county level data on per capita net peasant income, while for Anhui, the data that do exist are not an internally consistent series. Other problems with the quality of official Chinese income data are presented in Bramall and Jones (1993). As a result of these problems with the income data, per capita NDMP data are used as a good proxy for income. NDMP, being comprised of the net values of agricultural and industrial output (NVAIO) as well as construction, transportation, and commerce (services), which also makes it a good proxy for GNP. The coefficients of variation for per capita NDMP for Anhui and Yunnan are presented in table 5.1.

Table 5.1
The Dispersion of per capita NDMP, in Anhui and Yunnan 1978-90.

	Coefficients of Variation for Counties							
Prov.	1978	1983	1984	1985	1987	1988	1989	1990
Anhui(61)		0.28	0.27		0.33	0.37	0.40	
Anhui(19)	0.31	0.35	0.35		0.37	0.39	0.42	
Yunnan				0.64	0.75	0.88	0.96	0.96

Note: The numbers in parentheses for Anhui signify the number of counties for which data are available. For 1978, data on only 19 counties are available (Chuxian, Liu'an and Huizhou prefectures, and Linquan county), while for 1983-1989 data are available for all 61 counties. For Yunnan, Pu'er and Bijiang counties are omitted, due to missing data. The Coefficients of Variation were not found to be sensitive to weighting by population, therefore unweighted values are presented here.
Sources: Anhui: AHJJNJ 1985 - passim.; AHNJ 1988 - passim.; AHNJ 1989 - passim.; AHNJ 1990 - passim. Yunnan: YNTJNJ 1990 - 105-109, 170-174, 249-249; YNTJNJ 1991 - 606-610, 636-640, 676-680.

Unfortunately there are no comprehensive per capita NDMP data for the early reform period for either province. Nevertheless, the trend increase in spatial inequality in Table 5.1 is clear. For Anhui the coefficient of variation increases from 0.28 in 1983 to no less than 0.40 in 1989, or a 43% increase in six years; clear evidence of increasing divergence. While data for Yunnan are only available from 1985 to 1990, an increase in the coefficient of variation from 0.64 in 1985 to 0.96 in 1989 shows a very rapid increase in spatial inequality; a 50% increase over four years.[4] Similarly, there is an increase from 0.31 to 0.42 evident in the data on

[4] The levelling off in the trend in 1990 is a result of the strongly negative impact of the recession on the most dynamic counties.

a limited number of Anhui's counties from 1978 to 1989.[5]

To better understand the trends in spatial inequality throughout the reform period it is necessary to employ per capita NVAIO data, as these are readily available at a county level for the early 1980s. As NVAIO omits transportation, construction and commerce (which have tended to be the most dynamic sectors in the rural economy, contributing greatly to both spatial and interpersonal inequality, as demonstrated in Bramall and Jones (1993)), this indicator will somewhat underestimate the true extent of the increase in spatial inequality. However, since a solid agricultural foundation is necessary for continued economic prosperity in the reform period, and rapid expansion of industrial output is common to the most dynamic counties, per capita NVAIO is a fair indicator for measuring increases in spatial inequality. Per capita NVAIO data are also employed in determining the groups for further study in chapters six and seven that follow.

Table 5.2
Dispersion in per capita NVAIO in Anhui and Yunnan, 1978-90

	Coefficient of Variation for Counties										
Prov.	1978	1980	1982	1983	1984	1985	1986	1987	1988	1989	1990
Anhui	0.26	0.24	0.24	0.28	0.24	0.24	0.26	0.28	0.32	0.37	0.40
Yunnan	0.55	0.65				0.59		0.65	0.70	0.74	0.76

Note: Only Bijiang county is omitted from Yunnan. All figures are based on 1980 constant prices values of NVAIO.
Sources: Anhui: AHJJNJ 1985 - passim.; AHNJ 1988 - passim.; AHNJ 1989 - passim.; AHNJ 1990 - passim.; Yunnan: YNTJNJ 1990 - 105-109, 170-174, 249-249; YNTJNJ 1991 - 606-610, 636-640, 676-680.

There is a strong trend increase in spatial inequality in both provinces from 1978 based on the data in table 5.2. Some of the fluctuations in the value of the coefficient of variation for Anhui can be explained by the impact of meteorological factors on agricultural output.

[5] It is not difficult to explain the much higher, and slower growing, coefficient of variation for this limited sample of Anhui's counties. This results from the prefectures included in the sample. Chuxian prefecture is home to the counties that started the period at or near the top of the distribution, and they are also the ones with the most dynamic rates of growth. Liu'an prefecture, by contrast, was at the other extreme of the distribution, with some of the poorest counties, and the slowest growth rates. Huizhou prefecture has had a mixed experience, with several counties displaying relative dynamism, from a solid base, while the majority experienced virtual stagnation, moving from the upper-middle part of the distribution to near the bottom over the course of the reform period.

Given the pre-eminence of agriculture in NVAIO for the province from 1978 through the mid-1980s, this is easily understood.[6] The values in 1982 and 1984-5 may be lower due to the 'decollectivization settlement', which was particularly egalitarian and severely fragmented the large plots of land (Nolan and Sender, 1992). In 1984 the 'bumper' harvest resulted in part from the distribution of collective stores of famine relief grain to individual households, as part of the decollectivization settlement, in conjunction with a good year in terms of area affected by natural diasters (cf. Hinton, 1990: 22). This is particularly relevant, since, in the early 1980s, many resource rich, sparsely populated counties in mountainous regions were at or near the top of the spatial distribution in Anhui, only to stagnate relative to the counties with grain and cash crop production as the 1980s progressed. The rapid growth of agricultural outputs and yields in the latter group of counties produced an investible surplus, which resulted in increases in the industrial and 'service' sectors. The virtuous cycle was completed by the higher disposable income (and more importantly the enormous increase in cash incomes) and increased consumption by the households in these more dynamic regions. When the collective grain stores were liquidated (ibid.), and there was a record grain harvest, this helped numerous populous, grain producing, counties to catch up, and ultimately surpass their resource rich, sparsely populated, 'tea and timber'[7] cousins. The smooth increase in the coefficient of variation for 1985-90 in Anhui, reflects the ascendency of counties with

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[6] For example, the 1978 figure might well exaggerate spatial inequalities at the end of the Maoist period in Anhui, because the droughts which affected much of Anhui between the Changjiang and the Huai rivers only affected the summer rice crop, harvested in the late summer and early autumn. In fact, many of the wealthier counties that also harvest winter wheat in the spring had particularly good harvests due to the dry spring weather, exacerbating the usual pattern of inequality, making the scale of the natural disaster in this year seem relatively small, which was not the case (Bao, 1989: 1-66). Which also helps to explain why grain yields for Anhui were not overly depressed in 1978. The figure for 1980 is lower because the flooding in this year damaged both rice and wheat crops in many of the affluent counties bordering Sunan, serving to narrow the spatial distribution somewhat.

[7] 'Tea and timber' is used to describe the mountainous counties of southwestern Anhui, because the economy of this region is dominated by the production of tea, and commercial forestry.

strong agricultural foundations supporting industrial and 'service'[8] sector development, and the decline of mountainous counties with sparse populations and little agriculture. These patterns will be discussed in greater detail in the following chapters.

Decollectivization came late to Yunnan, with the national legislation in 1982-3. Therefore it is probably responsible for the depressed value of the coefficient of variation in 1985, which is the chief anomaly in an otherwise strongly upward trend in inequality.

The evidence for increased spatial inequality among counties is clear, based on the data on per capita NDMP and per capita NVAIO; but what of inequality within counties, as counties are themselves very large units. Considerable detailed inter-village data do exist for provinces such as Sichuan and Zhejiang showing increased inequality between villages.[9] Unfortunately systematic time series data are not available at the village level for either Anhui or Yunnan. There are, however, some interesting examples that can be drawn from data on Honghe prefecture, Yunnan.

Jinping county is in Honghe prefecture, a relatively poor area in southern Yunnan, bordering Vietnam, bisected by the Red River. For the prefecture as a whole, nominal per capita net peasant income was 91 *yuan* in 1978, compared to 131 *yuan* for the province as a whole. By 1988, average per capita net peasant income in Honghe had increased to 283 *yuan* (an increase of 12% per annum), while for Yunnan the figure was 428 *yuan* (an increase of 12.6% per annum). In other words, Honghe is poor, and fell further behind the average for the province throughout the reform period. Three of the counties in closest proximity to Jinping county receive state

[8] The term "service" sector is used as a short hand to refer to the transportation, construction and commerce.

[9] See for example: Bramall (1993) and Bramall and Jones (1993).

or provincial government assistance as designated poor areas (there are 13 counties in Honghe in total). In 1978, per capita NVAIO in Jinping at 1980 constant prices was 130 *yuan* or 75% of the rural provincial average, 174 *yuan* in that year. By 1990 Jinping's per capita NVAIO was 176 *yuan* (1980 constant prices), or only 50% of the province's rural average of 354 *yuan*. Jinping's per capita NVAIO grew at 2.6% per annum compared to 6.1% for the rural regions of Yunnan on average. This illustrates the enduring poverty of Jinping county relative to the provincial average.

The villages of Jinping are not, however, universally poor. On the Vietnamese border itself, there are 12 villages that have specialized in banana production since decollectivization in 1983. In Manqia hamlet (*cun*) of Shidong village (*xiang*), in 1983 60,000 kgs of bananas yielded a revenue of 50,000 *yuan* for the families of the village. By 1984 banana output had increased to 306,000 kgs (an expansion that did not necessarily owe anything to the collective period, because it takes only one to two years for banana palms to enter commercial production in the tropics[10] with a revenue of 189,200 *yuan*. This represented an average household income of 10,000 *yuan*, the first such village in Jinping county (JPGK, 1990: 89). By contrast, the average household cash income for the poorest village, Jinhe, in Jinping county was 1735 *yuan*, or 277 *yuan* per capita, and for the poorest hamlet in Jinhe, Zhenguang, the average household income was only 374 *yuan*, or 55 *yuan* per capita in 1985. In the same year, the average household income for the province was 2202 *yuan*, or 337 *yuan* per capita (JPGK, 1990: 139-140). As might be expected of a province with substantial border areas and national minority population, average household sizes are relatively large Yunnan, 6.5 people per household. However, the wealthy families of Shidong village had even larger households, averaging eight

10 cf. conversation with information officer, Royal Botanic Gardens, London.

people per household. Unfortunately it is not possible to ascertain the labour power of these households, nor to determine their dependency ratios, but studies of these matters for other parts of China find that wealthier households tend to have more labour power, and lower dependency ratios, often only half as large, as those of poor households (Bramall and Jones, 1993; and Croll, 1993: as discussed in chapter 7).

The results for the SSB survey in 1985 of three villages in Shiping county, Honghe prefecture, provide some indication of the relationship between household size and levels of income. Paizhuqing was the poorest of the three villages with a per capita net peasant income of 234 *yuan*, and an average household size of 7.2 people. The middle village, in terms of income level, was Lijiawei, with a per capita net peasant income of 393 *yuan*, and 7.5 people per household on average. Yangjiazhuang was the wealthiest of the three villages sampled, with only 5.2 people per household, and a per capita net peasant income on 582 *yuan* (SPXZ, 1990: 388) As this is a minority area, where birth rates are high, and the average number of children per household tends to be higher than in China as a whole, it is not unreasonable to assume that the smaller household size in Yangjiazhuang reflects a smaller number of dependents than in the two poorer villages.

Mile county, a more prosperous member of Honghe prefecture, had a per capita NVAIO of 182 *yuan* in 1978 (105% of the provincial average) growing to 357 *yuan* in 1990 (101% of the provincial mean) with an annual growth rate of 5.8% (MLXZ, 1987: 737-8). In 1985, the average per capita net peasant income in Hongxi district was the highest in the county at 456 *yuan*, compared to Xisan district, with the lowest per capita net peasant income in the county, 183 *yuan*. Within these two districts were the villages with the highest and lowest per capita net peasant income

respectively. Zhaobei village in Hongxi had a per capita net peasant income of 575 *yuan*, 4.2 times the income level in Sanpo village (137 *yuan*) in Xisan (MLXZ, 1987: 738). Similarly in the mountainous districts there is evidence of divergence in per capita net peasant incomes, with Zhongzhai hamlet in Sijia village of Wushan district at the bottom of the income distribution, where per capita net peasant income was 253 *yuan* in 1985 compared to 428 *yuan* in Longzhu hamlet, Longtan village in Zhuyuan district. Unfortunately there are no time series data for these villages, so it is impossible to provide an indication of the trend in spatial inequality. However, for the specialist banana growing villages in Jinping county, it is evident from the source material that household incomes have increased greatly in the wake of decollectivization, pointing to an increase in inter-village inequality since 1978, in addition to the increases in spatial inequality between counties.

4. Determining the Groups for Further Analysis

The counties of Anhui and Yunnan were initially subject to a mobility-type analysis based on ranking counties by per capita NVAIO over the time period to identify patterns of differential growth. This procedure was found to produce some rather misleading results, since the change in rank is a relative measure, and is dependent on the ranks and growth rates of other counties. As a result, a simpler analysis has been employed, making use of the level of per capita NVAIO on average for 1978-80 and 1988-90, and the growth rate achieved between these two end points. This has enabled counties in each of these provinces to be grouped according to their economic performance over the reform period. This in turn had enabled an analysis of the underlying factors responsible for

these differentials in economic performance. The individual groups of counties are discussed in detail, and a variety of independent variables and their contributions to economic growth are also considered in the following chapters.

The analysis employed to divide the counties into different groups is quite simplistic. However, it involves the consideration of many factors simultaneously, requiring a three dimensional matrix, with per capita NVAIO for 1978-80 on the X-axis, per capita NVAIO for 1988-90 on the Y-axis, and the annual growth rate in per capita NVAIO from 1978 to 1990 on the Z-axis. All per capita NVAIO values are based on 1980 constant prices. In the end, three broad groups were decided upon for each of the axes. In all cases, the middle group was roughly one standard deviation wide, containing the mean value for that indicator, and set in relation to the distribution of the counties about the mean. The higher and lower groups were then defined as being above and below the upper and lower limits of this middle group respectively. This yields a 3 by 3 by 3 matrix of 27 cells, although no more than 14 cells are filled for either province.

As it is difficult to function in three dimensions with two dimensional media, in practice the counties for both provinces were sorted in to a 3 by 3 matrix based on per capita NVAIO for 1988-90, and the annual percentage growth rate in per capita NVAIO from 1978 to 1990. These groups were then subdivided based on the values of per capita NVAIO in 1978-80. This means that there are seven groupings for each province (in both cases two cells of the 3 by 3 matrix were empty), each of which may be divided into two or three sub-groups based on the 1978-80 values of per capita NVAIO.

For Yunnan the groups are defined on the following basis:

Table 5.3 - Criteria for Groups for Further Analysis, Yunnan

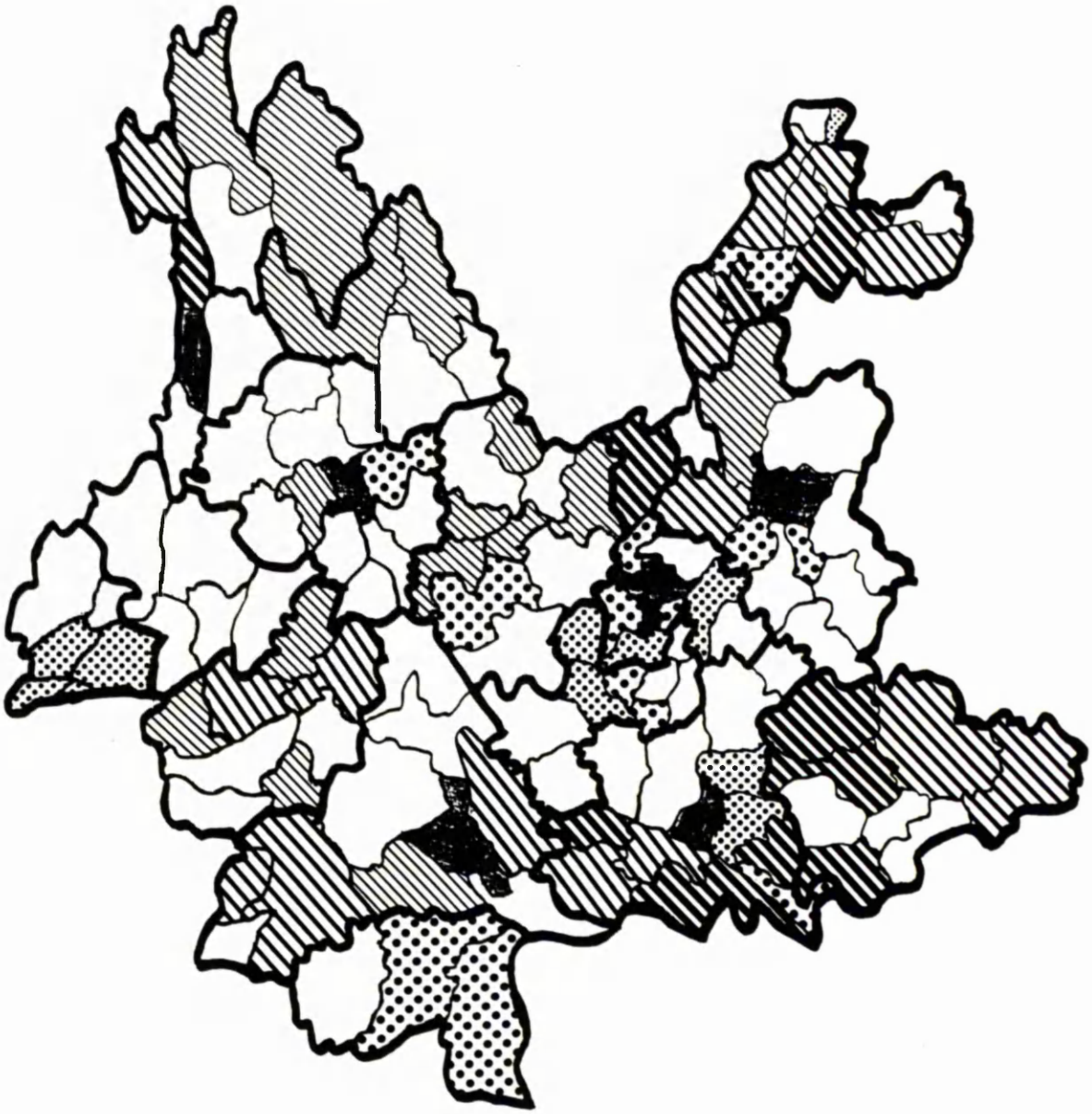
Group No.	pcNVAIO 1988-90	% an. Growth Rate pcNVAIO 1978-90	No. of Counties
1	401.0 + *yuan*	9.1 + %	13
2	401.0 + *yuan*	4.0 - 9.0 %	10
3	401.0 + *yuan*	<= 3.9 %	1
4	200.0-400.9 *yuan*	4.0 - 9.0 %	56
5	200.0-400.9 *yuan*	<= 3.9 %	15
6	<=199.9 *yuan*	4.0 - 9.0 %	16
7	<=199.9 *yuan*	<= 3.9 %	10

Where the mean value of 1988-90 per capita NVAIO was 332 *yuan*, with a standard deviation of 243. The distribution of counties by pc NVAIO 1988-90 looks quite similar to a Chi Squared distribution, with a long tail at the upper end of the output distribution. As a result the middle band is skewed somewhat towards the lower end of the output value scale.
Sources: As per table 5.2.

Within the first group, those at the top of the per capita NVAIO distribution and with the highest rates of growth, there are three distinguishable sub-groups. In the first sub-group, there are two counties, which have grown very rapidly, having started the reform period with per capita NVAIO below the lowest poverty line, or 125 *yuan*. The second sub-group is comprised of seven counties that in 1978-80 were between the upper and lower poverty lines, 125 to 225 *yuan*. Finally, in the third sub-group there are four counties that had per capita NVAIO in 1978-80 above the upper poverty line of 225 *yuan*. As all of these counties have experienced rapid economic growth, and are now at the top of the output distribution, they contribute greatly to the increased divergence in the standard of living, and as a result are examined in greater detail in chapter six.

The second group contains ten counties with high incomes, but only moderate rates of growth in per capita NVAIO from 1978 to 1990. None of these counties grew from below the lower poverty line for 1978-80, therefore there are only two sub-groups in this category. There were four counties that started the reform period with per capita NVAIO between the upper and lower poverty lines. The remaining six counties all had per capita NVAIO above 225 *yuan* in 1978-80. All of these counties are included

Spatial Inequality in Yunnan 1978-90
(Based on Real p.c. NVAIO, 1980 constant prices)



LEGEND

p.c. NVAIO 1988-90 <200 yuan
% g.r. 1978-90 ≤3.9%

p.c. NVAIO 1988-90 <200 yuan
% g.r. 1978-90 4.0 - 9.0%

p.c. NVAIO 1988-90 200 - 400 yuan
% g.r. 1978-90 ≤3.9%

p.c. NVAIO 1988-90 200-400 yuan
% g.r. 1978-90 4.0 - 9.0%

p.c. NVAIO 1988-90 400+ yuan
% g.r. 1978-90 ≤3.9%

p.c. NVAIO 1988-90 400+ yuan
% g.r. 1978-90 4.0 - 9.0%

p.c. NVAIO 1988-90 400 + yuan
% g.r. 1978-90 9.0+ %

Omitted urban areas, counties
with missing data, Lake Dian

in the analysis on prosperous counties in chapter six, as is the single county in group three. Shuifu county had very high per capita NVAIO at the end of the Maoist period, largely as a result of third front industrialization. It is located on the eastern-most fringes of the province on the Changjiang bordering Sichuan. The very high per capita NVAIO figure for 1978-80 has been little improved upon over the course of the reform period, with the county having one of the slowest rates of economic growth in the province as well.

The fourth group is a very large one, comprised of fifty six counties that are clustered around the mean values for both per capita NVAIO 1988-90, and the growth rate of per capita NVAIO 1978-90. As a result, the counties in this group have contributed little to exacerbating spatial inequality. The vast majority of these counties, forty nine, started the reform period with per capita NVAIO values between the two poverty lines, ending the period in the same band. The remaining seven counties were just below the lower poverty line in 1978-80, joining the ranks of the middle group by 1988-90. As both output values and growth rates are moderate for this group, they are omitted from further analysis.

The fifteen counties with per capita NVAIO in the middle range, but with slow rates of growth make up the fifth group of counties. None of the counties in this group started the reform period with per capita NVAIO below 125 *yuan*. Only three of these counties had per capita NVAIO above the upper poverty line in 1978-80, while the remaining twelve counties were in the middle per capita NVAIO group throughout the reform period, but all experienced below average rates of growth in per capita NVAIO. All of these counties are of interest in an examination of the causes of increasing divergence in living standards, and are included in the analysis of poor and stagnant counties in chapter seven.

There are sixteen counties with very low output levels at the end of the reform period, but with moderate rates of growth. These counties comprise group six. Fourteen of the total are in a sub-group which started the reform period with per capita NVAIO below the lower poverty line, while the remaining two counties started the reform period with per capita NVAIO between 125 and 250 *yuan*. The fourteen counties that started below the poverty line, are of particular interest, because they hold out some promise of progress to other poor counties, although all of the counties in this group will be studied in detail in chapter seven.

The final group of counties includes those with very low values of per capita NVAIO, below 200 *yuan*, in 1988-90, and experienced slow growth rates. Of the ten counties in this group, four started the reform period with per capita NVAIO between the two poverty lines, and the remaining six were below the lower poverty line in terms of per capita NVAIO in 1978-80. Why this group of counties has performed so poorly throughout the reform period is very important in understanding the forces behind increased spatial inequality and increased divergence in the standard of living. Appendix 5.1 contains a detailed list of all the counties of Yunnan and Anhui provinces by group and subgroup, flagging those for further investigation in chapters six and seven.

The groups of counties for Anhui are determined by the following criteria given in table 5.4. There are ten counties in the first group, all of which have high values of per capita NVAIO 1988-90. These ten counties can then be further divided into two sub-groups, those between the two poverty lines in 1978-80 (six counties), and the remaining four counties which started the reform period above the upper poverty line of 225 *yuan*. As these counties had a high per capita NVAIO and experienced rapid growth, they have been important contributors to the increasing

divergence in living standards among counties, and shall be discussed in detail in chapter six.

Table 5.4 - Criteria for Groups for Further Analysis, Anhui

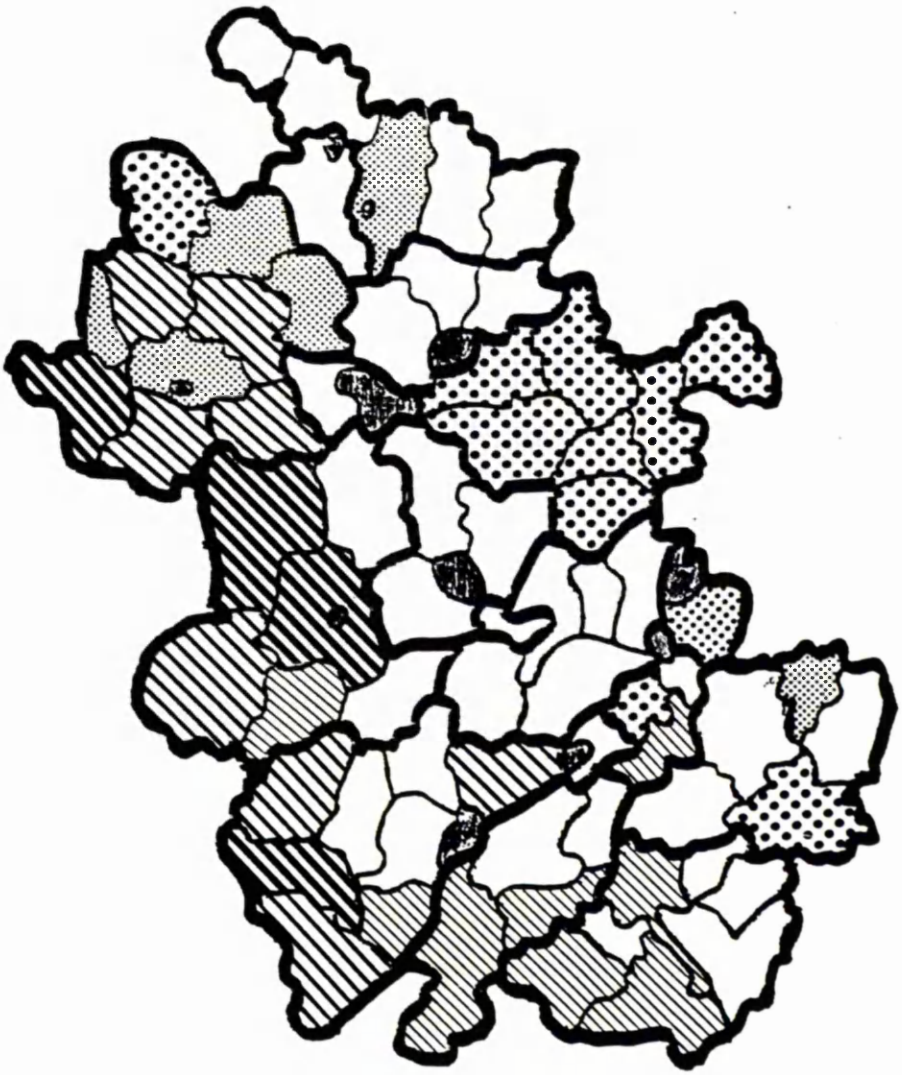
Group No.	pcNVAIO 1988-90	% an. Growth Rate pcNVAIO 1978-90	No. of Counties
1	451 + *yuan*	11.0 + %	10
2	451 + *yuan*	6.0 - 10.9 %	1
3	251 - 450 *yuan*	11.0 + %	6
4	251 - 450 *yuan*	6.0 - 10.9 %	33
5	251 - 450 *yuan*	<= 5.9 %	8
6	<=250 *yuan*	6.0 - 10.9 %	8
7	<=250 *yuan*	<= 5.9 %	4

Where the mean value of 1988-90 per capita NVAIO was 363 *yuan*, with a standard deviation of 130. The distribution of counties by pc NVAIO 1988-90 looks quite similar to a Chi Squared distribution, with a long tail at the upper end of the output distribution. As a result the middle band is skewed somewhat towards the lower end of the output value scale.
Sources: As per table 5.2.

The second group contains only a single county that throughout the reform period has remained above the upper poverty line, but has experienced only moderate growth, by Anhui standards at least. Dangtu county is also included in the analysis in chapter six. The final group of counties from Anhui for examination in chapter six, are those six counties in group three that have incomes only in the middle of the distribution, but that have grown very rapidly during the reform period. Two of these counties started the period with per capita NVAIO below 125 *yuan*, while the remaining four counties started the period between the two poverty lines.

The fourth group is comprised of thirty three counties that have contributed little to the changes in spatial inequality and the standard of living. As with the similar groups of counties in Yunnan, they are therefore omitted from the analysis in the remaining chapters of this dissertation. They all started the reform period with per capita NVAIO levels between the two poverty lines, and remained within the middle per capita NVAIO group in 1988-90. Their per capita NVAIO growth rates 1978-90 were average as well.

Spatial Inequality in Anhui 1978-90
(Based on Real p.c. NVAIO, 1980 constant prices)



LEGEND

- p.c. NVAIO 1988-90 250 yuan
  % g.r. 1978-90 5.9%
- p.c. NVAIO 1988-90 250 yuan
  % g.r. 1978-90 6.0 - 10.9 %
- p.c. NVAIO 1988-90 251-450 yuan
  % g.r. 1978-90 5.9%
- p.c. NVAIO 1988-90 251-450 yuan
  % g.r. 1978-90 6.0 - 10.9 %
- p.c. NVAIO 1988-90 251-450 yuan
  % g.r. 1978-90 11+ %
- p.c. NVAIO 1988-90 451+ yuan
  % g.r. 1978-90 6.0 - 10.9 %
- p.c. NVAIO 1988-90 451+ yuan
  % g.r. 1978-90 11+ %
- Omitted Urban Areas

There were eight counties in 1988-90 with middle range values of per capita NVAIO, and slow growth rates. Initially these counties had been near the top of the output distribution, but they have stagnated relative to the more dynamic counties of groups one through three. This fifth group can be divided into two sub-groups. One, with two counties, had per capita NVAIO above 225 *yuan* in 1978-80, while the remaining six counties had per capita NVAIO between the two poverty lines in 1978-80. The relative stagnation of these counties warrants their inclusion in chapter 7, particularly those closest to the top of the output distribution in 1978-80 which had the lowest growth rates.

The sixth group is comprised of eight poor counties that had moderate growth rates during the reform period, and are therefore included for examination in chapter seven. Five of these counties were below the lower poverty line in 1978-80, and comprise the first sub-group, while the remaining three counties had per capita NVAIO between the two poverty lines in 1978-80, making up the second sub-group. The final group includes four poor counties with very slow growth rates and are therefore included in the analysis is chapter seven. Three of the four counties started the reform period with per capita NVAIO between the two poverty lines, and have since declined in status, making up the first sub-group, while the remaining county has been below the poverty line throughout the reform period, and makes up the final sub-group.

5. Conclusion

In total there are 102 counties included in the analysis in chapters six and seven, while 87 counties are omitted due to their unexceptional economic performance during the reform period. These counties made little

contribution to the changes in the distribution of the standard of living in either province. Therefore they could be expected to cloud an analysis of the trends underlying the changes over the reform period. Chapter six instead focuses on the counties with high standards of living and with the highest rates of economic growth for both Anhui and Yunnan. This group should provide a clear insight in to the factors that contribute to economic success. The individual counties are outlined in appendix 5.1. In summary, there are 17 counties from Anhui included in the analysis, and 24 from Yunnan. The groups of counties will be examined across a broad range of indicators in each of four principal categories: agriculture, industry, 'services', and capabilities.

Under agriculture, trends in yields, sown area, and output volumes for grain and cash crops are examined (as also is the use of chemical fertilizer) to gain an impression of the performance of each group and sub-group. The provincial average will be referred to as a point of reference in these analyses. In the section on industry, growth in the industrial output value and industry's share in NVAIO is examined, as is the balance between state industry and *xiangzhen gongye* (township and village industry). The third section examines the growth of the *xiangzhen qiye* (township and village enterprises) sector, *xiangzhen qiye* as a proportion of gross material product, and finally the balance between industrial and non-industrial output in *xiangzhen qiye*. There is also an analysis of the composition of NDMP, and the sectoral contributions to NDMP growth. The final section, covering capabilities, focuses on death rates and illiteracy, as was the case in chapter four.

Chapter seven mirrors the analytical structure of chapter six, but concentrates instead on the poorest counties, and the ones with the slowest rates of economic growth. In total sixty one counties are examined in

chapter seven, twenty from Anhui and forty one from Yunnan. The synthesis of the analysis in chapters six and seven is reserved for the concluding chapter of the dissertation.

Appendix 5.1

Counties of Anhui and Yunnan by Group and Sub-groups

A Anhui:

1. Per capita NVAIO 1988-90 451 + *yuan*, 11 + % growth rate per capita NVAIO 1978-90.
   Ten counties, examined in chapter six.

a. Per capita NVAIO 1978-81 125.0 - 224.9 *yuan*, six counties.
   Fanchang; Boxian; Dingyuan; Fengyang; Jiashan; Ningguo.

b. Per capita NVAIO 1978-81 225 + *yuan*, four counties.
   Chuzhou; Tianchang; Lai'an; Quanjiao.

2. Per capita NVAIO 1988-90 451 + *yuan*, 6.0 - 10.9 % growth rate per capita NVAIO 1978-90.
   One county, examined in chapter six.

a. Per capita NVAIO 1978-81 225 + *yuan*, one county.
   Dangtu.

3. Per capita NVAIO 1988-90 250 - 450 *yuan*, 11 + % growth rate per capita NVAIO 1978-90.
   Six counties, examined in chapter six.

a. Per capita NVAIO 1978-81 <= 124.9 *yuan*, two counties.
   Fuyang; Jieshou.

b. Per capita NVAIO 1978-81 125.0 - 224.9 *yuan*, four counties.
   Guoyang; Mengcheng; Su; Langxi.

4. Per capita NVAIO 1988-90 250 - 450 *yuan*, per capita NVAIO 1978 -81 125.0 - 224.9 *yuan*, 6.0 - 10.9 % growth rate per capita NVAIO 1978-90.
   Thirty three counties, excluded from further examination.

   Changfeng; Feixi; Feidong; Wuhu; Qingyang; Huaiyuan; Wuhe; Guzhen; Fengtai; Suixi; Tongling; Dongshan; Xiao; Lingbi; Si; Shou; Shucheng; Xuancheng; Guangde; Jing; Chaohu; Lujiang; Wuwei; Hanshan; He; Jixi; Jingde; She; Yi; Huaining; Tongcheng; Qianshan; Guichi.

5. Per capita NVAIO 1988-90 250 - 450 *yuan*, <=5.9 % growth rate per capita NVAIO 1978-90.
   Eight counties, examined in chapter seven.

a. Per capita NVAIO 1978-81 125.0 - 224.9 *yuan*, six counties.
   Nanling; Huoshan; Xiuning; Shitai; Wangjiang; Dongzhi.

b. Per capita NVAIO 1978-81 225 + *yuan*, two counties.
   Qimen; Huangshan.

6. Per capita NVAIO 1988-90 <= 249.9 *yuan*, 6.0 - 10.9 % growth rate per capita NVAIO 1978-90.
Eight counties, examined in chapter seven.

a. Per capita NVAIO 1978-81 <= 124.9 + *yuan*, five counties.
Taihe; Funan; Jinzhai; Zongyang; Yuexi.

b. Per capita NVAIO 1978-81 125.0 - 224.9 *yuan*, three counties.
Yingshang; Lixin; Susong.

7. Per capita NVAIO 1988-90 <= 249.9 *yuan*, <= 5.9 % growth rate per capita NVAIO 1978-90.
Four counties, examined in chapter seven.

a. Per capita NVAIO 1978-81 <= 124.9 + *yuan*, one county.
Linquan.

b. Per capita NVAIO 1978-81 125.0 - 224.9 *yuan*, three counties.
Liu'an; Huoqiu; Taihu.

B Yunnan:

1. Per capita NVAIO 1988-90 400.1 + *yuan*, 9.1 + % growth rate per capita NVAIO 1978-90.
Thirteen counties, examined in chapter six.

a. Per capita NVAIO 1978-81 <=124.9 *yuan*, two counties.
Hekou; Binchuan.

b. Per capita NVAIO 1978-81 125.0 - 224.9 *yuan*, seven counties.
Chenggong; Fumin; Zhaotong; Malong; Chuxiong; Tonghai; Mengla.

c. Per capita NVAIO 1978-81 225 + *yuan*, four counties.
Anning; Qujing; Yuxi; Jinghong.

2. Per capita NVAIO 1988-90 400.1 + *yuan*, 4.0 - 9.0 % growth rate per capita NVAIO 1978-90.
Ten counties, examined in chapter six.

a. Per capita NVAIO 1978-81 125 - 224.9 + *yuan*, four counties.
Yiliang; Mengzi; Luxi; Longchuan.

b. Per capita NVAIO 1978-81 225 + *yuan*, six counties.
Jinning; Yimen; Eshan; Kaiyuan; Ruili; Wangding.

3. Per capita NVAIO 1988-90 400.1 *yuan*, <= 3.9 % growth rate per capita NVAIO 1978-90.
One county, examined in chapter six

a. Per capita NVAIO 1978-81 225 + *yuan*, one county.
Shuifu.

4. Per capita NVAIO 1988-90 200 - 400 *yuan*, 4.0 - 9.0 % growth rate per capita NVAIO 1978-90.
Fifty four counties, excluded from further examination.

a. Per capita NVAIO 1978-81 <= 124.9 *yuan*, seven counties.
Xichou; Jiangcheng; Nanjian; Weishan; Yunlong; Lincang; Cangyuan.

b. Per capita NVAIO 1978-81 125 - 224.9 + *yuan*, forty seven counties.

Songmin; Lunan; Dongchuan; Suijiang; Weixin; Xuanwei; Fuyuan; Luoping; Shigong; Luliang; Shuangbai; Dayao; Yuanmou; Lufeng; Jiangchun; Chengjiang; Huaining; Xinping; Jianshui; Shiping; Mile; Luxi; Wenshan; Malipo; Jingdong; Jinggu; Zhenyuan; Menglian; Mengbai; Xiangyun; Midu; Yongping; Eryuan; Jianchuan; Heqing; Baoshan; Shidian; Tengchong; Longling; Changning; Lianghe; Yingjiang; Yongsheng; Lushui; Lanping; Weixi; Gengma.

5. Per capita NVAIO 1988-90 200 - 400 *yuan*, <=3.9 % growth rate per capita NVAIO 1978-90.
Fifteen counties, examined in chapter seven.

a. Per capita NVAIO 1978-81 125.0 - 224.9 *yuan*, twelve counties.
Huize; Mouding; Nanhua; Yao'an; Wuding; Yangbi; Lijiang; Ninglang; Deqen; Fengqing; Zhenkang; Shuangjiang.

b. Per capita NVAIO 1978-81 225 + *yuan*, three counties.
Yongren; Simao; Zhongdian.

6. Per capita NVAIO 1988-90 <= 199.9 *yuan*, 4.0 - 9.0 % growth rate per capita NVAIO 1978-90.
Sixteen counties, examined in chapter seven.

a. Per capita NVAIO 1978-81 <= 124.9 + *yuan*, fourteen counties.
Qiaojia; Yanjin; Daguan; Yongshan; Zhenxiong; Yunyang; Luchun; Guangnan; Funing; Mojiang; Lancang; Ximeng; Gongshan; Yun.

b. Per capita NVAIO 1978-81 125.0 - 224.9 *yuan*, two counties.
Xundian; Yongde.

7. Per capita NVAIO 1988-90 <= 199.9 *yuan*, <= 3.9 % growth rate per capita NVAIO 1978-90.
Ten counties, examined in chapter seven.

a. Per capita NVAIO 1978-81 <= 124.9 + *yuan*, six counties.
Luquan; Ludian; Yiliang; Honghe; Jinping; Fugong.

b. Per capita NVAIO 1978-81 125.0 - 224.9 *yuan*, four counties.
Pingbian; Yanshan; Maguan; Qiubei.

Chapter 6

Rich and Fast Growing Counties in Anhui and Yunnan

1. Introduction

This chapter, the first of two examining the counties of Anhui and Yunnan, investigates the factors and agents underlying the apparent economic prosperity and rapid economic growth in these counties since 1978. Some counties have achieved this prosperity through rapid economic growth, starting from various levels of per capita NVAIO in the early reform period. Others started the period with very high levels of per capita NVAIO, and due to average-to-below-average growth rates, have declined somewhat in relative terms. However, due to the large advantage held by these counties at the beginning of the reform period, they remain advantaged in terms of material living standards.

The chapter will outline the relative roles of the primary, secondary and tertiary sectors in the economic success of these counties. In particular productivity gains in agricultural production[1] are highlighted as a source of investible surplus and higher incomes, leading to multiplier-based expansion of demand in rural economy. In general these gains in agricultural productivity occurred in the early 1980s setting the stage for the boom in the industrial and 'service' sectors in the latter half of the 1980s. At this point the experiences of Anhui and Yunnan diverge, because it was privately and collectively owned enterprises that were crucial to economic growth in the late 1980s in Anhui. In Yunnan, by contrast, it was the state industrial sector in tandem with increased agricultural productivity in the late 1980s that underlay the economic success stories.

The discussion in this chapter leads to the conclusion that there is a

[1] As measured by increases in yields per unit sown area.

significant gap between the level of development in Anhui and Yunnan. This is a theme which is taken up again in the conclusion.[2] The differential levels of development were particularly apparent in the comparison of agricultural production in Anhui and Yunnan that appeared in the introductory chapter. In terms of yields of principal food crops, use of chemical fertilizer, the multiple cropping index, and the area of land under irrigation. Yunnan lags behind both Anhui, and the China average. These factors are reflected in the smaller agricultural surplus for Yunnan, which has been instrumental in reinforcing the importance of state-run industry in the province. The smaller the agricultural surplus, the smaller the pool of funds for collective or private investment, and also incidentally, the smaller the pool of funds in the hands of local government for the provision of health care and education. Similarly lower incomes may be assumed to result in a smaller demand stimulus. The later date of decollectivization in Yunnan, relative to Anhui, has added further to the time-lag effect resulting from differential levels of development in 1978, or 1949[3]. The question of health care and education can be difficult to interpret in Yunnan, due to the large levels of aid received by some poor counties (and not so poor counties such as Jinghong) from the provincial or national government. In some places, such as Xishuang Banna, international aid agencies such as the Red Cross and the World Health Organization are also active, particularly in the health care sector.

The second section of the chapter examines those counties that started the reform period with moderate to high levels of per capita NVAIO, and have achieved the highest levels of per capita NVAIO in 1988-90, with high rates of growth from 1978-90. For Anhui, this section includes a group of ten counties

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[2] The question being, will it be possible for Yunnan to 'catch up' to either Anhui's current level, or future levels, of development? This of course also applies to any poor province of China, and provinces such as Jiangsu and Guangdong.

[3] This statement ignores the significant decline in economic, and in particular agricultural, growth since 1985 in Anhui, as a result of institutional constraints preventing agricultural modernization.

which all had per capita NVAIO in excess of 450 *yuan* in 1988-90 and growth rates in per capita NVAIO over 11% per annum for 1978-90. In Yunnan there is a group of thirteen counties that had per capita NVAIO in excess of 400 *yuan* in 1988-90, and growth rates in excess of 9% per annum, as was outlined in chapter 5. The third section of this chapter then examines the counties in Anhui and Yunnan which started the reform period at the top of the per capita NVAIO distribution, but which experienced only moderate to poor rates of economic growth. In Yunnan these counties can be divided into two groups. The first contains ten counties that have had moderate rates of growth; but due to the large gap between these counties and the provincial average in the early reform period they have managed to maintain a position in the upper portion of the distribution (even though they were increasingly being challenged by counties with faster growth in the late 1980s. The second group contains a single county that has had a very low rate of growth, but due to its high level of industrialization and high per capita NVAIO levels in 1978-81 has remained near the top of the income distribution. The future of this location is however, in some doubt due to the very high concentration of state-run heavy industry from the 'third front' development campaign[4]. There is only one county from Anhui included in this section, and that had a moderate rate of economic growth (4-11% per annum). The fourth section examines a group of six counties in Anhui which grew very rapidly from relatively disadvantaged positions in 1978-81 to be in the upper-middle portion of the distribution in 1988-90. The final section in this chapter contains the conclusions regarding sources of economic growth in Anhui and Yunnan. Unless otherwise cited, all the data presented in the text are drawn from the tables presented at the end of the chapter.

[4] See Naughton, 1988: 351-86; and ZGGYPC vol.2, 1989, for more information on third front industrialization.

2. Rich and Fast Growth Counties in Anhui and Yunnan

a. Anhui

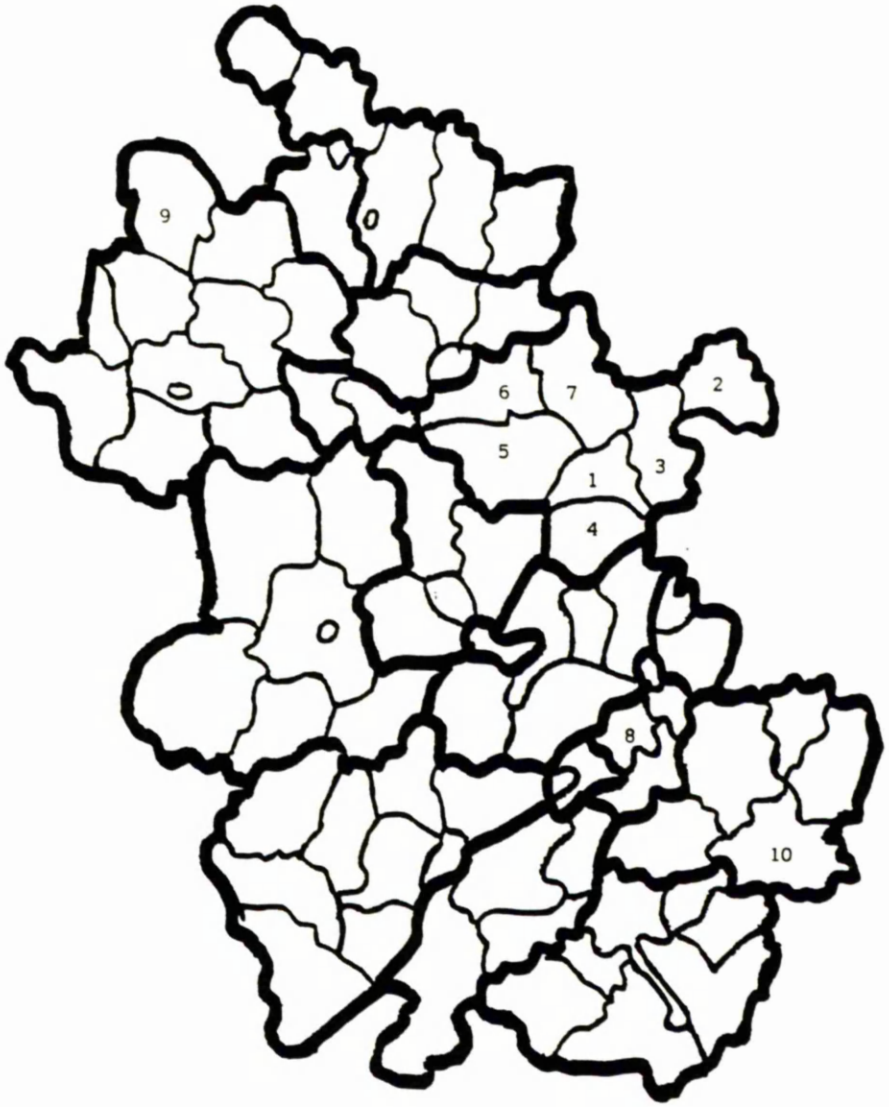
The ten counties in Anhui that by 1988-90 had achieved high values of per capita NVAIO (over 450 *yuan*) and had high rates of growth for per capita NVAIO from 1978 to 1990 (over 11% per annum) are spatially highly concentrated. Seven of the ten counties comprise Chuxian prefecture, which is bordered on two sides by southern Jiangsu and by the industrial core of Anhui on the other two sides. By Anhui standards, this is an area blessed both in terms of the availability of arable land and transportation links. The remaining three counties in this group are scattered across the province, but share with the Chuxian counties favourable conditions of agricultural production and good infrastructure. While economic growth was rapid in these counties, the crude death rate (CDR) also increased significantly from 5.11 deaths per thousand population in 1981 to 11.41 in 1989, at an annual growth rate of 10.6%. The provincial average (rural population only) was 5.66 in 1981, increasing to 9.66 in 1989 at a rate of 6.9% per annum. This points to significant declines in absolute and relative living standards in these counties, based on mortality data.

i. Chuxian Prefecture

The seven counties of Chuxian prefecture achieved spectacular growth over the reform period.[5] However, many of these counties entered the reform period at the top end of the distribution, and remained there through rapid rates of economic growth, thereby greatly increasing spatial inequality. Chuzhou, Tianchang, Lai'an, and Quanjiao counties all had per capita NVAIO values above

[5] The seven counties of Chuxian prefecture are: Chuzhou, Tianchang, Lai'an, Quanjiao, Fengyang, Dingyuan and Jiashan.

Anhui: Rich and Fast Growth Counties, 1978-90



LEGEND

1.Chuzhou
2.Tianchang
3.Lai'an
4.Quanjiao
5.Dingyuan
6.Fengyang
7.Jiashan
8.Fanchang
9.Bo
10.Ningguo

250 *yuan* in 1978-80. The remaining three counties started the reform period with per capita NVAIO of 125 to 250 *yuan*, the middle category, and not the conditions of abject poverty that are generally associated with Fengyang county (although some villages were indeed impoverished) and its two close neighbours Dingyuan and Jiashan counties.

Table 6.1a Anhui Rich and Fast Growth, Grain Output 1980-90

County	Yields, Tonnes/Ha. 1980	1985	1990	% Growth Rate Sown Area 1980-90	Output 1980-90	Yields 1980-90
Fanchang	3.2	4.9	5.6	-1.2%	4.6%	5.8%
Bo	1.8	2.5	3.4	0.1%	6.8%	6.6%
Chuzhou	3.8	6.4	6.6	0.9%	6.6%	6.8%
Tianchang	3.8	7.0	7.5	0.7%	7.7%	7.0%
Lai'an	3.5	5.1	6.1	1.1%	6.7%	5.7%
Quanjiao	4.4	6.9	7.3	1.0%	6.1%	5.2%
Dingyuan	2.2	3.6	5.1	0.6%	9.3%	8.8%
Fengyang	2.7	4.4	4.9	1.7%	8.0%	6.1%
Jiashan	2.6	3.9	4.7	0.8%	6.9%	6.1%
Ningguo	2.7	4.1	3.9	-1.2%	2.7%	3.7%
Anhui mean	3.1	4.0	4.3	0.4%	5.4%	3.3%

Sources: ZGFX 1980-87: passim.; 1990: passim.

Agriculture played an important role in the rapid rate of economic growth in the prefecture. All counties had above average growth rates in the use of chemical fertilizer[6], ranging from 11% in Fengyang county, which has had an above average use of chemical fertilizer throughout the 1980s, to 17% in Quanjiao, which started the reform period with a relatively low use of chemical fertilizer, but by 1990 was well above the provincial average. This compares to an average growth rate in chemical fertilizer use for Anhui as a whole of 10.6% per annum for 1980-90.

In 1980, the average yield for food grains for the counties of Chuxian prefecture was 3.3 tonnes per hectare (based on sown area), ranging from 2.2

[6] Chemical fertilizer was the one indicator for which county-level data were readily available. As a result, it is taken as being indicative of the extent to which agricultural infrastructure posed a constraint to increased agricultural production. The data presented in the introductory chapter on agricultural infrastructure at a provincial level had trends largely corresponding to those for chemical fertilizer, in that the periods of most rapid expansion occurred during the late Maoist period, while growth rates slowed or stagnated since 1978.

tonnes per hectare in Dingyuan county to 4.4 tonnes per hectare in Quanjiao.[7]

Table 6.1b Anhui Rich and Fast Growth, Oil Seed Output 1980-90

County	Yields, Tonnes/Ha. 1980	1985	1990	% Growth Rate Sown Area 1980-90	Output 1980-90	Yields 1980-90
Fanchang	1.0	1.4	1.4	9.6%	12.8%	3.4%
Bo	0.6	1.0	1.2	2.3%	8.9%	7.2%
Chuzhou	1.2	1.5	1.8	6.8%	11.4%	4.1%
Tianchang	1.0	1.8	1.7	12.1%	18.5%	5.4%
Lai'an	1.0	1.2	1.7	11.3%	17.1%	5.4%
Quanjiao	1.6	2.2	2.2	7.8%	11.0%	3.2%
Dingyuan	1.3	1.7	1.6	10.4%	12.5%	2.1%
Fengyang	1.3	1.6	1.5	7.1%	8.5%	1.4%
Jiashan	1.2	1.4	1.5	11.4%	14.0%	2.3%
Ningguo	0.5	1.0	1.2	3.1%	12.2%	9.1%
Anhui mean	1.1	1.4	1.3	5.8%	9.5%	0.9%

Sources: ZGFX 1980-87: passim.; 1990: passim.

In 1980, for Anhui as a whole, the average yield for food grains was 3.1 tonnes per hectare, while for China it was only 2.8 tonnes per hectare (ZGNYNJ, 1981)[8]. In 1980 these counties already had food grain yields 6% in excess of the national average. By 1990 the gap had widened significantly, as grain yields increased more rapidly in Chuxian than elsewhere. Food grain yields grew by an average of 6.2% per annum from 1980 to 1990 in Chuxian prefecture compared to 3.3% per annum for both Anhui and China. In 1990 the average yield for food grains in Chuxian prefecture was 6.03 tonnes per hectare, ranging from 4.7 tonnes per hectare in Jiashan to a high of 7.5 tonnes per hectare in Tianchang. The Chuxian average in 1990 represented 140% of the Anhui average grain yield and 152% of the China average (3.93 tonnes per Ha.) in the same year. Throughout the 1980s, the area devoted to food grain production increased modestly in all of these counties, adding further evidence to the

[7] In 1990 Dingyuan county was the ninth largest producer of oil bearing crops in China, and 38th largest producer of food grain. In the same year Quanjiao and Tianchang were also among the top 100 oil bearing crop producers - measured only in terms of total output volume - ranking thirty-second, forty-eighth and seventy-ninth respectively. Eight other counties from Anhui also ranked among the top 100 counties in terms of oil bearing crops in China. Tianchang also ranked in the top 100 Chinese counties in terms of grain output, along with Bo - discussed below - and seven other counties in Anhui. (ZGFX, 1991: 242-7)

[8] In 1992, the national average grain yield was 2.73 (ZGTJNJ, 1993: 358-64.).

assertion that agricultural production in general, and basic crop farming in particular (such as food grains and oil crops) provided the stimulus for rapid economic growth.

Table 6.1c Anhui, Rich and Fast Growth, Chemical Fertilizer Use 1980-90

County	Use, K.Tonnes 1980	1985	1990	% Growth Rate 1980-90
Fanchang	3.6	5.5	8.2	8.6%
Bo	11.3	21.3	35.1	12.0%
Chuzhou	4.5	10.5	15.8	13.4%
Tianchang	8.9	17.9	31.0	13.3%
Lai'an	4.6	12.3	18.9	15.2%
Quanjiao	5.0	15.7	23.7	16.8%
Dingyuan	10.6	28.0	43.0	15.1%
Fengyang	11.8	25.4	33.1	10.8%
Jiashan	4.8	12.0	19.6	15.2%
Ningguo	2.1	3.1	2.6	2.4%
Anhui mean	7.3	24.3	26.0	10.6%

Sources: ZGFX 1980-87: passim.; 1990: passim.

The expansion in oil seed production in Chuxian prefecture was equally impressive during the 1980s. The growth rate for the area devoted to the production of oil crops in the region varied from 6.8% in Chuzhou to 12.1% per annum in Tianchang, while output grew at an average rate of 13.3% per annum in the prefecture as a whole. Yields grew from 1.2 tonnes per hectare for the prefecture in 1980 to 1.7 tonnes per hectare in 1990 at a rate of 3.5% per annum. This represented 124% of the national yield in 1980, and 116% in 1990, or 111% and 143% respectively for Anhui as a whole. Quanjiao, which ranked thirty-second in the country for oil crop output had a yield of 2.2 tonnes per hectare which is very high in the China context.[9]

Much of the improvement in yields occurred in the early reform period (1980-85) with slower growth rates for 1985-90 (as per the national trends). It was this early expansion in agricultural production, in response to

[9] U.K. oil crop production yielded 1.7 tonnes per hectare from 1982 to 1992 for linseed, and 2.8 tonnes per hectare of oil seed rape over the same period. (Mr. B. Hayes, Ministry of Agriculture, Fisheries and Food, London.) Since the vast majority of Anhui's oil crops are sesame seed, linseed, sunflower seed, and peanuts, and not rape seed, the performance of these counties in Chuxian prefecture compares favourably with that of farms in Britain.

decollectivization and price reform, that provided the investible surpluses and increased incomes which fuelled the growth in the non-farm sector that is evident from 1984 on. For Chuxian prefecture, grain yields increased by 10.1% per annum from 1980 to 1985, and by only 2.5% per annum in 1985-90[10]. Similarly the growth rate in oil crop yields was 5.8% per annum for 1980-85, falling to 1% per annum for 1985-90. Although improvements in yields were sustained in the late 1980s, it is the rapid expansion from 1980 to 1985 that fuelled economic growth in the non-farm sector.[11]

There can be little doubt that the counties of Chuxian prefecture entered the reform period with advantages over other counties in Anhui. In 1978, all of them had significant shares of industry in NVAIO. Chuzhou, Quanjiao, Fengyang and Jiashan had above average shares of industry in NVAIO in 1978, while the remaining three counties were just below the provincial average of 14.8%. By 1984, only Dingyuan county lagged behind the provincial average of 16.3% for industry's share in NVAIO. By 1988 more than 50% of NVAIO came from industry in Chuzhou and Tianchang, while in Quanjiao, Fengyang and Jiashan more than 40% of NVAIO was contributed by industry. The growth rates in per capita real NVIO for 1978-88 and 1984-88 reflect this, with prefectural growth rates averaging 22.6% and 34% respectively, which is above the provincial average of 17.9% for 1978-88 and 30% for 1984-88. This rapid industrial growth was from a large industrial base.

In 1983 the prefectural average for real per capita NDMP, at 1980 constant prices, was 441 *yuan*, and this increased at a rate of 22.5% per annum to 1489 *yuan* in 1989.[12] For the province as a whole real per capita NDMP

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10 For the national average, the growth rates were 4.7% per annum for 1980-5, and 2.4% for 1985-90 (ZGTJNJ, 1993: 358-364).

11 See the conclusion (chapter eight)and Bramall and Jones (1993: 52-58) for a discussion of why investment funds flowed from agriculture to industry, due to structural impediments to agricultural modernization in the 1980s.

12 Data on per capita NDMP are only readily available from 1983 for the counties of Anhui, thus omitting important changes in the earliest reform years.

started at 279 *yuan* in 1983, increasing to 674 *yuan* in 1989 at an average annual growth rate of 15.8%. The gap between per capita NDMP in Chuxian prefecture and Anhui as a whole widened from 58 % in 1983 to 121 % in 1989. This signals a significant increase in spatial inequality, and similar trends can be seen evolving within the prefecture itself, where the coefficient of variation increased from 0.168 in 1983 to 0.583 in 1989, or the ratio of highest to lowest real per capita NDMP within the prefecture grew from 1.77 in 1983 to 3.76 in 1990.

Table 6.1d Industrial Output in NVAIO and Growth, For Counties 1978-90

County	NVIO % of NVAIO 1978	1984	1990	% Growth Rate Real p.c. NVIO 1978-88	1984-88
Fanchang	25.8%	32.7%	60.9%	22.9%	40.6%
Bo	11.9%	12.9%	37.6%	26.7%	50.6%
Chuzhou	25.3%	30.9%	56.5%	20.5%	27.4%
Tianchang	14.6%	18.1%	51.4%	26.4%	42.3%
Lai'an	12.6%	17.5%	29.2%	24.9%	38.0%
Quanjiao	18.9%	19.7%	42.9%	19.8%	30.8%
Dingyuan	11.5%	12.3%	23.4%	20.5%	30.1%
Fengyang	17.6%	16.6%	41.4%	24.2%	37.3%
Jiashan	18.0%	18.9%	42.7%	22.1%	38.1%
Ningguo	15.9%	24.3%	81.3%	25.1%	48.2%
Anhui mean	14.8%	16.3%	36.1%	17.9%	30.0%

Sources: AHNJ 1985: 325-525; 1990: 241-357; YNTJNJ 1990: 105-9, 170-4, 245-9; 1991: 601-610, 636-640, 676-680.

The XZQY (township and village enterprise) sector had grown to in excess of 50% of GMP (gross material product) in 1988 in all but Dingyuan, where the share nevertheless exceeded the provincial average. In 1984, the figure was below 20% of GMP throughout the prefecture, and most counties fell below the provincial average of 13.2%. This riding share was achieved by virtue of growth rates for the XZQY sector ranging from 42% to 121% per annum. For the prefecture as a whole it is possible to show that industry has been the dominant sector in XZQY for 1984-88, with 58% of XZQY coming from industry in 1984, falling to 55% in 1988. 'Services' - transportation, construction and commerce - have grown more quickly than industry. Perhaps more significant is

the very rapid increase in the share of XZGY (township and village industry) in total industrial output. In Chuxian prefecture, XZGY accounted for only 38% of GVIO in 1984, which equals the average for all counties studied in chapters six and seven. By 1988 XZGY accounted for 64% of GVIO in Chuxian prefecture, compared to 54% for all the Anhui counties studied in chapters 6 and 7.[13] This, however, masks two very different trends that can be identified within Chuxian prefecture. Chuzhou and Dingyuan experienced rapid increases in the value of XZGY over the period 1984-88, but the sector started its growth from a small base relative to state industry in both; 13.6% to 33.9% for Chuzhou, and 19.6% to 34.7% for Dingyuan for 1984 and 1988 respectively. Tianchang and Fengyang, by contrast, had relatively high and increasing shares of XZGY in GVIO from 1984 to 1988; 53.6% to 65.4% and 56.4% to 58.1% respectively, with a rather slower rate of increase in Fengyang. Unfortunately there are internal inconsistencies and missing data for either 1984 or 1988 for the remaining three counties in the prefecture. However, Lai'an and Quanjiao appear to fit the 'high share of XZGY in GVIO' model, while Jiashan appears to have a very significant state industrial sector, similar to Chuzhou and Dingyuan counties. Despite the absolute values of the shares of XZGY in GVIO in the counties of Chuxian prefecture, it can be concluded that the township and village industrial sector was highly dynamic - due to increased shares of total industrial output - leading growth within the industrial sector as a whole.

An examination of industry among township and village enterprises - XZQY - (as opposed to agriculture, transportation, construction and commerce which make up the non-industrial portion of XZQY) shows a slight decline in the importance of industry, although from a very large base. In 1984, 58% of XZQY output in Chuxian prefecture came from industrial enterprises, compared to 48%

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13 This group of rich and poor counties represent 53% of all counties in Anhui. The data for the remaining thirty-three counties are very sketchy, and no provincial average can be taken from aggregate statistics. As this approximation includes those at the two extremes of the output distribution, it should provide a reasonable approximation of the provincial average.

for all Anhui counties included in chapters six and seven. In 1988 township and village industries accounted for 55% of all XZQY output in Chuxian prefecture; this shows a slight decline in industry's share as a result of the rapidly growing 'service' sector. This is consistent with rural-based modern sector enlargement growth, where higher rural incomes promote the establishment of light industry and services, and support greater consumption of goods and services. A similar trend is apparent for all counties examined in chapters six and seven when taken in the aggregate. 48% of XZQY came from industrial enterprises in 1984, but only 45% in 1988. The decline is of a similar magnitude (small) to that experienced in Chuxian prefecture, but the difference in proportions illustrates the higher level of industrialization in Chuxian prefecture relative to rural Anhui as a whole.

Table 6.1e Anhui, Rich and Fast Growth, NDMP Composition 1983-90

County	% Agriculture 1983	1989	% Industry 1983	1989	% Other 1983	1989	% Growth 1983-89
Fanchang	na.	na.	na.	na.	na.	na.	na.
Bo	62%	48%	9%	29%	29%	23%	14.8%
Chuzhou	53%	9%	24%	11%	23%	80%	40.7%
Tianchang	77%	33%	17%	35%	6%	32%	17.3%
Lai'an	63%	40%	13%	16%	24%	44%	17.1%
Quanjiao	68%	30%	16%	23%	16%	47%	21.6%
Dingyuan	46%	36%	6%	11%	48%	53%	10.0%
Fengyang	71%	35%	14%	25%	15%	40%	16.9%
Jiashan	64%	28%	15%	21%	21%	51%	21.2%
Ningguo	39%	6%	12%	26%	49%	68%	26.3%
Anhui mean	65%	35%	13%	19%	22%	46%	15.8%

Sources: AHNJ 1985: 325-525; 1990: 241-357.

Again the experiences of the counties within Chuxian itself are divergent. In Chuzhou and Dingyuan, industry's share in the output from township and village enterprises grew between 1984 and 1988, but started from a relatively small proportion in 1984. For Chuzhou, industry's share in XZQY was 26% in 1984, increasing to 31% in 1988, while for Dingyuan the proportions were 29% and 39% respectively. In Tianchang and Fengyang the opposite trend was demonstrated, with the share of industry in township and village enterprise

output being high in 1984, and declining slightly by 1988. In 1984, industry's share in XZQY output in Tianchang was 67%, declining to 61% in 1988, and in Fengyang the proportions were 65% and 54% respectively. This corresponds to the trends in the rates of growth of industrial output values for these four counties from 1978 to 1988.

There also appears to be a link between fast rates of growth in per capita NDMP and smaller shares of industry in XZQY in counties where the industrial share in NVAIO is large, leading to the conclusion that modern sector enlargement growth has progressed farthest in areas such as Chuzhou. Where industry is a small share of both NVAIO and XZQY, and growth in per capita NDMP are small (10% per annum), then modern sector enlargement growth can be assumed to be relatively small, as in Dingyuan county. For the remaining five counties, moderate rates of growth (17 to 21% per annum) in per capita NDMP accompanied the relatively large share of the industrial sector in XZQY, and the relative importance of XZGY in GVIO, where the state sector was smaller, indicating some movement towards modern sector enlargement growth. These are reasonable observations, given that Chuzhou is a rural centre, but as the prefectural capital was the focus of state industrial investment under Mao, with spin-off effects for educational attainment, and the skill level of the labour force. Caution, however, is necessary at this point, due to the very small numbers of counties being discussed.

ii. Fanchang, Bo and Ningguo Counties

Fanchang county is attached to Wuhu city, and has a good transportation network provided by the Wuhu to Tongling branch line of the railway, river transport on the Changjiang and a road network. This county is located in the Ma'anshan - Anqing industrial development corridor along the Changjiang. In 1988, it had a very high proportion of industrial output in NVAIO (61%), and

a very rapid growth in the share of *xiangzhen qiye* (XZQY) in Gross Material Product (GMP). Despite the relative shares of agriculture and industry in NVAIO in Fanchang, yields for both grain and oil crops were well above the provincial average, and grew more rapidly than the provincial average over the course of the 1980s. There was virtually a 10% expansion in the area planted in oil crops from 1980 to 1990. The early 1980s saw the most rapid expansion in agricultural production, which in turn provided the impetus for the expansion in both the industrial and non-industrial sectors of township and village enterprises (XZQY) from 1984.

Bo county (Bozhou from 1988) is the northernmost county in Fuyang prefecture, and is surrounded on three sides by Henan province. Bo county was just above the 125 *yuan* per capita NVAIO poor county cut-off in 1978-80, and experienced a meteoric rise in material living standards over the 1980s. It remained largely agricultural, industry contributing just under 38% of NVAIO in 1988. However, in the latter half of the 1980s, per capita NVIO grew by 50.6% per annum. Values of per capita NDMP in the county remained marginally below the provincial average, and grew at a relatively slow rate, which provides evidence of the limited development of transportation, construction, and commerce. This trend should be reversed during the construction of the high speed rail link between Beijing and Guangzhou which will pass through the county. For this reason, the future prospects for Bo's industrial and 'service' sectors looks bright.[14] Bo county's agricultural production was unspectacular. Grain yields were below the provincial average, and oil crop yields were merely average, despite a relatively high use of chemical fertilizer. The XZQY sector grew rapidly, 48% per annum for 1984-88, but did not keep pace with the growth rate of industrial output. From 1984 to 1988 the

[14] Bo county's location meant that its commercial sector was especially large pre-1949. It was called 'little Nanjing' as a result. (I am grateful to Chris Bramall for pointing this out.)

township and village industrial sector (XZGY) lost ground to both state industry and the non-industrial sectors of XZQY, falling from 61% to 53% of industrial output, and from 65% to 45% of XZQY. This was in contrast with the trend increase in XZGY in XZQY and GVIO in the other counties in this group.

Ningguo county is the last in the group of rich and fast growth counties. It borders Zhejiang province, with good road links to Hangzhou, 125 kms away via the tourist area of Xitianmu and Dongtianmu mountains.[15] Ningguo is also located on the Nanjing - Jingdezhen railway, which branches to Xiamen/Fuzhou or Guangzhou where it meets the Shanghai-Guangzhou rail line. Despite this infrastructure, Ningguo had a poor agricultural base in the early 1980s, with no specialization in either grain or oil crops. Yields for both crops remained below the provincial average, and well below the average for the other wealthy and dynamic counties. The impressive performance of Ningguo was largely based on rapid industrialization, particularly between 1984 and 1988. In 1978, NVIO accounted for only 16% of NVAIO. By 1984 the proportion of NVIO in NVAIO had increased to only 24.3%, but subsequently exploding to account for 81.3% of NVAIO in 1988, with per capita NVAIO growing in excess of 11% per annum. This was accompanied by an equivalent increase in real per capita NDMP, growing at 26% per annum from 372 *yuan* in 1983 to 1511 *yuan* in 1989. Growth in the XZQY sector was an important contributor to the rapid rates of growth in NVAIO and NDMP in the county since 1978. From a relatively small base in 1984 XZQY increased to account for 55% of GMP in 1988 at a rate of 53% per annum. The XZQY sector itself has been dominated by industry. In 1984 industry accounted for 58.2% of a small XZQY sector - 35 million *yuan*. By 1988 industry's share in XZQY increased to 73.4% of a much larger base - 172 million *yuan*.

To the extent that industry led the impressive growth rates, Ningguo

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[15] Geographic conditions in Ningguo are not favourable, despite its transportation links. The topography is hilly, and the little flat arable land that there is, is of poor quality.

corresponds to the fastest growing counties of Chuxian prefecture. However, if XZGY dominated the XZQY sector, it was less dominant in the industrial sector as a whole, although this share increased. In 1984 XZGY represented 36% of an industrial sector totalling 57 million *yuan*. By 1988, the industrial sector had expanded to 301 million *yuan* (nominal GVIO), of which 47% was XZGY.

If grain and oil crops did not provide Ningguo with an investible surplus to stimulate rapid industrial growth, then what has been the source of the county's impressive performance over the Dengist decade? Forestry, as part of agriculture, grew at 16% per annum during the reform period, providing the only obvious source of growth in the agricultural sector. This feeds into a large paper and cardboard products industry in the county. Given the gestation period necessary for the exploitation of forestry resources, much of this success must be put down to silviculture programmes initiated under Mao. Another agriculturally based product that has promoted local economic growth is the production of "Red Cloud" brand wine.[16] With the increase in disposable (and cash) incomes, and the simultaneous increase in the consumption of alcoholic beverages, the wine has been produced in increasing quantities throughout the 1980s, with an expansion in vineyard area.

Cement production is important in Ningguo county, and with rapidly expanding numbers of firms, the demand for construction materials - principally cement in Anhui as in the rest of China - has been buoyant throughout the 1980s. Ningguo is also an important centre of silk production, with Xuancheng prefecture as a whole producing 22% of the provincial total, second only to Liu'an prefecture. Several state industries have also contributed to the increased prosperity of Ningguo county, as major producers of pumps for industrial use, and to a lesser extent for irrigation and agriculture, as well

16 This is a sweet (Chinese-style) grape wine that has been produced in the region for centuries, of a type favoured for consumption at Chinese banquets.

as electrical converters. Therefore Ningguo represents a special case where collective and state industry together have produced rapid economic growth, through the re-investment of industrial surplus.

b. Yunnan

In Yunnan there were thirteen counties in the wealthy and dynamic group, having achieved a per capita NVAIO in 1988-90 over 400 *yuan*, at a growth rate of more than 9% per annum for 1978-90. The counties are highly diverse, scattered about the province, with no obvious unifying factor. In the Kunming - Yuxi area of central Yunnan there appears to be a growth pole developing, with six of the thirteen counties in this category, and a further four counties from the group with somewhat lower growth rates. Zhaotong, Qujing, and Chuxiong counties appear to owe their economic prosperity and rapid economic growth to being prefectural capitals[17], and therefore have advantages in terms of transportation and industrialization compared to the other counties of these prefectures. Hekou, Jinghong, and Mengla counties benefited largely from the production of tropical and sub-tropical crops - rubber, bananas, pineapples and specialty rice crops - for which data are sketchy at best, and in the case of Jinghong and Mengla from tourism. Jinghong and Mengla are the two open counties[18] in Xishuang Banna. All three prefectures have also benefitted from cross border trade along the Honghe into Vietnam for Hekou, and into Burma and Laos along the Mekong for Jinghong and Mengla. Finally Binchuan county in Dali prefecture is in a very arid area, in the rain shadow of the high mountains between the Himalayan foothills and those on the west side of Erhai at Dali itself. The main crops are tobacco, maize, and millet, and economic growth

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17 Prefectural capitals tended to be centres of industrial production, as well as administrative centres, because often the main, and perhaps the only, factory of any given type is located in the prefectural capital. Evidence of this is readily available on the factory gates in any prefectural capita - Dali no.2 marble facing stone factory, for example.

18 These counties are open to foreigners for tourism and trade.

Yunnan: Rich and Fast Growth Counties, 1978-90

LEGEND

1.Anning
2.Chenggong
3.Fumin
4.Yuxi
5.Tonghai
6.Malong
7.Qujing
8.Zhaotong
9.Chuxiong
10.Hekou
11.Jinghong
12.Mengla
13.Binchuan

appears to come have from the *getihu* (private enterprise) sector, that centres on repatriated overseas Chinese from India and Indochina.[19]

Unlike Anhui, the data on Yunnan's economic performance from 1978 to 1990 are scarce. At a county level data on the composition of industrial production by ownership type are only available for 1990. This poses an obvious handicap when trying to assess the factors underlying differential rates of growth between counties in Yunnan. The lower average levels and growth rates for per capita NVAIO and per capita NDMP, and the much higher shares of agriculture relative to industry, and industry relative to 'services' suggests that Yunnan is several years behind Anhui in modern-sector development. This is hardly surprising given the physical geography of Yunnan, and the small light industrial sector and average heavy industrial sector during the Maoist period,[20] and the fact that decollectivization was initiated in the autumn of 1979 in Anhui, and only reached Yunnan in 1982-3.

For this groups of counties, their relative economic prosperity even at the beginning of the reform period is evident in the mortality data. The CDR was 6.86 per thousand population in 1981 for these counties, compared to the provincial average of 9.01. By 1989, the CDR for these rich and fast growing counties had fallen to 6.36, and the provincial average had fallen to 7.65, at rates of -0.9% and -2.1% respectively. This mortality rate was approaching those for the national average in 1989 (presented in chapter 3).

i. Kunming-Yuxi Area

The counties from Kunming prefecture included in the growth pole are: Anning, Chenggong and Fumin. Yuxi city and Tonghai county are included from

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19 Binchuan has a large number of English speakers from India and French speakers from former French Indochina particularly Vietnam and Cambodia. It is possible to get a variety of curries from different parts of the Indian sub-continent at the restaurants in the market place - *Niujin* (pun on the Chinese for Oxford).

20 By contrast Anhui was the recipient of much of the industry moved out of Shanghai during the 'third front' campaign (ZGGYPC vol.2, 1989).

Yuxi prefecture, and Malong county from Qujing prefecture completes the group (there are four more counties that form part of this region, but they are examined in section three). As with the counties of Chuxian prefecture in Anhui, although these counties are among the most advanced in the province, there are still differences in the level of modern sector development between these counties. First the case for their advancement, relative to other counties, as a group followed by an analysis of the trends within the group.

Table 6.2a Yunnan, Rich and Fast Growth, Grain Output, 1980-90

County	Yields, Tonnes/Ha. 1980	1985	1990	% Growth Rate Sown Area 1980-90	Output 1980-90	Yields 1980-90
Anning	2.9	2.9	3.8	-0.5%	2.4%	2.9%
Chenggong	3.3	3.4	4.1	-0.9%	1.2%	2.2%
Fumin	3.7	4.2	4.7	-0.1%	2.5%	2.6%
Zhaotong	2.8	4.7	4.4	-1.6%	3.0%	4.8%
Qujing	4.2	4.1	4.5	8.3%	9.1%	0.7%
Malong	2.9	3.0	3.1	1.3%	1.8%	0.5%
Chuxiong	2.5	3.0	3.4	0.2%	3.3%	3.1%
Yuxi	4.7	4.6	6.2	-0.6%	2.1%	2.7%
Tonghai	4.0	3.5	4.4	-0.4%	0.5%	0.9%
Hekou	2.4	2.7	2.8	2.5%	3.8%	1.3%
Jinghong	4.0	2.8	3.0	5.0%	2.1%	-2.8%
Mengla	2.0	3.0	3.2	-0.6%	4.0%	4.7%
Binchuan	2.3	3.8	3.9	-0.2%	5.3%	5.4%
Yunnan mean	2.4	2.8	3.0	0.4%	2.3%	2.3%

Sources: ZGFX 1980-87: passim.; 1990: passim.

The greater prosperity of these counties appears to have two foundations. The first is agriculture, both in terms of grain production (rice, maize and millet), the production of rope making fibres such as hemp, and tobacco. The second is heavy, state-run industry. The relative importance of the state-run industry in these areas would be expected to have a positive impact on the standard of living, through the continued provision of health care, education and other forms of income in kind such as staff housing.

All of the counties in the Kunming-Yuxi sub-group had grain yields above the provincial average throughout the 1980s, and only Malong county had grain yields below the national average. Given the large quantities of maize

produced in many of these counties along with a single rice crop, which has lower yields per hectare than rice and wheat or double cropped rice, this is evidence of their superior agricultural base. For the growth pole group as a whole, grain yields increased from 3.6 tonnes per hectare in 1980 to 4.4 tonnes per hectare in 1990. The average grain yields for China were 2.8 in 1980 and 4.0 tonnes per hectare in 1990, growing by 3.3% per annum. In these counties, the growth rate was very slow between 1980 and 1985, 0.1% per annum, compared to 4.0% per annum from 1985 to 1990. Within the growth pole region, Fumin, Yuxi and Tonghai counties had rapid growth in oil crop yields despite a shift away from oil crops, in terms of sown area, throughout the region, and indeed in virtually all 13 counties in this group.

Table 6.2b Yunnan, Rich and Fast Growth, Oil Seed Output, 1980-90

	Yields, Tonnes/Ha.			% Growth Rate		
				Sown Area	Output	Yields
County	1980	1985	1990	1980-90	1980-90	1980-90
Anning	0.3	0.6	1.5	0.0%	16.3%	16.3%
Chenggong	0.8	1.0	1.2	0.0%	4.2%	4.2%
Fumin	1.1	2.0	2.4	-4.0%	3.8%	8.1%
Zhaotong	0.8	1.1	1.1	-3.4%	-0.3%	3.2%
Qujing	0.4	0.9	1.9	-1.8%	15.3%	17.5%
Malong	0.2	0.4	0.4	1.0%	9.6%	8.6%
Chuxiong	0.7	0.4	1.9	-1.0%	2.6%	11.4%
Yuxi	1.7	2.1	2.9	-2.5%	-1.9%	5.2%
Tonghai	1.5	1.9	2.6	-7.2%	21.5%	5.6%
Hekou	0.2	0.8	0.5	7.2%	-5.0%	13.3%
Jinghong	0.6	0.6	0.7	-6.4%	-4.4%	1.5%
Mengla	0.4	0.7	0.7	-9.0%	9.2%	5.0%
Binchuan	0.4	1.5	1.6	-4.0%	6.2%	13.7%
Yunnan mean	0.7	1.1	1.1	0.9%	7.6%	5.3%

Sources: ZGFX 1980-87: passim.; 1990: passim.

Yields for oil crop production were above the national average, 0.97 tonnes per hectare in 1980, ranging from 1.1 to 1.7 tonnes per hectare, and increased to 2.4 to 2.9 tonnes per hectare in 1990 relative to 1.48 for China on average. The growth rates ranged from 5.2% to 8.1% per annum, compared to 4.3% per annum for China between 1980 and 1990. Growth rates for yields in oil crops were higher between 1980 and 1985, averaging 6.9%, than for 1985-90, 5.6%

on average, although in both cases this represents rapid increases in productivity per unit area.

Table 6.2c Yunnan, Rich and Fast Growth, Chemical Fertilizer Use 1980-90

County	Use, K.Tonnes 1980	1985	1990	% Growth Rate 1980-90
Anning	1.0	1.5	2.0	7.3%
Chenggong	1.1	3.9	6.8	20.2%
Fumin	2.4	1.1	1.8	-2.8%
Zhaotong	7.5	8.4	13.7	6.2%
Qujing	3.3	10.7	16.6	17.4%
Malong	0.8	2.3	4.4	18.3%
Chuxiong	3.1	3.7	5.8	6.3%
Yuxi	12.4	8.5	6.7	-6.0%
Tonghai	3.7	7.3	6.7	6.4%
Hekou	0.2	0.3	0.7	14.4%
Jinghong	1.1	2.0	3.5	12.0%
Mengla	0.2	0.5	1.6	21.5%
Binchuan	2.3	3.4	6.2	10.4%
Yunnan mean	2.4	3.2	4.4	6.4%

Sources: ZGFX 1980-87: passim.; 1990: passim.

The use of chemical fertilizer was much lower in Yunnan, on average, than Anhui. Given the greater area of most counties in Yunnan compared to those in Anhui, this may point to a serious short coming in the agricultural infrastructure in Yunnan compared to that in Anhui (although the ruggedness of Yunnan's topography relative to Anhui's clouds this issue), as was outlined in the introduction. However, by the end of the 1980s, the growth pole counties were advantaged in their use of chemical fertilizer by Yunnan standards. This advantage was magnified by the relatively small size of these counties, compared to many counties in the province - all of them less than half, and most less than a third, of the provincial average for county land area.[21] This adds to the body of evidence on the relative strength of agriculture in these counties.

21 The key question here is to determine whether or not agricultural infrastructure imposed a constraint on the growth of agricultural output and yields.

Table 6.2d Yunnan, Rich and Fast Growth, Industrial Output 1978-90

County	NVIO % of NVAIO 1978	1980	1985	1990	% Growth Rate Real p.c. NVIO 1978-90	1985-90
Anning	82.5%	85.3%	87.3%	89.2%	10.9%	12.3%
Chenggong	21.7%	27.0%	38.6%	58.1%	21.3%	24.3%
Fumin	11.1%	18.7%	22.9%	41.5%	24.8%	25.1%
Zhaotong	34.4%	44.7%	52.5%	73.0%	20.6%	21.3%
Qujing	46.5%	53.4%	62.8%	71.9%	14.4%	11.8%
Malong	45.9%	30.7%	40.5%	60.2%	13.7%	24.2%
Chuxiong	36.3%	38.0%	41.5%	80.5%	20.0%	46.0%
Yuxi	71.2%	73.8%	83.5%	90.1%	15.6%	15.9%
Tonghai	23.0%	25.9%	47.9%	63.4%	19.9%	17.8%
Hekou	18.1%	25.0%	14.8%	10.3%	11.2%	24.0%
Jinghong	34.7%	15.0%	14.4%	11.9%	-0.5%	5.9%
Mengla	26.5%	10.4%	7.3%	6.2%	0.8%	12.3%
Binchuan	14.6%	19.5%	10.5%	7.9%	4.6%	-1.3%
Yunnan x	28.5%	30.1%	32.3%	41.5%	9.1%	12.0%

Sources: AHNJ 1985: 325-525; 1990: 241-357; YNTJNJ 1990: 105-9, 170-4, 245-9; 1991: 601-610, 636-640, 676-680.

For the counties of the growth pole region, NVIO was a very important part of NVAIO throughout the 1980s. In 1980 NVIO accounted for an average 54% of NVAIO in these counties, increasing to 67.1% in 1990. The growth rates for real per capita NVIO, measured in 1980 constant prices, were 17.7% per annum for the 1978-90 period, and 19.9% per annum for 1985-90. Anning and Yuxi had the highest concentrations of industry, and some of the highest absolute values of industry, in the province. In 1978 82.5% of NVAIO came from NVIO in Anning, and 71.2% in Yuxi. By 1985 these shares had increased to 87.3% and 83.5% respectively, and the counties ended the decade with 89.1% of Anning's NVAIO from industry and 90.1% in Yuxi.

The remaining four counties in this region started the reform period with much lower shares of industry in NVAIO, ranging from only 11.1% in Fumin to 45.9% in Malong. By 1990 the range had shifted to 41.5% of NVAIO from industry in Fumin to 63.4% in Tonghai. Real per capita NVIO grew at 13.7% per annum from 1978 to 1990 in Malong, above the provincial average of 9.1%, while the real per capita NVIO growth rate in Fumin was 24.8% over the same period. For the period 1985-90, only Tonghai posted a real per capita NVIO growth rate

lower than for 1978 to 1985, and despite a slower growth rate (17.8% per annum) it was still in excess of the provincial average (12% per annum) for that period. The six counties of the growth pole region accounted for 28% of all rural GVIO in 1990, even though they represented less than 4% of Yunnan's rural population.

Data on the composition of industrial output by ownership type are only available for 1990, which limits the conclusions that can be drawn about the relative importance of the state and non-state sectors. However, there is such a high degree of polarization in industrial output by ownership type, that the conclusions that can be drawn are relatively safe. For the growth pole group as a whole, state-run industry accounted for almost 60% of all GVIO, which is close to the provincial average. This disguises the fact that two counties had very small state industrial sectors - Fumin 22%, and Tonghai with 14% -. In Fumin, 44% of GVIO came from collective industrial enterprises, and the remaining 34% from privately owned industrial enterprises in 1990. The dominance of the collective sector was evident in Tonghai county, with 63% of GVIO in 1990 coming from collectively owned industries, and the remaining 23% from privately owned industries. The remaining four counties were dominated to varying degrees by of state-run industry. In Yuxi, only 9.1% of industrial output in 1990 came from the non-state sectors. Given the very small base from which the non-state sectors must have started in Yuxi, it is safe to hypothesise that the state industrial sector must have grown at a relatively rapid rate to allow per capita NVIO in the county to grow by 15.6% from 1978 to 1990, as the real value of the increase was in excess of the entire output value of the non-state sectors combined. Similar assertions can be made about the importance of state-run industrial enterprises in the growth of total industrial output in Malong and Anning, where the non-state sectors represented a mere 14.1% and 15.8% of GVIO in 1990, respectively. As the GVIO value for

Chenggong was relatively small (just under 300 million *yuan* in 1990) it is more difficult to pinpoint which industrial enterprise ownership type was the most important contributor to economic growth during the 1980s. In 1990, state-run industry accounted for 69% of all GVIO in Chenggong, collective owned industry contributed a further 14% and privately run industry accounted for the remaining 16%. State industry could not have stagnated between 1978 and 1990, as its size would have prevented a per capita NVIO growth rate in excess of 21% per annum over the period. The source of the dynamism in the state-run industrial sector in these counties of Yunnan is most interesting, as this dynamism appears to be flying in the face of the conventional wisdom regarding productivity and growth in industry during the reform period.[22] This is perhaps all the more remarkable given that some of this industrialization was part of the 'third front' strategic campaign during the Maoist period and in marked contrast with Shuifu discussed below (ZGGYPC vol.2, 1989).

Table 6.2e Yunnan, Rich and Fast Growth, NDMP Composition 1983-90

County	% Agriculture			% Industry			% Other			% Growth
	1985	1988	1990	1985	1988	1990	1985	1988	1990	1985-90
Anning	8%	6%	7%	53%	44%	55%	39%	50%	38%	11.3%
Chenggong	31%	27%	27%	20%	27%	38%	49%	36%	35%	9.3%
Fumin	53%	44%	58%	15%	24%	41%	32%	32%	1%	3.0%
Zhaotong	35%	22%	20%	39%	42%	54%	26%	36%	26%	13.3%
Qujing	28%	18%	18%	48%	42%	45%	24%	40%	37%	13.0%
Malong	53%	35%	39%	36%	43%	59%	11%	22%	2%	12.6%
Chuxiong	36%	15%	14%	26%	43%	60%	38%	42%	26%	23.4%
Yuxi	10%	6%	5%	49%	41%	47%	41%	53%	48%	17.3%
Tonghai	43%	34%	36%	40%	47%	61%	17%	19%	3%	7.9%
Hekou	25%	50%	65%	4%	7%	7%	71%	43%	28%	8.8%
Jinghong	69%	71%	84%	11%	11%	11%	20%	18%	5%	6.5%
Mengla	65%	76%	90%	5%	7%	6%	30%	17%	4%	8.8%
Binchuan	64%	60%	61%	8%	8%	6%	28%	32%	23%	3.1%
Yunnan mean	42%	43%	48%	24%	27%	35%	34%	30%	17%	4.6%

Sources: YNTJNJ 1990: 105-9, 170-4, 245-9; 1991: 601-610, 636-640, 676-680.

An examination of trends in per capita NDMP reveals differential levels

22 This is not to suggest that state-run industry did not grow during the 1980s, nor that it is not usual for state-run industry to be the largest contributor to the growth of industrial net value added, but merely that it is unusual for it to be the fastest growing sector.

of development within the growth pole sub-group itself. Anning and Yuxi belong to the highly developed category, with large state industrial sectors, high contributions of transportation, construction and commerce in NDMP (in excess of 40%), and the 'service' sector weathered the 1989-90 recession with only a minor decline in per capita NDMP values or shares. This was accompanied by the highest levels of per capita NDMP in the province, and per capita NDMP growth rates of 19% and 26% per annum respectively for Anning and Yuxi from 1985 to 1988, or 11% and 17% for 1985-90. These factors combined reflect a high level of modern sector enlargement growth, although agriculture and state-run industry remain the largest employers.

Chenggong and Malong counties were in the middle development level group, although in terms of state-dominance of industrial production, both of these counties resembled Anning and Yuxi closely. The principal difference can be seen in the share of the construction, transportation and commerce, or 'service' sector in NDMP, and the level and rate of growth in per capita NDMP. Chenggong had a higher level of per capita NDMP (1032 *yuan* in 1990) but a slower growth rate, 9.3% 1985-90, in both cases just below the average for all 13 wealthy counties, although well above the provincial average. The factor which places Chenggong in the middle development group is the size and recession-prone nature of its 'service' sector. Construction, commerce and transportation accounted for 35% of NDMP in both 1988 and 1990 in Chenggong, compared to 53% at its peak in 1987. Malong had a lower per capita NDMP (573 *yuan* in 1990), and a more rapid rate of per capita NDMP growth from 1985 to 1988, 21% per annum, but was badly hit by the recession in 1989-90 - particularly the nascent 'service' sector - causing the per capita NDMP growth rate for 1985-90 to fall to 12% per annum. In 1990 virtually 98% of NDMP came from NVAIO, compared to 78% in 1988 in Malong, a characteristic it shared with the less developed counties.

Fumin and Tonghai comprise the low-level development group, with low levels of modern sector enlargement growth. This is evident in the low levels of per capita NDMP, the low share of the state industrial sector, and the severity of the impact of the 1989-90 recession on economic growth rates, as measured by per capita NDMP, and the composition of NDMP. There was a collapse of the 'service' sector in these counties in 1989-90. As a result of the recession, per capita NDMP grew at under 4% per annum, and NVAIO increased to account for more than 98% of NDMP, from 70-80% in the mid-1980s. Tonghai had the stronger performance of the two counties, due to the relatively large size of its collective industrial sector in 1990.

ii. Prefectural Capitals

The next sub-group to be examined is the prefectural capitals group, which includes: Zhaotong, Qujing and Chuxiong counties. These counties have many factors in common with Anning and Yuxi counties in the growth pole group, in that they have quite high values of per capita NDMP by a provincial standard, rapid per capita NDMP growth rates, and a dominant state-run industrial sector. Non-state industry accounted for only 7.8% of GVIO in all three counties. These three counties alone accounted for 25% of all state-run industry in rural Yunnan in 1990, and 21% of all industry (GVIO) in rural Yunnan in the same year. Grain yields were above the provincial average in all three counties throughout the 1980s, and Zhaotong and Qujing were efficient grain producers by all-China standards as well. By 1990, Qujing and Chuxiong both had very high oil crop yields by Yunnan and China-wide standards, with rapid rates of growth in both yields and total output over the 1980s. This suggest that agriculture was an important contributor to overall economic growth in these counties.

Agriculture played a strong supporting role, but industry dominated by

the state-run sector was the true engine of growth in these three counties. In 1978, the contribution of industry to NVAIO ranged from 34% in Zhaotong to 47% in Qujing. By 1990, industry's share in NVAIO had grown to 72% in Qujing and to 81% in Chuxiong. This was achieved through rapid rates of growth in real per capita NVIO in all three counties, but particularly in Chuxiong and Zhaotong. The annual growth rates in real per capita NVIO from 1978 to 1990 were: 14.4% in Qujing, 20% in Chuxiong, and 21% in Zhaotong. Qujing had a slow-down in NVIO growth rates in the latter half of the 1980s, while growth rates increased to 46% per annum in Chuxiong for 1985-90. As state industry accounted for 93.5% of a GVIO in 1990 of 1164.6 million *yuan*, state-run industry must have been the principal source of this rapid growth rate in industrial output. The continued importance of the state-run industrial sector has important spin-off effects on the standard of living in these counties through the provision of health care, education and housing as remuneration in kind.[23]

None of these counties had particularly large non-agricultural, non-industrial components in NDMP, and all were affected to varying degrees by the recession of 1989-90. As would be expected from the very rapid growth in industrial output value, Chuxiong also had the most rapid rates of growth in per capita NDMP - 41% per annum from 1985-88, and 23% per annum for 1985-90. But Chuxiong's construction, transportation and commercial sectors were severely affected by the recession, their share falling from 42% of NDMP in 1988 to 26% in 1990. Chuxiong owes much of its prosperity to its natural resources and its transportation links. The county is located two hours from Kunming on the Burma road, and the Chengdu-Kunming railway passes through the county, although it does not go to Chuxiong city itself. Qujing had a slower

[23] These services are provided on a collective basis, although low profits in any given unit would have an adverse affect on these benefits.

rate of growth of industrial output than Chuxiong, but its agricultural and 'service' sectors were much more dynamic, and the latter significantly more recession proof. Qujing had high rates of growth in yields and output for grain and oil crops. Despite this by 1990, industry accounted for 72% of NVAIO, and real per capita NVIO grew by 14% per annum from 1978 to 1990, with somewhat slower growth in the late 1980s. Construction, transportation and commerce together contributed 37% of NDMP in 1990, down slightly from 40% in 1989. In Zhaotong, per capita NDMP grew at a steady rate of 13% per annum in 1985-90, and industry and agriculture remained dominant in NDMP shares throughout the late 1980s, from a low of 60% of NDMP from NVAIO in 1987, to a high of 74% in 1990. As NDMP continued to grow in Zhaotong throughout the recession period, this highlights the strength and dynamism of the industrial sector. With values of real per capita NDMP ranging from 1243 *yuan* to 787 *yuan* in 1990, these counties belong to the upper-middle to high level of development group, particularly in light of the size and performance of their state-run industrial sectors.

iii. 'Trader' Counties

Jinghong, Hekou and Mengla counties all owed much of their prosperity to cross border trade and the production of speciality tropical cash crops ranging from rubber - natural latex - to pineapples and bananas. Jinghong also had a high concentration of state-run enterprises in its industrial sector, a function of its being the prefectural capital of Xishuang Banna. Tourism in addition to trade and tropical products played an important role in the economies of Mengla and Jinghong, and (in addition to the recession of 1989-90) the substantial fall in the numbers of foreign tourists adversely affected per capita NDMP in these two counties.

An examination of grain and oil crops yields, and chemical fertilizer use

would lead to the conclusion that the performance of the agricultural sector in these counties was lack-lustre. This was partly due to the production of specialty rice crops, both purple and white glutinous rice, and fragrant rice, which remained virtually wild rice varieties, untouched by green revolution scientists, and which command higher prices, but have lower yields. Data are not available on pineapple and rubber production at a county level, but rubber plantations have replaced all but two small pockets of primordial rainforest in Jinghong, and the upper slopes along the Mekong to the Laotian/Burmese border that are too steep for rubber or rice cultivation are planted with pineapples.[24] In 1990 Jinghong accounted for 6.8% of banana production in Yunnan, and Xishuang Banna accounted for 8.7% in total. Honghe prefecture contributed 70% of Yunnan's banana production (itself a sizeable share of the Chinese total), 13.9% from Hekou alone. Xishuang Banna also accounted for 45.5% of grape production in Yunnan in 1990, 33.6% of provincial output came from Jinghong, and 10.5% from Mengla. Hekou accounted for 26.1% of grape production in 1990, and Honghe prefecture contributed 41% in total. The fruit produced in these areas were sold throughout southwestern China, with bananas and grapes in Chengdu and Chongqing coming from these counties and commanded higher prices per unit weight than those for oil crops or grain. As the majority of these crops were single crop mono-culture, their predominance had a strong downward effect on the cropping index, despite an otherwise favourable climate for multiple crop cultivation.

The industrial sector in all three counties was very small, despite the modicum of state-run industry in Jinghong, which was only large in relation to the shares of other industrial ownership types. Industry's share in per capita NVAIO has fallen for all three counties between 1978 and 1990, further

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24 Yunnan was a highly efficient producer of rubber. Yunnan accounted for 22% of Chinese rubber production in 1989, second only to Hainan which produced 65%, and Guangdong was the third producing province of any note, contributing 11%. The yield in China was 0.84 tonnes per hectare in 1989. In the same year yields in Hainan was 0.93, and Yunnan was 1.13, while those in Guangdong were only 0.46. (ZGNYNJ 1989: 234)

emphasizing the importance of agricultural output in achieving high growth rates, as shall be illustrated in the examination of NDMP below. Hekou, in 1978, had 18% of NVAIO contributed by industry. This share increased to 25% in 1980, and subsequently declined to 10% in 1990, despite real per capita NVIO growth of 11% from 1978-90, or 24% from 1985-90. If industry, albeit from a small base, is loosing ground to agriculture in shares of NVAIO, agricultural output values must have grown more quickly. Indeed agriculture was the main contributor to economic growth and increased material well-being in Hekou. Jinghong, by contrast, experienced de-industrialization between 1978 and 1990, with per capita NVIO declining by 0.8% per annum. There was a sharp decline in industrial output value between 1978 and 1985, and for 1985-90 real per capita NVIO growth reached 5.9% per annum. The fall in industry's share in NVAIO from 35% in 1978 to 12% in 1990 under these circumstances is hardly surprising. Mengla followed a pattern similar to that for Jinghong. Growth rates in real per capita NVIO remained small, but positive, throughout the reform period. There was a significant recovery in the growth rate after 1985, but a severe drop in industry's share of NVAIO, from 27% in 1978 to 6% in 1990.

In Hekou, Jinghong and Mengla, transportation, construction and commerce have long played an important role in the economy. Hekou has a rail link to Hanoi, and trades along the Honghe and minor roads with smaller communities in northern Vietnam. Mengla, by virtue of road and river links, trades principally with Laos, while Jinghong trades along its border with Burma, and along the Mekong with both Burma and Laos. There are myriad small roads that link border communities in this area, and only the principal arteries have border guards. Along the Mekong, the Chinese border guards were more concerned about preventing foreigners from leaving the country illegally than in inspecting the contents of boats plying their trade between Jinghong city and riverside villages in northwest Laos or northeast Burma. Despite the growth

in cross-border trade (and in Jinghong the explosion in tourism both Chinese and foreign), the 'service' sector steadily lost ground to agriculture as a proportion of NDMP in all three counties. The recession combined with the drop in tourism in 1989-90 dealt the 'service' sector a virtual knock-out blow, with commerce, transportation and construction together accounting for only a very small proportion of NDMP - 5% in Jinghong, 10% in Mengla, and 19% in Hekou -. In 1985, by contrast, NVAIO accounted for only 30% of NDMP in Hekou, 80% in Jinghong, and 70% in Mengla.

Per capita NDMP grew relatively rapidly between 1985 and 1988 in all three counties, slowing somewhat if the 1989-90 recession is included. Jinghong was most severely affected by the recession, with a 13.5% fall in real per capita NDMP between its peak in 1988 and 1990. Mengla experienced a 6% decline in real per capita NDMP between 1989 and 1990, with a decline in Hekou of only 1% over the same period. The strength of economic growth in these areas is based on the exploitation of tropical agriculture, and the level of per capita NDMP, and the limited extent of the non-agricultural sectors, leads to the conclusion that these counties have obtained only a low level of economic development compared to Anning or Yuxi despite the apparently high level of material well-being. This view is reinforced by the data on irrigation, fertilizer use and the multiple cropping index, which was 1.09 in Xishuang Banna, and 1.45 in Honghe in 1990.

Binchuan county is in a category by itself because it is not a prefectural capital, nor is it a border county with trade, nor a tourist destination. On this last count, it is the tourists who are the poorer for having missed Binchuan, as it is a beautiful and interesting place, with connections to the Long March. Yields of grain and oil crops were high here by Yunnan standards, although they remained marginally below the China average, rather unsurprising given the cultivation of principally maize and coarse grain

due to the arid climate. Some of the dynamism here came from the specialization in oil crops, with high growth rates in both yields and output volume from 1980 to 1990, and somewhat slower growth in grain output, 9.2% and 5.3% per annum respectively. Binchuan produced virtually 50% of all sugar crops in Dali prefecture, although this represents just under 10% of the provincial total. Both tobacco and sugar crop production are ubiquitous in Yunnan, and as a result 5% of provincial sugar output and 3% of provincial tobacco output represented a sizable output volume.[25] Binchuan also produced 8% of the provinces oranges along with a sizable volume of apples and pears.

Binchuan was the only county in this group of thirteen with a sizable portion of its industrial output produced by privately owned enterprises, accounting for 17.8 million *yuan* or 56% of all GVIO in 1990. As with the previous sub-group of counties, NVIO represents a small and declining share of NVAIO, dropping from 19.5% in 1980 to 7.9% in 1990. Per capita NVIO grew slowly from 1978-90 as a whole, by 4.6%, although this masks quite rapid growth from 1978-85, followed by a decline of 1.3% per annum from 1985 to 1990. Despite the decline in its industrial output value between 1985 and 1990, NVAIO maintained a high share of NDMP over the same period, reinforcing the assertion regarding agriculture as both the foundation for and engine of growth. 72% of NDMP came from NVAIO in 1985, this share declined to 68% in 1988, only to increase during the recession to 77% in 1990. This at a time when real per capita NDMP growth was less than spectacular, falling below the provincial average for 1985-88 (8.8% per annum) and 1985-90 (3.1% per annum). Binchuan is a high material well-being county with a low level of development, on the strength of agricultural production, and privately owned extractive

25 Yunnan is a major tobacco producer, accounting for 19% of the output in China in 1989, second only marginally behind Henan. Yunnan was also one of the most efficient producer of tobacco, third highest in the country behind Anhui and Shandong, both of which are major producers. (ZGNYNJ 1989: 227)

industries.[26]

Within these high achieving counties in Anhui and Yunnan there are again varying levels of development. In Anhui, the counties with the highest level of economic development experienced rapid expansion in agricultural output and productivity between 1978 and 1985. This provided an investible surplus, and higher incomes fuelling the demand side of the rural economy, thereby reinforcing supply-side investment and economic growth. Disincentives prompted investment to be channelled away from the agricultural in general, and from crop farming in particular. Households were unwilling to part with their small allocation of land from the decollectivization settlement and household contract system, even once they had obtained a source of income outside the farm sector. This is partly because the land continues to represent their social welfare safety net against unemployment or declining non-farm earnings during a recession. As a result, it is the non-farm sector that provided the most rapid gains in income during the late 1980s (cf. Bramall and Jones, 1993: 52-8). In the highest development group, collective industry was the principal source of rapid economic growth. Counties in the upper-middle development sub-group relied upon the collectively owned 'service' sector, a development strategy which resulted in moderate economic growth in Anhui. Some counties with well established 'service' sectors in Anhui did ,manage to retain high levels of per capita NDMP during the recession of 1989-90.

In Yunnan, by contrast, the counties of the highest development sub-group had agriculture as the foundation, but it was state-owned industry that provided the lion's share of the gains in NDMP, particularly in the late 1980s and through the recession, assisted by their large and dynamic 'service' sector. The middle development group in Yunnan also had a strong agricultural

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26 The prevalence of private ownership is probably related to the repatriated overseas Chinese who have been settled in the area.

foundation, but here it was both the state-owned and the non-state industrial sectors that contributed to growth. The 'service' sector was also an important contributor to growth from 1985 to 1990, and resulted in stagnant or declining levels of NDMP in these counties during the recession. Finally, the low development group were heavily reliant on agricultural production for economic growth, combined in some instances with limited dynamism in the collective industrial sector or the 'service' sector. However, several counties experienced de-industrialization during the late 1980s. The 'service' sector was also severely affected by the recession, all but disappearing in the 'trader' counties.

3. Consolidation or Stagnation? - More Rich Counties from Anhui and Yunnan

This section examines one county from Anhui, Dangtu, that had a high level of per capita NVAIO throughout the reform period, but only a moderate level of growth, despite the impressive performance of its industrial sector. There are also ten counties from Yunnan that fall into this category. As with the wealthy and dynamic counties in Yunnan, this group can be divided into three sub-groups. First there is the growth pole sub-group, comprised of Jinning, Yiliang, Yimen and Eshan counties. Second, there is the traders group of counties from Delong prefecture: Luxi, Longchuan, Ruili and Wanding counties. Finally there are two counties from Honghe prefecture which most closely resemble the prefectural capital group from the previous section, Kaiyuan and Mengzi. Yunnan also has a single county that requires examination in a category on its own, because it had a very high per capita NVAIO in 1978-80, and experienced only a very slow rate of growth in per capita NVAIO from 1978 to 1990, with virtual stagnation in per capita NDMP between 1985 and 1990. Shuifu is located on the Changjiang, forming the northeast corner of Yunnan,

and was the site of much 'third front' strategically motivated heavy industrialization. However, unlike its cousins examined in the previous group who appear to have capitalized on their heavy industrial base, Shuifu has stagnated and failed to diversify its economy. First, an examination of Dangtu in Anhui.

a. Anhui

Dangtu had much in common with Fanchang county examined in the previous section. Both counties are to be found on the Changjiang and form part of the Ma'anshan - Anqing industrial corridor, with superior rail, road and water transport. Dangtu is the rural county attached to Ma'anshan city. There are two key factors which differentiated Dangtu from Fanchang, and have thereby contributed to its more moderate rate of economic growth during the 1980s. The first is its low level of agricultural productivity. Grain and oil crop output both grew at well below the average rate, although a decline in grain sown area resulted in grain yields moderately above provincial average. Chemical

Table 6.3a Anhui, Rich, Moderate Growth, Grain Output 1980-90

	Yields, Tonnes/Ha.			% Growth Rate		
				Sown Area	Output	Yields
County	1980	1985	1990	1980-90	1980-90	1980-90
Dangtu	3.0	4.9	5.0	-1.1%	4.1%	5.2%
Anhui mean	3.1	4.0	4.3	0.4%	5.4%	3.3%

Sources: ZGFX 1980-87: passim.; 1990: passim.

Table 6.3b Anhui, Rich, Moderate Growth, Oil Seed Output 1980-90

	Yields, Tonnes/Ha.			% Growth Rate		
				Sown Area	Output	Yields
County	1980	1985	1990	1980-90	1980-90	1980-90
Dangtu	0.9	1.2	1.1	5.1%	7.5%	2.0%
Anhui mean	1.1	1.4	1.3	5.8%	9.5%	0.9%

Sources: ZGFX 1980-87: passim.; 1990: passim.

fertilizer use remained limited in the county, and grew slowly relative to the

provincial average, suggesting a lack of emphasis on agricultural production and infrastructure in the county. Ma'anshan has a large petro-chemicals industry which produces, among other things, chemical fertilizer.

Table 6.3c Anhui, Rich, Moderate Growth, Chemical Fertilizer Use 1980-90

County	Use, K.Tonnes 1980	1985	1990	% Growth Rate 1980-90
Dangtu	6.8	12.2	16.3	9.2%
Anhui mean	7.3	24.3	26.0	10.6%

Sources: ZGFX 1980-87: passim.; 1990: passim.

Table 6.3d Anhui, Rich, Moderate Growth, Industrial Output 1978-90

County	NVIO % of NVAIO 1978	1984	1988	% Growth Rate Real p.c. NVIO 1978-88	1984-88
Dangtu	19.8%	27.3%	61.3%	21.0%	40.1%
Anhui mean	14.8%	16.3%	36.1%	17.9%	30.0%

Sources: AHNJ 1985: 325-525; 1990: 241-357; YNTJNJ 1990: 105-9, 170-4, 245-9; 1991: 601-610, 636-640, 676-680.

Table 6.3e Anhui, Rich and Moderate Growth, NDMP Composition 1983-90

County	% Agriculture 1983	1989	1990	% Industry 1983	1989	1990	% Other 1983	1989	1990	% Growth 1983-89
Dangtu	56%	24%		21%	38%		23%	38%		17.5%
Anhui mean	65%	35%		13%	19%		22%	46%		15.8%

Sources: AHNJ 1985: 325-525; 1990: 241-357.

The second factor differentiating Dangtu from Fanchang was the relatively low base from which the collective-owned sector started in 1984. This has been tempered somewhat in the late 1980s, because the collective sector grew more quickly in Dangtu than in Fanchang from 1984 to 1988, so that the shares of the collective sector in GMP in 1988 were virtually identical, about 72%. On the whole, Dangtu belongs in the high level of modern sector development group, despite a moderate rate of NVAIO growth. This is based on the strong growth and importance of the collective-owned industrial sector, and the expansion of the 'service' sector throughout the latter half of the 1980s including the recession. Material well-being increased between 1982 and 1990 at a moderate

rate, while the death rate rose substantially from 6.2 per thousand in 1981 to 9.87 in 1989 (both figures above the provincial average - 5.66 and 9.66 respectively), at a growth rate of 6% per annum (modestly below the provincial average - 6.9%).

b. Yunnan

For all of the Yunnan counties in this group with moderate growth, the main factor distinguishing them from their more dynamic cousins is the size and composition of the industrial sector. Agricultural production was quite strong throughout the 1980s, with grain yields in 1985 and 1990 universally above the Yunnan average (and actually above the China average in most cases) despite a reliance on lower yield (non-rice) grain crops in many of these counties. The counties of the growth pole region were also efficient producers of oil crops,

Table 6.4a Yunnan, Rich, Moderate Growth, Grain Output 1980-90

	Yields, Tonnes/Ha.			% Growth Rate		
				Sown Area	Output	Yields
County	1980	1985	1990	1980-90	1980-90	1980-90
Jinning	3.2	3.5	4.0	-0.5%	1.7%	2.2%
Yiliang	3.9	4.6	5.0	-0.2%	2.3%	2.5%
Yimen	2.2	3.0	3.7	0.1%	5.3%	5.2%
Eshan	2.7	3.5	3.9	-0.4%	3.4%	3.8%
Kaiyuan	2.1	3.3	3.8	0.4%	6.3%	5.8%
Mengzi	1.4	3.2	3.3	0.8%	9.9%	9.1%
Luxi	2.6	3.4	3.8	0.7%	4.7%	3.9%
Longchuan	2.4	2.8	3.7	-0.9%	3.6%	4.5%
Ruili	3.3	3.5	4.3	1.8%	4.4%	2.6%
Wanding	3.8	4.2	5.4	2.9%	6.6%	3.6%
Shuifu	na.	2.8	2.7	na.	na.	na.
Yunnan mean	2.4	2.8	3.0	0.4%	2.3%	2.3%

Sources: ZGFX 1980-87: passim.; 1990: passim.

both by Yunnan and China standards, although this factor was not shared by other counties in this category. Growth in grain output and yields was impressive, an average of 4.8% per annum for output, and 4.3% per annum for yields from 1980 to 1990. For Yunnan the growth rate was 2.3% for both output and yields, while for China they were 2.7% and 3.3% respectively over the same

period.

Table 6.4b Yunnan, Rich, Moderate Growth, Oil Seed Output 1980-90

County	Yields, Tonnes/Ha. 1980	1985	1990	% Growth Rate Sown Area 1980-90	Output 1980-90	Yields 1980-90
Jinning	0.7	0.9	2.0	4.1%	15.6%	11.0%
Yiliang	0.7	1.6	1.9	1.1%	11.1%	9.9%
Yimen	0.5	1.0	2.2	-2.8%	12.3%	15.5%
Eshan	1.0	1.2	2.0	2.9%	10.7%	7.6%
Kaiyuan	0.8	2.0	1.0	1.6%	3.6%	2.0%
Mengzi	0.6	1.1	0.7	-4.7%	-2.9%	1.9%
Luxi	0.6	0.5	0.8	-3.6%	-0.4%	3.3%
Longchuan	0.7	0.9	1.1	1.8%	7.4%	5.5%
Ruili	0.1	0.0	0.0	-10.4%	0.0%	na.
Wanding	0.0	0.0	0.0	0.0%	0.0%	0.0%
Shuifu	na.	0.7	0.7	na.	na.	na.
Yunnan mean	0.7	1.1	1.1	0.9%	7.6%	5.3%

Sources: ZGFX 1980-87: passim.; 1990: passim.

Table 6.4c Yunnan, Rich, Moderate Growth, Chemical Fertilizer Use 1980-90

County	Use, K.Tonnes 1980	1985	1990	% Growth Rate 1980-90
Jinning	1.2	1.9	3.2	10.5%
Yiliang	2.2	3.8	6.4	11.5%
Yimen	4.3	3.2	3.0	-3.6%
Eshan	8.4	3.0	3.5	-8.5%
Kaiyuan	1.3	3.6	4.0	11.7%
Mengzi	3.1	6.6	8.4	10.5%
Luxi	2.1	4.7	6.6	12.0%
Longchuan	5.7	4.2	4.6	-2.0%
Ruili	0.8	1.7	1.9	8.4%
Wanding	0.2	0.6	0.8	17.8%
Shuifu	na.	0.6	0.7	na.
Yunnan mean	2.4	3.2	4.4	6.4%

Sources: ZGFX 1980-87: passim.; 1990: passim.

This growth in agricultural output and productivity was accomplished despite a relatively poor agricultural infrastructure, with below average fertilizer use in the late 1980s. The cropping index was over 1.71 for Kunming and Yuxi prefectures in 1989, while for Honghe and Delong it was 1.45, compared to 1.54 for Yunnan as a whole. Yuxi, Kunming and Honghe all had high incidence of irrigated land ranging from 50 to 40% for the prefecture, compared to only 10% for Delong in 1989. The average for Yunnan was 34% of cultivated area

under irrigation. Thus these counties were modestly advantaged by Yunnan standards, with the exception of those in Delong, and this advantage was translated into higher agricultural productivity.

It is difficult to generalize about the composition of industrial production in these counties. Half of the counties had above average shares of NVIO in NVAIO, while half were below average. Of the counties where the proportion of industry was above average, four were heavily dominated by state industry, while in one collective and privately owned industries made up more than half of the total industrial output value. However, only one boasted above average growth in industrial output for 1985-90, while the remainder faced relative stagnation (a factor that is true for three of them from 1978 to 1985 as well). By contrast, where the industrial base was small, regardless of industrial ownership type, industry grew rapidly, particularly from 1985-90.

i. Trading Counties

All ten counties maintained above average levels of per capita NDMP for 1985-90, although growth rates in per capita NDMP were below average in half of the counties throughout this period, and most were hard-hit by the recession in 1989-90. It is the performance of the 'service' sector as a proportion of NDMP that holds the key to differential levels of modern sector development in these counties. First, the trading counties from Delong prefecture. The industrial sector in all of these counties was small relative to agriculture or the 'service' sector, and was largely state dominated. Industry averaged 20% of NVAIO in 1978 and increased its share to 30% by 1990, with particularly rapid growth in industrial output from 1985-90, averaging 15% per annum. Luxi county had the only significant industrial sector, with both state and collective industrial output in excess of the provincial average, 134.2 and 38.5 million *yuan* respectively in 1990. Non-state industry accounted for 24%

of GVIO in 1990. The small industrial sectors of Longchuan and Ruili were dominated by state industry, 91% and 87% of GVIO respectively, while the tiny industrial sector in Wanding, 4.9 million *yuan*, was virtually equally divided between state and collective ownership. Given the small share of industry in NDMP in these counties, the dynamic growth in this sector from 1985-90 was unable to generate high rates of overall economic growth. In the case of these counties, it was the size of the industrial sector that contributed most to their slower rate of growth.

Table 6.4d Yunnan, Rich, Moderate Growth, Industrial Output 1978-90

	NVIO % of NVAIO				% Growth Rate Real p.c. NVIO	
County	1978	1980	1985	1990	1978-90	1985-90
Jinning	60.0%	63.7%	59.9%	71.3%	10.4%	18.3%
Yiliang	43.7%	36.3%	37.0%	41.2%	5.6%	8.9%
Yimen	56.4%	60.3%	48.9%	54.2%	4.6%	7.0%
Eshan	20.7%	23.4%	30.1%	44.9%	12.4%	15.6%
Kaiyuan	76.2%	83.2%	74.7%	83.9%	6.0%	11.7%
Mengzi	38.2%	61.3%	48.4%	57.3%	10.5%	10.5%
Luxi	24.9%	28.4%	28.8%	38.2%	11.0%	14.4%
Longchuan	19.9%	18.6%	20.0%	28.5%	11.2%	14.8%
Ruili	20.8%	18.1%	22.2%	30.5%	11.3%	15.3%
Wanding	19.7%	23.3%	12.3%	22.1%	7.0%	16.4%
Shuifu	85.0%	90.1%	85.9%	85.1%	3.1%	2.7%
Yunnan x	28.5%	30.1%	32.3%	41.5%	9.1%	12.0%

Sources: YNTJNJ 1990: 105-9, 170-4, 245-9; 1991: 601-610, 636-640, 676-680.

The performance of the 'service' sector - transportation, commerce and construction - was also very important in Delong prefecture. The Burma road passes through these counties, and as a result there is a great deal of commercial and transportation activity in these counties, tied to trade with Burma.[27] For these four counties, the service sector accounted for 39% of NDMP in 1985, increasing to 55% in 1988, and then falling back to 38% in 1990 as a result of the recession. In Wanding, the service sector accounted for 74% of NDMP in 1988, higher than virtually any other county in the province. The

27 The area is also part of the Golden Triangle, and has a problem with narcotics. Evidence for this comes from the high incidence of HIV in Ruili and the large numbers of executions for drug related offenses that take place there. For example, in November 1991, it was estimated that in a town of 60,000, as many as 3,000 were HIV positive. During the first week of November that same year, as part of a province-wide anti-drugs campaign, 300 people were executed in Ruili.

importance of the 'service' sector in NDMP helps to explain the relative stagnation of these counties, and their apparently low-level of modern sector development, given its susceptibility to recession.

Yunnan: Rich Counties with Moderate Growth, 1978-90

LEGEND

1.Jinning
2.Yiliang
3.Yimen
4.Eshan
5.Kaiyuan
6.Mengzi
7.Luxi
8.Longchuan
9.Ruili
10.Wanding
11.Shuifu

ii. Prefectural Capitals

The two counties from Honghe that are included in this group look to be related to the prefectural capitals group of counties, with an unusually large share of industry, heavily dominated by the state. Similarly they could be interpreted as comprising a secondary growth pole focused around Gejiu city, although the great poverty of the majority of the surrounding counties suggests that these counties are poor transmitters of prosperity to their hinterland. (These poor counties are examined in chapter 7.) Both Kaiyuan and Mengzi had high shares of industry in NVAIO from 1978 to 1990, with a steady rate of increase, and above average growth rates between 1985 and 1990. In both counties, the 'service' sector was severely cut back as a result of the recession. In Kaiyuan, the 'service' sector represented 48% of NDMP in 1985, by 1988 this proportion had fallen to 22%, and in 1990 only 5% of NDMP came from the service sector. Both agriculture and industry gained in their shares on NDMP as a result of this decline. Despite the size and rapid growth of state industry, this failure of the 'service' sector points to the fleeting nature of modern sector growth in this county.

Table 6.4e Yunnan, Rich, Moderate Growth, NDMP Composition 1983-90

	% Agriculture			% Industry			% Other			% Growth
County	1985	1988	1990	1985	1988	1990	1985	1988	1990	1985-90
Jinning	26%	22%	24%	40%	45%	60%	34%	33%	16%	9.0%
Yiliang	52%	47%	47%	30%	34%	33%	18%	19%	20%	7.0%
Yimen	38%	36%	39%	37%	45%	46%	25%	19%	15%	2.2%
Eshan	54%	46%	48%	23%	29%	39%	23%	25%	13%	4.1%
Kaiyuan	12%	13%	15%	40%	65%	80%	48%	22%	5%	-2.5%
Mengzi	43%	33%	41%	40%	41%	54%	17%	26%	5%	4.0%
Luxi	61%	43%	49%	24%	28%	31%	15%	29%	20%	9.2%
Longchuan	62%	48%	55%	15%	28%	22%	23%	24%	23%	6.8%
Ruili	52%	32%	41%	15%	17%	21%	33%	51%	38%	7.9%
Wanding	38%	22%	34%	5%	4%	10%	57%	74%	56%	3.2%
Shuifu	14%	15%	15%	83%	84%	84%	3%	1%	1%	2.6%
Yunnan mean	42%	43%	48%	24%	27%	35%	34%	30%	17%	4.6%

Sources: YNTJNJ 1990: 105-9, 170-4, 245-9; 1991: 601-610, 636-640, 676-680.

The 'service' sector accounted for 17% of NDMP in Mengzi in 1985. There

was a rapid expansion in 'service' sector activities from 1985 to 1988, with 26% of NDMP coming from 'services' in 1988, only to collapse to 5% of NDMP in 1990. So the argument regarding level of modernization that applied to Kaiyuan also applies to Mengzi, placing both in the middle range of modernization.

iii. Kunming-Yuxi Area

Finally, there are the four counties of the growth pole region: Jinning, Yiliang, Yimen and Eshan. As with the growth pole group in the previous section, these counties can be further sub-divided by level of development. Jinning and Yimen counties are in the upper-middle modernization level, by virtue of the high proportion of state ownership in the industrial sector, and the dominance of industry in NVAIO. The two had similar experiences, with the composition of NDMP, where the 'service' sector was quite highly developed in 1985, 34% in Jinning, and 25% in Yimen, falling to 15% of NDMP in 1990 as a result of the recession. That the 'service' sector was not more severely hit by the recession signals a higher level of economic modernization than that achieved by other counties in this group.

Yiliang county is difficult to allocate to a level of development. Its agricultural sector performed well throughout the 1980s, with increased yields and agriculture gaining in its share of NVAIO from industry. Industry had a relatively low growth rate throughout the 1980s. Further, industry was divided by ownership type, such that 50% was state-owned, and 25% fell in each of the collective and private ownership categories. The final quandary comes in the form of a small, but steadily growing, share of 'services' in NDMP, from 18% in 1985 to 20% in 1990, when NDMP was growing by 7% per annum for 1985-90 - somewhat below the provincial average. The highly diversified and recession-proof nature of the economy in Yiliang (NDMP growth continued unabated through the 1989-90 recession), suggests that there is great potential for future

economic modernization and growth, from its present moderate level.

Eshan county started the reform period with a very low base in terms of agricultural productivity and industrial output, and as a result belongs in the lower modernization group of counties. Industrial output value was a small portion of NVAIO in 1978, but grew steadily and rapidly to account for 45% of NVAIO in 1990, at a growth rate of 15.6% per annum in per capita NVAIO between 1985 and 1990. State-owned industry accounted for 50% of the total, with collective industry comprising 37%, and privately owned the remaining 13% in 1990. The share of 'services' in NDMP fell from 23% in 1985 to 13% in 1990, indicating that there was a solid core of 'service' enterprises well enough established to weather the harsh economic conditions. The diversity of ownership types in the industrial sector, combined with the resilience of a core of 'services' during the recession, points to the capacity for future economic growth and modernization in Eshan.

iv. Shuifu (Rich, Low Growth County)

Shuifu is the last county to be examined in this section. It belongs in a separate category because of the very poor performance of its economy from a highly advantaged position. Located on the Changjiang in the northeastern tip of Yunnan, Shuifu was designated as a recipient for Third Wave industrialization during the 1960s and early 1970s for strategic reasons. Agricultural production in Shuifu was disappointing by Yunnan standards, and accounted for only 10% of NVAIO for virtually all of the 1980s. Despite this, per capita NVAIO growth was only 3.1% for 1978-90, and only 2.7% for 1985-90. As Maoist industrialization here was strategic in intent, it is unsurprising that in 1990 less than 4% of industry belonged to the collective or private sectors (virtually all of which was collective). To further illustrate the dominance of state industry, and its accompanying economic stagnation,

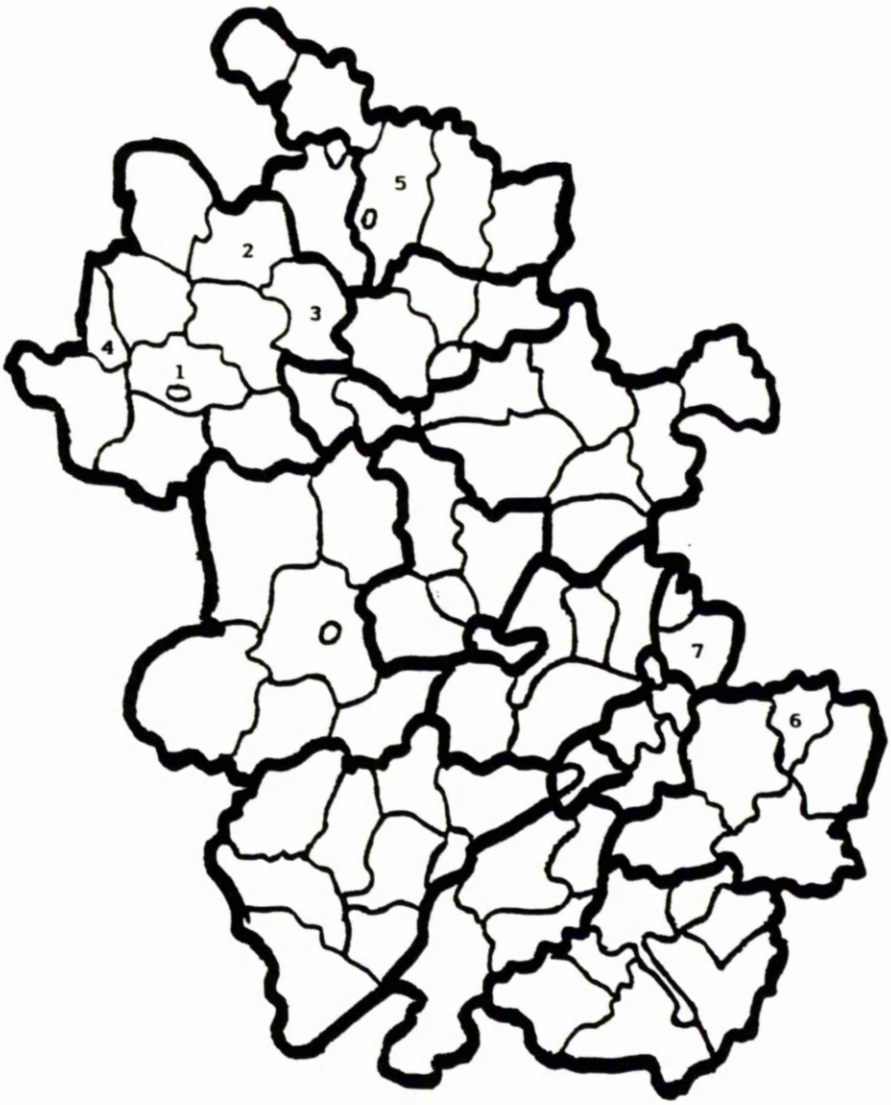
'services' fell from 3% of NDMP in 1985 to 1% in 1988, where it remained through 1990. Contrary to the experience of numerous other counties in Yunnan examined in this chapter, it is Shuifu that upholds the conventional wisdom regarding the stagnation and inefficiencies that predominate in the state industrial sector. Despite its dominance of output value, industry employed less than 30% of the population in Shuifu according to the 1982 census. The lack of a solid agricultural base in the county has doubtless contributed to the decline of material living standards in the county as the lack of investible surplus has prevented greater diversification of the economy in Shuifu.

4. Dynamic Growth from a Low Base in Anhui

There were six counties in Anhui that started the reform period with low levels of per capita NVAIO but ended the 1980s with upper-middle levels through per capita NVAIO growth rates in excess of 11% per annum. These counties had the greatest degree of upward mobility in the province. There were no equivalent counties in Yunnan. Five of these counties are in the north of the province: Fuyang and Jieshou in the northwest, and Guoyang and Mengcheng adjacent to Bo examined in section 2. All of these counties are in Fuyang prefecture (the remaining counties of which are discussed in chapter 7). In the northeast there is Su county, the rural county surrounding Suzhou in Suxian prefecture. Finally there is Langxi county in the southeastern part of the province, bordering southern Jiangsu. Along with high economic growth rates, mortality increased rapidly (13.3% per annum) in these counties (from 4.37 per thousand population in 1981 to 11.92 in 1989), going from below the provincial mean (5.66) in 1981 to above it in 1989 (9.66).

Despite high output volumes of grain in Su and Guoyang counties, agricultural productivity was quite low in these counties, with yields for

Anhui: Dynamic Growth from a Low Base, 1978-90



LEGEND

1.Fuyang
2.Guoyang
3.Mengcheng
4.Jieshou
5.Su
6.Langxi
7.Dangtu

grain generally below the provincial average throughout the 1980s.[28] Langxi had grain yields above the provincial average in 1985 and 1990, but only marginally so. There was, however, substantial growth in the area sown in grain in these counties, averaging just under 1% per annum, and an average growth rate in grain output of 6.7%, well above both the provincial average of 5.4% and the China average of 2.7%. The apparently low productivity of grain production reflects more the high share of wheat in total grain output relative to rice, than any true inefficiency on the part of farmers here.[29] The rapid growth in output was reflected in the high incidence of irrigated farm land,

Table 6.5a Anhui, Mid-range, Fast Growth, Grain Output 1980-90

	Yields, Tonnes/Ha.			% Growth Rate		
				Sown Area	Output	Yields
County	1980	1985	1990	1980-90	1980-90	1980-90
Fuyang	1.6	2.3	2.9	0.7%	6.4%	6.1%
Guoyang	1.6	3.0	3.4	1.1%	8.9%	7.8%
Mengcheng	1.8	2.9	3.1	0.9%	6.5%	5.6%
Jieshou	2.3	3.0	3.2	1.3%	4.7%	3.4%
Su	2.0	3.1	3.7	0.6%	7.2%	6.3%
Langxi	2.2	4.0	4.4	-0.4%	6.6%	7.2%
Anhui mean	3.1	4.0	4.3	0.4%	5.4%	3.3%

Sources: ZGFX 1980-87: passim.; 1990: passim.

the high and rapidly growing use of chemical fertilizer for most of these counties, and the multiple cropping index, which was approaching 2.0 in the late 1980s. For the majority of counties in this group (Jieshou and Su counties excepted) oil crop production was efficient by Anhui standards, although only Guoyang had yields per hectare above the China average[30]. All counties had productivity gains in oil crop production above the China average, and all but Jieshou and Su exceeded the China average growth rate of oil seed

28 Su county was the highest ranked county in Anhui, in terms of grain output, coming thirty-third out of the top 100 grain producing counties in China. Guoyang came sixty-third in the same ratings.

29 The majority of these counties are located north of the Huai river, on the North China Plain region of the province, a wheat and maize producing area.

30 This is not particularly indicative of the 'efficiency' of farmers in this region, because of the need to control for differences in geographic conditions, and therefore is meant more as a guideline.

yields for 1980-90. Therefore, all evidence points to a strong agricultural foundation for economic growth throughout the 1980s in these six counties.

Table 6.5b Anhui, Mod-range, Fast Growth, Oil Seed Output 1980-90

County	Yields, Tonnes/Ha. 1980	1985	1990	% Growth Rate Sown Area 1980-90	Output 1980-90	Yields 1980-90
Fuyang	0.6	1.5	1.2	-7.1%	-0.3%	7.2%
Guoyang	0.8	1.3	1.5	3.7%	10.7%	6.5%
Mengcheng	0.6	1.4	1.2	4.8%	12.3%	7.2%
Jieshou	0.5	1.4	0.7	-8.1%	-4.4%	3.4%
Su	0.9	1.2	1.1	4.7%	7.4%	2.0%
Langxi	0.7	1.1	1.3	11.5%	18.0%	6.4%
Anhui mean	1.1	1.4	1.3	5.8%	9.5%	0.9%

Sources: ZGFX 1980-87: passim.; 1990: passim.

If agriculture provided the foundation for growth, then it was the 'service' sector supported by sustained but modest growth in the industrial sector that accounted for the very rapid rates of economic growth achieved in Fuyang, Guoyang, Mengcheng and Langxi counties during the 1980s. For Fuyang, Guoyang and Mengcheng, agriculture accounted for between 65 and 69% of NDMP in 1983. In Langxi agriculture accounted for only 43% of NDMP in 1983. Of the counties in this group, Langxi had the most highly developed economy in the early 1980s, due to integration with townships in highly prosperous southern Jiangsu, which led to greater diversification in employment and output across the sectors. Agriculture experienced a decline in its share of NDMP between 1983 and 1989 in these counties compared to both 'services' and industry, although it continued to account for 10 to 20% of total NDMP growth. For Fuyang, Guoyang and Mengcheng the vast majority of NDMP growth came from the 'service' sector, accounted for between 66% and 80% of NDMP growth for the 1983-89 period. In Langxi the shift in shares of NDMP was somewhat smaller; industry increased by 8% of NDMP to 18% at the expense of agriculture, and 'services' also gained 7%, rising to 54% of NDMP. However, 20% of the increase in NDMP between 1983 and 1989 in Langxi came from growth in agriculture, 22%

from industry, and the remaining 58% from 'services', reinforcing the continued importance of the agricultural sector. In 1989, in Fuyang, Guoyang, and Mengcheng, 'services' grew to account for 51 to 54% of NDMP, gaining between 24 and 30% from agriculture. By contrast the gains to industry, at the expense of agriculture, in shares of NDMP ranged from 2% in Mengcheng to 7% in Fuyang. By 1989 industry accounted for between 9% and 13% of NDMP in 1989 in these three counties.

Table 6.5c Anhui,Mid-range, Fast Growth, Chemical Fertilizer Use 1980-90

	Use, K.Tonnes			% Growth Rate
County	1980	1985	1990	1980-90
Fuyang	9.5	32.1	28.9	11.8%
Guoyang	9.0	34.2	35.8	14.8%
Mengcheng	12.3	38.1	38.7	12.2%
Jieshou	11.2	11.5	13.5	1.9%
Su	12.7	25.4	29.7	8.9%
Langxi	5.3	4.5	9.5	6.0%
Anhui mean	7.3	24.3	26.0	10.6%

Sources: ZGFX 1980-87: passim.; 1990: passim.

In Langxi, XZGY dominated the industrial sector, representing 51% of GVIO in 1984, and increased to 58% in 1988. Therefore, collective industrial enterprises contributed significantly to economic growth in Langxi. However, XZGY only represented about 46% of XZQY throughout the second half of the 1980s. This indicates that the non-industrial portion of XZQY grew as quickly as XZGY did over this period. As industry grew somewhat more quickly than 'services' between 1983 and 1989 in Langxi, it can be concluded that state-owned and privately-owned industry also contributed modestly to economic growth.

Fuyang, Guoyang and Mengcheng, by contrast, were not dominated by XZGY in either XZQY or GVIO. For these counties 'services' contributed most to economic growth between 1983and 1989. In Mengcheng, 'services' increased their share of NDMP by 15 times more than industry did , while in Fuyang the ratio was 3.5 to 1. For all three counties XZGY accounted for a smaller proportion

of XZQY, and lost share part of its share of XZQY to 'services', while it represented an increasing share of GVIO between 1984 and 1988. This helps to illustrate that the collective sector was the most dynamic form of industrial ownership in these counties, fuelling the limited industrial growth that did occur, but it was the township and village enterprise 'service' sector that provided the source of the greatest dynamism for 1984-88.

Table 6.5d Anhui, Mid-range, Fast Growth, Industrial Output 1978-90

County	NVIO % of NVAIO 1978	1984	1988	% Growth Rate Real p.c. NVIO 1978-88	1984-88
Fuyang	7.6%	6.2%	23.8%	25.4%	43.7%
Guoyang	13.8%	12.2%	25.9%	18.7%	27.3%
Mengcheng	10.0%	9.5%	19.8%	20.3%	24.7%
Jieshou	25.1%	22.1%	48.7%	22.0%	28.7%
Su	21.7%	23.3%	30.8%	16.3%	10.6%
Langxi	17.7%	18.5%	38.2%	20.7%	33.0%
Anhui mean	14.8%	16.3%	36.1%	17.9%	30.0%

Sources: AHNJ 1985: 325-525; 1990: 241-357.

Due to the high level of development of the 'service' sector in these four counties, and the level of per capita NDMP, they can be classified as having achieved an upper middle level of economic development equivalent to counties such as Bo and Fengyang discussed in section 2.

Jieshou county was quite different from the four counties discussed above, as it was the industrial sector which showed the greatest dynamism between 1983 and 1989. Despite an adequate agricultural foundation, agriculture lost 29% of its share in NDMP, and actually fell between 1983 and 1989. This was compensated for by the large growth in industry and 'services', with growth in NVIO accounting for 76% of NDMP growth for 1983-89, and 'services' a further 33%. Over this same period, industry's share of NDMP grew from 20% to 40%, while 'services' expanded from 8% to 17%. XZGY represented the most dynamic sector in XZQY, with its share of XZQY rising from 36% in 1984 to 48% in 1988. However, collective industry was not the only source of

economic growth. In fact state and privately-owned industry (though principally the state sector), grew more quickly, with XZGY dropping from 37% of GVIO in 1984 to 33% in 1988. As a result Jieshou more closely resembles the dynamic counties of Yunnan, although the magnitude of the contribution of state-owned industry was smaller than in counties such as Anning, Yuxi or Chenggong. The small size of the 'service' sector in Jieshou meant that per capita NDMP was quite low in comparison with other counties in this group, and resulted in slower NDMP growth. This suggests that Jieshou was at a much lower level of development in the late 1980s, towards the lower-middle level.

Table 6.5e Anhui, Mid-range, Fast Growth, NDMP Composition 1983-90

County	% Agriculture 1983	1989	% Industry 1983	1989	% Other 1983	1989	% Growth 1983-89
Fuyang	67%	4%	29%	36%	11%	53%	14.2%
Guoyang	65%	9%	26%	36%	13%	51%	17.5%
Mengcheng	69%	7%	24%	37%	9%	54%	13.8%
Jieshou	72%	20%	8%	43%	40%	17%	7.6%
Su	58%	25%	17%	51%	10%	39%	11.5%
Langxi	43%	10%	47%	28%	18%	54%	18.5%
Anhui mean	65%	35%	13%	19%	22%	46%	15.8%

Sources: AHNJ 1985: 325-525; 1990: 241-357.

Su county is another special case. Agriculture retained the majority share of NDMP, although it fell from 58% in 1983 to 51% in 1989. Agriculture accounted for 43% of the growth in NDMP for 1983-89. Over this period, industry fell from 25% to 10% of NDMP contributing negatively to the growth of NDMP overall, despite a growth rate of 16.3% per annum for 1978-88 as a whole. The diminution of industrial growth rates after 1984 was accompanied by rapid growth in the 'service' sector, expanding to 39% of NDMP in 1989 from 17% in 1983, and contributing 63% of growth in NDMP for 1983-89. The relative shares of XZGY in XZQY and GVIO corroborate the importance of 'services' relative to industry in NDMP growth. In 1988 XZGY accounted for only 25% of XZQY, compared to 45% of GVIO, a complete reversal of the situation in 1984, where XZGY's share in XZQY was relatively large, 45%, and relatively small in GVIO,

having expanded from 19%. As a result, Su county appears to be somewhat more advanced in its level of modern sector growth than Jieshou county, but somewhat less advanced than Fuyang, Guoyang, Mengcheng and Langxi counties.

As with the majority of the counties examined in this chapter, these counties have built economic success through modern sector enlargement growth within the industrial and 'service' sectors in the late 1980s on the firm foundation provided by increased agricultural output and productivity in the early 1980s. The progress made as a result of modern sector growth in material well-being has been tempered by declines in functioning as measured by illiteracy and the death rate in these counties, often to the extent that these declines off-set gains in material well-being in the standard of living index.

5. Conclusion

For all of the counties discussed in this chapter, it was the commoditization of the rural economy that sparked rapid economic growth. Commoditization in turn was possible as a result of the creation of an investible, surplus from the agricultural sector based on rapid expansion in both productivity and output volume for basic agricultural crops such as food grains and oil crops. In areas with particular climatic conditions, commercialization was also achieved through specialization in cash crops such as tobacco, tropical fruits, rubber and silviculture. Profits flowed out of the agricultural sector, instead of being reinvested to promote modernization because upon the dissolution of the communes, private plots offered the only social security safety net against recession and unemployment. This dissolution ensured that no family felt confident enough of its non-farm income to persuade them to abandon grain production. Instead when economic conditions were good, pregnant women, women with young children, children themselves and grandparents were left to handle agricultural production, freeing the most

able-bodied and skilled labourers in the household to seek employment in the non-farm sector. This trend was reversed during recession when employment in the non-farm sector became scarce, as was argued in Bramall and Jones (1993: 52-8) on the basis of village level evidence on contracting out of grain land in Zhejiang. As a result of this unwillingness on the part of rural households to dispose of their *kouliang*[31] land or their household garden plot, there was no scope for either the mechanization of agricultural production, or the effective use of labour within the existing labour intensive modes of production.

This explains the supply-side stimulus to non-agricultural production in Anhui and Yunnan in the mid to late 1980s, but what of the demand-side of the rural economy? As the levels of productivity and output increased in conjunction with the shift in intersectoral terms of trade in favour of agriculture from 1979 to 1982, farm incomes in these provinces increased rapidly. This represented the first significant increase in rural incomes since the eve of the Great Leap and provided not only an investible surplus but also a huge stimulus to demand for food, housing, consumer durables, and other consumer goods and services within the rural economy. This fuelled the development of light industry and service enterprises (and off-farm employment) within the rural areas themselves.

The increase in agricultural production and productivity was facilitated by a removal of the twin bottlenecks imposed by the availability of water resources and soil nutrient content. For most counties, the easing of these constraints coincided with the introduction of HYV rice, wheat and soya beans, and an increase in absolute and relative purchase prices for these products.[32]

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31 This literally stands for mouth grain, and stands for land set aside for subsistence grain production.

32 See chapter 1, section 2 on the introduction of Green Revolution technology in Anhui and Yunnan.

However, the time involved in completing construction of chemical fertilizer plants and large irrigation schemes, suggests that the growth in agricultural output and rural incomes in the early 1980s owed much to Maoist investment in agricultural infrastructure, and the continuation of this investment through the dissolution of the communes in 1983.

In Anhui and Yunnan, where modern sector development was led by the industrial sector, growth rates and economic diversification were greatest. In Anhui collective industrial enterprises spearheaded economic growth in the most advanced counties. In Yunnan it was the large and dynamic state industrial sector that fuelled the highest levels of economic modernization. Counties with dynamic 'service' sectors also achieved rapid growth and increased per capita NDMP, but this appeared to be a second-best development strategy, with these counties falling short of the achievements of their industrially based cousins. This was most apparent during the 1989-90 recession, where the 'service' sector suffered greater declines than those experienced by the industrial sector.

As will be demonstrated in chapter 7, it is the fundamental strength of productivity and output growth in the agricultural sector in the early 1980s that provided the foundation for economic modernization, and its absence that ensured the poor economic performance of other counties.

Chapter 7

Poor and Slow Growth Counties in Anhui and Yunnan

1. Introduction

This chapter, the second of two examining the counties of Anhui and Yunnan in some detail, investigates the factors and agents underlying the poor economic performance of poor and slow growth counties during the reform period. There were counties that started the reform period as poor, and have experienced very modest growth, counties that started the period with mid-range per capita NVAIO, but which stagnated. Finally, there were counties that were poor at the beginning of the reform period, but showed signs of improvement through rates of growth around the provincial average. As with the wealthy and dynamic counties examined in chapter 6, dynamism in the agricultural sector was necessary, if not sufficient, for rapid economic growth.

This chapter illustrates the same trends seen in chapter 6. For the poor counties examined in chapter seven, it will be shown that agricultural productivity was low, and stagnant. Rapid increases in agricultural productivity accompanied fast growth rates in these counties, or the least sluggish growth was accompanied by rapid expansion in agricultural output in the absence of productivity gains. All counties were located in disadvantaged regions, where poor soil quality, and limited access to inputs such as chemical fertilizer and irrigation hindered productivity and output growth.[1] In both Yunnan and Anhui these counties had very small industrial sectors. In Anhui the industrial sector was dominated by state-owned enterprises, while in Yunnan collective and privately-owned

[1] If a county was disadvantaged in terms of agricultural infrastructure in the early 1980s, little investment took place to improve the situation once decollectivization was completed. For more on this topic, see the section on agriculture in chapter 1.

enterprises predominated. Where this was not the case, a county had NDMP levels and growth rates above those of its peers. Finally, the 'service' sector was small and grew rapidly from 1985 to 1988, only to contract severely during the 1989-90 recession. The net result was at best a modest contribution to NDMP growth during the 1980s, and at worst a significant contribution to its decline.

Places with limited improvements in commodity-based functioning often experienced considerable gains in non-commodity functioning. This was due to a shift towards the average in mortality in both rich and poor counties. The death rate declined in those counties where they it was high in 1982, and increased where it was low during the intercensal period despite the change in health care provision. Without institutional changes, and significant investment in infrastructure - transportation, electricity and agricultural are of greatest importance - it is difficult to be positive about the prospects for improved material well-being in these counties.

This chapter is divided into five sections. The introduction is followed by three sections on each of the groups of counties outlined above. Finally, there is a conclusion, synthesising the findings of each of the sub-sections.

2. Poor, Slow Growth Counties

There are four counties in this group from Anhui: Linquan, Liu'an, Huoqiu, and Taihu. They all had per capita NVAIO values below 250 *yuan* in 1988-90, and from 1978 to 1990 per capita NVAIO grew at less than 6% per annum. This was relative to a provincial average of 363 *yuan* per capita NVAIO in 1988-90, and a growth rate of 8.7% per annum in per capita NVAIO for 1978-90. In Yunnan province the average per capita NVAIO for 1988-90 was 340 *yuan*, and the average growth rate of per capita NVAIO was 6.6% per

annum, both lower than in Anhui. For this reason, counties in this category were defined as having per capita NVAIO below 200 *yuan* in 1988-90, and an annual growth rate of per capita NVAIO from 1978 to 1990 below 4%. There were ten counties in this group: Luquan, Ludian, Yiliang, Pingbian, Honghe, Jinping, Yanshan, Maguan, Qiubei and Fugong. The relatively large number of counties in this group from Yunnan is indicative of the lower level of economic development in the province relative to Anhui, and to its greater size.

The mortality data provide an indication of trends in non-commodity functioning, and based on the foregoing analysis are important in determining trends in overall living standards. For the these counties from Anhui, mortality increased by a rate in excess of the provincial average (7.6% compared to 6.9% for the provincial average, or 10.6% for the rich and fast growth counties). Mortality in these counties increased from just below the provincial average in 1981 (5.38 deaths per thousand population, compared to 5.66), to marginally above the provincial average in 1989 (9.7 deaths per thousand population, compared to 9.66). For the counties from Yunnan in this group, mortality fell more quickly than the provincial average (-4.0% per annum compared to -2.1% for 1981-89). Despite this, mortality in these counties remained above the provincial average throughout the 1980s (falling from 11.59 per thousand population in 1981 to 8.39 in 1990, compared to 9.08 and 7.65 respectively for the provincial average). These data suggest that there was an absolute decline in living standards, as measured by mortality in the poor and slow growth counties of Anhui, and also a decline in living standards in relative terms, although the relative decline was larger for other counties in the province. For the poor and slow growth counties of Yunnan, the trends in morality suggest rising absolute and relative living standards, although

mortality remains high in these counties.

a. Agriculture:

Huoqiu county in Anhui ranked fiftieth among Chinese counties in terms of total grain output, and Liu'an ranked forty-eighth in total oil seed output in 1990. Despite the appearance of agricultural prosperity that these rankings represent, low yields, and low growth rates for yields, for staple crops was one of the unifying factors in these poor and stagnant counties. Of the four counties from Anhui, only Taihu had grain yields above the provincial average, and all but Linquan county had below average rates of growth for grain yields. This, accompanied by high use of chemical fertilizer by Anhui standards in Linquan, Liu'an and Huoqiu counties, points to the conclusion that these counties were stagnant due to a lack of growth in the farm sector. Growth rates for chemical fertilizer use were low as well.[2]

Table 7.1a Agricultural Output in Anhui 1980-90

	Food Grain Yields Tonnes per Hectare			Oil Seed Yields Tonnes per Hectare			Chemical Fertilizer Use, K Tonnes		
County	1980	1985	1990	1980	1985	1990	1980	1985	1990
Linquan	1.7	2.6	3.1	0.4	1.2	0.7	12.6	30.3	31.1
Liu'an	3.2	4.4	4.2	0.9	1.2	1.0	13.7	20.8	27.2
Huoqiu	2.9	4.1	3.9	0.6	1.0	0.8	14.1	20.2	41.4
Taihu	3.5	4.7	4.8	0.8	1.0	1.0	3.9	6.0	8.2
Mean	2.8	4.0	4.0	0.7	1.1	0.9	11.1	19.3	27.0
Prov.Mean	3.1	4.0	4.3	1.1	1.3	1.2	7.3	15.6	20.0

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

Unlike the counties of Honghe and Xishuang Banna prefectures in Yunnan, these counties were large scale produces of grain and oil crops, and had no specialty agricultural crops that would redeem agricultural

[2] As in chapter six, chemical fertilizer is used as a proxy for availability of agricultural inputs and infrastructure, as there was a strong correlation between these factors (as illustrated in chapter 1) and because there are comprehensive county-level data on chemical fertilizer use.

production as a potential source of economic growth. This will be reflected in the discussions of sectoral shares of NDMP and sectoral contributions to NDMP growth below. Oil crop yields were even more disappointing, with all counties having rapid growth in oil crops yields, but from such a small base that yields remained below the Anhui average, and below the China average, throughout the 1980s.

Table 7.1b Growth Rates for Agricultural Output in Anhui 1980-90

County	Food Grain Growth Output 1980-90	Yields 1980-90	Oil Seed Growth Output 1980-90	Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Linquan	7.5	6.2	4.3	5.8	9.4
Liu'an	-0.4	2.8	10.4	1.1	7.1
Huoqiu	3.9	3.0	22.8	2.9	11.4
Taihu	0.8	3.2	6.0	2.3	7.8
Mean	3.0	3.8	10.9	3.0	8.9
Prov.Mean	5.4	4.7	9.5	0.9	10.6

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

The trends in agricultural production in poor and stagnant counties in Yunnan were hardly more encouraging. Use of chemical fertilizer was low in the majority of these counties, and although numerous counties enjoyed rapid growth in chemical fertilizer use from 1980 to 1990, it began from an extremely low base. Throughout the 1980s, only Yanshan and Maguan counties in Wenshan prefecture (bordering Guangxi province and Vietnam) had above average chemical fertilizer use in Yunnan. Qiubei county (also in Wenshan) started the 1980s with above average chemical fertilizer use, but this fell below the average in 1990, and was accompanied by a very low rate of growth in fertilizer use.[3] Oil crop yields were universally low in these counties, despite rapid growth of oil crop yields in Luquan, Yiliang, Pingbian, Honghe, Maguan and Qiubei counties. This growth was from a very low base.

[3] It should be reiterated that chemical fertilizer use in Yunnan was already very low on average in an all China context. Caution needs to be exercised in analyzing these data, because they are not adjusted to account for variations in topography.

Table 7.2a Agricultural Output in Yunnan 1980-90

County	Food Grain Yields Tonnes per Hectare 1980	1985	1990	Oil Seed Yields Tonnes per Hectare 1980	1985	1990	Chemical Fertilizer Use, K Tonnes 1980	1985	1990
Luquan	2.8	2.6	2.9	0.6	0.8	1.0	1.4	3.1	3.7
Ludian	2.3	3.2	2.0	0.5	0.8	0.6	2.0	4.1	4.6
Yiliang	1.8	1.9	2.1	0.4	0.7	0.7	1.0	2.3	3.6
Pingbian	2.0	2.3	2.5	0.2	0.5	0.5	0.5	0.9	1.7
Honghe	2.5	3.1	3.2	0.4	1.5	1.0	0.2	0.8	1.1
Jinping	2.4	2.5	2.6	0.4	0.6	0.5	0.3	0.7	1.3
Yanshan	2.1	2.4	2.2	0.6	0.9	0.8	2.5	5.8	6.7
Maguan	1.7	1.9	1.8	0.2	0.3	0.5	3.5	3.9	5.1
Qiubei	2.3	2.2	2.1	0.3	0.5	0.5	3.0	3.5	3.8
Fugong	2.1	2.0	2.1	0.5	0.4	0.4	0.2	0.1	0.3
Mean	2.4	2.8	3.0	0.7	1.1	1.1	2.4	3.2	4.4
Prov.Mean	2.4	2.8	3.0	0.7	1.1	1.1	2.4	3.26	4.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Table 7.2b Growth Rates for Agricultural Output in Yunnan 1980-90

County	Food Grain Growth Output 1980-90	Yields 1980-90	Oil Seed Growth Output 1980-90	Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Luquan	0.3	0.3	1.6	6.2	10.3
Ludian	-1.2	-1.4	2.4	0.8	8.4
Yiliang	0.4	1.5	5.2	6.9	13.6
Pingbian	2.0	2.3	19.6	9.1	12.7
Honghe	2.6	2.4	11.1	9.1	17.9
Jinping	2.7	0.8	24.0	2.8	17.3
Yanshan	3.0	6.6	7.6	3.0	10.5
Maguan	1.4	0.3	10.1	10.1	4.0
Qiubei	0.3	-0.8	10.4	5.5	2.2
Fugong	5.7	-0.4	5.2	-1.2	2.3
Mean	1.7	0.6	9.7	5.2	9.9
Prov.Mean	2.3	2.3	7.6	5.3	6.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Grain yields were above the Yunnan average in only Honghe county, and grain yields had grown at an above average rate in Honghe as well. By contrast, grain yields fell in Ludian, Qiubei and Fugong counties, while those in Luquan, Jinping, Yanshan and Maguan counties grew at less than 1% per annum over the 1980s.

Jinping is located next to Hekou county, which was among the rich and fast growth counties in chapter six. The Honghe (Red River) forms the

border between the two counties, giving both river and road access to markets in northern Vietnam. They both have tropical climates which permit specialization in tropical fruit crops and rubber production. Evidence from the Jinping minority area almanac (JPXGK, 1990) showed that some villages specialized in banana production, which led to very high household incomes. However, this phenomenon was highly localized, and has had no significant impact on conditions in the county as a whole. Jinping county was the largest producer of bananas in Yunnan, and accounted for 25.5% of all bananas grown in Yunnan in 1990. (YNTJNJ 1990: 656-8) In 1985, per capita NDMP stood at 180.7 *yuan*, falling to 149.4 *yuan* in 1990. By all accounts Jinping was a poor county. However, in 1985, 813 households had an annual total cash income above 1000 *yuan*, and another 87 had an annual total household cash income in excess of 10,000 *yuan* on the strength of specialization in banana production. Twelve villages in the county were designated as specialized banana-producing villages. In Shidong village of Manqia township, in 1983 60,000 kgs of bananas brought in revenue of 50,000 *yuan*. By 1984 this had increased to 189,200 *yuan* for 306,000 kgs of bananas.[4] This was equal to a cash income per capita of 1236 *yuan* in the village, or 10,000 *yuan* per household. Shidong became the first "10,000 *yuan*" village in Jinping county. This occurred at a time when the provincial per capita net peasant income was less than 350 *yuan*, and industrial wages in Jinping county stood at 1187 *yuan*. Spatial inequality in levels of material well-being within this county was also evident from a comparison of cash incomes per capita or per household (JPXGK, 1990: 89, 139-40).

[4] This increase included a virtual doubling of the wholesale price for bananas between the two years. Whether this resulted from an increase in official banana prices or from higher prices due to rapidly rising demand is not clear.

Table 7.3 Cash Incomes For Jinping County 1985

Area	Per Household (*yuan*)	Per Capita (*yuan*)	Household Size (people)
Yunnan	2202	337	6.5
Shidong Village	10000	1236	8.0
Jinhe Township	1735	277	6.3
Zhenguan Village	374	55	6.8

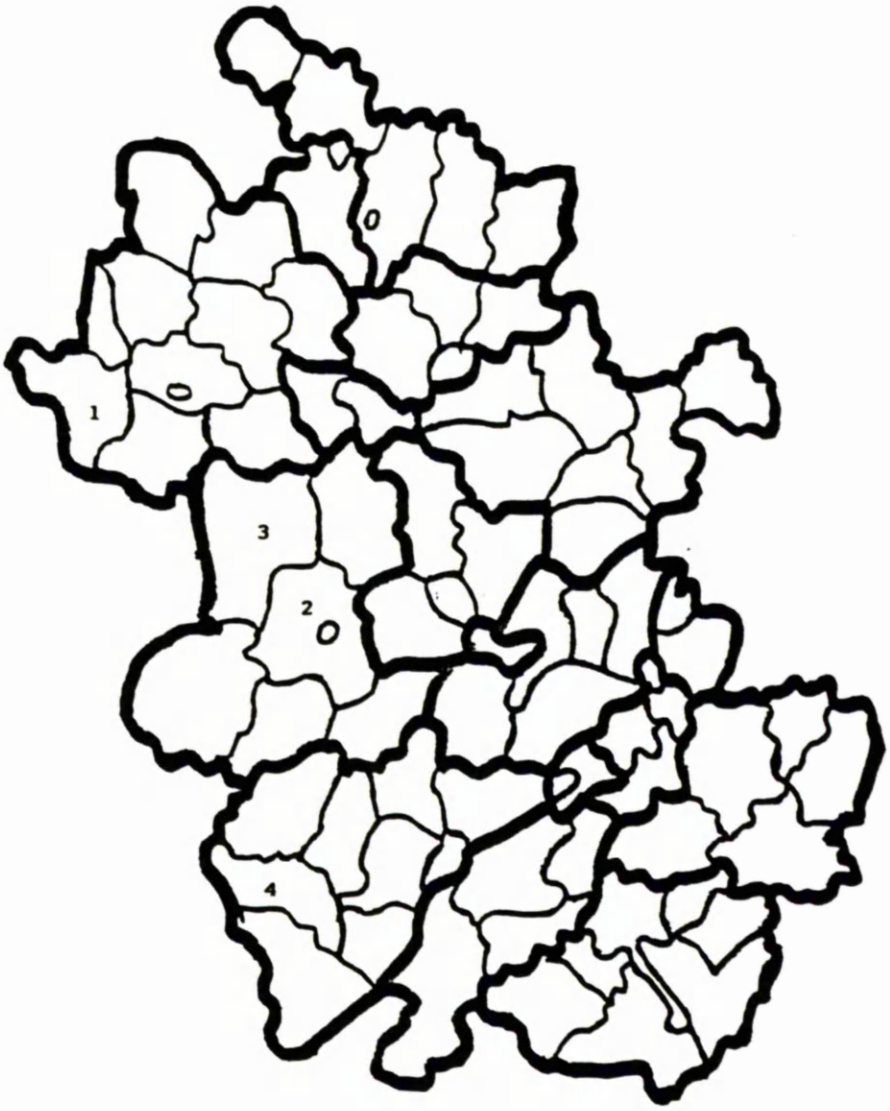
Source: JPXGK, 1990: 89, 139-40.

Household size is not very helpful here; dependency ratios are needed to illustrate the correlation between labour power and household cash incomes. Thus, Jinping's economic success was limited to a small number of specialized villages, while much of the remainder of the county continued in poverty. Agricultural production in Hekou was relatively diversified, with large-scale production of bananas, grapes and rubber in addition to subsistence rice growing, whereas Jinping was overwhelmingly reliant on bananas and subsistence rice cultivation and they grew virtually nothing else in 1990. Jinping is also more mountainous than Hekou, which led to localized micro-climatic conditions that permitted or inhibited tropical crop production, and fuelled regional differentials in agricultural production and economic growth. The contrast between Jinping's agricultural production and Hekou's also holds for Honghe county, where climate and terrain permitted only limited tropical crop production (again of bananas). Honghe accounted for 9.7% of the provincial total in 1990, while the remaining agricultural output was dominated by rice, supplemented by a little maize (YNTJNJ 1991: 646-60).

b. Industry and Composition of NDMP in Anhui

For the four poor and stagnant counties of Anhui, the share of industry in NVAIO remained very low throughout the 1980s, equal to just over half the provincial average (7.9% compared to 14.8% in 1978, and 18.7%

Anhui Poor and Stagnant Counties 1978-90



LEGEND

1.Linquan
2.Liu'an
3.Huoqiu
4.Taihu

compared to 36.1% in 1988, being the averages for poor counties and the province respectively). The growth rate for real per capita NVIO also lagged behind the provincial average for 1978-88 (14.8% compared to 17.9% for the province). Huoqiu county had very slow growth of industrial output, particularly for 1978-84. However, there was a strong recovery in industrial production after 1984, but to a level significantly below those for both province and the most rapidly growing counties. Liu'an county had above average growth in real per capita NVIO for 1978-88, although this owes much to its very low base in the late 1970s. As both of these counties were in backward and locationally disadvantaged Liu'an prefecture, this performance is not surprising; similarly for Taihu county in Anqing prefecture. By contrast, industrial output in Linquan county grew rapidly between 1984 and 1988, above the 30% provincial average. As Linquan borders two of the more dynamic counties of Anhui (Fuyang and Jieshou), rapid industrial growth could be taken as evidence of growth and prosperity spreading in the late 1980s. If trickle-down was working through increased industrial activity in Linquan, then by 1988-9 its effects were not evident in levels of per capita NDMP and accompanying growth in the 'service' sector. Any industrial boom should have resulted in a growth in construction and transportation activities, as well as the commerce sector (the latter being the result of the multiplier effect produced by increased household incomes, particularly cash incomes).

In Linquan, collectively- and privately-run industrial enterprises were the most dynamic sectors, driving growth in both per capita NVIO and in XZQY output between 1984 and 1988. However, industry, construction, transportation and commerce sectors started from very small bases in the early 1980s, and as a result their rapid rates of growth resulted in only very modest gains in real per capita NDMP from 1983 to 1989. NDMP grew by

10.8% per annum in Linquan, compared to 15.8% per annum for Anhui as a whole, or 13.2% for these four poor counties. This slow rate of NDMP growth illustrated the lack of trickle-down in Fuyang prefecture during the 1980s.

Table 7.4 Anhui's Poor and Slow Growth Counties
Industrial Output Composition and Growth 1984-88

	% XZGY in XZQY		% XZGY in GVIO		percentage growth rates XZQY	XZGY	pc.NVIO
County	1984	1988	1984	1988	1984-88	1984-88	1984-88
Linquan	52.0	59.5	20.1	38.3	55.8	61.1	33.5
Liu'an	34.6	69.3	31.2	60.9	27.2	51.3	24.5
Huoqiu	61.1	44.0	31.6	46.8	43.9	32.6	16.9
Taihu	35.5	42.3	30.3	44.0	27.3	33.0	8.3
Mean	42.9	55.9	28.9	49.2	35.6	44.9	14.9
Prov.Mean	43.8	46.0	32.9	40.6	40.7	42.4	30.0

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Liu'an and Taihu counties experienced similar trends, with XZGY the dominant sector in XZQY and industry between 1984 and 1988. The more rapid rates of growth in industry and 'services' in Liu'an translated into higher levels of real per capita NDMP, while growth rates of real per capita NDMP were very similar for the two counties. Unfortunately much of this rapid growth was from a small base.

Huoqiu exhibited a different trend, which resulted not only in more rapid per capita NDMP growth, but also a growth rate marginally higher than the provincial average. In Huoqiu, as elsewhere, the XZGY sector dominated industrial growth; however, XZGY was not dominant in the growth of the collective sector as a whole for 1984-88. The greater dynamism of collective-enterprise in construction, transportation and commerce in Huoqiu resulted in higher per capita NDMP growth rates and higher per capita NDMP levels over the 1983-89 period. The probable explanation for this growth is the superior infrastructure; the county has good river and road links to Shou and Changfeng counties, and to communities in Henan

along the Nanjing-to-Wuhan highway which follows the county's southern border and provides a link to the prefectural capital Liu'an city.

Table 7.5a Anhui's Poor and Stagnant Counties
NDMP Composition, Sectoral Percentage Shares 1983-89

County	Agriculture 1983	Agriculture 1989	Industry 1983	Industry 1989	'Services' 1983	'Services' 1989	% gr. NDMP 1983-89
Linquan	73.6	44.1	5.0	10.3	21.4	45.6	10.8
Liu'an	73.0	42.3	7.6	11.0	19.4	46.7	12.3
Huoqiu	74.8	33.1	6.7	6.1	18.5	60.8	16.0
Taihu	71.3	47.0	10.1	11.5	18.6	41.5	12.8
Mean	73.2	40.9	7.4	9.4	19.4	48.7	13.2
Prov.Mean	65.2	34.5	12.7	19.5	22.0	46.0	15.8

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Table 7.5b Anhui Poor and Stagnant Counties
Sectoral Shares in NDMP Growth 1983-89

County	Agriculture *yuan*	Agriculture %	Industry *yuan*	Industry %	'Services' *yuan*	'Services' %	δ NDMP *yuan*
Linquan	53.0	35.2	24.1	16.0	73.5	48.8	150.7
Liu'an	5.8	2.5	33.3	14.4	192.0	83.1	231.0
Huoqiu	41.6	12.8	18.2	5.6	265.3	81.6	325.1
Taihu	4.4	2.1	27.1	12.9	178.2	85.0	209.7
Mean	26.1	11.4	25.9	11.3	177.1	77.3	229.1
Prov.Mean	50.1	12.7	95.5	24.2	248.7	63.0	394.7

Note: All growth rates based on data at 1980 constant prices. δ NDMP stands for the change in the NDMP for 1983-9.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

These assertions are corroborated by data on the sectoral shares of NDMP, and the sectoral contributions to NDMP growth. In 1983, all four counties had a dominant agricultural sector, which accounted for 70-5% of all NDMP, with industry accounting for 5-10%, and the remaining 19% was contributed by construction, transportation and commerce. By 1989, agriculture shrunk to an average of 41% of NDMP. In Taihu and Liu'an agricultural output value did little more than stagnate and this made only a negligible contribution to overall NDMP growth. In Huoqiu, agriculture contributed more to NDMP growth than industry between 1983 and 1989, and this was reflected in the relative shares of agriculture and industry in

NDMP by 1989. In Linquan agriculture was an important contributor to overall NDMP growth between 1983 and 1989, despite a decline in its share of NDMP.

Linquan and Liu'an shared relatively large increases in the share of industry in NDMP. This was reflected in the relatively large contribution of industry to overall NDMP growth for 1983-9. Taihu had very little change in the shares of NDMP from industry, although industry did make a contribution to overall NDMP growth for 1983-89. In Huoqiu, industry's share of NDMP actually shrank between 1983 and 1989, and contributed little to NDMP growth over the same period. Linquan and Liu'an were also very similar in their shares of NDMP from 'services' in 1989. However, Liu'an resembled Huoqiu and Taihu in the contribution of 'services' to growth. In Linquan, a relatively small proportion of NDMP growth resulted from the growth of the 'service' sector. This was accompanied by low NDMP growth and low levels of real per capita NDMP: indeed, Linquan had the lowest NDMP in the province. The foregoing reinforces the arguments put forward by Hinton (1990), Riskin (1993) and Putterman (1993) regarding the importance of non-farm and slack season employment for the alleviation of poverty and the improvement of material well-being. The question of how well Huoqiu might have done with a higher level of industrialization remains.

c. Industry and Composition of NDMP in Yunnan

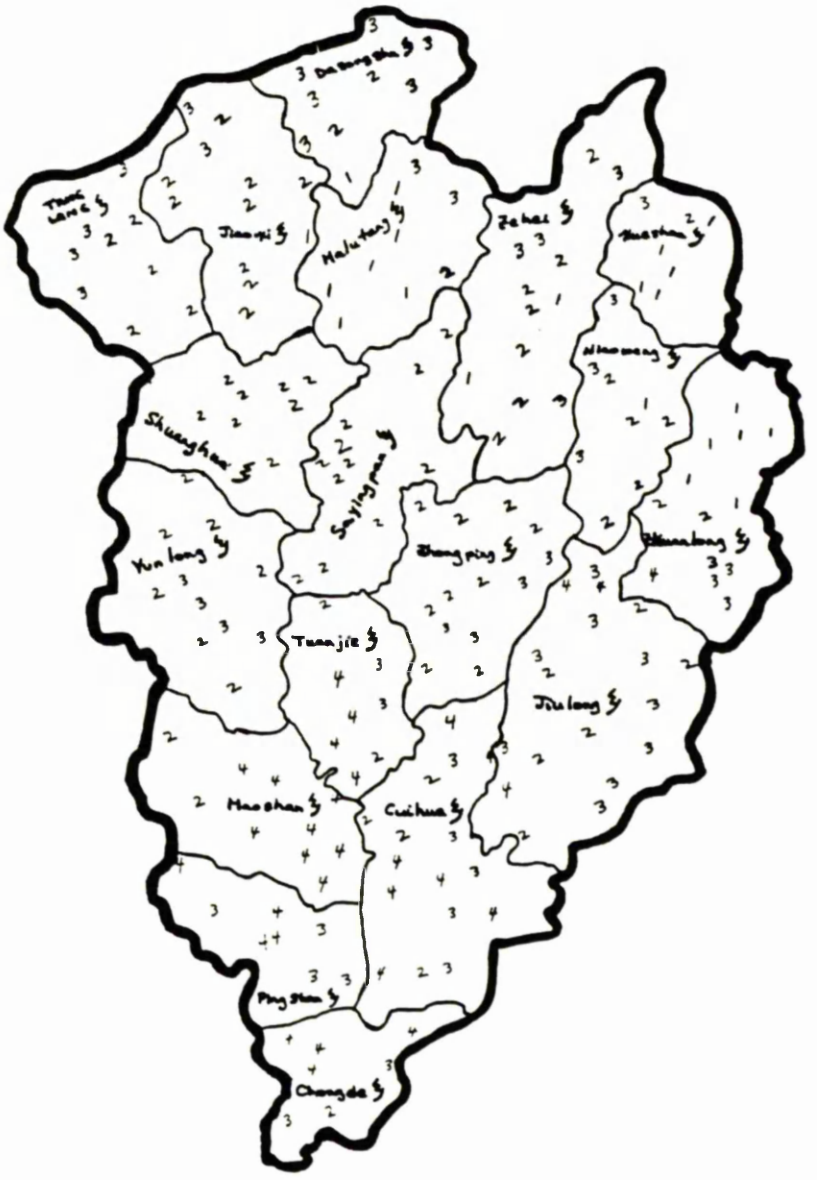
The absolute size of the industrial sector in the poor and stagnant counties of Yunnan was very small even in 1990. Unsurprisingly, this led to industry accounting for only a small portion of NVAIO, and also necessitates caution when discussing the role of industrial ownership type, because small differences in value terms give rise to large variations in percentage shares. Therefore the growth and composition of NDMP were

Yunnan: Poor and Stagnant Counties 1978-90

LEGEND

1.Luquan
2.Ludian
3.Yiliang
4.Pingbian
5.Honghe
6.Jinping
7.Yanshan
8.Maguan
9.Qiubei
10.Fugong

Spatial Inequality in Luquan County 1985
(Xiang and Cun by Net Peasant Income Level)



Legend

County Boundary

Xiang Boundary

1 p.c. Net Peasant Income 95.5 yuan

2 p.c. Net Peasant Income 127.6 yuan

3 p.c. Net Peasant Income 149.6 yuan

4 p.c. Net Peasant Income 170.5 yuan

Source: Derived from LQFZ, 1990: 111-2.

considered, instead of an expanded discussion of industry at this stage. The counties of Yunnan in this group were divided into three sub-groups sharing common characteristics in terms of NDMP growth and composition for 1985-90. The first sub-group was comprised of Ludian and Yiliang counties, which were the most backward of the ten counties in this group. The second sub-group included counties with low levels of industrialization that were hard hit by the recession of 1989-90. The four counties in this group were Jinping, Maguan, Qiubei and Fugong. The final group were those counties with high values of NDMP that were dominated by either agriculture or industry, and that weathered the recession quite well. Industry was dominant in Pingbian and Yanshan, while agriculture contributed the largest share of NDMP growth in Luquan and Honghe counties.

c.i Low NDMP, Economic Decline

Ludian and Yiliang both experienced an absolute decline in real per capita NDMP between 1985 and 1990. In this they were not unique, as several other counties in this group also had declines in per capita NDMP over the same period. However, the declines were largest in these two counties, and in 1990 they had unusually low values of per capita NDMP, below 150 *yuan*, or virtually a third of the provincial average. This alone puts them in a separate category. By any standard, the volume of industrial output in Ludian was derisory, while that in Yiliang looks quite respectable relative to the other counties in this group. In reality industrial output in Yiliang was small relative to the Yunnan average, let alone highly industrialized counties in coastal China. The privately-owned and collectively-owned industrial sectors combined accounted for more than half of all industrial output in these two counties in 1990. So the small size of the industrial sector, and the dominance of industry by non-state

ownership types separated these counties from their very dynamic and highly industrialized neighbour (Zhaotong county) which was the prefectural capital.

Table 7.6a Yunnan's Poor and Slow Growth Counties
Industrial Output Composition and Growth 1978-90

County	1990 Industrial Output million *yuan* State	Collect.	Private	percentage growth rate Real per capita NVIO 1978-90	1985-90
Ludian	4.4	2.8	4.1	-0.6	-16.7
Yiliang	20.5	6.1	14.5	3.7	-8.7
Mean	13.2	7.4	9.5	5.5	3.9
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

Table 7.6b Yunnan's Poor and Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

County	Agriculture 1985	1988	1990	Industry 1985	1988	1990	'Services' 1985	1988	1990	% gr. NDMP 1985-90
Ludian	77.9	59.8	71.3	15.0	5.3	7.7	7.2	34.8	21.0	-4.9
Yiliang	71.6	61.7	80.1	22.2	13.8	15.4	6.2	24.5	4.5	-1.8
Mean	65.6	59.4	72.1	10.0	9.7	13.3	24.4	31.3	14.6	-0.5
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Given that the size of the industrial sector was small in these counties, it is not surprising that agricultural production predominated, accounting for no less than 60% of all NDMP in these two counties for the 1985-90 period, and standing at 70% in 1985 and 1990. In Yiliang, there was a trend increase in agriculture's share of NDMP for 1985-90, while there was a modest decline in its share of NDMP in Ludian over the same period. In absolute terms, real agricultural output declined significantly between 1985 and 1990, and industry contracted as well. The 'service' sector expanded modestly over this period, although its positive effects were limited as a result of the recession in 1989-90. Without this modest expansion of 'service' sector activities, economic decline would have been

much greater in Ludian. In Yiliang agricultural output stagnated between 1985 and 1990, which did little to offset the declines in industrial output and 'service' sector output over the same period. 'Services' in Yiliang were hard hit by the recession. This resulted in both a trend decline in the proportion of NDMP from this source, and a falling value of NDMP. The trend decline in NDMP in these counties started before the recession in 1989.

Table 7.6c Yunnan's Poor and Slow Growth Counties
Sectoral Shares in NDMP Growth 1985-90

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Ludian	-41.2		-16.5		16.6		-40.8
Yiliang	2.7		-13.4		-3.4		-14.1
Mean	9.0		5.9		-20.3		-5.4
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices. δ NDMP stands for the change in NDMP from 1985-90.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

For both counties, there was a strong link between the performance of the agricultural sector, and economic growth. The marked decline in agricultural production in Ludian was accompanied by a 4.9% per annum decline in NDMP, and growth in the nascent 'service' sector did little to redress this decline. In Yiliang agriculture merely stagnated, and this resulted in a much smaller decline in NDMP over the 1985-90 period compared to Ludian. Therefore, agricultural productivity gains were a necessary, but not sufficient, factor in attaining high rates of economic growth.

c.ii Recession 'Victims' with Low Industrialization

For the counties with that were severely affected by the 1989-90 recession, moderate to modest growth in the agricultural sector helped to offset the negative impact of the recession on their 'service' sectors. For most of these counties, industry represented a very small but steadily

growing part of NDMP, which helped to offset the decline in 'services'. Jinping county had the smallest decline in per capita NDMP; increased agricultural output virtually balanced the decline in construction, transportation and commerce (industrial output was largely unchanged). Fugong showed a similar profile, although the gains in agriculture and industry only offset 60% of the decline in 'services'. Significant increases in both agricultural and industrial output in Maguan between 1985-90 accounted for only 60% of the decline in 'services', while very modest growth in both agriculture and industry in Qiubei over this period did little to counterbalance the rapid decline in the 'service' sector.

Table 7.7a Yunnan's Poor and Slow Growth Counties
Industrial Output Composition and Growth, 1978-90

	1990 Industrial Output million *yuan*			percentage growth rate Real per capita NVIO	
County	State	Collect.	Private	1978-90	1985-90
Jinping	16.9	1.1	1.1	-3.6	0.6
Maguan	23.9	4.3	14.8	5.3	8.9
Qiubei	16.5	5.6	17.9	3.5	2.0
Fugong	2.9	1.2	0.5	6.5	4.0
Mean	13.2	7.4	9.5	5.5	3.9
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

All of these counties were typified by small industrial sectors. Fugong's very small industrial sector was heavily dominated by state-owned enterprises, and the concentration of state ownership was even greater in Jinping. The industrial sectors were rather larger in Maguan and Qiubei counties, and were considerably more diversified, with a sizable privately-owned industrial sub-sector in both counties, although the collective sector in both cases was still very small. The scope for employment generation and greater prosperity was larger for collective firms than for private firms, as was the scope for capitalization. Therefore, there was only limited potential for the generation of employment and prosperity from

the industrial sector in these counties. This was also reflected in the small but growing shares of industry in NDMP.

Table 7.7b Yunnan's Poor and Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

County	Agriculture 1985	1988	1990	Industry 1985	1988	1990	'Services' 1985	1988	1990	% gr. NDMP 1985-90
Jinping	81.5	81.1	90.9	7.0	7.3	7.3	11.5	11.6	1.8	-0.1
Maguan	63.9	58.1	75.5	10.8	12.2	18.0	25.2	29.7	6.5	-1.6
Qiubei	65.3	53.8	74.9	13.5	8.4	16.6	21.2	37.8	8.5	-2.1
Fugong	62.2	52.2	72.4	6.1	6.3	7.8	31.8	41.5	19.9	-1.1
Mean	65.6	59.4	72.1	10.0	9.7	13.3	24.4	31.3	14.6	-0.5
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Table 7.7c Yunnan's Poor and Slow Growth Counties
Sectoral Shares in NDMP Growth 1985-90

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Jinping	15.8		0.4		-17.5		-1.3
Maguan	12.5		12.5		-41.3		-16.3
Qiubei	4.9		3.3		-30.9		-22.7
Fugong	12.4		2.5		-25.4		-10.5
Mean	9.0		5.9		-20.3		-5.4
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

The increase in value-added from the agricultural sector for Jinping, Maguan and Fugong exceeded the average for all of these counties as a whole, but at best was only half the increase for Yunnan as a whole. By contrast, Jinping, Qiubei and Fugong counties all suffered increased industrial value-added for 1985-90 at a rate below the average for these ten counties, and equalling less than 5% of the average increase for Yunnan. This, when value-added from 'services' fell by between 1.5 and 3 times the provincial average in all four counties. We can conclude that agriculture and industry, so vital to prosperity elsewhere in the province, were both lacking in dynamism here, and this led to the perpetuation of

poverty.

c.iii Recession 'Survivors'

The final group of four counties weathered the recession reasonably well; in three of the four counties real per capita NDMP grew between 1985-90. The rate of growth was slow in all but Honghe county, which managed to grow at a rate equal to the provincial average.[5]

Table 7.8a Yunnan's Poor and Slow Growth Counties
Industrial Output Composition and Growth 1978-90

County	1990 Industrial Output million *yuan* State	Collect.	Private	percentage growth rate Real per capita NVIO 1978-90	1985-90
Luquan	8.9	16.1	14.4	10.2	19.2
Pingbian	3.1	13.0	0.9	12.8	22.7
Honghe	6.5	3.4	1.7	4.4	7.0
Yanshan	29.3	20.5	24.6	10.6	17.1
Mean	13.2	7.4	9.5	5.5	3.9
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

In Pingbian and Yanshan counties, strong growth in industrial value-added - virtually five times that for the counties of this group on average, although under half that for Yunnan on average - was the most important contributor to economic growth for 1985-90. Agriculture contributed little to NDMP growth over this period in Pingbian. Industrial output was dominated by the non-state sector in Pingbian. Diversification of the economy appeared to be one of the great strengths of Pingbian, the least poor of all these Yunnan counties; there, 16% of NDMP came from industry, and 29% from 'services' in 1990. The small decline in value-added from 'services' was more than offset by the gains from agriculture and industry. This decline in 'services' was precipitated by the

[5] Yanshan county was included in this group due to the composition of its NDMP, the level of its real per capita NDMP, and because it matched the experiences of these counties, despite the large drop in 'service' sector value-added between 1988 and 1990.

recession, and given the buoyancy of other sectors in the Pingbian economy, it can be expected to recover in due course.

Table 7.8b Yunnan's Poor and Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

County	Agriculture 1985	1988	1990	Industry 1985	1988	1990	'Services' 1985	1988	1990	% gr. NDMP 1985-90
Luquan	60.5	59.5	76.6	5.5	9.1	12.5	34.0	31.4	11.0	1.3
Pingbian	58.3	52.2	55.7	6.2	10.9	15.8	35.5	36.9	28.5	1.7
Honghe	71.8	68.6	68.1	7.1	8.1	8.0	21.1	23.3	24.0	4.6
Yanshan	52.8	53.5	63.7	8.4	14.4	20.1	38.8	32.2	16.2	-1.6
Mean	65.6	59.4	72.1	10.0	9.7	13.3	24.4	31.3	14.6	-0.5
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ 1991, 1991: 596-600, 606-610, 636-640, 676-680.

Yanshan's economy was less diversified than that of Pingbian, largely as a result of a much larger decline in 'services', the pace of which was slow during 1985-88, but accelerated during the recession. The growth in agriculture and industry was not sufficient to compensate for this large decline, despite real per capita NVIO growth of 17% per annum for 1985-90. Nevertheless, Yanshan had a diversified economy relative to the other counties in this group, and 'services' fared little worse here than did the 'service' sector in Yunnan on average. This helped Yanshan to maintain its relatively high per capita NDMP, which was almost 40% higher than that of Ludian or Yiliang.

Luquan and Honghe were both more heavily reliant on the growth of value-added in agriculture than in industry as a contributor to overall economic growth. The relatively high shares of agriculture in NDMP confirm this. Honghe had the best overall economic performance of any county in this group, due largely to strong expansion in agricultural production. Despite the falling share of agriculture in NDMP between 1985 and 1990, 53% of the growth in value-added came from agriculture, while industry contributed 12%, and construction, transportation and commerce the

remaining 35%. The buoyancy of the 'service' sector in Honghe, when that of Hekou, Jinghong and Mengla failed during the recession poses an interesting quandary that warrants further investigation.[6]

Table 7.8c Yunnan's Poor and Slow Growth Counties
Sectoral Shares in NDMP Growth 1985-90

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Luquan	43.2		15.8		-45.3		13.7
Pingbian	5.6		25.3		-10.4		20.5
Honghe	19.2	53.0	4.2	11.6	12.8	35.4	36.2
Yanshan	15.0		25.0		-58.7		-18.7
Mean	9.0		5.9		-20.3		-5.4
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Luquan, by contrast, had a much less diversified economy, and a much lower rate of economic growth due to the ravages of the recession on the 'service' sector. The county was removed from Chuxiong prefecture and made part of Kunming prefecture in 1985-86, to try to foster development in this inhospitable and backwards area. Its backwardness is easily shown. For example, in 1986 11% of rural households in China had a net per capita peasant income below 200 *yuan* but more than 50% of rural households in Luquan were below this poverty line (LQFZ, 1990: 33-4). The impact Luquan's transfer can be partly measured by an examination of real per capita NDMP in the county from 1980 to 1990. In 1980, per capita NDMP stood at 76 *yuan*. By 1985, it had increased to 204 *yuan* (at 1980 constant prices), and to 248 *yuan* in 1987, falling back during the periods of

[6] Data are available from the third population census in 1982 on life expectancy and infant and child mortality in Honghe. They showed that life expectancy for men in Honghe was just above the value for male rural dwellers in Yunnan at 59.7 years compared to 59.5 years. Women fared even better in Honghe, with female life expectancy of 62.5 years, equal to that for urban women in Yunnan, and well above the 60.9 years for rural women. Male infants and children had low mortality, with values for Honghe between those for urban and rural Yunnan. Male infant mortality was 57.2 per thousand live births in Honghe, compared to 89.1 for rural Yunnan, and 46.3 for urban areas. Male under-5 mortality was 14.7 per thousand for urban Yunnan, 46.2 per thousand in rural Yunnan, but only 27.5 in Honghe. Female infant mortality was higher than the rural average for Yunnan, 107 per thousand live births, compared to 76.7. The same trend was evident for female under-5 mortality, with the rural Yunnan figure 50.4 per thousand, and for Honghe 68.3 per thousand (Cheng, 1990: 42, 45).

inflation and recession to 217 *yuan* in 1990.[7] For the 1980s as a whole, NDMP per capita in fact grew at 11.1% per annum, although much of this was due to rapid growth before the transfer in 1985-6, growth for 1980-5 was 21.8% per annum. However, this trend masks significant regional inequalities within Luquan county itself.[8]

Table 7.9 Inequalities Between Villages in Luquan County

Village Group	% Pop.	avg. p.c. net peasant Y	avg. p.c. grain availability[9]
1	12.5%	95.5 *yuan*	164 kgs
2	43.2%	127.6 *yuan*	172 kgs
3	28.1%	149.6 *yuan*	174 kgs
4	16.2%	170.5 *yuan*	195 kgs

Note: the poverty line in 1985 for per capita net peasant income was 200 *yuan*.
Source: LQFZ, 1990: 111-3.

Group one villages in Luquan comprised those located in mountainous and forested areas; all were poor. Group two villages were in more advantageous areas with less waste land, but were often remote from commercial centres (which resulted in subsistence agriculture and low marketable surplus). Villages in the third group were more advantaged still due to location. For example, port towns on the Jinsha Jiang opposite Sichuan were in category three, while the neighbouring villages were in groups one and two. Finally, group four consisted of the most advantaged villages. They were mainly located in the south of the county, where there is relatively abundant and high quality agricultural land, good

[7] All data at 1980 constant prices. Data for 1980, 1985 from LQFZ, 1990: 56. Data for 1987 and 1990 from YNTJNJ, 1991: 601.

[8] In 1985 a survey was conducted of the conditions in all 194 villages, both administrative and natural, in the county. The villages were ranked based on an index of thirteen measures of conditions for agricultural production. The factors included: the percentage area of rice paddy; the percentage forested area; the percentage mountainous and waste ground; area in excess of 25% that is dry land; percentage area protected from natural diasters; percentage area subject to soil erosion; percentage area sown in rice paddy; percentage area sown in tubers; percentage area sown in broad beans; grain availability per capita; and per capita net peasant income. Thus the map of Luquan based on survey data shows spatial variations in opportunities for agricultural and sidelines productions, as well as measuring current material well-being in terms of income and grain consumption.

[9] The source is not clear on the precise derivation of these grain availability data, and its is not known what leakages, if any, are taken into account in the estimation. These values are considerably higher than those for the province as a whole, and therefore, it can be assumed that these are probably per capita grain output data.

transportation routes, and the market provided by the county seat (Luquan city).

Based on income, Luquan in 1985 was undeniably poor across all categories of villages, regardless of land quality or access to transportation routes. Unfortunately, no data are available on the progress made under the development plan that might illustrate the extent to which villages and people escaped poverty, or experienced a narrowing of the poverty gap. But, given the relatively slow rate of economic growth from 1985 to 1990 in the county, it is unlikely that poverty declined to any marked extent.

The one unifying factor among all of these poor and slow growing counties was the lack of growth in agricultural productivity, and general stagnation in the value of agricultural net value added. The 'service' sector was, on average, more severely affected by the recession than the 'service' sector in dynamic regions. This may have resulted from the rapid expansion of the 'service' sector in these counties on the eve of the recession, such enterprises were unable to weather the harsh economic climate. Moreover, the very small size of the industrial sector, and in particular the lack of state-owned industry, and its moderate to below-average rate of growth, did little to bolster the fortunes of these counties. This reinforces the conclusion that poor economic performance stemmed from an over-reliance on a sluggish and low productivity agricultural sector.

3. Mid-range NVAIO, Slow Growth.

In this section the trends in counties from Anhui and Yunnan with mid-range values of per capita NVAIO for 1988-90, but with slow rates of

growth of per capita NVAIO for 1978-90 are considered.[10] For Anhui, the eight counties in this category were: Nanling from Wuhu prefecture; Huoshan from Liu'an; Xiuning, Qimen, Shitai and Huangshan from Huangshan prefecture; Wangjiang and Dongzhi from Anqing prefecture. For Yunnan there were fifteen counties in this group: Huize from Qujing prefecture; Mouding, Nanhua, Yao'an, Yongren and Wuding from Chuxiong prefecture; Simao; Yangbi from Dali; Lijiang and Ninglang from Lijiang; Zhongdian and Deqen from Deqen; Fengqing, Zhenkang and Shuangjiang from Lincang prefecture.

a. Anhui Counties

The slow growth, moderate NVAIO counties of Anhui were spatially concentrated in the southwestern corner of the province. These are counties in mountainous areas, heavily reliant on natural resource extraction, forestry, and tea production, and with low population densities relative to the north and eastern parts of the province. Huoshan was in Liu'an prefecture, and somewhat removed from the main block of these counties, but its general economic potential in terms of natural resources and population densities is comparable to those of Qimen or Shitai. Nanling was the only possible exception, as it bordered Fanchang county examined in chapter 6, and both were rural areas attached to Wuhu city.

Trends in the mortality data for these counties show that there was a modest increase in non-material well-being during the 1980s; the only such group in the province, although the decline was a modest -0.6% per annum. The CDR declined from 7.28 deaths per thousand population in 1981, to 6.93 in 1989. This meant that the CDR went from above the provincial average in 1981 (5.66) to below it in 1989 (9.66).

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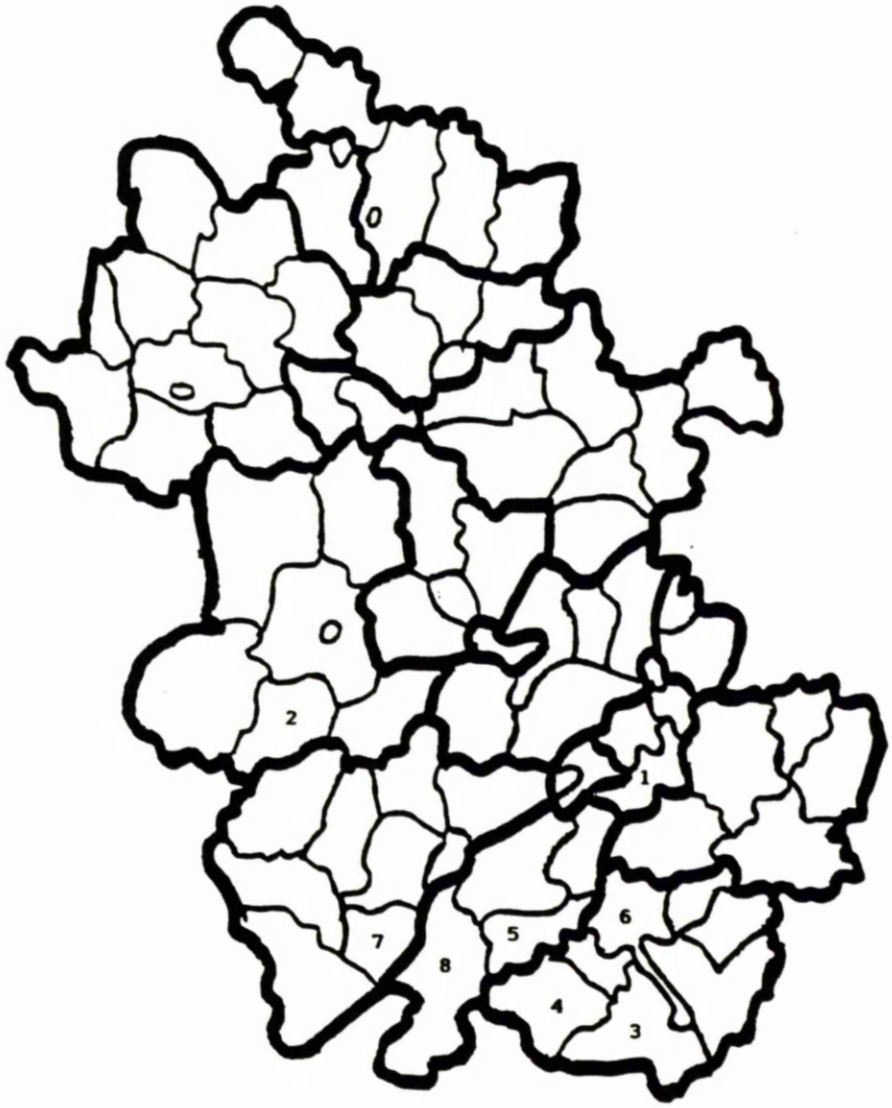
10 250-450 *yuan* in Anhui, 200-400 *yuan* in Yunnan; less than 5.9% growth in Anhui, less than 4% in Yunnan.

Anhui: Middle Income, Slow Growth Counties 1978-90



LEGEND

1.Nanling
2.Huoshan
3.Xiuning
4.Qimen
5.Shitai
6.Huangshan
7.Wangjiang
8.Dongzhi

Table 7.10a Agricultural Output in Anhui 1980-90

County	Food Grain Yields Tonnes per Hectare 1980	1985	1990	Oil Seed Yields Tonnes per Hectare 1980	1985	1990	Chemical Fertilizer Use, K Tonnes 1980	1985	1990
Nanling	2.5	4.3	4.9	1.1	1.2	0.9	5.6	8.7	13.4
Huoshan	2.6	3.7	3.8	0.6	0.8	1.0	1.8	2.2	3.2
Xiuning	2.6	3.9	4.0	0.5	0.8	0.9	2.5	3.2	4.7
Qimen	2.6	4.0	3.6	0.3	0.7	0.7	1.3	1.9	1.6
Shitai	2.9	4.2	4.1	0.4	0.8	0.8	0.8	1.2	2.6
Huangshan	3.6	4.5	4.8	0.8	0.8	0.9	0.9	1.9	5.6
Wangjiang	3.1	4.4	3.8	0.7	1.3	1.3	5.8	14.8	22.9
Dongzhi	3.1	3.6	4.4	0.6	1.0	1.0	5.2	7.1	11.1
Mean	2.9	4.1	4.2	0.6	0.9	0.9	3.0	5.1	8.1
Prov.Mean	3.1	4.0	4.3	1.1	1.3	1.2	7.3	15.6	20.0

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

Table 7.10b Agricultural Output in Anhui 1980-90

County	Food Grain Growth Output 1980-90	Yields 1980-90	Oil Seed Growth Output 1980-90	Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Nanling	-0.3	7.0	3.1	-2.0	9.1
Huoshan	2.7	3.9	8.9	5.2	6.3
Xiuning	-0.2	4.4	9.4	6.1	6.5
Qimen	3.7	3.3	17.3	8.8	1.5
Shitai	-1.0	3.5	12.8	7.2	12.7
Huangshan	20.6	2.9	28.9	1.2	19.4
Wangjiang	-0.8	2.1	10.7	6.4	14.7
Dongzhi	-0.4	3.6	11.5	5.2	7.8
Mean	3.0	3.4	12.8	4.8	9.8
Prov.Mean	5.4	4.7	9.5	0.9	10.6

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

As agricultural land was at a premium in these mountainous area, and was also often of poor quality and in locations that posed difficulties for cultivation, it is not surprising that grain and oil crop yields were below the Anhui average. For the majority of counties, grain yields were above the China average. However, productivity gains over the 1980-90 period were spectacular, with all except Huangshan and Wangjiang outpacing growth in grain yields at a provincial and national level, and all but Nanling for oil crop yields as well. A lack of agricultural infrastructure in these regions was apparent from the very limited use of chemical fertilizer, and

low growth rates for all counties except Wangjiang, which derived some benefit from the increased use of chemical fertilizer, as reflected in the increased yields for grain and oil crops between 1980 and 1990.

a.i High NDMP, High NDMP Growth Counties

Table 7.11a Anhui's Mid-range, Slow Growth Counties
Industrial Output Composition and Growth 1984-88

	% XZGY in XZQY		% XZGY in GVIO		percentage growth rates XZQY	XZGY	pc.NVIO
County	1984	1988	1984	1988	1984-88	1984-88	1984-88
Xiuning	59.3	34.9	27.6	28.3	46.1	28.0	25.4
Qimen	61.1	na.	13.7	na.	56.0	na.	21.5
Dongzhi	67.6	49.2	31.9	40.5	42.4	30.7	20.2
Mean	65.5	51.6	33.5	46.3	45.7	37.3	24.1
Prov.Mean	43.8	46.0	32.9	40.6	40.7	42.4	30.0

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

These eight counties were further sub-divided into three groups based on their level of development and patterns of industrialization. The most advanced group included Xiuning, Qimen and Dongzhi counties.[11] These three counties had very high levels of real per capita NDMP in 1989, and had rapid growth of real per capita NDMP for 1983-89. This resulted from highly diversified economies, where agriculture accounted for only about 30% of NDMP in 1989. Levels of industrialization were high relative to the other counties in this group, and compared to the Anhui average. There was also a large and dynamic 'service' sector. Construction, transportation and commerce accounted for more than 64% of all NDMP growth for the 1983-89 period in all three counties. The profiles of these counties differed little from that in Dangtu discussed in chapter six, except for the very low base from which they started in the late 1970s, and the relatively

11 Tea production was very important in agricultural production in the south western part of Anhui. In particular Qimen county was famous for its black tea, better known as "Keemun", and Huangshan itself was famous for green and yellow teas, particularly jasmine scented yellow tea.

inhospitable conditions for agricultural production in these mountainous counties.

Table 7.11b Anhui's Mid-range, Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1983-89

County	Agriculture 1983	Agriculture 1989	Industry 1983	Industry 1989	'Services' 1983	'Services' 1989	% gr. NDMP 1983-89
Xiuning	59.2	26.2	14.8	16.0	26.0	57.8	18.9
Qimen	52.9	27.4	26.3	28.5	20.8	44.1	13.8
Dongzhi	66.5	34.9	14.3	17.6	19.2	47.5	27.3
Mean	64.5	33.3	15.8	20.0	19.7	46.7	15.9
Prov.Mean	65.2	34.5	12.7	19.5	22.0	46.0	15.8

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Table 7.11c Anhui's Mid-range, Slow Growth Counties
Sectoral Shares in NDMP Growth 1983-89

County	Agriculture *yuan*	Agriculture %	Industry *yuan*	Industry %	'Services' *yuan*	'Services' %	δ NDMP *yuan*
Xiuning	44.8	8.1	92.5	16.7	416.3	75.2	553.6
Qimen	22.4	5.7	119.3	30.4	250.7	63.9	392.3
Dongzhi	47.6	6.6	73.5	10.2	600.0	83.2	721.1
Mean	39.3	10.8	83.3	22.9	241.3	66.3	363.9
Prov.Mean	50.1	12.7	95.5	24.2	248.7	63.0	394.7

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

XZGY was the most dynamic portion of industrial output between 1984 and 1988 in these counties, with XZGY growth outpacing NVIO growth, and which accounted for an increasing share of industrial output. XZQY grew at a faster rate than XZGY for 1984-88; in fact, industry declined as a proportion of the collective sector while 'services' expanded. Finally, to the large shift to 'services' in all three counties, per capita NVAIO fell modestly. However this modestly misrepresents the actual trend in material well-being, per capita NDMP increased at an annual rate of 18-26% between 1983 and 1989.

a.ii Counties with Industrial and Agricultural Growth

The second sub-group was comprised of counties that remained largely dependant on agriculture and industry, and as a result experienced relatively slow economic growth, and lagging standards of material well-being. The counties were: Huoshan, Huangshan and Wangjiang. Further, the agricultural and industrial sectors upon which these economies were reliant grew at rates below the provincial average. This prompted a decline in the per capita NVAIO portion of the standard of living index, accurately reflecting the stagnation in real per capita NDMP. The majority of NDMP came from the agricultural sector in all of these counties, despite low agricultural productivity, while a quarter of NDMP was derived from industrial net value added. Industry and agriculture also dominated the contributions to NDMP growth for 1983-89 in Wangjiang and Huoshan.

Table 7.12a Anhui's Mid-range, Slow Growth Counties
Industrial Output Composition and Growth 1984-88

	% XZGY in XZQY		% XZGY in GVIO		percentage growth rates XZQY	XZGY	pc.NVIO
County	1984	1988	1984	1988	1984-88	1984-88	1984-88
Huoshan	49.7	47.9	18.6	48.1	56.0	54.6	28.3
Huangshan	na.	36.5	na.	24.1	54.5	na.	28.8
Wangjiang	98.6	46.0	56.1	57.8	43.9	19.0	15.0
Mean	65.5	51.6	33.5	46.3	45.7	37.3	24.1
Prov.Mean	43.8	46.0	32.9	40.6	40.7	42.4	30.0

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Unfortunately NDMP data are not available for Huangshan, but given the tourism associated with Huangshan and Tunxi, 'services' would be expected to make a larger contribution to the economy in Huangshan than in either of the other two counties.[12]

12 Huangshan, (and Tunxi which is the railhead and airport for Huangshan) is the most important tourist destination in Anhui (AHTJNJ, 1991: 486). For example, it had 19.2 thousand visitors in 1991, compared to only 3.2 for Hefei, the provincial capital. Tourism was quite severely affected by the recession and the Tian'anmen incident in 1989, with person days falling from 123.0 thousand in 1988, to 66.6 thousand in 1989, recovering to 179.4 thousand in 1990 (ibid.).

Table 7.12b Anhui's Mid-range, Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1983-89

County	Agriculture 1983	1989	Industry 1983	1989	'Services' 1983	1989	% gr. NDMP 1983-89
Huoshan	57.4	48.3	12.4	28.1	30.2	23.6	5.3
Huangshan	na.	na.	na.	na.	na.	na.	na.
Wangjiang	74.7	65.2	12.0	24.3	13.3	10.5	13.0
Mean	64.5	33.3	15.8	20.0	19.7	46.7	15.9
Prov.Mean	65.2	34.5	12.7	19.5	22.0	46.0	15.8

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Table 7.12c Anhui's Mid-range, Slow Growth Counties
Sectoral Shares in NDMP Growth 1983-89

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Huoshan	23.8	24.9	67.5	70.6	5.3	5.5	95.6
Huangshan	na.	na.	na.	na.	na.	na.	na.
Wangjiang	62.5	38.1	53.8	32.8	47.8	29.1	164.1
Mean	39.3	10.8	83.3	22.9	241.3	66.3	363.9
Prov.Mean	50.1	12.7	95.5	24.2	248.7	63.0	394.7

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

For Huoshan, XZGY and XZQY grew at virtually the same rate, and the share of XZGY remained virtually constant at just under half of XZQY, while XZGY grew much faster than NVIO, contributing the lion's share of growth in industrial output for 1984-88. In Wangjiang by contrast, XZQY grew much more quickly than XZGY, which in turn marginally outpaced NVIO. This produced a pattern of growth similar to that in the Xiuning, Qimen and Dongzhi. However, due to the small size of the XZQY sector, this did not promote economic diversification and growth as was the case for Xiuning et al.

a.iii Mid-range NDMP, and Partial Economic Diversification

This final group included Nanling and Shitai counties. These counties represented a halfway house between the two previous groups, with

mid-levels of real per capita NDMP, and significant but limited diversification of the rural economy. By contrast with the other counties in this group, both counties experienced a decline in the value of the SLI between 1982 and 1990, despite somewhat higher levels of material well-being as measured by either per capita NVAIO or per capita NDMP. The analysis of trends in these two counties is limited by the absence of NDMP data for Nanling, as was the case with Fanchang examined in chapter six.

Table 7.13a Anhui's Mid-range, Slow Growth Counties
Industrial Output Composition and Growth 1984-88

	% XZGY in XZQY		% XZGY in GVIO		percentage growth rates XZQY	XZGY	pc.NVIO
County	1984	1988	1984	1988	1984-88	1984-88	1984-88
Nanling	na.	45.2	na.	53.6	38.4	na.	23.0
Shitai	76.4	na.	43.1	na.	39.5	na.	30.8
Mean	65.5	51.6	33.5	46.3	45.7	37.3	24.1
Prov.Mean	43.8	46.0	32.9	40.6	40.7	42.4	30.0

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Table 7.13b Anhui's Mid-range, Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1983-89

	Agriculture		Industry		'Services'		% gr. NDMP
County	1983	1989	1983	1989	1983	1989	1983-89
Nanling	na.	na.	na.	na.	na.	na.	na.
Shitai	69.1	38.6	13.0	23.2	17.9	37.7	12.7
Mean	64.5	33.3	15.8	20.0	19.7	46.7	15.9
Prov.Mean	65.2	34.5	12.7	19.5	22.0	46.0	15.8

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Both Nanling and Shitai had high concentrations of industry in NVAIO, about 38%, which in Shitai's case translated into a high proportion of NDMP by Anhui standards. In Shitai there was a balance between agriculture and 'services'; however, it was the service sector which accounted for the majority of NDMP growth between 1983 and 1989. For both counties, XZQY grew more quickly than NVIO, although the gap was smaller than that for the majority of counties in this group, and below or equal to the provincial

average in both cases. This suggests that XZGY was important for industrial growth, but that the non-industrial sectors of XZQY were less so.

Table 7.13c Anhui's Mid-range, Slow Growth Counties
Sectoral Shares in NDMP Growth 1983-89

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Nanling	na.	na.	na.	na.	na.	na.	na.
Shitai	28.2	9.5	100.5	33.9	167.8	56.6	296.4
Mean	39.3	10.8	83.3	22.9	241.3	66.3	363.9
Prov.Mean	50.1	12.7	95.5	24.2	248.7	63.0	394.7

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

b. Yunnan Counties

The moderate per capita NVAIO counties of Yunnan with slow growth over the 1980s were spatially dispersed, but located primarily in the west and northwest of the province. Three of the counties were prefectural capitals: Simao, Lijiang and Deqen. The greatest concentration is found in Chuxiong and Lincang prefectures, with Lijiang and Deqen also well represented. As with virtually every county in Yunnan, high quality agricultural land and flat land are at a premium in these counties, and particularly so as one moves to the north and west in the province.[13] Five of these counties (Wuding; Yangbi; Ninglang; Deqen; and Shuangjiang) were designated as poor counties in 1986 by the OLG.

Non-commodity functioning in these counties improved modestly over the intercensal period, as measured by the CDR, in absolute terms; although in relative terms, living standards remain below the provincial average.

13 An example of the difficult conditions in the north western counties in Yunnan comes from Lijiang. In Lijiang, many of the villages were located in valley bottoms that ranged in altitude from 2600m to in excess of 3000m, while the surrounding mountain peaks soared to 6000m. This was an area where there were seasonal water shortages, and rationing was often necessary to complete the transplanting of the rice crop before the monsoons in June, which annually replenished water supplies.

Yunnan: Middle Income, Slow Growth Counties 1978-90

LEGEND

1.Mouding	5.Wuding	10.Yongren	14.Huize
2.Nanhua	6.Simao	11.Ninglan	15.Deqen
3.Yao'an	7.Yangbi	12.Zongdian	
4.Shuangjiang	8.Lijiang	13.Fengqing	

The CDR fell by 1.9% per annum for 1981-89, from 9.34 deaths per thousand population to 8.02. This compares to the provincial average of 9.08 deaths per thousand population in 1981, declining to 7.65 in 1989, at a rate of -2.1% per annum.

As there are numerous counties in this group, it is necessary to discuss them in smaller groups based on common levels of development and patterns of economic activity. The first sub-group contained those counties that had balanced growth, and relatively rapid economic growth. They were: Mouding, Nanhua and Yao'an, neighbouring their prefectural capital Chuxiong; and Shuangjiang from Lincang prefecture. The second sub-group enjoyed solid growth in agricultural and industrial output, but the 'service' sector declined during the recession in 1989-90. This sub-group is comprised of: Wuding from Chuxiong; Simao; Yangbi from Dali; Lijiang; and Zhenkang from Lincang. The third sub-group of counties contained Yongren (Chuxiong prefecture); Ninglang (Lijiang prefecture); Zhongdian (Deqen prefecture); and Fengqing (Lincang prefecture). These counties are similar in that they experienced both agricultural growth and deindustrialization. Finally, the fourth sub-group suffered overall economic decline, despite growth in the industrial sector. Huize (Qujing prefecture), and Deqen made up this group.

b.i Rapid and Balanced Growth

Agricultural productivity was high in the majority of these counties in the early 1980s, but it failed to keep pace with the rates of increase in agricultural productivity in Yunnan and China. This meant that in 1990, none of these counties were achieving grain yields that were high by Chinese standards, and only Mouding and Yao'an compared favourably with the provincial average. Rice was the predominant cereal, accounting for more

than 50% of food grain output in most cases; maize and wheat provided most of the rest. The predominance of rice can be linked to the long-standing higher yields for food grains as a whole, due to the earlier introduction of HYV rice seeds than those for other food grains. Yao'an was also an efficient producer of oil crops throughout the 1980s, by both Yunnan and China standards. Shuangjiang, like the majority of the far north and west counties produced relatively large quantities of soft fruits such as: peaches, apricots and kiwis. Finally, the area planted in oil seed, the volume of output, and the yields for oil crops grew very rapidly in Mouding, Nanhua and Shuangjiang, where yields were only marginally below the Yunnan average in 1990 (YNTJNJ, 1991: 646-60)..

Table 7.14a Agricultural Output in Yunnan 1980-90

County	Food Grain Yields Tonnes per Hectare			Oil Seed Yields Tonnes per Hectare			Chemical Fertilizer Use, K Tonnes		
	1980	1985	1990	1980	1985	1990	1980	1985	1990
Mouding	2.6	2.6	3.0	0.5	0.3	0.9	1.8	2.0	3.6
Nanhua	2.4	3.4	2.5	0.4	0.6	0.9	1.2	2.6	4.2
Yao'an	3.2	3.0	3.9	1.1	0.7	1.8	1.0	1.6	2.3
Shuangjiang	1.9	2.2	2.3	0.4	0.6	1.0	0.3	1.6	2.0
Mean	2.3	2.4	2.5	0.6	0.9	1.2	1.0	1.7	3.0
Prov.Mean	2.4	2.8	3.0	0.7	1.1	1.1	2.4	3.2	4.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Table 7.14b Growth Rates for Agricultural Output in Yunnan 1980-90

County	Food Grain Growth Output 1980-90	Food Grain Growth Yields 1980-90	Oil Seed Growth Output 1980-90	Oil Seed Growth Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Mouding	0.9	1.5	8.5	6.1	7.3
Nanhua	0.7	0.5	-2.0	9.4	13.6
Yao'an	1.1	1.8	4.0	5.0	8.2
Shuangjiang	2.5	2.1	14.3	9.7	20.6
Mean	1.2	1.2	7.4	8.0	9.3
Prov.Mean	2.3	2.3	7.6	5.3	6.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Growth in these counties between 1985 and 1990 was relatively rapid compared to most other counties in this group, and was balanced across all

three sectors. Balanced growth and rapid growth often coincided, and economic diversification appears to be a necessary, if not sufficient, condition for rapid economic growth. Although the NDMP share of agriculture fell modestly for three of the four counties, its share in total NDMP growth for 1985-90 ranged from 30 to 60%, while industry accounted for between 14 and 38% of NDMP growth over this period, and had marginally increased shares of NDMP as well. Industrial ownership in all counties except Mouding was dominated by non-state-owned enterprises. Collective and privately-owned enterprises accounted for 55 to 75% of industrial output in 1990. However, Yao'an, Nanhua, and Shuangjiang all had very small industrial sectors; Mouding's was somewhat larger, and dominated by state-owned enterprises.

Table 7.14c Yunnan's Mid-range, Slow Growth Counties
Industrial Output Composition and Growth 1978-90

County	1990 Industrial Output million *yuan* State	Collect.	Private	percentage growth rate Real per capita NVIO 1978-90	1985-90
Mouding	67.5	7.4	9.9	7.2	9.7
Nanhua	14.0	1.3	18.4	1.5	8.7
Yao'an	14.2	9.3	7.7	6.0	5.8
Shuangjiang	9.6	14.7	12.5	6.2	5.3
Mean	48.2	12.9	13.8	3.5	4.8
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

'Services' contributed between 14% and 57% of NDMP growth for 1985-90 in these counties. Nanhua had the highest real per capita NDMP growth rate for all fifteen of the counties from Yunnan discussed in this section, and it experienced rapid expansion in the construction, transportation and commerce sector. This growth continued unabated through the recession of 1989-90. Compared to the dynamic counties of Anhui or Yunnan, these counties remained overwhelmingly agricultural in 1990. However, to the extent that they successfully diversified their economies and shifted away

from grain cultivation, they achieved respectable rates of growth and improvements in material well-being.

Table 7.14d Yunnan's Mid-range, Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

County	Agriculture 1985	1988	1990	Industry 1985	1988	1990	'Services' 1985	1988	1990	% gr. NDMP 1985-90
Mouding	62.3	53.6	56.6	17.5	15.3	21.8	20.2	31.1	21.6	5.0
Nanhua	78.9	67.1	63.0	12.4	12.2	12.8	8.7	20.7	24.2	7.9
Yao'an	60.6	56.0	57.8	11.7	10.5	13.0	27.6	33.5	29.2	3.6
Shuangjiang	53.8	44.7	55.0	14.8	14.2	16.3	31.4	41.1	28.7	3.4
Mean	59.9	48.6	60.4	16.8	15.5	19.5	23.2	35.9	20.1	2.1
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Table 7.14e Yunnan's Mid-range, Slow Growth Counties
Sectoral Shares in NDMP Growth 1985-90

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Mouding	29.0	35.9	30.3	37.5	21.6	26.7	80.8
Nanhua	28.3	28.9	13.4	13.7	56.1	57.4	97.8
Yao'an	28.5	43.2	13.0	19.7	24.5	37.1	66.0
Shuangjiang	29.1	61.9	11.4	24.3	6.5	13.8	47.0
Mean	21.5	65.0	14.4	43.5	- 2.8	-8.5	33.1
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

b.ii Agricultural and Industrial Growth, Service Sector Collapse

For most of the counties in this sub-group, rice was also the dominant food grain although, with the exception of Simao (which is much further south than the rest of the counties giving it an advantage in terms of rainfall and temperatures), this share was slightly below fifty % of output. In Lijiang, maize is the dominant food grain followed by wheat; this reflects the temperatures and aridity that accompany high altitudes

in Yunnan.[14]

Table 7.15a Agricultural Output in Yunnan 1980-90

County	Food Grain Yields Tonnes per Hectare 1980	1985	1990	Oil Seed Yields Tonnes per Hectare 1980	1985	1990	Chemical Fertilizer Use, K Tonnes 1980	1985	1990
Wuding	2.9	2.5	3.0	0.5	0.7	1.9	1.4	2.0	2.9
Simao	na.	2.0	2.5	na.	1.1	1.5	na.	0.7	3.3
Yangbi	1.8	1.8	2.1	na.	na.	1.4	0.3	0.3	0.5
Lijiang	1.9	2.2	2.4	0.8	1.4	1.9	2.4	2.7	3.4
Zhenkang	1.9	1.9	2.0	0.6	0.8	0.5	0.5	0.7	0.9
Mean	2.3	2.4	2.5	0.6	0.9	1.2	1.0	1.7	3.0
Prov.Mean	2.4	2.8	3.0	0.7	1.1	1.1	2.4	3.2	4.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Table 7.15b Growth Rates for Agricultural Output in Yunnan 1980-90

County	Food Grain Growth Output 1980-90	Yields 1980-90	Oil Seed Growth Output 1980-90	Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Wuding	0.6	0.2	2.3	13.1	7.9
Simao	na.	na.	na.	na.	na.
Yangbi	2.5	1.4	16.2	na.	7.6
Lijiang	1.5	2.4	16.8	9.7	3.3
Zhenkang	1.2	0.2	8.4	-2.8	5.5
Mean	1.2	1.2	7.4	8.0	9.3
Prov.Mean	2.3	2.3	7.6	5.3	6.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Grain yields were historically high in Wuding, but stagnated throughout the 1980s, and ended the period equal to the Yunnan average. Those for the remaining counties in the group were well below the Yunnan average throughout the 1980s, with very limited improvements in yields achieved in any of them. Lijiang was the only exception; there, the introduction of HVY maize and wheat seeds between 1980 and 1982 led to rapid gains in yields for 1980-85. Yields for wheat and maize were much lower than those for rice, so low yields for Lijiang partly reflected the composition of grain output, as opposed to solely a lack of productivity

[14] Cuisine among the national minorities in the northwest of Yunnan such as the Bai, or the Naxi, was heavily dominated by dishes containing tubers, particularly potatoes, and wheat and maize flour breads. By contrast the minorities in the south of the province, such as the Dai in Xishuang Banna had specialties centred around white and purple glutinous rice, often steamed in banana leaves.

in maize or wheat production themselves.

With the exception of Zhenkang, oil crop output and yields increased rapidly in all counties of this sub-group; Yangbi, Lijiang and Zhenkang increased their sown area as well. By 1990 all but Zhenkang county were efficient producers of oil crops by both Yunnan and China standards. Peanuts and canola were the dominant oil crops. Yangbi and Lijiang are also producers of significant amounts of soft fruits such as peaches, apricots and kiwis (YNTJNJ, 1991: 646-60).

Table 7.15c Yunnan's Mid-range, Slow Growth Counties
Industrial Output Composition and Growth 1978-90

County	1990 Industrial Output million *yuan* State	Collect.	Private	percentage growth rate Real per capita NVIO 1978-90	1985-90
Wuding	4.5	26.9	6.8	7.5	9.9
Simao	81.4	19.1	1.2	8.7	8.7
Yangbi	6.7	10.8	4.3	-1.7	5.2
Lijiang	97.2	36.0	7.9	5.1	8.0
Zhenkang	3.8	7.9	0.7	0.6	4.3
Mean	48.2	12.9	13.8	3.5	4.8
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

The industrial sectors of Wuding, Yangbi and Zhenkang were small and dominated by collectively-owned enterprises; private ownership was of next greatest importance. Simao and Lijiang, being prefectural capitals, had larger industrial sectors, and were dominated by state-owned industries (although collective industry was also important in Lijiang relative to the Yunnan average in 1990). This is reflected in the higher share of industrial output in NDMP for these two counties relative to the other three, and industry contributed the largest share of NDMP growth in Lijiang and Simao for 1985-90 as well. All counties had trend increases in the share of industry in NDMP between 1985 and 1990, and industry accounted for between 14% and 33% of NDMP by 1990. Due to the large decline in the

'service' sector in these counties, it is virtually impossible to discuss contributions to economic growth in percentage terms. However table 7.15e shows that, in money terms, industrial value-added was very important to the continued prosperity in these counties, particularly so in Simao and Lijiang.

Table 7.15d Yunnan's Mid-range, Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

County	Agriculture			Industry			'Services'			% gr. NDMP
	1985	1988	1990	1985	1988	1990	1985	1988	1990	1985-90
Wuding	58.2	55.6	68.6	8.9	12.1	14.3	32.9	32.3	17.1	-0.3
Simao	32.5	25.9	36.1	25.5	27.2	33.1	42.0	48.2	30.8	3.2
Yangbi	63.5	47.6	69.3	16.1	18.3	20.1	21.4	34.1	10.6	0.6
Lijiang	60.6	53.9	61.5	23.3	27.2	31.7	16.1	18.9	6.8	1.6
Zhenkang	75.8	62.2	84.3	8.3	5.1	9.8	15.8	32.7	5.9	1.0
Mean	59.9	48.6	60.4	16.8	15.5	19.5	23.2	35.9	20.1	2.1
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Table 7.15e Yunnan's Mid-range, Slow Growth Counties
Sectoral Shares in NDMP Growth 1985-90

County	Agriculture		Industry		'Services'		δ NDMP
	yuan	%	*yuan*	%	*yuan*	%	*yuan*
Wuding	29.3		16.5		-50.1		-4.5
Simao	47.2	57.1	64.6	78.2	-29.2	-35.4	82.6
Yangbi	24.9		12.8		-28.9		8.8
Lijiang	19.3		25.4		-28.0		26.6
Zhenkang	28.7		4.3		-21.3		11.7
Mean	21.5	65.0	14.4	43.5	- 2.8	-8.5	33.1
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

If industrial growth was important to the continued prosperity of these counties during the 1989-90 recession, then growth of value-added from agriculture was vital. Agriculture increased its share of NDMP between 1985 and 1990 in all five counties, and reached a high of 84% in Zhenkang. In Zhenkang and Yangbi, agriculture outpaced industry in its contribution to NDMP growth for 1985-88. It contributed significantly to

economic growth in Simao and Lijiang, and maintained the level of NDMP in the face of the rapid rate of decline of the 'service' sector between 1988 and 1990. Lijiang's 'service' sector is heavily tourism based, and its economy suffered a disproportionate decline in its 'service' sector due to the decline in tourism in the wake of Tian'anmen, as was the case with Jinghong and Huangshan. Similarly, the recession offset the favourable impact of the opening of Jinghong airport, by greatly diminishing the flow of tourists through Simao to Jinghong. Data from the Wuding *Xianzhi* show that peak NDMP growth corresponded to rapid growth of agricultural output in the early 1980s. For 1980-85, real NDMP in 1980 constant prices grew by 9.1% per annum, while for 1985-90 it declined by -0.3% per annum (WDXZ, 1990: 154-5); the corresponding figures for agricultural growth were 10.7% and 3.0%.[15]

b.iii Agricultural Growth and Deindustrialization

Agricultural value-added showed a small trend increase in its share of NDMP between 1985 and 1990 in all but Ninglang, where it declined from 83% to 82%. This continuing dominance was also evident in agriculture's contribution to NDMP growth. It was the most important sector in all counties in this sub-group, and significantly so in all but Zhongdian's case. Chemical fertilizer use was very low in these counties, suggesting only limited access to agricultural inputs and infrastructure - irrigated land as a percentage of total cultivated area was particularly low in the north and west of Yunnan, as discussed in the Introduction. Despite this, chemical fertilizer use grew very rapidly between 1980 and 1990 in Yongren,

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15 These growth rates for agricultural output in Wuding were adjusted to compensate for the change in definition in agricultural output in 1984. The township and village industrial sector was subtracted from the 1980 data to produce a consistent series. As these enterprises were very important in the industrial output of Wuding, their inclusion in agriculture for 1980 greatly under estimates the growth of agricultural output for the 1980-85 period.

Zhongdian and Fengqing.

Table 7.16a Agricultural Output in Yunnan 1980-90

County	Food Grain Yields Tonnes per Hectare 1980	1985	1990	Oil Seed Yields Tonnes per Hectare 1980	1985	1990	Chemical Fertilizer Use, K Tonnes 1980	1985	1990
Yongren	2.5	2.7	2.9	0.6	0.6	1.0	0.5	1.2	1.8
Ninglang	1.6	1.7	1.7	0.1	0.2	0.4	0.7	0.7	1.1
Zhongdian	2.3	2.5	2.7	0.7	2.7	1.7	0.6	0.7	1.3
Fengqing	1.9	1.8	1.9	0.8	1.0	1.9	1.4	2.8	4.3
Mean	2.3	2.4	2.5	0.6	0.9	1.2	1.0	1.7	3.0
Prov.Mean	2.4	2.8	3.0	0.7	1.1	1.1	2.4	3.2	4.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Table 7.16b Growth Rates for Agricultural Output in Yunnan 1980-90

County	Food Grain Growth Output 1980-90	Yields 1980-90	Oil Seed Growth Output 1980-90	Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Yongren	1.9	1.4	-3.7	5.5	13.6
Ninglang	-0.1	0.9	18.7	16.3	4.6
Zhongdian	1.2	2.0	5.9	10.3	8.1
Fengqing	0.0	-0.2	9.6	9.6	11.5
Mean	1.2	1.2	7.4	8.0	9.3
Prov.Mean	2.3	2.3	7.6	5.3	6.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Table 7.16c Yunnan's Mid-range, Slow Growth Counties
Industrial Output Composition and Growth 1978-90

County	1990 Industrial Output million *yuan* State	Collect.	Private	percentage growth rate Real per capita NVIO 1978-90	1985-90
Yongren	4.4	6.4	2.3	-0.3	-0.7
Ninglang	14.3	1.1	2.5	0.4	-4.6
Zhongdian	22.6	8.2	3.6	0.1	-3.3
Fengqing	27.1	20.9	5.7	1.5	-0.5
Mean	48.2	12.9	13.8	3.5	4.8
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

Grain yields for all counties were below the Yunnan and China averages throughout the 1980s, and growth rates for both output and yields were disappointing. In temperate and lower altitude Yongren, rice was the dominant grain crop (61% of total grain output in 1990) followed by maize

and wheat. Average grain yields were modestly higher here than in the remaining counties of this type due to this predominance of rice. For the remaining three counties, maize is the dominant food grain, followed by wheat and tubers in the northwest, and by rice in the more moist and temperate climate of Fengqing. Zhongdian also produced a significant amount of soft fruit in 1990, while Fengqing accounted for 2.2% of soft fruit production in the province (soft fruit here include: peaches, apricots and kiwis, apples, pears and grapes), and 12.2% of provincial tea output. Both of these represent large shares of total output in Yunnan given the highly dispersed nature of tea and soft fruit production (YNTJNJ, 1991: 646-60).

Table 7.16d Yunnan's Mid-range, Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

County	Agriculture 1985	1988	1990	Industry 1985	1988	1990	'Services' 1985	1988	1990	% gr. NDMP 1985-90
Yongren	67.0	62.5	68.5	10.8	13.0	10.1	22.2	24.5	21.4	0.5
Ninglang	83.3	74.5	81.6	11.0	6.7	7.3	5.7	18.8	11.1	3.6
Zhongdian	62.5	67.2	63.6	22.5	14.7	18.3	15.0	46.3	18.1	0.8
Fengqing	63.1	44.3	64.0	15.0	13.0	12.5	21.9	42.7	23.5	3.1
Mean	59.9	48.6	60.4	16.8	15.5	19.5	23.2	35.9	20.1	2.1
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Table 7.16e Yunnan's Mid-range, Slow Growth Counties
Sectoral Shares in NDMP Growth 1985-90

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Yongren	11.5		-1.4		- 0.7		9.4
Ninglang	31.0	72.9	-5.1	-12.0	16.6	39.1	42.5
Zhongdian	15.2		-13.5		15.0		16.7
Fengqing	27.3	69.1	-0.8	-2.0	13.0	32.9	39.5
Mean	21.5	65.0	14.4	43.5	- 2.8	-8.5	33.1
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

The industrial sector in all of these counties was small in absolute

terms, and represented a small and declining share of NDMP between 1985 and 1990. There was a small fall in industrial value-added in all four counties between 1985 and 1990, although between 1980 and 1990 Fengqing had a real per capita NVIO growth rate of 1.5%, while in Zhongdian and Ninglang the rates were only marginally above zero. Collective ownership dominated industrial output in Yongren in 1990. Ninglang was heavily dominated by state-owned industry in 1990, as were Zhongdian and Fengqing to a lesser extent. In the latter two counties, collective enterprises were also important contributors to industrial output in 1990. Ninglang and Zhongdian are found along the upper reaches of the Changjiang, and near to the industrial centre of Panzhihua in southern Sichuan. As was the case for Panzhihua, 'third front' industries were located in these counties and, as in Shuifu, industrial output stagnated or declined during the 1980s.

In Yongren there were small declines in industrial and 'service' sector output for 1985-90. This, coupled with slow growth in the agricultural sector, led to very slow NDMP growth, and scant improvement in material well-being. Zhongdian fared little better in terms of economic growth and material well-being over the 1980s, because the decline in industrial output negated virtually half of the growth in 'services' and agriculture. Ninglang and Fengqing, by contrast, enjoyed strong agricultural growth, and equally strong growth in 'services' given the small base from which they started. This was tempered marginally by a small decline in industrial value added, and the overall growth rate was significantly below the Yunnan average, and was positively snail-like compared to China's 9.0% per annum growth over the course of the 1980s. This doubtless a product of the heavy concentration of economic activity in the agricultural sector.

b.iv Economic Decline Despite Industrial Growth

There were two counties, Deqen and Huize, which experienced an absolute decline in real per capita NDMP between 1985 and 1990. This had serious implications for their material well-being. Maize dominated food grain production in both. Wheat was the second most important grain crop in Deqen, while tubers and rice were next most important in Huize. The relative productivity of tubers and rice was higher than that of wheat, partially explaining the somewhat higher grain yields in Huize than in Deqen throughout the 1980s. Both counties also had very limited growth in grain output and yields over the reform period. Huize was advantaged over Deqen in terms of agricultural inputs and infrastructure, which was reflected in the much higher use of chemical fertilizer. Oil crop yields were very low in both counties throughout the 1980s, although Deqen did have some soft fruit cultivation (YNTJNJ, 1991: 646-60). Indeed agriculture declined in both absolute terms, and as a share of NDMP, between 1985 and 1990 in the two counties.

Table 7.17a Agricultural Output in Yunnan 1980-90

	Food Grain Yields Tonnes per Hectare			Oil Seed Yields Tonnes per Hectare			Chemical Fertilizer Use, K Tonnes		
County	1980	1985	1990	1980	1985	1990	1980	1985	1990
Huizi	2.5	3.3	2.7	0.3	0.7	0.5	2.1	6.4	12.7
Deqen	2.1	2.1	2.4	na.	na.	0.5	0.1	0.1	0.1
Mean	2.3	2.4	2.5	0.6	0.9	1.2	1.0	1.7	3.0
Prov.Mean	2.4	2.8	3.0	0.7	1.1	1.1	2.4	3.2	4.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

As with agriculture, there was also a decline in absolute terms, and as a proportion of NDMP for the construction, transportation and commerce sector in both counties. This decline was a result of the recession, which trimmed back the rapid expansion of 'services' that occurred between 1985 and 1988.

Table 7.17b Growth Rates for Agricultural Output in Yunnan 1980-90

County	Food Grain Growth Output 1980-90	Food Grain Growth Yields 1980-90	Oil Seed Growth Output 1980-90	Oil Seed Growth Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Huize	1.3	0.8	0.8	4.6	19.7
Deqen	1.0	1.4	4.1	na.	-1.5
Mean	1.2	1.2	7.4	8.0	9.3
Prov.Mean	2.3	2.3	7.6	5.3	6.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Table 7.17c Yunnan's Mid-range, Slow Growth Counties
Industrial Output Composition and Growth 1978-90

County	1990 Industrial Output million *yuan* State	Collect.	Private	percentage growth rate Real per capita NVIO 1978-90	1985-90
Huize	348.7	19.4	33.1	4.0	4.4
Deqen	6.8	4.8	1.1	3.5	6.4
Mean	48.2	12.9	13.8	3.5	4.8
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

Industrial growth in these two counties was not sufficient to overcome the dead weight of declining agricultural production, nor the recession-ravaged 'service' sector. The industrial sector in Huize was large and heavily dominated by state-owned enterprises; private ownership placed a distant second ahead of collectives. This again reflected strategically-motivated industrialization, and industrial growth was relatively slow during the 1980s. Deqen had a minute industrial sector. More than half of its output was derived from state-owned enterprises in 1990, and the growth of industrial output was modest throughout the 1980s, although it gained momentum in the later part of the decade.

An examination of these counties again demonstrates the links between economic diversification, based on rapid agricultural output and yields growth, and rapid economic growth even among poor counties. The dominance of grain production, and the predominance of subsistence grain cultivation,

resulted in poor performance in the agricultural sector in the majority of these counties, preventing or limiting diversification and therefore also economic growth.[16] Material well-being improved little in these counties over the course of the 1980s, and they also had mixed experiences in non-material well-being as well. An illustration of this comes from a comparison of life expectancy, child and infant mortality.

Table 7.17d Yunnan's Mid-range, Slow Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

County	Agriculture 1985	1988	1990	Industry 1985	1988	1990	'Services' 1985	1988	1990	% gr. NDMP 1985-90
Huize	40.4	37.5	41.5	30.9	33.6	39.6	28.7	28.9	18.9	0.7
Deqen	68.3	34.8	63.7	12.5	10.3	18.2	19.2	54.9	18.1	-1.3
Mean	59.9	48.6	60.4	16.8	15.5	19.5	23.2	35.9	20.1	2.1
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Table 7.17e Yunnan's Mid-range, Slow Growth Counties
Sectoral Shares in NDMP Growth 1985-90

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Huize	-1.2		21.7		-30.3		-9.8
Deqen	-25.2		13.4		- 6.6		-18.4
Mean	21.5	65.0	14.4	43.5	- 2.8	-8.5	33.1
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Lijiang had a reasonably well diversified economy, which suffered a little due to the recession in 1989-90, but male and female life expectancy were marginally above the provincial rural average, and infant and child mortality were below the provincial rural average. Ninglang, which had a higher growth rate for NDMP, but was heavily reliant on agriculture, had life expectancies below the average for rural Yunnan, and infant and child

16 Many poor counties were unable to diversify into higher value-added 'economic crops'.

mortality well above those of Lijiang and many other poorer counties as well as the average for rural Yunnan.[17]

Table 7.18 Life Expectancy and Child Mortality For Lijiang and Ninglang Counties, 1981

Region	Life Expectancy (years) male	female	Infant Mortality per K live births male	female	Under-5 Mortality per K under-5's male	female
Urban Yunnan	66.8	62.5	46.3	34.9	14.7	12.9
Rural Yunnan	59.5	60.9	89.1	76.7	46.2	50.4
Lijiang	59.8	63.5	86.2	68.8	32.6	26.7
Ninglang	52.1	55.9	130.7	99.7	38.5	46.3

Source: Cheng, 1990: 42, 45.

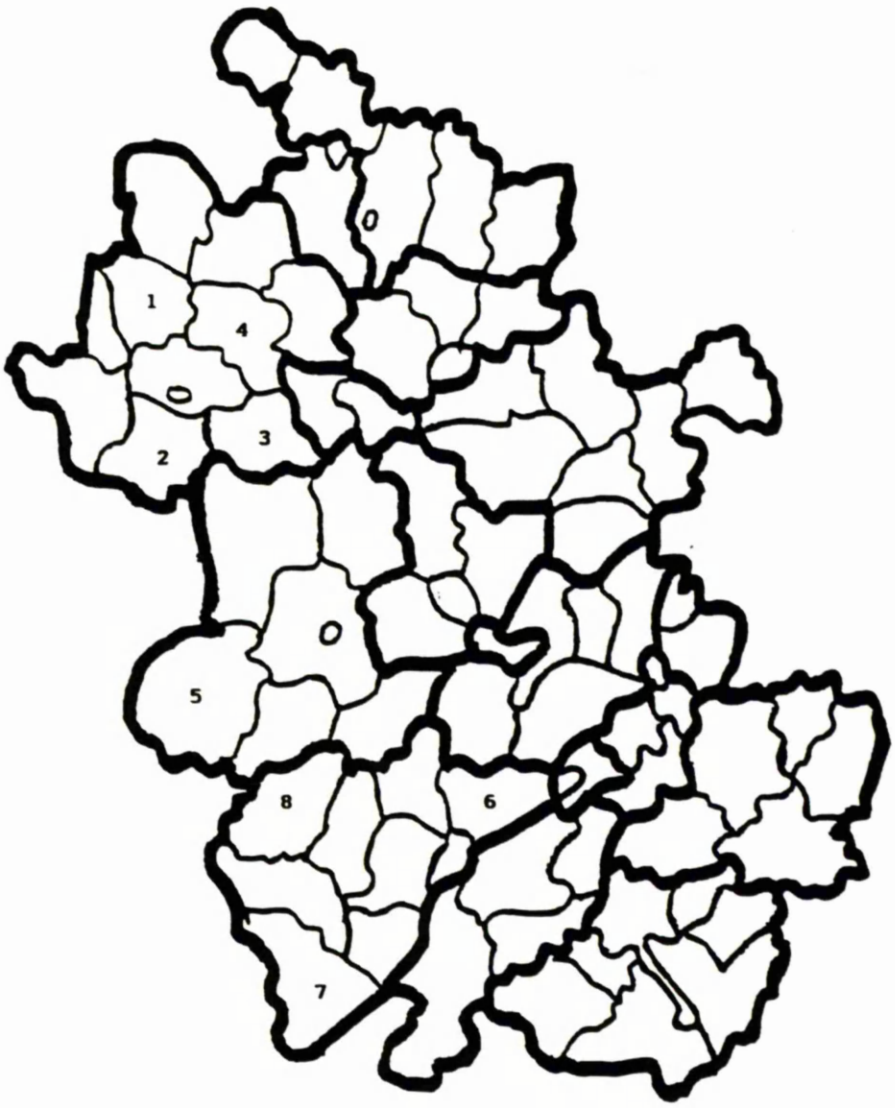
4. Poor and Fast Growth Counties

a. Anhui

The counties in this group from Anhui were further divided into three sub-groups. The first sub-group contained Susong, Zongyang and Lixin counties. These counties all attained high levels of per capita NDMP in 1989 through a solid agricultural base and rapid expansion of the 'service' sector, and which in turn led to rapid rates of growth in per capita NDMP for 1983-89. Taihe, Yuexi and Funan counties made up the second sub-group. These counties had moderate levels of NDMP in 1989, and moderate per capita NDMP growth rates between 1983 and 1989. This lower level of growth resulted primarily from growth of the service sector, with little complementary growth in agriculture or industry. Finally, Yingshang and Jinzhai comprised the third sub-group of low NDMP, low growth counties. For these two counties agriculture and industry were engines of growth, but the absence of complimentary growth in the 'service' sector severely limited the rate of overall economic growth.

[17] These data were for 1981 from the 1982 census. Trends based on data from the 1990 census are not yet available.

Anhui: Poor, Dynamic Counties 1978-90



LEGEND

1.Taihe
2.Funan
3.Yingshang
4.Lixin
5.Jinzhai
6.Zongyang
7.Susong
8.Yuexi

Despite the rapid growth in material well-being, as indicated by the per capita NDMP data, these counties suffered absolute declines in non-material well-being, based on the mortality data. In relative terms, achieved functioning improved for these counties, when compared to the provincial average. But, given the magnitude of the provincial increase (10.6% per annum) this is hardly comforting. Mortality increased from 5.94 deaths per thousand population in 1981 for these counties (marginally above the provincial average - 5.66) and increased to 9.55 in 1989 (marginally below the provincial average - 9.66).

a.i High NDMP, High Growth

Agricultural output and productivity improved significantly between 1980 and 1990 in all three counties, although none was an efficient producer of grain over the entire period by either Anhui or China standards. The very low grain yields in Lixin partly reflected the dominance of wheat in grain production, which had much lower yields than rice. Both Lixin and Susong were 'efficient' producers of oil crops by Anhui standards, although they lagged behind the China average in 1990.

Table 7.19a Agricultural Output in Anhui 1980-90

	Food Grain Yields Tonnes per Hectare			Oil Seed Yields Tonnes per Hectare			Chemical Fertilizer Use, K Tonnes		
County	1980	1985	1990	1980	1985	1990	1980	1985	1990
Lixin	1.3	2.6	2.5	0.7	1.5	1.2	13.0	34.9	31.6
Zongyang	2.1	3.8	3.9	0.7	1.0	0.9	4.3	11.2	14.8
Susong	2.8	3.9	3.8	0.8	1.2	1.3	7.3	12.0	23.2
Mean	2.2	3.1	3.4	0.6	1.1	1.0	8.4	18.9	20.0
Prov.Mean	3.1	4.0	4.3	1.1	1.3	1.2	7.3	15.6	20.0

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

Agriculture in these counties lacked the dynamism of that in the counties of Chuxian prefecture. Nevertheless the growth shown here, particularly in the 1980-85 period, provided the necessary foundation for sustained

'service' sector growth between 1983 and 1989, NDMP growth rates faster than those of their peers, and improved levels of material well-being.

Table 7.19b Agricultural Output in Anhui 1980-90

County	Food Grain Growth Output 1980-90	Food Grain Growth Yields 1980-90	Oil Seed Growth Output 1980-90	Oil Seed Growth Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Lixin	7.9	6.8	-1.8	5.5	9.3
Zongyang	7.3	6.4	13.1	2.5	13.1
Susong	3.1	3.1	13.5	5.0	12.3
Mean	3.6	4.7	7.1	5.0	9.2
Prov.Mean	5.4	4.7	9.5	0.9	10.6

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

Table 7.19c Anhui Poor, Moderate Growth Counties
Industrial Output Composition and Growth 1984-88

County	% XZGY in XZQY 1984	% XZGY in XZQY 1988	% XZGY in GVIO 1984	% XZGY in GVIO 1988	percentage growth rates XZQY 1984-88	percentage growth rates XZGY 1984-88	percentage growth rates pc.NVIO 1984-88
Lixin	57.1	10.4	54.0	39.2	52.4	-0.5	5.1
Zongyang	46.6	44.1	60.8	55.9	34.0	32.1	31.5
Susong	33.8	66.2	27.2	59.9	28.2	51.7	21.5
Mean	40.3	34.7	46.1	43.9	32.2	27.3	25.1
Prov.Mean	43.8	46.0	32.9	40.6	40.7	42.4	30.0

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

A disaggregation of NDMP showed that all counties had very small industrial sectors, and only Zongyang's industrial sector increased its share in NDMP between 1983 and 1989. For all three counties, value-added from agriculture declined precipitously from over 62% of NDMP in 1983 to between 20 and 28% in 1989. 'Services' accounted for the lion's share of NDMP in 1989 in all three counties, and also of NDMP growth for 1983-89. Zongyang's economy was the most diverse, and this is reflected in its higher rate of NDMP growth.

Lixin had the lowest NDMP growth rate of the three counties, which was the product of massive expansion of the 'services' portion of XZQY, while XZGY declined, and NVIO virtually stagnated. The contrasts with the

fast growth, high NDMP counties in Anhui, where collective industry contributed was an important contributor to rapid growth. Susong, by contrast, had a leading XZGY sector, which fuelled growth in both XZQY and NVIO, and accounted for approximately 85% of real industrial output growth in 1984-88. Zongyang had the most balanced growth profile, where the collective sector as a whole grew modestly more quickly than collective industry, which in turn grew somewhat faster than per capita NVIO. XZGY accounted for 43% of XZQY growth for the 1984-88 period, and 54% of industrial output growth.

Table 7.19d Anhui Poor, Moderate Growth Counties
NDMP Composition, Sectoral Percentage Shares 1983-89

County	Agriculture 1983	Agriculture 1989	Industry 1983	Industry 1989	'Services' 1983	'Services' 1989	% gr. NDMP 1983-89
Lixin	66.2	28.1	4.4	2.8	29.4	69.1	15.9
Zongyang	56.4	20.5	5.3	6.6	38.3	72.9	29.4
Susong	73.5	20.0	8.1	6.4	28.4	73.6	26.0
Mean	64.4	29.5	6.9	8.8	28.7	61.7	16.9
Prov.Mean	65.2	34.5	12.7	19.5	22.0	46.0	15.8

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Table 7.19e Anhui's Poor, Moderate Growth Counties
Sectoral Shares in NDMP Growth 1983-89

County	Agriculture *yuan*	Agriculture %	Industry *yuan*	Industry %	'Services' *yuan*	'Services' %	δ NDMP *yuan*
Lixin	4.4	1.2	6.3	1.7	359.7	97.1	370.4
Zongyang	54.8	10.8	35.0	6.9	417.8	82.3	507.6
Susong	35.8	5.5	37.8	5.8	577.8	88.7	651.4
Mean	22.5	7.1	31.6	10.0	262.2	82.9	316.3
Prov.Mean	50.1	12.7	95.5	24.2	248.7	63.0	394.7

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

a.ii Medium NDMP, Medium Growth

Of these three counties, it was Yuexi that had the best agricultural performance over the 1980s, and the most highly diversified economy. This

corresponded to the fastest rate of NDMP growth among these three counties, and only one was modestly below the provincial average. Throughout the 1980s, Yuexi was an efficient producer of food grains, with yields above both the Anhui and China averages. Yields and output of food grains grew steadily, if unspectacularly, throughout the 1980s despite very low use of chemical fertilizer. Increasing agricultural infrastructure provision in Yuexi could be expected to further increase agricultural production. Yuexi was not an efficient producer of oil seed crops, and the growth rate of both yields and output were very small during the 1980s. Both Taihe and Funan had high chemical fertilizer use throughout the 1980s. Despite this advantage, grain and oil crop yields remained low in both counties over the period, although the rate of growth of both grain and oil crop yields were above the provincial average for 1980s. Funan also had a rapid increase in grain output, while Taihe's grain output stagnated. Even by the standards of a predominantly wheat growing area, these yields were low - the average grain yields for the five counties of Fuyang prefecture examined in chapter 6 was 3.2 tonnes per hectare in 1990, compared to 2.8 for the counties from Fuyang prefecture examined in this chapter.

Yuexi had the highest rate of real per capita NDMP growth for 1987-89; indeed it was the only county in this group to have an NDMP growth rate above the provincial average during the recession. This economic stability in the face of rapid inflation followed by recession stemmed from the diversified nature of its economy, as is the case for Yingshang and Jinzhai discussed in the following sub-group. As with the three counties in the previous sub-group, agriculture accounted for less than 30% of NDMP in 1990 in Yuexi, and made a very small contribution to NDMP growth. The 'service' sector accounted for the majority of NDMP, while industry was relatively large in Yuexi, compared to the other counties in this group. In Yuexi

industry made a significant contribution to NDMP growth between 1983 and 1989. Industry therefore contributed directly to the higher rate of NDMP growth in Yuexi, as it did for the dynamic counties from Anhui discussed in chapter 6.

Table 7.20a Agricultural Output in Anhui 1980-90

County	Food Grain Yields Tonnes per Hectare 1980	1985	1990	Oil Seed Yields Tonnes per Hectare 1980	1985	1990	Chemical Fertilizer Use, K Tonnes 1980	1985	1990
Taihe	1.6	2.3	2.5	0.5	1.1	0.8	11.8	27.1	29.1
Funan	1.8	2.1	3.0	0.6	1.3	1.1	13.0	24.3	22.2
Yuexi	3.4	4.6	4.4	0.6	0.7	0.7	1.2	2.0	2.2
Mean	2.2	3.1	3.4	0.6	1.1	1.0	8.4	18.9	20.0
Prov.Mean	3.1	4.0	4.3	1.1	1.3	1.2	7.3	15.6	20.0

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

Table 7.20b Agricultural Output in Anhui 1980-90

County	Food Grain Growth Output 1980-90	Yields 1980-90	Oil Seed Growth Output 1980-90	Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Taihe	0.6	4.6	-1.0	4.8	9.5
Funan	6.5	5.2	0.3	6.2	5.5
Yuexi	2.7	2.6	6.7	1.6	5.9
Mean	3.6	4.7	7.1	5.0	9.2
Prov.Mean	5.4	4.7	9.5	0.9	10.6

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

Funan and Taihe had larger agricultural shares in value added, and lower ones for industry than Yuexi. For both counties the majority of value-added came from the 'service' sector in 1990. Funan had a somewhat larger industrial sector than Taihe, and a marginally larger 'service' sector. Funan needed this dynamism in the industrial and 'service' sectors to compensate for the decline in agriculture over the 1983-89 period. NDMP growth fell to just below the provincial average for 1987-89 in Taihe, while NDMP growth was above average for the 1984-88 period. Funan by contrast suffered a decline in its agricultural sector between 1983 and 1989, which was matched by low rates of NDMP growth for 1984-88 and 1987-

89. The very heavy reliance on the 'service' sector for NDMP growth from 1983 to 1989 in Funan and Lixin resulted in very low growth rates throughout the period of recession in Lixin's case falling from above the provincial average for 1983-89 and 1984-88 to a rate only half the provincial average for 1987-89.

Table 7.20c Anhui Poor, Rapid Growth Counties
Industrial Output Composition and Growth 1984-88

County	% XZGY in XZQY 1984	% XZGY in XZQY 1988	% XZGY in GVIO 1984	% XZGY in GVIO 1988	percentage growth rates XZQY 1984-88	XZGY 1984-88	pc.NVIO 1984-88
Taihe	19.3	23.5	38.4	36.6	15.1	20.9	18.6
Funan	20.9	46.0	24.4	44.2	21.9	48.5	24.4
Yuexi	na.	88.8	na.	61.1	30.9	na.	22.6
Mean	40.3	34.7	46.1	43.9	32.2	27.3	25.1
Prov.Mean	43.8	46.0	32.9	40.6	40.7	42.4	30.0

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Table 7.20d Anhui's Poor, Moderate Growth Counties
NDMP Composition, Sectoral Percentage Shares 1983-89

County	Agriculture 1983	Agriculture 1989	Industry 1983	Industry 1989	'Services' 1983	'Services' 1989	% gr. NDMP 1983-89
Taihe	69.7	40.6	5.8	6.6	24.5	51.8	11.2
Funan	73.2	33.4	6.0	9.2	20.8	57.4	12.8
Yuexi	62.0	28.6	10.9	13.9	27.1	57.5	14.6
Mean	64.4	29.5	6.9	8.8	28.7	61.7	16.9
Prov.Mean	65.2	34.5	12.7	19.5	22.0	46.0	15.8

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Table 7.20e Anhui's Poor, Moderate Growth Counties
Sectoral Shares in NDMP Growth 1983-89

County	Agriculture *yuan*	Agriculture %	Industry *yuan*	Industry %	'Services' *yuan*	'Services' %	δ NDMP *yuan*
Taihe	20.9	10.2	15.2	7.4	168.8	82.4	204.9
Funan	-8.7	-4.1	25.9	12.2	195.2	91.9	212.4
Yuexi	5.5	2.3	39.3	16.3	196.2	81.4	241.0
Mean	22.5	7.1	31.6	10.0	262.2	82.9	316.3
Prov.Mean	50.1	12.7	95.5	24.2	248.7	63.0	394.7

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

In Taihe and Funan, GVIO grew more quickly than XGQY, and XZGY grew faster than either of these. For Taihe, XZGY accounted to 29% of XZQY growth for 1984-88, while in Funan it accounted for 67% of XZQY growth. Over the same period XZGY accounted for 35% and 56% of growth in industrial output for Taihe and Funan respectively. The greater importance of XZGY in XZQY growth in Funan reflects the more rapid growth of industry, and the larger industrial sector, compared with Taihe.[18] XZQY growth outpaced industrial growth, leading to the assumption that XZGY would be more important to industrial growth than collective sector growth in Yuexi. The very high concentrations of XZGY in both XZQY and industrial output suggested that this sector was growing very quickly during the late 1980s, as was the case in Taihe and Funan.

a.iii Low NDMP, Low Growth

For the 1983-89 period as a whole, Yingshang and Jinzhai both had the slowest rates of NDMP growth in this group, and by 1989 also had a very low level of per capita NDMP. In the case of Yingshang, NDMP was virtually half the provincial average, and higher than that of only Wangjiang and Linquan in the province as a whole. Both counties were designated as official poverty areas by the OLG in 1986 and received central government assistance, as did Yuexi from this group.

Table 7.21a Agricultural Output in Anhui 1980-90

	Food Grain Yields Tonnes per Hectare			Oil Seed Yields Tonnes per Hectare			Chemical Fertilizer Use, K Tonnes		
County	1980	1985	1990	1980	1985	1990	1980	1985	1990
Yingshang	1.7	2.0	3.3	0.4	1.2	1.2	15.6	36.8	33.0
Jinzhai	2.7	3.2	3.4	0.7	0.8	0.9	1.3	3.1	3.5
Mean	2.2	3.1	3.4	0.6	1.1	1.0	8.4	18.9	20.0
Prov.Mean	3.1	4.0	4.3	1.1	1.3	1.2	7.3	15.6	20.0

18 For Yuexi the 1984 data on XZGY were missing.

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

In Yingshang, chemical fertilizer use was high throughout the 1980s reflecting the greater availability of agricultural inputs and infrastructure in Fuyang prefecture compared to Liu'an prefecture. Jinzhai in Liu'an prefecture had a use of chemical fertilizer well below the provincial average, and a rate of growth that was below the average as well. Although grain yields were quite high for a wheat growing region in 1990, the total output of food grains was stagnant in Yingshang and declined marginally in Jinzhai during the 1980s. Growth of oil crops output was rapid in both counties over this period, and Yingshang achieved an oil seed yield equal to the Anhui average in 1990. Agriculture remained an important factor in economic growth in both counties; just under 20% of NDMP growth for 1983-89 came from agriculture. Agriculture accounted for 38% and 46% of value-added in 1989 for Jinzhai and Yingshang respectively.

Table 7.21b Agricultural Output in Anhui 1980-90

County	Food Grain Growth Output 1980-90	Food Grain Growth Yields 1980-90	Oil Seed Growth Output 1980-90	Oil Seed Growth Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Yingshang	1.5	6.9	11.3	11.6	7.7
Jinzhai	-0.7	2.3	14.8	2.5	10.1
Mean	3.6	4.7	7.1	5.0	9.2
Prov.Mean	5.4	4.7	9.5	0.9	10.6

Sources: ZGFX 1980-87, 1988: 178-199; ZGFX 1990, 1991: 70-81.

Table 7.21c Anhui's Poor, Rapid Growth Counties
Industrial Output Composition and Growth 1984-88

County	% XZGY in XZQY 1984	% XZGY in XZQY 1988	% XZGY in GVIO 1984	% XZGY in GVIO 1988	percentage growth rates XZQY 1984-88	percentage growth rates XZGY 1984-88	percentage growth rates pc.NVIO 1984-88
Yingshang	72.1	41.0	85.9	41.6	36.6	18.6	37.7
Jinzhai	23.5	21.8	14.4	23.0	62.7	59.6	39.0
Mean	40.3	34.7	46.1	43.9	32.2	27.3	25.1
Prov.Mean	43.8	46.0	32.9	40.6	40.7	42.4	30.0

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Yingshang and Jinzhai both had larger industrial shares in NDMP in 1989, and rapid industrial growth during the 1980s. Growth in industry was well above the provincial average for 1984-88 in both. Industry contributed 25% and 30% of gains in NDMP for 1983-89 in Jinzhai and Yingshang respectively, in excess of the average for Anhui. The contribution of 'services' to the economies of Yingshang and Jinzhai were smaller than in the other counties in this group, and also below the Anhui average. Although the relatively small size of the 'service' sector in these counties may have limited economic growth before the recession, it was precisely this diversification which permitted these counties to maintain their economic growth rates through 1987-89.

Table 7.21d Anhui's Poor, Moderate Growth Counties
NDMP Composition, Sectoral Percentage Shares 1983-89

County	Agriculture 1983	Agriculture 1989	Industry 1983	Industry 1989	'Services' 1983	'Services' 1989	% gr. NDMP 1983-89
Yingshang	68.9	45.5	6.0	14.8	25.1	39.7	10.9
Jinzhai	53.9	37.5	7.9	18.4	38.3	44.1	11.1
Mean	64.4	29.5	6.9	8.8	28.7	61.7	16.9
Prov.Mean	65.2	34.5	12.7	19.5	22.0	46.0	15.8

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

Table 7.21e Anhui's Poor, Moderate Growth Counties
Sectoral Shares in NDMP Growth 1983-89

County	Agriculture *yuan*	Agriculture %	Industry *yuan*	Industry %	'Services' *yuan*	'Services' %	δ NDMP *yuan*
Yingshang	29.4	18.3	40.0	24.9	91.3	56.8	160.7
Jinzhai	36.3	19.9	55.4	30.4	92.5	50.7	182.4
Mean	22.5	7.1	31.6	10.0	262.2	82.9	316.3
Prov.Mean	50.1	12.7	95.5	24.2	248.7	63.0	394.7

Note: All growth rates based on data at 1980 constant prices.
Sources: AHJJNJ, 1985: 325-525; AHNJ, 1989: 225-338.

For both counties XZGY played only a limited role in the growth of collective enterprises, and industrial output overall, less than 30% in all cases. Industrial output grew more quickly than XZQY, which was dominated

by 'services' from 1984 to 1988 in Yingshang. This dominance of state-run industry helped to ensure that growth continued through the recession, but also moderated total economic growth during the earlier boom period. In Jinzhai 'services' dominated the XZQY sector, which grew more quickly than industrial output during the late 1980s. This resulted in higher NDMP growth rates before the recession, and higher values of NDMP. Growth rates slowed more as a result of the recession in Jinzhai than in Yingshang.

b. Yunnan Counties

The Yunnan counties examined in this section all experienced very limited economic diversification during the 1980s. The majority had relatively poor agricultural productivity, despite many counties being in the rice growing south of the province, and had little growth in output or yields of food grains and oil crops. In only one county did the value of industrial output approach the provincial average, and the majority of counties had industrial output values below one quarter of the provincial average in 1990. The growth rates for per capita NDMP from 1985 to 1990 were uniformly below the provincial average, and six had declines in real per capita NDMP between 1985 and 1990. Only six of these counties had 'service' sector shares in excess of the provincial average, a further indication of their heavy reliance on agriculture, and their low level of development. Ten of the sixteen counties were designated poverty areas by the OLG in 1986. Despite this, real per capita NVAIO grew by 4 to 9% per annum from 1980 to 1990 in these counties.

This group of counties had the largest decline in mortality of any group for Yunnan. The CDR declined by -4.3% per annum for 1981-9, compared to -2.1% for the provincial average. This represents a significant improvement in non-material well-being in both absolute and relative terms.

Yunnan: Poor, Dynamic Counties 1978-90

LEGEND

1.Qiaojia
2.Yanjin
3.Daguan
4.Yongshan
5.Zhenxiong
6.Xundian
7.Yunyang
8.Luchun
9.Guangnan
10.Funing
11.Lancang
12.Ximeng
13.Gongshan
14.Yun
15.Yangde
16.Mojiang

The CDR declined from 12.31 in 1981 to 8.68 (per thousand population) in 1989, remaining marginally above the provincial average at the end of the period (7.65 in 1989).

To examine patterns of growth, the counties were further sub-divided into three groups. The first sub-group included seven counties that had the highest per capita NDMP growth rates for 1985-90, but which started from a relatively low base. These counties were least affected by the 1989-90 recession. The second sub-group contained five counties that had high per capita NDMP in 1985, with virtually no change in this level in 1990 - these counties were more severely affected by the recession, and grew more slowly than sub-group 1 for 1985-88. The third sub-group was comprised of four counties that suffered severe economic decline during the recession, including deindustrialization, despite mid-range per capita NDMP in 1985.

b.i Growth from Low NDMP

The seven counties in this sub-group are concentrated in the south of the province, in temperate rice growing areas, although the usual caveats regarding the limits on agricultural production posed by the mountainous terrain in Yunnan apply to these counties. The counties were: Yunyang from Honghe; Guangnan from Wenshan; Mojiang, Lancang and Ximeng from Simao; Yongde from Lancang; and the northern outlier, Qiaojia from Zhaotong prefecture. All of these counties were located in the periphery, and all but Yongde were designated as poverty areas in 1986 and received assistance and tax relief from the central government. There can be little doubt that these counties were poor in 1985, and largely remained poor through 1990 despite reasonable rates of economic growth. In 1985, real per capita NDMP stood at 181 *yuan* for all of these counties on average.

By 1988, per capita NDMP had increased to 212 *yuan*, but fell to 202 *yuan* in 1990. Throughout this period, per capita NDMP remained below the poverty lines identified by the Chinese government and the World Bank.

Table 7.22a Agricultural Output in Yunnan 1980-90

County	Food Grain Yields Tonnes per Hectare 1980	1985	1990	Oil Seed Yields Tonnes per Hectare 1980	1985	1990	Chemical Fertilizer Use, K Tonnes 1980	1985	1990
Qiaojia	1.8	2.1	1.9	0.5	1.0	0.6	2.2	3.4	4.5
Yunyang	2.6	3.0	3.1	0.7	1.0	0.8	0.1	0.5	2.2
Guangnan	2.1	2.1	2.3	0.4	0.8	0.8	2.5	2.9	3.3
Mojiang	1.3	1.8	1.7	0.8	1.0	0.8	2.3	1.6	2.3
Lancang	1.1	1.5	1.5	0.4	0.5	0.6	0.5	0.8	1.8
Ximeng	1.0	1.4	0.6	0.3	0.3	0.2	0.0	0.0	0.1
Yongde	1.8	2.1	2.0	0.8	1.1	0.9	1.1	1.9	2.4
Mean	1.8	2.1	2.0	0.6	0.9	0.7	1.9	2.4	3.4
Prov.Mean	2.4	2.8	3.0	0.7	1.1	1.1	2.4	3.2	4.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Table 7.22b Growth Rates for Agricultural Output in Yunnan 1980-90

County	Food Grain Growth Output 1980-90	Yields 1980-90	Oil Seed Growth Output 1980-90	Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Qiaojia	-0.2	0.8	-5.3	1.5	7.4
Yunyang	2.8	2.0	6.2	0.9	33.9
Guangnan	3.1	0.8	11.7	7.1	2.7
Mojiang	2.6	2.6	5.3	0.1	0.0
Lancang	1.7	2.9	7.9	5.5	13.2
Ximeng	4.1	-5.0	4.1	-2.8	15.8
Yongde	1.7	0.9	9.6	2.3	8.1
Mean	2.1	1.2	3.8	1.2	5.8
Prov.Mean	2.3	2.3	7.6	5.3	6.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

All of these counties had grain and oil crop yields below the provincial and China averages in 1990. This was also true for the majority of these counties throughout the 1980s. The exception was grain yields in Yunyang county, which were above the provincial average throughout the 1980s, as was the growth rate for food grain output which was also above the China average. Use of chemical fertilizer was very limited, and it is safe to assume that agricultural infrastructure in these counties lagged

behind the China average, and probably the Yunnan average as well (although water shortages were less severe in the southern counties than in the north, posing a less serious constraint on agricultural production. However, for most of these counties agriculture was an important source of growth in NDMP between 1985 and 1990, as in NVAIO throughout the 1980s. If one ignores the magnitude of yields, and instead considers growth in agricultural output, the answer to the question regarding sources of economic growth is provided. These counties had increased grain output that matched the output growth of food grain in Yunnan as a whole. This was not the case for the counties in the remaining two sub-groups. Similarly growth in oil seed output was well above the average for all counties in this group, and excluding Qiaojia, equalled the provincial average for oil seed output growth.

For all of the counties except Qiaojia, rice was the dominant food grain, and accounted for between 48% and 77% of all grain output in 1990. Maize was the second most important food grain in these six counties in 1990, which accounted for between 11% and 39% of output. Ximeng also had 9% of grain output from other coarse grains, which corresponded to the high growth rate and increased volume of meat production in the county since 1985. Further, numerous specialty crops contributed to total agricultural output. Yunyang accounted for 12% of grape production and 8% of banana production in Yunnan in 1990, and a significant volume of soft fruit such as peaches and apricots. Soft fruit production was also important in Guangnan, Mojiang, Lancang, Ximeng and Yongde. Yongde also accounted for 5.2% of tea production in Yunnan, and sugar cane was an important crop in the county. Conditions for agricultural production in Qiaojia are much poorer than in the other six counties in this group, with value-added from agriculture falling modestly between 1985 and 1990. Qiaojia's grain

production was dominated by maize, 36%, and tubers, 30%, in 1990, with little diversification from staple crop farming in the county (YNTJNJ, 1991: 646-60). With the exception of Qiaojia, agriculture was an important contributor to economic growth in these counties. However, despite the increased output volume, prosperity was limited by the low yields in these counties.

Table 7.22c Yunnan's Poor, Moderate Growth Counties
Industrial Output Composition and Growth 1978-90

County	1990 Industrial Output million *yuan* State	Collect.	Private	percentage growth rate Real per capita NVIO 1978-90	1985-90
Qiaojia	26.1	9.3	8.2	6.2	2.3
Yunyang	24.0	4.7	1.9	9.3	4.7
Guangnan	17.6	10.2	18.9	9.8	4.9
Mojiang	33.2	6.5	2.7	3.5	2.3
Lancang	65.0	10.6	1.1	8.3	5.0
Ximeng	9.5	1.0	3.7	12.2	12.1
Yongde	20.8	2.8	3.6	7.3	3.8
Mean	18.7	8.9	7.9	6.3	3.4
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

Industry also played an important role in the economic growth of these counties. By provincial standards, none of these counties had a large industrial sector, but relative to the other counties in this sub-group, they were important centres of industrial production - ranging from 25% to 50% of the provincial average industrial output value in 1990. For the most part state-owned industry was the dominant sector, accounting for between 84% and 60% of industrial output in 1990. State industry accounted for only 38% of industrial output in Guangnan in 1990. There, industrial output was dominated by the private sector, which accounted for 40% of industrial output in 1990; the remaining 22% came from collective enterprises. Industrial output growth was faster between 1980 and 1985 in these counties than for 1985-90. For 1978-90, real per capita NVIO grew

at above the provincial average in Yunyang, Guangnan and Ximeng counties, while Ximeng also had rapid growth in industrial output for 1985-90. Qiaojia was the only county in this sub-group located in a strategic position, and as a result the majority of state industry in these counties must have been located for economic, not political reasons.

Table 7.22d Yunnan's Poor, Moderate Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

County	Agriculture			Industry			'Services'			% gr. NDMP
	1985	1988	1990	1985	1988	1990	1985	1988	1990	1985-90
Qiaojia	78.4	64.7	71.2	14.0	12.0	14.6	7.6	23.4	14.3	1.6
Yunyang	66.9	60.2	62.9	10.9	14.2	11.7	22.2	25.6	25.4	3.2
Guangnan	62.7	58.5	73.0	8.1	8.9	10.0	29.2	32.6	16.6	0.7
Mojiang	na.	63.5	73.0	na.	14.3	14.9	na.	22.2	12.1	na.
Lancang	62.7	56.0	56.4	18.2	18.0	18.7	19.2	26.1	24.9	4.4
Ximeng	73.8	69.1	72.5	10.7	16.5	18.2	15.4	14.4	9.3	0.8
Yongde	74.5	69.3	77.4	10.4	14.0	10.3	15.1	16.7	12.4	4.0
Mean	67.7	62.0	71.7	10.7	11.4	12.3	22.0	26.6	16.0	0.5
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Construction, transportation and commerce contributed to NDMP growth in some of the counties in this sub-group. However, the 'service' sector shrank during the 1989-90 recession in the majority of these counties, as was the case for the counties in the remaining two sub-groups. Therefore it was only through the strength of growth in the agricultural and industrial sectors that NDMP grew at all in the majority of these counties. This partially explains the faster rate of real per capita NVAIO growth compared to other Yunnan counties examined in this chapter. Throughout the 1985-90 period agriculture accounted for the majority of NDMP. In Qiaojia, Yunyang, Lancang and Ximeng there was a small trend decline in agriculture's share, while in Guangnan and Yongde there was a small trend increase. There was a trend increase in the share of NDMP derived from industrial value-added in Qiaojia, Yunyang, Guangnan, Mojiang, Lancang and Ximeng counties in the late 1980s, while there was a marginal decline in

Yongde. This despite the slow growth of industry in these counties over this period.

Lancang had the highest rate of NDMP growth for 1985-90 of all the counties in this sub-group. Lancang had a trend increase in the share of NDMP from 'services' over the 1985-90 period, with only a small decline in during the recession. Further, in 1990 the share of NDMP from 'services' exceeded the provincial average. In Lancang, 30% of NDMP growth for the 1985-90 period came from agriculture, 21% from industry and 49% from 'services'. Yunyang had a very similar pattern of NDMP growth, and similarly attained a high rate of NDMP growth by the standards of this group.[19]

Table 7.22e Yunnan's Poor, Moderate Growth Counties
Sectoral Shares in NDMP Growth 1985-90

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Qiaojia	-2.1	-17.5	2.5	20.8	11.6	96.7	12.0
Yunyang	11.1	38.9	4.7	16.5	12.7	44.6	28.5
Guangnan	28.2		4.7		-25.3		7.6
Mojiang	na.	na.	na.	na.	na.	na.	na.
Lancang	13.3	30.2	9.2	20.9	21.6	49.0	44.1
Ximeng	3.4		15.8		-11.0		8.2
Yongde	35.8	90.6	3.8	9.6	-0.1	-0.2	39.5
Mean	11.8		3.8		-11.0		5.3
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

More counties in this sub-group than in the group as a whole, small absolute experienced declines in the 'service' sector between 1985 and 1990 due to the recession. For these counties, economic growth was derived from the agricultural and industrial sectors, which also had to compensate for

[19] Data from the Yunyang *Xianzhi* are available for per capita NDMP from 1952 to 1985. Combined with the data from the 1991 Statistical Yearbook this gave a series up to 1990. These data showed that real per capita NDMP (at 1980 constant prices) grew by 2.4% per annum from 1952 to 1966, -1.9% from 1966 to 1980; this growth rate was artificially depressed due to the impact of natural disasters on NDMP and income in Yunnan in 1980, and can be re-estimated to be -0.3%. For 1980 to 1985, NDMP grew by 18.3% per annum, and then the growth rate fell to 3.2% for 1985-90. The adjusted growth rate for 1980-85, correcting for the impact of natural disasters in 1980, was 13.0%, and 8.0% for 1980-90. (YYXZ, 1990: 90-2)

the diminution of the 'service' sector. The larger the fall in 'services', the lower the NDMP growth rate. Yongde, for example, had a negligible drop in the 'service' sector, and achieved a growth rate of 4% per annum for the late 1980s based on the strength of its agricultural production. At the other end of the spectrum was a county like Guangnan, where the decline in the 'service' sector virtually negated all the growth in agricultural value-added, so that despite a relatively diversified economy - 'service' sector shares of NDMP were above the provincial average throughout the late 1980s - economic growth was very slow. Qiaojia did not fit either of these models, where moderate economic growth resulted largely from expansion in 'services', despite quite a significant drop in 'service' sector share of NDMP due to the recession, and a modest decline in agricultural value-added.

Croll (1993: 81-8, 276-9) described life in a village in southeastern Yunnan, bordering Guangxi, providing useful data that elucidates this discussion on several factors.[20] According to Croll, households were poor if nominal per capita net peasant income was below 150 *yuan*, and very poor if in addition they had little or no cash income. This poverty line is very low compared to the Chinese government's poverty line in 1990 of 200 *yuan*, or the 275 *yuan* poverty line set by the World Bank for the same year (World Bank, 1992b: 140). For the township and village, between 44% and 56% of households were below the poverty line in 1991, and 13 to 15% of households were very poor due to little or no cash income. By these standards, there can be little doubt that this village was poor, as 150 *yuan* was the 1985 poverty line employed by the Chinese government for

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[20] This village must be in either Guangnan or Ninglang, although Croll does not specify which. From other information, Guangnan seems the most likely candidate.

designating poverty relief counties.[21] Croll's sample of eight households had a heavy downwards bias; 38% of the sample were very poor by her standards, and 63% were poor or very poor compared to 15% and 56% respectively for the whole village.

Life in this village is typified as a struggle for bare subsistence. Villagers were caught in a 'poverty trap', where an insufficient quantity of productive agricultural land coupled with few opportunities for cash earnings either in sideline activities or outside the farm sector resulted in the age-old struggle for subsistence, with the added burden of debts incurred for extraordinary expenses, such as marriages, deaths or medical care, but also for daily necessities in poor years such as: salt, cooking oil, and grain. This vicious cycle was perpetuated by a shortage of cash in the economy. Ten percent of grain went for taxes, quotas and resales, while the remainder was used for household subsistence consumption. The average per capita household income in Anwang village was 150 *yuan*, which ranged from 227 *yuan* for a labour rich household, largely from animal husbandry, to zero *yuan*. The range for cash incomes among the eight households in the sample was 108.5 to 1 *yuan* in 1991. The key differences between poor and not poor households in terms of cash expenditures and cash earnings were striking. For the three non-poor households in the Croll sample, 25% to 39% of cash income in 1991 went on major expenditures such as grain, fertilizer or school fees, while in the five poor or very poor households, 100 to 290% of cash income was spent on salt, cooking oil, fertilizer, seed, school fees, and in one case on the purchase of a horse. However, this analysis did not capture all cash expenditures by households, including debt repayment, because Croll stated that at best these

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21 This is a rather simplistic representation of the criteria by which the OLG determined poor counties. A more complete discussion appears in chapter two.

households had no savings and no debts, and at worst had accumulated significant debts, some dating back two generations.

A lack of cash income, and the opportunity to generate it, ensured that these households remained caught in the poverty trap. Without cash income it is impossible for a household to buy fertilizer or HYV seed to improve agricultural productivity and generate a surplus which might then be invested in wells for household water and irrigation, saving the eight hour journey for water, thereby releasing much needed labour resources. Cash income could also be used to buy chicks or piglets which would both improve the nutritional content of the family's diet and/or provide a source of further cash income in the future. Cash income was also important for the majority of these households for daily subsistence, as five of the eight households had by buy grain to supplement their own production for two to six months of the year.

The village suffered from a lack of slack season employment. Slack season employment was vital to cash earnings elsewhere in China. (See Hinton, 1990: on Anhui; Selden, 1993; and Putterman, 1993: on Hebei; Riskin, 1993.) The sex ratio for labourers in the XZQY sector was lower than that for the population, 60.0 and 104.9 (males equal 100) respectively for the administrative village, or 71.4 and 84.9 for the natural village. This suggests that the majority of off-farm employment opportunities were in the female-dominated, low earning potential, piece-work handicraft trades such as: textiles, garments and bamboo weaving, as opposed to the salaried positions in light manufacturing industries or transportation, where remuneration was higher, and males predominated. The latter was true of northeastern and eastern China, where household cash incomes were considerably higher, and poverty relatively rare. Cash income and poverty was a theme discussed in chapter 2, and will be returned to in chapter 8.

Finally, Croll's data show that there was a strong link between poverty and dependency ratios. Labour poor households tend to be poor, with little scope for the generation of cash income. Anecdotal evidence presented by Croll on the composition of these households also suggests that there was a strong life-cycle element to poverty in Anwang, confirming Selden's findings (1993). The poorest households had dependency ratios of between 1.0 and 3.0, when the number of dependents was adjusted to take mental incapacity and chronic illness into account. The not poor households, by contrast, had dependency ratios ranging from 0.0 to 0.67. The 0.67 dependency ratio was for a household with six labourers and four dependants which, despite the high dependency ratio, was relatively labour rich. This confirms the relationship between poverty, income inequality and dependency outlined by in other studies on China (Selden, 1993; Bramall and Jones, 1993).

The economic performance of these counties poses the interesting counterfactual question: What rates of growth might have been achieved in these counties with greater gains in agricultural productivity based on their relative success with poor raw materials.

b.ii Wealthier, Less Dynamic Counties

This second sub-group comprised five counties which, throughout the 1980s, were reliant on growth in agriculture and industry. However, the industrial sector was very small and heavily dominated by privately-owned and collective enterprises. As with the previous sub-group, agriculture was the leading sector, and yet this was a sector with below average productivity and productivity gains in crop production over the 1980s. Particularly as a result of the recession, these counties had trend declines in the NDMP shares and values of 'service' sector output. As

these counties were scattered around the periphery of the province, there were differences in agricultural specialization due to physical and climatic factors.

Table 7.23a Agricultural Output in Yunnan 1980-90

County	Food Grain Yields Tonnes per Hectare 1980	1985	1990	Oil Seed Yields Tonnes per Hectare 1980	1985	1990	Chemical Fertilizer Use, K Tonnes 1980	1985	1990
Yongshan	1.9	2.3	2.0	0.4	0.8	0.6	2.0	2.4	3.1
Xundian	2.4	2.9	3.1	0.4	0.7	0.6	3.4	7.7	10.7
Funing	2.2	2.3	2.3	0.6	0.5	0.5	1.4	1.7	1.6
Gongshan	0.8	1.0	1.1	0.3	0.5	0.3	0.2	0.2	0.1
Yun	1.7	1.9	2.0	1.7	1.6	1.1	1.7	2.1	3.3
Mean	1.8	2.1	2.0	0.6	0.9	0.7	1.9	2.4	3.4
Prov.Mean	2.4	2.8	3.0	0.7	1.1	1.1	2.4	3.2	4.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Table 7.23b Growth Rates for Agricultural Output in Yunnan 1980-90

County	Food Grain Growth Output 1980-90	Yields 1980-90	Oil Seed Growth Output 1980-90	Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Yongshan	1.5	0.5	6.3	3.8	4.5
Xundian	1.8	2.3	4.6	5.4	12.1
Funing	2.5	0.7	5.6	-1.5	1.3
Gongshan	3.4	2.5	0.0	0.0	-3.7
Yun	1.1	1.5	-4.8	-4.8	6.6
Mean	2.1	1.2	3.8	1.2	5.8
Prov.Mean	2.3	2.3	7.6	5.3	6.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Given the locations of these counties, it is not surprising that agricultural infrastructure and inputs were limited, as was the case for chemical fertilizer use. Xundian was the only county in this sub-group with even a modest locational advantage, and it was the only county with above average chemical fertilizer use by Yunnan standards, but still well below the average for China. Xundian was also the only county in this sub-group with rapid growth of fertilizer use, and as a result was the only county with grain yields above the provincial average throughout the 1980s, with yield growth equalling the provincial average as well. The growth

rate for output and yields for oil seeds in Xundian were also high, although yields remained below average. In this, Xundian was exceptional and the picture for all counties was one of slow growth or stagnation in the production of these staple crops.

Table 7.23c Yunnan's Poor, Moderate Growth Counties
Industrial Output Composition and Growth 1978-90

County	1990 Industrial Output million *yuan* State	Collect.	Private	percentage growth rate Real per capita NVIO 1978-90	1985-90
Yongshan	5.1	12.2	9.9	7.7	8.5
Xundian	17.8	16.1	11.7	5.5	8.4
Funing	8.7	11.7	13.7	11.4	18.0
Gongshan	0.9	0.6	0.2	5.5	7.4
Yun	23.4	8.5	4.0	2.7	6.3
Mean	18.7	8.9	7.9	6.3	3.4
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

Rice was the dominant food grain in 1990 in Funing, Yun and Xundian counties, ranging from 63% in Funing to 31% in Xundian. Maize predominated in Gongshan, and accounted for 63% of grain output, and 39% in Yongshan (YNTJNJ, 1991: 646-60). Where rice was dominant, maize was the second most important grain crop. It accounted for between 20% and 38% of grain output in 1990. In Xundian, 18% of grain production came from tubers, and 11% from other coarse grains largely for use as feed grains, which tied into the high level of meat production. In Yongshan, tubers were the second most important grain crop, 29%, while rice contributed 18%. Yongshan also produced a considerable amount of meat. In Gongshan rice was second only to maize, contributing 12%, while 10% of grain production came from coarse grains. Xundian, Funing, Gongshan and Yun counties all produced significant amounts of soft fruit such as peaches, apricots and kiwis, while sugar cane was also an important crop in Yun county. Yun also produced 5.7% of the province's tea, somewhat compensating for the

stagnation in grain production, and the decline in oil crops.

Table 7.23d Yunnan's Poor, Moderate Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

County	Agriculture 1985	1988	1990	Industry 1985	1988	1990	'Services' 1985	1988	1990	% gr. NDMP 1985-90
Yongshan	75.0	64.4	64.3	7.8	10.3	10.6	17.2	25.3	25.2	2.0
Xundian	69.8	67.8	77.9	8.6	10.8	13.6	21.6	21.4	8.5	-1.0
Funing	52.6	52.3	72.2	4.2	10.6	10.8	43.2	37.1	17.0	-2.3
Gongshan	49.0	41.9	52.4	4.8	4.6	6.6	46.1	53.5	41.0	1.0
Yun	71.9	71.1	81.2	10.0	10.3	12.7	18.1	18.5	6.1	1.2
Mean	67.7	62.0	71.7	10.7	11.4	12.3	22.0	26.6	16.0	0.5
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Industrial output grew more quickly between 1985 and 1990, than in the first half of the 1980s in these counties, and all from a very small base. In all but Yun, industrial output was dominated by collective and privately-owned enterprises in 1990. Collective enterprises dominated industrial production in 1990 in Yongshan, and accounted for 45% of industrial output, while private enterprises contributed an additional 36%. In Funing private enterprises dominated industrial production, and accounted for 40%, while an additional 34% came from collective enterprises. For Xundian, Gongshan and Yun counties, state owned enterprises contributed the largest single share of industrial output in 1990, but the non-state sector accounted for 61%, 47% and 35% of industrial output respectively. The average for all five counties was 61% of industrial output from the non-state sector, compared to 24% for Yunnan on average, or 34% for collective industry only, compared to 14% for Yunnan in 1990. For all of these counties there was a trend increase in the proportion of NDMP contributed by industry, which accounted for between 7% and 14% of NDMP in 1990. This was very low relative to the Yunnan average in 1990 - 35%. As state industry was an important contributor to economic growth in the wealthy and dynamic counties of Yunnan discussed in chapter

six, the correlation between high non-state contributions to industrial production and low rates of growth, and the small size of the industrial sector in these counties confirms this relationship.

Table 7.23e Yunnan's Poor, Moderate Growth Counties
Sectoral Shares in NDMP Growth 1985-90

County	Agriculture *yuan*	%	Industry *yuan*	%	'Services' *yuan*	%	δ NDMP *yuan*
Yongshan	20.4		7.5		-7.5		20.4
Xundian	9.5		10.0		-31.4		-11.9
Funing	29.9		13.9		-72.4		-28.6
Gongshan	15.9		5.4		-7.9		13.4
Yun	28.3		6.9		-23.1		12.1
Mean	11.8		3.8		-11.0		5.3
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Yongshan was the only county that had a trend increase in shares of NDMP from 'services' for the 1985-90 period, the remainder all suffered trend declines. For three (Yongshan, Funing, and Gongshan) of the five counties, 'services' accounted for an above average share of NDMP, although given the small industrial sector, agriculture continued to dominate NDMP even here. For Xundian and Funing, there was a trend decline in 'services' as a share on NDMP for 1985-90, while the other three counties had increased shares of NDMP from 'services' for 1985-88, but a decline due to the recession for 1988-90. In Yongshan the decline was marginal, while in Gongshan it was more pronounced and in Yun it was precipitous. The rate of decline in 'service' sector share of NDMP accelerated in Xundian and Funing during the recession. The decline in the 'service' sector was so large in Xundian and Funing for 1985-90, that real per capita NDMP declined over this period. For Yongshan industrial value-added growth compensated for the small decline in the 'service' sector, and strong agricultural growth meant that real per capita NDMP grew by 2% per annum, a very low rate by Yunnan or China standards, but satisfactory relative to many of the

counties in this group. Gongshan's pattern of growth closely matched that of Yongshan, while in Yun county, the rapid decline in 'services' resulting from the recession negated a large portion of the growth from agriculture and industry, and greatly limited the real per capita NDMP growth rate for 1985-90.

b.iii Declining NDMP and Deindustrialization

There were four counties in this final sub-group. All had declines in real per capita NDMP between 1985 and 1990. These counties also experienced declines in real per capita NVIO over the same period, although Yanjin county had a decline in industrial value-added from 1978 to 1990. For the majority of these counties, the industrial sector was extremely small, and dominated by collective and privately-owned enterprises. To compound the economic difficulties experienced by these counties, agriculture, and/or 'services' either stagnated or declined. This raises the question as to how these counties achieve mid-range real per capita NVAIO growth rates if de-industrialization and agricultural stagnation occurred. The answer seems to be that these counties enjoyed a rapid expansion in the agricultural sector from 1978 to 1985, and then experienced stagnation and decline in the wake of decollectivization and a return to a price structure that supported industrial output and urban dwellers at the expense of agriculture and peasants (Ash, 1988; Riskin, 1993).

All of these counties show a limited use of chemical fertilizer, although Zhenxiong had rapid growth of chemical fertilizer use during the 1980s, which resulted in a level of use above the Yunnan average in both 1985 and 1990, although this remained well below the average use in Anhui

or China. As would be expected from the NVAIO data, growth of agricultural output was modest for the whole of the 1980s, with more rapid growth occurring before 1985, and stagnation between 1985 and 1990. This was also true of grain and oil crop yields for these counties, with rapid improvements made between 1980 and 1985, and declines or stagnation between 1985 and 1990. These trends on food grain and oil seed yields held in Luchun, but growth in output grew at or above the provincial average throughout the 1980s. This high growth in the agricultural sector in Luchun ensured that the economic decline was modest during the late 1980s.

Table 7.24 Yunnan, per capita NVAIO 1978-90

	Real per capita NVAIO					% Growth Rates		(Smoothed)	
County	1978	1980	1985	1988	1990	78-90	78-85	85-90	78-90
Yanjin	90.0	99.8	190.9	182.9	183.3	6.1	11.3	-0.8	6.8
Daguan	91.8	87.4	192.7	174.8	179.1	5.7	11.2	-1.5	7.0
Zhenxiong	98.1	96.5	162.9	134.9	158.1	4.1	7.5	-0.6	4.1
Luchun	111.2	82.0	133.9	136.6	148.9	2.5	2.7	2.1	4.0
Mean	105.6	102.2	157.4	163.1	172.3	4.2	5.9	1.8	4.9
Prov.Mean	174.4	175.7	255.3	315.6	353.6	6.1	5.6	6.7	6.6

Notes: All data are at 1980 constant prices. Smoothed growth rate for 1978-90 refers to the growth rate based on averaged end points, 1978-80, and 1988-90.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

In Yanjin, Daguan and Zhenxiong, maize was the dominant grain crop. It accounted for about 56% of all food grain production in all three counties. Tubers contributed 22-24% of grain production in Daguan and Zhenxiong, and 13% in Yanjin, while rice made up 23% of Yanjin's grain output, and 11% in Daguan. Daguan and Yanjin were also major meat producers, with output of 56.7 kgs per person relative to a provincial average of 42.3 kgs per person. Meat production exceeded the provincial mean throughout the 1980s in these two counties, although the growth rates were somewhat below the provincial average. As with grain and oil seed production, meat output grew quickly in the early 1980s, slowing considerably in the late 1980s. (YNTJNJ, 1991: 646-60; ZGFX 1980-87: 186-

201; ZGFX 1989: 186-201; ZGFX 1990: 186-201.) Soft fruits such as peaches, apricots and kiwis were also produced in the three counties from Zhaotong prefecture at a level of importance to the county, if not to the province as a whole. In Luchun, grain production was dominated by rice, 69%, and maize, 20%.

Table 7.25a Agricultural Output in Yunnan 1980-90

County	Food Grain Yields Tonnes per Hectare 1980	1985	1990	Oil Seed Yields Tonnes per Hectare 1980	1985	1990	Chemical Fertilizer Use, K Tonnes 1980	1985	1990
Yanjin	2.2	2.5	2.4	0.9	1.3	1.0	5.6	2.5	3.1
Daguan	1.8	2.4	2.2	0.6	0.7	0.4	0.5	1.5	2.0
Zhenxiong	1.9	1.9	2.2	0.7	0.9	0.7	2.9	8.4	12.7
Luchun	1.8	2.4	2.3	0.3	0.5	0.5	0.7	0.3	0.4
Mean	1.8	2.1	2.0	0.6	0.9	0.7	1.9	2.4	3.4
Prov.Mean	2.4	2.8	3.0	0.7	1.1	1.1	2.4	3.2	4.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

Table 7.25b Growth Rates for Agricultural Output in Yunnan 1980-90

County	Food Grain Growth Output 1980-90	Yields 1980-90	Oil Seed Growth Output 1980-90	Yields 1980-90	Growth of Chemical Fertilizer Use 1980-90
Yanjin	1.1	1.2	3.7	0.7	-5.9
Daguan	1.6	1.9	-5.3	-3.6	15.3
Zhenxiong	1.1	1.3	-1.8	-0.1	16.1
Luchun	3.3	2.3	12.8	5.2	-6.3
Mean	2.1	1.2	3.8	1.2	5.8
Prov.Mean	2.3	2.3	7.6	5.3	6.4

Sources: ZGFX 1980-87, 1988: 462-493; ZGFX 1990, 1991: 186-201.

In 1990, the industrial sectors of all counties except Zhenxiong were very small, and all but Luchun's industrial sector were dominated by collective or private enterprises, although in Yanjin and Daguan the state-owned enterprises did make up the largest share of industrial output, with collective ownership second most important, and the private sector a distant third. By 1990 (after five years of deindustrialization), Zhenxiong's industrial sector was just under half the average for Yunnan.

All of these counties experienced rapid expansion of industrial

output between 1978 and 1985, although given the dominance of the non-state sector, some of this growth may be attributable to the changes in definition of agricultural and industrial output in 1984, where output from township and village enterprises was changed from agriculture to industry. However, the average growth of industrial output (real per capita NVIO) was 9.4% per annum for 1978-85, above the provincial average of 7.5%, so growth in industry was considerable in these counties in the early 1980s. The overall growth rate for industrial value-added from 1978 to 1990 was 2.6% per annum for these counties, well below the provincial average. This resulted from the quite rapid decline in real per capita NVIO for 1985-90 of 6.3% per annum for the sub-group as a whole, compared to 12.2% growth for Yunnan during this period, and there were no changes in definition over this period to muddy the waters. For Daguan and Zhenxiong, the decline occurred between 1985 and 1988, with some modest recovery in industrial value-added over the 1988-90 period, while in Yanjin and Luchun the decline in industrial output was associated with the 1989-90 recession, as industrial value-added continued to increase through 1988.

Table 7.25c Yunnan's Poor, Moderate Growth Counties
Industrial Output Composition and Growth 1978-890

County	1990 Industrial Output million *yuan* State	Collect.	Private	percentage growth rate Real per capita NVIO 1978-90	1985-90
Yanjin	7.6	5.5	3.9	-0.9	-8.4
Daguan	9.1	5.9	2.4	3.9	-6.1
Zhenxiong	25.5	35.9	39.7	3.5	-5.9
Luchun	5.4	1.1	1.4	4.2	-4.6
Mean	18.7	8.9	7.9	6.3	3.4
Prov.Mean	124.6	23.0	15.8	9.1	12.0

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1990: 105-9, 254-9; YNTJNJ, 1991: 671-5, 676-80.

The composition of NDMP showed that between 1985 and 1990 all counties experienced a trend increase in the share of agriculture in NDMP, although in the cases of Yanjin, Daguan and Luchun this was divided into

a decline in agriculture's share in NDMP from 1985 to 1988, followed by a rapid increase for 1988-90. Similarly, all counties experienced trend declines in industrial shares in NDMP for 1985-90, which is consistent with the deindustrialization shown in the data on industrial output. Deindustrialization was compounded by a decline in transportation, construction and commerce as well during the late 1980s. There was a trend decline in 'service' sector share in NDMP in Daguan, Zhenxiong and Luchun counties, while in Yanjin there was a small increase in the share of 'services' in NDMP between 1985 and 1990, but this masks rapid growth for 1985-88, and a virtually equally rapid decline during 1988-90.

Table 7.25d Yunnan's Poor, Moderate Growth Counties
NDMP Composition, Sectoral Percentage Shares 1985-90

	Agriculture			Industry			'Services'			% gr. NDMP
County	1985	1988	1990	1985	1988	1990	1985	1988	1990	1985-90
Yanjin	82.0	67.2	84.8	13.0	7.7	8.6	4.9	25.5	6.6	-0.5
Daguan	67.3	64.2	74.1	12.3	9.0	10.2	20.4	26.8	15.6	-2.6
Zhenxiong	71.0	75.3	80.2	24.0	19.8	19.1	5.0	4.9	0.8	-1.5
Luchun	72.6	65.9	85.8	10.5	9.3	8.5	16.9	24.8	5.8	-0.4
Mean	67.7	62.0	71.7	10.7	11.4	12.3	22.0	26.6	16.0	0.5
Prov.Mean	50.8	42.4	48.7	24.3	27.1	34.6	24.8	30.4	16.7	4.6

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

Table 7.25e Yunnan's Poor, Moderate Growth Counties
Sectoral Shares in NDMP Growth 1985-90

	Agriculture		Industry		'Services'		δ NDMP
County	*yuan*	%	*yuan*	%	*yuan*	%	*yuan*
Yanjin	1.7		-9.3		3.1		-4.5
Daguan	-5.6	18.7	-8.0	26.8	-16.3	54.5	-29.9
Zhenxiong	6.0		-10.8		-7.4		-12.2
Luchun	18.5		-3.5		-18.2		-3.2
Mean	11.8		3.8		-11.0		5.3
Prov.Mean	34.0	40.0	64.3	75.7	-13.4	-15.7	84.9

Note: All growth rates based on data at 1980 constant prices.
Sources: YNTJNJ, 1991: 596-600, 606-610, 636-640, 676-680.

An examination of contributions to NDMP growth, or decline in these cases, illustrates the importance of each sector in determining the

magnitude of the decline. For example, Luchun had relatively rapid growth of agricultural output as discussed above. This largely offset the declines in the industrial and 'service' sectors, ensuring that the rate of decline in NDMP was low, while in Zhenxiong were agricultural growth was much slower, the contraction of industry and 'services' resulted in a more rapid rate of decline in material well-being. Daguan had the most rapid rate of NDMP decline, and this resulted from contraction in all three sectors for 1985-90, while Yanjin had modest growth in both agriculture and 'services' mitigating the decline in industrial value-added, and resulting in a slower rate of decline. The declines in Yanjin, Daguan and Zhenxiong matched the experiences of Shuifu county, where strategic industrialization combined with a lack of effective economic diversification resulted in economic decline.[22]

Table 7.26 Life Expectancy and Child Mortality For Ximeng, Funing and Luchun Counties, 1981

Region	Life Expectancy (years) male	female	Infant Mortality per K live births male	female	Under-5 Mortality per K under-5's male	female
Urban Yunnan	66.8	62.5	46.3	34.9	14.7	12.9
Rural Yunnan	59.5	60.9	89.1	76.7	46.2	50.4
i. Ximeng	35.9	40.9	148.2	151.2	136.5	106.9
ii. Funing	54.7	56.1	92.7	90.9	100.6	99.4
iii. Luchun	53.0	54.2	99.0	89.0	67.8	68.6

Source: Cheng, 1990: 42, 45.

Although the first sub-group of counties had higher rates of economic growth, and more balanced economic growth, levels of material well-being in the late 1980s remained low in these counties, lower than in the second sub-group. In 1985 material well-being in the counties of sub-group b.i was lower than that in both sub-groups ii and iii. This ranking also applied to non-material well-being as measured by life expectancy, infant

22 The micro-level explanation for the decline of industry in these counties, particularly when non-state industry was dominant, remains a very interesting question, and one beyond the remit of this dissertation. Why did state industry succeed and non-state industry fail in the majority of counties in Yunnan, when the opposite appears to be true for Anhui or other parts for China, such as Guangdong (Vogel, 1989).

and child mortality from the 1982 census. A comparison of data for these counties from the 1990 census would be very interesting, as they would show whether or not non-material well-being had increased in line with material well-being in these counties. Such data are eagerly awaited.

5. Conclusion:

This chapter shows that the general trends observed for the rich and fast growth counties in chapter six also holds for poor and slow growth counties. High agricultural productivity and rapid productivity gains accompanied fast NDMP growth and high material well-being; conversely, low productivity in agriculture accompany low rates of NDMP growth and low levels of real per capita NDMP. Among poor counties, places with better economic performances during the 1980s had either rapid gains in agricultural productivity, or rapid expansion in staple crop output relative to their peers. Several counties were also reliant on speciality agricultural crops, such as bananas, grapes, soft fruit, tea or timber. The majority of these non-speciality counties were locationally disadvantaged both in terms of infrastructure and the physical conditions for cultivation. These counties were largely located in the mountainous periphery of the two provinces - concentrated in the southwest in Anhui, and scattered around the periphery of Yunnan - where flat arable land was scarce, transportation difficult, water resources scarce during certain seasons, and lacking in gravity fed or power assisted irrigation relative to need. The latter is especially ironic for a province such as Yunnan, "the mother of rivers" as Barnett (1993: 488) dubbed it, with great potential for hydro-electric generation and therefore both gravity fed and power assisted irrigation.

The industrial sector played an important part in the continued and

increased prosperity of the counties discussed in chapter six during the 1980s. In Anhui it was the collective industrial sector that provided the dynamic for the highest levels of NDMP and the fastest growth rates. In Yunnan, state-owned industries provided the source of prosperity and dynamism for the counties in the growth pole centred on Kunming and Yuxi, and the prefectural capitals. In Yunnan it was the counties with small and collectively or privately-owned industrial sectors that had the worst growth rates, and the lowest levels of NDMP, often suffering deindustrialization during the late 1980s. There were also a clutch of counties which had benefitted from 'third front' industrialization under Mao in Yunnan's northwest and northeast which suffered deindustrialization between 1985 and 1990 with the expected negative effects on their economies. They followed the pattern exhibited by Shuifu which was examined in chapter six. In Anhui, the counties with the worst economic performance were heavily reliant on state industry, and had quite limited industrial sectors by comparison with their dynamic cousins in chapter six.

The 'service' sector was of considerable importance to the high income and fast growth counties of Anhui and Yunnan in chapter six, but second to industry in contributions to growth. By contrast, the poor and stagnant counties discussed in this chapter were highly reliant on the 'service' sector as the chief alternative to agricultural production, given the low level of industrialization. For both sets of counties, growth rates and levels of development were highest where the economy was balanced between agriculture, industry and 'services', permitting them to weather the recession with minimal loss of value-added.

Chapter 8 - Conclusion

1. Introduction

The conclusion is divided into three sections. The first outlines the findings of the dissertation relative to the questions set out in the introduction, and summarizes the results from the six substantive chapters. This is followed by a section on the implications of this study for poverty alleviation policies, the scope for improving living standards, and the likely trends in income inequality, for China and its provinces. It also suggests the policy implications arising from this analysis. The final section puts forward areas for further study that have arisen out of this dissertation.

2. Summary and Conclusions

The central question addressed in this dissertation is: What has happened to poverty, inequality and living standards during the 1978-90 period in rural Anhui and Yunnan? To answer this requires an investigation of the theoretical literature on the measurement of poverty, inequality and living standards, and how this theory can best be applied to China. This analysis forms the basis of a detailed investigation into the causes and correlates of the differential rates of economic growth among the counties of Anhui and Yunnan. A summary of the findings follows.

a. Poverty

The evidence on poverty from chapter two shows two trends, and suggests an important assertion regarding the need for localized poverty

criteria. First, there was a sharp decline in absolute poverty between 1978 and 1985 in both Anhui and Yunnan, mirroring the trend in China over this period, based on national poverty lines. During the second half of the 1980s, the incidence of poverty increased significantly in Yunnan and marginally in Anhui when measured against national poverty lines. By contrast, when provincial poverty lines are employed, a very large increase in the incidence of poverty occurs for Anhui, and a larger increase for Yunnan. This reflects the use of the provincial inflation rates to derive the provincial poverty lines and the fact that inflation in Anhui and Yunnan having is higher than the national average for 1986-90. The data show an increase in the incidence of poverty in both provinces relative to the national average in the late 1980s, in the case of Anhui, the incidence of poverty rose to above the national average, from below it, during the mid-1980s. The change in the incidence of poverty is a function of the severity of the economic retrenchment in Anhui and Yunnan, that effected those regions and individuals with income only marginally above the poverty line most severely (cf. chapter 7).

The use of income levels to examine poverty in Anhui and Yunnan is limited in two respects. First, it is reliant on income data, whose definition - as well as the coverage of the survey from which they are taken - are limited. However, this limitation is not severe because the poverty lines employed are based on these same income data, and both data sets of data contain the same underestimates. Further, even if the magnitude of the incidence of poverty at any given point is not perfectly accurate, the trends in poverty over time should be reasonably accurate; in the absence of any evidence to suggest that the degree of error inherent in these data has changed over time. The second shortcoming is that the provincial poverty lines are only adjusted to take into account the

differentials in inflation, but ignores other differences, such as those affecting relative prices or in consumption norms. Overall, the analysis improves previous studies. It also has important implications for future studies of poverty in China as a whole, relying on localized norms.

The assessment of trends in poverty in the two provinces, based on estimates of grain availability was less than conclusive. This largely reflects the inadequacy of the data available on the proportion of total calories provided by grain. The problem is particularly severe in Yunnan, which appears to suffer severe chronic calorie shortfalls; but where honey, coconut, cheese, yogurt and fruit consumption are all omitted from the data on total food consumption; all of which are important calorie, fat, and protein supplements in the Yunnan diet. Until more comprehensive information becomes available, no more accurate estimate of the adequacy of food consumption in Yunnan can be produced. If the average individual in Yunnan derived only 60% of their calories from grain, then grain availability in Yunnan in 1990 would put it above the poverty line (2200 kilocalories from all sources). But if grain accounted for 63% or more of food consumption in Yunnan, then the provincial grain availability falls below the poverty line. Even with the underestimates outlined above, prima facie it is difficult to imagine grain being such a minor part of the diet in Yunnan, when the majority of rural China is still reliant on grain for 85 to 90% of kilocalories consumed.

b. Living Standards

Chapters three and four dealt with the topic of living standards. Chapter three addressed theoretical aspects, reviewed the literature on China, and investigated the trends in achieved functioning in Anhui and Yunnan. Chapter four outlined the theoretical and methodological

foundations for the composite standard of living index. The analysis of the SLI also appeared in chapter four.

The theoretical discussion in chapter three focuses on the advantages, and shortcomings, of capability and functioning theory. In particular its superiority over more traditional social welfare and utilitarian analyses is stressed. The findings of the analysis on achieved functioning in Anhui and Yunnan uphold the superiority of capability and functioning analysis, over more traditional utilitarian analyses. The latter would ignore trends in mortality and life expectancy, which are strongly downward, despite rapid growth in many of the commodity-based aspects of living standards in both provinces, and for the national average. Five broad categories of achieved functioning are examined: command over commodities; longevity; medical care; education; and social and cultural indicators. Trends are examined both in absolute terms, and relative to the national average. For all indicators, with the notable exception of mortality, two trends are apparent. First, living standards in Anhui and Yunnan improved in absolute terms. Any other finding would have been very surprising given the rapid rate of economic growth in the two provinces. Second, living standards declined relative to the national average.

Mortality was a special case - and a crucial one in the determination of living standards over the 1982-90 period. The experiences of Anhui and Yunnan differ, and must therefore be treated separately. In Anhui, the CDR was low in 1974, and lower still in 1981. This reflected the benefits of the communal health care service and the preventative medicine that was widely practised in the province. Between 1981 and 1990, there was a strong trend increase in the CDR in rural Anhui, with a virtual doubling of the provincial average, and a tripling of the death rate in some

counties. The trends in mortality and life expectancy Anhui moved in the same direction as, but much more sharply than, the national average. In contrast to the findings based on the other criteria, this pointed to a significant decline in absolute and relative living standards in the province. It was infant and child mortality that led this increase in mortality both in China and Anhui during the 1980s. As the causes of child and infant deaths tend to be predominantly infectious diseases, infant and child mortality were particularly sensitive to the shift from preventative medicine to curative medicine that occurred due to the privatization of health care in rural China. This represents a warning of increased mortality and declining health care standards in the future.

In Yunnan, the CDR improved in both absolute terms and relative terms during the 1980s. This resulted from two factors. First, by Chinese standards, mortality was, and remains, very high in Yunnan. This was a result of the relative paucity of health care provision in rural Yunnan before 1980: the potential to reduce death rates was larger in Yunnan than in Anhui or the national average. Second, there is substantial evidence that communal health care was limited in its scope in rural Yunnan up to 1981. As a result, the benefits to the Yunnan population from communal health care were already limited before decollectivization, keeping mortality high. When the privatization of health care occurred, the losses to rural Yunnan were significantly smaller than they were in other parts of China where collective health care was wide-spread and well developed.

The analysis from the standard of living index developed in chapter four was hindered by the limitations within the index for inter-temporal comparisons in living standards. But the index provided a good measure of spatial dispersion in living standards, both at a given point in time, and over time. The index was of the human development type, but reference was

also made in its composition and formulation to Dasgupta's (1993b) index, Aschmoneit's index (1990) and Morris's index (1979). It showed an increased degree of spatial dispersion in living standards. This was only slightly mitigated by the increases in mortality in counties with high per capita NVAIO and low incidence of illiteracy. The chief shortcoming of the index was its inability to incorporate inter-temporal changes in the mean value from which the deviations were taken. This means that paradoxically, counties with increases in mortality that were smaller than the provincial average were treated as decreases in mortality by the index, contributing to increased living standards. This can be adequately compensated for by an examination of the trends in the absolute value of the components of the index.

The correlation coefficients based on the relationships between the elements of the index are very interesting. In particular the close inverse relationship between the CDR and the SLI is interesting in light of the foregoing discussion of mortality; while at the margin it was NVAIO that is most closely related to the SLI. This means that in the majority of counties, the CDR is most important in determining living standards, except in those few counties in Anhui where real per capita NVAIO grew so quickly that it more than compensates for the increase in mortality. This result serves to reinforce Sen's assertion that per capita output values themselves are an inadequate measure of living standards.

8.2c Spatial Inequality and Differential Growth Rates

Chapter five sets out the groups of counties for study in chapters six and seven, through an analysis of trends in spatial inequality. This analysis forms part of a broader work on inequality in China, which is presented in Bramall and Jones (1993). Spatial inequality, as measured by

the coefficient of variation for real per capita NDMP and real per capita NVAIO, increased during the 1980s in both Anhui and Yunnan. To understand the underlying dynamics of this increase in spatial inequality, the counties at the top and bottom of the spatial distribution are included in the analysis in chapter six (for those at the top of the distribution) and chapter seven (for those at the bottom). This chapter also includes a discussion of why inequality matters, and a discussion of the measures of inequality.

Chapters six and seven show that, in general, high agricultural productivity and rapid productivity gains accompany fast NDMP growth and high material well-being, while small gains in agricultural productivity accompany low rates of NDMP growth and low levels of real per capita NDMP. Among poor counties, areas with above average economic performances are those with either rapid growth of agricultural yields, or rapid expansion in staple crop output, relative to their peers. Several counties were also reliant on speciality agricultural crops, such as bananas, grapes, soft fruit, tea or timber. The majority of these counties are locationally disadvantaged both in terms of infrastructure and the physical conditions for cultivation.[1]

The industrial sector plays an important part in sustaining the increases in prosperity during the 1980s (for the rich counties with rapid rates of growth in particular). In Anhui it is the collective industrial sector that provides the dynamic for the highest levels of NDMP and the fastest growth rates. In Yunnan state-owned industries provides the principal source of prosperity and dynamism for the counties in the growth

[1] They are largely located in the mountainous periphery of the two provinces - concentrated in the southwest in Anhui, and scattered around the periphery of Yunnan - where flat arable land is scarce, transportation difficult, water resources scarce during certain seasons, and lacking in gravity fed or power assisted irrigation. The last deficiency being ironic in Yunnan ("the mother of rivers" as Barnett (1993: 488) dubbed it), given the great potential for hydro-electric generation and therefore both gravity fed and power assisted irrigation in the province.

pole centred on Kunming and Yuxi, and the prefectural capitals. In Yunnan, the counties with small and collectively or privately-owned industrial sectors have the lowest growth rates, and the lowest levels of NDMP, even to the extent of suffering deindustrialization during the late 1980s. The counties in the north east and north west of Yunnan, such as Shuifu, also suffered deindustrialization in their strategic, state-run, sector.
In Anhui the counties which performed worst were heavily reliant on state industry, and had quite limited industrial sectors by comparison with their fast-growing cousins examined in chapter six.

The 'service' sector is of considerable importance to the rich and fast growing counties of Anhui and Yunnan, but comes second to industry in contributions to growth. By contrast the poor and stagnant counties are highly reliant on the 'service' sector after agriculture, given their low level of industrialization. For both sets of counties, growth rates and levels of development are highest where the 'service' sector is large, and where it can economic downturns with only minimal loss of value-added.

In summary, whether rich and fast growing, or poor and slow growing, the highest levels of development are achieved through balanced growth across all three sectors of the economy. Growth in agricultural output and productivity provide the foundation for increased growth in other sectors. This is achieved through rapid increases in agricultural output and yields in the 1978-82 period in response to the changes in agricultural purchase prices and the terms of trade, among other factors. As decollectivization took place, individual households in areas with rapid growth experienced rapidly increasing incomes. Two factors fostered investment of savings in the non-farm sector. First, with the dissolution of the communes, the family farm represented the family's social security system. As a result very few families were willing to part with their land, thereby preventing

specialization in farming and agglomeration of holdings (cf. Bramall and Jones, 1993: 52-58). Given the scale of most family holdings, there were few gains to be had from investment in mechanization of farming to boost output per unit of labour, particularly when labour remained over-abundant. The second factor discouraging investment in agricultural production also had to do with uncertainty. In the early 1980s leases on family farms were very short. Households where uncertain how long the reforms and their land use rights would last, and as a result investment funds flowed out of the farm sector, even after leases had been extended to 15 year or more. The persistence of this trend was due primarily to the greater rates of return on investments in sidelines and the non-farm sector.

Investment in the non-farm sector boosted cash incomes in these areas not only because of profits from investments, but also through wages paid in cash to the expanding workforce employed in these enterprises. These new or higher cash incomes generated multiplier-induced demand. This new demand for light manufactures and 'services' reinforced supply-side growth, and the rural economy expanded across all three sectors. This was the pattern of development in the most successful counties. Where one or more elements of this process were missing, if it was a lack of dynamism in agricultural production in the early 1980s, growth rates were lower, and development was lacking.

There appeared to be a weak link between rapid economic growth and improvements in the living standard. Changes in the standard of living instead were dictated more by the death rate in 1982, as demonstrated by the correlation coefficients presented in chapter five. This means that in counties that achieved low mortality under the commune system, mortality either remains low (because there is little room for improvement in the face of institutional changes in health care provision) or mortality

increases toward the provincial or national average. In the worst cases, the provincial mean CDR itself was also rising, producing declines in living standards despite economic growth. Areas in which mortality was high in 1981, were disadvantaged in health care provision during the Maoist period. As a result, declines in mortality in these regions signalled improvements in absolute living standards. But as mortality remains above average and economic growth rates are low, relative living standards in these areas have improved little.

Changes in the incidence of illiteracy were much more closely tied to economic activity in the wake of decollectivization. In areas where collective and privately-owned industry was a leading sector, illiteracy rates tended to increase, as students dropped out of schooling to take up well-paying factory jobs, or to take care of the family farm and sideline activities while parents worked off-farm. Croll (1993) has also indicated that where labour was at a premium for basic subsistence, illiteracy tended to rise during the intercensal period.

3. Future and Policy Implications

The findings from this provincial analysis suggest the existence of serious structural impediments to rapid economic growth in many regions of rural China. First, the trends in mortality and illiteracy suggest that rural areas should prioritize the provision of affordable, preventative health care - preferably on an insurance basis, and adopt parallel measures to increase enrolment rates, completion rates, and educational attainment. Where counties are poor, and cash incomes very small, these measures are crucial to improving living standards, and increasing potential future earnings.

The second important institutional impediment to economic development is the highly fragmented nature of land holdings, which severely limits the scope for modernization of agricultural production. The slower rate of increase in agricultural yields in Anhui and Yunnan in the late 1980s is evidence that diminishing marginal returns are now being felt in the farm sector, and increased yields per unit land, and more importantly - in terms of poverty alleviation - per unit labour, will require more technological inputs. Increased returns to labour in the farm sector will also be dependant on a simultaneous expansion in non-farm employment opportunities. However, the analysis in chapters six and seven suggests that the scope for such an expansion is limited by the scarcity of cash income, or extractable surplus, for investment in non-farm production.[2] There are communities that effectively remain part of the subsistence economy in rural Yunnan - such as those described by Croll (1993). Without the means to escape this low level poverty trap, the chances of poverty alleviation or improved living standards are small.

Therefore poverty alleviation policies must be formulated, and implemented nation-wide to alleviate these institutional barriers to economic growth. Only then can there be any hope of genuine improvements in living standards in the poor regions of rural China, or for the poor in non-designated poverty regions. Riskin's findings (1993) that only 37% of those in poverty live in designated poverty areas, underlines the necessity of national policies.

4. Areas for Future Study

[2] For a discussion of the importance of income by source in fuelling inter-household differences in income, see Bramall and Jones (1993: 52-58).

This dissertation highlights several issues that would benefit from further investigation. The first is a more formal analysis of the causes of differential economic growth rates, including some econometric analysis and modelling of the rural economy. This might entail some survey work on rural patterns of savings and investments, particularly those outside the nascent banking and financial system. Also deserving more detailed analysis in isolation would be the role of cash income in the rural China. Such an analysis should span the Maoist and post-Maoist periods, examining the differing roles of cash, and the continued fragmentation of money in the dual track system. Such an analysis would have important implications for future estimations of rural incomes, since cash income carries a significant premium over income in kind - a premium that has seldom been captured in income studies.

To round out the analysis presented here on differential economic growth rates in Anhui and Yunnan, and their impact on poverty, inequality and living standards, a parallel examination of a rich province (or rich provinces) is essential. For example, consideration of trends in Guangdong, Jiangsu and Liaoning would be particularly interesting. Although all three provinces are rich, and relatively highly urbanized and industrialized, the mix between the free enterprise, collective and state-run sectors in each province is very different and has very different implications for the well-being of the residents of these regions.

A more detailed investigation of poverty in China is also warranted, particularly with a view to establishing the number of poor based on local criteria which accommodate differentials in prices and inflation. This analysis should be extended to embrace proposals for future poverty alleviation policies and strategies in China, extending Riskin's analysis of public finance and taxation.

In the search for appropriate measures of poverty and living standards, a survey to gather data on interpersonal variations in capability is necessary. Not only are new data (based at the individual, and not the household level) needed, but new questions to capture capability data, and not merely achieved functioning - as is currently the case - are also required. Such a survey, and the analysis resulting from it, promises to make a significant contribution not only to the literature on China, but also to the applied literature on capability and functioning, something that continues to be illusive.

Finally, a micro-level investigation of state-run industry in Yunnan is needed, due to the important role played by state-run industry in economic growth in the counties of Yunnan. By contrast, it was collective and free enterprise industry that was particularly important in the rapid economic growth of many other parts of China - such as Anhui and Guangdong (Vogel, 1989). There are two questions to be answered: What factors contributed to the relative success of state industry in Yunnan? and Are there lessons here for state industry elsewhere in China? The answers to these questions may have important implications for the extension of the economic reform process in the urban, industrial sector.[3]

[3] This may be a red herring, as it is possible that the state industrial sector in these rapidly growing counties is large, but is not the source of the rapid economic growth, but results instead from a severely under-reported collective and free-enterprise sector. The resolution of this quandary itself would be important, as it would provide some estimate of the size and importance of the informal economy in Yunnan, and perhaps be cause for significant increases in the estimates of the extent of industrialization in Yunnan.

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