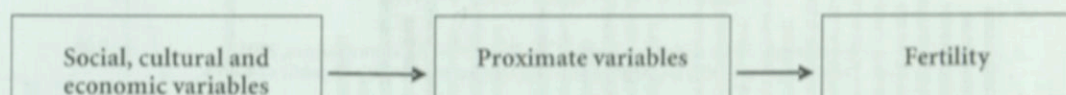# Determinants of Asian Fertility Decline

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It has been widely accepted that fertility levels and trends were shaped by social, economic and other intermediate determinants on one hand, and by proximate determinants on the other. Any change in individual fertility must occur through an alteration of one, or of a combination of several of these variables. As noted by Freedman (1986): «The proximate variables stand between fertility and all other preceding variables. They immediately determine fertility, and all other variables act through combinations of them».

ulation in urban areas, percent literate among female population and population employed in agriculture.

The data in Figure 1 demonstrate that the relationship between the TFR and life expectancy in Asian countries is a significant and positive. The life expectancy is low for those high fertility countries such as Afghanistan Cambodia, Bhutan, Pakistan and Lao People's Democratic Republic whereas life expectancy is the highest in all low fertility countries.

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┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│ Social, cultural and│ ───→ │ Proximate variables │ ───→ │     Fertility       │
│ economic variables  │      │                     │      │                     │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘
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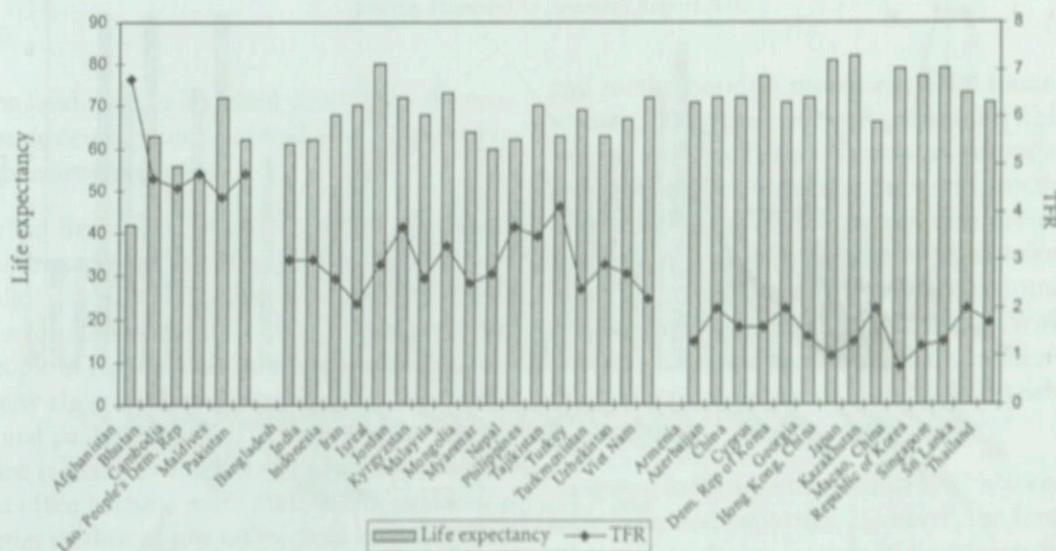
Intermediate determinants of Asian fertility decline

To order to examine intermediate determinants of fertility transition, the following conventional indicators used for this purpose: life expectancy at birth, GNI per capita (US$) adjusted for purchasing power, percent of pop-

Income is clearly linked to fertility levels across and within countries. Socio economic conditions of low fertility countries have provided strong motivation for couples to desire having a small fertility, and fertility control has became socially and culturally acceptable (Chesnais, J. 1992). Generally, women in richer countries have fewer children than women in poorer

Figure 1: TFR and Life expectancy

Source: World Population Data Sheet of the Population Reference Bureau, 2005

Figure 1: TFR and Life expectancy

Source: World Population Data Sheet of the Population Reference Bureau, 2005
Note: Data are not available for Afghanistan and Democratic People's Republic of Korea

ones. By contrast, high fertility remains in low income countries.

Although income levels and poverty thresholds are difficult to compare among countries, the relationship between GNI per capita and fertil-

ity varied much among countries, but in this study on the relationship between GNI per capita and fertility has not much relationship especially for those low fertility Asian countries. Figure 2 shows that, although fertility level is low as below replacement, Armenia, Azerbai-

Figure 3: TFR and Percent Urban

Source: World Population Data Sheet of the Population Reference Bureau, 2005

jan, China, Georgia, Kazakhstan, Sri-Lanka and Thailand has much lower per capita than rest of the low fertility countries. Israel is the only country which has high income among the intermediate fertility countries.

One of the salient features of demographic dynamics has been the increasing concentration of population in urban places, a process termed urbanization. This process involves the movement of people from rural-agricultural settings to urban-industrial, commercial and administrative centers in search of employment, educa-

urban areas and spreads to rural areas. Indeed, urban fertility has consistently been found to be lower than rural fertility.

Among the Asian countries, the percentage of urban is the highest in Hong Kong, China, Macao China, Republic of Korea, Japan and Singapore - has low fertility. In a few low fertility countries, most notably Azerbaijan, China, Sri Lanka and Thailand have same percentage of urban as intermediate fertility countries.

Increasing female literacy and employment lower the uncritical acceptance of childbearing

Figure 4: TFR and Adult literacy for female population
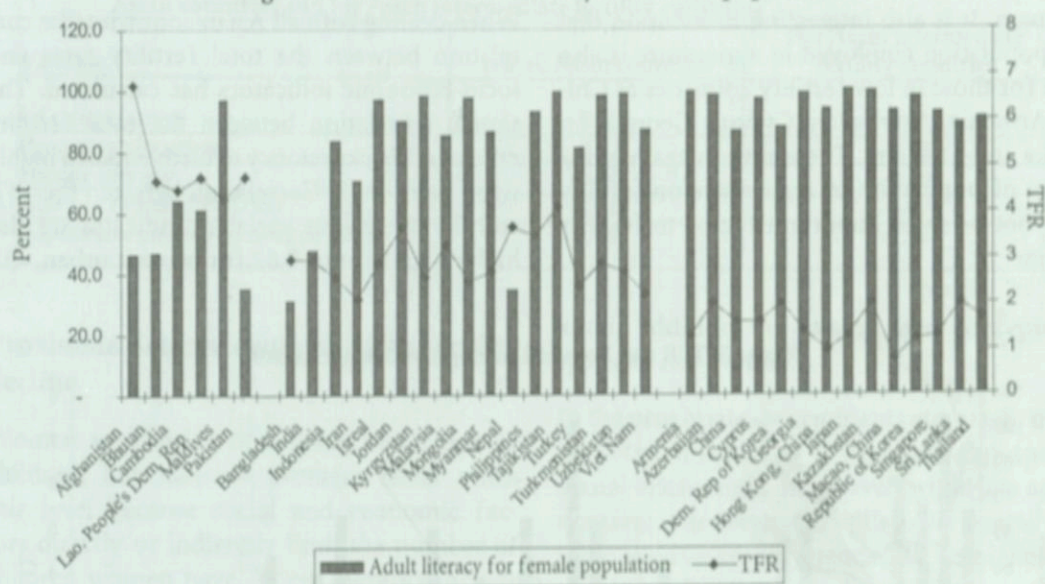
Source: Human Development Report 2005

tion, and a better standard of living as the economic development and trade were centered in urban areas and cities.

Urban living also raises the cost of dependent children to a nuclear family (education acts and child labor acts increase dependency). Partly due to education and access to family planning, people begin to assess more rationally just how many children they desire or need. Once traditional patterns of thinking are broken the decline is likely to accelerate. People in urban areas often become more materialistic and seek a better quality of life rather than large families. To the extent that fertility transition is often viewed as a diffusion process that begins from

and motherhood as measures of the status of women. Valuation of women beyond childbearing and motherhood becomes important. In addition, as women enter the workforce their life extends beyond the family, and the connections they make with other women serve to break their isolation and change their attitudes towards the burdens of childbearing. Within the family they become increasingly influential in childbearing decisions (Fehr,H & Jokisch, S & Kotlikoff, L, 2003)

As shown in Figure 4 the fertility level is lower in most educated countries. However, the female education is almost same in some intermediate fertility countries as low fertility countries, but fertility remaining still high. Also Maldives has

high literacy rate same as low and intermediate fertility countries, but fertility still high.

In general, the relationship between work and fertility is complex. Women who work in the urban have in higher status occupations and working away from home and have lower fertility than the rural ones. The opposite situation, the high fertility countries women in low status, low paid job because they are mostly in agricultural sector. For example, the TFR is highest in Bhutan among Asian countries, which is there almost 94 percent population employed in agriculture. (Figure 5) This situation is also similar for some intermediate fertility countries such as Nepal, India, Myanmar, Bangladesh and Vietnam. It is also interesting to mention that the population employed in agriculture is also high for those in low fertility countries as China, Armenia, Azerbaijan, Cyprus, Georgia, Sri Lanka and Thailand. These reveals again in the effect of population in agriculture on fertility may not be most important factor to fertility decline.

fluenced fertility decline in some low fertility countries, there have been notable exceptions. The case of Sri Lanka illustrates the crucial role of human development in the evolution of fertility decline. Despite the fact that Sri Lanka is still a low-income country, TFR dropped from around 5 children per woman in the late 1960s to the replacement level in the late 1990s. The main reasons cited for the sharp decline in fertility in Sri Lanka are the rise in age at first marriage, the increase in the proportions of women remaining single, the widespread use of contraception and an increasing percentage of temporal migration by young married women (Langford, 2001).

When dealing with all Asian countries, the correlation between the total fertility rates and socio-economic indicators has calculated. The simple correlation between the total fertility rates and life expectancy at birth equals a highly significant -0.79. Correlation between the TFR and the other four variables indicates are also highly significant: -0.62 for percent urban, -0.6

Figure 5: TFR and Population employed in agriculture
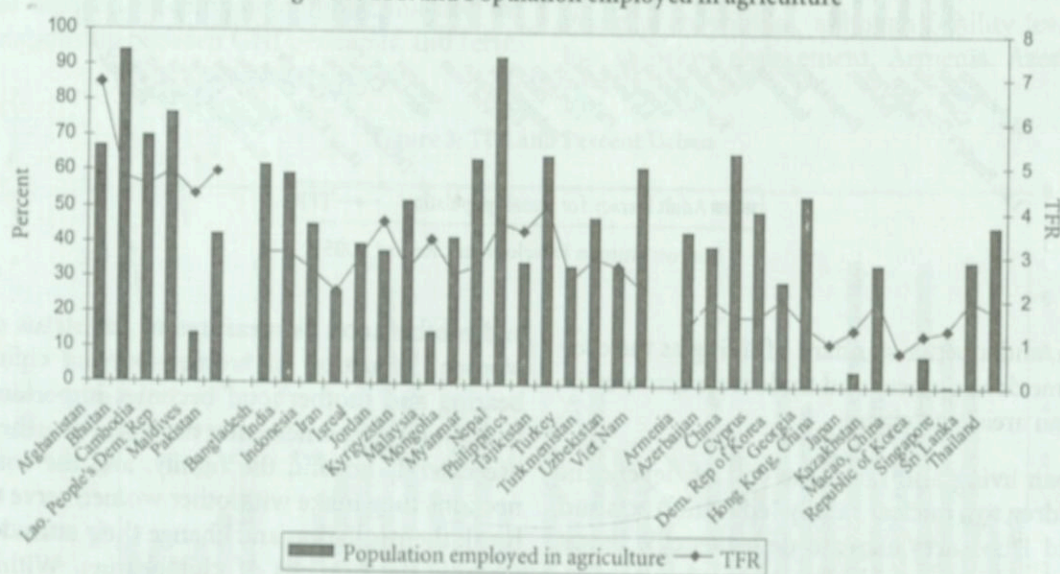
Source: Human Development Report 2005

It can be seen from the Figures that these low fertility countries, in general, have a high female literacy rate, a higher percentage of the population living in urban areas, higher income per capita, and higher life expectancies at birth. While socio-economic development has in-

for female literacy, -0.38 for GNI per capita (PPPUS$) and 0.56 for population employed in agriculture. For both the high fertility and low fertility countries, the correlation between life expectancy, GNI per capita (PPPUS$), female literacy, percent urban and population em-

ployed in agriculture, appears negligible (with R^2 around of less than 0.10) in all cases. It appears a bit better, but for weak for the intermediate fertility group (-0.14 for the association with life expectancy at birth, -0.13 for the association with the percentage of urban, -0.10 for female literacy, -0.07 for the association with GNI per capita and 0.28 for population employed in agriculture). These results suggested that relationship between socio-economic development and fertility levels can be still used to explain a country's fertility differentials and the overall fertility transition.

mined by the age at marriage, the proportion of women who never marry, and levels of divorce. Cultural mores about sexual activity and child-bearing outside marriage also play a role.

This section addresses the two major factors-marriage and contraception- that affect a woman's risk of getting pregnant, and hence, a population's fertility level and patterns. The remaining two factors that proportion of women of childbearing age who currently are unable to conceive a child and the level of abortion have not studied as these determinants have received relatively less attention in empirical research

Table 1. Correlation coefficients between TFR and socio-economic indicators for all Asian countries and for Asian intermediate fertility countries

Variable	For all Asian countries	For Asian intermediate fertility countries
Life expectancy	-0.79	-0.14
Percentage in urban	-0.62	-0.13
Female literacy	-0.60	-0.10
GNI per capita (PPPUS$)	-0.38	-0.07
Population employed in agriculture	0.56	0.28

Proximate determinants of Asian fertility decline

Women are capable of bearing more than 15 children, but national averages never reach this level because social and economic factors directly or indirectly limit the number of children women have. These fac¬tors include physical or biological impairments; marriage traditions; sexual mores; family size preferences; living arrange¬ments; job opportunities; child-care options; and many others. In the 1980s, demographer John Bongaarts identified four variables—referred to as proximate determinants—that directly affect fertility and explain most of the difference in fertility levels among countries: the proportion of women of childbearing age who are married or in a sexual union; the percent of women using contraception; the proportion of women of childbearing age who currently are unable to conceive a child (usually because of postpartum infecundity from breastfeeding); and the level of abortion. The importance of each of these factors varies across countries depending on the cultural and economic situation. For example, the proportion of women in a sexual union is partly deter-

and in addition, the data on these concepts are typically not available.

In the proximate determinants approach, marital status in intended to represent exposure to sexual intercourse. In general, while late age at marriage was associated with lower overall fertility, marital fertility tended to be higher for couples marrying later. In proportion with a fairly universal low age at marriage of women and high proportions of marrying, as in Bangladesh for example, marriage is strongly affect the level of fertility. As shown in the Figure 6 that these low fertility countries, in general, have lower proportions ever married among women aged 15-19. In contrast, proportions ever married are high in high fertility countries. The proportions ever married are much higher in Bangladesh, Nepal and India than other remaining intermediate fertility and high fertility countries. The relationship between marriage and fertility which has been supported by empirical research that age at marriage can be used as a policy tool to influence fertility (Farooq. G.M. & DeGraff. D.S. 1988). Most countries have legalized a minimum age at marriage, but in many Asian countries these laws are often

not enforced. In China, The Government made attempt to raise the age at marriage in order to reduce fertility.

tality rates and higher life expectancy at birth. All these indicators, along with advanced economic development, have created a favourable

Figure 6: TFR and percentage of woman ever married
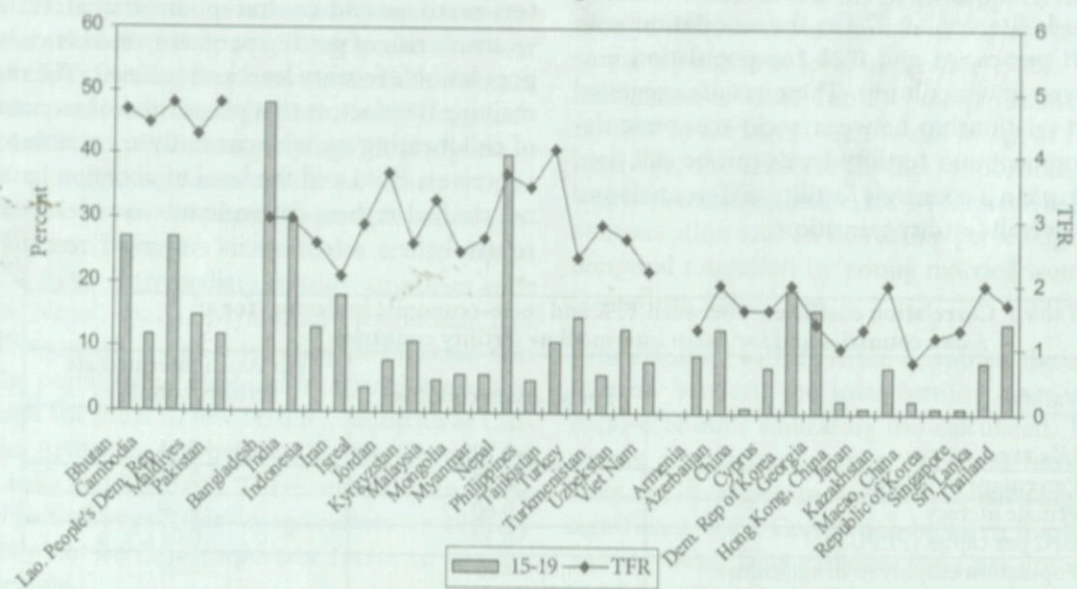
Source: United Nations Statistical Division, 2000
Note: Data is not available for Afghanistan

Improvements in contraceptive technology are now a major factor, but contraceptives were not widely available in the 19th century and so did not contribute to the European decline. Fertility decline is caused as much by changes in values about children and sex as by the availability of contraceptives and knowledge of how to use them. Today in the world there exist a close correspondence between fertility and contraceptive use, but this likely means that those families that have chosen to limit family size find contraceptives the easiest and most effective way to do so. In some countries birth rates fall more slowly or not at all because traditional religious beliefs inhibit the use of contraception.

In most countries, contraceptive use is the main proximate determinant of fertility and account for most fertility differences between countries. Low fertility countries as mentioned in the previous section that they have a higher female literacy rate, a higher percentage of the population living in urban areas, lower infant mor-

environment for contraceptive use, the rates of which range between 41 percent in Georgia, 55 percent in Azerbaijan, 56 percent in Japan and 86 percent in Hong Kong China and China.

Contraceptive use has generally reached a medium to high level with intermediate and low fertility countries. In Islamic Republic of Iran, Turkey and Vietnam, contraceptive prevalence has even reached 70 percent over, a level that comparable that low fertility countries. On the other hand, the countries with a contraceptive prevalence below 50 percent belong to the group of countries with the highest fertility.

One example of relationship between use of contraception and fertility is Thailand. The dominant factor in the rapid fertility decline in Thailand has been attributed to the success of the national family planning program implemented in the early 1970s. As a result, the use of contraceptives increased from about 34 per cent in 1975 to 72 per cent in 1996 and stands at 79 percent now (Ruffolo and Chayovan, 2000). Thus, the case of Thailand strongly suggests that

Figure 7: TFR and Use of contraception
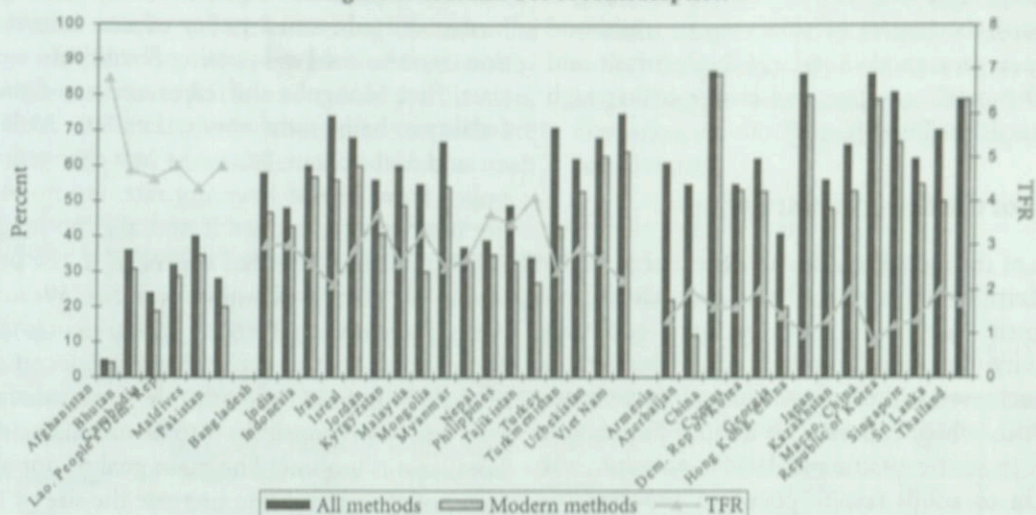
Source: World Population Data Sheet of the Population Reference Bureau, 2005

fertility transitions can progress rapidly when modern contraceptive methods are effectively provided in favourable social conditions where people are ready and willing to limit their fertility.

Role of the Mortality change

In a process of demographic transition, mortality decline usually takes place before fertility reduction. In many developing countries, including those in Asia, significant mortality decline took place without accompanying sub-

stantial socio-economic development. This was the mainly to importation of medical knowledge and technology from the West, and to the subsequent spread ideas of public health and hygiene programs through governmental programs. As a consequence of the spread of such imported modern public health and medical technologies, the reduction in mortality has generally been rapid in Asia since World War II. (Ogawa, 1994).

Among countries, those with high mortality almost always have high fertility while those with

Figure 8: TFR and IMR
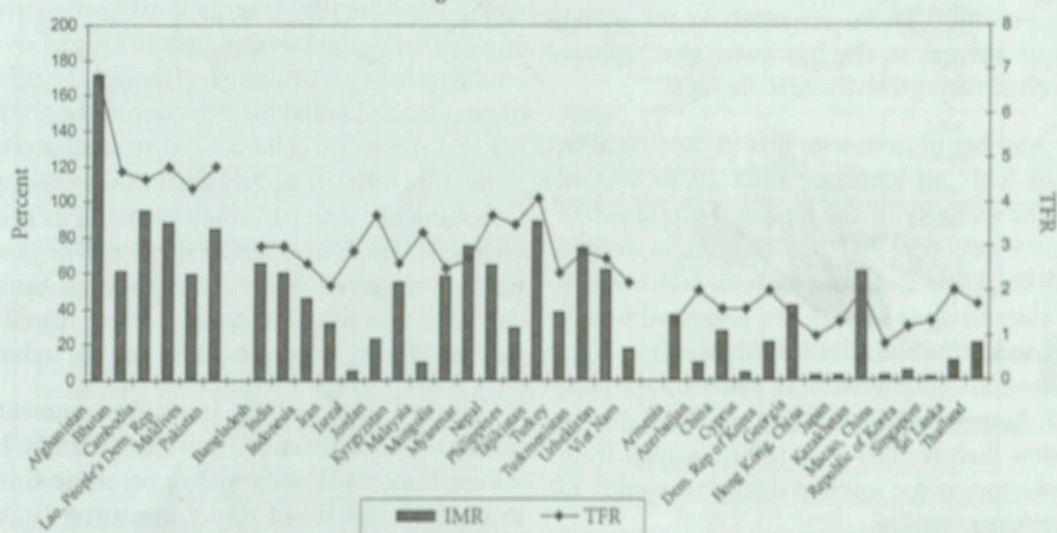
Source: World Population Data Sheet of the Population Reference Bureau, 2005

low mortality are usually characterized by low fertility. A crucial aspect of high mortality is that baby's chances of surviving to adulthood are not very good. Similarly, high infant and child mortality is one factor supporting high levels of fertility (Figure 8).

Role of the Government Policy

One of the most important factors for explaining fertility difference in Asian countries is government intervention. In developed countries fertility transition from high to low birth rates was achieved without government intervention. In Asia, which experienced a rapid population growth in the 1950's and 1960's, governments began to adopt family planning programs to curb population explosion of other regions of the world.

Soon after the ending of the Second World War, a baby boom period appeared in many countries. The high population growth rate was mentioned until the late 1960s. Total fertility rate in China and Republic of Korea were 6.1 and 4.6 in 1965-70 respectively. In Thailand, TFR reached 6, ranking fourth in South-Eastern Asian countries next to Vietnam, Cambodia and the Lao People's Democratic Republic. Even in urbanized country such as Singapore, the TFR was above 4 in the late 1960s. These extremely high fertility and growth rates shocked the Governments of Asian countries (United Nations, 1999). In 1976, two years after adoption of the World Population Plan of Action, over one third of Governments in the world and 41 percent in the less developed regions perceived their growth rate to be high.

The number of countries that viewed fertility as too high has increased since 1970s in Asia and the majority of the high and intermediate fertility countries has had policies to reduce fertility (Table 2). Countries with high fertility are more likely to have such a policy. Although Afghanistan concerns its fertility level too high, there seems no government intervention until now. Rest of the high fertility countries shifted to view their fertility level to be too high from satisfactory or too low and shifted to a policy to lower their fertility.

Among the intermediate fertility countries, In

the 1990s Jordan and Tajikistan also shifted to view their population growth to be too high. Jordan shifted from a policy of non intervention to one aimed at lowering fertility. In contrast, first Mongolia shifted to a view of their fertility as being satisfactory, then later Malaysia and Uzbekistan. Malaysia has changed its policy from one of lowering rate and no longer intervenes to reduce it and also no longer follows a target-oriented approach in the provision of family planning services. Western Asian intermediate fertility countries namely, Kyrgyzstan, Turkmenistan, Kyrgyzstan consider their population growth rate to be satisfactory and Israel considers it to be unsatisfactory because it is too low. The main goal of population policy in Israel is to increase the size of the population.

Singapore and Cyprus among low fertility countries shifted to a view of their fertility from satisfactory to too low in 1980s, then later in 1990s Japan, and in 2005 Armenia and Democratic People's Republic of Korea. China, Sri-Lanka and Thailand consider their fertility as being satisfactory and having a policy to maintain their fertility level.

Family planning has long been a core element of population policies and programs and central component of reproductive health. Since the World Population Conference at Bucharest in 1974, Government policies have shifted in the direction of increased support for services providing modern, effective contraceptive methods. At the 1994 International Conference on Population and Development in Cairo, Governments have particularly reaffirmed the right of couples and individuals to choose the number and timing of children and to have access to the information and means to do so. Many Governments support family planning as part of basic reproductive health services. The proportion of developing country women using contraception has grown from fewer than 10 percent in the 1960s to about 58 percent today.

To modify their fertility levels, Governments have used both direct and indirect measures. In earlier family planning programs, some Governments emphasized direct measures, establishing norm on the number of the children and spacing between them, using incentives

and disincentives, and targets for particular contraceptive methods. The leading type of incentive among countries seeking to lower the growth rate has been provision of free or subsidized contraceptives or services. Sterilization, IUDs, pills, condoms, and other methods are provided free of cost. In some countries cash incentives have been given to acceptors of sterilization operations, IUD acceptors and to motivators. Many Governments have introduced a variety of disincentives, with measures such as imposition of an extra tax, limiting paid maternity leave, or adjusting priority in housing or employment.

Table 2: Government views and policies on fertility in Asian countries

Country	View on fertility level				Policy to modify fertility			
	1976	1986	1996	2005	1976	1986	1996	2005
High fertility (TFR = 4.0 or higher)								
Afghanistan	Too high	Too high	Too high	Too high	No intervention	No intervention	No intervention	No intervention
Bhutan	Satisfactory	Satisfactory	Satisfactory	Too high	No intervention	No intervention	No intervention	Lower
Cambodia	Too low	Too low	Too high	Too high	Raise	Raise	Lower	Lower
Laos	Satisfactory	Satisfactory	Satisfactory	Too high	Maintain	Maintain	Maintain	Lower
Maldives	Satisfactory	Satisfactory	Too high	Too high	No intervention	No intervention	Lower	Lower
Pakistan	Too high	Too high	Too high	Too high	Lower	Lower	Lower	Lower
Intermediate fertility (TFR = 2.1-4.0)								
Bangladesh	Too high	Too high	Too high	Too high	Lower	Lower	Lower	Lower
India	Too high	Too high	Too high	Too high	Lower	Lower	Lower	Lower
Indonesia	Too high	Too high	Too high	Too high	Lower	Lower	Lower	Lower
Iran	Too high	Satisfactory	Too high	Too high	Lower	No intervention	Lower	Lower
Israel	Too low	Too low	Too low	Too low	Raise	Raise	Raise	Raise
Jordan	Satisfactory	Satisfactory	Too high	Too high	No intervention	No intervention	Lower	Lower
Kyrgyzstan	...	...	Satisfactory	Satisfactory	...	...	No intervention	No intervention
Malaysia	Too high	Satisfactory	Satisfactory	Satisfactory	Lower	Maintain	No intervention	No intervention
Mongolia	Satisfactory	Too low	Satisfactory	Too low	Too low	Raise	Maintain	Raise
Myanmar	Too high	Too high	Too high	Satisfactory	No intervention	No intervention	No intervention	Maintain
Nepal	Too high	Too high	Too high	Too high	Lower	Lower	Lower	Lower
Philippines	Too high	Too high	Too high	Too high	Lower	Lower	Lower	Lower
Tajikistan	...	...	Too high	Too high	...	...	Lower	Lower
Turkey	Too high	Too high	Too high	Satisfactory	Lower	Lower	Lower	Maintain
Turkmenistan	...	...	Satisfactory	Satisfactory	...	...	No intervention	Maintain
Uzbekistan	...	...	Satisfactory	Satisfactory	...	...	Maintain	Maintain
Vietnam	Too high	Too high	Too high	Satisfactory	Lower	Lower	Lower	Maintain
Low fertility (TFR = 2.10 or lower)								
Armenia	...	...	Satisfactory	Too low	...	...	Raise	Raise
Azerbaijan	...	...	Satisfactory	Satisfactory	...	...	Maintain	Maintain
China	Too high	Too high	Satisfactory	Satisfactory	Lower	Lower	Lower	Maintain
Cyprus	Satisfactory	Too low	Too low	Too low	No intervention	Raise	Raise	Raise
Dem. Rep of Korea	Satisfactory	Satisfactory	Satisfactory	Too low	Maintain	Maintain	Maintain	No intervention
Georgia	...	...	Too low	Too low	...	...	Raise	Raise
Japan	Satisfactory	Satisfactory	Too low	Too low	No intervention	No intervention	No intervention	Raise
Kazakhstan	...	...	Too low	Too low	...	...	Raise	Raise
Republic of Korea	Too high	Too high	Satisfactory	Too low	Lower	Lower	No intervention	Raise
Singapore	Satisfactory	Too low	Too low	Too low	No intervention	Raise	Raise	Raise
Sri Lanka	Too high	Too high	Too high	Satisfactory	Lower	Lower	Lower	Maintain
Thailand	Too high	Too high	Too high	Satisfactory	Lower	Lower	Lower	Maintain

Source: United Nations Department of Economic and Social Affairs/Population Division
(www.un.org/esa/population)
Note: Data are not available for Hong Kong, China and Macao, China
... - no information available

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