

Government-organized Distant Resettlement and the Three Gorges Project, China

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Resettlement of population displaced by major infrastructure projects is an important development issue with concerns about the economic, social and environmental consequences being paramount (World Bank, 2001; Cernea and

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McDowell, 2000; OED, 1998). Cernea and McDowell (2000:12) state that “the most widespread effect of involuntary displacement is the impoverishment of a considerable number of people”. They propose that socially responsible resettlement – that is, resettlement genuinely guided by equity considerations – can not only counteract this impoverishment but also generate benefits for both the national and local economy. The World Bank (2001) has indicated that the objectives in involuntary settlement should be as follows:

Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs... Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits... Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to beginning of project implementation, whichever is higher.

According to the Reservoir Development Bureau of the Ministry of Water Resources of China (1999), more than 83,000 reservoirs and dams were constructed in China between 1949 and 1998. The population displaced and to be displaced from these projects amounts to around 12.5 million. Before the late 1970s, vast displacement caused by dams such as Sanmenxia¹ and Danjiangkou² in China resulted in the impoverishment of dislocatees and in serious political and social instability in the resettlement areas. The Three Gorges Project (TGP) will involve resettlement of over 1.3 million persons over 17 years. When the entire project is completed in 2009, 13 cities, 116 towns/townships, 1,711 administrative villages and 17,160 ha of farmland will be submerged (CWRC, 1997). Even though rural relocatees to be displaced make up only 42.7 per cent of the total, the problems associated with their resettlement are generally greater than those associated with the resettlement of urban dwellers.

There have been two major policy adjustments during the history of TGP resettlement (Zhu, 1999). First, commencing in 2000, there has been a shift from a policy of settling rural migrants to uphill sites within the immediate reservoir area to encouraging rural migrants to move to more distant resettlement sites. Secondly, the policy of relocation of industrial enterprises in the reservoir area has shifted from simply re-establishing them at a destination to restructuring, merging and closing down small and unprofitable enterprises. This study examines the new government-organized distant resettlement (GODR) model of TGP. The first section analyses the rationale of the GODR scheme and this is followed by an examination of the nature of the scheme focusing on resettlement from one area to be inundated. Finally, there is a discussion of some important issues and problems related to the scheme.

The rationale for distant resettlement

Lack of land in the Three Gorges reservoir area

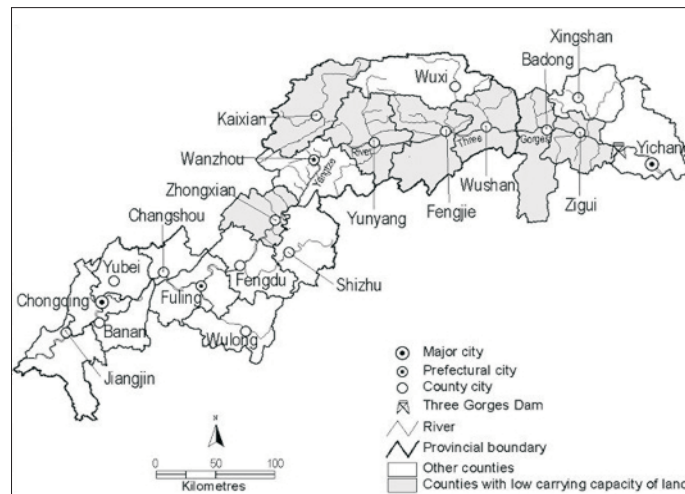
A survey conducted by the Changjiang Water Resources Commission (CWRC) in 1991–1992 in the reservoir area below the future 175-metre water level noted that 846,208 persons would be displaced (CWRC, 1993). This is called “the directly affected population” (*zhijie yanmo renkou*), whose housing will be inundated by the reservoir. Taking into account the natural population growth, the affiliated population of migrant households, the people displaced by land requisition for reconstructing new cities and towns, and some uncertain factors, the actual number to be displaced by 2009 will range between 1.13 million (REG, 1988) and 1.9 million (Dai, 1997).

The “near resettlement” scheme (*jiudi houkao*), by which rural migrants are moved uphill from the reservoir within their county of former residence, has been the main means to resettle rural migrants since 1993, when TGP was formally implemented. Other resettlement schemes such as “self-employed resettlement” (*zi mou*), “living with relatives or friends” (*touqin kaoyou*) in a city or town, “voluntarily-scattered distant resettlement” (VSDR) (*zizhu waiqian*) and “transferring rural migrants to secondary and tertiary industries” (*er san chanyei anzhi*) have also played a role in the resettlement of those displaced. The people displaced amounted to 457,035 by the end of 2001, among whom 231,959 were rural residents (Fang and Chen, 2002).

A major barrier to uphill resettlement is the limited carrying capacity which exists in that area, especially in the seven counties as shown in figure I. The total farmland to be inundated in this region will be 390,000 *mu* (1 ha = 15 *mu*) and the estimated total number of rural dwellers to be displaced as a result will be over 421,000. It is estimated that around 340,000 *mu* of cultivated land and orchards needs to be obtained in the upland area to accommodate this group. To do that will involve developing uncultivated land uphill, creating terraced land on slopes of less than 25 degrees, readjusting contract land from host communities and providing engineering protection of farmland in some areas. This farmland could resettle 340,000 rural migrants on the basis of 1 *mu* of farmland per capita, which the Government has promised to the migrants. However, the farmland to be flooded is much more fertile and more easily cultivated than the newly reclaimed land uphill, which generally has steep gradients.

This is especially difficult in the five counties Wushan, Fengjie, Yunyang, Kaixian and Zhongxian in Chongqing. The rural migrants to be displaced there amount to 223,000 and the farmland to be inundated is 215,000 *mu*. Yet the land available for resettlement is only 133,000 *mu* so that at least one third of the people displaced cannot be resettled locally because of land deficiency.

Figure I. Counties of uphill resettlement from the Three Gorges reservoir area, China



Fragile environments in the reservoir area

The massive floods in the Yangtze River and Songhua River catchments in the summer of 1998³ drew attention to the extent of environmental degradation along the Yangtze catchment. This increased awareness resulted in a change in resettlement policy. The environment of the reservoir area has suffered serious deterioration (Du and Yan, 1999). Water and soil erosion is the most significant environmental issue in the Three Gorges reservoir region (Lu, 1996). Owing to the complicated geological and geographical conditions in this region, landslides, mud-rock flows, droughts and other natural disasters take place frequently. Some bio-species have nearly become extinct. Pollution associated with urban areas in the region is becoming serious (Du and others, 1994; Chen and others, 1995).

Little attention has been paid to the interaction between displacement and environment. People displaced uphill may be forced to overexploit ecologically fragile areas, exacerbating the environmental degradation and especially worsening the soil condition by developing uncultivated land with steep slopes. Moreover, urban-based pollution and the inadequacy of sewerage disposal in rapidly growing urban areas in the region is exacerbating environmental problems (Gu and Huang 1999).

Soil erosion results in reservoir sedimentation, which will affect the longevity of the dam. Hence in 1998, the State Council of China (SCC, 1998) issued the “National Eco-environmental Construction Plan”, in which the Three Gorges reservoir area was listed as one of the key national regions where

deteriorating ecology must be reconstructed and a policy to stop cultivating uphill land with slopes of 25 degrees or greater announced. According to a study by the Chinese Academy of Sciences (GRICAS, 2000), among the currently available cultivated lands in the reservoir area, steep farmland with slopes of over 25 degrees makes up 18.6 per cent, or approximately 3.95 million *mu*.

Transferring rural migrants to secondary and tertiary industries

Over 4,000 displaced rural dwellers have been settled in secondary and tertiary industrial sectors in the Chongqing reservoir section, but 90 per cent of them have had to be resettled again. The bulk of them were received by local small enterprises or migrants' enterprises set up to resettle migrants. However, such businesses have been bankrupted or will be shut down.⁴ The original resettlement planning of 1988 intended for 40 per cent of the rural migrants to be resettled in secondary and tertiary industry (REG, 1988). That plan has proved to be overly optimistic because of changed macro- and microeconomic situations. The secondary and tertiary industries in the reservoir area are small or medium in size, with old equipment, backward management and narrow marketing channels; they generate pollutants and show poor economic performance (Wu, 1999). A total of 1,012 industrial and mining enterprises among the 1,599 enterprises affected by the project in the reservoir area have been identified as being unprofitable and are to be shut down, and of those, 1,008 enterprises are in the Chongqing reservoir section (CMG, 1999). The remaining 587 enterprises are about to be restructured and reorganized into 406 new enterprises (Fang and Chen, 2002). It is much harder in an intensively competitive labour market for the laid-off resettlers who have been resettled in secondary industry or service sectors to seek suitable new non-agricultural jobs than for other laid-off workers who are urban residents, owing to low education, lack of skills and lack of relevant social networks.

Problems encountered in the voluntarily scattered distant resettlement approach

There are 15,898 rural displaced people mainly from Yunyang, Wushan, Fengjie and Kaixian counties who have moved to Hubei and other provinces. That spontaneous mobility to locations beyond the reservoir area occurred prior to the development of a national policy on distant resettlement in 26 January 2000 (TGPPC, 2000a). However, these displaced migrants have suffered much stress owing to a lack of adequate compensation for their losses in being displaced.

Capital compensation and funding

Only migrants classified as "productive resettlement population" (*shengchan anzhi renkou*) are eligible to receive all the various types of compensation and funds. "Productive resettlement population" refers to persons who will lose their farmland or other production resources and need to be provided with land or means of production to restore agricultural production or job

opportunities for livelihood and production reconstruction. The average compensation and funding provided to this group of migrants is some 30,000 yuan (US\$1 = 8.27 yuan as at September 2002) (TGPCC, 2000b). Another group of migrants classified as “affiliated migrant family members” (*suiqian renkou*) are eligible to receive only some of the compensation and funds.

Displaced persons are required to discuss and sign agreements with the receiving county government (TGPCC 2000a). However, in practice, the migrants negotiate the provisions of their resettlement locations, contract for rebuilding houses and transfer of household registration (*hukou*) with town/township authorities. The migrants usually are allocated land to build houses and transfer their household registration for less than the compensation figure and the surplus from the compensation is retained by migrants. An official with the Distant Resettlement Division of Chongqing Resettlement Bureau explained that “migrants displaced by this scheme have kept 4,000-6,000 yuan per capita from the production resettlement fund, which was intended to be given to the host communities in the destination provinces for land supply, infrastructure and service access”.⁶ The governments in distant resettlement locations are now requiring the migrants to hand over the funding to the receiving communities.

Poor production conditions

The land provided in some receiving locations is not adequate for migrants to restore their agricultural production to pre-movement levels as the land is more often than not infertile or subject to frequent floods or droughts. However, the displacees would still accept it so that they can obtain the required “three certificates” from the local official institutions in the destination areas.⁷

Fake migrants

Some migrants have obtained compensation and funding from the VSDR scheme, but have actually remained in the reservoir area and worked in non-agricultural jobs or live on compensation, becoming “fake” migrants. It is hard to get an accurate figure for that group but they exist and potentially put stress on the resettlement institutions in the reservoir area.

Absence of preferential policies

Generally, migrants under the VSDR approach (implemented in 1997–1999) have not been granted preferential status in their distant resettlement. The people relocated in 2000–2002 under the GODR scheme enjoy three-years’ tax exemption for agricultural products, house reconstruction funding and taxation reduction during the transition period of resettlement.⁸ Those displaced under the VSDR approach have not been assigned a subsidy for livelihood restoration during the transition period after resettlement. Those families must pay transport fees because there is no funding for long-distance transport.

Other problems

A range of other problems include a lack of economic and technical support in the host communities to help the relocatees restore production; no farmland being made available to them or no non-agricultural job opportunities in most of the resettlement locations; difficulties in assimilating into and building new social ties in the host communities; resettlement locations are often ill-equipped to cope with the influx of new arrivals; and social instabilities in the host communities arising from clashes between the local authorities and/or the host people and the displacees, who view themselves as being disadvantaged and not receiving due recognition for their sacrifices.

Nature of government-organized distant resettlement

Scale

Generally, the GODR approach includes two schemes: moving rural migrant households out of the reservoir area to (a) 11 nominated provinces or municipalities, which will benefit from the services (flood prevention, electricity generation and navigation) provided by the project and economically developed areas on the east coast and in the middle and downstream areas of the Yangtze River basin (figure II) and (b) other non-flooded counties in the reservoir area.

Figure II. Origin counties and 11 destination provinces/municipalities, 2000 – 2002

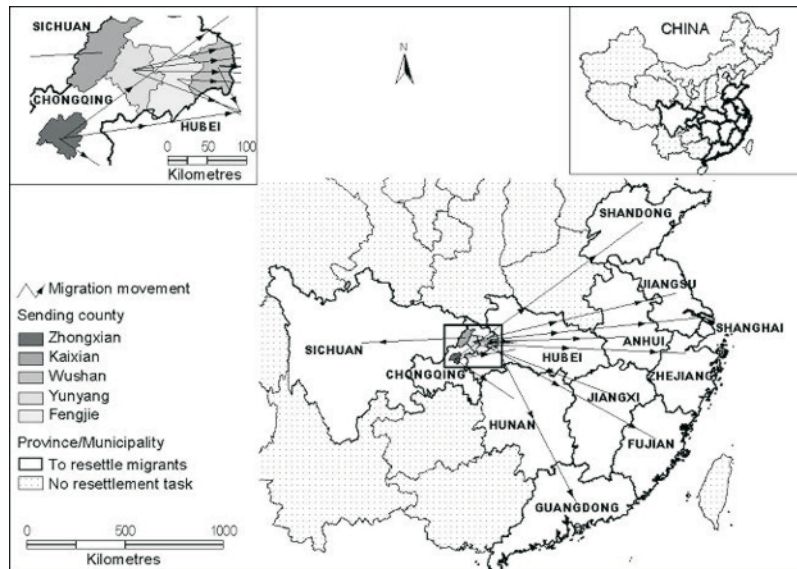


Table 1. Distribution of 100,000 rural dwellers to be moved out from the Chongqing reservoir section via distant resettlement schemes in 2000–2002

Origin county	Number of people to be moved out	Out of Chongqing		Within Chongqing		
		Recipient provinces	Number of people to resettle	County/city	Number of people to resettle	Via VSDR scheme
Wushan	17,000	Guangdong	7,000	Liangping	3,000	500
		Anhui	5,000			
		Hubei	1,500			
Fengjie	17,000	Zhejiang	7,000	Dianjiang	3,000	0
		Fujian	5,500			
		Hubei	1,500			
Yunyang	36,000	Shanghai	5,500	Tongliang	5,000	6,000
		Jiangsu	7,000	Jiangjin	5,000	2,000
		Jiangxi	5,000			
		Hubei	2,500			
Kaixian	11,000	Sichuan	9,000			
Zhongxian	19,000	Shandong	7,000	Hechuan	4,000	
		Hunan	5,000			
		Hubei	1,500			
Total	100,000	11 provinces	70,000	5 countries/cities	20,000	10,000

Source: Adapted from CRB (2000).

The major component of the GODR approach is to move out 100,000 rural dwellers from five counties in the Chongqing reservoir section, as shown in table 1. Some 20,000 rural migrants will be resettled by scheme (b) and 70,000 rural migrants will be displaced using scheme (a). Another 10,000 migrants are planned to be resettled by the VSDR scheme (Guo, 1999).

GODR includes two phases: trial resettlement of a small number of displaced persons followed by full-scale resettlement of the remainder. Table 2 and figure III show the breakdown for each year and province or county.

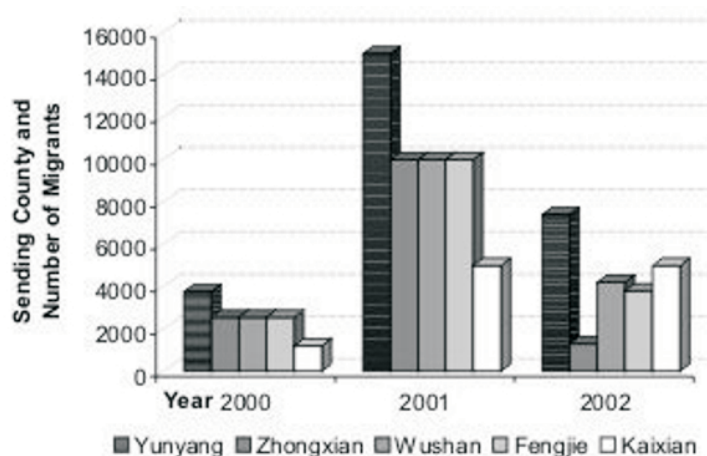
Table 2. Resettlement task and accomplishment of GODR

Resettlement province	Number of people planned to be moved out in 2000-2002	Actual number of people displaced			
		2000	2001	2002	Total
Sichuan	9,000	631	5,820	2,818	9,269
Jiangshu	7,000	810	4,312	2,155	7,277
Zhejiang	7,000	620	4,488	1,893	7,001
Shandong	7,000	612	4,096	2,335	7,043
Hubei	7,000	488	5,389	1,213	7,090
Guangdong	7,000	606	3,614	2,782	7,002
Shanghai	5,500	639	3,007	1,859	5,505
Fujian	5,500	603	3,067	1,887	5,557
Anhui	5,000	625	3,560	821	5,006
Hunan	5,000	699	3,064	1,283	5,046
Jiangxi	5,000	806	3,467	738	5,011
Total	70,000	7,139	43,884	19,784	70,807

Sources: Compiled from TGPCC (2000c); CRB (2001, 2002).

The removal procedure involves a series of steps. The first step is that resettlement institutions at the county, township and village levels in the sending areas organize a delegation, composed of a representative from each migrant household, to visit the distant resettlement locations. Each representative is required to sign a contract regarding rebuilding or purchasing houses with the township government in the receiving regions. The authorities in the sending and receiving counties will sign agreements on transferring the residence registration of migrant households and allocating land to migrants in the host communities. The second step involves the recipient communities allocating land to migrants for house building. Housing construction then begins along with purchase of available existing houses.⁹ That usually takes four months or longer. The final step is to move the displaced households out of the reservoir area to the distant resettlement locations and to redistribute farmland to them.

Figure III. Annual task sending out migrants via distant resettlement schemes, 2000–2002



Source: Adapted from CRB (2000).

Eligibility

For “affiliated migrant family members” (*suiqian renkou*), there are some criteria to fulfil whether or not they can move out with their families. Two categories of affiliated members are eligible. One is direct kinfolk: a spouse who has retired if he or she used to work as an urban resident and the aged who can no longer work as labourers and whose residence registrations are beyond the reservoir area. That group of affiliated migrants is entitled to the same right to transfer their residence registrations to host communities as normal migrants. However, they will not be treated as “productive resettlement population” (*shengchan anzhi renkou*), and hence will lose land and cannot receive subsidies and funding for living restoration, housing and agricultural land (Qi, 2000). The other group involves the migrants’ children. In accordance with the earlier resettlement policy, a second child over the age of seven years, born before 1992 and whose parents were fined for his birth as being above the national one-child family planning policy could receive compensation. A third child over 14 years of age, born before 1992 and whose parents had paid the penalty can also receive compensation. However, any additional children born in violation of the family planning policy after 1992 will not be treated as migrants. To motivate more migrants to move out of the reservoir area in October 2001, the TGP Construction Commission stipulated that migrant families with fewer than four children could be entitled as eligible households to be displaced through distant resettlement schemes.

Table 3. Family members in migrant households

Family members	Migrant households resettled in Deyang, Sichuan, in 2000		Migrant households to be displaced in 2001-2002	
	Responses	Percentage	Responses	Percentage
2	1	1.4	0.9	0.9
3	16	22.9	19	18.3
4	29	41.4	43	41.4
5	13	18.6	21	20.2
6	7	10	10	9.6
7	0	0	6	5.8
8	3	4.3	3	2.9
>8	1	1.4	1	0.9
Total	70	100.0	104	100.0

Source: Survey in 2001.

More than 60 per cent of the migrant households have three or more members (table 3), generally owing to the fact that most rural households in the reservoir area have more than one child despite government policy. That will result in a greater number of migrants than was originally estimated and put more pressure on land and resources in the destination areas.

Agriculture or land-based resettlement

Criteria for selecting resettlement locations

To ensure that the process of distant resettlement goes smoothly, the TGP Construction Committee addresses five criteria for selecting resettlement locations: physical environment, transport and infrastructure; abundant farmland; higher economic development level; strong leadership at the village and villagers' group level; and sound folklore and traditions. In addition, it also requires that conditions of all resettlement locations within a province/municipality be similar for both resettlement exercises – the trial resettlement in 2000 and the massive resettlement in 2001–2002. Nevertheless, the main issue in location selection is that the high expectations and demands of migrants are often not met, owing to unsatisfactory geographical locations and an underdeveloped economy in some destination provinces. Migrants hope to select their resettlement locations but actually those locations are quite restricted. Migrants generally prefer rebuilding

their houses in urban or peri-urban settings rather than in rural sites. Issues relating to land, infrastructure, social security and potential benefit conflicts between migrants and host people are often unavoidable. In 2001, over 90 per cent of migrants displaced to Sichuan province were eventually settled in areas close to county or town seats, after numerous (up to six or seven) reselections of locations. Resettling the planned 2,600 migrants from Kaixian County in 2002 has proved much harder than resettling 5,820 migrants in 2001 because the locations are not considered attractive and the economic situation in those locations is poorer than in the locations where migrants were resettled in 2000 and 2001 (figure IV). Also many migrants used to live in the peri-urban districts of the origin county seat and enjoyed a stable income from urban-based sources.

Figure IV. Resettlement locations in Sichuan province, China, 2000 – 2002



Primary methods of redistributing land

For the majority of peasants or migrants, farmland provides not only a basic income but also security (Tuan, 1970). The main principle for distributing land to migrants is to ensure that each migrant has a land holding no less than the average for the host people. According to articles 8 and 10 of the revised State Land Administration Law (1999), all rural land in China is collectively owned. Since the early 1980s, the household responsibility system has been implemented in the countryside. Peasant families share equal amounts of farmland allocated in terms of the numbers in the household. A household is entitled to utilize land but the land-use right is not transferable. In 1999, peasants throughout rural China were given a second term of land tenure for a period of 30 years. They are

encouraged to engage more actively in agriculture and make investments in their land. Ensuring fairness to the people displaced is difficult since the quality and quantity of the allocated land has to be taken into consideration. The approaches involved are the following:

- Breaking down the original land allotment system in a village and redistributing land to each host and migrant household in terms of the current total population including migrants;
- Slightly readjusting the original land relationship of the host residents by allocating a part of land collected from the host peasants to the migrants;
- Using a part of retained land which is kept for emergency use by the community in a host village as contract land for migrants;
- Adjusting farmland from the State-owned farms to the migrants.

Both “minor readjustments” (acquiring a part of the land from some of the host people) and “major readjustments” (total redistribution of the land in the affected villages) are difficult to implement. Most recipient provinces have adopted an approach that is a combination of both. Among the 57 host families interviewed in Deyang (Sichuan), 31.6 per cent experienced land readjustment. But the scale of land readjusted was small. The survey found that the land of two thirds had been adjusted by only 0.1 *mu*, and 90 per cent of them voluntarily turned over a portion of their land to migrants. In the massive distant resettlement in 2001–2002, readjusting land on a large scale was unavoidable and became very difficult and the compensation for the host households is a sensitive issue in distant resettlement. Variations in the quality and quantity of land provided for resettlement have been an issue in some areas.

Seeking suitable forms of land use for stable resettlement

Allocating land to the displaced would tie them to the land, and in turn help to restore their livelihoods and agricultural production, thus achieving social stability in both the distant resettlement communities and the reservoir area. The rationale of the GODR approach is based on the following considerations:

- In rural society and rural areas in China, land is the fundamental form of security because there is no social security system;
- Engaging in agriculture is a safe occupation that peasants have employed for thousands of years;
- If peasants enter a city or town to engage in industrial or services work, they must learn new knowledge and skills;
- Most rural migrants have low levels of education.

There are some differences between agricultural production in the sending and recipient regions. The reservoir area is mountainous. Migrants used to plant corn, wheat, sweet potato, other crops growing on dry land and fruits such as citrus, especially oranges. But in the eastern coastal provinces or municipalities and in the provinces situated in the middle and downstream catchment of the Yangtze River, local inhabitants mainly grow rice, cotton and rape. The cultivation systems, methods, techniques and farming tools are quite different.

Accordingly, a number of strategies to assist in adjustment at the destination have been developed, such as development of regional vegetable or fruit production bases, as determined by the skills possessed by the migrants (HPG, 2000). Deyang in Sichuan province has even been designated to become a local summer resort. Developments in local tourism may pave a way for migrants to generate sustainable income (ROMC, 2000).

Prohibiting rural migrants from changing their residency status

Unconditional allocation of housing-plot land and contract land for agricultural use is a fundamental resettlement principle to ensure smooth resettlement and stability in the host communities and reservoir area. Although most migrants would like to be registered as having urban status, taking advantage of distant resettlement to obtain a direct transformation from rural residence, registration to urban status in any distant resettlement regions is strictly forbidden. Some of them tried to obtain urban residence status by building their houses in urban settings or on city outskirts, running businesses in a city or town or engaging in non-agricultural work as floating workers, but they are all regarded as rural residence status holders. After a transition period or several years later, if those migrants who are resettled in towns or suburbs would like to claim non-agricultural residence status or engage in self-employed occupations, they will be subjected to the same rules as the original residents.

Concentrated and scattered resettlement models

Chinese rural communities have a long history characterized by stability, strong kinship linkages and a unique and exclusive culture (Fei, 1985). The farther the migrants are displaced, the greater the risk of loss of social capital. If loosely knit migrants were resettled as a big group, they might not merge quickly into the local socio-economic environment. Moreover, certain mindsets of the persons relocated can be difficult to change. They either think they may be discriminated against, as “(they) are migrants and (their) decedents will forever be migrants”, or at the other extreme, they consider (themselves) to be “a special group of civilians”, as some of them revealed when interviewed in 2001.

The distance of relocation and differences in cultural background have significant impacts. Distant-resettled migrants often have to pay a high social cost and go through a process of “social integration” to incorporate themselves into the

host communities. Compared with scattered resettlement, concentrated resettlement, by which migrants from the same origin area build their houses in a cluster, can maintain established relationships and resettlers can provide support and assistance to each other for mutual benefit. However, that may impede their integration into the local community. Having lost social networks and social capital, individual migrants and their households are encouraged or forced by circumstances to incorporate themselves into host communities. To ensure social stability, displaced people are sparsely resettled to a recipient community and far away from the capital city of a prefecture or province. Sparsely resettling the relocatees benefits both the host community and the migrants, in that the host community can be relieved of the fiscal burden to greatly increase infrastructure for large numbers of new arrivals and, at the same time, the displaced persons are encouraged to integrate themselves into the local community rather than congregate in distinct migrant groups. That resettlement pattern, “inserting flowers sparsely” (*fensan chahua*), is widely adopted in massive distant resettlement. Resettling 5–10 households in a location is suggested to be an appropriate spatial scale in most locations. But migrants prefer being resettled in a larger centralized group (table 4).

Table 4. Which resettlement pattern do you like?

Resettlement pattern (number of households)	Migrant households resettled in Deyang, Sichuan, in 2000		Migrant households to be displaced in 2001-2002	
	Responses	Percentage	Responses	Percentage
Larger group (>10)	35	49.3	94	90.4
Small group (5-10)	30	42.2	8	7.7
Exclusive family (<5)	6	8.5	2	1.9
Total	71	100	104	100

Source: Survey in 2001.

Distant resettlement issues

Compensation and funding

Compensation provides the primary financial means for migrants to replace the tools of production, to rebuild or purchase houses and to re-establish their livelihoods. According to the Yangtze Three Gorges Project Displacement and Resettlement Regulations (hereafter referred as the “Regulations”), “special funding” will be provided for displaced rural residents. It aims to benefit the people displaced and the communities affected by the dam, by setting aside some of the profits from each kilowatt hour of electricity generated by the dam project starting in 2003. Distant resettlement compensation and funding, some 30,000 yuan per migrant, is allowed for in the TGP resettlement budget.

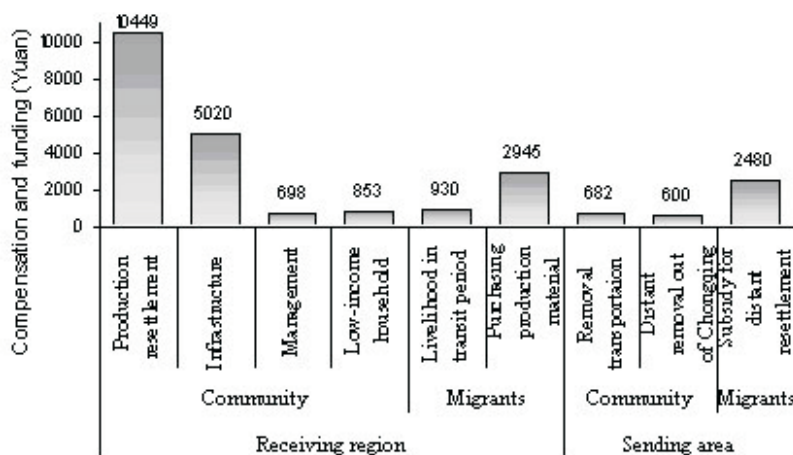
Inadequate compensation

That problem occurred mainly in the “responsibility system of resettlement funding” for the TGP resettlement.¹⁰ The compensation criteria are lower than the standards set forth in the Land Administration Law (1999). Compensation was determined by the amount of flooded land rather than the total population affected by TGP. In line with the plan of CWRC in 1994, per capita production resettlement funding for the five counties where rural migrants will be displaced via the GODR approach varies significantly between 9,458 and 6,773 yuan. According to the Land Management Law (1999), there are specific regulations on land requisition compensation. It stipulates that compensation for cultivated land requisition should include three components: compensation for land, funds for resettlement and compensation for attached assets and green crops on the land. The compensation amount for the first item is 6 to 10 times the derived land productivity (DLP), which is the average annual production per hectare in the preceding three years. The amount for the second item is 4 to 6 times the DLP, subject to a maximum of 15 times the DLP. The combined amount of the former two items is set at a maximum of 30 times the DLP. Unfortunately, when the compensation standard was established in the early 1990s, “compensation for land” and “funds for resettlement” were lumped together. Consequently, the gross compensation for arable land was 2,701 yuan/*mu*, which was only 3.5 times the DLP, and the average compensation for flooded orange orchards was 5,763 yuan/*mu*, a mere 2.3 times.

There may exist great compensation differences among migrant households as a result of differences in each household’s economic background, original housing areas, and structures and building materials of the houses. There are several reasons why rural migrants could receive a low level of compensation. First, the reservoir area has been a poverty-stricken region, with a backward economy and closed society, even though China has implemented an open policy since the late 1970s. Secondly, house construction below the 175-metre flooding baseline has been absolutely forbidden since 4 April 1992. Households which have built new housing since then are not entitled to compensation. Thirdly, some problems arise from the inappropriate assessment of housing structures, such as calculating the areas of the structures based on the built-up areas above the ground rather than the areas of the foundations which are often larger than the superstructures; miscalculations in the floor areas; omissions of some parts of the structures; or other administrative errors in records and documentations. The survey found that over 50 per cent of the houses of rural migrant households eligible for compensation are earth or earth-wood structures. Taking Kaixian county as an example, the compensation standard for housing has been set up as three classes and two types. The standard set for rural migrants is much lower than that for urban dwellers, at differences of 51 yuan/ square metre for main buildings and 24 yuan/ square metre for outbuildings (RBKC, 1997). About 60 per cent of migrant households had a per capita living area of less than 20 square metres, and over 95 per cent of households had less than 40 square metres of living space per head prior to displacement. Given the average per capita of 3,500–4,000 yuan for

housing compensation in the Chongqing reservoir section, to construct a new house, e.g., in Deyang city, Sichuan, for a four-member migrant family a gap of some 20,000 yuans has to be filled through other means, often borrowing money from relatives or friends.

Figure V. Quota of compensation and funds in the GODR approach (RMB yuan per capita)



Source: TGPC (2000b).

Funding for production resettlement and infrastructure provision

A reason for compensating receiving communities for allocating land to migrants is that land ownership rights in rural areas belong to collectives or villages. Migrants have the same land-use right as the host villagers. But many migrants complain about the allocation structure of compensation and funding between the recipient communities and the migrants. As shown in figure V, the compensation and funding which a host community receives for resettling a migrant is 15,469 yuan. That includes the funding for production resettlement (readjusting land and allocating it to migrants) and for infrastructure provision. They account for 61.4 per cent of the compensation and funding package. The package excludes compensation for migrant families' houses, affiliated facilities and orchards to be flooded because the areas of property and extent of flooding suffered by each household are different. Taking into account the average compensation for the three items' losses (about 7,000 yuan per capita), the gross compensation and funds for migrants moving out of Chongqing reservoir area is around 32,215 yuan, much higher than compensation in many large hydro projects in China. Although the people relocated have been allocated at least 1,000 yuan

per capita from the infrastructure funding for their house building and purchase of production materials (TGPCC, 2000b), the recipient community can still receive about 45 per cent of the overall GODR package for production resettlement and infrastructure provision. There is a perception among the migrants that they receive an unfair proportion of compensation, for which reason many believe they should receive greater funding. As a result, the ratio of funding for production resettlement and infrastructure provision is a disputed issue among migrants. It has become one of the factors causing instability in the resettlement communities after displacement.

Inconsistencies in implementing of compensation policies

Migrants perceive the present compensation policy to be different from the previous one. They compare the current compensation which they can receive, about 14,000 yuan per capita in cash, with the amount of 25,000–28,000 yuan for each rural migrant displaced via the VSDR scheme. They attribute the disparity to the “inconsistent resettlement policy” of the Government. An investigation in Dachang town (Wushan county), which has 1,200 migrants, shows that the migrants regarded the local resettlement authorities as unreliable. When interviewed, they recounted that:

“The Government treats us like goods to be treated between the sending and recipient areas. The sending areas sell people (migrants) and the receiving areas sell land (to migrants). They (local governments) get substantial commissions from this trade. Only if the money (compensation and funding) were held in our hands, would our minds be put at rest. We can do anything that we intend to do with the money in our hands.”

The migrants’ misconceptions of the compensation scheme are mainly caused by the various adjustments made to the resettlement schemes, lack of standardized operations in implementing the compensation policy and unrealized expectations of the migrants to shake off poverty through the displacement.

Governmental functions

Displacement and resettlement produced by hydro projects is involuntary. Migrants believe that the Government should be mainly accountable for their distant resettlement. Although China is experiencing economic transformation, the TGP resettlement was actually adopted under the centralized and planned economic mechanism. The Government has crucial roles in many aspects of the relocation: overall planning, coordinating the relationships among various institutions, making, implementing, inspecting and monitoring the policies and ensuring the consistency and continuity of the distant resettlement.

However, governmental functions sometimes clash seriously with market mechanisms. Resettlement is a social, economic and demographic process. It results in the spatial transmission and redistribution of regional productivity. It affects the distribution of population and the labour force. It impacts on the

restructuring of the regional economy and the reconstruction of societal networks. Institutions and authorities working on resettlement strongly expect a special law to guide the resettlement work, e.g., the Reservoir Relocation Law. Migrants expect their rights to be protected. Some of them prefer adopting a market-economic mechanism, through which they could voluntarily select their resettlement locations, actively choose resettlement schemes and enhance self-development ability and independence. But GODR has been implemented principally under the top-down approach of the administrative government, which has little room for market forces. As a consequence, the predominant role of the Government reinforces the migrants' dependence on the Government.

Conclusion

Involuntary resettlement operations involve a number of basic principles pertaining to governmental responsibilities, migrants' rights and participation, protection of the interests of host communities and a clear definition of the objectives of resettlement. The process of distant resettlement involves at least three stakeholders: government institutions and organizations, migrants and host people. The Government of China has played several significant roles in TGP resettlement but its administrative functions often clash with market forces. Lack of participation of migrants in their resettlement, particularly selection of location, may increase their dependence on the Government and result in more problems relating to the building of housing, land allotment and reluctance to move.

Land readjustment is a critical issue in the GODR approach. Distant resettlement can reduce the land and population pressures in the reservoir area. Migrants expect to be settled in urban or peri-urban settings. In the 11 densely populated destination provinces, the land potential is limited. The cost of distant resettlement is higher owing to some unavoidable items inherent in distant resettlement. "Special funding" has been stipulated in the resettlement regulations, but the percentage and distribution of that funding among different areas affected by the project remain unaddressed. Moreover, the quota of allocation of compensation and funding remain under dispute.

The Government of China has proposed the objectives of resettlement as being to move out migrants, maintain a stable resettlement and help migrants become wealthy gradually. Yet economic rehabilitation planning is weak. Although resettlement locations may provide migrants with some information on local market and skills training, a systematic and operational plan for agricultural and/or non-agricultural production reconstruction after removal is generally lacking. Whether the GODR approach can realize the objectives of resettlement and development of migrants, resettlement regions and the reservoir area remains to be seen.

Endnotes

1. Sanmenxia reservoir is located on the upper reaches of the Yellow River. It was started on 13 April 1957 and completed in April 1961. The reservoir resulted in 287,000 migrants displaced. The number of migrants has increased to 500,000 people.
2. Danjiangkou reservoir is located on the Han River, the largest tributary of Yangtze River. Dam construction started on 1 September 1958 and was completed in 1973. There were 382,000 migrants displaced.
3. Disastrous floods occurred in Yangtze River and Songhua River catchments between mid-June and mid-August 1998. The catastrophic flood in the Yangtze River area was the second largest one in the twentieth century since 1954 in the river basin. Meanwhile, the Shonghua River flood was the largest one in the twentieth century in its catchment. According to various provincial statistics, the farmland inundated was 22.29 million hectares. The death toll reached 4,150. The direct economic loss was 255.1 billion yuan.
4. Interview with the deputy director of the Rural Resettlement Division of Chongqing Resettlement Bureau in Chengdu on 15 August 2001, when he was organizing Kaixian migrants to settle in Sichuan province.
5. In order to control the flows of rural people into urban areas, the State Council passed a state policy "Directive concerning Establishment of a Permanent Household Registration System (HRS)" on 22 June 1955 regarding the residence registration (*Hukou*) system in China, which has been effectively implemented. The *Hukou* status of people results in the classification of "agricultural population" and "non-agricultural population", which has been an important factor not only in restricting population migration freely but also in producing great differences between urban and rural areas.
6. Interview with the director of the Policy and Regulation Division of Chongqing Resettlement Bureau on 19 January 2001.
7. The "three certificates" refer to the housing rebuilding certificate, residency registration transmission certificate and certificate of contract land allocated in receiving locations. The migrants must show them to the local resettlement authorities in the sending areas to obtain permission to resettle their household through the VSDR scheme and receive compensation and funding.
8. In 1999 the All-Chinese Taxation Bureau issued a "Circular about Relevant Taxation for Rural Migrants Displaced by Distant Resettlement Schemes in the Three Gorges Reservoir Area", government document No. 845 [1999].
9. "Entrusting construction" (*weituo jianfang*), "collective construction" (*jiti lian jian*) and "independent construction" (*zi jian*) are the three main methods for migrants to rebuild houses in the recipient communities. "Entrusting construction" is a method where migrants negotiate the price of construction with the builders to formulate a contract for house rebuilding. "Collective construction" is for a group of migrant households to voluntarily get together to build their houses, through which they can share the low cost of construction. "Independent construction" is for migrants to build the houses by themselves.
10. The total static investment of the TGP is estimated to be 90 billion yuan or US\$10.84 billion (rate as in 1993), which changes dynamically every year. The State distributed the compensation and funds to Hubei province and Chongqing municipality, which they allocate to each county and city affected by TGP within the reservoir area. The quota of the compensation and funds allocated at the provincial and county levels could never be exceeded. The quota, together with the resettlement task, forms "the responsibility system of resettlement funding" (*yimin jingfei baogan zhi*).

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Internal Migration Policies in the ESCAP Region

Although most Governments have recognized that allowing households some opportunity to enhance their economic security and welfare through spontaneous migration is harmonious with a national objective of economic growth, official awareness of the inevitability and desirability of massive population movements has not been accompanied by sufficient government efforts to protect the welfare of migrants.

By Dang Nguyen Anh *

The movement of people between various regions of a country is one of the most important processes shaping its settlement system, the spatial structure of its economy and the spread of sociocultural attributes over its national territory. Because it assumes such a significant role, internal migration has been the focus of long-standing attention by those involved in policy-making and public interventions.

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In the Asian and Pacific region covered by the Economic and Social Commission for Asia and the Pacific (ESCAP), the last three decades have seen a substantial increase in the scale, diversity and complexity of population movements between geographic regions. That has resulted in a significant redistribution of the population from rural to urban areas, blurring the economic, demographic and social characteristics of rural and urban areas in the region (Hugo, 1992). Net rural-urban migration has contributed much to the growth of the urban population in the ESCAP region (ESCAP, 1998). In several countries, migration from the countryside has occurred in reaction to natural resource depletion, calamities, civil conflicts, poverty and other pressures on rural areas. Moreover, internal migration cannot be discussed without considering the upsurge of international movements within the region and to other parts of the world (Skeldon, 1992). The migration experience of the ESCAP countries and their government policies regarding migration and spatial distribution are so divergent that the experience of one country must be interpreted with caution if used to guide the formulation of appropriate migration and development policies in another country.

With these caveats in mind, this paper examines internal migration policies that are pertinent to an understanding of the interrelationship between migration and development in the ESCAP region. Four countries, China, Viet Nam, Indonesia and Thailand, sharing differences and similarities in their migration and development policies, are considered. They vary considerably in their stages in the demographic transition, system of government, level of economic development, culture, political ideology and other criteria that have distinguished their migration patterns and influenced policies. The degree of control of migration also varies from country to country. The countries are discussed separately without attempt to generalize about the region as a whole.

Migration policies

Policies established and used by Governments to influence migration have varied widely in terms of efficiency and cost-effectiveness (Weiner, 1975; Oberai, 1987). Migration policies can be implemented in an attempt to achieve a socially desired population distribution. Governments can have a major influence on the relative attractiveness of a particular area and may encourage potential migrants from other regions, by shaping the availability of various opportunities and the provision of social services in that area. In contrast, some policy instruments may have been designed without taking account of whether they are consistent with the individual goals of migrants. Consequently, macropolicies aimed at creating a socially optimal match between population and resources may not be consistent with, or even conflict with, the desires of migrants and hence limit the success of the policies.

Government policies which influence migration can be divided into two major categories with regard to their direct or indirect effects. Direct policies, explicitly aimed at altering migration flows, include bans on urban in-migration,

travel restrictions, resettlement and transmigration programmes. In contrast, indirect policies consider the impacts on migration to be secondary goals of the policy. They are implemented for some other reason than migration but are likely to have an impact on patterns of migration. In many cases, the effects of these policies on migration are not even considered in their design and implementation.

The policy instruments used by Governments to slow down the pace of urbanization have included the adoption of three kinds of policies: (a) rural retention policies aimed at transforming the rural economy and thereby slowing the rate of outmigration; (b) policies to control the growth of large cities through migration restrictions; and (c) policies that try to redirect migration flows to outer rural areas and small urban centres. These policies can be classified as accommodative, manipulative, preventive and negative in their impact. In practice, most population distribution policies have adopted a somewhat narrow approach, focusing either on controlling the growth of large cities or on retaining people in rural areas. However, it should be noted that policy implications are different for different migration forms which have significantly varying determinants and consequences (Goldstein, 1987). In other words, different forms of migration need to be adequately considered for policy purposes.

China

For almost three decades after its revolution in 1949, China successfully controlled not only macro-level production and exchange but also micro-level consumption, employment and residence. Despite large differences in standards of living across geographic locations, spatial mobility was effectively blocked by the Government through the household registration (“*hukou*”) system (Goldstein and Goldstein, 1985b; Cai, 1999). Under this system, everyone was born with an official household registration, which determined eligibility for and access to the governmental provision of social services and benefits, including non-agricultural employment, education, medical services and pensions. In order to receive appropriate local social services and benefits, citizens must be officially registered as *de jure* residents.

Under the “*hukou*” system, rural residents were prohibited from moving into cities. They could not change residence or work unit unless these changes were part of the socio-economic plan formulated and managed by the State. Changes in official residence across administrative boundaries were strictly controlled. This did not mean, however, that people could not move. In fact, they could normally move where they wished, but without government approval, the migrants could not register at the new location, and without this registration, migrants could not find a job, buy food and other daily necessities, or have access to most social services. While in theory people could move freely, with no market alternatives in obtaining employment and social services, there were no noticeable labour flows among sectors and regions in China until the beginning of the rural reforms.

The profound structural changes that China has been experiencing since 1978 have greatly undermined the control mechanism of the household registration system and called into question the Government's control over consumption, employment and residence. The abolition of the people's commune system in the countryside, the reform of the food supply system and housing reform in urban areas have weakened the barriers that used to restrict labour flows. The more relaxed employment practices and the legalization of private businesses have resulted in an increasingly differentiated employment structure, which places more and more of the labour force outside the direct control of the Government (Cai, 1999). These simultaneous developments have provided a timely market alternative to government provision of employment and services, thereby allowing migrants to live outside the government allocation (ration) system. For the first time in decades, both the legal and market barriers to living in cities without a "*hukou*" have been considerably reduced.

A large surplus of agricultural labourers, estimated at 220 million excess farmers, were observed at the onset of the rural reforms. Concurrently, rapid economic growth in urban areas increased the income disparity between urban and rural areas to a historically high level in the 1990s. This increasing income gap provided a strong incentive to rural residents to migrate to urban areas in search of better lives. Not surprisingly, rural-urban temporary migration, which involves no change in migrants' official residence registration, increased rapidly, becoming part of rural households' strategy in reallocating labour through market opportunities. A large and continuously growing temporary migrant population has become a new addition to the landscape of cities in contemporary China (Goldstein and Goldstein, 1991).

Over 100 million Chinese peasants displaced from their native villages to cities now form a transient "floating population", the result of one of the largest internal migrations in China's recent history. Floaters do not have a household registration at their destination, regardless of the duration of their stay. Many floaters are rural migrant workers who search for a job in the urban areas without the urban "*hukou*". According to the State policy, a migrant residing in a city without an urban "*hukou*" is required to have a temporary registration with the public security agencies. However, most of the rural-urban migrants do not have such a permit. The official number of unregistered migrants in cities in 1994 was 105 million (Cai, 1999). Until recently, the Government has considered the "unregistered" rural-urban migrants illegal and has tried to control the "urbanward" migration by a number of measures in the cities.

Although every person in China is presumably registered and given a household registration booklet, holders of an urban residence household membership are still the only ones entitled to social benefits such as access to health care and education. Rural migrant workers and their family members remain "outsiders" in urban areas. The presence of large numbers of migrant children in cities, many of them without urban *hukou*, creates major problems for their

parents and challenges for policy makers. For example, school enrolment rates for temporary migrant children are reportedly lower than those of permanent migrants' children, local children and non-migrant children at the place of origin (Liang, 2001). The children who suffer most are those of temporary migrants with less than one year's residence in the city. As education becomes more and more important for socio-economic mobility in Chinese society, these disadvantages faced by temporary migrant children will have detrimental and long-term consequences for migrant children themselves and for urban society as a whole.

Viet Nam

As in most countries in the ESCAP region, the distribution of population in relation to spatial patterns of development is considered a fundamental issue in Viet Nam. Although population size remains one of the central concerns of Vietnamese planners and policy makers, the more recent policies of the Government appear to be more oriented towards the nature of the migration process.

Beginning in the mid-1970s, three objectives of the post-reunification migration policy were identified. They aimed to reduce the long-standing population pressure in the Red River Delta, a place with excessively high population densities, and the coastal plains of central Viet Nam; to restrain the rate of population growth in urban areas, especially in the two large cities of Hanoi and Ho Chi Minh; and to correct the population distribution within provinces and between regions, and at the same time to allocate labour for development and establish frontier regions to serve the interests of national security and defence.

The Government of Viet Nam has long been concerned with achieving what it considers a more balanced distribution of the population (Dang, 1999). Attempts to control population movements have been pursued for many decades. The rapid growth of urban places was considered detrimental to planning and orderly development. Thus, the Government's population and labour relocation policy was designed to directly affect population movements and urban growth. It focused on facilitating rural-rural and urban-rural migration rather than encouraging rural-urban migration. Migration flows involving changes of residence to urban places, especially to the largest cities, were strictly controlled through migration policies and the household registration system (*ho khau*). This system is a similar version of the Chinese model of "*hukou*" which aimed at controlling population mobility, especially spontaneous outflows of rural residents. Urban-rural and rural-rural migration was explicitly encouraged to avoid what was considered to be overurbanization, social insecurity and disorder. State jobs and the family reunion migration they occasioned became the main route to urban life. In practice, this system did not abolish spontaneous migration. It just made it expensive.

Immediately after the reunification of north and south Viet Nam in 1975, there were large-scale movements from the cities to rural areas. In 1976, 20.6 per cent of the population was living in urban places and this decreased to 18.6 per cent in 1981. Although reclassification of places from urban to rural was a factor in the declining levels of urbanization, urban-rural migration also played a role (Banister, 1993). Indeed, rural resettlement policies were promoted and viewed as an opportunity to benefit the resettled population by improving the quality of life of the rural poor from overcrowded regions. An agriculture-based policy of organized new economic zone development has been the main government migration policy over the decades. However, lack of facilities and infrastructure, poor health and schooling services and low and unstable incomes continued to prompt new settlers to leave the zones. Although the resettlement policy has been in place for several decades, the pace of resettlement has slackened and the achievements have been far from targets set (Desbarats, 1987; Do, 2000). As in the case of Indonesia, the implementation of the policies often created difficult problems. The Government has been making huge investments in the resettlement programmes, but at different times and in different places, the programmes have proved inefficient and achieved very limited success.

The economic renovations (*Doi Moi*) officially launched in 1986 have entailed increased economic opportunities and expanded migrant networks which have, in turn, greatly promoted the outmigration of rural labour (Dang, 1999). In essence, *Doi Moi* represents structural changes, shifting from a centralized planning system to a more market-oriented economy. As in the case of China, the increasing commercialization of agriculture and the replacement of labour with capital inputs have been of major significance in releasing the rural workforce and prompting it to leave rural areas. Regardless of migration status, people no longer have to depend on government subsidies and rationing to obtain their basic life needs, especially in urban centres. The household registration system, despite its continuation, no longer limits acquisition of essential goods and residence in the cities. Driven by extreme poverty and scarce resources, people are seeking locations where economic opportunities are perceived to be better, usually in major urban centres. Income inequality and rural-urban dual prices disadvantage rural residents and hence promote outmigration.

Today, household registration procedures no longer directly affect every aspect of people's lives the way they used to. Survey data and media reports suggest that rural-to-urban migration has fuelled the jump in levels of urbanization (Dang, 2001; Guest, 1998b). The fear of masses of rural poor flooding into the cities of Viet Nam has resulted in a number of policy suggestions to put in place some measures to control migration into major cities. Although these intended restrictions have not been implemented, perhaps because of the recognition that increased rural-urban migration is in part a response to the development policies adopted by the Government, concern over migration patterns remain. The result is a hybrid system operating in internal contradiction. A key interface is the issuance

of temporary residence. This is reflected in the statistics: by 1994, of those who had moved to Ho Chi Minh City after 1989, 62 per cent were accepted as “temporary long-term residents” based on an extendable three- or six-month stay (IER, 1996). Of 202,100 in-migrants to Ho Chi Minh City in 1990-1994, only 26.6 per cent had obtained a permanent residence permit (compared with 44 per cent of the 178,000 arriving in 1986-1990 and 64 per cent of 125,800 in-migrants in the early 1980s). There is little, however, that the Government can do to reverse or modify profoundly the direction of population flows through direct policy intervention on how or where people should migrate.

Looking ahead to the future, internal migration is a key aspect of population change that continues to be associated with rapid economic growth and modernization in Viet Nam. As a driving force of population change, unequal development and land shortage will result in a large-scale redistribution of the population. In that process, internal migration is a viable option for people, especially the poor, to earn their livelihood. The Government should consider policy measures that seek to work alongside market forces. The elimination of urban subsidies that serve as an indirect incentive for rural-urban migration would be useful. Overcoming the separation of rural planning from urban planning will become an important factor for better articulating rural and urban development in a manner that can benefit rural regions. Effective policies to promote rural off-farm employment and social services would have a significant impact on reducing the pressure felt by the rural population to migrate to cities.

Indonesia

Like the Governments of Viet Nam and China, the Government of Indonesia has long supported explicit policies to direct internal population flows. While China has strictly controlled the movement of people to the cities, Indonesia adopted a relatively less tight system based on dissuasion rather than rigid prohibition. The Government tried to reduce the imbalance between Java and the outer islands, and reduce primacy and uneven urban growth through a transmigration programme, rural and urban development in the outer islands, restraints on Jakarta’s growth and industrial dispersal.

Around 1970, an attempt was made to control the growth of the largest metropolitan area, Jakarta, through the notorious “closed city” policy enforcement to restrict in-migration. Periodically, street vendors were forcibly removed from the city. Reasons for the failure of this policy, notably its inconsistency with the regional development disparities, were described in detail two decades ago by Simmons (1979). Overall, anecdotal evidence suggests that it was ineffective. The result is supported by the persistent high growth rate of Jakarta and all other urban agglomerations from the 1970s into the 1990s at well over 3 per cent per annum.

Transmigration was the Government of Indonesia’s noteworthy policy to redistribute population from Java, the most densely populated island, to other less densely populated islands, such as Sumatra, Kalimantan, Sulawesi and Irian Jaya

(Hugo, 1997). This policy was initiated by the Netherlands colonial Government in 1905 and following independence and has been continued by the Indonesian Government up to the present. The transmigration policy, although embracing many goals, is essentially a land settlement scheme to enable poor families in Java and Bali to become farmers on other islands. Transmigration has been voluntary even though sponsored migrants must meet certain criteria (e.g., being married, of good character and with farming experience).

The promotion of sponsored and spontaneous transmigration, as a part of five-year development plans, bears some resemblance to the resettlement scheme of Viet Nam, at least in the number of migrants targeted. While initial targets for resettlement were not achieved, higher subsequent targets were exceeded in the next development plan. This is largely because of the growth in the proportion of spontaneous movers, who do not receive land tenure or direct subsidized services. Indeed, the resettlement programme has increasingly relied on spontaneous movers to fulfil its targets (Gardiner, 1997). Despite the hardships encountered by these migrants on already-crowded islands such as Sumatra and Kalimantan, the desire to be close to relatives and family continues to lure large numbers of people. Java, Madura, Bali Lombok and other inner islands where economic growth has been more likely to take place continue to experience a high level of in-migration.

Although the transmigration programme has been undertaken for a long time, only a very small proportion of the population has been transferred to the outer islands. The programme has, indeed, exerted a small influence on population redistribution (Hugo and others, 1987). It has been curtailed because of government budget constraints. A major cutback has taken place since 1986 as a result of a decline in oil revenues, which badly affected the programme's implementation. Transmigration is a complex policy that heavily involves various implementing agencies, at both the central and regional government levels. For this reason, bureaucratic coordination and the centralized top-down approach inherent in the administrative system have greatly hampered programme efforts. To complement the programme, more equal regional development may be an alternative and an even cheaper way to redistribute the population of Indonesia and optimize the development of natural resources over the islands, particularly those in the eastern part of the country.

Thailand

As the size of Thailand's population increased from 26 million in 1960 to over 62 million today, issues of population distribution became integral to the Government's population policy. Among the four countries examined in this paper, Thailand was the earliest to embark on a market economy and experienced particularly rapid social and economic change between 1960 and 1980 (Goldstein and Goldstein, 1986).

The determinants of migration in Thailand are related to the country's very large regional differences (Chamrathirong and others, 1995). In the period 1985-1990, rural-to-urban migration, especially to Bangkok, increased owing mainly to the Government's export-led growth policy and the expansion of the service sector (Phongpaichit, 1992). In 1980, Bangkok had 1.25 million lifetime migrants, who constituted 27 per cent of the population. The city also attracted a large number of seasonal migrants during the slack agricultural season. Problems faced by Bangkok owing to its rapid expansion have led the government planners to realize the urgent need for national policy instruments and development plans since the 1980s. Although the Government has tried to promote policies to reduce migration to Bangkok Metropolis, it has never introduced any absolute restrictions on population movement.

Although rural-rural migration continues to represent the bulk of migrants in Thailand (as in other countries of the region), the level of net in-migration to Bangkok more than doubled between 1975-1980 and 1985-1990 (Ritcher and others, 1994). Long-distance movement has increasingly occurred from the relatively poor North-East region towards Bangkok and its periphery in the central region owing to manifold income differentials between the regions. Although seasonal migrants in Bangkok have been viewed as an annoying and unorganized labour pool, seasonal migration from the North-East has taken place on a large scale. Indeed, North-Eastern households have depended on remittances from their family members who migrated to Bangkok. Such seasonal movement is facilitated by extensive networks of friends and relatives spread all over the country. It is the pervasiveness of the networks that has hindered policy interventions aimed at decentralizing urban concentration in Thailand.

In contrast to the other three countries, the Government of Thailand has acknowledged the need for rural development plans and the promotion of regional growth poles to discourage interregional migration. The development of the city's periphery and outer zones is one of the most important policies designed to reduce migration to Bangkok (Chamrathirong and others, 1995). In addition, the Government has also employed such measures as land-use and zoning regulation, taxation, industrial dispersal and, more recently, the development of the eastern seaboard as an industrial zone to accommodate migration. Recent policies, issued after the regional financial crisis, have mainly been aimed at limiting the size of Bangkok in response to regional disparities. Plans have included the promotion of new types of agricultural production to improve rural incomes and the extension of public services throughout the country, as well as heavily financed measures such as vocational training programmes and the provision of information on employment opportunities outside Bangkok.

However, policies implemented to divert migrants from Bangkok have been limited in their success. The above efforts cannot be seen as successful given that 55 per cent of the urbanites in Thailand reside in Bangkok. In the rural North-East, remittances accounted for almost a quarter of household income in the

mid-1990s and have probably contributed to an improved income distribution throughout the country (Guest, 1998a). Seasonal migration, despite its significant role in promoting rural-urban links, was largely ignored or suppressed by the policy, which placed greater focus on permanent migrants. These were assumed to contribute the most human resources to the economy. This policy gap was exposed by the time of the regional financial crisis in late 1997 and early 1998. The migration and development policy therefore failed to provide seasonal migrants with due support during the crisis, as they were disqualified from employment security and unemployment benefits.

In sum, the attempts by the Government of Thailand to develop regional centres to attract rural migrants have been faced with difficulties. Seaboard industries typically require higher skills than most rural-urban migrants possess. When industrial dispersal policies are being considered, the issue of economic efficiency is extremely important. Industrial deconcentration may not have a positive effect on poorer regions if other programmes do not accompany it. A potential consequence of labour shortages in the Northern region may be a continued or accelerated influx of illegal migrants from Myanmar and other poor neighbouring countries.

Conclusions and recommendations

Policies aimed at influencing migration are well known and have become a regular component of national policies. However, many migration policies have only partially been based on existing migration theories and have too often not taken into account the numerous empirical studies carried out on migration processes. Even more significant is the fact that migration policies have not been examined and assessed in many cases. This paper is an attempt to fill the gap. The four countries' policy experiences provide a better understanding of migration and development dynamics. Policy effectiveness varies from country to country, as discussed above. There appears, however, to be a common objective in the above spatial policy goals and instruments, which is to slow or reverse urban population concentration.

This paper reviews and points out the failure or limited effectiveness of migration-centred policies to directly control or to stem the heavy flow of migrants to urban centres. In all countries of the ESCAP region, recent migration has been influenced to a varying extent by the following important conditions: (a) perceptions that income-earning opportunities (wages or job probabilities), prospects for children and services (e.g., schooling) are superior in urban than in rural settings; (b) growth of modern transport and communication, most notably an increase in telephones and motor vehicles per capita, that generates greater interface (or “blurring” between rural and urban and areas; (c) dispersion of industry and accompanying job opportunities from the core of metropolitan areas to more remote areas; (d) primary concern for the welfare of households and

families rather than individuals in migration decisions and outcomes; (e) increased income-earning opportunities for women in cities and export-processing zones as economies integrate globally; (f) strengthening of informal migrants' support networks and recruitment channels that facilitate migration; and (g) persistence of circular mobility and seasonal migration as a common strategy for farmers. The main point is that the features above suggest that future internal migration in the region will occur at an accelerated pace, at higher volumes over both short and long distances and with decreased selectivity of migrants. The proportion of urban growth contributed by net migration will substantially increase in all countries in the future.

Although most of the Governments in the region have recognized that allowing households some opportunity to enhance their economic security and welfare through spontaneous migration is harmonious with a national objective of economic growth, official awareness of the inevitability and desirability of massive population movements has not been accompanied by sufficient government efforts to protect the welfare of migrants. This neglect is particularly disturbing in so far as the promotion of individual migrants' well-being can alleviate perceived negative costs of spontaneous migration for society. Enforcement of legislation and regulatory policies to ensure safe working conditions in female migrant-dominated export industries could secure and enhance levels of remittances to the rural places of origin and thereby contribute to agricultural development. Similarly, general education should be provided equally for children regardless of their registration status. And outreach programmes that teach young girls effective negotiation techniques, and that readily provide boys with condoms, presumably could modify the diffusion of HIV/AIDS and other sexually transmitted diseases.

- The aforementioned policy measures suggest that the success of future migration policies, beyond achieving an appropriate spatial distribution of the population in relation to resources and economic objectives, will be evaluated first by how well they respond to the primary needs of migrants.
- Different types of migration require different policies. In addressing the issue of migration and making policies, caution should be taken not to combine migrations of various types into a single category. Indeed, specific policies with particular objectives and implications should be formulated specifically for different migrant groups.
- It needs to be reiterated that migration policies should be formulated and implemented as a functional part of a national development strategy, so that conflicts with other policies are minimized. Most important is a determined policy to improve basic social services in rural areas and small towns, because such a policy will reduce the rural-urban gap, increase equity and raise living standards.

- Unless such a policy is pursued vigorously, it will continue to address merely the symptoms of a broader malaise. A sound population distribution strategy should strive to be holistic. Rural development programmes should not seek population retention alone. They should be directed primarily towards increasing non-farm incomes as well as rural welfare.
- Last, but not least, development activities in rural areas can increase the benefits of migration by making rural residents ready to participate more effectively in urban activities. Rural development associated with the improvement of levels of occupational skills, education and information enable rural migrants to make better use of urban economic opportunities.

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Fertility Transition in Asia: Past Experiences and Future Directions

The complexity of the fertility transition does not allow for easy generalization. However, it is apparent that the prime determinant of fertility decline lies in social development, particularly the level of women's education and autonomy, as well as commitments by Governments to provide effective family planning programmes.

By Bhakta Gubhaju and Yoshie Moriki-Durand *

During the second half of the twentieth century, many countries and areas in the region witnessed remarkable declines in fertility. For the region as a whole, the total fertility rate (TFR) dropped from 5.6 births per woman during the period 1950-1955 to 4.0 in 1975-1980. Fertility continued to fall to 3.3 during the period 1985-1990 and 2.6 in 1995-2000. The TFR of the region is currently estimated at

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2.4 births per woman (United Nations, 2003). However, this regional average masks a considerable difference in the TFR observed among subregions. The TFR has plummeted to below the replacement level in East and North-East Asia (1.8 births per woman) and North and Central Asia (1.5 births per woman). In sharp contrast, South and South-West Asia exhibit a TFR of 3.2 births per woman. The South-East Asian subregion has a TFR of 2.5 births per woman (ESCAP, 2003).

This paper begins with a discussion on levels and trends in fertility and presents age patterns of fertility by subregions; it then examines the factors leading to fertility decline. Country experiences are presented to highlight the relative impact of social and economic development vis-à-vis government interventions for family planning programmes aimed at reducing fertility. Drawing from experiences from countries with success stories in reducing fertility, this paper concludes with future prospects for fertility decline in countries that have high or moderately high fertility.

Levels and trends in fertility

East and North-East Asia and North and Central Asia

Table 1 shows the levels and trends in fertility in Asia. Fertility remained high during the periods 1950-1955 to 1970-1975 in several countries of these subregions, including China, Tajikistan, Turkmenistan and Uzbekistan. However, fertility transition was well under way in Japan and the Russian Federation, where the TFR was already less than 3 children per woman during the period 1950-1955 and it further declined to replacement level during the period 1970-1975. While Japan was the first country to complete the fertility transition from high to low level by the early 1960s (Jones and Leete, 2002), fertility transition had begun in the remaining countries in the beginning of the second half of the twentieth century, followed by a precipitous decline thereafter.

Overall fertility levels in East and North-East Asia and North and Central Asia in 1995-2000 represent low fertility (TFR of 2.1 or lower). In East and North-East Asia, all but one country, Mongolia, have below-replacement-level fertility. While many countries in North and Central Asia, namely Armenia, Georgia, Kazakhstan and the Russian Federation, have reached below-replacement-level fertility, some countries still have moderately high fertility, ranging from 2.3 in Azerbaijan to 3.7 in Tajikistan.

Table 2 shows the percentage decline in TFR between the periods 1970-1975 and 1995-2000. Many countries in the subregion experienced a rapid reduction in TFR. The most spectacular declines, with percentage declines of 50 per cent or more, occurred in such countries or areas as Armenia; China; Hong Kong, China; Macao, China; Mongolia; the Republic of Korea; Uzbekistan; and Turkmenistan.

Table 1. Trends in total fertility rates in Asia, 1950-1955, 1970-1975 and 1995-2000

Country, territory or area	1950-1955	1970-1975	1995-2000
East and North-East Asia			
China	6.2	4.9	1.8
Democratic People's Republic of Korea	3.3	3.9	2.1
Hong Kong, China	4.4	2.9	1.1
Japan	2.7	2.1	1.4
Macao, China	5.0	3.2	1.2
Mongolia	6.0	7.3	2.7
Republic of Korea	5.4	4.3	1.5
South-East Asia			
Brunei Darussalam	7.0	5.4	2.7
Cambodia	6.3	5.5	5.3
Indonesia	5.5	5.2	2.6
Lao People's Democratic Republic	6.2	6.2	5.3
Malaysia	6.8	5.2	3.3
Myanmar	6.0	5.8	3.3
Philippines	7.3	6.0	3.6
Singapore	6.4	2.6	1.6
Thailand	6.4	5.0	2.0
Viet Nam	5.7	6.7	2.5
South and South-West Asia			
Afghanistan	7.7	7.4	6.9
Bangladesh	6.7	6.2	4.0
Bhutan	5.9	5.9	5.5
India	6.0	5.4	3.5
Iran (Islamic Republic of)	7.0	6.4	2.5
Maldives	7.0	7.0	5.8
Nepal	5.8	5.8	4.7
Pakistan	6.3	6.3	5.5
Sri Lanka	5.9	4.1	2.1
Turkey	6.9	5.2	2.7
North and Central Asia			
Armenia	4.5	3.0	1.4
Azerbaijan	5.5	4.3	2.3
Georgia	3.0	2.6	1.6
Kazakhstan	4.4	3.5	2.1
Kyrgyzstan	4.5	4.7	2.9
Russian Federation	2.9	2.0	1.3
Tajikistan	6.0	6.8	3.7
Turkmenistan	6.0	6.2	3.0
Uzbekistan	6.0	6.3	2.9

Source: United Nations, *World Population Prospects: The 2002 Revision*.

Table 2. Percentage decline in total fertility rate: 1970-1975 to 1995-2000

Percentage decline		
Less than 25 per cent	25 to 49 per cent	50 per cent or more
East and North-East Asia		
	Democratic People's Republic of Korea (46.9)	Republic of Korea (64.6)
	Japan (32.8)	Macao, China (64.1)
		Mongolia (63.2)
		China (62.9)
		Hong Kong, China (61.9)
South-East Asia		
Lao People's Democratic Republic (13.8)	Myanmar (42.6)	Viet Nam (62.7)
Cambodia (5.1)	Singapore (40.3)	Thailand (60.8)
	Philippines (39.3)	Brunei Darussalam (50.0)
	Malaysia (36.8)	Indonesia (50.0)
South and South-West Asia		
Nepal (19.6)	Sri Lanka (48.5)	Iran (Islamic Republic of) (60.5)
Maldives (17.1)	Turkey (47.6)	
Pakistan (12.7)	India (36.4)	
Bhutan (6.8)	Bangladesh (35.8)	
Afghanistan (6.8)		
North and Central Asia		
	Azerbaijan (46.4)	Uzbekistan (54.2)
	Tajikistan (45.6)	Armenia (53.2)
	Kazakhstan (39.3)	Turkmenistan (51.0)
	Georgia (39.3)	
	Kyrgyzstan (38.8)	
	Russian Federation (38.4)	

Source: United Nations, *World Population Prospects: The 2002 Revision*.

South-East Asia

Fifty years ago, all the countries in this subregion had high fertility and all but Singapore continued to have high fertility during the period 1970-1975. However, fertility transition began to take place in most of the countries during the past 25 years and many of them experienced notable declines in fertility between the periods 1970-1975 and 1995-2000. A majority of the countries in that

subregion currently fall in the category of intermediate fertility (TFR of 2.11 to 4.99), with a couple of countries having high or low fertility. Countries with intermediate fertility include Brunei Darussalam, Indonesia, Malaysia, Myanmar, the Philippines and Viet Nam. While Cambodia and the Lao People's Democratic Republic exhibit high fertility (TFR of 5 and above), Singapore and Thailand are the only two countries in the subregion which have successfully reduced their fertility to below-replacement-level (see table 1).

Table 2 shows the variations in the percentage decline in total fertility rates between the periods 1970-1975 and 1995-2000. The most impressive declines occurred in Thailand and Viet Nam, both of which recorded more than a 60 per cent decline in fertility. In fact, Thailand is the only country which experienced a remarkable decline in fertility from a high level to below-replacement-level in a short time span. Other countries, such as Brunei Darussalam and Indonesia, also underwent fairly rapid fertility decline. In contrast, very little decline in fertility occurred in Cambodia and the Lao People's Democratic Republic during that period. However, the recent demographic and health survey of Cambodia suggests that there has been a resumption of fertility decline to 4.0 per woman (National Institute of Statistics, Directorate General for Health, and ORC Macro, 2001).

South and South-West Asia

All countries in South and South-West Asia had high fertility during the period 1950-1955. High fertility continued to prevail in all countries during the period 1970-1975, except in Sri Lanka, where TFR dropped to 4.1. Many countries in the subregion witnessed fertility transition during the past 25 years, with some countries, such as Bangladesh, India, the Islamic Republic of Iran and Turkey, exhibiting a fairly rapid decline in fertility. Nepal experienced a slow decline in fertility. Sri Lanka is the only country in the subregion with the current fertility reaching below-replacement-level, whereas other countries have current fertility levels that are at high or intermediate level. High fertility persisted in such countries as Afghanistan, Bhutan, Maldives and Pakistan, in which the TFR ranged from 5.5 to 6.9 during the period 1995-2000.

Age patterns of fertility

East and North-East Asia and North and Central Asia

Table 3 presents the age patterns of fertility for the most recent data available in each country or area, and the contribution of each age group of woman to TFR. Age patterns of fertility in those subregions are in sharp contrast with other subregions, particularly countries with high fertility rates. In those subregions, not only does childbearing start late in most countries, but also the fertility rate of women past age 35 begins to dip very rapidly. For example, in Japan and the Republic of Korea, women aged 25 to 34 contribute over 70 per cent to the country's TFR, while the percentage contribution of women above age 40 is almost negligible. That pattern of compressing fertility to a short reproductive span is a general trend that low-fertility countries have experienced.

Table 3. Age-specific fertility rates and contribution of each age group to fertility rate

Country, territory or area	Year	TFR	Age-specific fertility rates (per 1,000 women)										Contribution of each age group to fertility rate (percentage)									
			Age group										Age group									
			15-19	20-24	25-29	30-34	35-39	40-44	45-49	15-19	20-24	25-29	30-34	35-39	40-44	45-49						
East and North-East Asia																						
China	1994	1.9	5	161	144	47	10	4	1	1.3	43.1	38.5	12.6	2.7	1.1	0.3						
Hong Kong, China	2001	0.9	4	29	58	61	28	5	0	2.2	15.6	31.3	32.7	15.2	2.4	0.1						
Japan	2000	1.4	5	40	100	94	32	4	0	2.0	14.5	36.3	34.1	11.7	1.4	0.0						
Macao, China	1995	1.4	8	56	98	75	28	6	0	2.9	20.5	35.9	27.5	10.3	2.2	0.1						
Mongolia	1998	3.1	54	216	169	105	50	18	0	8.8	35.1	27.5	17.1	8.1	2.9	0.0						
Republic of Korea	2001	1.3	2	32	131	78	17	3	0	0.8	12.0	49.6	29.6	6.5	0.9	0.1						
South-East Asia																						
Brunei Darussalam	2000	2.4	33	91	132	113	76	27	17	6.7	18.4	26.9	22.9	15.5	5.5	3.5						
Cambodia	2000	4.0	51	191	203	165	118	55	15	6.4	23.9	25.4	20.7	14.8	6.9	1.9						
Indonesia	1995-97	2.8	62	143	149	108	66	24	6	11.1	25.5	26.6	19.3	11.8	4.3	1.1						
Lao People's Democratic Republic	2000	4.9	96	261	210	180	109	71	49	9.8	26.6	21.4	18.4	11.1	7.2	5.0						
Malaysia	1997	3.3	16	121	214	172	96	32	3	2.4	18.4	32.6	26.2	14.6	4.9	0.5						
Myanmar	1997	2.7	25	102	144	138	92	35	7	4.5	18.7	26.4	25.3	16.9	6.5	1.3						
Philippines	1998	3.7	46	177	210	156	111	40	7	6.1	23.6	28.0	20.8	14.8	5.3	0.9						
Singapore	1999	1.5	8	37	105	99	39	7	0	2.8	12.3	35.4	33.5	13.3	2.2	0.0						
Thailand	1995/96	2.0	54	126	107	68	36	11	3	13.2	30.9	26.2	16.8	8.8	2.8	0.7						
Viet Nam	1997	2.3	32	164	132	81	41	15	2	6.8	34.9	28.1	17.3	8.7	3.2	0.4						

Table 3 (continued)

Country, territory or area	Year	TFR	Age-specific fertility rates (per 1,000 women)										Contribution of each age group to fertility rate (percentage)				
			Age group										Age group				
			15-19	20-24	25-29	30-34	35-39	40-44	45-49	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
South and South-West Asia																	
Bangladesh	1999/00	3.3	144	188	165	99	44	18	3	21.7	28.3	24.8	14.9	6.6	2.7	0.5	
Bhutan	1984	5.9	57	229	268	223	201	141	53	4.8	19.4	22.8	18.9	17.1	12.0	4.5	
India	1998	3.2	54	220	183	104	54	25	9	8.3	33.7	28.1	15.9	8.3	3.8	1.4	
Iran (Islamic Republic of)	2000	2.2	35	110	131	90	48	16	4	8.0	25.2	30.0	20.6	11.0	3.7	0.9	
Maldives	1990	7.5	147	348	356	311	224	100	19	9.7	23.0	23.5	20.6	14.8	6.6	1.3	
Nepal	2001	4.1	110	248	205	136	81	35	7	13.3	30.0	24.8	16.5	9.8	4.2	0.8	
Pakistan	2000/01	4.8	65	211	258	206	128	61	26	6.8	22.0	26.9	21.5	13.3	6.4	2.7	
Sri Lanka	2000	2.0	14	72	123	105	58	18	2	3.6	18.3	31.2	26.7	14.7	4.6	0.5	
Turkey	1998	2.6	60	163	150	93	42	13	1	11.4	31.1	28.6	17.7	8.0	2.5	0.2	
North and Central Asia																	
Armenia	2000	1.7	50	149	88	35	16	3	0	14.6	43.5	25.7	10.2	4.7	0.9	0.0	
Azerbaijan	1998	1.9	38	147	106	53	26	7	1	10.0	38.7	27.9	14.0	6.8	1.8	0.3	
Georgia	1992	1.8	53	159	79	45	18	4	0	14.7	44.2	21.9	12.5	5.0	1.1	0.1	
Kazakhstan	1999	2.1	40	167	106	64	24	9	0	9.7	40.5	25.7	15.5	5.8	2.2	0.0	
Kyrgyzstan	1997	3.4	75	246	179	113	47	13	0	11.1	36.4	26.5	16.7	6.9	1.9	0.0	
Russian Federation	1998	1.2	34	99	68	33	12	2	0	13.6	39.7	27.3	13.2	4.8	0.8	0.0	
Tajikistan	1992	4.1	42	261	227	163	93	34	7	5.1	31.4	27.3	19.6	11.2	4.1	0.8	
Turkmenistan	2000	2.9	30	184	195	105	48	14	1	5.2	31.7	33.6	18.1	8.3	2.4	0.2	
Uzbekistan	1996	3.3	61	266	176	114	39	9	3	9.1	39.6	26.2	17.0	5.8	1.3	0.4	

Source: Database maintained by ESCAP, Bangkok.

The age patterns of fertility appear to show a distinct feature in those subregions. It is apparent from figure I that in Hong Kong, China; Japan; Macao, China; and the Republic of Korea in East and North-East Asia, women aged 25-29 have the highest fertility level. In China and Mongolia, however, there has been a drift in the peak age of fertility from the age group of 25-29 in the 1970s to that of 20-24 in the 1990s. As figure II suggests, a distinctively shaped of age pattern of fertility can be observed in North and Central Asian countries, where fertility reaches its peak among women aged 20-24, and then begins to decline sharply with age. That age pattern is consistent with the high percentage of women aged 15-19 and 20-24 reported to have ever married (see table 4). Moreover, despite the overall reduction in the level of fertility, the age pattern of fertility has remained consistent in most of those countries. Exceptions are Azerbaijan and Turkmenistan, where there has been a shift in the age patterns of fertility, with peak fertility drifting from women aged 25-29 to 20-24.

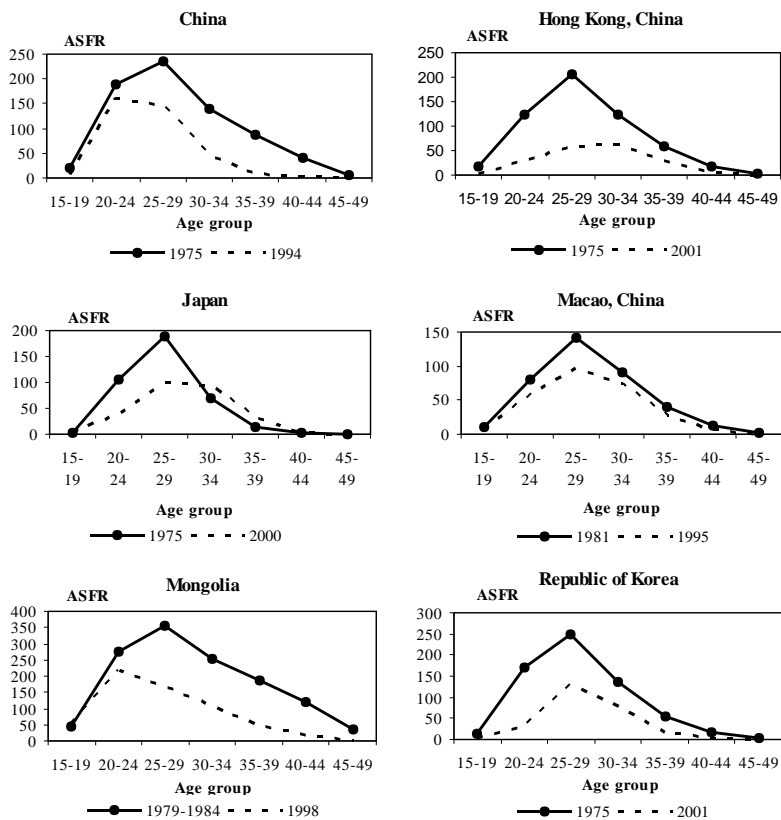
South-East Asia

The age patterns of fertility depicted by South-East Asian countries with intermediate fertility - Brunei Darussalam, Indonesia, Malaysia, Myanmar, the Philippines and Viet Nam - remained relatively similar at two points in time (see figure III). In Indonesia, Malaysia and Myanmar, fertility decline occurred in women of all age groups with a somewhat larger decline occurring among women in the older and younger age groups. A sharp reduction in adolescent fertility was observed in Indonesia and Malaysia. However, in the case of the Philippines and Viet Nam, fertility decline was more pronounced among women in the older age groups. The pattern observed in Singapore is somewhat different in that women in the prime reproductive age group, 20-29, exhibit a sharp reduction in fertility while the country maintains a low level of fertility among older women. That pattern is similar to the typical pattern observed in the East Asian countries, such as Japan and the Republic of Korea. By contrast, the patterns seen in Cambodia and the Lao People's Democratic Republic are quite similar to the ones observed in South and South-West Asia, such as that in Pakistan (discussed later).

South and South-West Asia

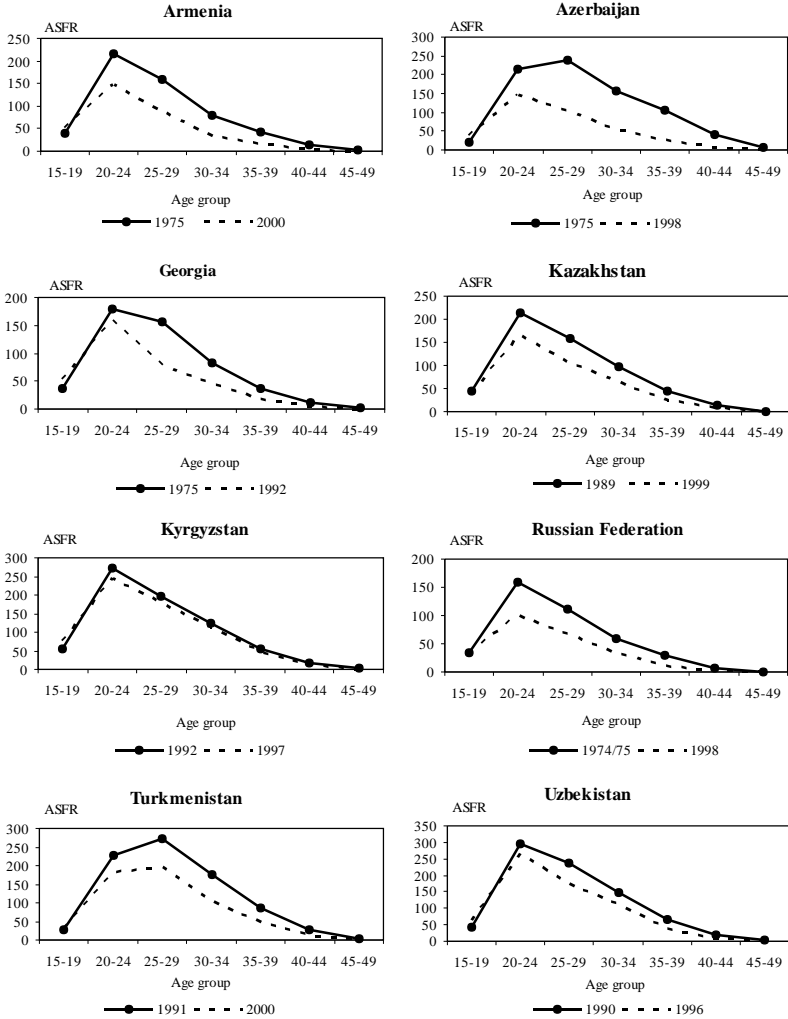
It can be seen from table 3 that age-specific fertility rates are typically high among women aged 15-19 in Bangladesh, Maldives and Nepal, countries that are characterized by a low age at marriage of females. In those countries, childbearing not only begins early but also spreads over a longer duration during the reproductive span, with the largest contribution to overall fertility by women in age groups 20-24 to 30-34. For example, in Bangladesh the share of adolescent fertility to overall fertility is over one fifth and the first three age groups of women, aged 15 to 29, contribute to 75 per cent of the total fertility rate. This is in sharp contrast to the pattern observed in East Asia, where childbearing is compressed into a narrow reproductive span.

**Figure I. Trends in the age-specific fertility rates:
East and North-East Asia**



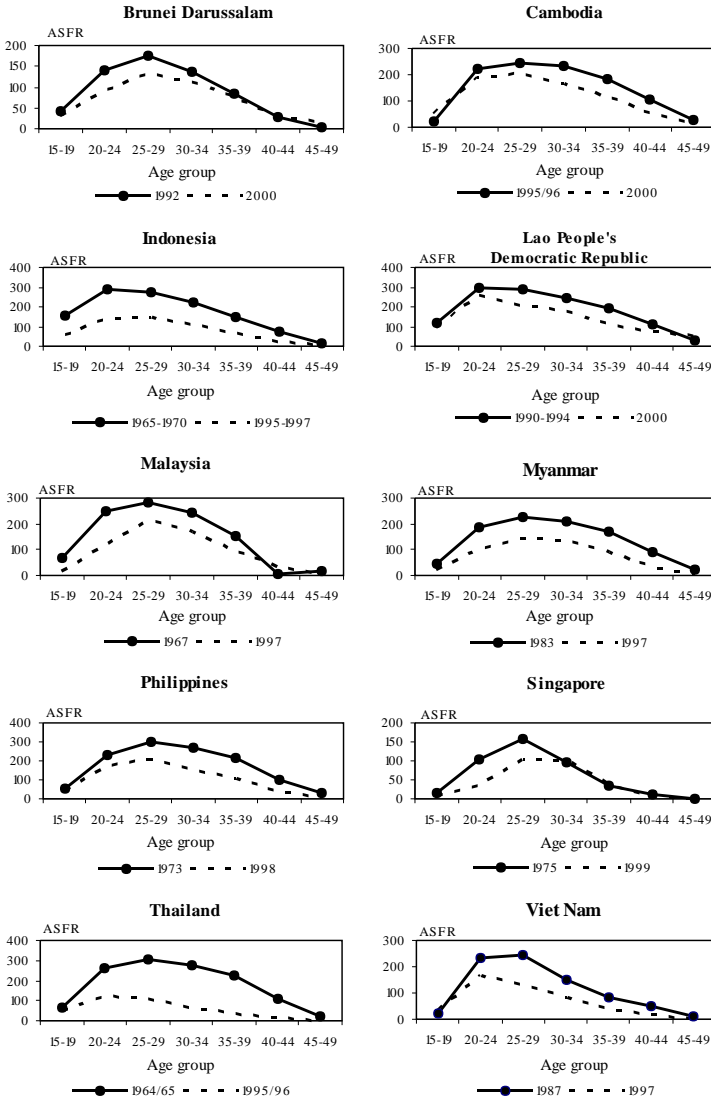
Source: Database maintained by ESCAP, Bangkok.

Figure II. Trends in the age-specific fertility rates: North and Central Asia



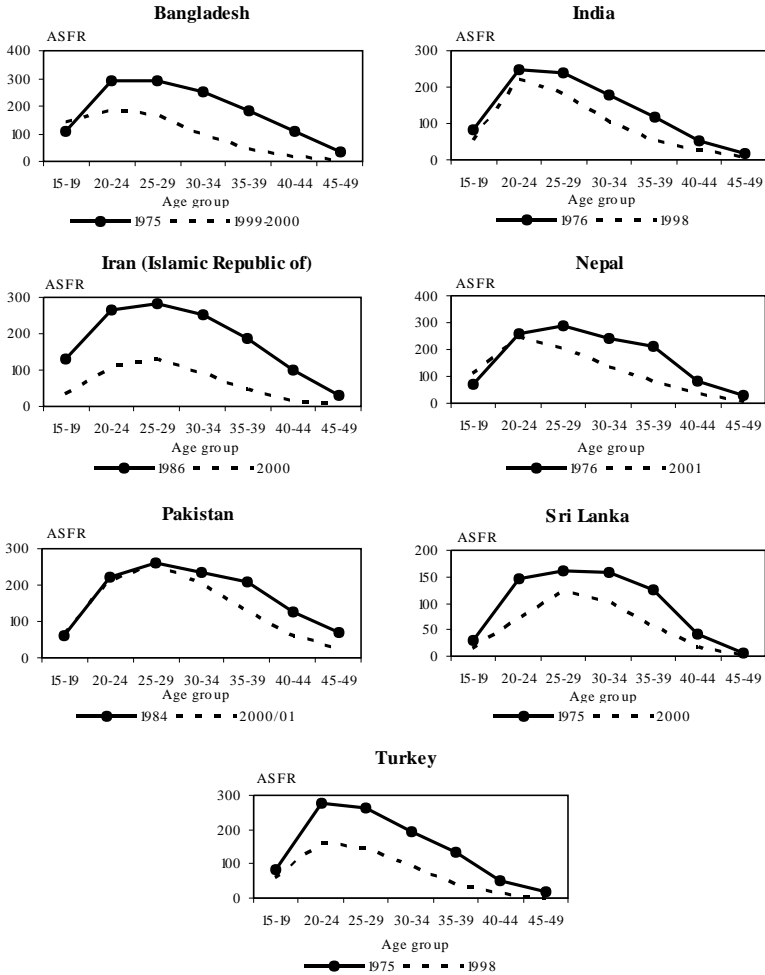
Source: Database maintained by ESCAP, Bangkok.

Figure III. Trends in the age-specific fertility rates: South-East Asia



Source: Database maintained by ESCAP, Bangkok.

**Figure IV. Trends in the age-specific fertility rates:
South and South-West Asia**



Source: Database maintained by ESCAP, Bangkok.

It is also important to mention that in Pakistan, one of the Asian countries with a high fertility rate, the shape of the fertility curve has remained relatively unchanged over time, and the change in the magnitude of the decline has also not been significant. Decline in fertility occurred, to a large extent, among women in older age groups in comparison with women in younger age groups. These are obviously the women who already have four or more children, who contribute very little to the overall fertility transition. A more or less similar pattern can be observed in Bangladesh, India and Nepal, where fertility decline occurred mostly among women in the older age groups. The lack of a precipitous decline in fertility among younger women in those countries is related primarily to the prevalence of early age at marriage of females, resulting in a higher proportion of women married in age groups 15-19 and 20-24. For example, in Bangladesh, India and Nepal more than four fifths of women in the age group 20-24 are already married (see table 4). Furthermore, a high female illiteracy rate, leading to a lower contraceptive prevalence rate, is another factor inhibiting fertility decline among adolescent women (ESCAP, 2001).

By contrast, in Turkey and the Islamic Republic of Iran, where the TFR has declined substantially, a sustained decline in fertility has occurred among women in all age groups, maintaining the same age pattern of fertility over time. In the case of the Islamic Republic of Iran in particular, a dramatic fall in fertility has occurred in a short period of time: the TFR plummeted from 6.2 in 1986 to 2.2 in 2002. During that period, fertility declined by over 50 per cent among women in all age groups and by more than 70 per cent among women aged 15-19 and women aged 35 years and older.

Explanations of fertility decline

East and North-East Asia and North and Central Asia

The traditional demand theories, such as the wealth flow theory of Caldwell, hypothesize that the demand for children declines with the changes in socio-economic conditions (Caldwell, 1976). More recent studies have concluded that the improvements in human development, measured by indicators such as literacy and life expectancy play a major role in reducing fertility, while economic development (a structural transformation of modes of production) is not a necessary condition for fertility decline (Bongaarts, 2002; Bongaarts and Watkins, 1996; Cleland and Wilson, 1987). A United Nations study also concludes that the driving force for fertility decline is socio-economic development, in particular decline in mortality and increased female education and labour force participation rates (United Nations, 2002a). Moreover, another study states that a prominent contributing factor in the changing demand for children is rapid social development, particularly the spread of primary education (Jones and Leete, 2002).

It can be seen from table 4 that countries in those subregions, particularly countries in East Asia, have a high level of human development. Along with advanced economic development, the high level of human development has created a favourable environment for a small family norm. In other words, as Coale (1973) has put it, fertility regulation has become a conscious choice of couples, based on the balance between the advantages and disadvantages of having a smaller number of children. Fertility regulation has been further recognized as advantageous to the couples; in addition, it became achievable by easily available and effective contraceptive methods. The socio-economic conditions of many countries in that region have provided the context for couples to desire a small family, while fertility control has become socially and culturally acceptable. Methods of controlling fertility were then introduced to meet the “unmet need” for family planning.

Table 5 shows a generally high percentage of contraceptive use in those subregions. Contraceptive use ranges from 56 per cent in Japan to 84 per cent in China and 86 per cent in Hong Kong, China (East and North-East Asia) and from 34 per cent in Tajikistan to 67 per cent in the Russian Federation (North and Central Asia). Somewhat lower contraceptive use reported in Japan is due to the legalization of induced abortion, which has been credited as one of the reasons for fertility decline (Atoh, 2001). Similarly, the much lower prevalence of modern methods of contraception reported in North and Central Asia, such as in Armenia, Azerbaijan, Georgia and Tajikistan, is attributed to the fact that in many of those countries induced abortion has been used as a method of family planning and that factor has played a major role in their fertility decline (UNFPA, 1999; Kandiah, 2003).

The case of China illustrates the crucial role that government policy can play in providing methods of family planning and thus reducing fertility even under low socio-economic conditions. As a result of the Government’s comprehensive and strong family planning programme in the 1970s, China experienced an unprecedented drop in TFR from 5.8 in 1970 to 2.8 in 1979 (Zhai, 2002). The principles of late marriage, longer birth spacing and fertility limitation were strictly enforced throughout the country along with the vigorous implementation of the one-child policy (Jiang and Zhang, 2000). China experienced a sustained decline in fertility, reaching below the replacement level in the early 1990s and the TFR currently remains at 1.8. The successful family planning programme helped to free married women from high-order births and heavy family burdens, providing them more opportunities to participate in socio-economic activities. Thus, the commitment of the Government to reduce the population growth rate not only contributed to fertility decline but also improved socio-economic conditions and people’s ideas about family and gender relations, making them more compatible with the low-fertility regime (Attane, 2002).

Table 4. Selected Human Development Index and percentage of ever-married women aged 15-19 and 20-24

Country, territory or area	Life expectancy at birth (years)		Infant mortality rate (per 1,000)	Female adult literacy rate (per cent)	Percentage married among woman aged		
	Males	Females			Year	15-19	20-24
East and North-East Asia							
China	69	73	39	77	1999	1.3	45.6
Democratic People's Rep. of Korea	70	76	20
Hong Kong, China	76	82	6	90	2001	0.7	10.8
Japan	77	84	4	..	2000	0.9	11.3
Macao, China	75	80	10	90	1991	2.3	22.0
Mongolia	65	68	65	99	2000	2.8	24.1
Republic of Korea	69	77	10	96	1995	0.8	16.7
North and Central Asia							
Armenia	68	74	25	99 a/	1989	16.3	64.2
Azerbaijan	66	75	34	96 b/	1999	12.5	47.4
Georgia	69	77	19	..	1989	16.8	56.1
Kazakhstan	64	73	33	99 a/	1999	7.1	47.4
Kyrgyzstan	64	73	38	95 b/	1999	7.3	50.4
Russian Federation	61	73	18	99	1989	10.5	62.2
Tajikistan	65	71	54	99	1989	11.4	73.8
Turkmenistan	63	70	52	97 b/	1989	6.2	51.5
Uzbekistan	65	71	42	100 b/	1996	12.7	73.4
South-East Asia							
Brunei Darussalam	74	79	9	88	1991	7.8	37.4
Cambodia	53	61	79	58 c/	2000	12.9	55.5
Indonesia	64	68	44	82	1997	17.1	61.4
Lao People's Democratic Republic	53	56	88	51	2000	26.8	73.0
Malaysia	71	75	11	84	1991	7.4	39.1
Myanmar	60	63	71	81	1997	6.6	34.8
Philippines	67	71	33	95	1998	4.8	34.5
Singapore	75	80	5	89	2000	1.0	15.7
Thailand	71	76	22	94	1990	13.9	48.7
Viet Nam	66	71	35	91	1997	7.7	52.0
South and South-West Asia							
Afghanistan	46	47	147	21
Bangladesh	59	60	73	30	1999/00	55.4	81.5
Bhutan	61	63	58	34	1990	25.5	64.8
India	63	64	68	42	1991	35.3	81.8
Iran (Islamic Republic of)	69	71	32	70	1996	17.5	59.5
Maldives	67	65	45	96	1995	20.1	70.1
Nepal	58	58	77	24	2001	40.2	82.9
Pakistan	64	66	70	28	2000/01	15.2	52.3
Sri Lanka	71	76	17	89	2000	8.6	37.1
Turkey	67	72	42	77	1990	15.1	61.2

Sources: ESCAP (2000); United Nations (2000b).

a. 1995, b. 1997 and c. 1996.

Table 5. Contraceptive prevalence rate among women of reproductive age and percentage of women with unmet need for family planning

Country, territory or area	Year	Contraceptive prevalence rate		Percentage of women with unmet need for family planning
		(per cent)		
		Any method	Modern method	
East and North-East Asia				
China	1997	83.8	83.3	..
Democratic People's Republic of Korea	1990-92	61.8	53	..
Hong Kong, China	1992	86.2	79.7	..
Japan	2000	55.9	55.1	..
Mongolia	1998	59.9	45.7	..
Republic of Korea	1997	80.5	66.9	..
North and Central Asia				
Armenia	2000	59	22.3	..
Azerbaijan	2000	55.1	15.8	..
Georgia	1999-00	40.5	19.8	23.8
Kazakhstan	1999	66.1	52.7	8.7
Kyrgyzstan	1997	59.5	48.9	11.6
Russian Federation	1994	66.8	48.6	..
Tajikistan	2000	33.9	27.3	..
Turkmenistan	2000	61.8	53.1	..
Uzbekistan	1996	55.6	51.3	13.7
South-East Asia				
Cambodia	2000	23.8	18.5	32.6
Indonesia	1997	57.4	54.7	9.2
Lao People's Democratic Republic	2000	32.2	28.9	39.5
Malaysia	1994	54.5	29.8	..
Myanmar	1997	32.7	28.4	..
Philippines	1998	46	28.2	19.8
Singapore	1997	62	53	..
Thailand	1996-97	72.2	69.8	..
Viet Nam	1997	75.3	55.8	6.9
South and South-West Asia				
Afghanistan	1973	1.6	1.6	..
Bangladesh	1999-00	53.8	43.4	15.3
Bhutan	2000	30.7	30.7	..
India	1998/99	48.2	42.8	15.8
Iran (Islamic Republic of)	2000	73.8	55.9	..
Nepal	2001	39.3	35.4	27.8
Pakistan	2000-01	27.6	20.2	33
Sri Lanka	2000	70.8	49.5	..
Turkey	1998	63.9	37.7	10.1

Sources: Population Reference Bureau (2002); United Nations (2001).

The Mongolian case elucidates a unique situation in which the weakening of pronatalist policies followed by economic crisis, rather than prosperity, has encouraged fertility decline. The TFR in Mongolia was consistently high at around 8 children per woman between 1960 and 1968. During that time, pronatalist policies were in practice: the distribution and use of modern contraceptives were prohibited, while women with many children were rewarded with various benefits. Since 1976, however, the pronatalist policies have gradually been relaxed, with a significant expansion of family planning services in 1988 and legalized abortion in 1989. Accordingly, the TFR declined to fewer than 5 children per woman by 1990. A further rapid decline was recorded with the collapse of the socialist system and accompanying economic crisis of the 1990s. Along with falling income levels and increased unemployment rates, the TFR dropped to less than 3 children per woman. More important, reduced social benefits for childbearing have adversely affected people's motivations for having many children as health care and schooling were no longer free, adding extra burdens for parents (Aassve and Altankhuyag, 2002). The Mongolian case thus suggests that changes in the level of social services along with economic hardship can depress people's desire to have many children.

South-East Asia

In addition to the previously mentioned demand factor, some studies have pointed out that the diffusion of new ideas and behaviours is another prime factor for fertility decline. According to the diffusion model, new ideas and information spread through social interactions, which is the process of changing (or not changing) people's attitudes towards a new idea. Social norms and traditions also act to encourage or discourage a new idea. Social interactions, which provide opportunities for diffusion, are communicated at the personal, national and international levels (Bongaarts and Watkins, 1996). Thus, the process of fertility decline is propelled by the transmission of information and ideas as regards the regulation of fertility and the use of modern contraceptives.

As is the case for China, the role of the Government is particularly important because it is a major institution that can effectively diffuse information at the national level. It has been argued by Bongaarts (1994:619) that national family planning programmes can have powerful impacts on fertility levels by "reducing noneconomic costs of contraceptive use, such as lack of knowledge, fear of side effects, and social and familial disapproval". Reviewing the development of family planning programmes during the latter part of the twentieth century, Caldwell and others (2002) emphasize that national family planning programmes have played a significant role in reducing fertility in the developing world by not only providing new contraceptive methods for free or at a reasonable price, but also and even more important, by popularizing the small family norm and legitimizing the use of contraceptives.

Thailand is an excellent example depicting the positive impacts of a national family planning programme. Thailand's TFR was close to 5 children

per woman until 1975, after which it drastically dropped to 3.8 in the 1980s and to 2.3 in the early 1990s. Fertility continued to decline through the 1990s, eventually dropping to below the replacement level (Chamrathirong, undated; Gubhaju and Moriki-Durand, 2003). The current TFR is estimated at 1.7 children per woman (ESCAP, 2003). As a result of the successful national family planning programme implemented in the early 1970s, the use of contraception increased from about 34 per cent in 1975 to 72 per cent in 1996 (Ruffolo and Chayovan, 2000). The national family planning programme in Thailand is well known for its innovative character, providing contraceptive services to the community level by employing nurses and auxiliary midwives as contraceptive providers (Rosenfield and others, 1982). In addition, some studies have argued that increasing economic pressures, the active participation of women in trading and farming and the relative autonomy of women have made Thai women desire a small family (Knodel and others, 1987; Mougne, 1988). Such factors as the rising age at marriage for both men and women, the increasing level of celibacy and the shortening of the childbearing span also contributed to the decline in fertility in Thailand. Thus, the case of Thailand strongly suggests that fertility transitions can progress rapidly when methods of modern contraception are effectively provided in favourable social conditions where people are ready and willing to limit their fertility.

The Vietnamese case further underlines the importance of the effect of family planning programmes under favourable socio-economic conditions. It presents an example of a sustained decline in TFR from 5.9 in the early 1970s to 4.0 in the late 1980s and 2.3 in 1999. This is consistent with the rise in contraceptive prevalence from 53 per cent in 1988 to 65 per cent in 1994 and 75 per cent in 1997. Although the increased contraceptive use is the main driving force in the reduction of fertility in Viet Nam, the transformation towards a market-oriented economy following the unification of the country has improved the socio-economic conditions of the people at large, thereby strongly affecting family structure, life style and reproductive behaviour (Hung, 2002).

The successful implementation of the Indonesian national family planning programme also contributed significantly to the reduction in fertility. Indonesia exhibited a remarkable decline in the TFR from close to 6 children per woman in the 1960s to less than 3 in the 1990s. This is associated with the percentage of married women currently using contraceptives, which increased from less than 20 per cent in the mid-1970s to over 50 per cent by the end of the 1990s. The success of family planning programmes in Indonesia is the result of the political change that occurred in the 1960s. The new regime changed the political climate from one that was traditionally Islamic to a less conservative one. The secularization of the Government helped the formulation of an effective family planning programme that was compatible with Islamic values. Increased involvement of women in school and the formal workforce further contributed to depress Indonesian fertility. A growing number of women are now choosing a life focused on higher education and a career rather than the traditional life based on

marriage and childbearing. The social reality of Indonesia is making it difficult for these young women to have both family and work (Hull, 2002 and 2003).

Some countries in South-East Asia, however, exhibit staggered fertility rates. The Philippines is an example where a religious institution appears to have hindered further progress in the country's fertility transition. Although the TFR in the Philippines started to decline in the mid-1960s, the pace of the decline has been quite modest during the past 25 years. The TFR has stalled at around 4 children per woman over the last 10 years (Cabigon, 2002). This is surprising in the light of favourable social indicators such as higher female literacy rate, relatively low infant mortality rate and higher life expectancies at birth (see table 4). One of the major reasons for the lower-than-expected performance is the resistance of the Roman Catholic Church to any effort to promote most forms of modern contraception and its ideological commitment to natural family planning methods such as the rhythm method. A weak political commitment to establishing a comprehensive family planning programme is further worsening the situation (Cabigon, 2002).

Malaysia is another case in which government policy influenced the course of fertility transition; yet the transition was not uniform across ethnic groups. In Malaysia, as a whole, the TFR dropped substantially from 5.4 in 1967 to 3.5 in 1987 and the decline slowed somewhat to 3.3 in 1997 (Peng, 2002). The establishment of the national family planning programme in the mid-1960s along with the impressive gains in socio-economic indicators led to a sustained decline in fertility among Malays and an accelerated decline among people of Chinese and Indian ethnicity. However, the slow pace of the overall fertility decline in Malaysia during the period between 1987 and 1997 is the result of a differential response by ethnic groups to the inequalities in the level of socio-economic development and government policy changes. Concerned over further reductions in fertility, the Government apparently de-emphasized the family planning programme and established a pronatalist policy in the early 1980s. The immediate effect of that policy was revealed in a slowing of the fall in the TFR of Malays, from 4.5 in the years 1977 and 1987 to 3.8 in 1997, as society responded quickly to the new government policy with its pronatalist messages. The fertility of people of Chinese and Indian descent, however, continued to fall, reaching 2.5 and 2.6, respectively, in 1997 (Jones and Leete, 2002; Peng, 2002).

South and South-West Asia

Among the countries in South and South-West Asia, the case of Sri Lanka stands as a unique example which demonstrates the crucial role of human development in the course of fertility decline. Despite the fact that Sri Lanka is still a low-income country, its TFR dropped from around 5 children per woman in the late 1960s to replacement level in the late 1990s. As table 4 suggests, the advanced level of human development, reflected in the high female literacy rate (89 per cent), low infant

mortality rate (17 per 1,000 live births) and fairly high life expectancies at birth (71 years for males and 76 years for females), has inevitably influenced the fertility level. Those social conditions that facilitated the acceptance of the small-family norm helped to complete the fertility transition earlier than economic indicators would suggest. The lessons from Sri Lanka clearly demonstrate that investments in social sector programmes with strong political commitment can be highly effective in reducing fertility in low-income countries (Sathar and Phillips, 2001).

The recent spectacular decline in fertility achieved by the Islamic Republic of Iran also suggests the importance of basic social and health infrastructures in improving human capital and thus facilitating the use of contraceptives. One of the characteristics of the fertility decline in the Islamic Republic of Iran is that it occurred in all segments of the population, including rural areas. Fertility rates fell from 4.5 to 1.8 in urban areas and from 8.1 to 2.4 in rural areas between 1976 and 2000. A fundamental improvement in female education as well as a change in marriage patterns made a significant contribution to the increase in contraceptive use from 37 per cent in 1976 to 74 per cent in 2000, leading to a rapid fertility decline (Roudi-Fahimi, 2002).

Those changes are attributed to the fact that government policies to increase public education and establish a health network system have resulted in

The rural health-care network in the Islamic Republic of Iran

There are now more than 16,000 health houses in the Islamic Republic of Iran, covering around 95 per cent of the rural population. In addition, mobile clinics bring health services to people living in remote areas. Each health house serves around 1,500 people, usually consisting of the people of one central village (where the health house is located) and those of satellite villages that are within an hour's walk from the central village. Each health house generally has two health providers (in principle, one man and one woman), known as *behvarzes*, who receive two years of training. The female *behvarz* is in charge of maternal and child health care and the male is responsible for issues related to environmental health, such as water safety and agricultural production.... The data also show the number of married women of reproductive age and their contraceptive prevalence rate by methods. *Behvarzes* are proactive: they are comfortable knocking on people's doors to talk about families' health-care needs, including family planning, and to give them appointments to visit the health house (Roudi-Fahimi, 2002: 4)

the promotion of successful family planning within the framework of the rural health-care network called “health houses” (see box below).

The implementation of the national family planning programme in 1989 was effectively enhanced through the health network. Religious leaders legitimized the family planning programme by giving full support, which enabled the Government to provide family planning services to the people without any religious barriers. Moreover, by the mid-1980s, the perceived costs of rearing children had increased owing to higher aspirations and investments by families in their children’s education (Abbasi-Shavazi, 2002).

By contrast, an example from Bangladesh presents a counter-case where insufficient human development is hindering maximum use of the family planning programme. Although the TFR in Bangladesh was impressively reduced from 6.3 in 1975 to 3.3 in the early 1990s, the decline has virtually stalled at around 3 during the last decade. The speed with which fertility declined from a high to an intermediate level was largely due to the successful family planning campaign, which was supported by a strong political commitment to reducing fertility. Culture-sensitive family planning programmes manifested in household visits by field workers, the involvement of religious leaders in the programmes’ promotion (McEachran and Diamond, 2001) and external funding to support the family planning programmes (Caldwell and others, 2002) have facilitated the progress of the campaign. As a result, the contraceptive prevalence rate increased from less than 10 per cent in the mid-1970s to about 40 per cent at the beginning of the 1990s and further to 54 per cent in 1999-2000 (Bairagi and Datta, 2001).

The stabilization of the TFR at slightly above 3 children per woman, however, indicates that a subsequent rise in contraceptive prevalence failed to show an impact on fertility decline. A study conducted in Matlab, Bangladesh, suggests that, conditioned by strong son preference in the area, fertility in Matlab has actually reached the level of couples’ desired number of children. The impact of the increase in contraceptive use has been offset largely by the decrease in the incidence of abortion, with the net balance resulting in the stalling of the total fertility rate at the desired number of children (Bairagi and Datta, 2001). Bongaarts and Watkins (1996) suggest that a low level of social development might be a factor in keeping the desired number of children at a relatively high level. According to them, the threshold level of social development (measured by the Human Development Index) required for the onset of fertility decline has dropped over time because of the diffusion of information transmitted from leading countries in the region which had initiated fertility decline; the onset of the fertility transition in Singapore occurred when its HDI was at 0.65, while the Bangladeshi fertility transition started when its HDI level was only at 0.32. Thus, since Bangladesh had begun its fertility transition earlier than anticipated in view of its level of social development, the social conditions were not sufficient to have a sustained fertility decline.

A further explanation concerning the apparent stalling of the fertility decline in Bangladesh is related to a decline in the quality of care. Islam and others (2003) found that the quality characteristics of fieldworkers, including regularity in work, innovative techniques in communication, technical competence, enthusiasm for work and conformity to social norms, have had significant positive impacts on the clients' current use of contraceptives. They conclude that the presence of or visits by a fieldworker are not enough to increase contraceptive prevalence/continuation rates and to decrease failure rates. What is needed is a good-quality fieldworker. The Bangladesh experience, therefore, suggests that a further decline in fertility would require renewed programmes with intensified training for fieldworkers emphasizing the quality of care and, more critically, fundamental improvements in social/human development.

Moreover, the case of India highlights the impact of human development on the uneven fertility transition among states divided between the northern and southern parts of the country. In India, as a whole, fertility declined from 6.0 children per woman in the early 1960s to 4.5 in the early 1980s. The process of decline continued at a gradual pace, reaching 3.2 in 1998. Such a steady decline in fertility at the national level is related to the implementation of the government family planning programme established in 1951 as well as perceptible changes in socio-economic development over the past 30 years in India (Ram and Ram, 2002). However, the aggregate fertility level of the country masks the substantial variations in fertility among states. For example, in the southern states of Kerala and Tamil Nadu, there has been a spectacular drop in TFR from around 5 in the early 1960s to below replacement level in 1998. By contrast, women in the northern states, such as Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, reported modest declines in TFR from over 6 children per woman to over 4 during the same period (Kumar, 2002). A distinct difference between north and south India is that the fertility transition began in the south at a higher level of social development, such as a higher female literacy rate (over 45 per cent), lower infant mortality (89 per 1,000 live births) and higher female age at marriage (20 years). By contrast, in most of the northern states the fertility transition began when female literacy was below 20 per cent, infant mortality was above 100 per 1,000 live births and female age at marriage was below 18 years (Ram and Ram, 2002).

Some studies have strongly argued the importance of women's autonomy in the manifestation of a clear fertility difference between northern and southern India, where underlying family structures as well as the status of women differ considerably. In the northern region of India, great emphasis is placed on males and the patrilineal family system. Dowry is usually required for women to marry, a strong son preference and neglect of girls are also persistent and the decision-making power of women is very low. In the south, however, marriage usually takes place within a circle of relatives, dowry is not as important and son preference not as strong. Thus, the earlier onset of social change in Kerala and Tamil Nadu in the south can be attributed to the fact that these states are examples

of more equitable societies with less strictly defined hierarchies and greater women's autonomy compared with the highly stratified class society found in some northern states (Sathar and Phillips, 2001; Dyson, 2002).

Finally, Pakistan represents a case where low status of women, coupled with weak political commitment has prevented the fertility transition from occurring. The TFR in Pakistan remained around 6 children per woman throughout the 1960s, 1970s and 1980s, while it declined marginally to a little over 5 children during the 1990s. This lack of decline is supported by the low prevalence of contraception, which nominally increased from 5.5 per cent in 1968 to 12 per cent in 1990-1991 and to 24 per cent in 1996-1997 (Hakim and Miller, 2001). Although recent estimates suggest that the TFR in 2000 dropped to about 4.8 with the contraceptive prevalence rate increasing to about 30 per cent, the unmet need for family planning still continues to be high at about 38 per cent (Sathar, 2001)

Comparisons with neighbouring countries in South Asia illuminate factors hindering a smoother fertility transition in Pakistan. For example, in contrast to the successful national family planning programme in Bangladesh, Pakistan's family planning programme suffered from a lack of political commitment, user-oriented contraceptive delivery systems, involvement of external agencies and international donors (Robinson, 2001). More critically, low education and the associated subordinate position of women have been suggested as major reasons inhibiting the onset of the fertility transition in Pakistan. A comparison of women's autonomy in Uttar Pradesh and Tamil Nadu in northern and southern India, respectively, and Punjab in Pakistan shows that a higher level of autonomy is associated with a lower desired number of children and a higher level of contraceptive use. Accordingly, women with more autonomy have fewer unmet needs for family planning (Sathar and others, 2001). Thus, the Pakistani case strongly suggests the adverse impacts of low status of women on the onset of the fertility transition.

Challenges and future directions

The preceding sections examined levels, trends and patterns of fertility and reviewed factors affecting fertility decline in the Asian region. The complexity of the fertility transition does not allow for easy generalization. However, it is apparent that the prime determinant of fertility decline lies in social development, particularly the level of women's education and autonomy, as well as commitments by Governments to providing effective family planning programmes. This section will present future prospects for fertility decline in intermediate- and high-fertility countries. It will also highlight challenges and emerging issues for countries having each level of fertility.

The future course of fertility in high- and intermediate-fertility countries will largely depend on several factors, including a high level of political

commitment, quality reproductive health information and services and investments in social sector development. Particularly in high-fertility countries, greater emphasis needs to be placed on strengthening family planning programmes in order to make services accessible and affordable to couples wanting to use contraceptives. The data reveal that there is a high unmet need for contraception, with at least a third of women of reproductive age reporting their desire to postpone or stop childbearing although not using contraceptives for various reasons (see table 5). At the same time, investments should be made to improve human development, which has been proven to reduce demand for children and increase demand for contraception. Improving women's autonomy and reducing gender inequality, especially in the case of Pakistan, have also been suggested to bring about positive changes towards increasing contraceptive use and reducing fertility (Sathar, 2001; Hakim and others, 2003).

Although there are groups in many societies that have fertility considerably higher than the national average, in general, the gap is the highest in the intermediate-fertility countries. For example, in the case of India, a considerable variation in fertility can be seen among the various states, with northern states generally showing a higher level of fertility than the southern states. Such variability in fertility therefore suggests that there are large pockets of the population who are less motivated to have a smaller family and/or have poorer access to quality family planning services and modern contraceptives. Thus, as a primary strategy to reduce the gap, special attention should be paid to the improvement of social and economic conditions along with an increase in the accessibility and affordability of quality reproductive health services for all. Moreover, a study by Foreit (2002) suggests that in order to better serve less advantaged women, it is important to determine categories of women who still need government-subsidized family planning services and women who can afford contraceptives from commercial sources. If more women with financial means use commercial outlets, the private sector will participate more in family planning and government support can more effectively reach women in real need.

Other important issues in intermediate-fertility countries relate to modification and adjustment of national family planning programmes in the course of fertility transition. First, the emphasis of programmes needs to be changed from a target-oriented approach to a holistic reproductive health approach, with the aim of providing quality primary health care, including family planning. The case of the Islamic Republic of Iran clearly suggests the effectiveness of establishing a quality health-care system rather than concentrating on narrowly focused family planning services. Secondly, it is apparent from the experience of Bangladesh that operating national family planning programmes heavily relying on external resources is not sustainable over a long period of time. In other words, it is necessary to transform programmes into more self-supportive systems (Caldwell and others, 2002). Thirdly, learning from the experience of low-fertility countries, the Governments of intermediate-fertility countries need to foresee the consequences of declining fertility rates. For example, the Government of

Malaysia has taken steps to decelerate its fertility decline well ahead of approaching low fertility. Needless to say, it is crucial for all countries with declining fertility to prepare measures for the consequent ageing of the population as soon as possible.

As to low-fertility countries, the challenge is to maintain a balance between population growth and economic development. Although low-fertility countries are the region's forerunners with some having reached replacement-level fertility earlier than their European counterparts, a continued depression in fertility in some of these countries has made them cautious about a further decline. In fact, national family planning programmes in the Republic of Korea and Singapore were phased out after fertility fell well below the replacement level (Caldwell and others, 2002). Experiences of European countries also confirm that the prospect of raising fertility to replacement level is most unlikely (United Nations, 2000a). Similarly, in the low-fertility countries of Asia, such as Japan, the Republic of Korea and Singapore, these measures have proved unsuccessful although concerted efforts were made to reverse the fertility decline.

Therefore, the pressing issue for low-fertility countries is the ageing of the population. As a consequence of a rapid fertility decline coupled with an increase in longevity, all low-fertility countries will be faced with a higher proportion of older population (aged 65 and over). The rapidity of the process leading to low fertility has not allowed enough time for these countries to adequately prepare for the problems associated with ageing of the population. For example, ageing countries like Japan, the Republic Korea and Singapore are facing the problem of increasing national expenditures for old-age social security and the mounting burdens of providing care for a growing number of frail elderly and shrinking labour force. The shrinking labour force and the increase in the ageing population have also contributed to lowering potential support ratios (United Nations, 2002b). Countries such as China and Thailand that have no established social security system, yet where fertility declined very rapidly, will face the problem of supporting an increased proportion of elderly with a smaller proportion of the younger generation (Gubhaju and Moriki-Durand, 2003). Thus, it is now especially important for low-fertility countries as well as near-low-fertility countries to take serious measures to prepare for an ageing society.

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The Impact of Maternal Work Participation on Duration of Breastfeeding among Poor Women in South India

As a consequence of rising women's participation in gainful activity, certain changes are called for in attitudes vis-à-vis the traditional role of women and the way in which domestic responsibilities are shared.

By M. Sivakami *

Breastfeeding is important because of its relationship to child health and birth spacing. It has been well documented that mother's milk is the best food for the newborn child and that it has a significant impact on reducing infant mortality. In developing countries, breastfed infants experience substantially lower

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morbidity and mortality risks than infants who are not breastfed, particularly in the first year of life (Knodel and Kinter, 1977; Palloni and Millman, 1986; Pebley and Stupp, 1987; Retherford and others, 1989; Shah and Khanna, 1990). The advantage of breastfeeding in terms of savings on expenditures on alternative food is also important in poor families. There are advantages for the mother too. Not only does breastfeeding help to establish a closer relationship between the mother and infant, but it also helps to delay the resumption of ovulation and thus promotes spacing of births (Van Esterik and Greiner, 1981). Bongaarts and Potter (1983) have pointed out that in populations without access to modern forms of contraception, birth intervals are determined primarily by duration of breastfeeding.

Availability of artificial products has considerably reduced the dependency of infants on breast milk. However, in poor hygienic environments, bacteria, parasites and viruses can easily be transmitted to infants through the process of feeding from bottles. In contrast, breast milk transmits the mother's antibodies, which help to resist infection. Khan (1990) has argued that in India, although breastfeeding is still almost universal, particularly in rural areas, there are indications that in certain segments of the population, such as the educated and urban elite, the duration of breastfeeding is declining. Unfortunately, this trend is also slowly trickling down to some disadvantaged urban segments of the population such as slum dwellers. However, it has also been observed that in India, particularly in rural areas, women continue to breastfeed their children exclusively for up to 8 months and in some cases even 12 months.

Breastfeeding may be terminated or the frequency of breastfeeding may be reduced for a number of reasons. In addition to factors such as the death of a child, modernization and cultural practices, work outside the house is increasingly affecting breastfeeding. The International Council of Infant Food Industries (ICIFI) identifies working mothers as one group using infant formula (ICIFI, 1977). Those mothers "must often choose between breastfeeding and work and the decision must be made in the best interest of the whole family". Huffman (1984) has argued that the type of work a woman does in developing countries could influence breastfeeding by affecting the mother's access to the infant and the time available with the infant. She states that breastfeeding is more likely to be compatible with part-time work or flexible working schedules. Women who work within their households are more likely to breastfeed their infants. She also suggests that location of work setting, transportation to the work place, alternative childcare availability and type of work are important factors which determine the incidence and duration of breastfeeding in developing countries. However, working women may not be able to spend as much time breastfeeding the child as non-working women. Moreover, the introduction of supplementary food happens early if a mother prefers to take up a job outside the home.

Demographers as well as experts in health research have extensively studied the effects of maternal work participation on duration of breastfeeding, yet the evidence does not show consistent results. Akin and others (1981), analysing World Fertility Survey data for Sri Lanka, have argued that maternal work status per se does not reduce the duration of breastfeeding, but work away from home has

a negatively significant impact on breastfeeding. A few others have also suggested that women's employment status have little effect on breastfeeding prevalence (Jain and Bongaarts, 1980; Van Esterik and Greiner, 1981). Most of those studies found that less than 10 per cent of women stop breastfeeding because of the demands of employment. Leslie (1987), based on the findings of various studies, has tried to give an overall picture about the relationship between women's work and infant feeding in developing countries. The review generally suggests that female employment is not a key determinant of breastfeeding practices. However, Popkin (1980) and Butz and others (1981) concluded, using data from Malaysia and the Philippines, that female employment is incompatible with breastfeeding. A study conducted at three metropolitan hospitals in Washington, D. C., among black and white women found breastfeeding rates to be significantly lower among white women who planned to return to work in the first two months post-partum than among those planning a later return (Kurini and others, 1989).

Research in India also suggests an unclear picture between maternal work participation and duration of breastfeeding. Zachariah and others (1994) found that in Kerala, children of working women have a higher risk of mortality than children of non-working women. The explanation offered is that duration of breastfeeding among working women was shorter. A study conducted in rural Tamil Nadu, India, showed that length of breastfeeding is higher among non-working women than working women (Sivakami, 1997). A few other studies have also found that the frequency of breastfeeding is less for working women than for non-working women (Usha and others, 1991; Sundaram and others, 1984). However, most of those studies have not controlled for other socio-economic factors. Srinivasan and others (1989), using data from Orissa found that maternal work status did not show any significant effect on stopping breastfeeding even after controlling for other socio-economic and demographic factors. Rama Rao and Pandey (1993-1994) found that in Goa, India, duration of breastfeeding was negatively associated with the employment status of the woman, but the effect became insignificant when other variables were controlled. Overall, analyses on the relationship between work status and breastfeeding gives an unclear picture. Some studies have shown that female labour-force participation reduces the duration of breastfeeding, but many have found no such effect. In spite of the complexity of the issue, it is surprising that the belief that maternal employment is a major reason for the decline in breastfeeding worldwide has become an established "truth" in the health as well as the demographic literature.

This article attempts to identify the magnitude of the effect of maternal work participation on duration of breastfeeding with data from poor women in Tamil Nadu, a southern state of India, where female labour-force participation is considerably higher (29.9 per cent according to the 1991 census) than in most other states in India.

This paper also explores further an aspect of the link between maternal work participation and duration of breastfeeding that has not been touched on so far owing to non-availability of data. If one looks at the available literature, the work status variable pertains to activity during a reference period, often a one-year

period prior to a survey. In fact, many large-scale surveys including the Demographic Health Survey (DHS), World Fertility Survey (WFS), Census and the recent National Family Health Survey (NFHS) normally collect information on current economic activity, i.e., usual activity during a reference period prior to the survey. But it has been noted that work status changes over life. Some of the women working during the last year may not have been working for time periods in the past. In particular, many women stop working during late pregnancy and resume work only after a few months or even a year after delivery. In an analysis of breastfeeding, work status at that time is more relevant than work status at or just before the time of the survey. The risk of terminating breastfeeding would possibly be influenced by whether the woman was working at the time rather than working during a reference period prior to the survey. Hence, this paper also examines the effect of work status at the time of breastfeeding on the risk of terminating breastfeeding among poor women.

Female work participation in India

Information on the nature and extent of women's work in India, as in many other parts of the developing world, is sketchy. The level of female work participation is reported to be low in India. According to the 2001 census, only 25.7 per cent of women are economically active in India (Office of the Registrar General and Census Commissioner, 2001). However, the actual level of participation may be higher than that reported in the Census. Pointing out methodological difficulties in measuring women's work in India, Bose (1979) observed that data on women workers do not give a correct picture of women's work. That is because the great majority of women in India, especially in rural areas, are engaged in agricultural and household activities that are mostly unpaid and frequently uncounted (Sen, 1982; Sen and Sen, 1985). Although agricultural and dairy production for own or family consumption is considered gainful economic activity by most standards, census enumerators and indeed women themselves frequently consider those activities simply as an extension of domestic work and do not report it as economic activity (Desai and Jain, 1994). That is so because censuses or surveys are not designed specifically to gather information on women's economic activity. As in many developing countries, in India large proportions of economically active women are seasonal, occasional or unpaid family workers. Many women who are participating in the labour force as unpaid family workers would not be classified as employed. The literature has increasingly begun to stress (Krishnaraj, 1990) that the female labour force participation rates, especially in developing countries, are much higher than those estimated in the conventional censuses and surveys and that the greatest undercounting occurs in those activities in which women are disproportionately represented. Despite those data limitations, the available estimates give an idea of spatial variations in female labour force participation. First, the participation rates are much higher in rural areas (27 per cent in 1991) than in urban areas (9 per cent) and there are large interstate variations. The level of participation is higher in the southern and central region than in the northern region and there are notable

rural-urban differences in the nature of activities. Working women in villages are engaged mostly in agricultural and related activities. But urban working women are engaged in different types of activities such as construction and domestic services.

Apart from the Census, the recent large-scale NFHS conducted in India during 1992-1993 and 1998-1999 provides information in greater detail about the nature of work and the extent of women's work. According to NFHS II, 39 per cent of ever-married women in the age group 15-49 were employed during the 12 months preceding the survey (International Institute for Population Sciences and ORC Macro, 2000). Forty-four per cent of rural women and 26 per cent of urban women worked during the year preceding the survey. A large majority of the urban women (89 per cent) and more than half of the rural women (62 per cent) who worked during the year before the survey earned money for their work. Agricultural workers including farmers, farm workers and women in other agricultural occupations accounted for more than three quarters (76 per cent) of women who work in rural areas. In urban areas, there was greater occupational diversity. Twenty-seven per cent of urban women who worked were production workers, 17 per cent were professional, 15 per cent were agricultural workers and 13 per cent were in sales and service occupations.

A significant feature of women's work participation in India is their substantial contribution to family earnings. Nearly one in five (17 to 18 per cent) urban as well as rural women who worked for money at any time in the 12 months preceding the survey reported that the family is entirely dependent on their earnings. Another 30 per cent in urban areas and 24 per cent in rural areas reported that they contribute half or more (but not all) of the total family earnings.

Materials and methods

Tamil Nadu, situated on the south-eastern side of the Indian peninsula, extends between 8°5' and 13°35' north latitude and 76°15' and 80°20' east longitude. According to the 2001 Census of India, Tamil Nadu has the sixth largest population among the states in India (Office of the Registrar General and Census Commissioner, 2001) and has an area of 130,058 sq km. Tamil Nadu is one of the economically and industrially more developed states. Although it continues to be predominantly an agricultural state, the Tamil Nadu economy has been changing rapidly into an industrial economy. According to the 2001 Census, Tamil Nadu has a population of 62.1 million, accounting for 6 per cent of the total population of India (Office of the Registrar General and Census Commissioner, 2001). Except for Kerala, Tamil Nadu recorded the lowest population growth rate from 1991 to 2001 among all the states in India. The population density in Tamil Nadu (478) is much higher than the density for the country as a whole (324).

According to the 2001 census, Tamil Nadu has become one of the most urbanized and educationally most advanced states in the country. The literacy level for population aged 7 years and above in 2001 is 73 per cent, which is above the national average of 65 per cent. Male literacy is 82 per cent, whereas female

literacy is 65 per cent as opposed to 76 per cent for males and 54 per cent for females at the all-India level. The crude birth rate of 19.0 per 1,000 population in Tamil Nadu is substantially lower than the all-India crude birth rate of 25.4, as estimated by the Sample Registration System(SRS) in 2001. The infant mortality rate is also lower in Tamil Nadu than in the country as a whole. For the year 2001, the infant mortality rate estimated by SRS was 49 per 1,000 live births as compared with 66 for all India. The population sex ratio (number of females per 1,000 males) of 986 in 2001 is much higher than the figure of 933 for all India. For 1996-2001, life expectancy in Tamil Nadu was projected to be 65.2 years for males and 67.6 years for females (Ministry of Health and Family Welfare, 1999). Overall, the performance of maternal and child health services in the state appears to have been above the all-India level.

The data for this study are taken from a survey of poor women in Tamil Nadu, a state that shows a higher than average participation of women in the labour force. It must be noted at the outset that this survey was not primarily designed to see the relationship between maternal work participation and breastfeeding. Instead, it sought to examine the effect of mother's work participation on child health. Breastfeeding was conceived as an important intermediate factor and hence detailed data on breastfeeding were also collected. In many developing countries, large proportions of working women live in localities with poor hygienic conditions. Also, the nature of work may differ in rural and urban areas. For that purpose, slums in urban areas and Scheduled Caste¹ (SC) populations in rural areas were chosen. The study is restricted to Coimbatore city and rural areas in the district of Coimbatore.

In Coimbatore city, out of 59 municipal wards, two wards with high female work participation and low literacy were identified. In the absence of ward-level data on incomes, wards with low literacy were presumed to have a large proportion of poor population. From each ward, one slum, with the highest level of female participation in the labour force was selected. For the rural sample, one *taluk*² (Palladam) from Coimbatore district with a female literacy rate, SC population and a female labour force participation rate close to the district rural population average was chosen. In Palladam *taluk*, three villages, which had female work participation rates and female literacy rates close to the district average and an SC population of at least 500 persons, were first chosen. The SC settlements in those villages were covered. The survey was carried out during August 1998 to January 1999 (for more details of sampling, see Sivakami, 2001).

A preliminary listing of households in the slums as well as in the village was undertaken. Currently married women in the age group 15-49 who had at least one live birth were systematically selected in the survey. Women who were normally engaged in economic activity during the previous year were identified as working women. There were 529 women, 285 in the urban slums and 244 in the rural settlements. Information on breastfeeding was obtained for the last three live births; there were 1,163 such births to women in the study, 627 births in urban areas and 536 in rural areas. The survey elicited information on whether a child was ever breastfed, reasons for not breastfeeding and duration of breastfeeding. The time of

the mother's resumption of work after a birth was also obtained, something that is not normally obtained in large-scale surveys. At the time of survey, a few of the children were still being breastfed. A few other children were breastfed until death. For those children, the observation is censored. Hence, the life-table approach is used to compute the proportions being breastfed at various durations.

Life-table analysis

A life table can be constructed by pooling completed and censored cases of breastfeeding (for methodology, see Lee, 1993). The completed observations are those in which breastfeeding was stopped and the exact duration of breastfeeding is known. Censored observations are those in which the child was either still being breastfed at the time of survey or was breastfed until its death. First, probabilities of terminating breastfeeding are computed for each month and from these, life tables are constructed.

- Let
- N = Number of live births,
 - N_0 = Number of children ever breastfed,
 - d_i = Number of children for whom breastfeeding was stopped during the i^{th} month since birth, for $i = 1, 2, \dots$,
 - c_i = Number of children who were being breastfed at the time of survey with child in the i^{th} month at the time of survey, for $i = 1, 2, \dots$,
 - w_i = Number of children who were breastfed until death with child in the i^{th} month at the time of death, for $i = 1, 2, \dots$.

- Then,
- N_i = Number of children being breastfed at the end of the i^{th} month since birth,
 $= N_{i-1} - d_i - c_i - w_i$ for $i = 1, 2, \dots$,
 - q_i = Probability of discontinuing breastfeeding during the i^{th} month
 $= \frac{d_i}{[N_{i-1} - 0.5(c_i + w_i)]}$, for $i = 1, 2, \dots$, and,
 - P_i = Proportion continuing breastfeeding at least up to the end of the i^{th} month
 $= (1 - q_i) * P_{i-1}$, for $i = 1, 2, \dots$, where
 - P_0 = Proportion ever breastfed = N_0/N .

A small adjustment is required if it is reported that a few babies died immediately after birth before breastfeeding could be initiated. If the number of such deaths is n , then P_0 will be given by $N_0 / (N - n)$ instead of N_0 / N .

From the computed values of P_i , the mean length of breastfeeding can be obtained. Since the proportion breastfeeding after 36 months is not large, the mean is computed here by treating the maximum duration of breastfeeding as 36 months (truncated at 36 months) and is given by

$$[0.5 P_0 + \sum_{i=1}^{35} P_i + 0.5 P_{36}].$$

Cox proportional hazard analysis

The net contribution of maternal work participation on stopping of breastfeeding was assessed by using the Cox proportional hazard model, which combines the features of life table and regression (Cox, 1972). Application of the Cox hazard model was proposed as appropriate for analysis of the duration of breastfeeding (Huffman and others, 1987; MacDonald, 1981). The benefit of using such a multivariate life-table model is that censoring of nursing by either the survey or the deaths of children are taken care of. The technique of the proportional hazard model is similar to regression analysis but also useful to analyse the process of survival, in which termination may occur at any time (in that case stopping of breastfeeding or termination of breastfeeding). It also models the influence of a set of variables on the hazard of termination. The hazard function at time point t (here it is stopping of breastfeeding or termination of breastfeeding), denoted by $\lambda(t, z)$, is expressed as

$$\lambda(t, z) = \lambda_0(t) \cdot \exp \sum_i X_i \beta_i,$$

where X_i are explanatory variables, β_i are regression coefficients and $\lambda_0(t)$ is a baseline hazard. It is assumed that the explanatory variables influence the hazard by the same degree at each time point (hence the term “proportional hazards”). This method is useful to assess the net effect of an explanatory factor on the hazard of termination (stopping of breastfeeding) of a process controlled for the effects of other factors.

As mentioned earlier, work status changes over life and the risk of terminating breastfeeding would possibly be influenced by whether the woman was working at that time. Hence, work status should be used as a time-dependent variable. In the survey, data were obtained on the time of resumption of work, in months, after each delivery. These data enable one to ascertain work status (working or non-working) for each month after delivery and thus can be used as a time-dependent variable. If a woman resumed work at x months after delivery, her work status is treated as non-working for months 1, 2, 3, ..., $x-1$, and as working thereafter. That information has been used to examine whether work status at a given point of time has an effect on stopping of breastfeeding. The time-dependent covariate version of the Cox proportional hazard model is used for that purpose.

In the following analysis, the primary aim is to estimate the net effect of maternal work participation on stopping of breastfeeding. Here, the work status of the woman is a dichotomous variable with working and non-working as two categories and non-working as the reference category. The other variables used as controls are: education of the mother (dichotomous: illiterate [ref.], literate), annual household income (log), age of the mother (age in completed years), sex of the child (dichotomous: male [ref.], female) and type of birth (dichotomous: single [ref.], multiple). The analysis was carried out separately for urban and rural areas. It should be reiterated that this study has not been designed to investigate the effects of those factors on breastfeeding; the focus is on the effect of work participation on duration of breastfeeding. However, earlier studies have recognized the role of those factors, and hence it is necessary to control their effects in order to ascertain the net influence of work participation.

Nature of work by women in the present study

In the urban slums, the main economic activity for women is construction. Sizeable proportions were also engaged as domestic servants. The work is outside the slums, but mostly at a nearby place in the city. In rural areas, the main economic activity for women is agriculture and related activities. The work is often seasonal and is outside the home though mostly in the same village or in a neighbouring village. In both rural and urban areas, the working hours are generally from six to seven in the morning to about two to three in the afternoon with a break for breakfast. The proportion of women working the full day (normal working day) is higher in rural areas than urban areas. About 80 per cent worked throughout the year; i.e., for all 12 months, and that percentage does not differ between urban and rural areas (not shown in the table). However, in a month, the urban women worked an average of 20.5 days, and the rural women an average of 16.5 days. Thus, although both urban and rural working women work year round, the number of days is less for rural women on average. That is because agricultural labour, the predominant occupation of rural working women, may not be available on many days. In both rural and urban areas almost all women work away from home. The wages are Rs 30-40 per day (US\$ 1= Rs 45.84).

In the urban slums, women as well as their husbands are usually engaged in construction work in the same place but not necessarily all the time. In rural areas, whereas women accomplish tasks such as sowing seeds, harvesting, weeding and transplanting, men do the ploughing and digging. Since their work is casual and seasonal, women in rural areas often stay at home, especially during the off-season period. Working women, of course, also take care of their household activities such as cooking, childcare, fetching water, etc. Most of the working women in both rural and urban areas leave their children at home to be cared for by neighbours or elder siblings. However, when a child is ill, many women forgo work to attend to the child.

Findings

Profile of the sample

Of the 529 currently married women in the sample, 267 (141 from urban areas and 126 from rural areas) were working women and 262 (144 from urban areas and 118 from rural areas) were non-working. A comparative view of the demographic and socio-economic characteristics of the two areas is presented in table 1. It can be seen that the non-working women are younger than the working women on average in both rural and urban areas. The mean age at marriage of non-working women as well as that of their husbands is slightly higher than that of working women and their husbands. The mean number of pregnancies, mean working women. In both rural and urban areas, the level of literacy is higher among non-working women than working women; overall, it is quite low in rural areas as compared with urban areas. Working women have higher household incomes than

Table 1. Demographic and socio-economic characteristics of the sample population

Characteristics	Urban		Rural	
	Working	Non-working	Working	Non-working
Age of women	(Percentage distribution)			
Under 25	9.2	23.6	13.5	56.8
25-29	29.1	38.9	33.3	30.5
30-34	31.2	13.2	20.6	5.9
35+	30.5	24.3	32.5	6.8
Total	100.0	100.0	100.0	100.0
Mean age of the respondent	31.5	29.2	30.7	24.8
Mean age of the husband	37.4	35.3	36.1	29.8
Mean age at marriage of the respondent	17.7	18.6	16.1	17.2
Mean age at marriage of the husband	23.6	24.7	21.5	22.1
Mean number of pregnancies	3.1	2.5	3.0	2.4
Mean number of live births	2.6	2.2	2.7	2.2
Mean number of living children	2.3	2.0	2.4	1.9
Percentage of respondents literate	55.3	75.0	15.9	34.7
Percentage of husbands literate	70.2	84.0	30.2	53.4
Mean annual household income	26,898	24,227	26,898	21,122
Percentage residing in <i>pucca</i> houses	41.8	50.7	40.5	40.7
Percentage having separate kitchens	16.3	28.5	32.5	30.5
Number of women	141	144	126	118

non-working women in both the areas, but the gap is wider in villages (among working women, the annual household income includes their own income also). In urban areas, a greater proportion of non-working women than working women reside in *pucca*³ houses; no such difference is seen in rural areas. Overall, working women are slightly older, have more children and higher incomes, but are less literate than non-working women. Working women in urban areas alone have poorer living conditions, than non-working women.

Results of the life-table analysis

It is observed from table 2 that breastfeeding of children is almost universal in the study areas as in other parts of India and in other developing countries. In a few cases, the baby died immediately after birth before breastfeeding could be initiated. Among the babies that survived for even a short period after birth, almost all were breastfed. Volitional non-breastfeeding during early infancy is extremely rare.

Table 2. Breastfeeding by work status of mother

	Urban				Rural			
	Working		Non-working		Working		Non-working	
	Number	%	Number	%	Number	%	Number	%
Number of live births^a	329		298		306		230	
Baby died soon after birth (before breastfeeding could be initiated)	3		7		4		8	
Number of babies who survived	326	100.0	291	100.0	302	100.0	222	100.0
Ever breastfed	320	98.2	288	99.0	296	98.0	222	100.0
Never breastfed	6	1.8	3	1.0	6	2.0	0	0.0

^a The data on breastfeeding have been obtained for the last three live births of women.

As mentioned earlier, information on breastfeeding was obtained for the last three live births. Results of the life-table analysis are given separately for working and non-working women in rural and urban areas (table 3 and figures I and II). It can be seen that there are steep falls after the twelfth month, eighteenth month, twenty-fourth month and thirtieth month. That is because of heaping in mother's reporting of length of breastfeeding that is commonly done in units of one year or half a year. In many studies, duration of breastfeeding shows heaping at multipliers of six months (Lesthaeghe and Page, 1980; Diamond and others, 1986). However, it is also possible that mothers deliberately decided to discontinue

breastfeeding at those points owing to local customs and prior planning about an age appropriate for weaning. It is to be noted that the difference in the life table is seen from the beginning in urban areas. By contrast, in the rural areas, the difference in the life table is seen only in later years (after 2 years). The number of children with such long duration is not large enough in the sample to detect differences. The Wilcoxon (Gehan) test is used to test the significance of the difference between the two life tables. It shows that non-working women have a significantly longer duration of breastfeeding than working women in urban areas. But in rural areas, there is no significant difference between the breastfeeding patterns of working and non-working women. Thus, labour-force participation is incompatible with breastfeeding in urban areas but not in rural areas.

Table 3. Life-table analysis of duration of breastfeeding by work status of mother

Duration of breastfeeding	Urban		Rural	
	Working	Non-working	Working	Non-working
	Proportion of children being breastfed at specific durations			
0	0.9816	0.9893	0.9795	1.0000
3	0.9340	0.9862	0.9664	0.9862
6	0.8634	0.9467	0.9526	0.9767
9	0.8050	0.8795	0.9112	0.9357
12	0.7887	0.8369	0.9009	0.8002
15	0.6170	0.6590	0.7660	0.8002
18	0.6137	0.6428	0.7591	0.7761
21	0.4119	0.4639	0.5491	0.5350
24	0.4119	0.4639	0.5456	0.5279
27	0.2330	0.3158	0.3259	0.2277
30	0.2330	0.3158	0.3223	0.2108
33	0.1713	0.2461	0.2607	0.1230
36	0.0445	0.0743	0.2607	0.1230
Mean length of breastfeeding in months^a	19.3	21.6	23.0	21.6
Median length of breastfeeding in months	18.6	18.8	24.2	24.1
Number of live births	329	298	306	230

^a Mean is computed by treating breastfeeding as truncated at 36 months.

Figure I. Duration of breastfeeding: urban constructed life table

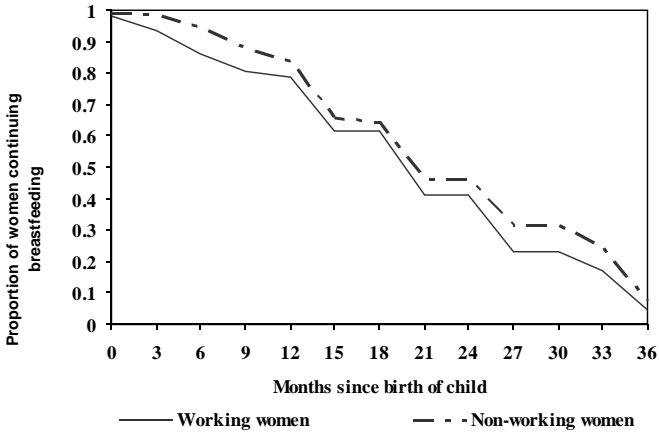


Figure II. Duration of breastfeeding: rural constructed life table

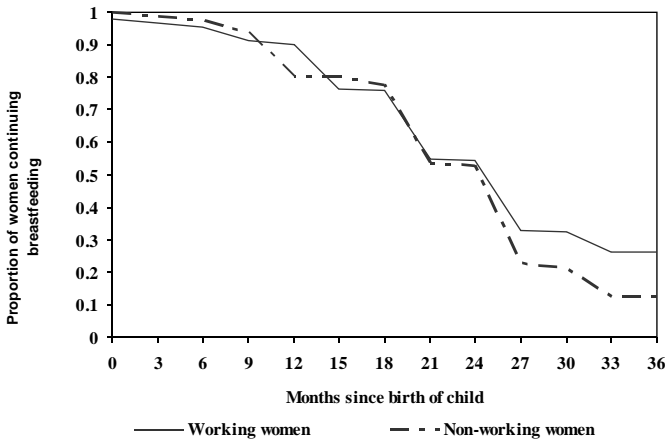


Table 4. Estimated regression coefficients from Cox proportional hazards model for the risk of discontinuing breastfeeding

Explanatory variables	Urban		Rural	
	Beta	Exp.(Beta)	Beta	Exp.(Beta)
Work status of the mother				
Non-working (Ref.)	0.0	1.0	0.0	1.0
Working	0.0929** (0.037)	1.0973	-0.0798 (0.186)	0.9233
Education of the mother				
Illiterate (Ref.)	0.0	1.0	0.0	1.0000
Literate	0.0334 (0.469)	1.0339	0.0024 (0.970)	1.0024
Annual household income (log)	0.1829** (0.049)	1.2007	0.0309 (0.777)	1.0314
Age of the mother (in completed years)	-0.0021 (0.774)	0.9979	-0.0044 (0.624)	0.9956
Sex of the child				
Male (Ref.)	0.0	1.0	0.0	1.0
Female	0.0829* (0.057)	1.0864	0.0915* (0.065)	1.0958
Type of birth				
Single (Ref.)	0.0	1.0	0.0	1.0
Multiple	0.4418 (0.130)	1.5555	1.3772*** (0.000)	3.9637
Chi-square value		14.367		31.688
-2 Log likelihood		5,925.935		4,535.745
Number of live births		627		536

Notes: Figures in the parentheses are “p” values.

Coefficients significant at at least the 10 per cent level are shown in bold type.

Level of significance: *** p < 0.01; ** p < 0.05; * p < 0.10.

Mean length of breastfeeding (truncated at 36 months) and median length of breastfeeding, that is the month by which half of the women discontinued breastfeeding, for both working and non-working women are given at the bottom of table 3. The mean length of breastfeeding is higher among non-working women than to working women by about two months (19.3 months for working women and 21.6 for non-working women) in urban areas. By contrast, in rural areas, the mean length of breastfeeding is longer by about one and a half-months for working

women than for non-working women. In the rural areas, for working and non-working women, those figures are 23.0 and 21.6, respectively. It is seen that the median length of breastfeeding does not vary much between working and non-working women in both rural and urban areas. One reason could be that the difference in the median is smaller presumably because large differences in the life-table values in later months influence the mean but not the median. But the median length of breastfeeding is about five months longer in rural areas than in urban areas.

Cox proportional hazards analysis

The Cox regression estimates (beta values) are provided in table 4. Exp (beta) gives the relative risk of discontinuation of breastfeeding (relative to the risk for the reference category). The analysis has been carried out separately for urban and rural areas. In urban areas, work participation of women has a significant positive effect on stopping of breastfeeding. That means that the risk of stopping of breastfeeding is significantly higher among working women than among non-working women in urban areas. It is also observed from the table that the hazard of discontinuation of breastfeeding is higher for female children. As household income increases, the risk of discontinuation of breastfeeding rises. Education does not show any significant effect on stopping of breastfeeding.

The results of the Cox regression analysis show that in rural areas, participation of women in the labour force does not have any significant effect on stopping of breastfeeding when other variables are controlled. Variables that show a significant effect are sex of the child and type of birth. That is, the risk of discontinuation is higher for female children and twins. Education, income and age of the mother do not show any significant effect on stopping of breastfeeding in rural areas.

Cox proportional hazards analysis with work participation as a time-dependent covariate

In this section, the effect of work participation on stopping of breastfeeding was examined by treating it as a time-dependent covariate. The other explanatory variables (fixed variables) are as used in the earlier analysis, namely, education of the mother, sex of the child, annual household income, type of birth and age of the mother. The analysis is carried out separately for urban and rural areas.

The results of the analysis using work participation as a time-dependent covariate are shown in table 5. These are similar to those of the earlier analysis, which used work status at survey as a variable (shown in table 4). In urban areas, maternal work participation has a significant positive effect on stopping of breastfeeding. Note that the coefficient in the time-dependent model is different but the level of significance is about the same. Income has a positive effect and sex of the child a moderate positive effect (the risk of stopping breastfeeding for a female child is greater than that for a male child).

Table 5. Estimated regression coefficients from the Cox proportional hazards model for the risk of discontinuing breastfeeding with work status as a time-dependent covariate

Explanatory variables	Urban		Rural	
	Beta	Exp.(Beta)	Beta	Exp.(Beta)
Work status of the mother (time-dependent)				
Not-working (Ref.)	0.0	1.0	0.0	1.0
Working	0.2209** (0.050)	1.2472	-0.1843 (0.140)	0.8317
Education of the mother				
Illiterate (Ref.)	0.0	1.0	0.0	1.0000
Literate	0.0264 (0.564)	1.0268	0.0038 (0.951)	1.0038
Annual household income (log)				
	0.1883** (0.041)	1.2072	0.0032 (0.998)	1.0003
Age of the mother (in completed years)				
	-0.0037 (0.606)	0.9963	-0.0040 (0.660)	0.9960
Sex of the child				
Male (Ref.)	0.0	1.0	0.0	1.0
Female	0.0810* (0.064)	1.0844	0.0820* (0.095)	1.0854
Type of birth				
Single (Ref.)	0.0	1.0	0.0	1.0
Multiple	0.4358 (0.135)	1.5461	1.4054*** (0.000)	4.0770
Chi-square value		13.957		32.092
-2 Log likelihood		5,926.603		4,535.261
Number of live births		627		536

Notes: Figures in the parentheses are "p" values.

Coefficients significant at at least the 10 per cent level are shown in bold type.

Level of significance: *** p < 0.01; ** p < 0.05; *p < 0.10.

In rural areas, work participation does not show a significant effect (table 5), as was noticed in the previous analysis (table 4) as well. Type of birth shows a strong effect and sex of the child a moderate effect. These effects too are similar to those in the previous analysis. Thus, the time-dependent covariate model yields essentially the same results as the fixed work status model used earlier but it must be seen whether a large sample size yields the same results. It may be noted, however, that the time-dependent model is more appropriate in that case. Overall, breastfeeding is universal and differentials by work status persist only in urban areas when other socio-economic and demographic variables are controlled.

Discussion

In recent years, many Governments have become concerned with declines in breastfeeding because of its health effects on infants as well as women. One argument is that the recent rise in female labour force participation has a negative impact on the health of the child owing to the abandonment of breastfeeding (Zachariah and others, 1994). The data in the present investigation show that breastfeeding is nearly universal among poor women in Tamil Nadu as is the case in other parts of India and developing countries as a whole. The life tables constructed from the completed and censored breastfeeding cases reveal that the mean length of breastfeeding is longer by about two months among non-working than among working women in urban areas but shorter by about one and half months among non-working than working women in rural areas. The proportional hazards analysis clearly shows that differentials by work status persist in the urban areas even after controlling for other socio-economic and demographic factors like income of the household, sex of the child, type of birth, education and age of the mother. But in rural areas, the net effect of mother's work status on the length of breastfeeding is not significant. The analysis using work status as a time-dependent covariate confirms these results. Thus, labour force participation of women is to some extent incompatible with breastfeeding in the urban areas but not in the rural areas. The present study is in agreement with earlier findings indicating that in traditional settings women's work is nearly always compatible with breastfeeding and other aspects of childcare (Brown, 1970).

That is probably because of the nature of the work in rural areas, which is often seasonal and carried out mostly in the same or a neighbouring village. Hence, it is possible for working women to come home and take care of the children, especially for breastfeeding, because of the short distance between the workplace and home. That may not be possible for working women in urban slums, where the main economic activities for women are construction and domestic service. Often in urban areas, the available jobs are very restrictive in terms of work schedules. The jobs are also available throughout the year. In rural areas, agricultural work allows women to take some time off and that flexibility allows rural women to give greater attention to an infant. However, job insecurity usually forces women in the urban unorganized sector to continue to work throughout the year.

Although the mean length of breastfeeding for working women was lower than for non-working women in urban areas, the difference still is not large while the median length remains almost equal. Overall, one would expect that the mean length of breastfeeding might decrease in the future because of modernizing influences or increase in income. But as more and more young cohort women with a better education and employment chances enter the reproductive years, the difference in mean length of breastfeeding between working and non-working women might widen over a period of time, especially in urban areas. One reason could be that modernization and rise in income help more women to become aware of easily accessible substitutes for mother's milk and consequently chances increase that they could resort to those substitutes even when the child is quite young. However, given that the cost of such substitutes is high, rural working

women are not likely to use them so long as women can take the child along to their workplace. The effect of annual income on discontinuation of breastfeeding was considered in this paper. Annual income is found to be positively associated with discontinuing the practice in urban areas only. That is, as the household income increases, the risk of discontinuation of breastfeeding rises in urban areas.

As Huffman (1984) indicated, it is important for policy purposes to determine who the women are that work away from home, why they do so, what the working conditions are, what the implications are for breastfeeding, childcare and time allocation within the household and what in turn the effects are on the health and development of infants, children and family welfare in general. If the work location tends to be close to home and the nature of the work does not preclude breaks to breastfeed, a far stronger case can be made for legislation requiring infant day-care facilities at places of women's work. The size of the place of employment of women will also be relevant since larger-scale industries can much more easily provide such special facilities for women. One of the major problems of women in developing countries who are working outside their home is time constraints. Any time-saving methods that can be promoted may help to enhance their ability to breastfeed. That would include enhanced transport and availability of water supply and electricity. All of those factors are associated with modernization and the development process. Probably the most beneficial way to increase breastfeeding among working women is to encourage partial feeding for extended durations. That will imply encouraging women to breastfeed before they go to work, once they return home from work, before they go to sleep and also during the night. The encouragement of partial feeding can be made through media campaigns, education, health services available in work and industrial settings and also through women's support groups.

The fact that mother's work participation has some adverse effect on breastfeeding in poor urban localities in Tamil Nadu does not mean that women should not participate in economic activities. However, to compensate for the possible adverse effects on breastfeeding, there is a need to have crèches in the workplace even within the informal sectors. For women who are employed in major organizations such as factories and mills, crèches for their babies are provided by the employers. That is a legal obligation. However, employers in the unorganized sector do not provide such facilities. Virtually no such facilities are available for children of women who perform arduous tasks like construction work. Hence, crèches at the workplace, even in the unorganized sector, may allow poor women to spend adequate time with their children, especially at the time of breastfeeding. However, crèches at the workplace may be possible where large numbers of women work together at a particular site as is the case for construction work but difficult for sectors such as fisheries which are mobile in nature. Future research on such communities may provide answers in this regard.

As a consequence of rising women's participation in gainful activity, certain changes are called for in attitudes vis-à-vis the traditional role of women and the way in which domestic responsibilities are shared. Positive support from husbands, cooperative attitudes of family members and sharing of household

duties may help working women to manage dual roles as income earners and family-care providers especially in the case of urban areas. As female participation in the labour force increases, the problem will become acute. Temporal flexibility of work may enable employed mothers to devote more time to their children, especially during breastfeeding (Presser, 1989). That calls for adjustments at the family level and for policy measures at the societal level.

Table 6. Number of births in different categories

	Urban	Rural
Work status of the mother		
Non-working	298	230
Working	329	306
Education of the mother		
Illiterate	230	415
Literate	397	121
Sex of the child		
Male	331	274
Female	296	262
Type of birth		
Single	619	532
Multiple	8	4
Number of live births	627	536

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Endnotes

1. Scheduled Castes are castes which were historically oppressed and treated as untouchables and enumerated as such by Census authorities. Most are generally very poor, own little land and traditionally engage in low-paid occupations.
2. A *taluk* is a unit of revenue administration in India below the state and district level. It is headed by a *tehsildar*.
3. A *pucca* house is one that is made with high-quality materials throughout, including the roof, walls and floor.

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