WORKING PAPER NO. 67

HUMAN DEVELOPMENT, DEMOGRAPHIC TRANSITION AND ECONOMIC GROWTH LINKAGE

An Econometric Analysis with Indian Data

Devendra Kumar Pant

NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH
Parisila Bhawan, 11 - Indraprastha Estate
New Delhi -110 002
Tel: (91-11) 3317860-68

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Devendra Kumar Pant
Junior Economist
Human Resources Development Division
National Council of Applied Economic Research
New Delhi-110 002 (INDIA)

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Foreword

In recent years there has been considerable discussion on the enhancement of our understanding of what constitutes economic development and human well being. Income growth as an indicator of development has been subjected to considerable questioning. A view has emerged that the understanding of economic development has to be achieved by supplementing income measurement with other indices of human development. Research has also been done on understanding better the relationship between human development and income growth. Many of the composite indices proposed in the recent past have considered education, health status and such other variables as important components of well being. In this context public investment in these sectors assumes significance. A study of the effect of such investment and its judicious allocation is therefore useful for policy formation and programme design for the future.

This working paper is the result of such an attempt. Using cross section data from secondary sources, this study makes an assessment of the impact of public investment in human resources, particularly in education and health, under a social sector model. Under realistic assumptions this also attempts to trace the growth pattern in these aspects of well being in the near future.

Rakesh Mohan
Director General

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An Econometric Analysis With Indian Data

Section I

INTRODUCTION

A near paradigmatic shift took place in the concept of 'development' in the nineteen eighties. Considered almost synonymous with 'economic growth' until then, the shift put 'human resource' at the core of the concept, thus subsuming within its scope the provision of more development options to the people. One of the options is access to income not as an end result, but as a means to enlarge choices. The whole development process has two sides: one, the formation of human capabilities, such as improved health, knowledge and skill, and the other the use of these by the people for development. If a proper balance of these two is not maintained it could lead towards human frustration and social disintegration. In order to arrive at meaningful conclusions about the factors which affect development, it is necessary to study the inter-relationships between these variables. There are many factors which affect the level and changes in human development, ranging from aspects of macro economy — which, in turn, are affected by developments in international economy — to micro factors operating at household level. The level and structure of government expenditure and government

programmes and policies for the social sector are important intermediate policy variables. Intermediate policies cover the whole range of fiscal policies including those which directly affect income distribution, poverty and social sector expenditure.

United Nations Development Programme (UNDP) through its Human Development Reports (HDRs) is advocating higher investment in human resources in order to have sustainable development. According to Dr. Mahbul Ul Haq, Human Expenditure Ratio (expenditure on priority areas such as primary education and health care as percentage of Gross National Product) should be around 5 per cent. Our Human Expenditure Ratio is nearly 2.5 per cent (for the year 1988, HDR 1991). The interlinkages of the above mentioned variables have not been studied in a systematic manner (at least for India). In this paper a social sector model for the country is proposed to find out how the investment in human resources could be instrumental in demographic transition and high economic development. Interlinkages between economic development and health and education are discussed in Section II, Section III describes the model, and Section IV presents the estimated model alongwith some policy simulation and forecasting on the basis of the model. The concluding section gives the main findings and policy implications for a sustainable development strategy in the nineteen nineties and in early 21st century.

Section II

INTERLINKAGES BETWEEN VARIABLES

Education and health are two main aspects of human development. Education is regarded as a powerful policy tool for not only raising the average level of wellbeing but also improving income distribution in poor countries. Literacy, especially female literacy, affects fertility and child mortality. It has been observed that as the female literacy rises, fertility and child mortality decline substantially. Literacy enables the mother to take better care of children and have better concern for hygiene, immunization and family planning practices. Enrolment and retention ratios of children of educated mothers are higher than those of uneducated mothers. Education brings awareness to the people to adopt modern health care practices instead of the traditional ones. An educated labour force can contribute substantially to economic development. However, the link between education and economic development is not unidirectional. A better educated labour force increases productivity level on the one hand, while, on the other, economic development demands a better quality of labour force.

The other important aspect of human development, i.e., health, affects productivity indirectly through physical and mental ability in general. Population control (demographic transition) affects economic development through increasing per capita investible resources (physical as well as investment in human resources). Less developed/developing countries with low levels of income have low levels of per capita investment which yield low levels of income.

A non-egalitarian income distribution coupled with low levels of income is a general phenomenon in developing countries, which leads to higher incidence of poverty. It is difficult for poor people to make sufficient investment in human resources, which leads to a not very efficient labour force. Hence, government investments in human resources are important investments, specially in developing countries, which will not only increase the productivity level but could also be instrumental in attaining demographic transition.

In short, education has a strong positive impact on reducing mortality and fertility, and increasing quality (productivity) of labour force. This leads to a healthy and educated labour force which contributes towards higher economic growth/development, and higher economic growth increases the demand for education and enlarges their choices through income. Hence education not only increases income but also reduces poverty, and income inequality. It can also be instrumental in attaining demographic transition (through its impact on fertility and mortality).

Indian Scene

Since independence, universalisation of elementary education (up to standard VIII) has been an important public concern in India. The Indian Constitution, Five Year Plans and other policy documents have dwelt on the importance of, and need for, universalisation of elementary education. The National Policy on Education (NPE,1986) gives adequate emphasis on childhood care and education, universal enrolment and retention of children up to fourteen years of age and a substantial improvement in the quality of education.

To meet the objectives of NPE the Government of India has initiated a number of programmes which, *inter alia*, include: preschool education through Integrated Child Development

Scheme (ICDS), free elementary education in government schools, various incentive schemes like free uniforms, text books, mid-day meal, etc., for increasing enrolment and retention, operation black board, non-formal education schemes and availability of primary school within habitation to increase accessibility.

All these attempts have had positive impacts on literacy, enrolment and retention rates. The Gross Enrolment Ratio (GER) at primary level (up to standard V) has increased from 42.6% in 1950-51 to 105.7% in 1992-93, the literacy rate has increased from 18.33% in 1951 to 52.21% in 1991 and there has been an increase in the retention rate. However, these achievements are still far away from Universal Elementary Enrolment (UEE) by 1995. GER overstates the achievements, since many overaged children are enrolling in primary schools. Net Enrolment Ratio (NER) obtained from the data collected in various sample surveys are much less than the GER. The overall literacy rate of 52.21% covers the bad performance of BIMARU (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) states in literacy. There are large inter-state disparities in literacy rate. The state of Kerala has a literacy rate of over 90%, while in the BIMARU states and the state of Andhra Pradesh it is less than 45%. Gender disparity is almost negligible in the state of Kerala, while among BIMARU states female literacy rates are less than 50% of the male literacy rates. Rural literacy rate is around 60% of the urban literacy rates. In some of the states rural-urban disparities are wider.

Pal and Pant (1995), concluded that primary school enrolment rates are mainly affected by quality (blackboard, number of teachers and their qualification) and availability of educational infrastructure, supply of free books and uniform, mid-day meals, scholarships, etc. However, when the poverty-illiteracy syndrome interacts with high private cost of schooling, it becomes an inhibitive factor in improving access to schooling.

Rural-urban differences in enrolment can be reduced mainly by removing the bottlenecks in the infrastructure facilities and by reducing direct private cost of education.

A comparison of social data for India and newly industrialised Asian countries, reveals that in 1960 the Republic of Korea, Malaysia, Thailand and the Philippines attained a much higher level of education and health than India during the nineties. This resulted in fast economic growth of these economies as compared to India and other developing nations. In 1960, income disparity between India and Korea was negligible (73 PPP$ in real per capita), but a healthier and more educated workforce enabled Korea to adopt more sophisticated technologies and to realise a faster growth in output compared to India. This growth could be sustained over a long period owing to the country's ability to sustain investment in human resources. Income disparity between India and the Republic of Korea has significantly widened in the nineties (per capita income of Korea is nearly 7 times that of India). For the rest of the countries, income disparity with India has not widened as much as with Korea. As compared to India, these countries are investing more in human resources. Per capita human expenditure (expenditure on priority areas) in these countries were $ 133 for Korea, $ 123 for Malaysia, $ 25 for Thailand and $ 15 for the Philippines as compared to $ 9 for India in the year 1988 (Human Development Report, 1991). As a whole, for economic growth and sustainable development, an educated and healthy population and a low population growth are pre-requisites, which in turn could be ensured through investments in human resources.

Alma-Ata Declaration of 1978 was a historical step taken by the Government of India with regard to provision of Health For All (HFA) by the year 2000. The health delivery system in the country is slowly shifting from the curative, urban biased hospital based system to the preventive, primary health care

system. Government is committed towards provision of one Sub-Centre for every 5,000 population and one Primary Health Centre (PHC) per 30,000 population. Keeping the present situation in view, HFA seems to be a distant dream. Though at All-India level achievements are close to the norms there are inter-state variations in availability/accessibility of health infrastructure. As in the case of education, large inter-state variations exist for health indicators. States like Kerala and Tamil Nadu have low levels of child mortality, fertility and population growth, while BIMARU states have high levels of these parameters.

Government's recent announcement that 6 per cent of the Gross Domestic Product (GDP) will be spent on education, with emphasis on elementary education (Central Budget, 1995-96) is an initial step towards UEE.

In this paper a social sector model is proposed for India, to find out how investments in human resources can be instrumental in achieving a higher state of human development, demographic transition and economic growth. The model has linkages from (i) economic variables (income and its distribution in the form of percentage of people below poverty line and expenditure on social sector) to social variables (literacy), (ii) economic and social variables to demographic variables (fertility and mortality), and (iii) social variables to economic growth.

The *a priori* hypotheses of the proposed model are as follows:

— Positive impact of Government investment in human resources on educational and health infrastructure,

— Positive impact of educational infrastructure, urbanisation, income and its distribution on education,

- Positive impact of female literacy on females age at marriage,
- Negative impact of female literacy, health infrastructure and income equality on infant mortality rate,
- Positive impact of infant mortality and negative impact of female literacy and age at marriage on birth rate,
- Negative impact of education, health infrastructure and income equality on death rate, and
- Positive impact of quality of labour force on income.

Section III

THE MODEL

Keeping in view the linkages between economic, social and demographic variables, a social sector model for India is proposed. The model has linkages from (i) economic variables like income, poverty and expenditure on social sector to social variables like female and overall literacy rate, and (ii) economic and social variables to demographic variables like birth rate, death rate, infant mortality rate, female's age at marriage and life expectancy at birth. The model is estimated using cross sectional data of 15 major states of the country for the year 1991. The main reason for using cross sectional data for the model is non-availability of time series data on most of the variables like literacy rate, female's age at marriage and life expectancy. However, there is one major advantage in using cross sectional data, i.e., it gives large variation in the data, on one extreme is socially developed state of Kerala (comparable to the developed countries) with high literacy rate and life expectancy and low birth, death and infant mortality rates, while on the other extreme are the BIMARU states, with low level of literacy and life expectancy and high birth, death and infant mortality rates. The functional form of the model proposed in this study is as follows:

1. BRATE = f(IMR, FLIT, NONAGR, AGEMAR)
2. IMR = f(FLIT, SIHELTHS, PPBPL)
3. DRATE = f(LIT, SIHELTHS, PCYPOV)

4. LEBIRTH = f(IMR, LIT, PCYPOV)
5. AGEMAR = f(FLIT, PCYPOV)
6. PHOSP = f($PHOSP_{-1}$, PCPEXPH3)
7. PHC = f(PHC_{-1}, PCPEXPH3)
8. POPLN = $POPLN_{-1}$ * { 1 + (BRATE - DRATE)/1000 }
9. PCPEXPH3 = $PCPEXPH_{-2}$ + $PCPEXPH_{-1}$ + PCPEXPH
10. SIHELTHS = α_1*HOSP + α_2*PHCR + α_3*SROAD + α_4*WATER + α_5*SANI;
    $\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 1$
11. HOSP = (PHOSP + PVTHOSP) / TAREA
12. PHCR = PHC / RAREA
13. LIT = f(SIEDUTR, PCYPOV, URBAN)
14. FLIT = f(SIEDUTR, PPBPL, URBAN)
15. LITWORK = f(LIT)
16. PSCHPRI = f($PSCHPRI_{-1}$, PCPEXPE3)
17. PCPEXPE3 = $PCPEXPE_{-2}$ + $PCPEXPE_{-1}$ + PCPEXPE
18. SIEDUTR = β_1*BB + β_2*TEACH + β_3*SCHOOL + β_4*TROAD;
    $\beta_1 + \beta_2 + \beta_3 + \beta_4 = 1$
19. SCHOOL = (PSCHPRI + PVSCHPRI) / TAREA
20. NSDP = f(ELECT, LABOUR, LITWORK)
21. PCY = NSDP/POPLN
22. PCYPOV = PCY * (100-PPBPL) / 1000

List and explanation of variables are given in *Appendix I.*

The first equation of the model is estimation of Birth Rate (BRATE). BRATE is estimated by IMR, FLIT, AGEMAR and NONAGR. FLIT is included in the equation to capture effect of education on BRATE, on the theoretical basis of economic theory of fertility[1], since the opportunity cost of time is important, female literacy rate is included in the equation. Female's mean age at marriage is introduced in the equation as a proxy for age distribution, AGEMAR will capture social as well as demographic aspects. A lower value of AGEMAR shows the prevalence of marriage at an early age and hence the exposure of a large proportion of the female population to the risk of child bearing for a longer period, which will have its impact on the birth rate. IMR has a major impact on the BRATE, if IMR is high, parents always go for more children in order to have a desired family size. NONAGR is included in the equation to capture the impact of technological and production process changes on BRATE. Non-agriculture sector demands are for more educated labour force than the agricultural sector, hence NONAGR will have a negative impact on BRATE. If non-agricultural base of the economy widens (which is the situation in India) then the parents will prefer the quality than quantity of children. The expected signs of the co-efficients of BRATE with exogenous variables are: positive with IMR and negative with rest of the variables namely, FLIT, AGEMAR and NONAGR.

IMR is estimated by FLIT, SIHELTHS and PPBPL. Education, especially the female education has a large impact on mortality among children through better acceptance of immunization, hygiene and sanitation etc. According to the 1981 Census, as the education level of the mother goes up child mortality declines[2]. SIHELTHS (component indicators and method of aggregation is discussed later in the text) is

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[1] In economic theory of fertility time constraint, especially women's time is recognized.

[2] Child mortality [q(2)] for illiterate mothers in 1981 was estimated as 138, for literate but below middle 99, for middle but below graduate 43 and for graduate and above 28 at All-India level. Across State it varies from 40 (Manipur) to 162 (Madhya Pradesh).

included in the equation to capture the effect of the availability of health infrastructure and immunization on IMR. The purpose of inclusion of poverty variable is two fold, it takes into account percentage of population which is below the poverty line to take into account the percentage of population which is totally dependent on public infrastructure for provision of immunization on the one hand, and on the other, it takes into account the magnitude of the problem of nutrition, since poverty estimates in India are based on the calorie requirement of the population. The expected sign of the co-efficients of the exogenous variables with IMR are: negative with FLIT and SIHELTHS and positive with PPBPL.

DRATE is estimated by LIT, SIHELTHS and PCYPOV. LIT is included because education improves the concern of the people about environment and linkage between sanitation and health. SIHELTHS takes into account the accessibility of health infrastructure and its impact on DRATE is similar as for IMR. PCYPOV takes into account the effect of growth and equity factor, a higher value of the variable means, either higher income or higher percentage of non-poors, or a combination of both the factors. A higher value of PCYPOV reduces Government's burden in providing health infrastructure to the people, as people can afford paying (fully or partly) for availing of these services. The expected signs of the co-efficient of the exogenous variables with DRATE are: negative with all the three variables.

LEBIRTH is one of the indicators of the health status of the population. It is estimated by IMR, LIT and PCYPOV. IMR is the factor which has negative impact on life expectancy. The explanation of inclusion of other variables in the equation have already been discussed. The expected signs of the co-efficients of the exogenous variables with LEBIRTH are: negative with IMR and positive with LIT and PCYPOV.

AGEMAR is estimated by FLIT and PCYPOV. Higher the education of the females, females will be more aware of the changing situation around them and will be able to participate more effectively in the decision regarding their marriage which will have a positive impact on AGEMAR. PCYPOV is included to capture the effect of material resources on AGEMAR, it is found that AGEMAR of females belonging to lower strata of the population are low as compared to others.

LIT is estimated by SIEDUTR, PCYPOV and URBAN. PCYPOV affects the LIT in the same way as it affects other demographic variables. SIEDUTR (component indicator and method of aggregation is discussed later in the text) is included in the equation to capture the effect of availability and quality of educational infrastructure on LIT. Urbanization (URBAN) is included in the equation to capture the effect of demand for education, since industrialization (non-agricultural activities) and urbanization are inter-related, and it demands educated and skilled labour force as compared to agricultural activities, which are the main economic activities in the rural areas.

FLIT is estimated by SIEDUTR, PPBPL and URBAN. SIEDUTR and URBAN affect FLIT the same way as they affect LIT. However, PPBPL is used in the estimation of FLIT as against PCYPOV in the case of LIT. The reason being the effect of poverty on female education. It has been observed that female labour force participation has a strong positive correlation with poverty, at least in the case of India. Female participation in economic activities forces young girls to take care of young siblings at home. The expected signs of the co-efficients of the exogenous variables with FLIT are: positive with SIEDUTR and URBAN and negative with PPBPL.

LITWORK is estimated by LIT. LITWORK is included in the model to capture the effect of quality of labour force in the production process (*i.e.* estimation of NSDP).

NSDP is estimated by ELECT, LABOUR and LITWORK. NSDP is an aggregate production, function estimated in linear form, as against the normal practice of estimation by Cobb-Douglas or Constant Elasticity of Substitution (CES) production function. Three factors of production, capital, labour and its quality, are used here. Instead of capital stock, consumption of electricity in non-domestic (commercial) purposes is used here, due to the non-availability of capital stock data at state level. Use of commercial electricity consumption instead of capital stock in our opinion is not a proxy, but a better variable than capital stock at least for developing/under-developed countries. The reason being, it takes into account only the capital which is actually used in the production process and excludes the ideal capital. LABOUR is used in the absolute number and the LITWORK is the quality of labour force variables. It has been shown that in developing countries the quality of labour has a positive impact on growth. The expected signs of the co-efficients of all the three exogenous variables with NSDP are positive.

Government health and educational infrastructure (PHOSP, PHC and PSCHPRI) is estimated by their lagged values and real government per capita expenditure on the respective sectors. However, these relationships are estimated by using time series data for the country as a whole. The reason for using the time series data is that government expenditure on education and health is by the states as well as by the Central government. No distinction is made in expenditure regarding revenue/capital expenditure or Plan/non-Plan expenditure.

Supply index of health infrastructure (SIHELTHS) is a combined index of availability and accessibility of infrastructure. The component indicator of SIHELTHS are: Hospital Density (public and private hospital per thousand

square kilometre of the state), Primary Health Centre Density (PHC per thousand square kilometre rural area of the state), Safe Drinking Water (percentage of households with safe drinking water facility), Sanitation (percentage of households with toilet facility) and Surfaced Road Density (surfaced road per thousand square kilometre area of the state). Two types of health delivery infrastructure are used here, *viz.*, hospital for serious diseases or treatments for rural and urban areas and PHC in rural areas for primary health care, immunization of children and nursing mothers, ante natal, and post natal care. Safe drinking water and sanitation are included in view of their importance and impact on health related issues. The fifth and last variable, surfaced road density, is included for mode of accessibility, since health problems call for immediate attention. All these indicators are correlated with each other. In order to eliminate the problem of multi collinearity and to retain all the variables in the system these variables have been combined into one index using principal component analysis. The weights are obtained as proportion of principal component loading.

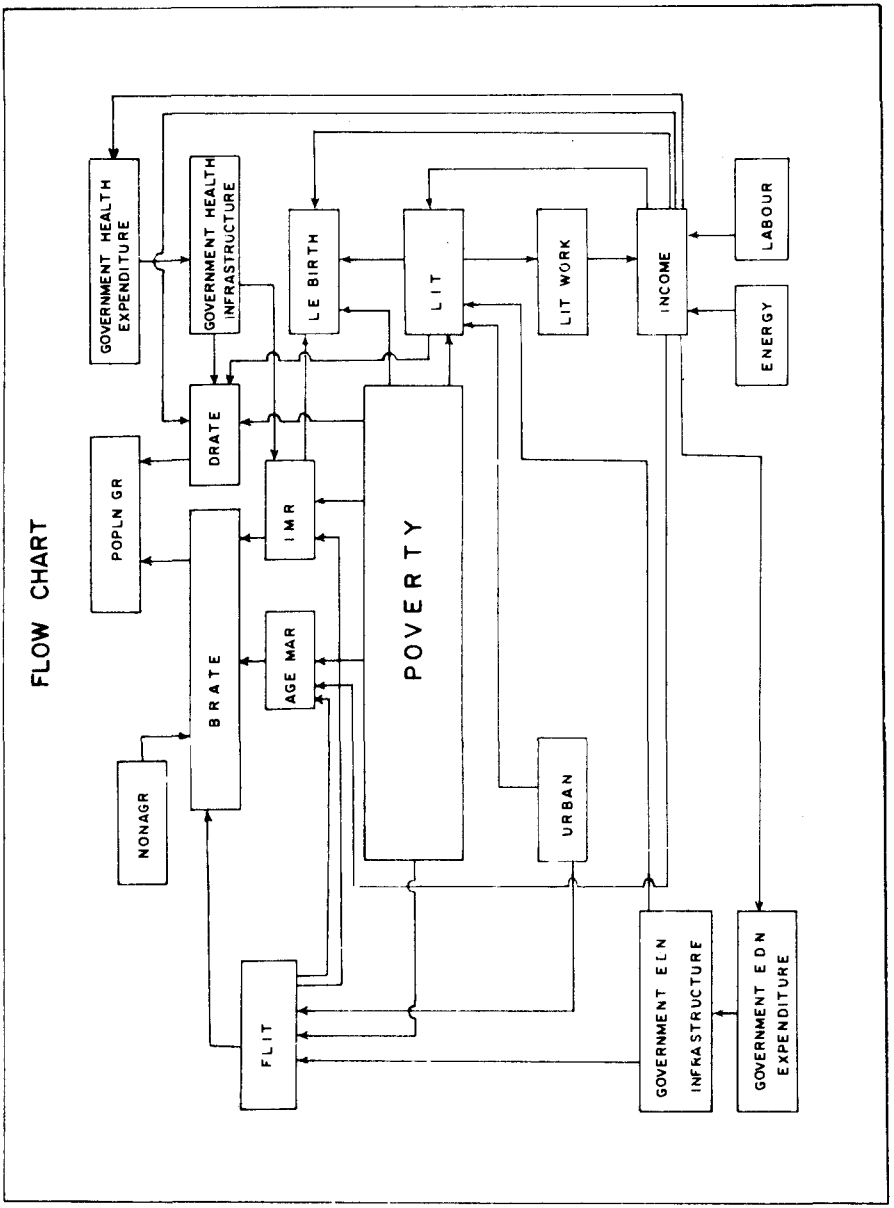
Supply index of educational infrastructure (SIEDUTR) is a combined index of availability, quality and accessibility of educational infrastructure. The component indicators of SIEDUTR are: Primary School Density (public and private primary schools per thousand square kilometre of the state area), percentage of primary sections with usable black boards, percentage of primary sections with three or more teachers and total road density (surfaced and un-surfaced road per thousand square kilometre of state area). The first indicator is availability of primary education infrastructure, while the second and third are proxy for the quality of teaching provided in primary schools. It is sad to find out that 44.59% of primary sections are without usable boards and 38.31% are having

less than three teachers in primary section (NCERT, 1992). The last variable is included to capture the accessibility problem. All the four variables are combined into one index (SIEDUTR) by using principal component analysis. Interlinkages of model are explained by Flow Chart.

Data

As in most developing countries, availability of reliable data on social variables is a serious constraint in India. As mentioned earlier the model is estimated by using mainly cross-sectional data for the year 1991 for 15 major states of India. These states cover 95.85% of population and 85.51% of area of the country (taken mainly from Census of India 1991). For estimation of relationships between government infrastructure and expenditure, time series data have been used. However, data on some of the variables like LEBIRTH, AGEMAR and LITWORK are not available from the 1991 Census. Data on variable PPBPL are available from consumer expenditure survey and the latest state-wise data are available for the year 1987-88. Data on variables BB and TEACH have been taken from the Fifth All India Educational Survey and refer to the year 1985-86 (latest available).

Projected figures for LEBIRTH are available for the period 1991-96 separately for males and females (Expert Group's projections). LEBIRTH has been estimated from these by taking weighted average of life expectancy at birth for males and females; sex ratio observed during 1991 Census has been used as weights. Latest available data on AGEMAR and LITWORK are from 1981 Census. These two equations have been estimated at 1981 Census data and using 1991 figures of exogenous variables, AGEMAR and LITWORK data for 1991 are estimated and used in the model. Mean, standard deviation


FLOW CHART
GOVERNMENT HEALTH EXPENDITURE
GOVERNMENT HEALTH INFRASTRUCTURE
LE BIRTH
LIT
LIT WORK
INCOME
LABOUR
ENERGY
DRATE
POPLN GR
IMR
POVERTY
BRATE
AGE MAR
NONAGR
URBAN
FLIT
GOVERNMENT E L N INFRASTRUCTURE
GOVERNMENT E D N EXPENDITURE

of variables for 15 major states alongwith All-India figures are presented in *Table 1*.

Table 1

Mean, Standard Deviation, Co-efficient of Variation and All-India Figures of Crucial Variables

Variables	*Mean*	*Standard Deviation*	*Coefficient of Variation*	*All-India*
AGEMAR	17.8	1.2	6.7	17.3
BRATE	28.7	4.9	17.1	29.5
DRATE	9.6	2.0	20.6	9.8
FLIT	41.9	15.7	37.6	39.3
IMR	74.1	25.0	33.7	80.0
LEBIRTH	62.4	3.9	6.2	60.8
LIT	54.4	12.7	23.4	52.2
LITWORK	53.5	11.9	22.2	51.4
NSDP	108482.9	61419.2	56.6	1894462.0
PCY	2179.5	755.2	34.7	2258.0
POPLN	53.6	30.8	57.4	839.0

Section IV

ESTIMATED MODEL

Model, estimated by the method of Ordinary Least Squares (OLS), on the basis of the interlinkages described in *Section II* and hypothesis mentioned in *Section III*, is as follows:

1. BRATE = 63.734 + 0.089104 IMR* - 0.046949 FLIT
(4.85) (1.02)

- 0.33870 NONAGR* - 0.94789 AGEMAR****
(6.73) (1.93)

$R^2 = 0.97$

2. IMR = 93.132 - 0.75993 FLIT*** - 0.11923 SIHELTHS
(2.29) (1.33)

+ 0.85873 PPBPL***
(2.06)

$R^2 = 0.82$

3. DRATE = 14.797 - 0.075526 LIT** - 0.0043679 SIHELTHS
(2.88) (0.71)

- 0.45976 PCYPOV
(1.26)

$R^2 = 0.90$

4. LEBIRTH = 58.849 - 0.071304 IMR*** + 0.12295 LIT****
(2.19) (1.99)

+ 0.78283 PCYPOV
(1.01)

$R^2 = 0.79$

5. AGEMAR = 14.391 + 0.05515 FLIT* + 0.44786 PCYPOV*
(9.76) (3.89)

R^2 = 0.95

6. PHOSP = 283.58 + 0.84475 $PHOSP_{-1}$* + 3.3528 PCPEXPH3****
(12.32) (1.98)

R^2 = 0.99

7. PHC = -12631 + 0.61869 PHC_{-1}* + 185.52 PCPEXPH3*
(4.40) (3.07)

R^2 = 0.97

8. SIHELTHS = 0.24846 HOSP + 0.21397 PHCR + 0.23560 SROAD
+ 0.04919 WATER + 0.25278 SANI

9. LIT = 14.268 + 0.092488 SIEDUTR* + 3.3596 PCYPOV****
(7.97) (1.75)

+ 0.68534 URBAN*
(3.64)

R^2 = 0.89

10. FLIT = 14.083 + 0.10256 SIEDUTR* - 0.35673 PPBPL*
(9.70) (3.05)

+ 0.74811 URBAN*
(4.87)

R^2 = 0.95

11. LITWORK = 2.6929 + 0.93369 LIT*
(13.71)

R^2 = 0.94

12. PSCHPRI = 253935 + 0.40440 $PSCHPRI_{-1}$**** + 187.27 PCPEXPE3*
(1.90) (3.07)

R^2 = 0.98

13. SIEDUTR = 0.24033 BB + 0.37840 TEACH + 0.23387 SCHOOL + 0.14741 TROAD

14. NSDP = 88191.0 + 5.1687 ENERGY* + 0.0030425 LABOUR*
(3.47) (3.43)

+ 620.77 LITWORK
(1.03)

$R^2 = 0.89$

* Significant at 1% level of significance.
** Significant at 2% level of significance.
*** Significant at 5% level of significance.
**** Significant at 10% level of significance.

Note: Figures in parenthesis are t-values.

The model has reasonably good fits and expected signs. However, as is the case with most of the cross-sectional data estimates, the model is plagued by the multicollinearity problem. As far as possible multicollinearity problem is minimized by converting health and educational infrastructure into an index, but in some of the places it is difficult to avoid multicollinearity. Despite this, some variables with insignificant co-efficients have been retained because of their importance in the model.

Estimated equations confirm the *a priori* hypothesis (*Section II*) of positive relationship between accessibility and availability of educational infrastructure and literacy (females as well as overall). However, insignificant relationship between health infrastructure and output indicators (IMR and DRATE) is a cause of concern. One of the possible reasons for insignificant relationship could be the poor functioning of the health infrastructure as compared to the primary educational infrastructure. But the direction of the health infrastructure

variable again confirms the *a priori* hypothesis. Another important factor which has the impact on most of the social and demographic variables is level of poverty in the states. Non-poor and their interaction with per capita income (equity and growth factor) is significant in achieving social and demographic transition in the country. Most of the demand side variables are quite significant in the model.

Functioning of the Model

Main economic linkage to the model is through government investment in human resources. Government investment on health and education determines: Government educational (primary school) and health infrastructure (hospitals and PHCs), which along with private infrastructure determine the total health and educational infrastructure. The total health and educational infrastructure along with other supply factors determine the supply index of health and education. The supply index of health and education in combination with other economic variables (income distribution and growth) determines literacy rate. Social variables (literacy rates) and economic variables together with the demand variables (*e.g.*, NONAGR) determine the demographic variables (BRATE, DRATE, IMR, LEBIRTH and AGEMAR). The link between social and demographic variables on the one hand, and economic variable, on the other, was tested by taking into account contribution of quality of workforce (literacy rate of workers and life expectancy at birth) to productivity, but this led to a serious statistical problem. At the same time, the effect of life expectancy on income is not in conformity with existing literature. However, anthropometric measures (weight for height) are found to be significant (Deolalikar, 1988). However, this is not suitable for macro relationship. Hence

NSDP is estimated by taking into account the literacy rate of workers.

The estimated model confirms the *a priori* hypothesis that increased investment in human resources will yield a better state of human and economic development. Investment in human resources will not only improve the level of human development but will also be instrumental in achieving demographic transition in the country. Growth and equity factor (interaction between per capita income and its distribution) is another factor which affects the social and economic development process in the country. Estimated model is used for simulation and forecasting purposes.

Simulation

Simulation results presented in *Table 2* clearly show the impact of investment in human resources and income distribution on different aspects of development. Five percentage point decline in poverty ratio (*Sim-1*) results in: a decline of 5.78 points for IMR, around 2 per cent increase in FLIT, as a result POPLN declines by 0.341 million, income increases by Rs. 232 million. Impact of investment in education is higher than in health (*Sim-2* and *Sim-3*) except for IMR (directly), BRATE (through IMR) and population (through BRATE). When all the three factors (*Sim-5*) are considered together, IMR declines by 6.22 points, FLIT increases by 2.13 per cent, as a result POPLN declines by 364 million, income increases by Rs. 317 million. *Sim-6* and *Sim-7* show the impact of SIEDUTR and SIHELTHS on different variables. A comparison of *Sim-6* and *Sim-7* shows that investment in education is more beneficial than investment in health. This is partly due to the significant impact of education (especially female) on demographic parameters.

Table 2
Simulation Results Under Alternative Scenarios

Variables	*BASE RUN*	*Sim-1*	*Sim-2*	*Sim-3*	*Sim-4*	*Sim-5*	*Sim-6*	*Sim-7*
AGEMAR	17.28	0.126	0.009	0.000	0.009	0.135	0.005	0.000
BRATE	29.47	-0.758	-0.022	-0.028	-0.050	-0.814	-0.014	-0.011
DRATE	9.80	-0.084	-0.011	-0.011	-0.023	-0.107	-0.006	-0.005
FLIT	39.30	1.965	0.165	0.000	0.165	2.130	0.083	0.000
IMR	79.86	-5.784	-0.125	-0.314	-0.439	-6.223	-0.064	-0.121
LEBIRTH	60.81	0.554	0.027	0.022	0.050	0.603	0.014	0.009
LIT	52.23	0.401	0.148	0.000	0.148	0.549	0.074	0.000
PCY	2257.50	1.195	0.138	0.048	0.174	1.359	0.081	0.027
POPLN	839.00	-0.341	-0.009	-0.014	-0.023	-0.364	-0.007	-0.005
NSDP	1894462	232.0	95.2	9.6	94.7	317.0	52.6	10.4

Note: Figures under column Sim-1 to Sim-7 indicate the absolute difference from base run.

Sim-1: Change in income distribution such that there is 5% point decline in poverty ratio.
Sim-2: Government education expenditure is 6% of the GDP during 88-89, 89-90 and 90-91.
Sim-3: Government health expenditure is 5% of the GDP during 88-89, 89-90 and 90-91.
Sim-4: Sim-2 and Sim-3 together.
Sim-5: Sim-1, Sim-2, and Sim-3 together.
Sim-6: SIEDUTR increases by 1 point.
Sim-7: SIHELTHS increases by 1 point.

Forecasting

Using the estimated model presented earlier, a forecasting exercise has been undertaken for the year 2000-01 under the following assumptions:

i) Government expenditure on education will be 6% and on health, 5% of income (GDP).

ii) BB, TEACH and WATER will be 100 per cent by the year 2000-01 and SANI will follow the growth of WATER.

iii) Poverty level will decline by the same rate as observed during the period 1983 to 1987-88.

iv) Growth in URBAN will be twice the observed growth during 1981-91.

v) All other exogenous variables are assumed to have the growth rates observed during 1981-91.

The values of the variables forecast on the basis of the assumptions mentioned above are presented in *Table 3*.

Table 3
Forecast of Values of the Variables

Variables	*1990-91 (Base Run)*	*2000-01*	*% change From Base Run*	*Average Growth Rate (%)*
AGEMAR	17.28	18.74	8.49	0.82
BRATE	29.47	22.06	-25.14	-2.85
DRATE	9.80	7.84	-19.96	-2.20
FLIT	39.30	54.50	38.08	3.28
IMR	79.86	51.26	-35.82	-4.34
LEBIRTH	60.81	65.72	8.06	0.78
LIT	52.23	66.44	27.22	2.44
LITWORK	51.46	64.73	25.79	2.32
PCY	2257.50	3628.62	60.74	4.86
POPLN	839.00	989.69	17.93	1.66
POPLN G.R.	1.97	1.42	-27.72	-3.19

The results presented in *Table 3* clearly show that judicious investment in human resources can bring social and demographic transition in the country. All the assumptions used for forecasting are feasible. The assumption regarding

government expenditure on education is consistent with the announcement by the Prime Minister after the EFA by 2000 Summit of the nine most populous nations of the world (held at New Delhi in 1994).

Between 1990-91 and 2000-01 the largest increase (60.74% change over base and 4.86% average annual change during the same period) is observed in the variable PCY. This increase is mainly due to the increase in labour productivity. The recent policy changes favouring increased foreign investment, economic liberalization and privatization have not been considered while making the forecast. The decline in the population growth rate (POPLN G.R.) is substantial (27.72 % during the 10 year period), from 1.97% in 1990-91 to 1.42%. This is due to a sharp decline in BRATE, from 29.47 per thousand population in 1991 to 22.06. Another significant decline is in the variable IMR (35.82%), which is primarily due to the increase in FLIT (38.08%) and the change in the income distribution. However, the increase in the LEBIRTH is not substantial (8.06%).

Section V

CONCLUSION AND FINDINGS

The analysis clearly shows the impact of education on all the fronts of development (social and economic). Lessons from countries like Sri Lanka, Myanmar and China and the state of Kerala in India clearly show that social development can be attained despite low levels of income. However, education is a necessary but not a sufficient condition for economic development; upgraded technology and investment also play a crucial role in economic development. Success of the east Asian giants (South Korea, Hong Kong, Singapore, etc.) in achieving higher economic growth is due to their emphasis on social development (healthy and educated masses) as the first step and then upgradation of technology thereafter.

Alleviation of poverty is another dimension of development, through its linkages to literacy and impact on demographic variables along with literacy. To achieve social development, female literacy is a prerequisite, as is evident from its impact on fertility and mortality. Literacy is largely dependent on the availability of the educational infrastructure, which depends on the expenditure on education by the Government and the private sector.

In order to have a sustainable development policy, the central and state Governments should invest more in human resources, particularly in priority areas such as primary

education and health care, safe drinking water, nutritional programmes and poverty alleviation. These programmes should be target-oriented and should not be for the entire population. The success of the mid-day meal programme (in the state of Tamil Nadu) in attaining high enrolment and retention rates, and social intermediation (in the state of Kerala) in achieving high educational levels (specially for females) and low population growth rates, could be taken as lessons by other states. The accessibility and quality of infrastructure is another factor which influences education. Hence, the quality of educational infrastructure should be improved. At a time when resources are limited for the Government, health and education should not be subsidized for all. It should be targeted towards people who really cannot afford to pay for it, while those who can afford to pay should pay.

To sum up, in order to have sustainable development strategies the Government should adopt the following four steps (apart from adjustment policies) during the later part of the nineteen nineties and the early years of the twenty first century:

i) Increased investment in human resources (specially education).

ii) Strengthening of educational, health, road and minor irrigational infrastructure.

iii) Improving quality of Government's health and educational infrastructure.

iv) More stress on the labour-intensive technologies, specially in rural areas, wherever possible.

Appendix I

LIST OF VARIABLES USED IN MODEL

A. *Endogenous Variables*

1. AGEMAR: Females Mean Age at Marriage (Years).
2. BRATE: Crude Birth Rate (No. of Births Per '000 Population).
3. DRATE: Crude Death Rate (No. of Deaths Per '000 Population).
4. HOSP: Hospital Density (Public and Private Hospitals Per Thousand Square Kilometre of Total Area of the State).
5. PCPEXPE3: Real Per Capita Expenditure on Education During Current and Preceding Two Years (Rs.).
6. PCPEXPH3: Real Per Capita Expenditure on Medical, Public Health and Family Welfare During Current and Preceding Two Years (Rs.).
7. FLIT: Effective Female Literacy Rate (%).
8. IMR: Infant Mortality Rate (No. of Infants, *i.e.* upto age one year, deaths per '000 live births).

9. LEBIRTH: Life Expectancy at Birth (Years).

10. LIT: Effective Literacy Rate (%).

11. LITWORK: Literacy Rate of Workers (%).

12. NSDP: Real Net State Domestic Product at Factor Cost (Rs. Million).

13. PCY: Real Per Capita Net State Domestic Product at Factor Cost (Rs.).

14. PCYPOV: Growth and Equity Factor (Interaction of Per Capita Income and Percentage of Non-poors in the State).

15. PHC: Number of Primary Health Centres in the State.

16. PHCR: Primary Health Centre Density (PHC per Thousand Square Kilometre of Rural Area of the State).

17. PHOSP: Number of Government Hospitals in the State.

18. POPLN: Population (Million).

19. PSCHPRI: Number of Government Primary Schools in the State.

20. SCHOOL: Primary School Density (Public and Private Primary Schools Per Thousand Square Kilometre of the State Area).

21. SIHELTHS: A Composite Index of Health Infrastructure (Index).

22. SIEDUTR: A Composite Index of Educational Infrastructure (Index).

B. *Exogenous Variables*

1. BB: Percentage of Primary Sections with Usable Black Boards (%).
2. ELECT: Electricity Consumption in Non-Domestic (Commercial) Purposes in the State (GWH).
3. LABOUR: Absolute Number of Labour (Main and Marginal Workers) in the State.
4. NONAGR: Percentage of State NSDP from Non-agriculture Activities (%).
5. PPBPL: Percentage of People Below Poverty Line in the State (%).
6. PVSCHPRI: Number of Private Primary Schools in the State.
7. PVTHOSP: Number of Private Hospitals in the State.
8. RAREA: Rural Area of the State (Square Kilometre).
9. SANI: Percentage of Households with Toilet Facilities (%).
10. SROAD: Surface Road Density (Surfaced Road Per Thousand Square Kilometre of the State Area).
11. TAREA: Total Area of the State (Square Kilometre).
12. TEACH: Percentage of Primary Sections with More Than Three Teachers (%).
13. TROAD: Total Road Density (Surfaced and Un-surfaced Road Per Thousand Square Kilometre of the State Area).
14. URBAN: Urbanization (Urban Population in the State) (%).
15. WATER: Percentage of Households with Safe Drinking Water Facility (%).

Bibliography

Behrman, Jere R., (1990), *Human Resource Led Development? Review of Issues and Evidence*, New Delhi, ILO-ARTEP.

Deolalikar, Anil B., (1988), "Nutrition and Labour Productivity in Agriculture: Wage Equation and Farm Production Function Estimates for Rural India", *The Review of Economics and Statistics*, Vol. 70, No. 3, August 1988.

Gaiha, Raghav, (1991), "Structural Adjustment and Household Welfare in Rural Areas: A Micro-Economic Perspective", *FAO Economic and Social Development Paper 100*, Rome 1991.

Gaiha, R. and Anil B. Deolalikar, (1992), "Persistent, Expected and Innate Poverty: Estimates for Semi-arid Rural South India, 1975-84", *Cambridge Journal of Economics*, December 1992.

Government of India, (1989), "SRS based Abridged Life Tables 1981-85", *Occasional Paper No.1 of 1989*, Vital Statistics Division, Office of the Registrar General and Census Commisioner of India.

Government of India, (1989), "Household Literacy, Drinking Water, Electricity and Toilet Facilities", *Occasional Paper No.1 of 1989*, Demography Division, Office of the Registrar General and Census Commissioner of India.

Government of India, (1989), "Child Mortality, Age at Marriage and Fertility in India", *Occasional Paper No.2 of 1989*, Demography Division, Office of the Registrar General and Census Commissioner of India.

Government of India, (1989), *Report of Standing Committee of Experts on Population Projection*, October 1989.

Government of India, (1990), *Statistical Abstract*, Central Statistical Organisation.

Government of India, (1991), *Estimates of Net State Domestic Product and Capital Formation*, Central Statistical Organisation.

Government of India, (1991), *Population Data Sheet*, Office of the Registrar General and Census Commissioner of India.

Government of India, (1993), *Report of the Expert Group on Estimation of Proportion and Number of Poor*, Planning Commission, June 1993.

Government of India, (1994), "Housing and Amenities - A Data Base on Housing and Amenities for Districts, Cities and Towns", *Occasional Paper No. 5 of 1994*, Demography, Training and Data Dissemination Division, Office of the Registrar General and Census Commissioner of India.

Government of India, *Central Government Budget Papers* (Various Issues), Ministry of Finance.

Government of India, *Economic Survey* (Various Issues), Ministry of Finance.

Government of India, *Health Information India*, (Various Issues), Ministry of Health and Family Welfare.

Government of India, *Indian Economic Statistics (Public Finance)*, (Various Issues), Ministry of Finance.

Government of India, *Selected Educational Statistics* (Various Issues), Department of Education, Ministry of Human Resources and Development.

Jha, Satish C., Anil B. Deolalikar, and Ernesto M. Pernia, (1993), "Population Growth and Economic Development Revisited with Reference to Asia", *Asian Development Review*, Vol. 11, No. 2, Manila.

Klein, Lawrence R., Roberto Mariano, Dominick Salvatore, and Fred Campano, (1994), "Complementarity and Conflict Among Population and Other Policies: Policy Models/Applications", Second Phase Report for the joint UNFPA/DSED Project.

Moreland, R. Scott, (1984), *Population, Development and Income Distribution - A Modelling Approach, BACHUE - INTERNATIONAL*, St. Martin Press, New York.

National Council of Educational Research and Training, (1992), *Fifth All India Educational Survey*, Volume I and II.

Pal, S. P. and D. K. Pant, (1995), "Strategies to Improve School Enrolment in India", *Journal of Education Planning and Administration*, Volume IX, No.2, April 1995, pp.159-68, New Delhi, 1995.

Rao, N. Rama, J. R. Rele and James A. Palmore, (1987), "Regression Estimates of Fertility for India 1971 and 1981", *Occasional Paper No. 3 of 1987*, Office of the Registrar General and Census Commissioner of India.

Rosenzweig, M. R. and R. E. Evenson, (1977), "Fertility, Schooling and the Economic Contribution of Children in Rural India", *Econometrica*, Vol. 45, No. 5, July 1977, pp. 1065-80.

Sharma, O. P. and Robert D. Retherford, (1993), "Literacy Trends in the 1980s in India", *Occassional Paper No. 4 of 1993*, Office of the Registrar General and Census Commissioner, New Delhi.

Sharma, O. P. and Robert D. Retherford, (1987), "Recent Literacy Trends in India", *Occassional Paper No. 1 of 1987,* Office of the Registrar General and Census Commissioner, New Delhi.

Streeten, Paul P., (1979), "Basic Needs: Premises and Promises", *Journal of Policy Modelling,* 1, pp. 136-46.

Summers, Lawrence H., Vinod Thomas, (1993), "Recent Lessons of Development", *The World Bank Research Observer,* Vol. 8, No. 2 (July 1993), pp. 241-54.

Suri, K. C., J. G. Bauer and J. R. Rele, (1988), "Analysis of Work Force in India", *Occasional Paper No. 8 of 1988,* Office of the Registrar General and Census Commissioner, New Delhi.

United Nations Development Programme, *Human Development Reports* (Various Issues), Oxford University Press, New York and New Delhi.

Wheeler, David, (1980), "Basic Needs Fulfilment and Economic Growth, A Simultaneous Model", *Journal of Development Economics,* Vol. 7, No. 4, December 1980, pp. 435-52.

Wheeler, David, (1984), *Human Resource Policies, Economic Growth, and Demographic Change in Developing Countries,* Clarendon Press, Oxford.

Wolfe, B. L. and J. R. Behrman, (1982), "Determinants of Child Mortality, Health and Nutrition in a Developing Country", *Journal of Development Economics,* Vol. 11, pp. 163-93.

Wolf, Scott and N. T. Mathew, (1983), *Levels of Living and Poverty in Kerala,* Geneva: United Nations Research Institute for Social Development.

World Bank, *World Development Reports* (Various Issues), Oxford University Press, New York.

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(July 1997)

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The papers included in this volume were first presented at an international conference on *Gender Perspectives in Population, Health and Development* organized by NCAER in January 1996, with support from the MacArthur Foundation. The first two papers highlight aspects of women's employment in India. The paper by Sarala Gopalan gives an overview of the work participation rates, sectoral distribution, and the concentration of women's employment by industry groups in different states. This paper is complemented by Renana Jhabvala's study of the characteristics of unorganized sector workers in India. Based on this, some elements of a National Employment Policy are identified.

The remaining two papers look at different aspects of Sri Lankan development experience. Vishaka Hidellege examines the situation of home based women workers in the cashew industry. In the prevailing situation of exploitative marketing arrangements and gender inequality, women workers have not been able to get the benefits of various incentive schemes. The paper by Pieris and Caldwell looks at an aspect of Sri Lankan development that has clearly been very successful, i.e. the reduction in mortality rates, and in the gender differential in these rates. The social change that explains this has, as expounded here, several different components.

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