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COMBATING OVERPOPULATION:
A STUDY OF THE POPULATION POLICIES OF CHINA AND INDIA

by

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B.S. Georgia Institute of Technology, 1996

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ABSTRACT

With the world population now at 6 billion, the topic of overpopulation is becoming increasingly important. The planet cannot absorb an infinite number of humans, and steps need to be taken to combat unchecked growth. The thesis begins with a discussion of the problems currently manifesting themselves, including land degradation, water supply loss, farmland appropriation for living space, overfishing, and unequal food distribution.

The thesis considers the population policy of China, long criticized by the West for its unusual harshness. In studying its history, though, it can be seen why the Chinese government felt radical steps were necessary. India's policy over the last few decades is also examined. In this case, early excesses on the government's part led to public unpopularity for the whole population control concept. Despite this, positive steps have been taken in several areas.

The current availability of food and farmland in both states is studied to determine what environmental and nutritional effects the respective population policies have had. Comparisons are made between the two in an effort to gauge their relative success and to attempt to draw any lessons for either China or India.

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CHAPTER 1

INTRODUCTION AND METHODOLOGY

For thousands upon thousands of years of humanity's existence, only a few million people roamed the earth. The coming of agriculture around 8000 BC provided the first big spurt in population growth, boosting it from five million to 250 million by the time of Christ. The first billion mark was not even reached until around 1820. However, each additional billion people arrived at increasingly shorter intervals: two billion by 1930, three billion by 1960, four billion by 1975, and five billion by 1987 (Ehrlich, Ehrlich, and Daily, 1995, p. 18). On October 12, 1999, the United Nations declared that the six billionth person had been born. This billion took as long as the fifth thanks to the slowdown of population growth in the developed world combined with the relative smallness of most of the Third World states. Unfortunately, ninety-five percent of this growth has occurred in the developing world. Population momentum (nearly exponential growth as large numbers of childbearers give birth to multiple children who themselves will soon become childbearers) has resulted in the current figure of over a billion people

between the ages of fifteen and twenty-four (United Nations Population Fund (UNFPA), 1999, 1). In sixty-two of the world's poorest countries, over forty percent of the population is under the age of fifteen (UNFPA, 1999, 2).

Because population growth has slowed if not stopped in the developed world, most of its policymakers believe that the effects of the population explosion, horrible as they may be, will be largely confined to the developing world. However, as with other problems that are global in scope, no country in the modern world can remain totally isolated from its effects. The truth is that overpopulation impinges even on the developed world on different levels. All people require food, shelter, and the means to make a living. More people require more food, which must come from somewhere, even if per capita amounts decline. If necessary, they will do all they can to grow it themselves, with little heed paid to the long-term sustainability of the land and water supply. Should this fail, the excess of the developed world will come under increasing demand even as it declines. As they make homes for themselves, they move onto any unused land they can find, often meaning forests and other wilderness areas that are then cleared. This results in the loss of biodiversity and high rates of species extinction, along with the loss of trees serving as the planet's "lungs", making a long-term contribution to the "greenhouse effect". As they try to make a living, governments must provide them with jobs where possible. Unfortunately, even the developed world has had difficulty creating large numbers of new jobs. The results are either large numbers of

unemployed eking out a subsistence living, or masses of economic refugees who will attempt to make it to any country with a better economy (a developed country if possible). Should a developing country attempt to improve its economy by industrializing, its poverty will usually prevent it from implementing modern environmental or efficiency measures. This results in profligate use of finite energy supplies, along with huge amounts of pollution contributing to a thinning of the global ozone layer and occurrences of acid rain in surrounding countries. For all these reasons, if none other, the developed world must try to understand the root causes of high population growth and assist in the implementation of methods to combat it.

The methodology used in this thesis is that of explicit binary comparison, which is the comparison of phenomena displayed by two foreign cases. For example, speaking as an American, a look at patterns of industrialization displayed by England and Japan would be an explicit binary comparison. This is as opposed to implicit binary comparison, which compares another state with one's own. An example of this would be a study of factors of wartime mobilization in the Second World War in the United States and United Kingdom. There are two possible tacks to take with this approach. One can focus on two largely similar systems and attempt to analyze what has made them different. If the two are close enough, any essential differences found will be the sole cause of whatever divergent outcomes

occur. On the other hand, one can focus on two systems that are largely dissimilar and try to find areas of commonality between them.

The cases used in any binary analysis must share some sort of clear contextual similarity to be able to provide a meaningful comparison. Such a study of two cases allows one to look at historical variables to try to determine what has made each case unique. Simultaneously, any similarities that are found may be used to draw conclusions towards broad and general phenomena. However, care must be taken that neither an ecological fallacy nor an individualistic fallacy be made. The first would result when a generalization is made from two particular cases that holds true, but then fails to apply to another similar case. The second can result when individual differences are found between two particular cases that are then incorrectly assumed to apply generally to all similar cases. Two additional dangers are that some factors one might wish to compare may not be compatible, and that the use of a limited number of cases may threaten the overall validity of any conclusions drawn from the study. Nevertheless, the prime advantage of this approach is that it makes possible a broad sketch of a case, involving multiple facets of politics and society. It is the depth afforded by this approach that makes it relatively easy to make broad interpretations of the data, and this is why this method was appealing. Furthermore, should the cases result in a clear contrast, they may then be considered as the prototypes for two sets or models of states.

China is an obvious choice as a case in the arena of population. It was the first country to reach a population of one billion, doing so in 1982. It is a huge country covering most of eastern Asia whose society, though urbanizing quickly, remains primarily agrarian. Thus, many millions of people have always been needed to attempt to subdue nature. The ancient riches of the region and the fertility of its river valleys led to the founding of one of the world's oldest civilizations. These same riches, however, led to frequent wars and invasions, while these combined with the mostly uniform climate gave rise to famines. Therefore, a high birth rate was necessary to maintain a stable population. Despite these historical forces, China has had astounding success in reducing its fertility in recent years with the implementation of a "one-child" policy, limiting couples to having only one child.

India is almost as obvious a choice. It became the second country to achieve a population of one billion, doing so in the fall of 1999. As in the case of China, it is a large country with a primarily agrarian society. It also served as home to an ancient civilization thanks to the area's natural bounty. As with China, it was a frequent target of invasions and suffered from famines almost as a matter of course. It too needed a high birth rate to achieve population stability. India, though, differs from China in several important respects. Both have traditionally had autocratic governments with (despite some exceptions) a decidedly patriarchal cast pervading both government and society. However, after a brief flirtation with a republican

government early in this century, China has retained an authoritarian system of government under the Communist Party. India, on the other hand, was given the trappings of a parliamentary democracy during its time as a British Crown Colony, and has become one in fact since achieving independence in 1948. An additional difference is that China's economy is growing at a phenomenal rate, serving as the dynamo for the Pacific Rim since the mid-1990s. With an average annual growth rate of over seven percent, the Chinese economy is outstripping population growth, keeping per capita figures and average quality of life rising. The Indian economy, though, is even now barely keeping ahead of population growth; any economic dip would result in an immediate drop in quality of life. Table 1 provides some general statistics which illustrate this point.

This thesis hopes to discover what is working and what is not within the population policies of these two states. It will begin with a study of the global effects of current population levels and a look at its possible outcomes. Following this, an examination of the two countries' demographic histories and cultures will be undertaken to determine why their stances took the forms they did. An important variable here is the traditional view of women and the roles they play within Chinese and Indian societies. In both cases, a clear preference is held for the bearing of male children as a support system; daughters are born almost as an afterthought. The Indian tradition is harsher in that women are held hostage in a system of marriage emphasizing control by males and the economic cost of bearing

Table 1: General Statistics of China and India

Source: United Nations Development Programme, Human Development Report 1999

Country	1997 Population (millions)	GNP per capita (US \$) 1997	GNP per capita annual growth % 1975-1995	Population annual growth % 1975-1997	Female literacy %	TFR	CPR
China	1244.2	860	7.7	1.3	74.5	2.3	83
India	966.2	370	2.8	2.0	39.4	3.1	41

daughters. Also to be studied are the current methods of policy implementation and the setbacks that have been noted. It will conclude with a comparison of the respective policies and an analysis of their strengths and weaknesses in order to attempt to derive possible solutions. Additionally, current nutrition security prospects within both states are summarized to ascertain if their current population levels already exceed their respective carrying capacities.

The belief entering this thesis is that the Chinese are the preferable model, with a central government needed to make the drastic decisions necessary to succeed in curbing population growth and an economy dynamic enough to absorb the existing growth. Furthermore, the education of women is of paramount importance in achieving success. As they are educated they are more exposed to the world outside their family and home. They acquire the knowledge of contraception and its utility. At the same time, they are more likely to gain substantive employment, making the bearing of children more a hindrance than a desire.

An authoritarian government like China's has the advantage of not having its individual provinces wishing to follow different paths than the one laid out by the capital. The center decides what it wishes the provinces to achieve, and whatever policy it lays out for a particular province will be obeyed. In addition, because there are no elections, only incompetence or old age can remove officials from their positions. Therefore, once a policy is decided upon, there is usually consistent leadership in its implementation. More often than not, a democracy has the

individual provinces trying to sway the central government as to what plan it should follow; usually, their ideas differ from one another. Simultaneously, each round of elections results in the changing of at least some officials, and often the national leadership itself, resulting in changes in policy priorities and vigor in implementation with each administration.

In conclusion, the results of this thesis' investigation into the population policies of the world's two most populated developing countries has tended to confirm, in large part, the belief or theoretical orientation assumed upon its initiation. China has designed, implemented, and maintained a more effective population policy than India has been able to. However, the thesis will argue that the reasons for China's success have been more complex and intricate than originally anticipated.

CHAPTER 2

OVERVIEW OF THE ISSUE

The United Nations Population Fund (UNFPA), the organization which attempts to monitor growth and trends actively worldwide, maintains constant, high, medium, and low projections for population growth in the next 150 years. At the UN International Conference on Population and Development, held in Cairo in 1994, it was declared that the Conference Programme would result in growth at levels fairly close to the UN's low projection, stabilizing late in the 21st century (Grant, 1996, p. 8). While this indeed is the result of the low projection, both it and the constant projection are absurd, albeit for different reasons. The constant projection assumes that the 1990 growth rate will continue *ad infinitum*, with doubling times growing ever shorter. At that rate, by 2150 the Earth's population will be 694 billion, giving each person 0.19 hectares of land (and that only if *all* land is considered, including deserts, mountains, and glaciers) (Grant, 1996, p. 8). Of course, long before this, the food will have run out or some natural disaster will have run its course. The low projection, on the other hand, has the world's

population peaking at 7.8 billion in 2050 before sliding downward. Its problem lies in its assumption that the average number of children born to each woman (total fertility rate, or TFR) in Africa drop to 2.31 between 2015 and 2020, then to 1.6 by 2040. Currently African women possess the highest TFR in the world, with an average of 5.9; furthermore, since 1950 only a ten percent TFR reduction has been achieved.

Working to lower the TFRs of the developing world slowly, a decimal point at a time, is the goal of UNFPA and its various family planning programs. The Holy Grail is to achieve rates where all growth is absorbed by simple replacement of the dead, which will stabilize the population within the next generation or two. Unfortunately, overall fertility throughout the developing world (with the exception of China) has dropped less than one-third since the 1950s, to 4.2 (Grant, 1996, p. 9). This figure must be cut in half again, to 2.1, if global population is ever to stabilize. However, all the projections share the assumption that 2.1 is the number to aim for, based on current mortality data. As more and more people crowd onto the planet, an increasingly likely outcome is that mortality rates, which have been dropping worldwide for over half a century, will begin to rise again. Should this happen, UNFPA won't have so high a goal to reach, although probably not for the reason it would have wished.

Three Developments

In the last century, humanity has forged ahead recklessly, pushing back the frontiers of science in an effort to better everyone's lives and manipulating the environment to suit its needs better. However, with its typical shortsightedness, it undertook these efforts without stopping to consider what the consequences might be. In this vein, three scientific developments in particular, each made with the most noble of intentions, have led us down the road to ruin we are currently on. The first is not a single invention, but rather a series of improvements: the basics of the modern health care system, including vaccinations and antibiotics. During and after World War II, these were introduced in large scale throughout the Third World, with the laudable goal of preventing deaths from such things as simple childhood illnesses. What could be the harm in that? Unfortunately, parents in these countries had grown used to large numbers of their children dying and bore even larger amounts just to ensure the survival of some. They kept bearing the large numbers, but more children were now surviving – the beginnings of population momentum.

The second development is the Haber-Bosch process of synthesizing ammonia, discovered in 1913. Throughout recorded history, humans had been forced to provide their crops with the nitrogen they needed with the use of such things as compost and manure. However, with the synthesis of ammonia one can

create nitrogen, and the chemical fertilizer was born. With its use, crop yields shot up to record amounts, fueling higher consumption levels on all levels of society in the developed world. Among other things, the extra grain led to its use as livestock feed, making grain-fattened beef an integral part of the developed world's diet. Unfortunately, as we have entered leaner times, we are caught in "the nitrogen trap". Although additional fertilizer inputs increase yields, past a certain level diminishing returns are achieved, until eventually no further increase is possible. Indeed, the Norwegian government recently decided to cut fertilizer use in half; the yields actually rose! (Ehrlich et al, 1995, p. 206) The trap lies in synthetic fertilizer's heavy usage throughout the developing world. These poorer countries must have the additional yields provided by high fertilizer input to attempt to be even self-sufficient. Should a worldwide return to non-fertilizer agriculture take place, the rich nations could get by without their grain-fed livestock and subsist on a mostly cereal diet, but for the poor states it would mean the starvation of one-third of their population. Already, "virtually all protein needed for the growth of more than 400 million babies to be added in the eight populous but land scarce countries (China, India, Indonesia, Bangladesh, Pakistan, the Philippines, Egypt, and Thailand) during the 1990s will have to come from synthetic nitrogen." (Grant, 1996, p. 23) Traditional methods of maintaining soil fertility in poor countries are flagging, as in the case of Nepal (Ehrlich et al, 1995, p. 185). As forests are being converted into farmland, firewood availability is reduced, leading to fuel

substitution by cattle dung. This, however, eliminates it from its role as fertilizer, further impoverishing the soil. Additionally, heavy fertilizer usage results in nitrates seeping into the groundwater and nearby rivers. Worse still is something lying further down the road. Eventually, there will be too little food to go around, boosting the price on whatever remains. The extra money made by the producers will warrant additional fertilizer, to attempt to maximize profits, but in time this will zero out. Before then, though, the price of food will have risen so high as to lock the poorer states out.

But why should food be unavailable? This brings me to the third development: high-yield varieties (HYVs) of cereal crops. In 1951, the Colombo Plan was organized, under which technological assistance for rural development would be sent to developing countries to build stable rural communities that would support the post-colonial governments. The agricultural portion of the plan would be termed “the Green Revolution”, as improved grain varieties tested in developed nations in the 1940s and 1950s were disseminated throughout the Third World in the 1960s and 1970s with dazzling results. Several countries, including Mexico and Egypt, became net exporters of cereals. This sort of foreign aid was viewed as a “win-win” situation for the United States, which prevented famines while opening markets for farm machinery and fertilizers. In addition, these countries had less likelihood of peasant uprisings which would put them in the Soviet bloc. While average worldwide grain yields rose nearly two and a half times between 1950 and

the early 1990s thanks to HYVs (Brown, Kane, & Roodman, 1994, p. 41), this was only possible if they were provided with abundant fertilizer and water (HYVs are called “fertilizer-sensitive varieties”). This led to a tenfold increase in synthetic fertilizer usage during that time period (Ehrlich et al, 1995, p. 151), as well as the creation of many irrigation works, leading to the eventual concomitant problems. Because they make use of more of the actual plant, less of a root system is left behind to replenish the soil, leading to increased soil erosion. At the same time, only a few HYVs represent the bulk of a country’s agriculture; as monocultures, they are extremely susceptible to blights and other infestations. Another side effect of monocultures is that they are more vulnerable to attacks by pests, so they require large amounts of pesticides. This high pesticide usage has several unwanted effects. First, it mutates the pests, making them resistant to the pesticide’s effects. Second, it kills off those predators that would normally keep the pests at bay. Third, it allows previously harmless creatures to “graduate” to pests now that no predators exist to keep their populations limited. As a result, total insect crop losses doubled between 1945 and 1989 despite a tenfold increase in pesticide usage (Pimentel, 1992). The only possible solution foreseen for the synergistic problem of HYVs and synthetic fertilizers is the creation of crops that fix their own nitrogen supply into the soil, obviating the need for fertilizer. While this has been a goal for genetic engineers for several years now, it remains a long way off. Furthermore, the effect of an ingrown nitrogen supply on yields is uncertain, as is the long-term effect on

the soil and atmosphere. It may prove to be another example of humanity's creation of a short-term solution and a long-term problem.

Problems with Land Supply

Considering that so many hassles surround the use of HYVs, one would think that it would be in the public interest to have as much farmland available as possible, if only in an effort to have some margin for error. Already, humans either occupy or use ninety percent of all land that isn't desert or under permanent ice cover – seventeen percent is planted in crops, two percent is urban or otherwise built on, and the rest is pasture or forest land exploited to some degree (Ehrlich et al, 1995, p. 171). The remaining land covered by natural habitat is almost entirely deemed “marginal” – unsuitable for intensive agriculture. In 1950, 593 million hectares were planted in grains; by 1990 this had increased by twenty-one percent to 720 million hectares. Production, though, increased by about 175 percent from about one ton of grain per hectare per year to over two and a half tons (Brown et al, 1994), due more to the use of HYVs than to the land increase. However, with the great bounds in population, the amount of arable land *per capita* has declined by thirty-five percent since 1970 (Grant, 1996, p. 17). This figure will drop an additional forty percent in the next two generations, even if all farmland loss for

any reason is stopped (Grant, 1996, p. 18). Furthermore, since 1981, the global land area dedicated to cereal production has declined by five to six percent (Ehrlich et al, 1995, p. 172). This is due to several factors, among them: the switching of land to production of other foods, conversion of farmland to nonfarm use, setting aside of marginal lands, and the abandonment of severely degraded land.

Unfortunately, because this is a finite world, it is impossible for the supply of farmland to grow. Consequently, in these space-starved times, increases in population require increases in land usage for such things as housing and infrastructure. This is usually undertaken at the expense of such things as forests and farmland. In East Asia, more than 1900 square miles of farmland are lost to urbanization annually (Ehrlich et al, 1995, p. 172). In some countries, an attempt to compensate for this loss is made through the conversion of existing forests.

Using this method, Brazil has doubled its arable land since 1970, while Indonesia has increased its total by twenty-three percent (Grant, 1996, p. 18). Unfortunately, the resulting soil, used to long-term support of trees, is generally poorly suited to support repeated crop cultivation. Historically, deforestation served as part of the indigenous agricultural cycle, commonly termed “slash-and-burn” – villagers would clear a small area, cultivate some crop for a few seasons, then move on to some other area when the soil was too poor. This worked in the past because there was enough forest available for everyone to use that the forest could grow back in between clearing periods and revitalize the soil. With the increased numbers of

people, though, the time between clearings grew shorter and the soil had less of a breathing space, eventually reaching the point where it could not even support forest regrowth. Despite this, deforestation continues in the developing world, even if only as the result of increasing numbers of villagers seeking firewood for fuel. This need has served to undermine various reforestation schemes as well.

Factors other than urbanization remove the limited supply of farmland from production. Already mentioned was the catchall category of soil degradation, which encompasses the processes of desertification, salinization of fields, and soil erosion. Although these are all natural processes (for example, the erosion of land along the Mississippi River for countless millennia has formed the Mississippi Delta of Louisiana), misuse of various farming techniques has accelerated the processes to crisis levels. A large problem caused by the massive buildup of irrigation works is that of improper drainage; this tends to cause a buildup of salts within the pipes, which eventually makes its way through the fields, harming plant growth. An estimated ten percent of the world's irrigated land is suffering from reduced yields due to salt buildup, while in the United States an estimated twenty-five to thirty percent of irrigated land is affected (Postel, 1992). Similarly, as greater expectations are placed on food productivity, the tendency has been for farmers to overcultivate parcels of land until they can produce no more, even if the particular area was fairly poor to begin with. This overcultivation, along with the deforestation of lands where the soil now has nothing to hold it in place, has

promoted a disastrous amount of soil erosion. In the United States, where most of the land is still in fairly good condition, around twelve to thirteen tons of topsoil is lost per hectare per year, while only one ton is replaced by natural processes (Grant, 1996, p. 18). While the global total can only be guessed at thanks to a lack of reliable information, one estimate concludes that planetary topsoil is eroding away at the rate of about twenty-five billion tons per year, which may possibly be as much as seven percent per decade (Ehrlich et al, 1995, p. 174). Currently, an area of arid and semi-arid land the size of Colorado is abandoned each year due to loss of productivity (Daily, 1995). An estimated eight- percent of the potential value of productive land worldwide has already been lost to degradation; at present rates twenty percent will have been lost by 2020 (Ehrlich et al, p. 175). It is also estimated that forty-three percent of this planet's vegetated surface has been degraded to some degree since 1945 (Daily, 1995).

Another threat facing us regarding farmland does not have it ceasing production, but rather has its production being channeled into industrial uses. As consumers in the developed world move away from products that damage the environment, they attempt to look for naturally occurring substitutes - for instance, the use of methanol made from corn rather than gasoline. As our petroleum supply dwindles, an effort is made to create, among other things, plastics which can be grown; the advancing science of genetic engineering is being applied to that end. Although such goals are probably worthwhile, such use of farmland competes with

what remains to grow the food we desperately need. Just how bad is our land situation? The figures on soil degradation are certainly telling. Another indication comes from a group of scientists at Stanford, who analyzed the “terrestrial net primary productivity” (NPP), which is basically the energy created through photosynthetic action which then fuels the entire planetary food chain. Their study indicated that humanity had appropriated or made less productive forty-one percent of that, leaving fifty-nine percent for the combined populations of every other creature on Earth (Vitousek, 1986). If our population should grow by another two-and-a-half times, to about fifteen billion, we would be using almost all of it.

Problems with Water Supply

A lack of land is not the only crucial limiting factor when it comes to food production. Water supply is increasingly becoming a problem in most agricultural areas. While this troubles not every country – Canada, for example, has an estimated 106,000 cubic meters per capita per year and only uses about two percent of it (Grant, 1996, p. 29) – other countries are not so fortunate. Indeed, the issue has achieved regional importance within the United States and international importance within the Middle East and North Africa. Within the American Southwest, water rights have for years been bought away from farmers by

developers for residential use. Meanwhile, the Colorado River's water management plan was laid out in a period of heavy rainfall early in the century. It has now been overdammed and overutilized; the mouth of the river in the Gulf of California has trickled to a bare stream. The situation is not so sanguine in the Middle East. In 1960 the total annual water availability there and in North Africa was 3000 cubic meters per person per year, but in 1990 this figure had gone down to 1436. It is estimated that by 2025, this figure will have declined to 667, of which Jordan will have 91, Syria 161, and Israel 311. Nearly all discussions between Israel and the Palestinians involve the ceding of Israeli water rights. Palestinian Arabs claim that Israel is diverting water from the occupied territories and allocates four times as much water per Israeli as per Palestinian. They also claim that Israel is pumping water at twice the replenishment rates, causing saline intrusion into the water table (Grant, 1996, pp. 151-152).

The question of overpumping is a serious one everywhere. Most of the water used as feed for irrigation works, especially in inland cities with no access to great rivers, is derived from underground aquifers. However, aquifers have finite, albeit immense, quantities of water within them; once emptied, they require millennia to be replenished to any significant degree. One would like to believe that farmers around the world would want to protect what drives much of their irrigation, especially considering that thirty-three percent of total harvested crops come from the seventeen percent of cropland that is irrigated (Postel, 1989).

Despite this, in the United States alone, the overdraft of aquifers for irrigation purposes is estimated to total between six-and-a-half to eight *trillion* gallons annually, supplying one-fifth of the country's irrigated land (Ehrlich et al, 1995, p. 181). Furthermore, while many aquifers are alluvial and are replenished through part of the hydrologic cycle where rainfall seeps into the earth, the current quick pace of urbanization is interfering with this process. As more buildings, roads, and parking lots are erected, rainwater is kept from the aquifers and is channeled uselessly into the sewers. In addition, as toxic chemicals seep into the ground at various dumpsites, they make their way into the water table and the aquifers, polluting them against future use. Worst of all, much of the overdrafts are the result of shortsighted government policies that effectively reward farmers for the profligate waste of water. Thanks to various government subsidies, farmers end up paying at most a few cents on the dollar for the water they use, leading them to use not as much as they need, but as much as they like.

But what of using sources of water other than aquifers? Unfortunately, not too much is left to use. Already, humans have appropriated an estimated fifty-four percent of all planetary water runoff. While dams have traditionally been used to create artificial lakes and other such supply points, nearly all the logical sites have already been utilized. More dams will only add about ten percent more of the runoff to our use (Postel et al, 1996), at the cost of flooding or submerging badly needed farmland and displacing the inhabitants, creating a migrant population.

Desalinization is an option that has found some use in the Middle East, particularly in Saudi Arabia, under which the salt is extracted from seawater to make it potable. However, despite several decades of use, it has failed to achieve cost-efficiency, costing an average of fourteen times as much as building a single irrigation works (Grant, 1996, p. 30). Only countries with both urgent need and wealth to spare, such as Saudi Arabia, can really utilize this option. In addition, desalinization plants are large, bulky, and complicated affairs, providing ripe targets for military or terrorist attack, a serious consideration in the volatile Middle East.

Governments in the industrial world have been slow to react to the problems of food supply. With the advent of the “Green Revolution” in the early 1960s, grain yields rose to such levels that they were able to beat the pace of population growth; cereal amounts per capita rose each year. However, this pace plateaued in the early 1980s as yields reached their upper limits; per capita amounts began to decline. Several different reasons were used to explain away what was seen as more of a perceptual drop in production. Beginning in that year, the Conservation Reserve Program in the United States began removing from cultivation the most seriously degraded farmland in the country; similar programs did the same in Europe. In addition, the Department of Agriculture decided that it wished to reduce surplus grain stocks and began to keep less on hand. Finally, it was explained, less grain was needed because one of its traditional uses in the developed world, that of livestock feed, was becoming less of a concern as grain-fattened cattle became less

popular for both health and economic reasons. Despite these, a powerful assumption pervading both government and non-governmental organizations is that most of the inequities in food consumption result from hang-ups and shortfalls in the distribution system. If all the food shipped abroad was able to get to its destination without spoilage, then many less people would go hungry. There is some truth to this notion – in both the Ethiopian and Somali famines, much of the food aid sent to those countries was appropriated by the ruling military forces and reserved for their supporters in the cities. However, according to current figures, even if all grain produced was evenly distributed, each person would receive 333 kilograms per year. Mind you, this figure is at the current population levels! This sounds like a good deal, but if one ate a strict vegetarian diet, he would consume about 200 kilograms yearly. The traditional Chinese diet, with the rare inclusion of a little meat, totals about 300 kilograms yearly. Nearly the entire difference is what goes into the feed for the livestock; Americans, for example, consume about 800 kilograms of grain per year (Grant, 1996, pp. 35-36). The problem here is that the conversion of feed to carcass is very inefficient. The peak of efficiency is that achieved in the modern chicken farm using the “factory” approach – two kilograms of feed for one of meat (Grant, 1996, p. 38). This is achieved by keeping the chickens in small pens so they are largely unable to work off the calories they gain. If we are willing to extend such horribly inhumane treatment to all our livestock

facilities we can probably achieve similar levels of efficiency, but even this level is nothing to be proud of.

Overfishing

Many societies have largely obviated the need for meat by seeking their protein from the sea. However, even this option is under serious attack due to human mismanagement. Since 1987, the world fish catch has been between ninety-five to one hundred million metric tons each year, coincidentally very close to the predicted total maximum sustainable yield (MSY), assuming all fisheries are properly managed. Of course, the fisheries are not properly managed at all. All major fishing areas have reached or exceeded their respective MSYs; half of them are now in serious decline (Ehrlich et al, 1995, p. 164). Fish stocks have been depleted by forty-five percent in American fisheries and by fifty-six percent in European ones (Rosenberg, 1993). Per capita fish yields have been declining since 1989 and the falloff from peak levels has been anything from two to fifty-three percent everywhere except the Indian Ocean (Grant, 1996, p. 39). The practice of overfishing continues for several reasons. Because there is no easy way to enforce property rights in the sea (which has caused several international incidents involving the United States, Canada, Japan, and several European nations), the resulting

situation resembles the realist school's international framework – every man for himself. Since everyone seeks to promote their own livelihood, each will attempt to catch as many fish as possible, regardless of the consequences. In addition, in the last century, the fishing industry has received so much investment that it is now overcapitalized. Fishing fleets comprise forty-one percent of all ships on the sea – some three million – and thousands of processing plants are in operation, all of which must try to turn a profit (Ehrlich et al, 1995, p. 165). At the same time, governments continue to subsidize the fishing industry despite the declining catches, effectively spending more than the value of the fish catches. This subsidization has the additional effect of promoting large, over-efficient operators catching massive amounts of fish, while driving away the small, indigenous subsistence fishermen. At the same time, pollution of the ocean tends to be concentrated in the shallow areas near the shore, which happens to be where the richest fisheries are located. In fact, ninety percent of the total fish catch comes from the third of the ocean closest to land (Brown et al, 1994). The pollution and/or destruction of coastal wetlands also hamper fish growth since these wetlands serve as “nurseries” for either the fish themselves or for their prey. The only growth in fish catches since 1983 has come in five low-value species, four of which are only used as animal feed (Swardson, 1994). A few solutions have been proposed to combat this decline. Aquaculture, or the “farming” of fish, already accounts for fifteen percent of total consumption (Brown et al, 1994). However, just as with the overcrowding of humans,

overcrowding of fish leads to high levels of pollution. Another proposes the direct consumption of krill, a form of phytoplankton that lends itself to harvest and consumption by humans. The problem with this option is that krill is one of the low links in the food chain for many ocean organisms; its harvest would probably have some effect on the marine ecosystem.

Problems with Energy Supply

Another problem area rearing its ugly head is the supply of energy. As the developed world conspicuously consumes, the developing world sees them and covets their lifestyle. Still, the industrialized countries have all gone through learning curves where they made themselves more energy-efficient. The industrializing countries, on the other hand, want to jump straight there no matter the inefficiency. Unfortunately, their populations are growing much too fast for supply to be able to keep up with demand. At the moment, proven petroleum reserves will last less than fifty years, while unproven and estimated reserves will extend that to about seventy-one years, if consumption levels remain static. However, energy consumption grew by an average of 1.6 percent per year from 1970 to 1990, and projections for 1990 to 2010 call for a 1.5 to 1.7 percent increase per year, assuming that there is a forty percent rise in usage efficiency in the Third

World. Otherwise, the increase will be 2.5 percent per year (Grant, 1996, pp. 46-47). At that rate, unproven reserves will only last from forty-two to forty-eight years. Even should energy efficiency be improved, all the simple ways to achieve it have already been implemented and each successive gain represents a smaller absolute figure, is more expensive, and would require everyone to participate. To preserve some oil supply, countries can transition their energy usage to natural gas, which has the advantage of being cleaner-burning. At current consumption levels, known gas supply will last for 132 years; accounting for increased consumption, it will last for fifty-nine years (Grant, 1996, pp. 49-50). While this tally cannot estimate how consumption will increase as countries shift to gas *en masse*, unlike oil, estimates for gas reserves are still rising as new fields are discovered. If even this should run low, countries can always shift to coal. The supply will last over 200 years at current consumption levels; adjusted for increased consumption, it will last for over one hundred years (Grant, 1996, p. 50). Again, this does not account for the changes brought by a systemic shift to coal nor does it figure whether the coal will be subjected to the treatment necessary to avoid nasty environmental effects, as only some countries do nowadays. By this time, the promise of the nearly unlimited power of nuclear fusion may be reality. It is unknown, though, if the availability of so much power would serve as a disincentive to energy efficiency, which might eventually return us to the current situation. In the meantime, modern methods of agriculture represent major energy inefficiency.

Thanks to gas-powered farm machinery and large electric heaters/dryers, among other things, farming has become a very labor-efficient industry while being subsidized to waste energy. One obvious way to solve this problem would be to return to the more “organic” agriculture of the past, highly labor-intensive and with barely any machinery. Unfortunately, this would vastly reduce yields at a time when they are necessary; some countries can even now no longer afford to undertake this shift.

Economic Problems

Nevertheless, let us assume for a moment that there was enough food to feed everyone, enough water for everyone to use, and enough energy to fulfill everyone’s wants. Overpopulation would still pose several political and security problems. For example, as population increases, it both expands towards the periphery and requires more redundancy and depth in infrastructure. Countries must continually extend their distribution networks to obtain and disseminate supplies to growing numbers of people. As these networks grow more complex, they become both harder to supervise and more vulnerable to disruption – deliberate or accidental. A much more critical problem, though, is growing unemployment. With the increased prevalence of laborsaving technology in the workplace, more

and more people are losing jobs as the technology makes its way around the world. While workers at all income levels are being displaced, it is the class of semi-skilled workers, where most of current population growth lies, that is being particularly undercut. Whereas several decades ago these technologies were expensive enough to not warrant their application in poorer countries, they are now efficient and inexpensive enough where they are appearing even there. Even very low-income workers can now be dispensed with, often from jobs that are the only things they know. Currently, thirty percent of the world's labor force is unemployed, including thirty-five million in the industrial countries (Miller, 1994). Both the poor countries and the United States now have more young people than they can reliably train to join the modern workforce and utilize the new technologies. This problem is particularly pernicious because, no matter how quickly a solution is enacted, one must wait for twenty years to view any effects. What is worse is that, as the new technologies become more complex, the skill requirements to operate them may be pushed above the limits of the workers who remain to use them. This cauldron of the underutilized young is a spawning ground for civil unrest and urban riots; governments must remain ever vigilant when there is no room for economic advancement among the people.

Even without examining additional consequences of overpopulation, such as its deleterious effects on different levels of the environment, it should be fairly clear that its ramifications will be quite grave. Therefore, it behooves all governments to

attempt to limit their TFRs, as no one will be spared the consequences should population growth continue unchecked. Unfortunately, such a prospect is easier stated than undertaken. An adequate population policy delves heavily into both social and economic spheres, and, in many cases, threatens to overturn the status quo. Few governments in the developing world have the money to spare to implement such programs as might ameliorate the situation. Of those that do, fewer still have the political will to go against the grain by making unpopular choices. To attempt to illustrate this situation adequately, the population policies of two countries will be examined - China and India. It is hoped that by examining their policies and their history, their strengths and weaknesses can be seen and understood, and perhaps possible solutions will present themselves.

CHAPTER 3

CHINA: ONE CHILD ONLY?

Recorded Chinese history stretches back for five thousand years and, for most of that time, its civilization has been one of the largest on the planet. Today, it is one of the three largest countries in the world, although its exact size is a subject of some dispute. Nevertheless, with its size has come a historically dense population, concentrated especially along the southern coast and the Yellow River basin. Exact numbers are impossible to arrive at, but demographers have estimated that the population may have been about 410 million in 1840 (Neurath, 1994, p. 158). During these periods, no true population policy was necessary, as the age-old methods of famine and war continued to limit growth. Indeed, from 1850 to 1880, the period of civil war known as the Taiping Rebellion is thought to have caused the deaths of seventy million, either through the fighting or the resulting famine. However, with such a large base to draw from, even this drop-off could be remedied fairly quickly and the population was able to rebound to around 426 million by 1901 (Tobias, 1998, p. 65). By 1949, despite the losses incurred by

both the Japanese occupation and the Communist/ Nationalist civil war, the population is guessed to have reached 540 million (Neurath, 1994, p. 158).

Policy History

Upon the assumption of power by the Communists in 1949, Mao Zedong declared that mass starvation and widespread hunger quickly were to become things of the past. They were the products, he stated, of capitalist exploitation and poor distribution of resources. A country with the huge expanses of land and natural resources that China possessed need not fear population growth. After all, "people are the most precious thing in the world", and the more people in China, the higher its production capacity, and, therefore, both the more it would be able to provide its citizens and the faster it would be able to bring about the global socialist revolution. "The absurd theory that increase in food cannot catch up with the increases in population, put forth by such Western bourgeois economists as Malthus and company had been refuted by Marxists in theory, but also had been overthrown in practice in the post-revolutionary Soviet Union and in liberated China" (Mao quoted in Aird, 1981). Such a statement was easy to make in a period where the average life expectancy was still thirty-five years and infant mortality ranged from 200 to 300 for every thousand live births (Tobias, 1998, p. 50). In fact, the practice of the

government through the early 1950s was to award medals to those mothers with large numbers of children.

Unfortunately for Mao, the first census of the People's Republic in 1953-54 revealed a population of nearly 583 million people, about thirty to forty million more than the government had expected (Neurath, 1994, p. 158). The census downgraded all of the government's per capita estimates, and showed that hunger still ran rampant in the countryside and that the lagging industrial base threatened to fall further behind population growth. In 1953, the Contraceptives and Induced Abortions Procedures Act was passed, legalizing the import and sale of contraceptives as well as sterilization and abortion with certain restrictions; the law would be further liberalized in 1957. The next year, a high-level government committee was established, holding several birth control conferences. By August 1956, under the direction of Prime Minister Zhou Enlai, the Ministry of Public Health began an anti-population boom propaganda campaign. Initially, Mao seemed to support it, making statements in 1957 to the effect that Chinese sexual activity was approaching "total anarchy" and that the Chinese people were headed towards "extinction" (Mao quoted in Aird, 1990).

However, in 1958 he reversed course by initiating the "Great Leap Forward", based on the belief that the resulting economic growth would outpace population growth. Unfortunately, the industrial sector was buttressed at the expense of the agricultural one, and it is now believed that thirty million Chinese

died of famine during the three years of the "Great Leap". These thirty million, though, were quickly replaced over the next few years, as the birth rate doubled from the low twenties to over forty per thousand, while the death rate dropped from forty-five to nearly ten per thousand (Tobias, 1998, pp. 57-58). This was despite a second campaign for birth control initiated by Zhou Enlai in 1962. That campaign was disrupted by the Cultural Revolution of 1966, which held that "birth control" was a bourgeois idea with no place in Communist China.

It was not until 1971 that a new campaign was begun, this one with a more definite goal in mind than simple birth control. This campaign quite specifically set two children as the limit for couples. Under the slogan "later - longer - fewer", people were expected to marry later, to space their children more widely apart (one guideline held four years in the city and three in the country (Neurath, 1994, p. 159)), and to have fewer of them. To aid in the implementation of the program, all contraceptives began to be distributed for free to married couples in 1974. Special "contraceptive stations" were created in every province, with disbursement controlled by the local family planning committees. In 1975 alone, seventeen million Chinese women had IUDs inserted, becoming an all-time global record (Tobias, 1998, p. 58).

Two years later, though, even this was determined to not be enough. *Renkou Lilun* ("Population Theory"), a paper written by the Office of Population Theory Research of the Beijing College of Economics, concluded that the government

needed to be directly involved in the sexual behavior of the citizens for the benefit of the country. "Human reproduction, like the production of goods and services in a planned economy, must not remain in a state of anarchy" (quoted in Tien, 1992). It was calculated that the 2015 population under the current two-child policy would equal the 2050 population under a one-child policy (Tobias, 1998, 59). In April 1979, Deng Xiaoping agreed with the paper and officially instituted the one-child policy. He went to great lengths to set an example, issuing an open letter to Communist Party members and the youth league cadres on September 26, 1980 urging them to only have one child. Part of the reason for this was to forestall debate over implementation of the policy in the National People's Congress; the military worried about future enlistment, and rural communities wondered if they would be able to adequately support the elderly with no sons. In September 1982, the Twelfth National People's Party issued a report officially setting a goal of maintaining the Chinese population at 1.2 billion for the year 2000.

Policy Implementation

What was the immediate effect of the one-child policy? In 1979, its first year of implementation, there were nearly eight million induced abortions, thirteen million IUD insertions, and seven million sterilizations (Tobias, 1998, 61). While

these figures sound like steps in the right direction, in actuality they hid a darker truth. In a country without true social security, rural families (still the majority of China's population) require a son to provide for them in their old age. While those elderly who can no longer work are theoretically protected by the "five-guarantee scheme" - every village must provide food, clothing, medicine, old-age care, and burial - most communes are too poor to do much in this direction and cannot replace the psychological and material comfort a son could provide. Furthermore, a Confucian adage still largely believed holds that the greatest sin one can commit against one's parents is to lack posterity of your own. Thus, with no sons, the primary vector for traditional ancestor worship is destroyed. The new policy, therefore, immediately threatened the well-being of fifty percent of Chinese families. Many whose first child was female chose either not to report it, give her up for foreign adoption, or kill her. The evidence of increased infanticide, however, is more anecdotal than empirical.

To promote compliance with the policy, various incentive and disincentive programs were initiated. The exact provisions tended to vary by province, but overall, as more violations or attempted violations were observed, the later provisions were much stricter and more punitive than the earlier ones. For example, the regulations for Shanxi province of June 1982 were stricter than those for Guangdong province of February 1980. As part of both: couples pledging to only have one child receive "honors certificates" granting them certain privileges;

should a second child be born the certificate is rescinded and benefits suspended; and if a third child is born, various penalties are imposed. The specific benefits offered are the following. Those with the honors certificate receive free neo-natal and post-partum health care, as well as free health care for the child until it is fourteen years old (the Shanxi regulations allow priority in registration, examination, and hospitalization). The mother receives two months of maternity leave at full pay, with an extra two weeks if she was sterilized after the birth; the Shanxi regulations allow for an extra fifteen days for both parents if they have married over three years past the minimum date, plus a hundred-day maternity leave if the mother is over twenty-four years old. The child has free schooling and is entitled to preferential treatment when applying either for university or government employment. The parents receive a monthly stipend of five yuan (or equivalent work points) until the child turns fourteen, as well as a five percent higher pension. They have priority for living space in the city or for land and building materials in the country, and can lay claim to the same amount as families with two children. They receive for the child one-and-a-half to two times the normal child's grain ration. Should the child be unable to support its parents, the "five guarantees" system is invoked on their behalf. Finally, if the child is crippled so that it cannot support itself or its parents, the parents can apply for a second child and continue to receive benefits. The Shanxi regulations are stricter in this regard, allowing for application only under carefully defined "special circumstances" or "real

difficulties" (the child is deformed, infertility among brothers, etc.). Even if the couple meets these requirements, the application must be confirmed by the community before being referred to the local family planning organization office. The specific penalties are the following. Under the Guangdong regulations, if a second child is born (which cannot occur until the first is at least four years old), the honors certificate must be returned and all benefits disbursed thus far paid back. If a third child is born, the parents suffer a five percent cut of their monthly wage or work points until it is fourteen years old. Under the Shanxi regulations, upon a second pregnancy, coworkers should attempt to persuade the mother to have an abortion; should the persuasion be unsuccessful, a twenty percent pay cut is imposed on both parents (which is returned if the pregnancy is terminated). Until the child is seven years old, the parents have fifteen percent of their pay deducted as well as losing one chance at a wage adjustment. Should a third pregnancy not be terminated, thirty percent of the couple's pay shall be deducted (to be refunded upon an abortion). Those with a third child are demoted one grade, lose ten percent of their wages until the child is fourteen, lose one chance at a wage adjustment, and have the maternity leave unpaid. Furthermore, those couples with two or more unapproved children receive neither additional land/building material nor subsidies in case of financial difficulty (Neurath, 1994, pp 162-163).

The policy's implementation occurred on several levels. Not only did contraceptives remain free, but all medical services relating to their usage (fitting of

IUDs, maintenance checkups) as well as sterilizations, vasectomies and abortions were also free and carried out upon request. Birth control pills were available at the workplace or were delivered to homes. The local family planning unit maintained a file on each woman's menstrual cycle and her IUD or pill usage. Great pains were taken to tie the family planning system in to the general health care system. The "barefoot doctors", villagers with limited medical training who were the backbone of rural Chinese health care, were trained in the fitting of IUDs and other such services. The whole system was organized hierarchically, with the highest committee devising guidelines, the provincial committees establishing appropriate quotas for the major regions, and so on down to the committee of a work unit or agricultural commune, which knew exactly how many births they were allowed in any one year. It is this committee which then decided exactly which eligible couples would be allowed to attempt conception. Couples had to inform these local committees when they planned to marry a least a year in advance. During this premarital period, they were to notify the committee which year they planned to have a child. This would be taken into account when the decision was made as to whether it would be allowed, with preferential treatment given to those who had married late or delayed childbirth for several years.

Those who planned to violate the one-child policy had to contend with a powerful weapon: conformity and peer pressure. Any woman who had an unsanctioned pregnancy was supposed to request an abortion on her own. Should

she not do so on her own, group pressure was applied by her fellow workers and citizens to get one. The strongest pressure came from other women slated to have a child, who were now in danger of losing their position in order to accommodate that one pregnancy and stay within the local quota. If a community were to exceed its quota, it would lose bonuses granted it by the central government. In some cases, the five yuan stipend granted to honors certificate holders would be withheld from everyone in the community if there was a single violator. In addition, Party officials and those connected with the family planning programs also received bonuses for maintaining quota compliance in their respective regions. Flagrant quota violations could not only cost their bonuses, but advancement within the Party and, eventually, their positions.

This group pressure, particularly in the early years of the policy, proved to be quite powerful. In 1983, a British documentary crew was allowed to film the tour of Chanzhou, a model city for population control, by a group of family planning officers from another city. Among the stories covered by the film crew was that of a woman in the process of having an abortion in her sixth month of pregnancy; the film shows the doctor inject a syringe into her womb. She explains that she had been determined to give birth, but was spoken to by the family planning officer. Upon resisting, increasing numbers of community officials began to counsel her towards an abortion each day and no one stood up for her. Eventually, she forced herself to give in; the family planning officer then confirmed

the story. Another interview tells of a woman who hid her pregnancy until it was impossible to hide any longer and was then persuaded to abort. The night before the abortion, she escaped from the hospital and fled to Shanghai. However, the people of Shanghai had joined the search for her so that she could be returned and eventually found her (Neurath, 1994, p. 157). While such late-term abortions were not recommended by the authorities, it was seen as an acceptable method of last resort. Indeed, it could not be understood why such people would not want to follow the advice of their government and simply have an abortion once the pregnancy was apparent. It was primarily on the basis of this documentary, which aired in the United States on February 14, 1984, that the Reagan administration would suspend funding for the United Nations Population Fund (UNFPA), on the grounds that its support of Chinese policy condoned gross human rights abuses.

Despite what would appear to be strict observance by the government, the policy has not been working as well as might be hoped. Initially, the numbers were promising: in 1979, five million couples took out the one-child honors certificate, and by 1983 that had risen to sixteen million, two-thirds of all eligible families (Neurath, 1994, p. 168). Furthermore, in 1983, twenty-one million Chinese, two percent of the entire population, were sterilized - eighty percent being women (Tobias, 1998, p. 62). Even today, there are promising statistics. China's TFR had been over 6.0 in 1960; in 1997, it was 2.5. The drop from 6.0 to 3.5, which required fifty-eight years in the United States (1842-1900), was accomplished by the

Chinese in seven (1968-1975) (Tobias, 1998, p. 51). The country possesses vast quantities of contraceptive materials, with forty contraceptive factories producing nearly one billion condoms, several billion pills, twenty-two million IUDs, and 300 million vaginal foam suppositories yearly (Conly & Camp, 1992-a, p. 36). This has led to a contraceptive prevalence rate (CPR) estimated at seventy-three percent in 1990 and eighty-three percent in 1997, compared with the United States' sixty-eight percent (Tobias, 1998, p. 48). China is considered a pioneer in contraceptive methods, having developed the "no-scalpel" vasectomy technique and vacuum aspiration abortion, and in the foreground in areas such as contraceptive vaccines and reversible sterilization.

Problems with Implementation and the Emphasis on Sons

However, several factors have undermined the policy's overall effectiveness. The decollectivization of farming communes, designed both as a means to increase agricultural output and as an incentive to meet quotas (since the committees decide land allocation), has actually served in some cases to increase birthrates. In these cases, land has been allocated on the basis of number of laborers *without* specifying whether or not these are family members; hence, more children would equal more laborers. It also had the effect of jeopardizing the barefoot doctor system, because

it was financed largely through the collective system. Some of these ended up returning to farming to earn more money, while others underwent more training and began charging for their services. As a result, health care on the village level has deteriorated. Another problem faced is the tenaciousness of old beliefs. In a survey of ten villages in ten different provinces, over forty-five percent of interviewed couples wanted three or more children, testimony to the strength of the concept of perpetuating the clan (Jinsheng, 1992). Furthermore, the female child remains unwanted, as Chinese orphanages have been filled with girls, doubling the adoption rate since 1979. Although it has been made illegal to disclose the sex of the fetus during ultrasound exams, gender-specific abortion is the only way to explain the 500 to 600 thousand girls which were demographically "missing" each year of the mid-1980s (Tobias, 1998, p. 61). Sudden demographic shifts have also caught the family planning committees unprepared. In 1984, a rumor surfaced that the one-child policy was easing because Beijing had determined that the crisis had abated. Before the rumor mill was stopped, the population growth rate that year jumped from 11.2 to 14.8 per thousand, meaning one hundred million more Chinese by 2050 (Tobias, 1998, p. 67). The government has been attempting to compensate for such trends by changing the structure of the family planning program enough to maintain public support. The formation of specific policies was delegated to the provincial level so it would better meet local conditions. As a result, Liaoning province instituted an allowance for a second child if the first was

female in 1984 and 1985; nowadays, eighteen provinces have such allowances (Tobias, 1998, p. 63). In 1988, the Minister of the State Family Planning Commission, Peng Peiyun, acquiesced to public demand, increasing the number of exemptions for second children, especially if the first was a girl. During the late 1980s, an increasing amount of program responsibility was shifted to the provincial and local levels. To assist in this decentralization (and to help replace the old barefoot doctor system), a new network of family planning clinics was established at the county and township levels. In 1990, a national "Administrative Law" was passed, granting citizens the right to sue government and Party officials for misuse of power. This was another attempt to curry support by allowing citizens some protection against abuses by local family planning officials. Even before the law was passed, a family planning worker in Hunan province was supposedly sentenced to a year in prison for forcing a woman to undergo an abortion (Conly & Camp, 1992-a, p. 20).

Despite these attempts at amelioration, the one-child policy continues to suffer. The worst offenders are its structural "exclusions", designed to avoid accusations of genocide among the minority groups and to maintain a rural labor force. There are eighteen "exception" provinces, so designated because they are primarily rural; after all, "for manual work, you need manpower". Depending on how one defines "rural", rural areas comprise anywhere from seventy to eighty-three percent of the country and account for up to eighty-seven percent of all births.

In fact, it was determined that, in 1986, fewer than eighteen percent of all fertile women in China were compliant with the one-child policy (Tobias, 1998, p. 54). Because of these exclusions, it appears that the number of couples with a second child has increased from ten percent in 1983 to possibly fifty percent in 1997 (Tobias, 1998, p. 52). In addition, now that the mini-boom of the Cultural Revolution has come of age, there are currently over one hundred million married Chinese women of childbearing age, plus an extra 200 million unmarried women and girls of childbearing age. This last is significant because a recent study showed that one of every five Shanghai women were pregnant at the time of their first marriage (Conly & Camp, 1992-a, p. 32). China's TFR *had* stabilized at 2.3 during the late 1980s and early 1990s, which promised to lead to a 2090 population of 2.2 billion. At its current rate of 2.5, it will instead reach 2.5 billion in 2090, adding the equivalent of another United States and Canada (Tobias, 1998, p. 52). Thanks to this heightened TFR, many officials have admitted that the one-child policy is probably doomed. By 1997, they had shifted their population goal for 2000 to 1.3 billion, a number China has probably already reached. However, as Chapter 4 demonstrates, the Indian government, which has been a procedural democracy since independence, has experienced even more problems with its population policy, albeit for somewhat different reasons.

CHAPTER 4

INDIA: FALLING BEHIND

India, serving as the cradle of another ancient civilization, has historically always had a comparatively high population. About twenty-five hundred years ago, during the period of Alexander the Great's aborted invasion of the Indus valley, it is thought that as many as forty thousand villages dotted the forests of the subcontinent (Tobias, 1998, p. 86). Perhaps fifty million people already lived in South Asia (Tobias, 1998, p. 93). Despite this high number, growth during this period was relatively slow, as was the rest of the world's, being checked by such natural processes as famines and wars. The establishment of India as a British Crown colony in the eighteenth century did nothing to ameliorate this situation; if anything, it was worsened by the resource drain exacted by the colonial administration. In 1892, twenty-five percent of the Indian budget was used not to help the Indian people, but to pay off British pensioners. Soon afterwards, a series of events (plague-carrying rats coming into Bombay from China, devaluation of the rupee against the pound, and four major famines over thirty years (Maharatna, 1996))

combined to both depress the Indian economy and increase the death rate to the point where the Indian population actually declined from its 1872 census level of about 260 million (Tobias, 1998, p. 120). The decrease was almost a testament to the ability of nature to serve as a check on population if left alone, and it would continue for nearly thirty years, up through 1921.

Policy History

However, by 1931 medical advances and improving social conditions had finally managed to decrease the death rate, bringing it down from 47.2 per thousand to 36.3 (Tobias, 1998, p. 121). Even then, it was realized that the birth rate had to be reduced as well and the first Indian birth control clinic was opened in Bombay in 1925. Unfortunately for India, Mahatma Gandhi disapproved of Margaret Sanger's doctrine when he heard it during the 1930s, thinking that birth control was unnatural. Ignoring the fact that most Indian women then could not count past twenty, he instead advocated the use of the rhythm method. As a result, between 1921 and 1951 the Indian population increased by 110 million to 361 million. The population growth rate increased as well, from 1.5 percent in the 1940s to two percent (Tobias, 1998, p. 121). The newly independent India sought to stabilize population to improve its per capita economic standings; this became the basis of its

first Five-Year Plan and all future family planning policies. Despite this and the efforts of the National Family Planning Program, whose goal was to reduce India's birth rate to twenty-five per thousand by 1975, the 1975 population reached 620 million (Tobias, 1998, p. 121).

It was in this state of increasing alarm that Indira Gandhi first came to power in 1966. Under her administration, family planning was placed under the Ministry of Health and made a priority for the government. The use of IUDs was promoted, but was troubled by reports of complications and inadequate follow-up care. In 1971, the government passed both the Medical Termination of Pregnancy Act legalizing abortions and a law forbidding women to marry before the age of eighteen (however, enforcement of this last proved difficult). Rather than driving for female sterilization, the trend during the early 1970s was to push for vasectomies. The Gandhi government instituted the practice of holding mass vasectomy camps, beginning in Cochin in Kerala state in November 1970. Over a thirty-day period, 62,913 vasectomies and 505 tubectomies were performed (Krishnakumar, 1972). The camp's incredible success was attributed to a broad-based coalition of support from government, the media, and medical institutions. It was given a carnival atmosphere, complete with festive decorations, clowns, 24-hour variety shows, and incentive money.

Based on that model, more than one thousand vasectomy camps were held throughout the villages of Gujarat state over 1971. With word-of-mouth being

spread by colorful stiltmen, 221,933 vasectomies were performed in a two-month period (Thakor & Patel, 1972). Unfortunately, when the camp approach was attempted in the state of Uttar Pradesh, the country's most populous state, four deaths as a result of tetanus proved enough to stop the program. Soon after, the governments of Haryana, Rajasthan, and Uttar Pradesh decided to use other sterilization methods.

It was after the failure of the camps that the Indian government began instituting sterilization quotas to be met by the states in order to receive financial assistance. However, these did not become a real issue until 1975. When Indira Gandhi was reelected that year, the Allahabad High Court attempted to overturn the election due to certain irregularities. She responded by declaring a state of emergency - certain civil rights were suspended, and censorship was imposed on the media. A Twenty Point Program was issued as a means of improving the country and, under that plan, Indira Gandhi's son Sanjay was put in charge of a program of reforestation, adult education, and population control. The central government began tying overall financial assistance to sterilization performance and state governments were encouraged to mobilize their entire administrative structure to that end. Teachers, construction bosses, farm labor managers and others were required to help achieve family planning quotas. With such an emphasis on meeting quotas, new "drastic" measures had to be used. Aggressive harassment to be sterilized became the norm, especially in the northern states of Rajasthan, Uttar

Pradesh, and Haryana. Government employees in many places could not be transferred or promoted, or even obtain medical care without a vasectomy certificate. In 1976, the Maharashtra state assembly passed a bill requiring couples with three or more children to be sterilized, although it was never ratified. This atmosphere led the 2.6 million sterilizations of 1975 to skyrocket to 8.1 million in 1976, most of which were vasectomies (Tobias, 1998, p. 123). In September 1976 alone, 1.7 million sterilizations were performed, about what the annual average had been for the last ten years (Conly & Camp, 1992-b, p. 7). It is a distinct possibility that Indira Gandhi sincerely believed that what she was doing was necessary to avert a demographic disaster. Indeed, it is probable that the additional six million surgeries prevented over two million births (Tobias, 1998, p. 124). Nevertheless, some of the methods used to achieve her goals were reprehensible. The 1978 Shah Commission of Inquiry revealed that the police had met their quotas in part by surrounding whole neighborhoods in the dead of night and dragging men and women to the local surgeons. Most of these were poor and could not afford to be arrested, which was the fate of anyone who resisted. In addition, infection was a significant concern during these mass sterilizations; the Commission found that they had resulted in 1,774 deaths (Bandarage, 1997, p. 75).

Actions such as these produced a groundswell of discontent, forcing Indira Gandhi to call for national elections in March 1977. She and her party were humiliated, unable to win a single Parliamentary seat out of the eighty-five in Uttar

Pradesh. The incoming Janata Party, realizing the political hot potato family planning was, barely touched it. They did rename it "family welfare", and shifted the onus from male towards female sterilization. As a result, up through today tubectomies represent eighty percent of all sterilizations in India (Bandarage, 1997, p. 75). Through sheer Janata mismanagement and the hold of the Nehru dynasty on the Indian consciousness, Indira Gandhi was reelected in 1980. But she could not establish any sort of policy emphasis on population control, even after the 1981 census showed that the population was seventeen million higher than had been expected and was rising at 2.2 percent annually (Tobias, 1998, p. 123). Since then, Indian family planning has become enmeshed in politics, with the measures in place being totally ineffective and the draconian steps increasingly necessary being politically unpopular.

The Status of Women

There are several glaring obstacles to any comprehensive family planning regimen in India. First and foremost among these is the state's primarily patriarchal society and its structural bias against women. This bias was, in a way, codified in the seventh century B.C., in *The Laws of Manu*, which placed women under the control of their fathers, husbands, and then sons. The only person they had any

power over at all was their daughter-in-law, leading over time to a perpetuation of the cycle of male dominance. A woman was to be married young, for multiple reasons. The younger she was, the less likely she was to have been raped. She was more likely to be uneducated and thus passive and accepting of her husband's dictates. Finally, the younger she was, the less of a dowry the bride's family had to pay. Parents of girls were eager to marry them off early, seeing as they would be an economic drain in the best of circumstances. Incidentally, this has led to India having the world's highest rate of teenage pregnancies. It became the woman's sole function to have several sons, and it was only after having done so that it became acceptable for her to use birth control. Of course, the laws of probability dictate that most people trying for two sons have one or more daughters as well. There is, however, little other option for a woman than to attempt this. Should she attempt to lead a life of the spirit, she will probably be considered crazy, as great an outcast as if she had borne no sons. If she attempts to remarry, *The Laws of Manu* state that she will be reborn in a jackal's vagina.

In Indian society, with its lack of an organized welfare system, the son serves as a support system. With so much of the population living on the edge of or below the poverty line, the loss of a single day of work by the head of household due to illness can economically ruin a family. Therefore, a son is needed to assume his father's place, or, if he is young, do such things as shine shoes to make temporary income. Women, it is felt, do not have the capacity to do anything other

than beg. They are additionally hampered by the traditional belief that it is impossible for one to reach heaven unless a son lights his funeral pyre.

As a result, female infanticide is not an uncommon practice. One common method is to pour scalding soup down a newborn's throat before burying it under a pile of cow dung. The reason most often cited by mothers utilizing such practices is that they cannot imagine ever being able to pay the dowry the child would engender. In the state of Tamil Nadu, it was found that half of the 1,250 women surveyed admitted to killing daughters for this reason; thirty-eight percent said they would do it again if they had another daughter (Tobias, 1998, p. 116). Bolstering the idea of the perceived uselessness of females is the fact that, as late as 1973, female mortality among children was ten times higher than male mortality.

Furthermore, a survey of abortion clinics in the city of Mumbai found one aborted male fetus out of thousands of female ones. Such practices have led to demographic losses; in the 1991 census, twenty-two million girls were declared to be "missing". The grim statistics continue. About seventy-five percent of all marriages include a wife who is a minor. Of the twelve million girls born each year, one quarter die before they are fifteen years old (Tobias, 1998, p. 115). Most tellingly, India is one of the few nations where female life expectancies are lower than male.

Problems with Implementation

Another obstacle to effective administration is the bane of all bureaucracies - corruption. Incentive schemes are still in place to promote sterilization, providing financial rewards for both doctors and clients. This, of course, enables both parties to be less than honest about the process in order to get their money. For example, at the First Conference of the Central Council of Health and Family Welfare in 1988, it was stated that the family welfare program had had a record 20.5 million fresh acceptors. It was discovered, however, that seventy-five percent of these were over the age of thirty and had already had four or more children (Tobias, 1998, p. 125). At the same time, some of the entrants had undergone repeat vasectomies to obtain the 180 rupee prize. The surgeons had to have been accomplices, seeing as it should be easy for them to notice if a vasectomy has already been performed. Old men were also occasionally sent in for sterilization to meet quotas. Female sterilizations, however, are the greater prize, because they come with a 250 rupee incentive. For a poor woman, this amount can literally mean the difference between life and death. Since *dais* (village midwives) are also allowed to receive compensation, their practices have shifted away from providing basic health care towards becoming sterilization advocates. A new phenomenon has arisen to meet the demand artificially generated by the *dais* and the incentive

schemes: "speed doctors". These sometimes perform between 300 and 500 female sterilizations a day, when the maximum theoretically possible should be fifty. The conditions under which these doctors practice is often unhygienic and potentially deadly. In 1988 a sterilization camp in Rajasthan was found to be using a bicycle pump to pump air into women's bodies; in the two years prior, forty-four women had died at the camp (Bandarage, 1997, p. 77). Many of these women receive no postoperative care and suffer lingering aftereffects years after the operation. This often makes them incapable of performing stretches of hard physical labor, which is nearly always required in any paid job they could apply for.

Yet another obstacle is the state of contraception in both the country itself and in people's minds. Following the 1984 Union Carbide disaster in Bhopal, the Indian government disassociated itself from the company. Unfortunately, Union Carbide happened to be the distributor for fifty percent of all condoms in India; their departure severely hampered the country's condom supply (Tobias, 1998, p. 118). Nevertheless, this is not enough to explain the low condom usage in India, which attempts to maintain a supply of two billion. Instead, there appears to be public discomfort with their usage, as people of all levels of society profess ignorance of how to use condoms. The Chennai branch of the Family Planning Association of India once admitted to having buried tens of thousands of unused condoms because they were embarrassed that they had been unable to distribute them due to low demand. Part of the problem with Indian condoms is that the

quality of their manufacture is erratic. Tearing is fairly common, caused when the speed of semen hitting the tip breaks hidden defects in the latex.

The government's insistence on the use of sterilization, while praiseworthy in its way and certainly a definite solution (albeit long-term) to the population problem, is blinding it to the use of other, more temporary solutions. Local family planning officials are fixated on the use of sterilization to the point where they do not know what stage of a woman's menstrual cycle she has the most risk of getting pregnant (Conly & Camp, 1992-b, p. 38). Furthermore, officials have tended to ignore the fact that people normally undergo sterilization *after* they have already had the children they want. Even the CPR figure of forty-three percent is suspect, because the larger part of this is composed of older couples. The prime reproductive age group of couples aged fifteen to twenty-nine only has a CPR of sixteen percent (Tobias, 1998, p. 119). This bracket is understandably reluctant to undergo the sterilization option espoused by the government. Although abortion has been legal for the first twenty weeks of a pregnancy since 1971, it is not widely perceived as a valid contraceptive choice. Even should a woman wish to receive one, only about ten percent of rural clinics are equipped to perform them (Tobias, 1998, p. 119). The central government is beginning to attempt to switch towards the introduction of more high-tech solutions like Depo-Provera and Norplant. However, these suffer from licensing and testing holdups from the Drug Controller's Office, lack of experience and training of medical staff in their use,

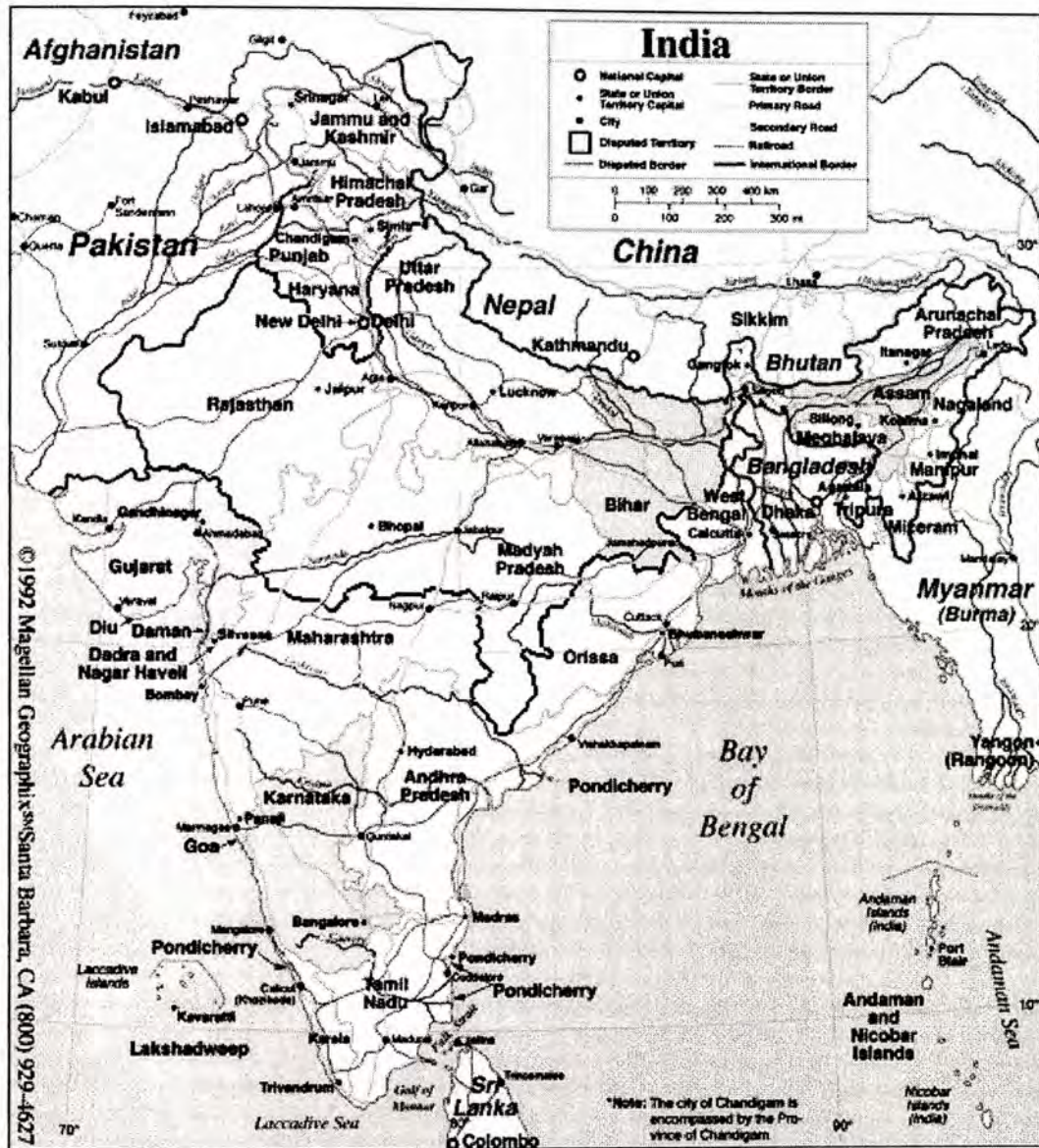
inadequate distribution networks and medical facilities in rural areas, and a general disinterest among the public for their use.

Cultural and religious identity also plays a role in India's difficulties with family planning. India has long been plagued by religious strife between Hindus and Muslims. This led to the creation of Pakistan in 1948 and that of Bangladesh in 1971 as a result of the Indo-Pakistani War. Part of the reason family planning has done so poorly in the north of India is this religious animosity. With Pakistan's burgeoning Muslim population nearby, no Hindu politician can safely advocate family planning without being denounced both by other Hindus for possibly weakening their military position and by the Muslim minority for being a racist wanting to keep it downtrodden. By the same token, should a Muslim politician advocate family planning, he is denounced as a fool, if not a traitor, and be answered by pronatalist sentiment. At the same time, India as a whole is quite aware that China has over a billion people along their northeastern border, and may, perhaps subconsciously, wish to have enough people to provide a counterweight. Another cultural impediment, the dowry system, has actually been illegal since 1961. Unfortunately, its practice is so ingrained that enforcement of this law has proven to be nearly impossible. Should the political will exist to enforce it, though, parents might be less eager to have more children. With the demand of a dowry for each daughter gone, more sons to make up for the financial drain would no longer be necessary. Female infanticide would also be significantly

reduced. In the long term, it would help eliminate the pervasive patriarchal bias in India.

A final obstacle to family planning is, perversely enough, that it is doing well in the states which are fairly minor, while the major ones continue to boom. The states and territories closest to achieving their family planning goals are Kerala, Goa, Tamil Nadu, and Chandigarh, all either smaller states or tiny island territories. Meanwhile, the ones needing help are Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh, all northern states. These four states represent forty percent of India's population, with Uttar Pradesh itself having over 150 million people. Map 1 shows how much area these states cover, illustrating how dire their lack of success is. Collectively, they have the highest infant mortality rates (over one hundred per thousand), the highest TFR (5.4), the youngest marriages (averaging at sixteen to seventeen), the fastest growth rates (2.2 percent), the lowest life expectancies (forty-nine for women, fifty-two for men), and the worst CPRs in the whole country (twenty-five percent compared to the national average of 43.3 percent) (Tobias, 1998, pp 117-118). These four states have been given the acronym BIMARU, which in Hindi means "sick" or "not so well". It is very possible that the performance differences exhibited are more related to culture than anything else. One study of two groups of immigrants, one from Tamil Nadu and one from Uttar Pradesh, living in a "multicultural resettlement colony" (read: glorified slum) in New Delhi found that they were exposed to similar economic and social conditions

Map 1: BIMARU Region of India
(outlined in bold)



at home. Despite this, those from Uttar Pradesh tended to be more prosperous with an average household income 10 percent higher and an average individual income fifty percent higher than those from Tamil Nadu. They tended to have more regular employment and less debt, and were more likely to have electricity and a private water supply. Nevertheless, those from Tamil Nadu tended to have lower fertility and lower infant mortality. Furthermore, the higher mortality rates common for female children did not occur in the Tamil families. These findings exactly mirrored the actual conditions in the different states; it appeared to make no difference where the inhabitants lived. The explanation offered by the study was that Tamil women stopped having children earlier, either through sterilization or greater use of contraception (used by half of Tamil couples aged thirty to forty-nine, but only one-third of those from Uttar Pradesh). The reason for this was that Tamil households did not seclude their women as much, allowing them more exposure to the world, particularly to India's family planning campaign and contraception. Tamil women were also more likely to find paying jobs than women from Uttar Pradesh. Additional children tend to be more of an interruption and drain on working women. Educational level among the women, however, was not found to be a significant factor, as the cultural differences in family size occurred even with uneducated women (Ehrlich et al, pp 91-93).

Success Stories

This is not to say, though, that the education of women is not an important factor in India. Many studies have shown that increased education correlates highly with reduced fertility. The policies of both Kerala and Tamil Nadu states help to underscore this point. Kerala has historically been more generous in its treatment of women than the rest of India. This may have had to do with the fact that, unlike other states, inheritance passes through the mother rather than the father. Early governments and missionaries helped establish educational and health care systems. These were effective enough that, even today, females actually outnumber males (1032 for every thousand) and the female literacy rate is higher than the male (ninety-three percent versus ninety-two percent) (Tobias, 1998, p. 131). In the 1930s, men from outside Kerala complained that their women actually saw their education as a means to compete in the job market. Upon the introduction of contraceptives in the 1960s, their utility was immediately seized upon by the women in Kerala. They could understand what contraception offered, and since most were gainfully employed, they knew what the costs and benefits of having children were. By 1988, the CPR in the state stood at an incredible eighty percent (Tobias, 1998, p. 131). Today, the TFR is down to around 2.0 and infant mortality is twenty-two per thousand (Conly & Camp, 1992-b, p. 18). In all demographic categories, Kerala has the best showing of any Indian state.

Tamil Nadu, Kerala's eastern neighbor, is second-best, with a TFR of 2.6, a combined literacy rate of fifty-five percent, and an infant mortality rate of fifty-seven per thousand. This last is the most impressive, seeing as it has dropped by over thirty since 1980 (Tobias, 1998, p. 131). Tamil Nadu's history, though, more closely resembles the rest of India's, and the state is thus seen as a more realistic model for improvement than atypical Kerala. Although several tactics are in place in the state, the most original and noteworthy has been the Mid-Day Meal Scheme. Instituted in 1982 by then-Chief Minister Dr. M.G. Ramachandran, its aim was to prevent protein deficiency in schoolchildren by providing them with a hot meal of rice and vegetable curry every day. The cost of the program, nearly seventy-five million dollars, represented nearly one quarter of the family planning budget for the whole country, and was paid by the state rather than the federal government. It entailed not just feeding almost a million children every day, but providing one hundred thousand pregnant women health food packets each afternoon, as well as employing 200 thousand women who are otherwise destitute to distribute the food (Tobias, 1998, pp. 131-132).

The success of Tamil Nadu appears to provide an object lesson for the other Indian states. Although it is still too early to see direct demographic effects, health among children and mothers has been improving and literacy rates for both boys and girls have been increasing among the people of Tamil Nadu. Parents now want their children to stay in school, because it is often the source of their best meal of

the day. While such a program would probably not work in all states, it nevertheless represents unusual political will by the state government. If all state governments could craft their own unique programs and have the will to support them, perhaps India could see a light at the end of the population tunnel.

CHAPTER 5

COMPARISONS AND CONCLUSIONS

China's family planning program represents an incredible expenditure of political will, with provincial and local officials often willing to go the extra mile to help their country. The central government has basic goals set, and leaves the actual procedures up to the individual provinces and regions. It has done its best to ensure an adequate support system throughout the country, and has given the program top priority, with multiple administrative departments and economic sectors involved in its implementation. Of course, the basic problem with such massive involvement is that the prospective parents are besieged by societal and governmental pressure from all sides. The levels of pressure are so high that they are probably only possible in an autocratic system, and keep the program from being able to truly call itself "voluntary". Despite this, over the last decade reports of out-and-out physical coercion, including forced abortions and sterilizations, have become rare. Such actions are, of course, officially forbidden, and the government has enacted reforms that may aid in combating them, but actual accountability or

oversight is difficult to determine. Another disadvantage is that political leaders are setting unrealistic or undesirable goals because they have not availed themselves of the knowledge of specialists in the field. Such an attitude is perhaps an outgrowth of the Cultural Revolution, where intellectuals were scorned and persecuted because of their supposed lack of devotion to Party ideology. For example, the one-child policy itself, although the result of a scholastic paper published in a journal, was implemented without any direct consultation with demographic experts. These would have preferred that China's family planning program, which had already shown remarkable gains before 1979, been gradually escalated instead. They fear that successful implementation of the one-child policy will distort the "population pyramid", creating a small labor force insufficient to meet the needs of a large elderly population. At the same time, officials have set family size goals without discussing their intent with the public, whose preferred family size is often much larger. Furthermore, disincentives have become a greater lever to ensure compliance than incentives, making the family planning workers people to be feared rather than trusted. However, enforcement of these punishments tends to be erratic, particularly in the countryside, serving to undermine government authority in the long run.

In fact, this last speaks of a larger problem, which results from the lack of central authority. Problems with or abuses by any local or even provincial family planning official can go uncorrected, simply because the State Family Planning

Commission remains unaware that they exist. Simultaneously, varying priorities among the different provinces results in uneven policy implementation.

Enforcement is usually stricter in urban areas than in rural, but even in rural areas there is a wide continuum of levels. Supplies of short-term contraceptives such as condoms are often short on the village level, despite the massive stockpiles available. Although a comprehensive network of clinics exists, China is still large enough and poor enough that some people's planning needs still go unmet. Among these people are adolescents, which the government has until recently denied exists as a problem area despite evidence to the contrary, and the 120 million residents of the 300 poorest rural counties (Conly & Camp, 1992-a, 32). It has proven difficult to train adequately the huge numbers of workers needed to staff all the extant clinics; although they tend to be fairly knowledgeable about popular contraceptive methods like the steel-ring IUD, specifics on newer methods can befuddle them.

India's family planning program, on the other hand, is unfortunately more noteworthy for its weaknesses than its strengths. The central government has established a fairly well-structured hierarchy for dealing with population control. It also has considered it an important enough issue to maintain funding at nearly constant levels. However, consistent political support on the national level for the program is lacking, and has been ever since the Indira Gandhi debacle of the mid-1970s. Support on the state level has also been weak, with the exception of a few such as Kerala, Tamil Nadu, and Maharashtra. At the same time, with the

changing of ruling parties and coalitions comes a shuffling of offices and officeholders. Few in the bureaucracy of the Ministry of Health and Family Welfare stay in one post long enough to make a difference. Indeed, between 1980 and 1988, there were five different appointments to the post of Additional Secretary for Family Welfare (Conly & Camp, 1992-b, p. 22). Nearly all the authority is located at the center, which gives authorities at the state level almost no authority to modify the official policies based on local conditions. Similarly, local level staffs cannot determine particular resource allocations handed down from the state level

On paper, the official family planning policy is comprehensive in approach, seeking to incorporate family planning as part of a broader maternal and child health care program, as well as calling for the use of multiple methods of contraception. However, there are wide gaps between the plan and its practice. Its success depends on demographic goals experts consider unrealistic. For example, up through the early 1990s, the official family planning program goal was to achieve an average family size of two children by the year 2000 (Conly & Camp, 1992-b, p. 23). This was despite clear indications that this was quickly approaching the realm of fantasy. Similarly, such a level was expected to be achieved by raising the CPR to sixty percent. However, Punjab, a fairly wealthy state, currently has a TFR of 3.4 *despite* having a CPR of sixty-eight percent (Tobias, 1998, p. 119). Experts suggest that only a CPR on par with Kerala's – seventy-five to eighty percent - have any hope of bringing the country's TFR to replacement levels. At

the same time, there are many organizational turf wars in the central government as a result of this comprehensive plan, with various ministries squabbling over whether or not certain facets such as female education fall under the purview of family planning. In addition, as already mentioned, the government retains a bias towards the use of contraceptive sterilization as opposed to other methods. There are too few workers to service the rural population, particularly in the northern states, which are the most conservative and thus should receive the most personnel. Finally, many of the family planning personnel are inadequately trained, thanks to a lack of public health curricula in Indian medical colleges and shortages of educational materials. A 1987 survey in Uttar Pradesh revealed that fewer than one-fifth of the doctors assigned to primary health centers had been trained to perform IUD insertions, early abortions, or female sterilizations (Conly & Camp, 1992-b, p. 37).

The emphasis on meeting targets is partially an illusion, as lower-level family planning officials perceive that their positions depend upon it. This could be the case, or perhaps it is a remnant of the bad old days of the Emergency, when officials' jobs truly did depend on it. Nevertheless, it is the reception of these signals which has led to the occasional abuse of authority, particularly at the end of the fiscal year. It has also contributed to overall loss of quality in medical care and the treatment of women as cattle, as surgeons rush to accomplish as many procedures as possible. Another contributing factor is the question of payments for

sterilization. Admittedly, poor women may be desperate enough to undergo the procedure for the money, but it is really too small to induce most women on its own. Surgeons and other family planning staff have had a vested interest in promoting sterilizations because, although the payments to them are small, cumulatively they can be quite handsome. It has been argued that the payment scheme continue only for the patients. However, another argument against it is that the more resources are spent on enticing people, the less remains for other items such as temporary and reversible methods, counseling, and education. Compensatory payments have been estimated to take up between ten and fifteen percent of the family planning budget (Conly & Camp, 1992-b, p. 28).

Country Comparisons

Can the policies of either country be transferred to the other? China's current policy implementation procedures are probably only possible in a non-democratic society, where the central authority can speak with a single voice and exert a single will. This is aided by the fact that the ministers and policy makers serve for relatively long terms, allowing for continuity in the implementation of policy. For all its virtues, a democratic society is often unable to come to a consensus on any number of issues. Barring extraordinary circumstances, the

leadership cannot mobilize a united political will on any single issue. India is a prime example of weakened will. The politicians know that population control is an important issue. Many can at least guess at the problems it will cause in the near future. Yet, thanks to public backlash against it almost twenty-five years ago, no prime minister is willing to acknowledge it as a national priority or devote resources to it on anything approaching the level the Chinese have. In fact, India's best results in population control have occurred in a period when the leaders were acting in a state with extraordinary power and void of civil liberties – in short, an autocracy. India's aggressive roundups of nonsterilized couples were an even more aggressive form of coercion than the social jabs and peer pressure imposed by China.

Both countries suffer from a few of the same maladies. For example, both have problems properly training their family planning staff in the local clinics. Both have problems providing everyone with access to a local clinic. Both have trouble maintaining a steady stream of supplies and materials to all their clinics. All of these are merely a function of their mutual large size and variegated terrain. The only way these problems can be solved is to throw more money at the problem to improve services; unfortunately, money is one thing that is always in short supply.

Another commonality is the establishment by the central governments of sterilization targets to be met each year. In both countries, the attempts to meet these targets have determined job evaluations and have accordingly been the cause of abuses of power by officials. Interestingly enough, over the last two years, both

countries have begun experimenting with the abolition of such quotas in an attempt to determine if the goodwill generated by non-coercive behavior is enough to retain voluntary sterilizations at approximately the same level. Thomas Merrick is Senior Demographer of the Health, Nutrition, and Population department of the World Bank. As such, he has participated in the composition of many reports for the Bank in this area with the advantage of firsthand experience. He recounts:

We had quite a dialogue with the government of India in '95 and '96 which basically was the period in which we were preparing our new project, which was a reproductive child health project, which ...tries to put family planning in the context of meeting residual needs, a consumer focus rather than a top-down demographic approach. It was part of the process that led the government of India then to drop the targets and end this performance management approach. Where they tried to plan the work programs and then judge the performance of the workers on the basis of how well they are meeting consumer needs rather than serving this demographic imperative. (T. Merrick, personal interview, November 5, 1999)

Finally, the social and educational standing of women and/or daughters in both countries is fairly low, serving as an impediment to successful family planning policies.

The Food Situation

Another issue to be considered when dealing with large masses of people is how to feed them. Traditional Chinese agriculture could achieve support for seven people per hectare of arable land, assuming a return to a simple vegetable diet,

confinement to a few choice parcels of land, use of massive human labor, and constant recycling of manure. Unfortunately, the population is now thirteen people per hectare and rising. People have gotten used to eating a little meat with their vegetables as well. Agriculture today uses three times as much fertilizer as the United States but only achieves an eighty-seven percent yield because the land is generally poorer and the farmers are less experienced with modern crop hybrids (Grant, 1996, p. 113). The Chinese cannot return to organic agriculture with its lower yields, even if everyone returned to a subsistence diet. China is well into the “nitrogen trap”, with synthetic fertilizer being needed for forty percent of crop production just to avoid mass starvation (Grant, 1996, p. 113). All future population increase will depend on synthetic nitrogen despite its diminishing returns.

The situation is bad and is getting worse. There has been a six percent decline in arable land between 1970 and 1991, and the 1992 rate of loss to urbanization was equal to five percent per decade (Grant, 1996, p. 114). The land closest to cities, though, is usually the most productive because it receives the most nightsoil (contains recycled dead organisms). China’s arable land is also generally poorer than that of the United States, and had suffered severe soil erosion on fourteen percent of its total farmland by 1990 (Ehrlich et al, p. 175). There has also been a nine-fold increase in irrigation, but it is not certain that it can be supported; during the hot summer of 1995, 622 kilometers of the Yellow River, the

main irrigation source, went dry (Grant, 1996, p. 114). Disputed is the amount of grain China will need in the future. The Chinese government insists that production can be boosted to 625 to 675 million tons by 2020, which is forty-five percent above current production (Grant, 1996, p. 115). Most experts disagree, with one estimate predicting that 479 million tons of food will be needed by 2020, 207 million of which must be imported, assuming that the vegetable/meat ratio in the current diet remains the same. Otherwise, 641 million tons will be needed, of which 369 million must be imported (Brown, 1995, pp, 96-97). This figure represents twice the present level of total grain exports. In any event, it is uncertain that even current export levels could continue to be reliably imported. Should the problem of overpopulation continue to escalate, the relatively few countries with food surpluses would become harder pressed to meet the needs of the world's hungry. Consequently, food prices would rise to whatever the market would bear. China's "economic miracle" has progressed to the point where it could conceivably manage to afford these hypothetical market prices. However, the quantities it would probably need would not be available, and should it buy up all the remaining grain exports, nothing would remain for any other country.

India certainly would not be able to compete on the global market, although it would definitely need to. For all intents and purposes, the Green Revolution has run its course in India, and existing output has leveled off and begun sharp declines from its peaks in the 1970s and 1980s. In some farm regions, rice yields are said to

have dropped by half, and wheat yields by seventy-eight percent (Tobias, 1998, p. 263). However, food requirements are estimated to increase from 146 to 238 million tons per year before 2010. Furthermore, as of 1985, half of India's total surface area, 329 million hectares or 1.35 percent of the earth's total, was being deemed "wasteland", while nearly 260 million more are considered "moisture-stressed" (Tobias, 1998, p. 96). Population and farm densities roughly three times greater than the recommended amounts have overrun the lower slopes of the Himalayas. This has led to both a drying up of the mountain water supply and the intermittent destruction of one-sixth of the Gangetic plains due to the loss of natural controls over the flow at the Himalayan river sources. In addition, six billion tons of topsoil are lost every year to soil erosion. No further large-scale irrigation works construction is possible, and over a third of the existing works has been either clogged by silt or damaged by saline intrusion, contributing to the destruction of the land (Tobias, 1998, pg. 97). Table 2 outlines the availability of farmland and water per capita, as well as the quantity of forest land and grain produced per capita in India and China, and compares them with average global figures and those of the United States.

Table 2: Resource Availability in China and India
 Sources: Conly & Camp, 1992-a, 5; Conly & Camp, 1992-b, 4

Country	Arable land per capita (m ²)	Grain production per capita (kilograms)	Forest area per capita (m ²)	Annual renewable water resources per capita (m ³)
China	1000	360	1200	2.47
India	1954	223	661	2.17
U.S.	9733	1451	12467	9.94
World average	3200	310	9067	7.69

Immediate Lessons

Ultimately, it would appear that, despite serious food production troubles and ongoing problems with maintaining a low birth rate, China may be able to avoid a major demographic catastrophe. Through the forceful and steady direction of the government, it has not only managed to drastically slow its birth rate, but also to achieve an economic turnaround. This last, though, will probably prove to be a double-edged sword. It allows the newly rich the capability to emulate a more Western lifestyle of conspicuous consumption, with all the draw on natural and energy resources that that entails. As more people share in the wealth, the environmental damage and loss of food and water supplies can only increase. However, that burgeoning economy will be all that allows such a future China to save itself, by buying the supplies to keep itself afloat.

India is nowhere near so lucky. There, cultural, political, and demographic trends have all conspired to slowly sink the country into a morass of its own making. Without a firm hand at the tiller, the fractious federal system has all the states going their own way, resulting in practices which, although beneficial to the states themselves in the short-term, have resulted in long-term calamities. Despite the efforts of many hardworking people in India's family planning offices, the fertility rate does not appear to be declining significantly any time soon. In fact, this September India became the second country to pass the billion mark, and

accomplished it one year early. Food and water are already in short supply, and threaten to become even shorter, as millions of destitute people starve in city streets or village hovels. Economic indicators are dropping as population growth outstrips economic growth, lowering all per capita amounts. Ashish Bose, senior demographer and coiner of the term BIMARU, has proposed the creation of a “literacy corps of engineers”. He would mobilize the thousands of retired military officers and thousands more of unemployed college graduates with English literature degrees and put them to work in the countryside educating people. It is a novel idea, designed to try to boost employment nationwide and allow for a fertility drop by boosting literacy. However, the long term it requires may be longer than India can now afford.

Despite the basic incompatibility of their methods, which are largely suited to countries like themselves, India could stand to learn a few things from China. India’s stratified and regimented command structure discourages initiative and innovation on the local and state levels, which may be what is ultimately keeping them from success on the demographic front. By establishing a framework and letting the lower levels decide how to best achieve their goals, not only might the states find solutions that worked for them where the federally-mandated ones did not, but they would also diminish the image of the family planning agency as one controlled by a distant, unfeeling monolith. At the same time, its almost slavish devotion to the use of sterilization as a contraceptive tends to sour younger couples

who don't want something quite so permanent on the whole notion of contraception. It is these younger couples who most need to use some form of contraception. China, on the other hand, offers a comparative wealth of contraceptive choices, to the point where their use is generally understood and accepted.

This is not to say that India has nothing to offer. Although, on average, the status of Indian women is worse than that of the Chinese, several Indian states currently are innovative enough to use female literacy and education as a tool to help combat high fertility rates. While the Chinese do attempt to make certain quality-of-life guarantees as part of their policies, these tend to concentrate on survival of the elderly without children to provide for them. An emphasis on improving the educational standing of women, particularly in rural areas, might prove of use to the Chinese. Tables 3 and 4 will illustrate this point, with a perusal of Table 4 showing that, at least among the Indian states, there is a strong negative correlation between female literacy rates and total fertility rates, while an even stronger positive correlation exists between female literacy and contraceptive prevalence rates.

However, teaching an increasing number of women to read, a laudable goal in itself, still falls short of being a final solution. The World Bank, for one, holds that government programs need to work on several levels regarding the status of women. Mr. Merrick comments:

If you have a gender system in which women no matter what their level of education are still disempowered, that system can undermine some of these

Table 3: Demographic Figures for Indian States, 1991

Source: Conly & Camp, 1992-b, 18

State	Population (millions)	TFR	CPR	% Female Literacy
Kerala	29	2.2	80	87
Tamil Nadu	56	2.6	56	52
Karnataka	45	3.4	48	44
Punjab	20	3.4	69	50
Maharashtra	79	3.5	53	51
Andhra Pradesh	66	3.6	N/A	34
Gujarat	41	3.6	55	49
Himachal Pradesh	5	3.6	59	52
Orissa	32	3.7	45	34
West Bengal	68	3.8	55	47
Assam	22	4.0	43	N/A
Jammu & Kashmir	8	4.1	50	N/A
Haryana	16	4.3	50	41
Madhya Pradesh	66	4.7	39	28
Rajasthan	44	4.8	30	21
Bihar	86	5.3	30	23
Uttar Pradesh	140	5.5	28	26

Table 4: Correlation Between Indian State TFR, CPR, and Female Literacy

	TFR	CPR	Female Literacy Rate
TFR	1.000	-0.884	-0.862
CPR	-0.884	1.000	0.941
Female Literacy Rate	-0.862	0.941	1.000

effects. That is, you may have potentially this force working through education, but if women are turning around and marrying even if they're educated right back into settings where the husband decides everything, you basically undermine that whole process. The generalization holds, but with exceptions that force you to pay attention to these cultural variables. (T. Merrick, personal interview, November 5, 1999)

Emphasis also needs to be placed, for example, on combating high maternal mortality. Here, China takes the lead over India, with a rate of ninety-five deaths for every 100,000 births, a better rate than more developed countries like Argentina and South Korea. India's rate is a fairly high 570 deaths.

General gender empowerment initiatives are also useful, simply in that they expand the economic and intellectual horizons of women long accustomed to male dominance. The Grameen Bank is one such project, started in 1976 in Bangladesh by Muhammad Yunus, serving as a lending institution giving poor women start-up funds to establish small businesses, or "micro-enterprises". In this arena, China again has a strong position, with the female GDP per capita at 66.5 percent of the male's (comparable to the United States' 68.0 percent). The Indian woman's GDP per capita is only 37.8% of her male counterpart's. At the same time, a more egalitarian government ideology has enabled 21.8 percent of Chinese parliamentary seats to be held by women, a higher proportion than countries such as the United States, Japan, and the United Kingdom. Female administrators in China make up 11.6 percent of the total, and female technicians and professionals make up 45.1 percent. Indian females, by comparison, represent 8.3 percent of their parliament, 2.3 percent of their administrators, and 20.5 percent of their professionals. More

than anything, it is the interstate variation among gender systems in India that hampers further development of gender equality. While Chinese variations have been muted by a rigid central authority, the federal Indian system cannot impose much uniformity on its states.

Conclusions

This thesis began with the belief that the Chinese policy would serve as a better model than the Indian one largely on the strength of its authoritarian government. It was felt that such a government would be able to lay out a clear policy rigidly structured with clear lines of control moving down an established Party hierarchy. It would be able to impose its will on the provincial governments and the populace by making decisions that, while drastic and rather harsh, would serve to benefit the country in the long run. Without the need for elections, the government would be able to implement its policy with officials who had long experience in the area, making for a steady undertaking. In some respects, this has proven to be the case. China is indeed a preferable model to India. It has in fact imposed a harsh-seeming one-child policy on many of its people in much of the country in order to achieve the greater good. This policy has been implemented through a clearly organized hierarchy and has benefited from the political backing

and willpower it has received from the central government. Here, though, the expectations take a turn.

The Chinese central government began both its two-child and one-child policies by imposing strict control from the center, but with time they changed their approach. The State Family Planning Commission began to issue guidelines to the provinces, then let them decide how to best carry them out according to the individual needs of each province. In addition, it became more responsive to the needs of the people, particularly in the rural provinces, and began to allow for exceptions in the government's stated policy. Despite this, similar levels of success were seen during this period of change in the late 1980s/early 1990s as during the period of direct government control of the late 1970s/early 1980s. What has not changed over this period is the strong degree of support given to family planning programs by the central government. Although actual funding has been fairly limited until recently, it has done its best to establish a network of clinics extending into the hinterlands while maintaining an adequate supply of a range of domestically-produced contraceptive materials and a decently trained workforce.

By contrast, India's population policy is plagued by the hardships imposed by a democracy. It remains difficult to achieve a political consensus on what course to take. The different states wish to follow different tacks and have different priorities. Some do not feel family planning is an issue at all. Nevertheless, its main problem with implementation is that it is not structured to take state needs into

consideration, as one would expect of a democratic system. Instead, it is incredibly centralized, with the national family planning organization dictating exact policies and spending guidelines to the states, who then have little leeway in adjusting them for local conditions. Both the differing state attitudes and the unforgiving family planning regime have led to a shoddy, haphazard execution. Although the country has attempted to implement a comprehensive plan, lack of training, materials, and public acceptance have combined to keep the comprehensiveness on paper only. Unfortunately, India's best successes have come either from states that are acting apart from the national organization, footing their own bills, or when the central government was acting in an imperious manner, as in the Emergency of 1975. Thus, the state with the autocratic government has a population policy that might best be described as democratic, while the one with the democratic government has a policy that has best functioned in an autocratic environment.

Perhaps the solution lies with culture and its relationship with central government. It has been argued that the Chinese might have been able to stabilize their population with the two-child policy without having to resort to a one-child one – it simply would have taken longer. According to the argument: “the changing, especially the bringing in of a market economy and the pressures on families to educate their children, housing pressures in the cities, were quite substantial. That in fact there was a preference for choosing smaller families anyway.” (T. Merrick, personal interview, November 5, 1999) It is possible that

the preferences changed because the Chinese culture is better suited towards taking a longer-term view. At the same time, since Confucian times the culture has had a predisposition towards accepting the will of authority and putting one's trust in its moral certitude. Although such faith in the family planning authorities has made abuses like forced abortions possible, one can say that it has been rewarded by the 1990 Administrative Law, which allows citizens redress for such abuses. Indian citizens, on the other hand, have not shown any propensity to think towards the long-term. As the massive deforestation and species extinction rates of the country show, the country has traditionally been geared towards short-term profit-taking. Their faith in the government, democratic though it may be, has been shaken in part by the abuses carried out under the aegis of the family planning program. The poor tend to bear the brunt of these abuses and, unlike the Chinese, they have no method of redress. This may be a cause of feelings among the Indian poor that their "democracy" is designed for the elites of their country at their expense.

Culture is probably the determining factor in the status of women in both countries as well. As Mr. Merrick's comment suggests, it is the creation of an enabling environment that is most important. No matter how much education a woman receives or how much money is given her or how healthy she is, she cannot achieve any sort of power if the prevailing system will always conspire to keep her in a subordinate position. This is where India's fatal flaw lies – up until now, its culture remains apprehensive of the archetypical strong capable woman,

stigmatizing her. The Chinese, true, also have a stated preference for sons. This, though, is not so much a cultural stigma as a labor necessity. It is entirely possible that, should the economic realities of the country make it possible for the people to have a solid social safety net, it would not matter at all what sex the child was.

If culture is indeed the most important variable, then perhaps what is needed is a medium with great popular appeal and the ability to slowly change social mores. If such a medium were properly tapped by a government wise enough to take a long view and “bite the bullet” now for the rewards of the future, it might make a significant change in the perception of family planning efforts by the public. It could also be used to promote the acceptance of educated women in highly visible roles. While it may sound farfetched, all it might take is creative television programming to achieve greater gender equality and complete demographic transitions. Certainly, some form of popular media that is able to achieve sufficient appeal to positively influence the whole culture would provide a definite contribution to the population policies of both states. For although China and India have made significant progress along their transition to low fertility rates, many pitfalls still lie ahead.

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