ASIAN POPULATION STUDIES SERIES NO. 92

Frameworks for Population and Development Integration

Volume I: ESCAP Regional Perspectives

PROCEEDINGS OF THE REGIONAL SEMINAR ON FRAMEWORKS FOR POPULATION AND DEVELOPMENT PLANNING

Bangkok, Thailand
6-10 June 1988

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC
BANGKOK, THAILAND

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POPULATION AND DEVELOPMENT

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PREFACE

The present publication is a result of the project on development of an analytical framework for population and development research and planning executed by the Population Division, ESCAP, with financial support from the United Nations Population Fund (UNFPA). The long-range objective of the project is to provide systematic information, based on research findings, about significant population-development interrelationships as a basis for the more effective integration of population and development planning by ESCAP members and associate members. The immediate objectives are to analyse and synthesize existing research findings and literature on population and development for the formulation and improvement of public policy and programmes, and to develop analytical frameworks which would set research priorities and provide guidelines for future research in this field. Generally, the conceptual framework of the project is more or less the same as the preparation of country reports on population and development.

The need for and the nature of this type of country report were discussed in detail by Paul Demeny at the Workshop on an Analytical Framework for Population and Development Research and Planning, organized by ESCAP under this project in 1987. The report of the Workshop was published as *Asian Population Studies Series No. 82,* entitled *Population and Development: Frameworks for Research and Planning.* At the Workshop, Demeny also suggested that there were quite a few approaches for preparing population and development country reports, depending primarily on emphasis, interest, target groups, and time and resource constraints. In the light of Demeny's suggestion, the participants at the Workshop, considering the time constraints on the project, agreed that this project should adopt the "issue perspective approach", which is centred on investigation of the demographic variables in affecting certain perceived "social problems" or "issues".

For this project, four countries were selected for investigation: Bangladesh, Nepal, the Philippines and Thailand. Aside from the reason that the limited resources do not permit the secretariat to undertake as many country studies as it should, the four countries were selected primarily on the ground that they are at different stages of integrating population and development activities and research. The "issues" selected for investigation by these countries are: for Bangladesh, health/nutrition, education and women's development; for Nepal, basic needs and environment; for the Philippines, poverty; and for Thailand, health/nutrition, education and old age security.

To narrow the gap in coverage and to enhance understanding of the region's population-development integration and research activities for better population and development plan, policy and programme formulation in as

many countries of the region as possible, regional studies of the above issues were undertaken and presented for discussion at the Regional Seminar on Frameworks for Population and Development Planning, held in Bangkok in June 1988.

The present publication is presented in two volumes. Volume I, *Asian Population Studies Series No. 92,* the proceedings of this Regional Seminar, gives regional perspectives of frameworks for population and development integration. Volume II, *Asian Population Studies Series No. 93,* contains reports of country studies of the four participating countries.

In conclusion, the secretariat wishes to take this opportunity to express its deep appreciation to those who, directly and indirectly, contributed to the successful completion of this project. The assistance of country study teams, experts and concerned agencies is gratefully acknowledged. In particular, the secretariat wishes to note with appreciation the continued interest and generous support of the United Nation Population Fund, without which this project would not be possible.

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REPORT OF THE SEMINAR

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I. BACKGROUND

The Regional Seminar on Frameworks for Population and Development Planning is a major component of the ESCAP Population Division project "Development of an Analytical Framework for Population and Development Research and Planning", which is being carried out with the financial support of the United Nations Population Fund. The project involves the preparation of status reports on population and development in selected countries in the region, with the ultimate aim of providing a current and accurate description, analysis and interpretation of the major trends in population and development in each country, as well as insights into the interrelationships between the trends. The project also aims to provide an assessment of the implications of these trends and interrelationships for the formulation of public policy and the preparation of development plans.

The integration of population and development has been widely recognized as an effective strategy in development planning as well as in population planning. The Second Asian Population Conference, held at Tokyo in 1972, which stressed the necessity for integrating population factors into over-all development planning schemes, also suggested that an improved understanding of the interrelationships between demographic and socio-economic factors would provide a basis for formulating a better conceptual framework for population policy. This view was reiterated at subsequent international fora such as the United Nations World Population Conference, held at Bucharest in 1974; the Regional Post World Population Conference Consultation, Bangkok, 1975; the Third Asian and Pacific Population Conference, Colombo, 1982 and the International Conference on Population, Mexico City, 1984. The Asia-Pacific Call for Action on Population and Development adopted by the Third Asian and Pacific Population Conference convincingly recommended that an integrated approach should be evolved and followed in regard to population and related programmes of economic and social development. While a growing number of the developing countries in the ESCAP region acknowledge the interrelationships between demographic factors and development policies, many have yet to fully recognize population planning as an essential element in overall development planning and integrate it therein.

Among the factors contributing to the slow progress of integration is the lack of accurate data on population and development trends, a lack of analytical frameworks to identify the kinds of information that should be readily available to researchers, policy makers and planners, and a sufficient body of research findings on which to base policy, planning and programmatic decisions.

It was to address these problems that four country studies were undertaken. The outlines of these studies were based on the findings of the work-

shop on an Analytical Framework for Population and Development Research and Planning (Bangkok, 16-20 February 1987). These studies were prepared by countries which are at different stages of advancement in population and development integration activities and research: Bangladesh, Nepal, the Philippines and Thailand. The preliminary version of these studies were reviewed at a study directors, meeting in September 1987. After this meeting the reports were revised and submitted to ESCAP in December 1987.

The Regional Seminar, which was the culmination of this project, gave the experts who prepared the country case studies an opportunity to share their experiences with planners from various countries in the region, as well as with other experts in this field.

Though the main purpose of the Seminar was to review and discuss analytical frameworks for effective integration of population and development policy and programmes, other functions that might be served by the Seminar included:

(i) Enhancing awareness of population and development trends and their implications;

(ii) Providing relevant data and research findings concerning population and development interrelationships;

(iii) Identifying key gaps in knowledge of population and development and establishing priorities for data collection and research;

(iv) Facilitating international exchange and comparison of findings on population and development relationships;

(v) Contributing to the development of better theoretical frameworks and analytical trends for investigating these relationships and incorporating the resultant information in the weighing of alternative policy options.

II. OBJECTIVES

The long-range objective of the Seminar was to promote the integration of population and development planning in the member and associate member countries of the ESCAP region through the provision of systematic data and research findings concerning significant population-development interrelationships.

The immediate objectives of the Seminar were to:

(a) Review existing knowledge on the interrelationships between population change and development issues in selected ESCAP countries;

(b) Consider the policy implications of selected interrelationships between population change and development;

(c) Discuss analytical frameworks for population and development planning;

(d) Discuss analytical frameworks for population and development research; and

(e) Recommend strategies for integrated population and development plan and policy formulation as well as research priorities.

III. ORGANIZATION OF THE SEMINAR

A. Participation

The participants in this Seminar included the study directors who had prepared the case studies of Bangladesh, Nepal, the Philippines and Thailand, representatives of planning agencies from Bangladesh, China, India, Indonesia, Nepal, Papua New Guinea, the Philippines, Sri Lanka and Thailand and experts in the integration of population and development. Representatives of United Nations Headquarters, the United Nations Children's Fund, the United Nations Development Fund for Women, the International Labour Organisation and the Food and Agriculture Organization of the United Nations also participated.

The list of participants at the Seminar is given in annex II.

B. Opening Statement

The Seminar was opened by the Executive Secretary of ESCAP who welcomed the participants and expressed appreciation to those who had directly or indirectly contributed to the Seminar and to the project of which it was a part.

He called attention to the size and the rapid growth of the population of the ESCAP region, and to its developmental context. While the region's average population growth rate has slowed to 1.8 per cent, it remained close to 3 per cent in much of South Asia. Development plans notwithstanding, in a number of low-income Asian countries with large populations, the grim struggle to cope with that growth had all but deferred the many improvements needed in their quality of life.

Noting that in countries of the region which had succeeded in slowing population the rapid decreases in fertility were altering the population structure, giving greater weight to older persons, he suggested that changing the structure of Asian families towards smaller size would have important consequences on the status and welfare of the elderly.

Because population changes affected many aspects of social and economic development, population policies and programmes must be considered within the larger setting of comprehensive development strategies. Conversely development efforts could no longer neglect taking population issues into account.

The integration of population and related development issues required a clear understanding of the complex interrelationships between population and development. To formulate realistic policies and programmes that integrated

demographic considerations into overall development planning, decision makers needed a steadily improving understanding of the direct and indirect linkages between economic, social and demographic variables, and the consequences of population levels and trends.

Fresh insights and new impetus were clearly required to stimulate progress in many countries. The Executive Secretary expressed the hope that the participants' detailed discussions on those problems would therefore yield valuable guidelines for formulating more effective population and development policies and programmes in the region.

C. Election of Officers

The Seminar elected Mr. S.R. Hashim chairman, Ms. Brigida L. Jayme vice chairman and Mr. Kit Ronga rapporteur.

D. Agenda

The following agenda was adopted:

1. Opening of the Seminar.

2. Election of officers.

3. Adoption of the agenda.

4. Review of the situation in the region as regards population and development planning.

5. The interrelationships between population change and selected development issues and policy implications:

   (a) Population change and poverty/basic needs;

   (b) Population change and women's development;

   (c) Population change and welfare of the aged;

   (d) Population change and environment;

   (e) Population change and education;

   (f) Population change and health/nutrition.

6. Research requirements for integrating population factors into development planning.

7. Recommendations for population and development plan and policy formulation and research priorities.

8. Other matters.

9. Adoption of the report.

E. Documentation

The participants had, in addition to nine country statements, seven background papers to support the agenda items. A list of documents is presented in annex I.

F. Adoption of the Report

The participants adopted the report of the Seminar on 10 June 1988.

IV. REVIEW OF THE SITUATION IN SELECTED COUNTRIES IN THE ESCAP REGION

The situation on population and development research and planning in the ESCAP region was reviewed in a paper prepared by the secretariat and discussed by the participants at the Seminar.

Discussion

In connection with the review of the situation in the countries represented at the Seminar as regards population and development research and planning, there were a number of questions and comments.

The Seminar recognized that the integration of population and development was a challenging but difficult undertaking. All the countries in the region had accepted the importance of integration. However, because of the lack of knowledge on cause-and-effect relationships, countries had been facing difficulties at the implementation level. A continuing problem before the planners, administrators and politicians, therefore, was how to pursue integration effectively.

The countries in the region differed in the extent to which they attempted to integrate population into development planning. An increasing number of countries had established population units within their planning secretariats. Thailand had been the first to establish a population cell within the planning agency. Bangladesh, Sri Lanka and Pakistan had established population divisions at the central ministerial level. A population commission, a leading group or a department in the central ministry, had been established in Burma, China, India, the Philippines, Maldives and Nepal. High-level national family planning/population boards had been established in Indonesia, Malaysia and Singapore. Moreover, Indonesia had established population units in each ministry, while the Philippines had set up regional-level units also. A cabinet-level population policy co-ordinating committee had been directly overseeing the population programmes in the Republic of Korea since 1976. In a number of other countries, the responsibility for population policy had been delegated to central planning offices.

The basic responsibilities and function of those population units were more or less similar throughout the region. For example, almost all the units were supposed to assist in (a) the formulation and execution of appropriate population policies; (b) the establishment of mechanisms for integrating population policies with other development policies and programmes; and (c) the promotion of related research activities. However, those units had not yet been

delegated several important and essential responsibilities in integration. For example, they did not have authority over development plans submitted by ministries other than the ministry to which they were attached, nor were they responsible for funds allocated for those ministries. As a consequence the ability to influence sectoral investment decisions was impaired.

Many Governments formulated population policies as an important component of the development programme as a way of dealing with the problems associated with overpopulation and high fertility levels. India had been the first country in the world to adopt a national-level family planning programme. By 1980, a majority of the countries in the region had active family planning programmes. In the countries in which there were no specific population growth policies there were population distribution policies or policies with regard to the growth of primate cities.

In 1975, the National Executive Council (Cabinet) of Papua New Guinea had directed that a population programme be prepared which would involve successive stages: (a) research and evaluation; (b) population policy formulation; and (c) policy implementation, monitoring and evaluation. In 1980, the Family Planning and Population Co-ordinating Committee has been formed. In 1985, the National Advisory Committee on Population Policy had begun work on formulating a population policy for the country and had produced a draft policy in April 1988. It would be submitted to the Cabinet for consideration in due course.

Indonesia was expanding community family planning institutions with the aim of moving family planning beyond mere fertility control. Efforts had been initiated to integrate the family planning programmes with programmes of private, governmental and social organizations, both horizontally and vertically. That meant that some functions were implemented at each level by several sectors in such a way that each programme contributed to the whole and shared collective responsibility.

The Government of Indonesia believed that in order to have a successful population programme it must involve co-ordinated activities across sectors. To achieve that, the State Ministry of Population and Environment was established in 1983 with the specific task of developing policy and co-ordinating population activities, which were incorporated in various sectoral plans.

The Ministry, on population issues, was geared towards national and regional planning. The other sectors with population related activities, such as the National Family Planning Co-ordinating Board and the Ministries of Health, Transmigration, Public Works, the Interior and Manpower, had the specific task of operationalizing and implementing population and development objectives. The State Ministry of Population and Environment had the task of developing general population policies and monitoring their impact on development.

In the Philippines, two major government agencies were responsible for population activities – the National Economic Development Authority and the Population Commission. The Population Commission's mandate encompassed all population activities, while the National Economic Development Authority was the agency responsible for the co-ordination of development planning efforts in the country. A population/development planning unit had been established within the latter body.

The result of the establishment of that unit had been that a cumulative, systematic, sustained and co-ordinated effort had been undertaken to achieve greater integration of population concerns in the planning process.

Under the reorganized structures of the National Economic Development Authority, the facilitator/co-ordinator role for activities to integrate population and development would be a technical working group, rather than a unit. The working group would involve those working the mainstream of planning activities as key members, and they would be drawn from many different sectors and offices.

Some of the countries were paying increasing attention to other aspects of development, such as the status of women, or interventions which could affect the population trends in the long-run. In Java and Bali for example, the Indonesian Family Planning Co-ordinating Group had evolved an integrated approach using women's clubs and women's unions to participate actively in the promotion of health.

As a response to the Asia-Pacific Call for Action on Population and Development adopted by the Third Asian and Pacific Population Conference, held in Colombo in September 1982, several countries had made concerted and deliberate attempts to reinforce their efforts to integrate population and socio-economic development. For instance, India and Nepal had each appointed a high-level task force, including cabinet ministers, to monitor and review the integration activities. Recently, Thailand had conducted a pilot survey to ascertain difficulties and problems relating to integration.

The experiences of some countries in the region, particularly China and Indonesia, indicated that the integration of population programmes with other sectoral programmes could be achieved more easily at grass-root levels by making the local administration responsible for the integration of the various development programmes in their respective areas.

Despite increasing recognition of the significance of interrelationships between population and development and a growing commitment to adopt an integrated approach to population and development, progress had been rather slow. The slow progress of integration was considered to be due both to the limited knowledge base relating to diverse population processes and to inadequate planning structures to incorporate linkages between population and development.

The lack of adequately trained personnel to implement the process of integration was also responsible for the slow progress.

The Seminar concluded that integration remained at an experimental stage; there was no guarantee of its successful application in every situation. Thus, integration had to be attempted in the context of what was feasible in each country situation.

V. THE INTERRELATIONSHIPS BETWEEN POPULATION CHANGE AND SELECTED DEVELOPMENT ISSUES AND POLICY IMPLICATIONS

Papers were presented on population change as it related to six aspects of development. These papers addressed poverty/basic needs, women's development, the welfare of the aged, the environment, education and health/nutrition, respectively.

A. Population Change and Poverty/Basic Needs

The background paper on poverty and basic needs was presented and discussed. The paper is given in Part Two.

With a caution against the lack of a universally accepted concept or definition of poverty, as well as a lack of adequate data and precise techniques for measuring poverty levels and trends, the paper concluded that poverty was an ever-present condition for millions of people in the Asian and Pacific region. While in some areas there appeared to have been an improvement, in many countries, the situation appeared to have deteriorated over the years. In many countries the incidence of poverty was very severe among certain socio-economic groups.

The findings of various studies suggested that poverty was often associated with conditions of high fertility, high mortality and migration. Several reasons had been advanced to explain the high fertility patterns of poor households: the economic value of children, insurance against parents' old age; cultural preference for sons; early age at marriage of parents; and lack of knowledge of and accessibility to family planning methods.

High mortality was a characteristic feature of poverty. The poor had less physical and economic access to health facilities and services; were ill-housed without adequate sanitation facilities; had no knowledge of medical and sanitary requirements; and were often undernourished and more susceptible to disease, and constantly exposed to the risk of mortality from any case of illness.

Poverty also influenced migration in several ways. Refugee movements occured when the poor were unable to protect themselves against such crises as famines or floods. In several countries, homeless wage-earners continuously moved either within an organized production system or from one casual job to another. The poor also often migrated from destitute rural areas to urban centres in search of better employment opportunities.

The Seminar raised the question of the validity of two assumptions underlying the population-economic growth paradigm spelled out in the paper. The first related to the assumption that the higher dependency burden generated by rapid population growth lead to a reduction in savings and therefore in capital accumulation and the rate of economic growth. If the burden of higher fertility was largely on the poor people – who did not have any margin for saving over and above subsistence consumption and therefore did not contribute much to the savings of the economy – then the consequence might only be to redistribute consumption; the aggregate savings might be unaffected.

The second question related to the composition of investment, on the usual presumption that high fertility resulted in a diversion of investment away from directly productive activities to the provision of social services such as education, health and housing. It would perhaps be more realistic to assume that, given the economic constraints, the funds for investment in social services would be fixed within narrower limits. That would result in rationing of those services (rather than the diversion of additional resources), with the distinct possibility that the poorer sections of society would be denied access.

The Seminar also noted that urban poverty was not always a transference of rural poverty; in many countries a substantial proportion of the urban poor were residents of urban areas (rather than migrants).

B. Population Change and Women's Development

The background paper on women's development was presented and discussed. The paper is given in Part Two.

The paper noted that there was increasing recognition of the close association between various aspects of women's status in society and components of population change. However, a systematic analysis of those interrelations was to a large extent hampered by the absence of an unambiguous operational definition of "status of women". The various theoretical definitions suggested that "women's status" was a multi-faceted phenomenon or a composite of several different and interdependent variations. Further, there had also been no concensus in regard to the social indicators used for measuring women's development or their ranking *vis-a-vis* that of men.

A brief review of the situation revealed that in several countries of the region, particularly in Asia, equality of education proved to be an elusive goal; women remained under-represented within the education system; and also dominated the ranks of the illiterate. Further, in most countries, there was a tendency for female students to be largely concentrated in liberal arts while male students were largely enrolled in the field of pure and applied sciences. Female illiteracy also continued to be a major problem, particilarly in rural areas of much of South Asia and China.

The health situation of women appeared to have improved considerably over the years as evidenced by trends in death rates, particularly maternal mortality rates, and improvement in life expectation. However, in several South Asian countries the health and mortality situation with regard to women remained rather unsatisfactory.

Although there had been a considerable expansion in the volume of the labour force over the years, in most countries the reported female labour force participation rates were substantially lower than the male rates. Despite those increases, women still tended to be concentrated in the "unpaid family labour" category and employed mostly in agricultural and related occupations and other family-based enterprises. While the proportion of women in "professional and technical" occupations had been increasing in recent years, the majority of women in the category are employed in low-paid, low-status jobs, perhaps involving limited training requirements.

The early age at first marriage, common in several countries, affected the status of women by limiting their educational development and consequently their employment opportunities. High fertility meant women were burdened with frequent child-bearing and rearing, with hardly any opportunity for their own advancement. Further, among most low-income or poor families, there was a tendency to give preferential treatment to male children in the matter of education, food and nutrition, and health care, given the large family size and limited resources.

Frequent pregnancies seriously damaged the health and lives of mothers. That was reflected in the significantly lower life expectancies for women of child-bearing age as compared with men. However, the expansion of health care and improvement in nutritional standards had made child-bearing safer. In several areas, early marriage of girls coupled with wide age desparities between brides and grooms, as well as higher female than male life expectancy, had increased the incidence of female widowhood, which had implications for women's status.

Several studies had shown conclusively that the level of female education was inversely related to the level of fertility and mortality, particularly infant and child mortality. It had also been shown that the participation of women in the labour force helped to lower fertility through such factors as delayed marriage, increased education, reduction of preferred family size and increased adoption of family planning practices.

The Seminar noted that while the link between the improvement in the status of women and fertility reduction was well established, whether or not greater employment resulted in the improved status of women depended on the nature and character of the work performed by women. The need was expressed for clear-cut empirical studies on the link flowing from employment of women to fertility via the improvement in the status of women.

The seminar also emphasized the need to focus on policies needed to improve the status of women and on identification of variables amenable to policy interventions, as well as potential areas for interagency co-operation.

C. Population Change and Welfare of the Aged

The background paper on the welfare of the aged was presented and discussed. The paper is given in Part Two.

The paper noted that as a consequence of rapid fertility decline over the past few decades, a number of Governments of Asian developing countries had been increasingly aware of various aging problems, which required more focused attention, in the process of formulating their long-term development plans. Primarily because the fertility transition in those developing countries had been substantially more rapid than in the developed countries, the rate of population aging in the former would be considerably faster than that observed in the latter.

The population aged 65 and over in Asia was estimated at 132 million in 1985, which corresponded to 4.7 per cent of the total Asian population. Owing to large population size, the elderly residing in the Asian countries amounted to 46 per cent of the aged population of the world as a whole in 1985, but that percentage was expected to rise to 57 per cent in 2025. More importantly, the tempo of aging was likely to accelerate in some of the Asian developing countries, particularly in the early part of the next century or beyond the year 2025.

The expectations of life at birth differed substantially from country to country, but such intercountry differences were not so pronounced at higher ages. The data on mortality compiled from various Asian countries indicated the presence of intercountry differentials by sex; in most of those countries, the demographic feminization of the elderly could be observed. Moreover, the relative surplus of women at older ages in the Asian countries was also reflected in the high incidence of widowhood among older women. However, as a result of improved mortality conditions, the joint survival of both husbands and wives had recently increased, thus the incidence of widowhood had declined. In addition, the percentage of old persons living alone had been rising in some Asian countries, due not only to the extension of life but also to improved health, increased income security and greater availability of housing.

In several countries in Asia the majority of the elderly resided with their children. Because most of the aged in Asia inhabited rural areas, the labour force participation rates for the elderly were notably high, ranging from 40 to 60 per cent for males, and from 9 to 31 per cent for females.

Demographic changes were directly and indirectly related to the welfare of the aged through development. To account for some of the principal linkages between the two factors in the process of development, the modernization hypothesis advanced by Cowgill and Holmes had been used, and the validity of

that hypothesis in the context of developing countries had been assessed on the basis of cross-sectional data around 1980. The results seemed to suggest that the data gathered conformed to a set of 10 generalizations derived from the modernization hypothesis. Apart from those generalizations, Cowgill and Holmes had also hypothesized that with modernization the responsibility for the provision of economic security for dependent aged persons tended to be shifted from the family to the state. The applicability of that hypothesis to the developing countries had been substantiated by intercountry data. Based upon those analytical results, a simplified conceptual framework had been suggested as a base for analysing the plausible interrelationships between population change and the welfare of the aged.

Despite the fact that most old-age support in the Asian countries came from traditional sources rather than public transfer programmes, a relatively wide range of public support programmes had already been implemented by many Governments of those countries. Those public programmes included the provision of day-care facilities for the elderly, financial incentive schemes for families living with the elderly, and housing policies favouring the elderly. In addition to those public programmes, Government-sponsored pensions were available to a limited proportion of the elderly, mainly in urban areas.

Compared with pensions, health care was more widely available to the elderly of Asia. However, its adequacy and accessibility were substantially different from country to country. The impact of population growth and its age structural change upon the Government's future financial requirements was demonstrated by drawing extensively upon a recent health sector study commissioned by the National Economic and Social Development Board of the Thai Government. That health sector study showed that the process of population aging in Thailand affected different household types in a different fashion and to a different degree: the population aging effect, coupled with higher medical care costs at higher ages, was the post pronounced among one-person male households, followed by one-person female housholds, single male households, and single female households. Findings of that nature provided useful information when public health policies were changed.

The paper also analysed the burden of an increasing number of elderly patients in need of intensive home care upon middle-aged Japanese women. One of the results derived from numerical experiments showed that the probability for full-time housewives at ages 40-49 having to take care of elderly patients suffering from senile dementia or bedridden was expected to increase from 0.08 in 1985 to 0.47 in 2025. That finding had serious policy implications for measuring the extent to which the family support system could be utilized for the provision of home care for elderly patients in Japan.

The paper lastly recommended two further research areas to improve knowledge on the welfare of the aged and population change. One of them was related to the use of a Computable General Equilibrium model in analysing the impact of changes in trade-related external factors upon the economic well-

being of the elderly. The other was concerned with greater research efforts directed towards further analysis of the changing life-cycle pattern upon the formation of households, particularly among elderly persons.

Subsequent to the presentation of the paper, a number of comments and suggestions were offered by the participants. One of them was related to the use of the United Nations definition of the "aged" population. Although a 1956 United Nations study might have suggested that a population would be classified as "aged" if more than 7 per cent of its members were above the age of 64, that definition might be no longer applicable to the contemporary world, particularly since the elderly population was now defined by the United Nations as persons aged 60 and over. It was also mentioned that the use of the familial support ratios should be encouraged for analysing the burden of the aged population upon younger generations. Several views were expressed with regard to the consequences of fertility declines. Some participants were optimistic about population aging, while others were pessimistic. Those who were optimistic about the aging process pointed out that the welfare of the aged could be further enhanced by changing institutional factors such as the pensionable or retirement age. Those who were negative about population aging expressed the need for a rise in fertility to a certain extent.

D. Population Change and Environment

The background paper on the environment was presented and discussed. The paper is given in Part Two.

The paper noted that the Asian and Pacific region currently faced major problems of deforestation, desertification, air and water pollution and other environmental degradation. Those environmental problems were interrelated with population problems. Population increase and economic development to raise standards of living frequently involved depletion of resources and degradation of the environment. In turn, depletion of resources and environmental degradation adversely affected development, welfare and population trends. It was noted that it was not just population growth that was putting pressure on resources. Rather, population growth in conjunction with other processes was leading to much more rapid depletion.

The most serious environmental problem facing the region was the exhaustion and degradation of terrestrial ecosystems. Deforestation was occurring at an alarming rate, destroying top-soil and genetic diversity, exacerbating flooding and drought, silting up lakes and reservoirs and undermining local and regional economies. Desertification was another problem; it was threatening the lives of millions of the poor people in the region.

A third major environmental problem of the region was the degradation of the aquatic environment and related ecosystems (for example, mangroves and corals) as a result of the onslaught of environmentally unsound development

activities. Over the past decade, the aquatic environment had been degraded owing to the discharge of pollutants through rivers into coastal areas, the promotion of coastal tourism, the discharge of oils and toxic chemicals from onshore and offshore sources, and the exploration and exploitation of sea-bed resources. Similarly, the stability and productivity of the marine environment had been disturbed by the large-scale destruction of mangrove forests and coral reefs in the Asian and Pacific region owing to coastal mining, tourism development, extensive commercial fishing and extraction of fuelwood and corals for commercial purposes.

The last problem was the impairment of human health due to environmental pollution and lack of adequate water supply and sanitation facilities in both rural and urban areas.

Basically, the environmental and natural resource problems that afflicted most countries of the ESCAP region were caused by human activities, often arising from the needs of growing populations for land to cultivate subsistence crops. Those activities included the farming of marginal land, particularly on slopes, insufficient fallow periods, the clearing of forest land for agriculture, and the felling of trees for firewood and timber. Water pollution, air pollution, deforestation and desertification were all related to human activities.

In order to have a clearer idea of the interrelationships between population and environment a framework was presented. The purpose of the framework was to identify or speculate on how population variables affected and were affected by environment and how intervening factors or policies and measures could be introduced to cope with environmental as well as population problems.

According to the framework, the three basic demographic variables, fertility, mortality and migration, determined demographic outcomes such as population size, age structure and population distribution. A population demanded goods and services which could be met by two major means, from nature and from commodity markets or economic production. Both means affected the physical environment quantitatively and qualitatively.

The interrelationships between population and the environment could also be looked at from the development point of view. In that respect, population played an important role in determining the society's demand for employment, education, health services and shelter. The demand for and supply of goods and services, as well as other related economic activities, which would involve resource depletion or degradation, were positively related to the size of the population. The distribution of population also played a significant role in terms of resource allocation and utilization.

On the other hand, the effects of the environment on population could also be identified. The quality of the physical environment affected the quality of life variables (health, housing, education, employment and income) directly and indirectly. Those effects in turn affected demographic variables. For

example, polluted and contaminated water could cause diseases and lead to a higher mortality incidence.

The role of government, public policy and technology could also be discussed under the framework. The issue of property rights, under which it had been argued by many economists that cost distortions led to a more rapid rate of environmental deterioration, could be introduced under the framework. Technology was another issue that could be brought in, since it helped to increase the efficiency of resource use and to substitute one resource for another.

Based on that framework some policy implications were derived. First, because of the complex interrelationships between population and the environment one of the priorities for population and development planning in the region would be action-oriented research into the linkages to guide national and regional development policies. Second, both population and environmental concerns must be integrated into social and economic development plans in order for development to be sustainable. Third, rapid population growth must be slowed down, and strategies on optimal population distribution should be formulated. Correspondingly, environmental conditions must be maintained or improved.

The Seminar also noted that population increase led to inequality in accessibility to resources. It also emphasized that population was also a resource and that population also played a positive role in the environment. Thus, whether population increase was a threat to the environment depended on how man dealt with the environment.

E. Population Change and Education

The background paper on education was presented and discussed. The paper is given in Part Two.

The paper noted that while population and education were interrelated, the interrelationship was not always direct and simple. A number of interdependent and intermediate factors determined the cause-effect relationship, and the nature and extent of the interaction varied from one socio-economic and cultural context to another.

High rates of population increase due to declining mortality and constant fertility resulted in rapid expansion of the population of school-going age, thereby causing an increase in educational requirements. That in turn resulted in an increase in the share of national resources for educational development. The increasing proportion of the school-age population also meant an increasing school-age dependency burden. The sex-composition of the population also played an important part in planning for educational development, particularly in those countries where wide disparities between the two sexes existed in enrolment and where national policies gave priority to enhancing women's education.

The distribution of the population in small and widely dispersed settlements also presented problems for educational development.

In countries where education was not provided or subsidized by the Government low-income families with large numbers of children often found it difficult to educate their children even minimally. Large family size also implied the possibility of early withdrawal of children from the educational system, and a decrease in the chances of access to higher education.

Several studies had established that educational levels, particularly of women, were inversely related to fertility. Female education influenced fertility through delayed marriage or non-marriage, reduction in desired family size and exposure to knowledge, attitudes and practices favourable to birth control.

Several studies had also indicated that parental education, especially of the mother, was a major determinant of infant and child mortality, although the precise mechanism by which a mother's education lowered the mortality of children was not well understood.

Education also influenced migration. First, people migrated from one area to another to acquire or further their education. Second, educated people migrated in search of better employment opportunities or better life styles. Since it was the relatively more educated who moved out of rural areas, their out-migration resulted in a decline of the educational levels in rural areas.

While noting that the aspirations of mothers in respect of their children's education were usually higher than their own educational attainment, the Seminar also noted that education of women had an impact on the quality of education of children by shaping the family environment in which children were educated.

It was also suggested that if education was viewed as a process which modified the individual's desired family size rather than as an instrument of providing information, then there would be inescapable time lags between education as an input and fertility decline as an outcome. That in turn would raise questions about the time-horizon underlying the planning process. In particular, in the context of short- and medium-term planning exercises, the impact of education (viewed as an instrument of fertility decline) on the size and structure of the population might be rather small.

The Seminar noted that empirical studies often used years of formal schooling or level of formal education attained as a measure of education. Those measures were not fully satisfactory since they did not reveal whether, for example, the school attended was a religious one or a general one, or what curriculum was covered. It was also noted that measures of formal schooling did not reflect the dimension of informal learning acquired at home, among friends, and at work and in the community.

The Seminar also noted that non-formal education programmes such as the population-family welfare education programme for workers had also had a positive impact on contraceptive prevalence in countries of the region.

F. Population Change and Health/Nutrition

The background paper on health and nutrition was presented and discussed. The paper is given in Part Two.

The paper noted that health, like development, was a multidimensional concept which could not be readily achieved by single or a few measures. However, using conventional measures such as the life expectancy at birth and the infant mortality rate, wide variations in health status among ESCAP countries were found. (For example, high mortality levels persisted in such countries as Afghanistan, Bangladesh and Nepal, where the life expectancy at birth was still below 50 years and the infant mortality rate still exceeded 130 per 1,000 births. In contrast, mortality had reached very low levels in such economically advanced countries or areas as Australia, Japan, New Zealand, Hong Kong and Singapore, where the life expectancy at birth was above 70 years and the infant mortality rate less than 10 per 1,000 births.) Those wide differences in current mortality levels reflected differences in initial conditions and the differences in the pace of mortality change during the past 30 years or so. That differential pace of mortality change was in turn related to the differential pace of economic and social progress among countries and to the differential impact of the health care systems that had been put in place. At the country level, mortality differentials also existed between subnational geographical regions, between rural and urban areas, and between various social groups characterized by levels of education and socio-economic status.

In order to improve the health and mortality situation in countries which still had very high levels of mortality, it was necessary to identify the major factors affecting health and survival in a manner useful for policy formation and programme intervention.

There was a need to consider a broad conceptual framework of the determinants of health/nutrition and mortality as a basis for an integrated policy for health development. The broad framework suggested consisted of four basic components, namely, measures of health outcome, (morbidity, nutritional status and mortality), the proximate determinants (fertility, environmental contamination, dietary/nutrient intake, injury and utilization of preventive and curative health care), the socio-economic determinants (individual and household endowments and community environment), and exogenous factors (mainly public policies and programmes) which influence both the socio-economic and proximate determinants. (In the framework, households, in an attempt to improve their welfare, were assumed to make various kinds of decisions subject to a set of opportunities and constraints defined by their endowments and by the community environment; public policies affected the structure of opportunities and constraints facing households, which in turn made decisions on the various

proximate determinants which directly affected their health status.) Such a framework had been shown to be useful in guiding research as well as in assessing trends in health improvement in a country. It was also useful in identifying sectoral intervention points (such as family planning, environmental sanitation, health care, occupational safety, education, and employment and income) and their interrelationships.

While various factors affected the health and nutritional status of the population, the performance of the health care sector obviously remained an important factor and was a major concern of health ministries. A framework for examining the relationships between population, socio-economic factors and health care service utilization was suggested. In that framework, the level of utilization of specific types of health care service depended upon the demand for, and the supply of, such services. The demand was influenced by the size, age-sex structure, and the spatial distribution of the population on the one hand, and by socio-economic and cultural factors, for example, income, education, health knowledge and beliefs, on the other. The supply of specific health care services, on the other hand, depended on socio-economic factors, such as the capacity of the economy to invest in health care facilities, which were influenced by public choices and priorities. (On the basis of the framework, raising health-care utilization by the population to improve health and nutrition must invariably consider demand and supply factors.) The framework clearly put into a larger context the role of demographic factors in understanding current health problems. While a rapidly growing population directly increased the number of people requiring various types of health service, the actual use of such services would often be constrained from the demand side by low income and high costs, and from the supply side by lack of adequate facilities and personnel, especially in the rural areas where the bulk of the population was found.

The frameworks for integrating population into health development planning were available. What was needed for policy making was accurate, timely and relevant information about the many factors determining health/nutrition and the relative strength of the relationships between those different factors. There was also a need for information on the cost of various policy options and programme alternatives to deliver basic health and nutritional services to the population who were most in need.

The discussion focused mainly upon four major areas. The first concern was certain empirical results and data. It was noted that education, particularly the mother's education, had been shown to be the most significant socio-economic factor affecting survival independently of other factors in countries where studies had been undertaken. Moreover, they observed that the higher male than female life expectancies in some countries, contrary to the common pattern, might be related to the status of women in those countries. The second area of concern was the adequacy of the frameworks suggested in the paper. It was clearly pointed out that a fuller analysis of the determinants of health care service utilization must distinguish between specific types of services. Moreover, one must also explicitly consider the interactions between the different deter-

minants themselves in analysing health and nutrition status. The third concern was the adequacy of health and nutrition concepts and their measurement. Finally, a question was raised on the data situation in some countries and the extent to which the frameworks described in the paper had been used in actual analysis, planning or assessment of health/nutrition status. It was pointed out that the basic frameworks suggested were useful and, at least in some countries, had been used as a guide to data collection as well as analysis.

VI. RESEARCH REQUIREMENTS FOR INTEGRATING POPULATION FACTORS INTO DEVELOPMENT PLANNING

The background paper on research requirements was presented and discussed. The paper is given in Part Two.

The paper considered institutional arrangements for promoting integration-related research, research on demographic levels, trends and projections, research on the interrelations between population and development, policy research and considerations for setting research priorities.

In the discussion of institutional arrangements it was noted that structures were required to ensure that research findings would actually be used in the planning process. That could be done by a population planning unit which would identify requirements for additional data and promote efforts for their collection, would prepare inventories and policy syntheses of research already completed, would conduct and commission new research and disseminate the research findings.

The initial activities of a population unit should include an assessment of its anticipated needs for population data. Such needs included demographic data classified by social class. Since development plans were often aimed at specific target groups and regional development strategies would require data for small areas, population data in considerable detail by social or area subgroups were needed. Similarly detailed projections for specific population groups were among the primary demographic data needed for planning.

Studies of the impact of population growth should be a regular feature of the process of planning for socio-economic development. Such impact studies should also be decomposed geographically, sectorally and according to social groups. They should bring out both the costs and benefits of trends in fertility, mortality and migration.

At present an important obstacle to the integration of population factors into development planning was the fact that research studies had not yet developed pursuasive quantitative linkages between demographic trends and their socio-economic determinants. In the case of fertility determinants there was a need for further research on the factors that determined the age of marriage as well as measurements of the costs and benefits of children. Studies were also needed to determine the processes by which education of women influenced fertility. Similarly, research was required to determine the causal mechanism by which the level of education of women influenced the level of infant and

child mortality. In the case of migration, village-based, micro-level studies were needed to identify the motivation to migrate.

Population policy research went beyond measuring relationships between development and demographic variables to investigate specific policies and programmes. It was concerned with the instruments of policy as well as the objectives. Among the policies designed to alter demographic variables, those which required additional research efforts were the social, economic and political structures which created fertility incentives and disincentives and the cost effectiveness and likely mortality impact of health policies designed to reduce the socio-economic differentials in health status. An important question for policy research was identification of policies to influence rural-urban migration.

Among the most important research issues to be addressed in evaluating family planning programmes were an assessment of the likely fertility reduction that could be achieved by a well-designed programme and an assessment of the cost effectiveness of family planning programmes now in effect.

In assessing the demographic impacts of development projects, research studies should indicate how development projects could contribute to the solution of problems created by demographic variables and how development projects could be designed to have the desired demographic impact.

In establishing national priorities for research efforts in support of integrated planning the following factors should be taken into account: (a) national objectives; (b) the availability of data; (c) the availability of suitable frameworks, and research methodologies; (d) the prospects for application of the research findings; and (e) the availability of technical expertise.

There was some discussion of the merits of alternative institutional arrangements for promoting population-related research in support of development planning. There was agreement that a variety of institutional arrangements could produce good results. A more fundamental problem was that though population problems were multidimensional and should involve professionals in many fields, there was often insufficient communication between population units, however structured, and other elements of the planning community. That problem could not be overcome simply by changes in institutional structure but would require constant and skilful effort by those involved to open and expand lines of communication.

Several participants observed that the suggested research topics gave too little weight to interrelations between population and the environment. A number of countries in the region faced severe environmental problems which both affected and were affected by population factors. Among the studies proposed were an analysis of the impact of migration on natural resources by subgroups, the access of women to natural resources, policy issues relating to land ownership and land use, and indicators of critical levels of population in relation to resources and environmental impact studies.

It was noted that in some countries research concerning the impact of national growth was less urgently required than studies concerning the spatial distribution of the population, particularly the growth of large cities. Among the studies suggested were an investigation of the relationship between population distribution and urban problems, methods for integrating population planning with urban planning, and the consequences of alternative patterns of urban hierrarchy. The need was cited for research at the level of the individual city to determine and project the distribution of population within the city.

It was suggested that a useful contribution to integration would be the development and application of a projection methodology which would take into account the likely future impact of development programmes and projects.

Several participants observed that the five-year period of the typical planning horizon led to the treatment of population as an exogenous factor. It was suggested that the five-year plans should be prepared in the context of a long-term-perspective plan.

Several participants suggested that in setting priorities for research, the structure used should be that of planners rather than demographers. The exercise should begin with planners' perceptions of critical issues. It should identify what planners saw as obstacles to their work and where planners felt that population-related research could be useful in overcoming those obstacles. That involved assessing the problems faced by planners and determining the causes of those problems, such as a lack of data or a lack of research findings.

VII. RECOMMENDATIONS FOR POPULATION AND DEVELOPMENT PLAN AND POLICY FORMULATION AND RESEARCH PRIORITIES

A. Institutional Arrangements

The Seminar reiterated Recommendation 81 adopted at the International Conference on Population in Mexico City in 1984 which called upon the international community to emphasize the institutionalization of the integration of population planning in the development process in line with country-specific characteristics. The Seminar also emphasized that careful consideration should be given to the location and the authority of and the necessary support for population units.

Although there had been considerable progress in most countries of the region in institutionalizing the integration of population planning in the development process, the Seminar recommended that the functioning of existing population units or committees should be strengthened. The aspects which should be emphasized in making population units more effective included (a) multi-disciplinary staff with an in-house capability for quantitative demographic, economic and social analyses and for conducting small-scale surveys with quick turnaround time in areas with direct policy relevance, including women's concerns; (b) authority, political mandate, the delineation of responsibilities (on population matters), decentralization of decision-making; and (c) communication, co-ordination and networking between the units and relevant national, subnational and sectoral agencies, committees or bodies.

The effectiveness of a population unit should be evaluated at appropriate intervals to identify problems and curative measures. On the basis of those evaluations, the Governments might wish to take prompt action to improve the effectiveness of population units.

Among the research functions of the population planning unit would be to identify requirements for additional data and to promote efforts for their collection and inventory, and policy synthesis of research already completed; to conduct or commission new research to supply other substantive units in the planning structure with the demographic data and research findings; and to disseminate research findings through policy papers, publications, seminars and workshops.

B. Methodology

Many population policies, programmes and projects had weak scientific underpinning because the causes, consequences and interrelationships involving

population and other variables were poorly understood. The Seminar recommended that scientifically-sound analytical frameworks, specific to the socio-economic setting of each country, should be developed to help to understand the complicated linkages between population and socio-economic factors and to identify the information that should be made readily available to researchers, policy makers and planners. Efforts should be given to ensure that such frameworks were up-to-date and operational. The use of frameworks for actual planning applications should be illustrated or demonstrated. Specific areas where frameworks should be developed were investment programming and project prioritization.

Because the need for integration was based on the assumption that, at the micro and macro levels, economic and demographic variables were related in such a crucial way as to make it important to consider them a part of the same interactive system, the Seminar recommended that that assumption should be re-examined and tested if policy integration efforts were to be continued.

Although economic-demographic modelling was a difficult undertaking –there were always problems of data availability, consistency and reliability, estimation techniques, model specification, etc. – and the predictive ability of models in the past was doubtful, the exercise was considered useful in terms of identifying data needs, giving frameworks for planning, searching for new and effective methodology and providing various scenarios under given conditions. Besides, as a perspective plan was increasingly needed, there was a subsequent need for long-range economic-demographic projections based on interactive models. Therefore, the Seminar recommended that the exercise be encouraged and supported.

Because the time horizon of most development plans of five years or so was too short for the effects of population change on socio-economic development or *vice versa,* to be really seen, Governments were invited to consider the benefits to be derived from the preparation of long-term perspective plans with a time horizon of 15 years or more.

Mathematical models of population development interrelationships could be useful in making planners cognizant of population-economic linkages. They could be used to provide a framework for studying the interrelations between population and development variables, to provide a framework in which population and economic projections were mutually consistent, and to evaluate the consequences of alternative demographic and socio-economic development policies.

(a) Since it was necessary to assess the way in which various socio-economic factors and governmental interventions affected demographic variables, efforts should be devoted to developing partial models of the determinants of demographic change, particularly in relation to particular policy instruments and programmes.

(b) Efforts should be made to bring together the results of research on partial demographic social and economic linkages into the consistent framework of an economic-demographic simulation planning model. Ultimately the research programme should include efforts to develop a macroeconomic-demographic planning model which would treat both socio-economic and demographic variables as endogenous. Such models would be most useful if they were to address resource allocation issues directly and include disaggregated public sector functions.

C. Research

(a) Demographic levels, trends and projections

The Seminar recognized that in many countries of the ESCAP region, the availability and quality of demographic data had significantly improved in the recent past. Nevertheless, the lack of accurate demographic and population-related socio-economic data and projections remained one of the most important constraints on effective integration of population factors into the development planning process. It was to address that problem that the Seminar made the following recommendations.

- The initial activities of a population unit should include an assessment of the anticipated needs for population data. The assessment should involve a review of available data sources, data producers and users and means of access to population data. Planners should be provided with those inventories of available data.

- Development plans often contained policies and programmes aimed at specific target groups such as landless labourers, the urban poor and other poverty groups, and women and children. Similarly, the introduction of regional and rural development strategies would require new forms of data for small areas. Therefore, efforts should be made to provide appropriately classified demographic data.

- Consideration should be given to surveys in particular areas which used the same questionnaire to collect economic and social data from households each year. The data resulting from those surveys could show how economic change affected family size, marriage and other population aspects.

- Data pertaining to the patterns, problems and policy options associated with infant and child (under-five) mortality should be collected during the forthcoming 1990 round of censuses. The proposed census schedules should be reviewed carefully to ensure that they included the questions needed to facilitate the analyses of infant mortality.

- The formulation of policies and plans in the field of migration would require improved data on how many persons moved, who they were, and where and why they moved. Those data should be collected using appropriate time intervals, spatial units and definitions of types of movement. Such data should be collected for households in both areas of origin and areas of destination. The collection effort should also include information about the initial flows of money and goods to the migrants and the later return flows of remittances.

- Detailed population projections by size, sex-age group and location and projections for specific population groups should be prepared to meet the needs of planning. For many planning purposes it would be necessary to have subnational population projections as well. In particular, the effects of migration upon subnational projections should be explained.

(b) Research on interrelations between population and development

The Seminar recognized that a knowledge of the consequences of demographic change for socio-economic development was essential both as a basis for planning to accommodate demographic trends and as a basis for deciding whether to adopt population or socio-economic policies designed to alter demographic trends. Conversely knowledge of the determinants of demographic change was essential to identify appropriate points of intervention to alter undesirable demographic trends and to encourage desirable trends. At the present time, knowledge of the quantitative impact of demographic trends and the causal mechanisms responsible for those impacts was often insufficient to serve as a basis for policy formation. To address those gaps in understanding, the Seminar suggested that research in the following critical areas be considered.

- Studies of the impact of population growth decomposed geographically, sectorally and according to social groups. It is also necessary to measure better the impact of population trends on particular sectors such as agriculture, health, education and employment.

- Research to identify differential impacts according to social class, rural-urban residence, region and occupation.

- Studies of environmental problems, such as soil erosion, resulting from population growth and settlement patterns. Such studies could include a set of alternative populations and a set of alternative consumption patterns, an analysis of production required to meet these needs, a translation of production levels into physical resource requirements and an analysis of environmental constraints.

- Research related to linkages between population changes and resource allocation towards the social services sectors.

- Studies of the effects of declining mortality on family structure and economic behaviour. Such studies should include the evaluation of the effect of declining mortality on age structure and family composition over the life cycle, and examine the effects on inheritance patterns, savings patterns and the potential for migration.

- Studies to identify the effects of migration on population growth and income distribution in the areas of origin and destination. Among the factors which should be considered are the volume of needed public sector services, agglomeration economies, costs of congestion and pollution, the efficiency of education and health programmes and the subsidization of housing.

- Studies on the relationship between population redistribution and urban growth which would be useful in linking population planning with urban planning. These studies should examine the effects of demographic trends on urban services and the urban environment.

- Studies to identify the determinants of differential levels of fertility among subgroups of the population. Such studies should give particular attention to the role of contraceptive prevalence.

- Studies of the factors that determine the age at marriage. A principal focus of such research should be the social factors that determine the age pattern of marriage, the supports for such traditional marriage patterns and the elements which are militating for change.

- Research on parents' perceptions of the value of children, according to gender, studies to determine the actual costs and benefits based on community studies. This could involve research on the economic roles of children, the relationship between work activity and school attendance and conversely the effect of children's education on their subsequent migration from rural areas.

- Studies to examine the linkage between demographic factors and the labour force participation of women which takes into account the potential incompatibility between the roles of mother and worker, the degree to which employment increases women's psychological and economic independence and how employment increases womens' exposure to the outside world, including family planning options.

- Research to determine the processes by which education influences fertility and to determine how such contextual factors as urbanization, the availability of family planning services and the quality of transportation and communication facilities affect the linkage between female education and fertility.

- Research linking other dimensions of women's development to demographic factors.

- Research to determine the causal mechanisms by which the education of mothers is a major factor in determining the level of infant and child mortality.

- Research to identify the mechanisms responsible for the existence of large differences in mortality by social class, such as differential access to health facilities or differences in knowledge and nutrition.

- Research on migration, studying the characteristics of the sending as well as the receiving areas and the effects of migration on family structure and marital patterns. Village based, micro-level studies would be useful to identify the motivations to migrate and actual patterns of movement.

(c) Population policy research

The Seminar recognized that the development of data and projections and the identification of the determinants and consequencies of demographic change were necessary but by themselves not sufficient for purposes of planning and policy formulation. It was necessary to apply the results of data collection and interrelations studies to policy analysis, which was concerned with the instruments of policy as well as objectives. For policy purposes it was necessary to investigate specific programmes that could serve to bring about the desired results and to analyse them from the viewpoint of effectiveness, administration feasibility and cost. With this in mind the Seminar identified the following studies which might prove useful as part of an integrated approach to population and development planning.

- A systematic examination of all major options for government or private action to influence population variables. There is also a need for conducting an analysis of current government policies, plans and programmes to determine how they deal with population factors with a view to identifying areas where such factors might have been neglected.

- Research on reversible (temporary) methods of family planning, which would indicate why certain methods are more popular, and on ways and means to improve the safety of certain methods.

- A study of the relationship between declines in fertility and infant mortality and the problems that must be solved in implementing a strategy to reduce the number of infant deaths.

- Research to determine the cost effectiveness and likely mortality impact of health policies designed to reduce the socio-economic differentials in health status.

- Research on the way general development strategies influence demographic levels and trends. Such studies should bring out the differences between the consequences of such policies for the government and the consequences for the individual.

- Assessment of the demographic impact of infrastructural development projects such as hydroelectric dams, irrigation canals and rural electrification.

A number of studies were necessary at the international level to promote integration by allowing planners to learn from the experience of population and development integration in other countries. The Seminar considered that studies which would evaluate the status of population and development integration in each country (including obstacles faced, institutional arrangements, analysis of plans, research programmes and training activities) would be particularly useful in promoting effective integration and recommended that they be undertaken by the appropriate bodies.

(d) Setting priorities

Research priorities for integrating population into development planning would differ from one country to another. In establishing national priorities for research efforts in support of integrated population and development planning, the following factors should be taken into account: (a) national objectives in population and development; (b) the availability of data; (c) the availability of suitable conceptual frameworks and research methodologies; (d) the prospects for using the research findings; and (e) the availability of technical expertise.

D. Training

The Seminar reiterated Recommendation 75 adopted at the 1984 International Conference on Population which invited Governments to develop an adequate corps of trained persons (academics, researchers and planners) for the effective formulation and implementation of integrated population and development policies, plans and programmes at all levels.

The development of expertise in demography, economics and other disciplines needed for integrated planning should be emphasized (or given high priority) in the least developed countries where the need for such high-level manpower was crucial.

The main aim of training activities in that field should be to develop national capabilities for understanding interrelationships, for projecting population growth, evaluating its social and economic consequences and communicating analytical frameworks, methodologies and research results to planners and policy makers. Specific training objectives should include broadening knowledge among national and regional planners about population-development inter-

relationships and improving their technical skills, creating a core group of national and regional trainers for integrated planning, and preparing instructional materials for such training.

Awareness and commitment on the part of high-level policy makers and planners were crucial determinants in integrating population and development, the Seminar, therefore, recommended that workshops on integration be held to keep awareness and commitment at a high level.

Simple manuals which required little time to understand the basic ideas of how to integrate population into development planning should be developed for policy makers and project managers. They should illustrate the use of population and development frameworks, methodologies, research and statistical information.

E. Dissemination

Population information systems should be developed as part of national management information systems. In particular, activities should be undertaken to ensure that planners were fully informed of how demographic data could be used in development planning. Information should focus on techniques for linking specific aspects of population change to sectoral requirements and decisions concerning resource allocation.

To keep policy makers informed of up-to-date research findings in that field, the population information system should provide executive summaries of new research, together with a critical evaluation of the findings on a regular basis.

F. Role of the United Nations and Other International Organizations

To assist Governments in strengthening population units, ESCAP and other concerned international organizations should provide technical expertise in line with country-specific needs, and financial support, where appropriate.

ESCAP and other concerned international and regional agencies should provide greater technical and financial support to policy-cum-action-oriented research and training in the area of population-development integration, including the use and testing of software packages, exchange of experience among countries through seminars and workshops, and institutional networking to facilitate the exchange of experts and expertise in the region.

ESCAP and other concerned international and regional agencies should try to identify emerging issues concerning the impact of population change, such as population aging and women's concerns, compile and disseminate information and provide timely recommendations for government action.

Interagency meetings should be held from time to time to co-ordinate and provide guidelines for assistance to members and associate members in the region in terms of the integration of population into development planning.

ESCAP should:

- Undertake and promote detailed country case studies directed at a sharper delineation of the development planning processes and a clearer identification of areas in the planning process with a demographic interface constraining the development planning efforts in the member countries.

- Undertake and promote demographic and development planning research directed towards identification of research and policy inputs which would help relax the identified constraints in the way of successful development planning efforts.

- Promote closer and more frequent contact and collaboration among agencies, researchers and development planners in ESCAP members and among subgroups of countries with common demographic situation.

- Support and assist members and associate members in developing simple manuals for policy workers and project managers providing basic ideas on how to integrate population into development planning.

G. Selected Development Issues

(a) Poverty and income distribution

Given the high rates of population growth experienced by many countries of the ESCAP region during the past three decades, high priority should be given to resolving the problems related to rapid population growth. A concerted attack must be made on the causes of poverty and income distribution in conjunction with population policies and programmes.

The experience of several countries of the ESCAP region had demonstrated that high rates of economic growth, though desirable, were not sufficient for increasing the well-being of the poor. A more equal distribution of the benefits of development, even though modest, would do much to alleviate poverty.

In view of the fact that a large majority of people in the developing countries of the ESCAP region lived in rural areas, the development of policies and programmes to better the standard of living of the poor should accord priority consideration to undertaking or reinforcing integrated rural development policies and programmes.

In that context, the Seminar also emphasized the need to examine the urban poverty problem as a distinct problem, and not merely as a spill-over of rural poverty, and the need to formulate and implement anti-poverty policies and programmes directly addressed to the urban poor.

(b) Women's development

Although women constituted nearly half of the population in almost all countries of the ESCAP region they had not been accorded equal status with men in many very important respects and thus were prevented from realizing their full potential as participants in national socio-economic development. In order for women to participate more fully and effectively in all aspects of development, all forms of discrimination against women and the obstacles to their advancement in the fields of education, training and employment must be removed.

In order for women to be able to take advantage of the opportunities which would result from the elimination of discrimination, efforts should be intensified to provide them with education and training, health, nutrition and employment including access to credit and other supportive services for promoting self employment, particularly among the poor.

(c) Education

Changes in the size, composition and distribution of the population had a bearing on educational development. In turn, levels of educational attainment (especially among females) had a significant impact on fertility, mortality and migration.

Since education was an important instrument in influencing attitudes and behaviour, the educational system and the educational process should be utilized to create a clearer understanding of the interactive relationship between population change, development and quality of life. Thus, it was essential that population education constitute an important component of the curriculum at all levels of education, formal and non-formal.

(d) Welfare of the aged

In recent decades the life cycle patterns of the elderly in the ESCAP region had been changing rapidly as a result of the extension of the life cycle and the reduction in fertility. To improve the quality of planning for the welfare of the elderly, more research efforts should be directed to analysing of changing life cycles utilizing advanced systems for making household projections. Research of this nature is expected to provide a useful base for analysing the impact of population change upon the family support system available to the elderly.

In the context of the fast changing economic structure there are certain factors which adversely affect the aged more than the other sections of the

society, such as changes in the price structure and the consequent changes in production patterns. These problems need to be studied, may be, in the framework of computable general equilibrium models.

(e) Environment

Efforts by governmental and voluntary organizations aimed at increasing the acceptance of fertility reduction programmes and the efficiency of health programmes should be reinforced at the community level by information on the relationship between population pressure on the nature and likelihood of environmental degradation.

Resource constraints on the economy in general, and constraints imposed by rising population on environment resources, was widely noted. As ecological conditions in most countries were distinctive due to diversity of natural conditions and population groups, detailed surveys of areas with a low resource base and high population growth might be helpful for developing major policy alternatives and action-oriented programmes.

Planning agencies should identify critical areas which were experiencing, or were likely to experience, acute population pressures on environmental resources. Specific development plans should be prepared and implemented in such areas, with priority attention being given to the role of population distribution in the context of investment to improve environmental conditions.

The effects of population factors on development were mediated by institutions, economic systems, the distribution of wealth and income and population policies. Therefore, countries experiencing severe environmental stress related to population growth the distribution should review their commercial technological, pricing and taxation policies and their interaction with population factors.

(f) Health and nutrition

While a rapidly growing population directly increased the number of people requiring various types of health services, the actual use of such services would often be constrained by factors such as low income, high costs, the lack of adequate facilities and personnel, especially in rural areas. Therefore planning efforts designed to raise health care utilization to improve health must consider both demand and supply factors.

Improving the health of the population in the ESCAP region would require an integrated approach to planning that took into account such demographic factors as past mortality experience, the continued growth of the population, changes in fertility and associated changes in the age structure and population movements in response to differential pace of social and economic progress between subnational regions.

In order to integrate population fully into health development planning, policy makers and planners should be provided with research findings on inter-relationships between demographic factors and health, and information on the cost of various policy options and programme alternatives to deliver basic health and nutritional services to segments of the population that are most in need.

(g) Other areas of concern

While the Seminar had deliberated on a limited set of concerns, there were traditional as well as emerging concerns that merited serious attention from an integrated perspective. Those areas included manpower planning and training, social welfare, including that of children and teenagers, urban development and capital infrastructure.

Annex I

LIST OF DOCUMENTS

Provisional agenda	POP/RSFPDP/L.1
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Research requirements for integrating population factors into development planning	POP/RSFPDP/7
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Annex II

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Part Two
Background Papers:

REGIONAL PERSPECTIVES OF POPULATION AND DEVELOPMENT INTERRELATIONSHIPS

* These papers have been issued as submitted by the authors, without formal editing. The views expressed are those of the authors and do not necessarily reflect those of the United Nations.

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I. AN OVERVIEW OF POPULATION AND DEVELOPMENT INTEGRATION IN ASIA

ESCAP Secretariat

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The integration of population and development is a challenging but difficult undertaking. There is no doubt that all the countries in the region have realized the importance of integration. However, because of the lack of knowledge on cause-and-effect relationships, developing countries have been facing enormous difficulties at the implementation level.[1] The major problem facing the planners, administrators and politicians is how to integrate effectively. A satisfactory answer has yet to be found.

The countries in the region differ widely in the extent to which they attempt to integrate population into development planning. However, the action so far taken by these countries is appreciable. An increasing number of countries have established population units within their planning secretariats. Thailand was the first to establish a population cell within the planning agency[2] Bangladesh, Sri Lanka and Pakistan have established population divisions at the central ministerial level. A population commission, a leading group or a department in the central ministry has been established in countries such as Burma, China, India, the Philippines, Maldives and Nepal. High-level national family planning/population boards have been established in Indonesia, Malaysia and Singapore. Moreover, Indonesia has established population units in each ministry while the Philippines has set up regional-level units also. A cabinet-level population policy co-ordinating committee has been directly overseeing the population programmes in the Republic of Korea since 1976. In other countries, the responsibility for population policy has been delegated to central planning offices.

The basic responsibilities and functions of these population units are more or less similar throughout the region. For example, almost all the units are supposed to assist the Governments in (a) the formulation and execution of appropriate population policies; (b) the establishment of mechanisms for integrating population policies with other development policies and programmes; and (c) the promotion of related research activities. However, a careful examination of functions indicates that these units have not been delegated important and essential responsibilities in integration. A review in seven Asian countries by the Population Council contends that none of these units has authority over development plans submitted by ministries other than the ministry to which they are attached, nor are they responsible for funds allocated to those

[1] Currently available knowledge about population and development suggests certain relationships; for example, between fertility and such factors as age at marriage, female education and employment. See the Population Council, *Population Policy and Development Planning Units in Asia* (Bangkok, Regional Office for South and East Asia, 1980).

[2] G.W. Jones, "Review of the integration of population and development policies and programmes in Asia", paper presented to the Third Asian and Pacific Population Conference, 20-29 September 1972, Colombo (POP/APPC.3/BP/1), p. 15.

ministries.[3] As a consequence, the ability to influence sectoral investment decisions is negligible.

Many Governments formulated population policies as an important component of their development programme to intervene in problems associated with overpopulation and high fertility levels. India was the first country in the world to adopt a national-level family planning programme.[4] By 1980, a majority of the countries in the region had active family planning programmes. In the countries in which there are no specific population growth policies there are population distribution policies or policies with regard to growth of primate cities.[5]

In most countries, since family planning programmes were first formulated they have been integrated with health and in some cases also with nutritional programmes because of the efficiency of using health personnel for family planning activities. For instance, since 1971, family planning has been integrated with the maternal and child health services under the rural health services of the Ministry of Health as well as the social programmes offered by the Federal Land Development Authority in Malaysia. Since 1977, however, the National Population and Family Development Board of Malaysia has implemented activities and programmes using a multidisciplinary approach, viewing the population problem in the context of pupulation and development at the macro level, and population and family development at the micro level.[6] The Economic Planning Unit, Malaysia's planning agency, has recently taken up the integration of population factors into development planning more rigorously. A large-scale economic-demographic model for development planning has been developed by the Unit. Indonesia is at the stage of expanding community family planning institutions with the aim of moving family planning beyond mere fertility control.[7] Efforts have started recently to integrate the family planning programmes with programmes of private, government and social organizations, both horizontally and vertically. This means that some functions are implemented at each level by several sectors, in such a way that each programme contributes to the whole and shares a collective responsibility. In the Republic of Korea, since about 1975, increasing attention has been given to population issues beyond family

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[3] *Population Policy and Development Planning Units in Asia op. cit.*, p. 13.

[4] "Integration of population and development policies: a comparision of the developing regions of the world", paper submitted to the Third Asian and Pacific Population Conference, 20-29 September 1982, Colombo (POP/APPC.3/SP/12).

[5] G.W. Jones, *op. cit.*

[6] R. Othman, "An overview of the organization, processes and results of population policy and development efforts in Malaysia", in *Population Policy and Development Planning Units in Asia, op. cit.*, p. 68.

[7] P.P. Sambung and P. Rathardjo, "The Indonesian family planning programme: an overview of the organization, its processes and the achievements of the population and development planning effort", in *Population Policy and Development Planning Units in Asia, op. cit.*, p. 53.

planning. As a consequence the Fourth Five-Year Plan (1977-1981) of the Republic of Korea included a sectoral plan for population and employment for the first time.[8] In the Philippines, there are two major government agencies responsible for population activities – the National Economic Development Authority (NEDA) and the Population Commission. The Population Commission's mandate encompasses all population activities while NEDA is the agency responsible for the co-ordination of development planning efforts in the country. The Population/Development Planning Unit has been established within NEDA. The Philippine Development Plan for 1977-1988 gives the impression that population and development plans and policies have been successfully integrated.

It has been observed that some of the countries are paying increasing attention to other development aspects, such as the status of women, or interventions which could affect the population trends in the long-run.[9] In Java and Bali the Indonesian Family Planning Co-ordinating Group has evolved an integrated approach using women's clubs and women's unions to participate actively in the promotion of health.[10]

As a response to the Call for Action of the Third Asian and Pacific Population Conference held in Colombo in September 1982 several countries have made concerted and deliberate attempts to integrate population and socio-economic development. For instance, India and Nepal have each appointed a high-level task force including Cabinet ministers to monitor and review the integration activities. Recently Thailand has conducted a pilot survey to ascertain difficulties and problems relating to integration. The experience of some countries in the region, particularly China and Indonesia, indicates that the integration of population programmes with other sectoral programmes could be achieved more easily at grass-roots levels by making the local administration responsible for the integration of the various developmental programmes in their respective areas. Although integration at the national level and at appropriate administrative levels is equally desirable, indonesia's experience demonstrates that there are a lot of problems, since different ministries work towards different targets or objectives.

Despite increasing recognition of interrelationships between population and development and a commitment to adopt an integrated approach to population and development, progress has been rather slow. The Third Asian and Pacific Population Conference heard some revealing observations on this whole issue. The slow progress of integration was considered due both to the limited

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[8] S.U. Kim and J.E. Sloboda, "Population and development planning and policies in the Republic of Korea", in *Population Policy and Development Planning Units in Asia, op. cit.*, p. 61.

[9] G.W. Jones, *op. cit.*

[10] World Health Organization, "Formulation and implementation of integrated population and development policies", a paper submitted to the Third Asian and Pacific Population Conference (POP/APPC.3/GP/8).

knowledge base relating to diverse population processes and to a lack of planning structures to incorporate linkages between population and development. Moreover, the lack of data of good quality, inadequate use of existing data and information and lack of adequately trained personnel to implement the process of integration are also responsible for the slow progress. Integration remains in an experimental stage; there is no guarantee of its successful application in every situation. It is possible that some forms of integration could dilute the effect of certain population programmes. Integration has to be attempted in the context of what is workable in each situation in order to achieve the desired results. These gaps were reiterated at the third session of the ESCAP Committee on Population held at Bangkok in August 1983.

This is a very rough overview which is intended to serve as an introduction for a more comprehensive review, at this Seminar, of country situations regarding population and development integration. Because of the increasing concern about and recent improvements in population and development integration activities, the information that this paper was based on may not be up-to-date. ESCAP will appreciate being informed of the most recent situation regarding the population and development integration activities of its member countries.

II. POPULATION AND POVERTY

S. Selvaratnam

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A. CONCEPTS AND MEASURES

A systematic and comprehensive analysis of the interrelations between population change and poverty incidence is to a large extent handicapped by the lack of a universally accepted concept or definition of poverty, as well as precise methods or techniques for measuring its levels and trends. While demographers and statisticians have developed clear and uniform definitions of various components of population change (such as fertility, mortality and migration) and accurate techniques for measuring these components, there is considerable variation in regard to the way in which poverty is perceived and measured. Indeed the concept of poverty hardly lends itself to a precise definition.

However, there are basically two approaches to the estimation of overall impoverishment within a country: relative poverty, and absolute poverty. Relative poverty is measured in terms of relative shares in income or consumption of various sections of the population, as for example, the proportion of income received by the lowest 20 per cent or 40 per cent of the population. This measure shows the inequality of distribution of incomes but does not say anything about the level of deprivation of the various sections of the people.

Absolute poverty is commonly measured by the proportion of the population that is unable to meet specified minimum needs. In other words, it refers to a group that falls below defined minimum basic needs for subsistence, usually referred to as the poverty line. Since poverty has a dimension of intensity as well as of size, persons falling below the poverty or minimum needs line should not all be assumed to be either equally or absolutely deprived. Within the group that falls below the line, those on the brink of the line may be only on the margin of subsistence while those at the bottom may suffer far greater deprivation.

There is also considerable variation in the methods and techniques adopted by researchers even within the same country in determining the poverty or threshold line. Consequently, no uniform poverty line has been applied across various studies.[1] In a few cases, the poverty line was based on the minimum expenditures required for meeting the absolutely necessary food and non-food items. In most cases, the poverty line was calculated in terms of nutritional requirements alone; housing, clothing, health and other essential needs were not taken into consideration. Whatever the norms (nutritional requirements or

[1] For instance, for Pakistan, Naseem defines the poverty line in terms of a consumption level enabling a household to obtain at least 95 per cent of the recommended minimum intake of 2,100 calories per head. Irfan and Amjad define the poverty line as per capital income needed to obtain 2,500 calories per adult. Mujahid arbitrarily fixes the poverty line at an annual per capita income of Rs. 300 at 1959-1960 prices.

overall necessities) adopted for defining the poverty threshold, the decision still remains arbitrary and hence subject to some controversy.

Apart from the several issues in the area of poverty analysis which still remain unresolved, the current data base in many developing countries of the region does not appear to be adequate for obtaining accurate estimates of the incidence of poverty. Consequently, the findings of most of the studies have to be treated as tentative, indicating broad orders of magnitude rather than precise numbers.

Further, poverty levels are monitored on a regular basis only in a few of the countries in the region. For example, in India, the successive rounds of the National Sample Survey of household consumer expenditure have provided the needed data to estimate poverty levels on a continuing basis. But most countries do not have recent data on household income and expenditure; the latest available information relate to the 1960s and 1970s.

It may also be noted that poverty implies insufficient food and nutrition intake; inadequate housing; poor sanitation, disease and high mortality; low levels of education; unemployment or under-employment; etc. All these factors, individually or collectively, may be associated with various components of population change. Hence, an estimate of poverty based on a single measure such as per capita or per household income may be sufficient for many purposes, but is likely to be misleading in assessing interactions with demographic variables.

B. POVERTY SITUATION

Despite the conceptual and methodological limitations, the available studies indicate that poverty is an ever present condition for millions of people in countries of the Asian and Pacific region. In many of these countries, the poverty situation appears to have deteriorated over the years. For example, estimates for the Philippines show that between 1971 and 1985, while overall poverty rates increased from 49.3 per cent and to 59.3 per cent, rural poverty increased from 55.6 per cent to 63.7 per cent and urban poverty from 38.4 per cent to 56.1 per cent.[2] In Malaysia, the overall poverty incidence is reported to have increased from 29.0 per cent in 1980 to 30.3 per cent in 1983. During the same period, rural poverty increased from 37.4 per cent to 41.6 per cent, while urban poverty declined from 12.6 per cent to 11.1 per cent.[3] For Bangladesh, estimates based on calorie intake indicated that the percentage of the population in poverty increased from 41.7 per cent in 1966-1967 to 60.4 per cent 1976-1977 in rural areas, and from 23.4 per cent to 41.3 per cent in urban

[2] Alejandro N. Herrin, *Population Welfare and Public Policy in the Philippines,* Country report on population and development: Frameworks for research and planning, Bangkok, United Nations, ESCAP, 1988.

[3] Government of Malaysia, *Mid-term Review of the Fourth Malaysia Plan, 1981-1985.*

areas.[4] According to recent estimates, overall poverty rates in Sri Lanka recorded an increase from 18.5 per cent in 1978-1979 to 20.1 per cent in 1981-1982. These estimates also show that poverty was more marked in the rural areas (22.4 per cent in 1981-1982) and less severe in the estate sector (10.0 per cent).[5] For Nepal, it has been estimated that in 1977, at least 60 per cent of the rural population lived in absolute poverty.[6]

In some countries there appears to have been a reduction in the proportion of households below the poverty line. In India, nearly 54 per cent of the rural and about 41 per cent of the urban population were estimated to be below the poverty line in 1972-1973.[7] But estimates for 1983-1984 indicate that the poverty ratio had declined to 40.4 per cent in the rural areas and to 21.8 per cent in the urban areas.[8] In rural Pakistan, the proportion below the poverty line declined from 51.5 per cent in 1969-1970 to 39.8 per cent in 1979;[9] in Thailand from 56.0 per cent in 1962-1963 to 31.0 per cent in 1975-1976;[10] and in Java (Indonesia) from 51.6 per cent in 1969-1970 to 46.0 per cent in 1976.[11]

The overall poverty rates also conceal the wide variations in levels of impoverishment among various socio-economic groups. For example, estimates of poverty incidence as of 1983 for Malaysia show that the poverty rate is highest in the agricultural sector (54.9 per cent) and is concentrated in four major groups: rubber small-holders (61.1 per cent); rice-farmers (54.4 per cent); estate workers (54.6 per cent); and "other agricultural workers" (54.0 per cent).[12] In the urban Philippines, relatively high rates of poverty incidence occurred among farming, fishing and livestock-raising families during the period

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[4] John Malcom Dowling, *Income Distribution and Poverty in Selected Asian Countries,* ADB Economic Staff Paper No. 22, Manila, November 1984.

[5] Leslie Gunaratne, "The poorest of the poor in Sri Lanka", paper presented to the *Symposium on Alleviations of Poverty in Sri Lanka,* 19-21 May 1987, Central Bank of Sri Lanka, Colombo, 1987.

[6] Dharam Ghai and Rahman, *Rural Poverty and Small Farmers Development Programme in Nepal,* Geneva, International Labour Organisation, Rural Employment Policies Branch, 1979.

[7] Government of India, *Planning Commission, Sixth Five Year Plan 1980-1985,* p. 51.

[8] Government of India, Planning Commission, *A Technical Note on the Seventh Plan of India (1985-1990),* Perspective Planning Division, New Delhi, June 1986, p. 11.

[9] M. Irfan and Rashid Amjad, "Poverty in rural Pakistan" in A.R. Khan and Eddy Lee (Eds), *Poverty in Rural Asia,* ILO ARTEP, Bangkok, 1983.

[10] Rizwanul Islam, "Poverty, income distribution and growth in rural Thailand" in A.R. Khan and Eddy Lee (*Ibid.*).

[11] Eddy Lee, "Agrarian change and poverty in rural Java", in A.R. Khan and Eddy Lee (*Ibid.*).

[12] Government of Malaysia, *Mid-term Review of the Fourth Malaysia Plan 1981-1985.*

1980-1983, while in rural areas a high poverty incidence occurred among the families dependent on corn, coconut, "other crops", and fishing.[13]

C. POPULATION POVERTY LINKAGES

1. Introduction

Population and poverty are both linked with the welfare of the individual, the quality of life in society, and, by the same token, with the development of the country. However, we do not yet have a precise understanding of the interrelationship of population change and poverty incidence. For example, it is not quite clear whether the current high levels of poverty in most developing countries of the region are caused by their high rates of population growth or *vice versa.* Nor is it clear whether improvement in economic conditions would necessarily follow or automatically result in a reduction in the national rates of population growth.

In most developing countries one can observe a parallel between demographic characteristics such as high overall population growth, high fertility, high infant mortality and high population density on the one hand, and severe poverty among a large section of the people on the other. The tendency, therefore, has been to infer that population and poverty are inextricably linked and that each is a determinant and consequence of the other, or that population growth is, by and large, responsible for the increasing poverty in many of these countries. It is true that there are certain linkages or reciprocal actions between population and poverty. These relationships are exceedingly complex and most of the factors involved have not been properly understood. The exact nature of the relationships must be established after careful investigation and analysis and not simply assumed in advance of such investigation. As noted by Rodgers, "the topic is one in which ideology and preconception, rather than empirical considerations tend to predominate. For many observers, population growth is either the primary cause of poverty or a major obstacle to its elimination. For others, population growth contributes to progress".[14]

The interrelationship between population and poverty can be examined at two levels: the macro or aggregate level; and the micro or household level. Most of the available studies relate to the macro level perspective by analysing the impact of population growth on land, natural resources, savings and investment, or on the provision of infrastructure facilities and services. But it is the micro level, where decisions are usually made in regard to family size and migration, that serves as the starting point for most of the interactions between population and poverty. Indeed, these interactions are also most strongly felt at the micro

[13] World Bank, *The Philippines: Recent Trends in Poverty, Employment and Wages.*

[14] Gerry Rodgers, *Poverty and Population: Approaches and Evidence,* ILO, Geneva, March 1985, p. 1.

level, which absorbs the effects of mortality and life cycle variations in dependency. Although some of the micro-level relationships between population and poverty affect the individual, and others affect the household, a majority of studies analysing these relations have focused on the household.

A considerable number of studies have been undertaken to assess the nature of the interactions between population dynamics and poverty incidence both at the macro and micro levels. These studies cover a large number of developing countries throughout the world. The findings of most of these studies have been reviewed in a recent ILO publication.[15] Unfortunately, on many issues there is relatively little concensus in that the conclusions reached are either mixed or ambiguous. Consequently, national planners and policy-makers are left in a somewhat confused state without any firm knowledge base to rely on for formulation of appropriate and viable policies and strategies.

2. *Impact of Population Growth on Poverty*

It is well known that most developing countries of the region experienced an acceleration in the rate of growth of their populations in the years immediately following the Second World War. This upsurge was largely due to sharp reductions in mortality rates, while fertility rates continued to remain for a considerable length of time almost unchanged at high levels. Consequently, in the 1950s and 1960s, the population grew at an unprecedent rate of around 3.0 per cent per annum in most of these countries. Although there has been substantial slackening in growth rates in recent years, the estimated 1987 rates of growth in almost all these countries are still unusually high, ranging from about 1.4 per cent in Sri Lanka to 2.8 per cent in Pakistan.[16]

Studies undertaken in some of these countries[17] concluded that prevailing rapid rates of population growth posed a serious challenge to the attainment of national economic and social goals, and that a slower rate of population increase would be more conducive to a faster improvement in the incomes and standards of living of the people. On the other hand, others argued that the greatest expansion of the economies of the now-industrialized nations had taken place during a time of rapid population growth and that this very growth in numbers had been an important factor in setting in motion the process of development.[18]

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[15] *Ibid.*

[16] See, United Nations, ESCAP, *1987 ESCAP Population Data Sheet.*

[17] See, for example, Ansley Coale and Edgar Hoover, *Population Growth and Economic Development in Low-Income Countries: A Case Study of India's Prospects,* Princeton, 1958; and Gavin W. Jones and S. Selvaratnam, *Population Growth and Economic Development in Ceylon,* Colombo, Hansa Publishers, 1972.

[18] See, for example, Simon Kuznets, *Modern Economic Growth: Rate, Structure and Spread,* New Haven, Yale University Press, 1966; and Everett E. Hagen, "World economic trends and living standards" in Philip M. Hauser (ed), *Population and World Politics,* Glencoe, Illinois, Free Press, 1958.

There are, however, essential differences between the demographic experience of the now-industrialized countries of the West during the 19th century and that of the developing countries during the latter half of the 20th century. In the modernized countries of the West, the upsurge in population growth that occurred during the last century was mainly in response to social and economic development. The agricultural and industrial revolutions helped to improve the standard of living of the people and their nutritional levels. They also made possible improved and greatly expanded health and sanitation facilities. These developments were largely responsible for the gradual decline in mortality and consequent increase in population over an extended time period. By contrast, the extraordinarily rapid mortality decline in most of the Asian countries after the Second World War preceded, and did not follow, serious attempts at socio-economic development. It was the result largely of the eradication of epidemic and endemic diseases by means of "instantly available" measures that were developed over a period of years in the West, and was not due to any radical alterations in the economic structure of these Asian countries.[19]

What is more, high rates of population increase in most developing countries of the Asian and Pacific region are taking place at a time when most of these countries are striving to achieve a satisfactory level of social and economic progress. The rates of population growth now prevailing in these countries are very much higher than those the Western industrialized nations experienced in the initial stages of their development. During its period of industrialization, the growth rate of population in Western Europe never exceeded 1.5 per cent, and in many countries did not exceed 1.0 per cent. Thus, in the developing countries rapid population growth has come to be regarded as an obstacle to social and economic development in so far as it has not by itself generated higher rates of economic growth.[20]

An important consequence of rapid population growth is the increasing pressure exerted on arable land. In most countries availability of arable land is limited, and increasing population therefore results not only in fragmentation of existing land holdings which are already relatively small in size, but also in increasing landlessness. In fact, the number of landless labourers has been growing at an alarming rate in the densely populated countries of the region. Since, as noted earlier, a vast majority of the rural poor in most countries are small farmers and landless labourers, the incidence of poverty will increase with increase in the number of landless and near-landless families. This is particularly true of countries like Bangladesh where it has been reported that "population

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[19] S. Selvaratnam, *Demographic and Socio-Economic Situation in Rural Areas of Nine Selected Asian Countries,* Background paper presented to the Inter-country Seminar on the Role of Rural Workers' Organizations in Population/Family Welfare Activities, Hyderabad (India), 30 November – 5 December 1987 (Bangkok, ILO Office).

[20] United Nations, *The Determinants and Consequences of Population Trends: New Summary of Findings on Interaction of Demographic, Economic and Social Factors,* vol. 1, New York, 1973 (ST/SOA/SER.A/50), p. 519.

growth combined with inheritance laws are increasing sub-divisions and fragmentation of landholding" aggravating rural poverty in a situation "where growth of alternative employment opportunities has been very sluggish".[21]

Another important consequence of rapid population growth is the increase in the labour force or the number seeking employment, though there is always a time lag of 15 years or more. In most developing countries of the region, the unprecedented growth in the labour force that had taken place during the past three decades or so was not matched by an equally high rate of employment creation. Agriculture, which has traditionally been the mainstay of employment and livelihood, has not been able to absorb the huge increases in the rural labour force. Although over the years the proportion of the labour force in agriculture has declined substantially in several countries,[22] the actual number of persons dependent per hectare of cultivated land continues to rise, and this has adversely affected the living conditions of the people in rural areas. The problems of unemployment and underemployment have become acute in both rural and urban areas.

Since for the vast majority of the people in developing countries, employment is the chief source of income and sustenance, lack of employment often results in poverty and hunger. The close association between unemployment and poverty is clearly brought out by two independent analyses of the 1977-1978 National Sample Survey data for India. According to the first analysis, unemployment rates steadily decline from high levels for very poor households (14.7 per cent for rural and 17.6 per cent for urban households) to moderate levels for households just below the poverty line (8.4 per cent for rural and 11.1 per cent for urban households), and to low levels for well-to-do households (4.0 per cent for rural and 5.8 per cent for urban households).[23] The second study found that "the rates of unemployment are distinctly higher for the set of poor households than for the nonpoor under the weekly status but much more so under the daily status. The association between poverty and unemployment is also reflected in the fact that the contribution to the unemployed person-weeks and the unemployed person-days originating in the poor households is higher than their share in the economically active persons or persons aged 5 and above".[24] While unemployment is not the only cause of poverty, its greater

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[21] Mohiuddin Alamgir and Sadiq Ahmed, "Poverty and income distribution in Bangladesh", in T.N. Srinivasan and Pranab K. Bardhan, (Eds) *Rural Poverty in South Asia*, Delhi, Oxford University Press, 1988, p. 21.

[22] As the farmers' land holdings become progressively smaller in size, an increasing number of them, particularly those whose land holdings are already very small, are compelled to seek employment outside the agriculture sector.

[23] J. Krishnamurty, "Unemployment in India: the broad magnitudes and characteristics" in T.N. Srinavasan and P.K. Bardhan, *Ibid.*

[24] K. Sundaram and Suresh D. Tendulkar, "Toward an explanation of interregional variations in poverty and unemployment in India" in T.N. Srinivasan and P.K. Bardhan, *Ibid.*

incidence among the poor should make its reduction an aim of anti-poverty policies.[25]

Rapid population growth also adversely affects the income levels and living standards of the people as well as the rates of savings and investments. In recent times, a number of developing countries in the region experienced relatively high rates of economic growth and substantial increases in their gross national products. But these increases have not resulted in an equally large increase in per capita incomes because of rapid population growth. Per capita incomes are still relatively low in most of these countries. Further, since even these low incomes have not been equally distributed, a vast majority of the people continue to have very low standards of living.

A country must increase its level of investment in order to speed up the rate of growth of its economy. Capital is the most important factor in economic development, but rapidly increasing population aggravates the problem of capital shortage in many developing countries. The main source of capital formation is domestic savings[26] effected through refraining from consuming some part of the current national output and setting aside that part for the purpose of investment in future production. Any population growth requires some investment of available capital just to maintain the same level of per capita GNP.[27] The higher the rate of population growth, the greater the proportion of available capital that must be used for investment simply to maintain constant per capita GNP and the less there is available to increase per capita GNP.

But a rapidly increasing population affects both the rate as well as the distribution of investment. In most countries an increasingly large proportion of the limited resources has to be set apart for feeding, clothing, educating and providing health and other facilities and services for the large and increasing number of dependent children. This increased current consumption expenditure will tend to restrict both public and private savings and hence investment. Further, a substantial percentage of even the limited investment is devoted to meeting social needs such as school buildings, hospitals, houses, as well as non-development activities such as defence and bureaucracy, at the expense of investment in the directly and immediately productive spheres. Such an imbalance in

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[25] ESCAP, *Economic and Social Survey of Asia and the Pacific 1985*, Bangkok, 1986.

[26] Though imported capital also contributes to capital formation in a large number of developing countries, by and large the capital required for the development of a country must be generated within the country through savings and the useful employment of the savings.

[27] On the basis of an overall capital-output ratio of 4:1, it is estimated that merely to maintain the existing per capita income, a population increase of 2.0 per cent a year will require a net investment of 8 per cent of the national income and a population increase of 3 per cent per annum requires an investment of 12 per cent of the national income. In other words, an increase in population has to be accompanied by more investment merely to maintain the existing levels of per capita income.

the distribution of investment would not only affect the rate of economic growth, but will have a depressing effect on the level of future investment.

It may also be noted that while in the developed countries, it is possible to reinvest much of the increased production in economic development, in the developing countries, increased production has tended to be balanced by the increase in numbers of people. The inevitable result has been increasing poverty and lack of surplus capital for socio-economic development in the developing countries. It is therefore argued that the prospects for accumulation of capital necessary for investment in development will be limited so long as populations in the developing regions continue to grow at the current high rates.

3. *Impact of Poverty on Population*

(a) Poverty and fertility

Poverty is often associated with conditions of high fertility,[28] although it is not yet clear whether large family size is the cause of a household's poverty, or whether high fertility is a response to poverty, or whether there are other factors responsible for both. It has usually been argued that poverty breeds poverty in that really poor people do not care how many children they have because they will still be poor.

Available evidence indicates that the poor tend to have more children who are dependent on the family for several years before they begin to contribute to family income and welfare. For example, in the Philippines, Herrin noted that agricultural households (in respect of which poverty incidence is greater) exhibit a higher number of children ever born than non-agricultural households, and in urban areas current fertility was higher among the lower income groups.[29] For India, it was observed that the proportion of poor households in the total number of households of a given size rises with an increase in the household size up to seven persons, and that an important reason for this is that the proportion of children, or household members under 14 years, also tends to be high over the range.[30] In Indonesia, "poorer households are handicapped from a demographic perspective. They are larger and have a larger proportion of children to be supported".[31]

Traditionally, two reasons were advanced to explain the observed high fertility among the poorer sections of the community. Firstly, under con-

[28] However, there is some evidence that extreme poverty levels have depressing effects on fertility through higher incidence of pregnancy wastage and sub-fecundity.

[29] Alejandro N. Herrin, *op. cit.*

[30] R. Gaiha and N. Kazumi, *Aspects of Poverty in Rural India,* paper presented at the 17th General Conference of the International Association for Research in India and Wealth, France, 1981, (revised in 1982).

[31] Dov Chernichovsky and Oey Astra Meesook, *Poverty in Indonesia: A profile,* World Bank Staff Working Paper No. 671.

ditions of rural life and subsistence agriculture, children not only cost little but also begin to make economic contributions at an early age. More hands can always be used for the few weeks of planting, hoeing and harvesting the crop, even though they will be idle for the rest of the year.[32] Also, "in low-wage settings, much of women's traditional work – in agriculture, traditional crafts and petty retailing – can be combined with care of children, so that children involve no opportunity cost at all".[33] Secondly it was argued that in a situation of high infant and child mortality rates which characterize many poor families, only a fraction of the babies born survive to adulthood. Since parents desire *surviving* children to provide support in their (parent's) old age, high birth rates were essential as an insurance against high death rates.[34] Further, the cultural preference for sons prevalent in many Asian countries, particularly among poor families, also tended to increase the number of children.[35]

There are also other causal linkages between high fertility and high infant mortality. The first one is related to the practice, widely prevalent among the poor, of mothers breast-feeding their surviving infants. This practice reduces the chances of conception because lactation delays the return of regular ovulation.[36] In most societies there are also cultural constraints on intercourse during lactation. New pregnancies are also avoided for some time to allow the mother to devote more attention to the health of the present child.[37] Conversely, an early infant death can shorten the interval between birth and the next conception through involuntary cessation of breast-feeding leading to early resumption of ovulation and/or a desire to replace the dead child.[38]

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[32] It has been reported, for example, that Nepalese village boys and girls aged six to eight years work for about three to four hours a day caring for farm animals and helping with younger siblings; Javanese teenagers work eight to ten hours a day while many Bangladesh children work even longer hours. See World Bank, *World Development Report, 1984*, p. 51.

[33] Nancy Birdsall, *Population and Poverty in the Developing World*, World Bank Staff Working Paper No. 404, Washington, D.C., July 1980, p. 45.

[34] For example, see S.H. Preston, *The Effects of Infant and Child Mortality on Fertility*, (London, Academic Press, 1978); Helen Ware, "The relationship between infant mortality and fertility: replacement and insurance effects", in *International Population Conference Mexico 1977, vol. I.*

[35] Son preference has been found to be present in all of East Asia and among groups outside of that region that share a heritage of Confucian patriarchal tradition. See, Fred Arnold and Liu Zhaoxiang, "Sex preference and fertility in China", *Population and Development Review*, vol. 12, No. 2, June 1986. Also see Radheshyam Bairagi and Ray L. Langsten, "Sex preference for children and its implications for fertility in rural Bangladesh", *Studies in Family Planning*, vol. 17, No. 6, 1986.

[36] In countries such as Bangladesh, breastfeeding has been shown to be the major determinant of fertility levels.

[37] John C. Caldwell and Pat Caldwell, "The role of marital sexual obstinence in determining fertility", *Population Studies*, vol. 31, 1977.

[38] J.G. Cleland and Zeba A. Sathar, The effect of birth spacing on childhood mortality in Pakistan, *Population Studies*, vol. 38, No. 3, 1986.

An important factor responsible for the high fertility among poverty-stricken people is the age at marriage of the parents, particularly the women. It is well-known that among the poor, the girls are married at a very early age, sometimes immediately after puberty, thus exposing them to the risk of pregnancy over a longer period. Indeed, increase in age at marriage is one of the factors to which the observed fertility decline in countries like Sri Lanka is attributed, while the persistence of very low age at marriage for women is one of the causes for the persistence of high fertility in Bangladesh, Nepal and Pakistan.

Another factor contributing to high fertility among the poor is their lack of knowledge of, and access to family planning methods and services, as well as lack of proper facilities to practise the methods. The vast majority of the poor are illiterate and live in remote rural areas or in the slums and shanty towns of urban areas which are invariably not covered by family planning programmes. In certain societies, there appears to be some "cultural discrimination" against the poor in regard to the provision of family planning services. For instance, according to a study conducted in Kathmandu (Nepal), "the quality of services is positively related to the socio-economic status of the client. Unsophisticated lower-class clients are likely to receive scantier, less accurate information and less courteous treatment then educated middle-class clients. Clients who lack the requisite social status and skills to elicit useful information from the staff in family planning clinics are apt to leave without sufficient information to make an appropriate decision, or with an inadequate understanding of the method they adopt, and they are unlikely to return for follow-up."[39]

(b) Poverty and mortality

Although high mortality is considered to be a characteristic feature of poverty, it is well-known that poverty itself is a contributory factor to high mortality. Indeed several studies have clearly established that poor countries have higher death rates than rich countries and that, within countries, it is the groups which have very low socio-economic status (measured in terms of income, occupation, education and the like) that have substantially more than average mortality.

The burden of high fertility falls hardest on the poor who can least afford to provide for the basic needs of a family rapidly increasing in size. Often, the poor, particularly the rural poor, have less physical and economic access to health facilities and services compared to better-off or higher socio-economic status groups. In some societies there are also cultural barriers to utilization of available health services.[40] The poor are also illhoused without proper sanita-

[39] Sidney Ruth Schuler *et. al.*, "Barriers to effective family planning in Nepal", *Studies in Family Planning*, vol. 16, No. 5, September/October 1985, pp. 268-269.

[40] For example, in some societies female doctors and health workers are needed to care for women patients.

tion facilities, nor do they have any knowledge of medical and sanitary requirements. Consequently, they are not provided with adequate nutrition and health care, are more susceptible to diseases, and are constantly exposed to the risk of mortality from any case of illness.

The high fertility pattern of the poor is found to be a factor contributing to high infant and child mortality, because frequent births and close spacing of births may exhaust the mother's physical capability to nurse the babies and the family's economic resources to provide adequate care for them. For instance, analysis of the fertility survey data for Pakistan indicates that "children born within two years of the preceding birth experience an infant mortality rate nearly two and a half times that experienced by children born after an interval of four or more years, their neo-natal rate is twice as high and post-natal rate three times as high" [41]

In certain poor communities, high fertility also contributes to infant and child mortality through a process of more or less deliberate neglect of less wanted children. In large poor families, a child of the desired sex or parity may receive more attention, food and other resources that improve the chances of survival.[42] For example, a study conducted in rural Punjab (India) revealed that boys receive more food and medical care than girls,[43] and that the death rate for children in the first five years of life was substantially higher for girls (74 per thousand) compared to boys (50 per thousand).[44] Another study for Bangladesh reported that a girl is more likely to survive in a family with more boys than girls.[45]

The quality of the medical attention given at the time of delivery is also an important factor responsible for the observed high infant mortality among poor people. Over 90 per cent of the births in poor communities occur at home unattended by a trained mid-wife and under very poor hygenic conditions. Consequently, neo-natal death rates in respect of poor households is invariably more than double the rate for high income groups. A study for India reported that: (a) poverty, type of birth attendant, and triple vaccination are the three important determinants of infant mortality; (b) poverty and medical care received at

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[41] Iqbal Alam and John Cleland, "Infant and child mortality: trends and determinants" in Iqbal Alam (ed), *Fertility in Pakistan: A Review of Findings from the Pakistan Fertility Survey,* International Statistical Institute, 1984, pp. 197-198.

[42] Susan C.M. Scrimshaw, "Infant mortality and behaviour in the regulation of family size", *Population and Development Review,* vol. 4, No. 3, September 1978.

[43] Sohan Singh, John E. Gordon, and John B. Wyon, "Causes of death at different ages and by season in a rural population of the Punjab, 1957-1959: A field study", *India Journal of Medical Research,* vol. 53, No. 7.

[44] John B. Wyon and John E. Gordon, *The Khanna Study: Population Problems in Rural Punjab,* (Cambridge, Harvard University Press, 1971).

[45] Finis Welch, *Sex of Children: Prior Uncertainty and Subsequent Fertility Behaviour,* (Santa Monica, The Rand Corporation, 1974).

birth are the two most important determinants of neo-natal mortality; and (c) the neo-natal mortality rate decreases with an increase in the percentage of births attended by trained medical personnel and increases with the poverty level.[46]

It has also been observed that frequent childbirth contributes to maternal deaths directly through the risks of pregnancy and parturation, and indirectly by harming the health of high parity women. According to studies conducted in two rural districts of Bangladesh, maternal mortality increases with parity or number of live births, although the relationship is not montonic because of the dip in mortality rate at parity four.[47] It was also noted that "when child bearing occurs among women who are within a safer maternal age range (that is, 20-34 years) and who have fewer children, the risk of reproductive casualities is significantly reduced".[48]

(c) Poverty and migration

There are several ways in which poverty influences migration. The first is refugee movement which occurs when the poor are unable to protect themselves against crisis such as famines or floods. For example, in Bangladesh, the 1974 famine resulted in a high rate of destitution and up-rooting and separation of families.[49] The second relates to the continuous movement of homeless wage earners either within an organized production system or from one casual job to another. Such seasonal movements occur, for example, in Nepal from the hills to the terai, and in India from Bihar and Uttar Pradesh to Punjab, and are largely due to seasonal poverty in the areas of origin.[50]

Thirdly, the limited opportunities for employment and for earning a living in the destitute rural areas have in many countries resulted in massive movements of population to the large urban areas. As noted earlier, rapid population growth in many rural areas has resulted in unemployment, underemployment, landlessness and consequently in an increase in poverty. Land which is the principal source of livelihood in the rural areas has become scarce resulting in smaller plots for ownership and the growth of landless agricultural labourers. Thus, for instance in Java (Indonesia), the increasing economic pressure on household members who are landless or have a piece of land which is too small

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[46] A.K. Jain, "Determinants of regional variations in infant mortality in rural India", *Population Studies,* vol. 39, No. 3, November 1985.

[47] Mohammad Alauddin, "Maternal mortality in rural Bangladesh: the Tangail District", *Studies in Family Planning,* vol. 17, No. 1, 1986, p. 17.

[48] Atiqur Rahman Khan, Farida Akhter Jahan, and S. Firoza Begum, "Maternal mortality in rural Bangladesh: the Jamalpur District", *Studies in Family Planning,* vol. 17, No. 1, 1986, p. 11.

[49] M. Alamgir, *Famine in South Asia: Political Economy of Mass Starvation,* Cambridge, Mass: Oelgeschalger, Gunn and Haim.

[50] Gerry Rodgers, *op. cit.*, p. 52.

to meet family needs adequately, has resulted in many of these persons moving out in search of better lives.[51]

It has, however, to be noted that it is not the poor alone who migrate from rural to urban areas. Several studies indicate that rural-urban migration is largely bi-modal, with one mode among the relatively poor and the other among the rich. Analysis of the data based on the 38th round of the National Sample Survey of India shows that the highest migration rate was observed for households with per capita monthly expenditure of Rs 300 and above, while the second highest rate was observed in respect of households with per capita expenditure ranging from Rs 0 to Rs 30 per month.[52] A similar pattern has also been noted in Indonesia. "First, the children of well-to-do families who seek further education and eventually high paying, high status jobs in the civil service or the formal sector of the urban economy, have no chance to fight aspirations encouraged by an urban-biased education system within the home village. This group is forced out of the village and into the city by lack of suitable range of opportunities – rather than by other causes since its members could survive quite comfortably in the village if they remained. The second group, however, comprises those who are forced out of a sheer lack of job opportunities".[53]

It has also been argued that urban problems in the poor countries are to a large extent merely the displaced problem of rural poverty.[54] In the Philippines, for example, part of the rapid increase in urban poverty rates is attributable to migration of the rural poor to urban centres.[55] In Bangladesh, urban inequality and poverty is considered to be only an extension of rural inequality and poverty.[56]

D. POLICY IMPLICATIONS

The discussion in the preceding sections suggests that there are certain interactions between population and poverty. While problems of poverty have existed in most countries for a long time, the unprecedentedly high rates of population growth which these countries experienced during the past three decades or so appear to have made these problems intractable by changing their

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[51] Graeme J. Hugo, Terrence H. Hull, Valerie J. Hull, and Gavin W. Jones, *The Demographic Dimensions in Indonesia Development,* East Asian Social Science Monographs, Oxford University Press.

[52] Government of India, Department of Census and Statistics, *National Sample Survey Organization: Thirty Eighth Round, Report on Internal Migration, All India,* (draft), New Delhi.

[53] Graeme J. Hugo, *et. al., op. cit.*

[54] William W. Murdoch, *The Poverty of Nations: The Political Economy of Hunger and Population,* Baltimore, The John Hopkins University Press, p. 83.

[55] Alejandro N. Herrin, *op. cit.*

[56] Mohiuddin Alamgir and Sadiq Ahmed, "Poverty and income distribution in Bangladesh, *op. cit.*

scale.[57] On the other hand, poverty and its several dimensions are associated with high rates of fertility, mortality and migration.

Today, a large number of developing countries in the region have accorded high priority to tackling the problems of rapid population growth, and have, towards this end, formulated various policies and programmes. However, a concerted attack on poverty must be made at the same time if population programmes are to have a chance of success. In other words, the success of pupulation and development policies depends very much on meeting the basic needs and demands of the poor people who comprise a very large proportion of the population of most developing countries.

As noted earlier, in most developing countries, poverty levels are higher in the rural than in the urban areas. This is largely because of the uneven distribution of incomes; incomes are typically much higher in the urban areas. Further, the availability and accessibility of health, education, and other facilities and services are also much greater in urban areas. Since in most developing countries, the great majority of the people live in rural areas, and higher rates of fertility, mortality and migration also occur in these areas, it has been argued that a more equitable distribution of incomes and infrastructure facilities between rural and urban areas will contribute to appreciable reductions in poverty levels as well as in fertility, mortality and migration rates.

While there is general agreement that a more even distribution of incomes and infrastructure facilities and services will lead to improvements in the living standards of the poor, there are two opposing viewpoints in regard to the manner in which such distribution should be effected. One point of view contends that an attack on poverty requires heavy reliance on direct measures to meet basic needs. An explicit assumption of this approach is that economic growth by itself is too slow to provide substantial benefits to the poor in a reasonable amount of time. Consequently, Governments should provide goods and services directly to the population in order to ensure that the poor receive an equitable share. The other viewpoint (again an extreme version) is that policy makers should reduce government involvement in the provision of goods and services and concentrate instead on increasing long-term economic growth. The former method, which can be described as the direct approach, emphasizes government interventions and equity, while the latter, which can be called the indirect approach, emphasizes economic growth and less government intervention.[58]

Several studies have concluded that sustained and often rapid decline in mortality and fertility occurred in countries such as the Republic of Korea, and

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[57] Rafael M. Salas, *Reflections on Population*, New York, Pergamon Press, 1984, p. 66.

[58] Surjit S. Bhalla and Paul Glewwe, "Growth and equity in developing countries: a reinterpretation of the Sri Lankan experience", *The World Bank Economic Review*, vol. 1, No. 1, September 1986, pp. 35-36.

Sri Lanka and in the state of Kerala in India which have concentrated on spreading the benefits of economic growth to the majority of the people, and especially to the rural poor, even though average income was low.[59] There, genuine attempts were made to raise the welfare of the rural poor through land reforms, by spreading health services, raising literacy levels and enrolment ratios, concentrating educational expenditure at the primary level to benefit most people, and ensuring a more even distribution of income. Some of these studies have also shown that birth rates, for example, have remained for a long time at traditionally high levels in countries like India, the Philippines and Thailand where distribution of benefits was extremely skewed and little effort has been made to improve the welfare of the rural poor.[60]

Sri Lanka is often cited as a country which has successfully implemented the direct approach to raising economic welfare through a more equitable distribution of income and socio-economic infrastructure facilities. Since independence, successive governments have vied with each other to develop a poor man's welfare state by providing food subsidies, free and universal education, free health care widely available and easily accessible to the rural people, security for wage earners, and protection for the tenure of small farmers. The conscious decentralization efforts and increasing social expenditure have resulted in geographically dispersed economic and social services and nearly equal levels in terms of social welfare indicators across space. The relatively high standard of living of the people is indicated by the long life expectancy, low infant mortality and high level of literacy.

The Sri Lankan Government's continuous policy of improving the welfare of the mass of the rural people, even with very modest national income, has also been responsible for the steady decline in the country's fertility rate since the 1950s. In fact, fertility has been declining faster in the rural than in the urban areas.[61] The gradual decline in fertility has been associated with the higher status which women enjoy in the country; the increase in the average age at first marriage; and decrease in marital fertility, the trend towards fewer children being stronger in younger parents. Of course, "there is no way to *prove* that

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[59] For example, see James E. Kocher, *Rural Development, Income Distribution and Fertility Decline,* New York, The Population Council, 1973; William W. Murdoch, *The Poverty of Nations: The Political Economy of Hunger and Population, op. cit.*; and John C. Caldwell, "Routes to low mortality in poor countries", *Population and Development Review,* vol. 12, No. 2, June 1986.

[60] Recent analysis indicates that fertility rates have started to decline in the Philippines, Thailand, and even India, although no egalitarian economic policies are being implemented in these countries. In Thailand, for example, the fertility decline is attributed to increasing use of contraception across all broad segments of society. See, John Knodel, Aphichat Chamratrithirong and Nibhon Debavalya, *Thailand's Reproductive Revolution: Rapid Fertility Decline in a Third World Setting,* Madison, Wisconsin, 1987.

[61] Dallas F.S. Fernando, "A note on differential fertility in Sri Lanka", *Demography,* vol. 11, 1974.

Sri Lanka's socio-economic policies have caused the decline in fertility, but that is certainly the most reasonable explanation".[62]

By ensuring the well-being of the rural people, Sri Lanka has also virtually succeeded in containing the rural population within the rural sector itself, thus preventing large-scale movement from rural to urban areas so typical of most developing countries today. During the period 1963-1971, net migration contributed to only about 22 per cent of total urban growth.[63] Sri Lanka experiences one of the lowest rates of urbanization in the region and today only about 23 per cent of the country's population reside in areas nationally defined as urban.

Since the early 1960s, the Kerala state government in India has been implementing policies and programmes aimed at a more equitable distribution of income and benefits between rural and urban areas. The land reforms initiated in 1964 resulted, at first, in the improvement of tenancy, and, finally, in its abolition, enabling tenants to become owners of land they had worked on. Landless labourers were granted small plots and agricultural wages were considerably increased. Medical care is available free in hospitals and health care units are distributed evenly throughout the state. Education is free up to and including high school level and educational facilities are more evenly distributed than in other Indian states. The diet of the poor has been improved through the free provision to needy children of cooked mid-day meals and through a system of rationed distribution of cereals at controlled prices below market prices.

As a result of these welfare measures, Kerala's death rate declined faster than the Indian average and today Kerala has the lowest death rate and longest life expectancy in India. Unlike in the rest of the country, Kerala women live longer than men. Kerala's infant mortality rate is also the lowest in India. The school enrolment ratio in Kerala is about three times the national average and is especially high among girls. The state's literacy level is also more than twice the country average. Kerala's birth rate also declined substantially over the years, particularly between 1965 and 1974. In that period the Indian birth rate declined by four points, Kerala's birth rate declined by 12 points. Today Kerala has the lowest birth rate in India, with its rural birth rate being slightly lower than the urban birth rate. "Kerala's success in improving the welfare of its people and in achieving fertility decline cannot be explained by exceptional affluence in the state. On the contrary, the per capita income in Kerala is in fact *lower* than the average for all Indian states".[64]

The experience of Sri Lanka and Kerala clearly indicate that a programme of slowing down population growth cannot be successful until and unless there

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[62] William W. Murdoch, *op. cit.*, p. 72.

[63] ESCAP, *Migration, Urbanization and Development in Sri Lanka,* Bangkok, 1980.

[64] William W. Murdoch, *op. cit.*, p. 75.

are real and permanent increases in the standards of living of the ordinary people. Overall economic growth by itself may not bring about improvements in the welfare of the poor; but development combined with broad participation will definitely help to achieve these goals. It is also clear that high rates of economic growth are not essential for upgrading the welfare of the poor; a more equitable distribution of the available benefits, even if modest, will go a long way in improving the living standards of the poor.

It is true that in Sri Lanka, income transfer programmes of various kinds have helped to raise rural prosperity artificially and consequently bring about the desired changes in demographic patterns. However, the various strategies adopted have not been able to generate overall economic growth through the broad participation of the people in productive work. For the future at least it will be necessary to increase rural prosperity by enhancing rural productivity.

In view of the fact that a large majority of people in developing countries live in rural areas, the role of rural development policies and programmes is of paramount importance in ensuring better standards of living. Fortunately, an increasing number of Governments have accorded priority consideration to integrated rural development policies and programmes. Such programmes can be a major vehicle for bringing about social change and related changes in demographic behaviour. Indeed, there is considerable scope for combining rural development and population programmes in all countries irrespective of their population policies and demographic goals.

III. POPULATION CHANGE AND WOMEN'S DEVELOPMENT

S. Selvaratnam

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INTRODUCTION

It is well known that in practically all countries the world over, women are not accorded equal status with men, and that compared to men, women have very limited opportunities in most spheres of economic and social activities.[1] However, it is being increasingly recognized that there is a close association between various aspects of women's status or position in society and demographic patterns of fertility, mortality and migration. This association is shown to be more pronounced in regard to fertility and the social processes associated with it. "The status of women may be seen as both a determinant and consequence of variations in reproductive behaviour. A woman's health, educational opportunities, employment, political rights and role in marriage and the family all affect, and in turn are affected by, the timing and number of her children and by the knowledge of how to plan them."[2]

But a systematic study of the interrelations between population dynamics and the status of women[3] is hampered by the absence of an unambiguous operational definition of "status of women", although there is some agreement regarding its theoretical definitions. Theoretically, women's status has been defined, for example, "as the degree of women's access to (and control over) *material* resources (including food, income, land, and other forms of wealth) and to *social* resources (including knowledge, power and prestige) within the family, in the community, and in society at large",[4] or as "the ranking, in terms of prestige, power, or esteem, according to the position of women in comparison with, relative to, the ranking – also in terms of prestige, power, esteem – given

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[1] Nafis Sadik, "Integration of women in population and development programmes", in ESCAP, *Asian-Pacific Population Journal,* vol. I, No. 3, September 1986; and Leslie B. Curtin, *Status of Women: A Comparative Analysis of Twenty Developing Countries,* (Washington, D.C., Population Reference Bureau, Reports on World Fertility Survey), 1982.

[2] United Nations Secretariat, "Women's rights and fertility" in United Nations, *The Population Debate: Dimension and Perspectives,* Papers of the World Population Conference, Bucharest, 1974, vol. II (New York), 1975, p. 370.

[3] Distinction should be made between "role of women" and "status of women", *"Role"* is defined as a "bundle of expected behaviour and attributes", and *"status"* as the "prestige accorded to the social category which typifies or does these things". See Barbara Bellow Wand (ed), *Women's Studies: The Social Realities, New York, Harper's* College Press, 1976, p. 61.

[4] Ruth B. Dixon, *Rural Women at Work,* (Baltimore, John Hopkins University Press, 1978), p. 6.

to the position of men".[5] These definitions suggest that "women's status", like poverty, is a multidimensional phenomenon, or a composite of several different and perhaps interdependent variables.

Since the concept, as well as various definitions of, "status of women" implies gender inequality, several alternative terms to connote some aspects of this inequality have come into usage in demographic literature in recent years. These include, for example, "female autonomy"[6] or the extent to which women are free of *men's* control; "patriarchy"[7] also meaning the extent to which men control women; "rigidity of the sex-stratification system";[8] "women's rights"[9] or rights of women as compared to those of men; "men's situational advantage"[10] or men's advantage as compared to women. The way that these terms are defined suggests that demographers have more than one aspect in mind when they discuss women's status, rights or autonomy".[11] However, several authors prefer to adopt the term "female autonomy" because it indicates "the ability (technical, social and psychological) to obtain information and to use it as the basis for making decisions about one's private concerns and those of one's intimates. Thus, equality of autonomy between the sexes .... implies equal decision-making ability with regard to personal affairs".[12] Further, this term is considered to be more amenable to empirical measurement than the concept of status.[13]

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[5] Mayra Buvinic, *Women and World Development: An Annotated Bibliography,* (Washington, D.C., American Association for the Advancement of Science, and Overseas Development Council. 1976), p. 2.

[6] Tim Dyson and Mick Moore, "On kinship structure, female autonomy, and demographic behaviour in India", *Population and Development Review,* vol. 9, No. 1, March 1983, pp. 35-60.

[7] Mead Cain *et al.*, "Class, patriarchy and women's work in Bangladesh", *Population and Development Review,* vol. 5, No. 3, September 1979, pp. 405-438.

[8] Constantina Safilios-Rothschild, "A class and sex stratification theoretical model and its relevance for fertility trends in the developing world" in C. Holn and R. Machensen (eds), *Determinants of Fertility Trends: Theories Re-examined,* Leige, Ordina Editions, 1980, pp. 189-202.

[9] Ruth B. Dixon, "Women's rights and fertility", *Reports on Family Planning,* No. 17, January 1975.

[10] John C. Caldwell, "The mechanism of demographic change in historical perspective", *Population Studies,* vol. 35, No. 1, March 1981, pp. 5-27.

[11] Karen Oppenheim Mason, *The Status of Women: A Review of its Relationships to Fertility and Mortality,* Paper prepared in 1984 for the Population Science Division of the Rockefeller Foundation, Population Studies Center, University of Michigan, (mimeo), p. 6.

[12] Tim Dyson and Mick Moore, "Kinship structure, female autonomy ...", *op. cit.,* p. 45.

[13] ESCAP, "Female autonomy and fertility: an overview of the situation in South Asia", *Asia Pacific Population Journal,* vol. 2, No. 4, December 1987, Bangkok, pp. 43-52.

Because the definition and measurement of women's position or status involves somewhat arbitrary decisions,[14] there is no concensus in regard to the social indicators to be used for establishing the ranking of the position of women *vis-a-vis* that of men. Consequently, it is difficult to assess accurately the status of women within a society, and more so across societies. Nevertheless, several studies have attempted to illustrate women's position in society in terms of certain arbitrarily selected indices pertaining to women's participation or access to equal opportunities in such areas as education, health and employment, and their integration in major areas of political decision-making and the recognition they receive and the power they wield in society.[15]

It is generally agreed that indices relating to educational attainment, health levels, and labour force participation are particularly important for studying the association between population and the status of women. For example, a number of studies have shown that the level of education of the mother is a crucial element in the success of activities aimed at reducing fertility rates, improving health and reducing mortality, particularly infant and child mortality. In addition, it has also been shown that greater participation of women in non-traditional roles of economic activity, greater access to health care and subsequent decline in infant and child death rates influence the level of birth rates, and have played a part in their decline.[16]

It has, however, to be noted that some of the indicators used for assessing women's status have important limitations. For instance, women's participation in economic activity is often measured in terms of the proportion of women in the labour force. But a wide range of activities traditionally performed by women are by definition excluded from the ambit of gainful employment.[17] The debate continues as to whether such activities as home management, cooking, household cleaning, fetching water for domestic use, bearing and rearing of children, tending and feeding animals, or looking after home vegetable gardens,

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[14] Jerrold W. Huguet, *Women's Position and Internal Migration in Asia,* Paper prepared for the Conference on Women's Position and Demographic Change in the Course of Development, Asker (Oslo), Norway, 15-18 June 1988, (Bangkok, ESCAP).

[15] For example, see Ester Boserup, *Women's Roles in Economic Development,* (New York, N.Y. St Martin's Press, 1970); Ruth B. Dixon, *Rural Women at Work, op. cit.;* Rounaq Jahan, *Women in Bangladesh,* in Ruby Rohrlich-Leavitt (ed), *Women Cross Culturally: Change and Challenge,* (The Hague, Netherlands: Mouton Publishers (World Anthropology Series, 1975); Christine Oppong and Elina Haavio-Mannila, "Women, Population and Development", in Philip Hauser (ed), *World Population and Development: Challenges and Prospects* (New York, N.Y. United Nations Fund for Population Activities, 1979).

[16] See for example, John G. Cleland, "Socio-economic determinants of fertility: an assessment of recent findings and their implications", ESCAP, *Population Policies and Programmes Current Status and Future Directions,* Asian Population Studies Series No. 84, Bangkok, Thailand, 1987, pp. 43-58.

[17] A.V. Jose, "Employment diversification of women in Asian countries" in ILO, *Diversification of Women's Employment and Training,* ILO/Japan Tripartite Seminar Report on Diversification of Women's Training and Employment, Tokyo, 8-12 December 1986, Bangkok, 1987.

should be considered as having economic value or not. "The dilemma is that most of the women's work either in the home or the family farm is still not really considered as "work" by men and by women themselves. Woman's work is commonly regarded as assistance to the husband or effort to supplement family income".[18] Consequently, in many countries, labour force data tend to exclude large numbers of female unpaid workers on farms and other family-operated economic enterprises, home-based productive work for cash income, as well as several activities undertaken jointly with men, thus resulting in an understatement of the number of economically active women. On the other hand, since relatively many female workers are part-time workers, a complete enumeration of all activities engaged in by women irrespective of the extent of their involvement may exagerate their contribution to the labour force.

A. STATUS OF WOMEN: CURRENT SITUATION

1. Educational Attainment

During the past two decades or more, most countries in the region had made vigorous efforts to expand their educational facilities, raise enrolment ratios for both boys and girls as well as narrow sex disparities in enrolment, and reduce illiteracy levels. However, not all countries have succeeded in achieving substantial progress in these directions. Equal education has proved to be an elusive goal even in countries where equality is guaranteed by law. By and large, women remain underrepresented within the educational system; they constitute less than half of the school population in several countries and their proportions decline rapidly at the highest levels of training. Concomitantly, women dominate the ranks of the illiterate in most countries.

The situation in East and South-East Asia, however, appears to be encouraging. Most countries in these two subregions have succeeded in attaining gross female enrolment ratios in excess of 90 per cent at the primary level, and in considerably narrowing the gap between the two sexes (table 1). At the secondary level, enrolment rates tend to equalize in most countries and areas, but in Hong Kong, Japan, Mongolia, the Philippines and Singapore, the rates for females exceed those of males. Among the developing countries and areas in these two subregions, Hong Kong, Malaysia, Mongolia, the Philippines, the Republic of Korea and Singapore record female secondary enrolment rates higher than 50 per cent. At the tertiary level, the female enrolment rate exceeds the male rate only in Mongolia and the Philippines. In Mongolia, for example, more than half of the students at the higher educational institutions and the specialized secondary schools are female.[19]

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[18] UNFPA, *Women' Population and Development*, Population Profiles No. 7, New York, p. 5.

[19] ESCAP, *Achievements of the United Nations Decade for Women in Asia and the Pacific*, Bangkok, 1987.

Table 1. Gross school enrolment ratios[a] at primary, secondary and tertiary levels in selected countries and areas

Country/area	Year	Primary		Secondary		Tertiary	
		Female	Male	Female	Male	Female	Male
Afghanistan	1985	11	24	5	11	–	–
Australia[b]	1985	105	106	97	94	27.0	28.4
Bangladesh	1985	50	70	10	26	1.9	8.3
Bhutan	1985	18	32	1	6	0.01	0.10
Burma	1980	81	87	18	22	–	–
China[b]	1985	116	132	32	45	1.0	2.2
Fiji[b]	1985	128	129	55	53	3.0	3.5
Hong Kong[b]	1984	104	106	72	66	9.3	16.3
India	1984	76	107	24	45	–	–
Indonesia[b]	1984	116	121	34	45	4.2	8.9
Japan[b]	1984	101	100	95	94	20.7	30.2
Lao People's Democratic Republic	1984	79	101	15	23	0.8[c]	1.6[c]
Malaysia	1985	99	100	53	53	5.3	8.7
Mongolia[b]	1981	106	106	92	84	32.3	18.8
Nepal	1984	43	100	10	34	1.9	7.4
New Zealand[b]	1983	106	107	86	84	28.7	34.2
Pakistan	1984	32	61	9	24	2.8	6.2
Philippines[b]	1985	106	105	66	63	40.3	35.5
Rep. of Korea[b]	1986	94	94	93	98	20.3	44.5
Singapore[b]	1983	110	115	69	68	10.2	13.3
Sri Lanka[b]	1985	102	105	67	60	3.6	5.5
Thailand	1980	96	99	19	30	3.1	–

Source: UNESCO, *Statistical Year Book 1987.*

Notes: [a] Percentage of those in the appropriate age groups who are actually enrolled.

[b] Ratios in excess of 100 per cent recorded in respect of primary level enrolment reflect the participation of children of older ages.

[c] Refers to the year 1982.

But in South Asia, with the exception of Sri Lanka and some states of India, female primary and secondary enrolment ratios are still very low in both absolute and relative terms. Primary enrolment rates of 50 per cent and below have been recorded for Afghanistan, Bangladesh, Bhutan and Pakistan. Disparities in male-female enrolment are also very large in most South Asian countries. It is only in Sri Lanka that the enrolment ratio for females is almost equal to the ratio for males at the primary level, and exceeds the male ratio at the secondary level.

It has, however, to be noted that in the South Asian subregion considerable progress has been achieved in enrolment ratios over the years. But owing to historical disadvantages, parity in education still remains a distant goal in most of these countries. Government efforts to push up female enrolment and literacy[20] appear to be compounded by centuries' old prejudices and social attitudes. In India, for example, despite constitutional provisions, there appears to be a reluctance to give girls and women freedom of movement and to acknowledge the equality of sexes in most communities. This is particularly reflected in the wide variations in illiteracy rates between regions and very high illiteracy rates recorded among rural women of the scheduled castes and scheduled tribes.[21]

In practically all countries, there appears to be a tendency for students to pursue fields of study conforming to socially-defined female and masculine roles, although the degree of sex-typing varies considerably between countries. Particularly at the tertiary level, there is a continuing concentration of female students in liberal arts and education, while the preference of the male students is for law, business administration, and the pure and applied sciences, especially engineering. It would appear that since social perceptions undervalue the role of women in the labour market, education and training facilities are not equally accessible for girls and women. Moreover, the education systems in most countries do not yet provide the same facilities to women as they do to men for qualifying as technicians, scientists and physicists.[22] "Educational segregation with regard to fields of study and curricula at the secondary and post-secondary levels turns women away from the mainstream of development. Few have fully participated in the dynamic, better paying industrial and technological fields because of inadequate preparation".[23]

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[20] For instance, in India, a comprehensive set of measures was implemented to encourage higher female enrolment, consisting of scholarships, free textbooks, uniforms and lunches, as well as financial incentives to the state governments to spur female enrolment. In Nepal, scholarships for girls are available in some districts and financial awards are bestowed upon outstanding female students. In addition, priority is assigned to the improvement of schools with the highest female enrolment ratio and preference is given to the hiring of female teachers.

[21] Asok Mitra, *The Status of Women: Literacy and Employment*, ICSSR Programme of Women's Studies II, (New Delhi, Allied Publishers Pvt. Ltd.), p. 9.

[22] ILO, *World Labour Report*, vol. 2, Geneva, 1985, p. 218.

[23] ESCAP, *Achievements of the United Nations Decade for Women in Asia and the Pacific, op. cit.*, p. 35.

Although many countries of the Asian and Pacific region have achieved considerable progress in reducing illiteracy levels, female illiteracy continues to be a major problem in the countries of South Asia, where, with the exception of Sri Lanka, more than 75 per cent of the female population is illiterate. The problem is more acute in the rural areas of much of South Asia where the bulk of the female population is illiterate (table 2). Among the developing countries

Table 2. Illiteracy rates of population aged 15 years and over by sex and residence for selected countries and areas

Country/area	*Year*	*Total population*		*Urban population*		*Rural population*	
		Male	*Female*	*Male*	*Female*	*Male*	*Female*
Afghanistan	1979	69.7	95.0	47.7	79.2	73.7	97.8
Bangladesh	1981	60.3	82.0	42.0	65.9	64.5	84.7
China	1982	20.8	48.9	9.5	26.4	23.1	53.2
India	1981	45.2	74.3	23.6	48.1	52.7	82.4
Indonesia	1980	22.5	42.3	8.8	24.0	26.8	47.7
Iran, Islamic Republic of	1976	51.8	75.6	32.7	56.5	72.3	93.4
Korea, Rep. of	1970	5.6	19.0	2.0	9.3	8.5	26.6
Lao People's Democratic Republic [a]	1985	8.0	24.2	–	–	–	–
Malaysia	1980	20.0	36.0	12.0	26.0	24.0	41.0
Nepal	1981	68.3	90.8	40.3	67.0	70.4	92.4
Pakistan	1981	64.0	84.8	43.1	65.3	73.4	92.7
Philippines	1980	16.1	17.2	6.1	7.7	22.4	23.9
Singapore	1980	8.4	26.0	–	–	–	–
Sri Lanka	1981	8.7	18.0	4.4	8.9	10.0	20.5
Thailand	1980	7.7	16.0	–	–	–	–
Fiji	1976	16.0	26.0	–	–	–	–
Papua New Guinea [b]	1971	60.7	75.6	–	–	–	–
Tonga	1976	0.3	0.5	–	–	–	–
Samoa	1971	2.2	2.1	1.3	1.2	2.5	2.4

Source: UNESCO, *Statistical Year Book 1987.*

Notes: [a] Refers to the age group 15-45 years only.

[b] Refers to the population aged 10 years and over.

in East and South-East Asia, China has the highest female illiteracy rate; nearly 70 per cent of the 200 million illiterates and semi-illiterates in China are female.

2. *Health*

Over the past three or four decades, most countries in the region have gradually expanded their health infrastructure facilities and services to cover an increasingly wider section of the population. Consequently, the health status of the population has improved significantly and there has been steady and substantial decline in the mortality rates. In most countries women have apparently benefited more from improvement in health care, their health concerns being largely addressed through family planning programmes, maternal and child welfare and nutrition education.

In East Asia, China has built up an extensive network of health care facilities and personnel, particularly in the field of maternal and child health, thereby raising the proportion of child deliveries performed with trained assistance and lowering the maternal mortality rate.[24] In the Republic of Korea, the maternal death rate has been considerably lowered, while the rate of child delivery assistance by trained midwives, clinics and hospitals increased dramatically between 1971 and 1982.[25] Today female life expectancy at birth is about 71 in China and 72 in the Republic of Korea (table 3). In all East Asian countries, women now have a higher life expectancy than men.

In South-East Asia, the Philippines designed its maternal and child health programme to minimize the health risks associated with pregnancy and childbirth through special care and supervision. Consequently more than 50 per cent of births now occur with medical assistance, and there have been appreciable reductions in maternal and infant mortality rates. In Malaysia, despite considerable progress, rates of maternal mortality, abortion, still birth and perinatal mortality remain high, particularly in districts in which rural poverty is comparatively higher, where acceptance of national family planning has been low and where the proportion of home deliveries continue to be higher.[26] In rural Indonesia, over 80 per cent of deliveries still take place in the home attended by traditional birth attendants. Consequently maternal mortality in rural areas is estimated to be quite high: 80 per 10,000 in 1984.[27] In all South-East Asian countries, however, female life expectancy is higher than male life expectancy.

In the South Asian region, with the exception of Sri Lanka, the health and mortality situation in regard to women remain rather unsatisfactory. In

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[24] ESCAP, *Ibid.*

[25] *Ibid.*

[26] ESCAP, *Mortality and Health Issues in Asia and the Pacific,* Report of a Seminar held at Beijing in collaboration with the Institute of Population Research, Peoples University of China, 22-27 October 1986, Asian Population Studies Series No. 78.

[27] Budi Utomo, and Meiwita B. Iskandar, *Mortality Transition in Indonesia 1950-1980,* Bangkok, ESCAP, Asian Population Studies Series No. 74.

Table 3. Expectation of life at birth for selected countries and areas in the ESCAP region, 1987

Country/area	*Life expectancy*	
	Male	*Female*
Afghanistan	40.6	41.6
Australia	72.5	79.5
Bangladesh	50.5	49.8
Bhutan	48.1	46.8
Burma	51.9	55.0
China	67.8	70.7
Democratic Kampuchea	46.5	49.4
Fiji	68.0	72.4
Hong Kong	73.0	78.5
India	56.7	57.6
Indonesia	54.4	57.2
Iran, Islamic Republic of	58.9	59.3
Japan	75.3	81.0
Korea, Rep. of	65.6	71.8
Lao People's Democratic Republic	50.3	53.3
Malaysia	68.0	72.7
Mongolia	61.4	65.5
Nepal	53.9	51.1
New Zealand	71.8	77.8
Pakistan	53.7	51.9
Papua New Guinea	53.0	54.6
Philippines	61.7	64.9
Singapore	70.0	76.3
Sri Lanka	68.3	71.5
Thailand	61.6	67.6
Viet Nam	58.5	62.9

Source: ESCAP, *1987 ESCAP Population Data Sheet.*

most countries, female mortality has long been found to be consistently higher than male mortality. In Bangladesh female life expectancy is lower than that of men; the female infant mortality rate is estimated at 155 per thousand, and malnutrition is substantially higher among female than male children.[28] In India, the absence of, or limited access to pre-natal care and trained attendants at birth, particularly in the rural areas, is still the cause of high neonatal and maternal mortality.[29] In Pakistan, maternal mortality is around 7 per 1,000 live births; 30 per cent of babies are born underweight and 60 per cent of mothers lose a child within a year of its birth. Anaemia afflicts nearly a third of all women, the incidence being higher among those pregnant and lactating.[30] A shorter average life span for women has been observed for many decades in Bangladesh, Bhutan, India, Pakistan, and until about the early 1960s in Sri Lanka.[31] However, today life expectancy at birth for females exceeds that of males in Afghanistan, India, the Islamic Republic of Iran and Sri Lanka. In most of these countries, one could expect a further lowering in maternal and child mortality rates with the gradual increase in contraceptive practices, birth spacing, and postponement of first births.

3. Employment Patterns

Since the mid-1960s, developing countries in the Asian and Pacific region have witnessed an unprecedented expansion in their labour force, resulting largely from the high rates of population growth[32] which these countries experienced since the early 1950s. A noteworthy feature of this expansion has been the rapid growth in the volume of the female labour force. The gradual expansion of opportunities for female education also contributed to the increased influx of women into the labour market. Further, recent fertility decline in several countries also meant that women now spend less time in family-building roles and have more time to take on economically productive activities.[33] In most countries, increasing participation of women in the labour force has continued to date.

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[28] Ashraf Uddin Ahmed, *Analyses of Mortality Trends and Patterns in Bangladesh,* Asian Population Studies Series No. 72.

[29] ESCAP, *Mortality and Health Issues, op. cit.,* p. 11.

[30] ESCAP, *Achievement of the United Nations Decade for Women in Asia and the Pacific, op. cit.,* p. 174.

[31] Lado Ruzicka and Penny Kane, "Trends and patterns of mortality in the ESCAP region: comparative analysis" in UN ESCAP, *Mortality and Health Issue,* Asian Population Studies Series No. 78. p. 37.

[32] Population increase due to declining mortality and high fertility affects the size of the labour force in the short as well as the long run. In the short run, the decline in mortality results in an increase in the survival of the existing labour force. In the long run, the large number of births occurring as a result of high birth rates will tend to increase the number of persons seeking employment after about 15 years or so.

[33] ESCAP, *Women's Economic Participation in Asia and the Pacific,* Bangkok 1987, p. 1.

Yet, in most countries of the region the reported female labour force participation rates are substantially lower than the male rates (table 4). In these countries, while the male participation rates are 70 per cent or more, the female rates, with the exception of China,[34] are very low, less than 55 per cent. Further, whereas the rates of male labour force participation vary little from

Table 4. Labour force participation rates by sex for selected countries and areas

Country/area	*Year*	*Data source*	*Age group covered*	*Participation rate*	
				Male	*Female*
Australia	1986	Labour Force Sample Survey	15+	75.2	47.5
Bangladesh	1983/84	–do–	10+	78.2	8.0
China	1982	Census (Provisional)	15+	86.4	70.6
Hong Kong	1986	Household Survey	15+	80.4	48.9
India	1981	Census (5% Sample)	10+	83.1	29.8
Indonesia	1985	Household Survey	10+	68.9	37.6
Iran, Islamic of Republic of	1982	Official Estimates	10+	65.3	10.0
Japan	1986	Labour Force Sample Survey	15+	77.8	48.6
Korea, Rep. of	1986	–do–	15+	67.4	43.0
Malaysia (Peninsular)	1980	–do–	15+	80.1	42.1
Nepal	1981		15+	87.7	45.2
New Zealand	1986	Census (Provisional)	15+	77.0	53.1
Pakistan	1984/85	Labour Force Sample Survey	10+	77.0	8.7
Philippines	1985	Household Survey	15+	80.2	48.0
Singapore	1986	Labour Force Sample Survey	15+	79.4	45.6
Sri Lanka	1985	–do–	10+	68.6	32.5
Thailand	1984	–do–	11+	77.0	53.1

Source: ILO, *Year Book of Labour Statistics 1987,* table 1, excepting Nepal for which data was obtained from Central Bureau of Statistics, *Population Monograph of Nepal,* Kathmandu, 1987.

[34] In China, the female labour force in rural areas has greatly increased over the past 25 years, as women's participation in agricultural work and in many non-farm activities has been strongly encouraged, both to increase production and to combat discriminatory practices and prejudices. See ILO, *World Labour Report,* vol. II, 1985, p. 206.

country to country, rates of female participation differ enormously between countries and between different data sources. It may also be noted that, with the exception of Sri Lanka and Nepal, countries in South Asia have very low female participation rates, the rates being abysmally low for Muslim countries such as Bangladesh, Pakistan and the Islamic Republic of Iran.[35]

Several factors have contributed to the relatively low female participation rates in countries of the Asian and Pacific region. Firstly, since women are still largely responsible for domestic work and child rearing, they are not as free as men to enter the labour market. The vast majority of the Asian women who work do so for economic reasons, and practically every one of them, excepting the highly educated and career-oriented, would prefer to stay at home and look after their children.[36] On the other hand, in societies where it is difficult to combine child care with wage employment outside the home, women often withdraw from the labour force on marriage or child bearing.[37] Further, since leisure has status, middle- and high-income educated women often choose not to work.[38] Secondly, as noted earlier, in most countries labour force data tend to underestimate the number of economically active women especially in the category of unpaid helpers on farms and other family operated economic enterprises. A major reason for underestimation of women in rural employment appears to be the reluctance of male farmers to acknowledge the economic activities of their wives and daughters outside the household.[39] This is particularly so in a number of Muslim countries where the custom of "purdah" inhibits the employment of women.[40] These cultural traits may affect not only the extent to which women actually engage in income-producing work, but also the reporting of these activities in the censuses or labour force surveys.[41]

In the developed as well as in most developing countries, the majority of female workers have been reported as employees, although these proportions vary from country to country (table 5). It is only in Afghanistan and Nepal that a typical woman worker is reported as employer and/or own account worker (more as own account worker), and in Indonesia as unpaid family worker.

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[35] By contrast, in Indonesia, also a predominantly Muslim country, women have for long been highly active in the labour market.

[36] Robert Orr Whyte and Pauline Whyte, *The Women of Rural Asia,* Bouldor Colorado, Westview Press, p. 12.

[37] ESCAP, *Women in the Economy: Employment,* Status of Women in Asia and the Pacific Region, Series No. 1, Bangkok, 1986, p. 7.

[38] ESCAP, *Women's Economic Participation in Asia and the Pacific, op. cit.,* p. 3.

[39] Nadia Youseff, "Women and agricultural production in Muslim societies", *Studies in Comparative International Development,* vol. 12, 1977.

[40] A.F.A. Husain, *Employment of Middle Class Muslim Women in Dacca,* Dacca University, Socio-economic Reserarch Board, 1958, p. 65.

[41] United Nations, *The Determinants and Consequence of Population Trends: New Summary of Findings on Interaction of Demographic, Economic and Social Factors,* vol. 1, New York, 1973 (ST/SOA/SER.A/50), p. 303.

Table 5. Percentage distribution of the employed population by activity status, males and females, for selected countries and areas in the ESCAP region

Country/area	*Employer and/or own account worker*		*Employee*		*Unpaid family worker*		*Not classified by status*	
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*
Afghanistan (1970)	3.0	63.3	35.0	15.0	13.3	22.0	–	–
Australia (1986)	17.2	11.8	77.3	83.2	0.6	1.3	4.9	3.7
Bangladesh (1983/84)	40.9	16.6	42.4	71.5	16.4	11.5	0.4	0.4
Hong Kong (1986)	14.1	2.8	82.6	90.7	0.4	4.0	3.0	2.5
Indonesia (1985)	53.2	33.6	33.5	23.9	13.2	42.5	0.1	0.1
Japan (1986)	17.8	12.3	79.3	68.1	2.7	19.4	0.3	0.2
Korea, Rep. of (1986)	37.1	22.8	58.6	48.0	4.3	29.2	–	–
Malaysia (1980)	27.6	17.6	66.6	61.9	6.3	20.5	–	–
Nepal (1981)	84.1	90.4	11.8	3.8	1.7	4.0	2.4	1.8
New Zealand (1981)	16.1	6.9	79.8	87.0	0.2	1.1	3.9	5.0
Pakistan (1981)	58.6	34.5	26.9	37.6	14.6	27.9	–	–
Philippines (1985)	41.4	31.3	44.2	42.3	12.1	22.5	2.3	3.9
Singapore (1986)	18.0	6.6	81.1	89.8	0.9	3.6	–	–
Sri Lanka (1985)	29.1	14.7	51.9	46.3	8.2	18.2	10.8	20.8
Thailand (1984)	42.4	17.7	28.6	20.4	29.0	61.9	–	–

Sources: (1) ILO, *Year Book of Labour Statistics, 1987.*

(2) ESCAP, *Achievements of the United Nations Decade for Women in Asia and the Pacific.*

Further, unpaid family labour is a more commonly reported category for females than males in practically all countries. The very low percentage of women workers classified as employers and own account workers perhaps "reflect their lack of access to vital resources such as land and capital, as well as an under-reporting of women-headed households in rural areas, and women in the informal sector".[42]

Over the years, there appears to have been a transition in the pattern of female employment status with an increasing number being reported as employees instead of as unpaid family workers. To some extent, this trend may be

[42] ESCAP, *Achievements of the Unitied Nations Decade for Women in Asia and the Pacific, op. cit.*, p. 23.

regarded as genuine in view of the expansion in the number of women working outside their homes as oppotunities for paid employment have increased in recent years, with socio-economic development.[43] To some extent, this shift may be largely due to the fact that an increasing number of women engaged in home-based piece-rate work which they can combine with their unpaid domestic tasks, as well as a large number of women casual employees, tend to be reported as paid employees.[44]

In terms of occupation, a majority of the female workers are engaged in agriculture and related occupations in most developing countries, and in production and service occupations in the developed and newly industrializing countries (table 6). However, in the Republic of Korea, a newly industrializing country, agricultural occupations are still common, followed by production jobs. In most of the countries of the region, women workers in the modern sector tend to concentrate in four occupational groups: professional and technical, clerical, service, and production.[45]

The proportion of the total female labour force reported as engaged in professional and technical occupations exceeds the corresponding proportion for males in all countries excepting China, India and Nepal. However, in absolute terms, women's share in these categories is smaller than that of men except in the Philippines where nearly 65 per cent of the workers in these occupations are women (table 7). In most countries, the majority of the females reported as "professional and technical" are only employed in low paid jobs such as nurses and teachers, which are of relatively low status, carry low salaries, and perhaps involve quite limited training requirements.

Despite their increasing participation in the labour force, the pattern of women's employment has changed very little over the years. Even today, most women workers have only a limited range of job opportunities and are engaged in occupations characterized by low skills, low productivity, low wages, and hence low status. On the other hand, male workers are represented in a wider range of occupations, including those that involve higher skills and generate higher incomes.[46] This inherent segregation of jobs based on sex thus has two

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[43] For example, the export processing zones in serveral countries of Asia (for example, Malaysia, the Philippines, Singapore, Sri Lanka) have increasingly attracted a young and docile female labour force for export-oriented industries relying on cheap but intensive labour processes. See E. Eisold, *Young Women Workers in Export Industry: The Case of the Semi-Conductor Industry in South-East Asia,* ILO, Geneva, 1984.

[44] See Andrea Manefee Singh and Anita Kelles-Viitanen (eds.), *Invisible Hands: Women in Home-based Production,* Women and the Household in Asia, vol. I (Series Editor: Leela Dube), New Delhi, Sage Publications, 1987.

[45] Siew-Ean Khoo, "Development and women's participation in the modern economy: Asia and the Pacific" in ESCAP, *Women's Economic Participation in Asia and the Pacific, op. cit.*, p. 20.

[46] Inez Wyngaarde Mahajan, "Family related responsibilities of women workers and diversification of training and employment" in ILO, *Diversification of Women's Employment and Training,* Bangkok, 1987.

Table 6. Distribution of the employed population by occupation for selected countries or areas

(Percentages)

Country/area	*Professional, technical and related workers*		*Administrative and managerial workers*		*Clerical and related workers*		*Sales workers*		*Services workers*		*Agricultural and allied workers*		*Production/ related workers, transport equipment operators*		*Unclassified*	
	M	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*	*M*	*F*
Afghanistan (1979)	2.4	4.4	–	–	3.0	2.5	6.0	0.7	3.0	1.0	66.0	3.4	24.0	88.0	–	–
Australia (1986)	15.2	16.3	8.0	5.2	8.7	32.6	6.2	13.7	10.8	9.4	8.7	3.9	42.4	18.4	–	–
Bangladesh (1983/84)	2.4	3.2	0.7	0.2	2.5	1.6	11.3	5.6	3.6	45.9	63.5	8.9	14.9	31.7	1.2	2.9
China (1982)	5.6	4.4	2.5	0.4	1.7	0.7	1.7	1.9	2.0	2.4	68.0	77.1	18.3	13.0	0.1	0.1
Hong Kong (1986)	6.1	8.1	4.2	1.0	10.5	26.4	12.1	9.1	17.2	16.6	1.8	1.4	48.2	37.4	–	–
India (1981)	3.1	2.3	1.2	0.1	3.9	0.8	5.3	1.1	3.1	1.9	64.2	57.5	16.3	6.8	2.9	29.6
Indonesia (1985)	3.2	3.9	0.2	–	5.0	1.9	11.2	20.9	2.4	5.9	55.3	53.7	21.1	13.4	1.4	0.3
Japan (1986)	8.3	10.8	5.6	0.6	12.6	25.2	15.7	14.2	6.6	12.0	7.3	10.0	43.5	26.8	0.4	0.3
Korea, Rep. of (1986)	6.4	5.6	2.3	0.1	12.2	10.5	13.3	18.1	6.9	16.6	21.5	26.2	37.4	22.7	–	–
Nepal (1981)	1.2	0.5	0.1	0.0	1.0	0.1	1.6	0.5	0.3	0.1	88.9	96.1	3.9	1.7	2.3	1.0
New Zealand (1981)	11.8	17.9	4.8	0.8	7.7	32.7	8.6	11.5	5.8	12.5	13.3	6.7	44.8	14.9	3.2	2.9
Pakistan (1981)	3.4	16.6	1.4	0.8	3.2	2.7	8.4	4.7	4.1	8.4	51.9	38.2	25.5	26.0	2.2	2.5
Philippines (1985)	3.2	9.6	1.2	0.5	3.4	6.1	6.4	23.5	5.5	13.6	56.6	34.5	23.7	12.1	–	0.1
Singapore (1986)	10.8	11.4	7.5	3.4	7.6	29.3	14.3	12.2	8.4	17.6	1.4	0.7	42.1	25.2	7.9	0.2
Sri Lanka (1985)	3.8	8.7	0.7	0.1	5.9	4.6	9.9	5.7	4.2	5.9	45.0	53.4	30.3	21.6	0.3	–
Thailand (1984)	3.1	3.2	1.8	0.5	2.5	2.2	5.6	10.2	3.0	3.6	67.9	72.4	16.1	7.9	–	–

Source: ILO, *Year Book of Labour Statistics, 1987* for all countries excepting Afghanistan and Nepal. Figures for Afghanistan were obtained from UN ESCAP, *Achievements of the United Nations Decade for Women in Asia and the Pacific*, Table 8. For Nepal, Central Bureau of Statistics, *Population Monograph of Nepal*, Kathmandu, 1987.

Table 7. Female representation by occupation[a] in selected countries or areas of the ESCAP region

Country/area	*Professional, technical and related workers*	*Administrative and managerial workers*	*Clerical and related workers*	*Sales workers*	*Services workers*	*Agricultural and allied workers*	*Production/ related workers, transport, etc.*	*Unclassified*
Afghanistan (1979)	14.0	0.7	9.0	1.5	4.0	4.0	24.0	–
Australia (1986)	40.6	29.6	70.5	58.4	35.9	22.5	22.0	–
Bangladesh (1983/84)	11.1	2.2	5.9	4.5	55.0	1.3	16.9	18.8
China (1982)	38.3	10.4	24.5	45.9	47.9	46.8	35.4	41.7
Hong Kong (1986)	43.3	12.1	59.2	30.1	35.6	31.2	30.8	–
India (1981)	20.6	2.5	6.4	6.7	18.0	23.9	12.7	78.0
Indonesia (1985)	40.8	6.6	17.6	51.2	57.5	35.3	26.3	11.7
Japan (1986)	46.1	7.1	56.7	37.5	54.6	47.6	28.9	31.8
Korea, Rep. of (1986)	36.7	3.6	36.6	47.4	61.1	44.6	28.6	–
New Zealand (1981)	43.9	8.1	68.7	40.7	52.8	20.6	14.7	32.2
Pakistan (1981)	15.2	2.0	3.1	2.0	7.0	2.6	3.6	4.1
Philippines (1985)	64.8	21.9	52.1	68.8	59.6	26.9	23.6	100.0
Singapore (1986)	38.9	21.2	69.7	33.8	55.5	22.9	26.4	1.6
Sri Lanka (1985)	49.6	6.9	25.3	20.1	37.7	33.9	23.6	3.1
Thailand (1984)	47.0	20.6	43.7	61.4	51.0	48.3	30.1	43.8

Source: ILO, *Year Book of Labour Statistics, 1987* for all countries excepting Afghanistan in respect of which figures obtained from ESCAP, *Achievements of the United Nations Decade for Women in Asia and the Pacific.*

Note: [a] Percentage of those in each occupational group who are female.

important aspects: horizontal segregation whereby women's choices or opportunities are limited to a very narrow range of mostly traditional or female occupations; and vertical segregation whereby within the same industry, occupation or profession, men tend to occupy the higher, and women the lower ranks of the occupational hierarchy.[47]

Gender segregation in regard to occupation is not something new in the region; it has been a characteristic feature of the Asian labour market for a long time. Nor is it a phenomenon peculiar to the developing countries; indeed, the degree of this segregation is greater in some of the developed than in developing countries. For instance, among the developed countries, Australia and New Zealand show particularly high gender segregation with most women employed as teachers and nurses, clerical and service workers, and most men employed as production workers and tradesmen.[48]

A variety of factors – legal, economic, socio-cultural and educational – have been cited as having contributed to gender segregation in occupation in the Asian and Pacific region. Whatever the cause, segregation has serious consequences for women as well as national socio-economic development efforts. It contributes to wage differentials between men and women, restricts women's occupational mobility in the labour market, and increases their rate of unemployment. It has also been observed that when an occupation or profession becomes preponderantly "female", its economic and social status diminishes.[49]

B. INTERRELATIONSHIPS BETWEEN POPULATION AND STATUS OF WOMEN

1. Introduction

As noted at the beginning, there is a very close association between population dynamics and the status of women. In any society, determinants and consequences of population trends affect, and in turn are affected by, the status of women, or the degree of equality between men and women. However, the interrelationships between population and status of women are complex, involving the interaction of a multiplicity of factors. Hence, it is not possible to isolate particular aspects of the population process in order to identify their influence on women's status. Nor can one be definite as to which aspect or dimension of women's status has a bearing on any of the components of population change.

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[47] Ayse G. Mitchell, "Diversification of women's occupations: a regional overview" in ILO, *Diversification of Women's Employment and Training, op. cit.*

[48] Siew-Ean Khoo, "Development of women's participation in the modern economy: Asia and the Pacific", *op. cit.*

[49] ILO, *World Labour Report, op. cit.*, p. 222.

2. *Impact of Population on the Status of Women*

Several studies have shown that the continued high rates of population growth which most developing countries are experiencing today pose a serious challenge to the achievement of national objectives and targets in regard to socio-economic development.[50] This in turn would have serious implications for improving the status or position of women, particularly in the areas of education, training and employment. Unfortunately, not many studies have been focused on analysing the impact of the trends and consequences of population on the status of women, although a large number of studies have examined the impact of the status of women on population trends, particularly fertility.

Nevertheless, one could easily give examples of countries in the region where there are parallels between demographic characteristics, such as high growth rates, high fertility, and high dependency, on the one hand, and low levels of female educational attainment, high infant and maternal mortality, lower female life expectancy and low rates of female labour participation on the other. It would appear that rapidly growing populations, by increasing the dependency burden and exerting pressure on limited material and social resources, have hindered the advancement of women in these countries. There are also highly visible examples of countries where population growth rates are low, fertility moderate or low, the dependency burden low, and where women are approaching equal status with men in regard to education, literacy and employment, and where the life expectancy of women exceeds that of men. The Governments of these countries have invested adequately in maternal and child health care, social security, maternity benefits and other essential social services. "However, beyond these two extremes, it is almost impossible to evaluate the impact on the status of women of different rates of population growth in the middle range. And even including the extremes, it is obvious that demographic conditions may play only a minor role in determining the absolute and relative positions of women in the family and in society at large, as compared with the role played by economic conditions, stages of development, political and social structures, cultural values and beliefs, and governmental priority for policy and action".[51]

(a) Fertility and status of women

Fertility and the social process associated with it, marriage, affect the status of women in several ways. In societies where home-making is still considered to be the main function of women, there are strong social pressures for girls to marry when they are young. This is particularly true in a large number

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[50] For example, see Robert H. Cassen, *India: Population, Economy and Society*, New York, Holmes and Meier, 1978, pp. 419; and Gavin W. Jones and S. Selvaratnam, *Population Growth and Economic Development in Ceylon*, Colombo, Hansa Publishers, 1972.

[51] United Nations Secretariat, "Women's rights and fertility", *op. cit.* (see footnote 21), p. 380.

of Muslim countries, and in many areas of India and Nepal.[52] In these societies, an unmarried daughter past a certain age may be considered a disgrace to the family. Nevertheless, marriage is normally an obstacle to the continued education of women; the younger the average age at marriage, the sooner the girls terminate their schooling. Thus, most women are denied the opportunity for improving their status through continued education and training which would have qualified them for employment and income.

It has also been observed that in societies where girls marry early, the age difference between brides and grooms may average 10 to 12 years, and in some instances as high as 20 years. This would imply that the girl's already subordinate position at the time of her marriage is further compounded by the additional advantage her husband has accrued with his age and experience. Further, the average age at first marriage for women is much higher, and the age difference between bride and groom narrower, among educated and employed women in most countries.[53] The substantial age difference between wife and husband is also considered to be one of the causes of early widowhood for women in Nepal.[54]

The pattern of high fertility obtaining in most developing countries means that women are burdened with the task of frequent child-bearing as well as the responsibility for caring for and rearing the many children they produce. Since alternative arrangements, such as day care centres, for assisting women with their family responsibilities are not available in most countries, women are engaged full-time in their traditional roles, and are not free to upgrade their knowledge and skills or to participate in economic production. However, in the rural agrarian setting in many countries, it is often possible for the mother to combine children with work on the farm or other family-operated enterprises because of the "availability of extended family, kin, and neighbourhood support networks

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[52] For example, a study in Bangladesh reported that girls marry between the ages of 8 to 16, and the presence of an unmarried girl over the age of 16 is often a sign of poverty. See J. Ellickson, *Women of Rural Bangladesh: Variation in Problems of Self-perception,* (Paper presented to Women and Development Conference, Wellesley, Mass. 1976). However another study places marriage for girls between 12 and 16 years, with restrictions on her movement from the age of 10. There is less urgency in marrying off a daugher who is attending school. See, Tahrunessa A. Abdulla, *Village Women As I Saw Them* (Bangladesh Academy for Rural Development, Comilla, 1976). Most Pakistani girls are married a few months after menstruation, and poverty is the chief reason for delay. See, Seemin Anwar Khan and Faiz Bilquees, *The Environment, Attitudes and Activities of Rural Women: A Case Study of Jhok Sayal* (Research Report No. 98, Pakistan Institute of Development Economics, Islamabad, 1976). In most parts of rural India, prepuberty marriage was the ideal. See S.C. Duke, "Men's and women's roles in India: a sociological review", in B.E. Ward (ed), *Women in the New Asia* (Paris, UNESCO, 1963). In Nepal, the tradition of child marriage at the age of six is still prevalent in some rural areas. Some orthodox people believe that giving a daughter away before her first menstruation, when she is a virgin, is really a religious credit. See Indra Majupuria, *Nepalese Women* (Kathmandu, M. Devi (publisher), 1982).

[53] United Nations Secretariat, "Woman's rights and fertility", *op. cit.*

[54] Indra Majupuria, *Nepalese Woman, op. cit.*, p. 115.

for child care, and the location of farm work and market activity near the home".[55] On the other hand, large family size may compel a woman to seek employment to augment family incomes to support the large number of children.[56]

In most countries, high fertility is a phenomenon usually associated with low-income families who constitute a substantial proportion of national populations. Among these people, given their limited incomes and resources, there is a tendency to accord preferential treatment to male children in the matter of education, food and nutrition, health care, etc.[57] This is to a large extent due to the traditional preference for male children.[58] In many of these societies, the inferior position of the girls is acknowledged from the moment of birth when, for example, the attendant midwives are rewarded better for a baby boy than for a baby girl.[59] In countries where education is not free, low income families often give priority to investing in the education of boys from which they can expect a higher rate of return than from investments in the education of girls.[60] For instance, in India, the education of girls is sacrificed in favour of boys, and there is a lurking fear that education may alienate girls from their roles and submissive behaviour.[61] In China, girls are withdrawn from school more readily than boys to help in household tasks.[62]

Poverty and the consequent reservation of limited resources for the welfare of boys has also resulted in the deliberate neglect of girls in regard to food, nutrition and health care. For example, a 1980 study covering 105 families in four villages in Matlab Thana, Bangladesh, showed that at all ages the females

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[55] Inez Wyngaarde Mahajan, "Family related responsibilities of women workers and diversification of training and employment", *op.cit.*, p. 115.

[56] P. Hamalatha and M. Suryanarayana, "Married working women: a study on their role interactions", *The Indian Journal of Social Work*, vol. XLIV, No. 2, July 1983.

[57] See, for instance, Amartya K. Sen, "Family and food: sex bias in poverty"; and Pranob K. Bardhan, "Sex disparity in child survival in rural India" in T.N. Srinivasan and Pranob K. Bardhan (eds.), *Rural Poverty in South Asia*, Delhi, Oxford University Press, 1988.

[58] Son preference is found to be prevalent in most East Asian and South Asian countries. For instance, in China, economic considerations make parents as anxious to have sons today as in the past. See, W.L. Parish, Jr., "Socialism and the Chinese peasant family", *Journal of Asian Studies*, vol. 34, 1975. It has been reported that son preference is very strong in Bangladesh. See, N.R. Ahmed, "Family size and son preference among women in Bangladesh", *Studies in Family Planning*, vol. 22, No. 3, May 1985.

[59] For instance, in a Pakistani village, Rs. 10 is paid for a boy and Rs. 5 for a girl. See Seemin Anwar Khan and Faiz Bilquees, *The Environment, Attitudes and Activities of Rural Women, op. cit.*

[60] ILO, *World Labour Report, vol. 2, op. cit.*, p. 218.

[61] Indian Council of Social Science Research, *Status of Women in India*, New Delhi, Allied Publishers, 1975.

[62] W.L. Parish, Jr., "Socialism and the Chinese peasant family", *Op. cit.*

consumed fewer calories and less protein than the male family members.[63] A 1976-1978 study for Calcutta City (India), reported a higher level of female morbidity compared with male morbidity except for those aged below 14 years.[64]

In those societies where social values and customs favour large family size, high fertility confers high status or prestige on the mothers. In these communities, a woman's status is defined largely in terms of the number of her children, or the number of her sons. Consequently, the more fertile she is, the higher her status, or the greater her authority.[65] Even today in many Hindu and Buddhist societies, it is the fertile couples who are accorded pride of place in marriage ceremonies, and requested to bless the bride and groom.

(b) Mortality and status of women

In the absence of an adequate number of empirical studies, it is not possible to state precisely the nature and extent of the effects of changing mortality conditions on the status of women. However, the experience of several developing countries in the region that have completed, or are in the process of completing, their mortality transition clearly indicates that high mortality conditions have been associated with high infant and child mortality as well as higher female than male mortality at practically all ages, particularly in the reproductive age groups. In these countries, the decline in mortality has been accompanied by substantial declines in infant and child mortality as well as female mortality.[66]

It is often argued that high infant and child mortality is a cause of high fertility in many societies;[67] mothers have to produce more children in order

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[63] L.C. Chen, E. Huq and S. D'Souza, *A Study of Sex-Biased Behaviour in the Intra-Family Allocation of Food and the Utilization of Health Care Services in Rural Bangladesh,* International Centre for Diarrhoeal Disease Research, Bangladesh, and Department of Population Science, Harvard School of Public Health, 1980.

[64] Calcutta Metropolitan Development Authority, *Health and Socio-economic Survey of Calcutta Metropolitan Development Area,* Calcutta International Statistical Institute and Calcutta Metropolitan Development Authority, 1980. It has however to be noted that there is a tendency to under-report female morbidity. See J. Kynch and A.K. Sen, "Indian women: well-being and survival", *Cambridge Journal of Economics,* vol. 7, 1983.

[65] For instance, in many rural areas of Sri Lanka, folklore sings the praises of the prolific mother; and the common saying is "A mother who has borne ten children is a *pathini* (goddess)".

[66] These developments are best attested to by the experience of Sri Lanka. See T. Nadarajah, "Trends and differentials in mortality" in ESCAP, *Population of Sri Lanka,* Country Monograph Series No. 4, Bangkok, 1976, pp. 123-153; and S. Selvaratnam, *Population Projections for Ceylon, 1956-1981,* Colombo, Planning Secretariat, 1959.

[67] However, evidence in regard to the effect of infant and child mortality on fertility is mixed. See, for example, Samuel H. Preston, *The Effects of Infant and Child Mortality on Fertility,* New York, Academic Press, 1978.

to ensure the survival of a few of them. Loss of their children and frequent pregnancies seriously damage the health and lives of mothers. Data for several developing countries indicate that life expectancy among women of child-bearing age is significantly less than that of men due to the hazards of child birth.

In most countries, declines in mortality have occurred as a result of the expansion of health care, sanitation and improvement in nutritional standards of the people. These developments have also made child-bearing safer and ensured better chances of survival for infants and children. "But the trend could be disadvantageous if it means "unwanted" increase in fecundity among women who are already overburdened with family responsibilities and who lack the knowledge and means to prevent further pregnancies. And a higher survival rate among infants, if it occurs at a time of food shortages, could mean that female children are even more likely to be deprived of adequate nourishment when males are given priority for scarce resources within the family".[68]

Mortality has an important effect on the status of women through widowhood, which in many instances is an unhappy state for the women concerned.[69] In several countries, higher female than male life expectancy results in an increase in the number of widows, particularly at the older ages. In others, early marriage of girls coupled with wide age disparities between bride and groom has resulted in early widowhood.[70] In many parts of India, and among certain communities, social customs forbid the remarrying of widows, although the legislation permits such remarriage. Further, a widow economically dependent on members of her husband's family could be ill-treated and abused; she has to work hard and put up with all kinds of indignities and humilation from senior, sometimes even junior, household members.[71]

However, many societies including Muslim ones, permit the remarriage of widows. In Bangladesh, young widows and divorcees often remarry, but older widows generally remain in their husband's home to ensure receiving a share of his property.[72] In China, widows have the right to remarry, even though some still feel this to be wrong, and young men are reluctant to marry a widow.[73] Although there is no objection to the remarriage of widows in the Republic of

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[68] United Nations Secretariat, ' Women's right and fertility", *op. cit.*, p. 380.

[69] For full discussion of this aspect, see Robert Orr Whyte and Pauline Whyte, *The Women of Rural Asia, op. cit.*

[70] For example, it has been reported that in Bangladesh there is a sharp increase in the number of widowed females above 34 years of age. In the 1961 census, 41 per cent of women in the 40 to 59 age group were widows. See S. Khartun and K. Begum, "Life of urban middle-class widows" in *Women for Women, op. cit.*, 1975.

[71] A.S. Altekar, *The Position of Women in Hindu Civilization from Pre-historic Times to the Present Day*, second edition, Delhi, Motilas Banarsidass, 1959.

[72] Tahrunnessa A. Abdulla, *Village Women as I Saw Them, op. cit.*

[73] W.L. Parish Jr. and M.K. Whyte, *Village and Family in Contemporary China*, University of Chicago Press, Chicago and London, 1978.

Korea today, in practice this is rare; there is still adherence to the Confucian ideal of the chaste widow. Further, women do not wish to lose the access to their children which remarriage automatically involves.[74]

(c) Migration and the status of women

In a large number of South Asian countries, rural-urban migration is often dominated by males who leave behind their wives and children in the village.[75] It is likely that the remaining female population may "improve" its status by taking over many activities formerly performed by men and by acquiring a major decision-making role in the family and in the community. For example, it has been reported that in Korean villages, migration of males to cities in search of industrial jobs forced women to take on agricultural tasks for which they were not trained or prepared.[76] Similar examples are found in many other Asian countries. On the other hand, a heavy outmigration of males may mean a double burden for women and increased competition for the attention of the remaining males. In societies where the responsibility of looking after family matters in the absence of the husband is entrusted to another senior male, or to an elderly female, the status of the wife may be weakened or lowered as a result of the outmigration of the husband.

For some women who migrate to urban areas from the village, the move may free her from the conservative and constraining traditions of village life, and provide opportunities for higher education and paid employment. For example, in many South-East Asian countries, a very large number of single as well as married rural females have found employment in the urban "bazaar economy", and in domestic service in urban households.[77] Also, in several countries, an increasing number of unmarried females are migrating to urban centres, in response to new employment opportunities for women in the industrial sector created by activities of transnational corporations and local industrial entrepreneurs.[78] Although most of the female migrants from rural areas may be employed in low-paid, low status jobs without any long-term benefits or job

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[74] Robert Orr Whyte and Pauline Whyte, *op. cit.*, p. 89.

[75] Andrea Menefee Singh, "The impact of migration on women and the family: research, policy and programme issues in developing countries", *Social Action*, vol. 30, No. 2, April-June 1980.

[76] Mihye Roh, "A case study on the diversification of women's training and employment in Korea" (October 1986) reported in ILO, *Diversification of Women's Employment and Training, op. cit.*, p. 51.

[77] See for example, Beverly Hackenberg, "Migration and mobility among women in the Philippines", and Suwanlee Piampiti, "Policies and programmes for female migration in Thailand", both papers prepared for *Women in the Cities Working Group*, East-West Population Institute, Hawaii, 1979.

[78] See, Aline Wong, "Problems and adaptive strategies of female rural-urban migrants: a selective review"; Jamilah Ariffin, "Survey approach to female migrant adjustment in Malaysia"; and Nora Huang, "Urban adaptation through jobs and housing in Taiwan"; papers prepared for *Women in Cities Working Group*, East-West Population Institute, Honolulu, Hawaii, March 1979.

security, their earnings are invariably much higher than they would have been in the home village. Also, since their regular remittances help support their parents and siblings, they enjoy better status and recognition within the family and in the village.

For many other women who move to the city, particularly those who accompany their husbands, the move may isolate them from their formerly supportive environment, and deprive them of child care and household assistance, as well as their earlier productive role in agriculture, handicrafts or marketing. In many South-Asian countries, particularly Muslim countries, women who move to the city do not find themselves in a freer environment, but end up in greater seclusion than in the village.[79] For many women in search of employment, the urban destination with its usually high unemployment rates may offer them only very limited opportunities compared to men, and may even have a negative impact on their social status.[80] It has also been observed that since the young female migrants are isolated physically and socially from the supportive environment of the village and family, they are exposed to problems, such as unwanted pregnancies, psychological distress and difficulties in finding marriage partners.[81]

Rural-rural migration is of special importance to women, for instance, in India where 69 per cent of all migration is rural-rural and 77 per cent of rural migrants are females.[82] Since demographers tend to label this comparatively greater volume of migration as marriage or dependency migration,[83] the consequences of such migration for women and the family are also assumed to be linked to the fate of the provider.[84] However, several sociological and economic studies suggest that female labour migration constitutes a substantial proportion of total female rural migration.[85] It has also been reported that in several parts

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[79] See, for example, Andrea Menefee Singh, "Rural-urban migration of women among the urban poor in India", *Social Action*, vol. 28, No. 4, 1978; Nasra M. Shah, "The female migrant in Pakistan", paper prepared for *Women in Cities Working Group, op. cit.* and Nadia Youssef, "Women in development: urban and labour" in Irene Tinker and Michele Bo Bramsen (eds), *Women and World Development*, Overseas Development Council, Washington, D.C., 1979.

[80] Andrea Menefee Singh, "The impact of migration on women and the family", *op. cit.*, (see footnote 75).

[81] *Ibid.*, p. 187.

[82] *Ibid.*, p. 183.

[83] For example, see Mahendra K. Premi, *Patterns of Internal Migration of Females in India*, Indian Council of Social Science Research, New Delhi, 1979.

[84] Andrea Menefee Singh, *op. cit.*, p. 192.

[85] For instance, the Committee on the Status of Women in India reported that a large number of women were seeking casual employment during the slack season in irrigation, road and other public works programmes. See, Government of India, *Towards Equality: Report of the Status of Women in India* (New Delhi, Department of Social Welfare, 1974). Female rural migrant labour plays an important role in sugar cane harvesting in Maharashtra and Gujarat, in paddy cultivation in the Punjab and Haryana and in plantation labour in north-east and south India.

of China and India, marriage migration often results in a loss of autonomy for women during the prime child-bearing years. This is because, upon marriage, she has not only to live away from her natal kin, but also invariably subject herself to the authority of her mother-in-law or the older sister-in-law in her new household.[86]

3. Impact of Women's Status on Population

(a) Status of women and fertility

A large number of studies undertaken in various countries have focused on analysing the status of women, particularly their access to education and employment, in relation to fertility. Very often these studies have reported contradictory findings, expecially when women's labour force participation has been used as an index of status and examined in relation to fertility.[87] This is because the relationships are many and complex, and the seem to vary according to place and time.[88] Hence great caution needs to be exercised in utilizing those findings for purposes of policy formulation.

According to numerous studies, level of education is an important factor determining fertility levels and trends; the educational level of the wife being more strongly correlated with a couple's fertility than the educational level of the husband. Indeed, it has been claimed that the educational level of the female is the strongest and most consistent predictor of fertility.[89] Female education helps to "prevent" marriage and child bearing or postpone them beyond the average age[90] of family formation so long as the woman stays in school. Education also exposes the women to knowledge, attitudes and practices of family planning. It is also considered to be associated with an increase in women's domestic power and their participation in extra-domestic employment before marriage.[91]

Most studies indicate a negative relationship between the level of women's education and their fertility; that is, fertility declines with an increase in the

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[86] Karen Oppenheim Mason, *The Status of Women: A Review of its Relationships to Fertility and Mortality, op. cit.*

[87] Constantina Safilios – Rolthschild, *The Status of Women and Fertility in the Third World in the 1970-1980 Decade,* Working paper No. 118, Centre for Policy Studies, The Population Council, New York, November 1985, p. 3.

[88] Ghazi M. Farooq and George B. Simmons (eds), *Fertility in Developing Countries: An Economic Prospective on Research and Policy Issues,* ILO, Geneva, 1985.

[89] William W. Murdock, *The Poverty of Nations: The Political Economy of Hunger and Population,* Baltimore, The Johns Hopkins University Press, 1982, p. 41.

[90] For instance, for Pakistan it has been reported that primary education was related to a higher average age at marriage. See Mehtab S. Karim, "Differential in age at first marriage" in Iqbal Alam (ed), *Fertility in Pakistan: A Review of the Findings from the Pakistan Fertility Survey,* Voorburg, Netherlands, International Statistical Institute, 1986.

[91] Karen Oppenheim Mason, *The Status of Women: A Review of its Relationships to Fertility and Mortality, op. cit.*, p. 45.

level of women's education.[92] Also this inverse relationship tends to be strongest when factors such as husband's education, women's employment, type of education and place of residence are uncontrolled. Monotonic inverse patterns of fertility by educational level and substantial differentials have been reported for those developing countries with high per capita income, high literacy and a high level of urbanization. For instance, in the Republic of Korea, fertility rates decline by 7.9 per cent after primary education; by 14.2 per cent after secondary; and 16.3 per cent after higher education.[93]

However, several studies indicate that the extent to which women's education influences fertility depends upon the level and type of education. For instance, in India, the inverse relationship between education and fertility occurs only after matriculation,[94] and in the Philippines, it does not occur until after the mothers have completed sixth or seventh grade of high school.[95]

It has often been argued that participation of women in the labour force helps to lower fertility through such factors as delayed marriage, increased education, reduction of preferred family size and increased adoption of family planning practices. Hence there has been a tendency to recommend that an effective way to reduce national birth rates is to increase women's participation in economic activity.[96] However, as noted earlier, a review of available evidence does not seem fully to support these conclusions. While the inverse relationship between female labour force participation and fertility appears to be strong in most developed countries, this relationship tends to be either weak or absent in many developing countries. However, in the developing countries, the probability of an inverse relationship appears to be higher in the urban than in the rural areas, and in the "modern" than in the "traditional" sectors of the society.

According to several studies undertaken in third world countries, the relationship between female labour force participation and fertility is either not significant or absent in the case of women who work as unpaid family

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[92] See, for example, Sidney Goldstein, "The influence of labour force participation and education on fertility in Thailand", *Population Studies,* vol. 26, No. 3, 1972; German Rodriguez and John Cleland, *Socio-economic Determinants of Marital Fertility in Twenty Countries: A Multivariate Analysis,* 1980; Anrudh Jain, "The effect of female education on fertility: a simple explanation", *Demography,* vol. 18, No. 4, November 1981.

[93] Hyo-chai Lee and Hyoung Cho, *Fertility and Women's Labour Force Participation in Korea,* 1986.

[94] Kamala Rao, "Status of women: factors affecting status of women in India", in *ILO Sub-Regional Seminar on Status and Role of Women in the Organized Sector,* ILO, Bangkok, 1979.

[95] G.T. Castillo, *The Filipino Woman as Manpower: the Image and the Empirical Reality,* Council for Asian Manpower Studies, Quezon City, 1976.

[96] Mercedes B. Concepcion, "Female labour force participation and fertility", *International Labour Review,* vol. 109, Nos. 5-6, May-June 1974.

workers in "cottage industries", agriculture and other family-based enterprises,[97] but strongly inverse in respect of women engaged in non-domestic, non-familial enterprises and non-agricultural employment.[98] The general message of these studies is very clear; labour force participation *per se* may not be so important as the *type* of employment that is engaged in by the women.[99] Equally important is the compatibility or incompatibility of a women's employment with her maternal role; the assumption being that women's employment "away from home" is more incompatible with their maternal role than family-based work.[100]

In the rural setting of the developing countries, a women's employment, whether paid or unpaid, has little impact on fertility for two reasons. Firstly, the value of large numbers of children still remains strong. Secondly, the nature of the employment engaged in (mostly agricultural, marketing or cottage industry type), is compatible with her role as mother, as she can either keep the young children with her or entrust them to other family members while at work. On the other hand, in an urban setting, a woman's employment is more likely to be incompatible with her maternal role, because invariably that employment is outside her home and no alternative arrangements are available for taking care of her young children while she is away at work. But an urban woman worker is more likely to learn about birth control and have relatively easy access to family planning services.[101]

Studies undertaken in the Asian and Pacific region also attest to the contradictory nature of the findings in regard to the relationship between women's labour force participation and fertility. These findings also seem to support the argument regarding the compatibility or otherwise of women's employment with their maternal role. For example, it has been reported that in Thailand the majority of female workers in urban as well as rural areas are engaged in sales

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[97] For instance, see C.A. Miro and W. Martens, "Influence affecting fertility in urban and rural Latin America", *Milbank Memorial Fund Quarterly,* vol. 46. No. 3, Part 2, 1968; A.J. Jaffe and K. Azumi, "The birth rates and cottage industries in underdeveloped countries", *Economic Development and Cultural Change,* vol. 9, 1960; Da Vanzo and D.L.P. Lee, "The compatibility of child care with labour force participation and non-market activities: preliminary evidence from Malaysian time budget data", paper presented at the Conference of the International Centre for Research on "Women in Poverty: What do we know?", Belmont, Maryland, 1978.

[98] See for instance, A.J. Jaffe and K. Azumi, "The birth rate and cottage industries in underdeveloped countries", *loc. cit.;* J.D. Kasarda, "Economic structure and fertility: a comparative analysis", *Demography,* vol. 8, 1971; S.K.P. Chi and R. Harris, "Interaction between action programmes and social structural variables: a study of family planning and fertility differentials in four Columbian cities", paper presented at the annual meeting of the Population Association of America, Seattle, 1975; K. Maurer, P. Ratajczak and T.P. Schultz, *Marriage, Fertility and Labour Force Participation of Thai Women: An Econometric Study,* Report R-829-Aud/R.F., Rand Corporation, Santa Monica, California.

[99] Mercedes B. Concepcion, *op. cit.*

[100] Constantina Safilios – Rothschild, *The Status of Women and Fertility in the Third World 1970-1980 Decade, op. cit.*

[101] United Nations Secretariat, *op. cit.*

or farming occupations. Since the nature of their work is compatible with their maternity roles, these women have the highest fertility.[102] Yet another study for Thailand has noted that the cumulative fertility of female unpaid workers is as high as, and sometimes higher than, women not in the labour force. Employed women, particularly in the urban areas, have lower fertility; they are younger, have been married for a short period, tend to marry later and practice birth control. Women in non-farm occupations have the lowest mean number of children, and women in farm occupations the highest, with intermediate levels reported for the unemployed. The highest level of non-farm labour participation is likely to be found among those who have completed more than four grades of education. Modernity, non-farm employment, and lower levels of fertility are closely linked.[103]

In the Republic of Korea, the type of work engaged in by women is an important factor influencing fertility; home-based agricultural work or unskilled work nearby, being compatible with higher fertility. In urban areas, working women have lower fertility rates at all ages compared with housewives; but in rural areas working women have higher fertility than non-working women. Jobs which are urban and modern and require high levels of education and technical skills have an influence on fertility. Correlation between lower fertility and employment is noted only in respect of some non-agricultural jobs.[104]

According to 1968 data for the Philippines, the average number of children ever born to women aged 35-44 years was lower for working than non-working women; but among women aged 45-54 years, those in the labour force had slightly higher fertility than those not in the labour force. Further, the relationship found in respect of women aged 35-44 held regardless of their residence. There was also a gradient of low to high fertility starting from urban working females, to urban non-working, to rural working and rural non-working.[105] Other studies for the Philippines revealed that the non-working women in metropolitan Manila and the Visayas had the highest average total number of marital births, while in other areas of Luzon unpaid family workers had the highest marital fertility.[106]

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[102] Nibhon Debavalya, *Female Employment and Fertility: Cross-Sectional and Longitudinal Relationships from a National Sample of Married Women*, Institute of Population Studies, Chulalongkorn University, Paper No. 24, Bangkok, 1977.

[103] M.J. Cook, *Female Labour Force Participation, Modernity and Fertility in Rural Thailand*, Ph.D. thesis, Brown University, 1977.

[104] Hyo-Chan Lee and Hyoung Cho, *Fertility and Labour Force Participation in Korea, op. cit.*

[105] Mercedes B. Concepcion, *op. cit.*

[106] T.W. Pullum, "An overview of differentials in Philippines marital fertility", paper submitted to USAID pursuant to Contract No. 92-154, 1971; Mercedes B. Concepcion, E.M. Pascual and W.F. Stinner, "Differences in child-bearing patterns of Filipino women 25-34 years, NDS, 1968", report submitted to USAID pursuant to Contract No. 92-154, 1972.

A 1966-1967 survey in Peninsular Malaysia showed that women who worked in a truly urban setting had fewer children than those who never worked, and that urban employment lowered the fertility of married women. Fertility differences by labour force participation were small or insignificant among women who were starting their child bearing, irrespective of residence.[107]

There are several reasons why premarital employment tends to increase a woman's age at first marriage. Firstly, in cultures which require married women to contribute to her in-laws' rather than her parental household, parents whose daughter is working may try to delay her marriage in order to enjoy the benefit of her earnings.[108] Secondly, in societies where parents are required to provide an adequate dowry when giving their daughter in marriage, the girl may have to work long enough to accumulate the necessary amount.[109] Thirdly, premarital employment may influence a woman's aspirations and attitudes towards marriage.[110] Drawing a regular and assured income may give her a taste for independence thereby fostering greater female autonomy and a later age at marriage.[111]

(b) Status of women and mortality

An important factor contributing to the success of activities aimed at improving health and reducing mortality, particularly infant and child mortality, appears to be the level of education of mothers. Several studies have also reported strong differentials by educational level of the mother in the utilization of health care, in the practice of family planning, in the physical and mental development of children and in community development.[112] There are three aspects of mortality that have been argued to reflect variation in the status of women or some aspect thereof. These are (a) level of infant and child mortality; (b) level of maternal mortality; and (c) sex-differentials in mortality, especially among children (sometimes referred to as "excess female child mortality").[113]

In most societies, it is the mother who is most directly involved in the care of young children. Hence, women's education is more likely to have an influence on children's survival. Female education is said to influence infant and child mortality in several ways. The first is through birth spacing; better educated

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[107] National Family Planning Board, *Report on the West Malaysian Family Survey, 1966-1967,* Kuala Lumpur, 1967.

[108] Janet W. Saloff and Aline K. Wong, "Chinese women at work: work commitment and fertility in the Asian setting", in S. Kupinsky (ed), *The Fertility of Working Women,* New York, Praeger, 1977, pp. 81-145.

[109] Shirley Lindenbaum, "Implications for women of changing marriage transactions in Bangladesh", *Studies in Family Planning,* vol. 12, November 1981, pp. 394-401.

[110] Janet W. Saloff and Aline K. Wong, *op. cit.*

[111] Karen Oppenheim Mason, *op. cit.*

[112] Rafael M. Salas, *Reflections on Population,* New York, N.Y. Pergamon Press, 1984, p. 82.

[113] Karen Oppenheim Mason, *The Status of Women, op. cit.,* p. 33.

women are more likely to practise birth control methods than less educated women.[114] Birth control practices may in turn lengthen birth intervals; this in turn tends to reduce infant and child mortality. The second is through greater gender equality or women's domestic autonomy. More education enables a woman to acquire a great deal of autonomy which helps to undermine traditional feeding practices and ensure a more equal distribution of food within the family. This would mean that mothers and children experience improved nutrition. Greater female autonomy will also enable a mother to detect in time when a child falls sick, to decide that something must be done immediately, to go out and obtain appropriate and adequate treatment, to understand the medical advice and take responsibility for carrying it out. Further, an educated mother is able to understand the need for and practice hygienic forms of child care.[115]

Although a woman's gainful employment is also considered to be an important exogenous determinant of infant and child mortality, there is as yet no concensus in regard to the hypothesized effects; indeed the arguments in this regard appear to be contradictory. Some authors have argued that earning women are better able to feed their children than non-earning dependent women,[116] an effect that presumably reduces infant and child mortality, particularly in countries where traditional family support systems are breaking down. Yet others point out that since employed women do not find enough time for child care, they have to depend on surrogate help, and this is likely to increase the risks of infection and accidents among children.[117]

Nutritional status and birth parity levels appear to be important determinants of maternal mortality in most developing countries of the region.[118] In these countries, a major determinant of women's nutritional status, apart from the family's socio-economic status and certain traditional beliefs, is the feeding

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[114] Susan H. Cochrane, "Effects of education and urbanization on fertility" in R. A. Bulatao *et al.*, (eds), *Determinants of Fertility in Developing Countries* (Washington, D.C., National Academy Press), 1983, pp. 992-1026. It has also been pointed out that in some societies, educated women are also less likely to follow traditional post-partum abstinence taboos, though this may be because they are able to substitute contraception for abstinence. See, for example, Valerie J. Hull, "Fertility, women's work and economic class: a case study from Southeast Asia" in S. Kupinsky (ed), *The Fertility of Working Women* (New York, Praeger), 1977.

[115] John C. Caldwell, "Education as a factor in mortality decline: an examination of Nigerian data", *Population Studies*, vol. 3, No. 3, 1979; and John C. Caldwell, "Routes to low mortality in poor countries", *Population and Development Review*, vol. 12, No. 2, 1981.

[116] For example, see Tim Dyson and Mick Moore, "On kinship structure, female autonomy, and demographic behaviour in India", *op. cit.*

[117] For example, see B. Ximena Bunster, "Market sellers in Lima, Peru: talking about work", in M. Buvinic, M.A. Lycette and W.P. Mcgreevey (eds), *Women and Poverty in the Third World*, Baltimore, John Hopkins University Press, 1983, pp. 92-103.

[118] See for example, Lincoln C. Chen, *et al.*, "Maternal mortality in rural Bangladesh", *Studies in Family Planning*, vol. 5, Nov. 1974, pp. 334-341.

priority given to adult men in the households.[119] This gender system results in nutritional deficiency among young girls and old women;[120] it also contributes to the poor nutritional status of pregnant women, thereby contributing to maternal mortality levels.[121] Some authors have argued that women's domestic powerlessness tends to produce high fertility levels which in turn contributes to higher risks of maternal mortality.[122]

It has also been argued that women's status is an important factor contributing to the establishment of effective rural health services.[123] In rural societies where girls are adequately educated and enjoy considerable autonomy, they are more likely to become nurses; where there is less autonomy, parents may not permit their daughters to be trained as nurses and work with male doctors or male patients. Futher, the experience in Sri Lanka and Kerala (India) has shown that where trained nurses and midwives can be recruited from within the home areas, they are more effective in house-to-house visits than nurses and midwives brought from outside.[124]

C. POLICY IMPLICATIONS

Although women constitute nearly half of the population in practically all countries of the region, they do not enjoy equal status with men in most respects, and play only a very limited role in national socio-economic development. It is, however, being increasingly recognized that the full and unfettered participation of women is very essential for the success of any development scheme. In particular, women's active participation is absolutely necessary for the formulation and implementation of population policies and pogrammes, because they have as much at stake as men, if not more, in whatever action is taken in this area.

The full participation of women in population programmes and other development activities is possible only if they enjoy a considerable measure of autonomy or equality with men. This, in turn, is possible, only if serious efforts are made to eliminate discrimination and remove obstacles to their advancement in the field of education, training, employment and career prospects. The examples of Sri Lanka and Kerala (India) clearly demonstrate that when such barriers and obstacles are eliminated, and women are brought into the mainstream of national life, there is a distinctive improvement in the content and pace of development as well as in the quality of life of the entire community.[125]

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[119] Judith Katono-Apte, "The relevance of nourishment to the reproductive cycle of the female in India" in Dano Raphael (ed), *Being Female*, The Hague: Monton, 1975.

[120] John C. Caldwell, "Education as a factor in . . .", *op. cit.*

[121] Judith Katono-Apte, *op.cit.*

[122] Tim Dyson and Mick Moore, "On kinship structure . . .", *op. cit.*

[123] John C. Caldwell, "Routes to low mortality . . .", *op. cit.*

[124] Ibid., p. 184.

[125] Rafael M. Salas, *Reflections on Population, op.cit.*, p. 24.

In Sri Lanka, women enjoy a much higher status than their counterparts in South Asia. As was noted earlier, female enrolment in primary and secondary education almost equals that of males. At the university level, female enrolment exceeds that of males in many courses of studies. During the last decade or so, female life expectancy at birth has been higher than that of males. Because of their educational attainment, large numbers of women are engaged in paid employment outside their homes. In fact, wage earning is preferred and education is considered an important preparation for employment.[126] These developments have resulted in raising women's age at first marriage, widespread adoption of family planning, increased utilization of health services and facilities, and consequently in considerable reduction in fertility and mortality, particularly maternal, infant and child mortality.

Of course, the measures adopted in Sri Lanka can be suitably adapted and applied in other countries of the region as well. Various international strategies and action plans focusing on the integration of women into development have also provided valuable guidelines for national action in this regard. It has been generally accepted that special attention should be given to measures which broaden the scope of education and vocational training for girls and increase their employment opportunities. Since numerous studies have clearly indicated that the level of female education is a determining factor in reducing fertility and mortality, national policies should aim at expanding educational facilities and opportunities for women, especially in the rural areas where illiteracy levels are high and enrolment very low. Further, reduction in family size may also be achieved by the adoption of policies specifically related to the provision of new roles and interests for women supplementary or alternative to those of marriage. Their participation in paid employment not only helps to bring them into the economic mainstream but also gives them prestige and security in the family and the community.[127] Policies should therefore be directed at fostering greater participation of women in non-traditional employment outside the home.[128]

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[126] William W. Murdock, *The Poverty of Nations: The Political Economy of Hunger and Population, op. cit.*

[127] Nafis Sadik, "Integration of women in population and development programmes", ESCAP, *Asian Pacific Population Journal,* vol. 7, No. 3, Sept. 1986.

[128] Mercedes B. Concepcion, "Female labour force participation and fertility", *op. cit.*

IV. POPULATION CHANGE AND WELFARE OF THE AGED

Naohiro Ogawa

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INTRODUCTION

Until recently, many of the Governments of developing countries in Asia perceived that population aging was an issue only among developed countries. However, as a consequence of their rapid fertility declines over the past few decades, these Asian Governments have been increasingly aware of various aging problems which require more focused attention in the process of formulating their long-term development plans. Primarily because the fertility transition in these developing countries has been substantially shorter than in the developed countries, the speed of population aging in the former has been and will be much faster than that observed in the latter (Leete, 1987).

It is axiomatic among demographers that declining fertility, not increased life expectancy, is the principal determinant of population aging. It should be stressed, however, that the mortality effect on population aging becomes increasingly strong as the process of demographic transition and economic development proceeds (United Nations, 1987). In Japan, for instance, the fertility effect was approximately 10.5 times more dominant in inducing the aging process than the mortality effect over the period 1950-1970. During the period 1970-1985, however, mortality improvements contributed to the aging of the Japanese population about 22 per cent more than fertility reduction. At present, the mortality effect on population aging seems relatively limited in most of the Asian countries, as compared with the fertility effect. However, if the recent trends in remarkable mortality improvements continue in these countries, mortality at advanced ages will fall substantially in the relatively near future, thus contributing to population aging as a major force. It is generally considered that the role of mortality improvements in inducing the aging process becomes increasingly important, especially when life expectancy at birth exceeds 70 years (Myers, 1988). In view of the fact that some of the developing Asian countries have already achieved a higher than 70-year life expectancy at birth, one can easily conceive that in these countries the mortality effect will overtake the fertility effect before the turn of this century or in the early part of the next century. This implies that development planners in these countries should pay greater attention to mortality change in the years to come.

Both fertility declines and mortality improvements affect not only the proportion of the elderly in the total population at the macro level but also the elderly's way of life at the micro level. As a result of lowered fertility, each old person has fewer children on whom he or she can depend for old-age security. Owing to the extension of life expectancy, old persons may need to modify their retirement plans.

In addition to these demographic factors, the urbanization process is likely to affect the welfare of the aged. Urbanization tends to contribute to an increase in nuclear families and to a decrease in traditional joint families. It also

brings about numerous life-style changes not only among the young but also among the aged. In parallel with such changes in family structure and life-styles, development induces a rise in rural-urban mobility, which in turn, poses geographical obstacles to reciprocal family aid.

In Asia, the urbanization process has been slower than in other parts of the world. It is expected, however, that the tempo of urbanization in many Asian countries will accelerate in the next few decades (Pernia, 1987). For this reason, the well-being of the elderly in Asia is likely to be seriously jeopardized with the passage of time unless a series of effective government policies are brought into effect.

It is also important to note that both population aging and economic development are closely interconnected and mutually interdependent. For example, the provision of health care and old-age pensions for the aged population requires a vast amount of financial and manpower resources, thus competing with alternative government investments.

In the present paper, therefore, an attempt will be made to analyse the interrelationships among population change, the welfare of the aged, and overall development. In the section A, we will briefly discuss the demographic profile of the elderly in Asia. In section B, some of the major linkages among demographic factors, the socio-economic well-being of the aged, and developmental processes will be investigated, using a simplified theoretical framework. In section C, some of the serious problems related to the welfare of the elderly in Asia will be discussed, with special emphasis upon both public and family support systems on the basis of findings obtained from several studies recently conducted. In the final section of this paper, further research areas will be considered.

A. DEMOGRAPHIC PROFILE OF THE ELDERLY IN ASIA

The population aged 65 and over in Asia was estimated to be 131.8 million in 1985 (United Nations, 1986). These elderly persons correspond to 4.7 per cent of the total Asian population, which is considerably lower than in developed regions (11.2 per cent), and slightly below the average for the world (5.9 per cent). Owing to the large population size in Asia, however, the elderly residing in the Asian countries amount to 46.1 per cent of the aged population of the world as a whole. According to the 1984 United Nations population projections, this percentage is expected to rise to 50.9 per cent in the year 2000 and to 56.9 per cent in 2025. Moreover, the expected huge increase in a single segment of a population, those aged 65 and over in Asia, is historically unprecedented (Myers, 1988).

Table 1 compares the proportion of the population at ages 65 and over for selected Asian and Western countries and areas in 1985. In Asia, Japan's popula-

Table 1. International comparison of the proportion of those aged 65 and over in 1985

Selected Asian countries		*Selected Western countries*	
Country/area	*Percentage of aged population*	*Country/area*	*Percentage of aged population*
Japan	10.3	Australia	10.1
Nepal	2.9	Canada	10.4
Bangladesh	3.1	United States	11.7
Philippines	3.4	Netherlands	11.8
Indonesia	3.5	Finland	12.3
Thailand	3.7	France	12.4
Malaysia	3.8	Italy	13.0
Republic of Korea	3.8	Belgium	13.4
India	4.3	Switzerland	14.0
Sri Lanka	4.6	Germany, Federal Rep. of	14.5
Singapore	5.2	United Kingdom	15.1
China	5.3	Norway	15.5
Hong Kong	7.6	Sweden	16.9

Source: United Nations, *World Population Prospects: Estimates and Projections as Assessed in 1984*, Population Studies, No. 98 (New York, 1986).

tion is by far the most aged; 10.3 per cent of its population are aged 65 and over. Japan is followed by Hong Kong (7.6 per cent), China (5.3 per cent), Singapore (5.2 per cent), and Sri Lanka (4.6). One of the United Nations studies suggested that populations would be defined as "aged" if they had more than 7 per cent of persons above the age of 64 (United Nations, 1956). Based upon this somewhat arbitrary definition, only Japan and Hong Kong belong to this category at present. Although Japan's population is noticeably aged in the Asian region, it is still young relative to the population of the Western industrialized countries.

Table 2 shows changes in the proportion of the aged population for 20 selected Asian countries and areas over the period 1950-2025. A few points of interest emerge from this table. First, by the year 2000, the populations of both China and Singapore are expected to be classified as "aged", and by 2025, 14 out of 20 countries and areas are projected to reach the benchmark commonly used to define an aged population. In particular, it is estimated that in 2025, Japan (20.3 per cent), Singapore (17.9 per cent) and Hong Kong (17.5 per cent) will have more aged populations than Sweden in 1985, which among the

Table 2. Changes in the proportion of population aged 65 and over in selected Asian countries or areas, 1950-2025

(Percentage)

Countries/areas	*Year*									
	1950	*1960*	*1970*	*1980*	*1985*	*1990*	*2000*	*2010*	*2020*	*2025*
Afghanistan	1.9	2.1	2.2	2.5	2.7	2.7	3.1	3.7	4.2	4.5
Bangladesh	4.6	4.0	3.5	3.4	3.1	2.9	2.8	3.1	3.6	4.3
Burma	3.2	3.4	3.7	4.0	4.2	4.4	4.7	5.2	7.0	8.1
China	4.5	4.8	4.3	4.7	5.3	5.9	7.2	8.2	11.4	12.9
Democratic Kampuchea	2.7	2.7	2.8	2.5	2.6	2.9	3.6	4.4	6.5	7.7
Hong Kong	2.5	2.8	4.0	6.5	7.6	8.4	10.0	10.4	14.4	17.5
India	3.3	3.4	3.7	4.0	4.3	4.6	5.6	6.6	8.3	9.7
Indonesia	4.0	3.3	3.1	3.3	3.5	3.8	5.0	6.1	7.4	8.7
Iran, Islamic Rep. of	1.2	2.1	3.1	3.4	3.3	3.3	3.5	4.0	5.6	6.6
Japan	4.9	5.7	7.1	9.0	10.3	11.4	15.1	18.0	20.8	20.3
Lao People's Democratic Republic	2.4	2.3	2.6	2.9	3.1	3.2	3.5	4.0	4.7	5.2
Malaysia	6.4	4.2	3.2	3.7	3.8	3.9	4.4	5.6	7.8	9.4
Nepal	4.5	3.9	3.0	3.0	2.9	3.1	3.5	3.8	4.1	4.5
Pakistan	6.1	4.4	3.2	2.9	2.8	2.8	3.0	3.2	4.2	5.1
Philippines	4.5	3.6	2.7	3.4	3.4	3.5	3.8	4.7	6.3	7.5
Republic of Korea	3.0	3.3	3.3	3.8	4.0	4.4	5.8	7.6	9.6	11.7
Singapore	2.4	2.1	3.4	4.7	5.2	5.6	7.1	9.2	14.5	17.9
Sri Lanka	3.9	3.6	3.6	4.3	4.6	5.1	6.4	7.6	10.2	11.8
Thailand	4.1	3.3	2.9	3.5	3.7	3.9	4.7	5.7	7.5	9.1
Viet Nam	3.9	4.2	4.3	4.0	4.0	4.1	4.3	4.7	5.5	7.1

Source: Same as table 1.

developed countries currently has the highest level of elderly in the population. Moreover, by the year 2025, these Asian countries are expected to have older populations than some of the developed countries, such as the United States of America (17.2 per cent) and Australia (15.9 per cent).

Second, it is interesting to observe that in 1950 Japan's aging level was lower than that for Pakistan. Owing to the difference in the subsequent fertility paths in these countries, the percentage of the aged population for the former is 3.7 times higher than that for the latter in 1985. In the case of Pakistan, the relative share of the elderly population declined considerably from 6.1 to 2.8 per cent during the period under consideration. In addition to Pakistan, several countries in Asia underwent a rejuvenation of their population. These countries include Bangladesh, Democratic Kampuchea, Indonesia, Malaysia, Nepal, the Philippines and Thailand.

Third, it is important to note that the speed of aging is likely to accelerate in some of the countries and areas listed in table 3. This observation is applicable particularly in the early part of the next century. For instance, China is expected to increase its share of the aged population from 7.2 per cent in 2000 to 12.9 per cent in 2025, Hong Kong from 10.0 to 17.5 per cent, the Republic of Korea from 5.8 to 11.7 per cent, and Singapore from 7.1 to 17.9 per cent. Furthermore, the pace of aging for Singapore is considerably faster than for Japan, although at present the latter is currently more aged than the former. In the case of Singapore, the proportion of those aged 65 and over increases from 10 to 15 per cent in 9 years, namely from 2012 to 2021 while it requires 15 years for Japan. It should be emphasized, however, that as displayed in table 3, the tempo of the aging of the Japanese population is substantially more

Table 3. International comparison of the speed of population aging

Country	*Year in which the aged population reaches*		*Time required to increase from 10% to 20% (years)*
	10%	*20%*	
Japan	1985	2 017	32
Finland	1973	2 021	48
Switzerland	1958	2 012	54
Netherlands	1968	2 020	52
Germany, Federal Rep. of	1954	2 010	56
Denmark	1956	2 017	61
Luxemburg	1952	2 022	70
Sweden	1929	2 014	85

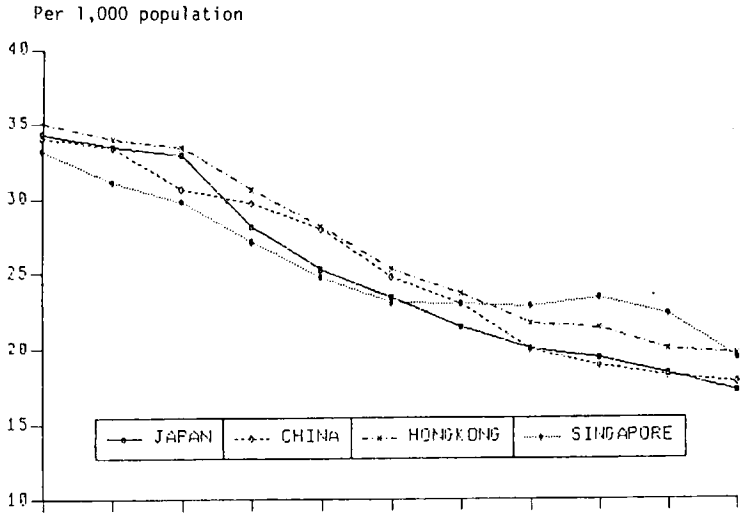
Source: Same as table 1.

rapid, compared with that of Western industrialized populations, implying that Singapore's aging process may be the fastest in the world.

Figure I depicts the pattern of intertemporal changes in the crude birth rate for four Asian countries or areas over the selected periods. By inspecting this graphical exposition, one can easily observe that all four underwent highly comparable fertility declines, although the time period for each differs considerably. This result seems to suggest that as a forerunner of the fertility transition, Japan's population aging experience may be used for the other Asian countries or areas as a base for formulating appropriate policies to cope with various aging problems, particularly because all four share similar cultural settings.

As briefly mentioned earlier, China's population is projected to age at a pronounced rate in the next several decades. According to one of the population projections recently prepared for the Government of China under the auspices of UNFPA (Ogawa and others, 1985), China's population aged 65 and over will be 138 million in 2014, which is larger than Japan's entire population. In this projection, the percentage of Chinese elderly in the total population will peak at 22.6 per cent in 2045.

Figure I. Changes in the crude birth rate for four Asian countries or areas over selected time periods



1947	48	49	50	51	52	53	54	55	56	57	Japan
1969	70	71	72	73	74	75	76	77	78	79	China
1961	62	63	64	65	66	67	68	69	70	71	Hong Kong
1964	65	66	67	68	69	70	71	72	73	74	Singapore

Shown in table 4 are expectations of life at birth and at later ages for selected Asian countries in the 1970s and 1980s. Expectation of life at birth in Japan in 1984 was 74.54 years for males and 80.18 years for females, the highest anywhere in the contemporary world. It is important to note, however, that Japan's life expectancy at age 65 is not the highest of all the countries in the table; Pakistan shows an even higher life expectancy at this age for both males and females. This cross-over phenomenon can be observed between various pairs of the countries listed in this table. For instance, although the Republic of Korea shows higher life expectancy at birth than Bangladesh, Burma and Pakistan, the remaining years of life at higher ages for the Republic of Korea are considerably shorter than those for Bangladesh, Burma and China. More importantly, in terms of number of years, the differences between the countries at higher ages are not so pronounced as at birth. Although the difference in life expectancy at birth for males between Japan and Bangladesh amounts to approximately 20 years, it shrinks to only 3.73 years for males at age 65. One of the primary reasons for this pattern is that for individuals who survive to age 65 in both developing and developed nations, average remaining years of life are rather similar owing to the principle of survival of the fittest.

Another crucial point emerging from table 4 is related to the difference in life expectancy at higher ages between males and females. In all the countries with the exception of Pakistan, the number of remaining years to be lived at advanced ages is larger for females than for males, although the male-female differential varies widely cross-nationally. In the case of Bangladesh, for example, life expectancy at age 65 for females is only 1.4 years higher than that

Table 4. Expectation of life at birth and at later ages for males and females in selected Asian countries

(Unit: year)

Country	Year	Males				Females			
		0	*60*	*65*	*70*	*0*	*60*	*65*	*70*
Bangladesh	(1981)	55.30	14.70	11.70	9.00	54.40	16.00	13.10	10.40
Burma	(1978)	58.93	14.63	11.82	9.20	63.66	17.40	14.06	10.87
China	(1981)	66.43	–	12.44	–	69.35	–	14.60	–
Japan	(1984)	74.54	19.24	15.43	11.93	80.18	23.00	18.71	14.67
Malaysia	(1979)	67.17	16.59	13.57	11.37	72.49	20.00	16.62	13.94
Pakistan	(1976-78)	59.04	19.25	16.08	13.08	59.20	19.27	15.71	12.72
Rep. of Korea	(1978-79)	62.70	12.74	9.89	7.69	69.07	17.87	14.13	10.77
Singapore	(1980)	68.70	15.20	12.20	9.70	74.00	18.80	15.10	11.80
Sri Lanka	(1981)	67.78	17.74	14.25	11.07	71.66	19.57	15.69	12.19

Source: United Nations, *Demographic Year Book, 1985* (New York, 1985).

for males, but the corresponding figure for the Republic of Korea is 4.24 years. In addition, mortality risks between males and females vary substantially at different ages; in high-fertility countries, for instance, middle-aged women show higher mortality due to various complications arising from pregnancies and deliveries. As a result of such intercountry mortality differentials by sex, the sex ratio of the elderly differs markedly from country to country. The predominance of women can be observed in virtually all the countries included in table 5, particularly at higher ages. There are two intriguing exceptions here; in both Afghanistan and Nepal the number of males exceeds that of females even at ages 85 and over. In contrast, there are only 27 men for every 100 women after the age of 85 in Hong Kong and the Republic of Korea. In Japan, the demographic feminization of the elderly is the most pronounced between the ages of 60-64. These results seem to point to the positive relationship between the level of development and the predominance of women at higher ages.

Table 5. Gender ratios at higher ages in selected Asian countries and areas

(Unit: males per 100 females)

Country/area	*(Year)*	*Age*					
		60-64	*65-69*	*70-74*	*75-79*	*80-84*	*85+*
Afghanistan	(1979)	116.8	158.6	125.2	169.9	128.5	168.8
China	(1982)	100.4	91.7	81.3	68.3	57.4	44.6
Hong Kong	(1981)	101.3	90.4	70.1	51.8	37.8	26.8
Japan	(1980)	77.2	78.5	77.3	71.4	61.8	48.1
Malaysia	(1980)	102.4	113.2	107.7	118.6	94.5	93.7
Nepal	(1981)	109.0	115.8	112.9	112.1	104.8	106.1
Philippines	(1980)	95.0	94.6	96.3	100.6	86.4	77.1
Rep. of Korea	(1980)	83.2	72.5	61.5	47.8	36.4	26.9
Sri Lanka	(1981)	116.5	109.9	117.5	108.5	115.7	89.9

Source: Same as table 4.

The relative surplus of women at older ages in Asian countries and areas is also reflected in data on marital status. As presented in table 6, in the early 1980s, the proportion of women aged 65 and over who were married falls in the range of 20 to 50 per cent. On the other hand, the proportion of men at ages 65 and over who were married was markedly higher, ranging from 70 to 90 per cent. In view of the wide prevalence of the universal marriage pattern in Asia, these results appear to suggest that the modal marital status for older women in these Asian countries is widowhood (Martin, 1987). It should also be

Table 6. Marital status of males and females at ages 65 and over in selected Asian countries and areas

(Percentage)

Country	*(Year)*	*Males*			*Females*		
		Single	*Married*	*Widowed*	*Single*	*Married*	*Widowed*
Bangladesh	(1981)	0.2	89.1	10.6	0.1	27.6	72.2
China[a]	(1982)	2.5	69.0	27.0	0.3	41.2	58.1
Hong Kong	(1981)	3.6	79.9	15.8	7.1	34.4	57.5
India	(1981)	2.0	74.2	23.3	0.4	28.9	70.3
Indonesia	(1980)	1.3	81.3	15.4	1.4	25.1	68.2
Japan	(1980)	0.8	80.6	17.0	13.0	35.4	60.1
Malaysia	(1980)	3.8	76.1	17.2	2.1	29.7	60.8
Nepal	(1981)	8.4	78.1	13.1	7.1	56.7	35.5
Pakistan	(1981)	4.3	77.4	18.0	2.7	47.3	49.7
Philippines	(1980)	3.4	76.2	19.3	8.2	41.0	49.6
Rep. of Korea	(1980)	0.2	79.9	19.7	0.1	24.3	75.4
Singapore	(1980)	4.6	75.7	18.6	5.4	29.5	64.3
Sri Lanka	(1981)	6.7	78.3	14.4	4.9	44.6	50.1
Thailand	(1980)	1.4	71.2	20.6	1.9	33.5	58.4

Source: Linda Martin, "The aging of Asia", paper presented at the annual meeting of the Population Association of America, Chicago, 1987.

Note: [a] At ages 60 and over for China.

noted that although marital status among the elderly is influenced by divorce and remarriage at older ages to a certain extent, it is more strongly affected by differential mortality between males and females (Myers, 1988). It should be further noted that as a result of the improved joint survival to older ages of both husbands and wives, the incidence of being widowed for both males and females has declined or remained the same for a number of countries in recent years (*Ibid.*).

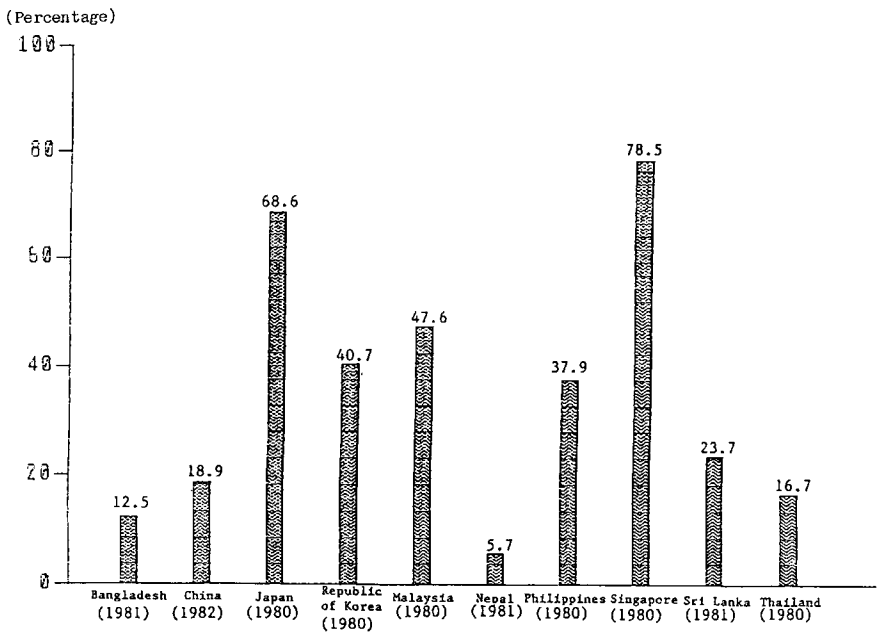
Now, let us discuss living arrangements for the elderly in Asia. One of the national sample surveys undertaken in the Republic of Korea in 1985 shows that 79 per cent of 1,856 respondents aged 60 and over were living with their children (Choi, 1985). A sample survey conducted in one of the provinces in northern China in 1983 found that 79 per cent of the rural elderly were living with their children (Qu, 1984). According to recent World Health Organization surveys on the elderly, 72 per cent of Malaysians aged 60 and over were living with their children, and the corresponding figure for the Philippines was 79 per

cent (Andrews and others, 1986). In the case of Japan, 56.6 per cent of those aged 65 and over were living with their children in 1985 (Ministry of Health and Welfare, 1986); it should be stressed, however, that this percentage has been gradually declining; for example, it was 64.0 per cent in 1975.

Figure II illustrates the intercountry differences in the proportion of aged women residing in urban areas in the early 1980s. From this graph, one can observe that the majority of the female elderly in Asia are in rural areas. It can also be observed from figure II that the older women in the more developed nations tend to live in urban areas. In Singapore, approximately 80 per cent of the female population aged 65 and over were residing in urban areas in 1980. Singapore is followed by Japan (68.6 per cent) in 1980, Malaysia (47.6 per cent) in 1980, and the Republic of Korea (40.7 per cent) in 1980. In marked contrast, in 1981, only 5.7 per cent of Nepalese elderly women were in urban areas, followed by Bangladesh (12.5 per cent).

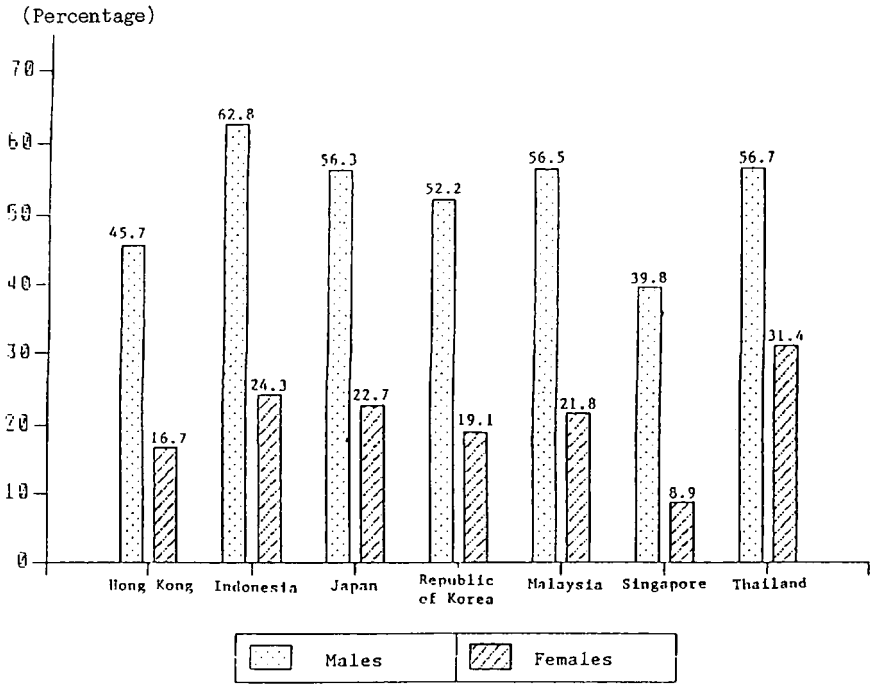
Because the predominant portion of the elderly in Asia inhabit rural areas, their labour force participation rates are extremely high by international standards, as shown in figure III. Among the seven countries and areas in this graph, the male labour force participation in Indonesia is the highest; in 1980, 62.8 per

Figure II. Percentage of women aged 65 and over residing in urban areas in selected Asian countries



Source: Same as table 6.

Figure III. Labour force participation rates for males and females aged 60 and over in selected Asian countries and areas, 1980



Source: International Labour Office, *Year Book of Labour Statistics*, Geneva, 1984.

cent of Indonesian men aged 60 and over were in the labour force. The male labour force participation rates for the other countries range roughly from 40 to 55 per cent. But the labour force participation rates for the female elderly were substantially lower than those for the male elderly. As compared with males, the female labour force participation rates among the aged vary more widely from country to country, ranging from 9 per cent for Singapore to 31 per cent for Thailand.

Based upon the foregoing discussions, one can describe the demographic profile of the elderly in Asia as follows: the majority of the aged are women, many of whom are widows; most of the Asian elderly are living with their children and in rural areas; and a substantial proportion of the elderly are engaged in economic activities. It seems from the fragmentary evidence presented above and elsewhere, however, that in the process of economic development, this general profile of the elderly in Asia has been gradually changing. In some Asian countries, these changes have already aroused the concern of policy makers and development planners, particularly because the tempo of population aging in these countries is unprecedentedly fast.

B. INTERRELATIONSHIPS BETWEEN DEMOGRAPHIC CHANGE AND THE WELFARE OF THE AGED: A SUGGESTED CONCEPTUAL FRAMEWORK

In this section, we will discuss some of the principal linkages between population change and the welfare of the aged. Because these two factors are closely connected with the modernization process, the section draws heavily upon the modernization hypothesis advanced by Cowgill and Holmes (1972) as a useful base for discussion. To a certain extent the validity of this hypothesis will be tested on the basis of cross-sectional data for around 1980 gathered from more than 120 countries including a number of Asian countries. These intercountry data have been collected from annual reports and statistical yearbooks published by various organizations.

The modernization hypothesis consists of a host of generalizations, but the following few generalizations are related to the population-modernization nexus:

(i) Longevity is directly and significantly related to the degree of modernization;

(ii) Modernized societies have higher proportions of old people;

(iii) Modern societies have higher proportions of women and especially widows.

As examined in the previous section, these generalizations are highly applicable to the Asian context. As displayed in figures IV and V, the validity of the first two generalizations has been endorsed by a set of intercountry data covering both Asian and other regions. In both graphs, the level of economic development is proxied by per capita GNP.

As regards the linkage between population changes and the welfare of the aged, the following generalizations can be highlighted:

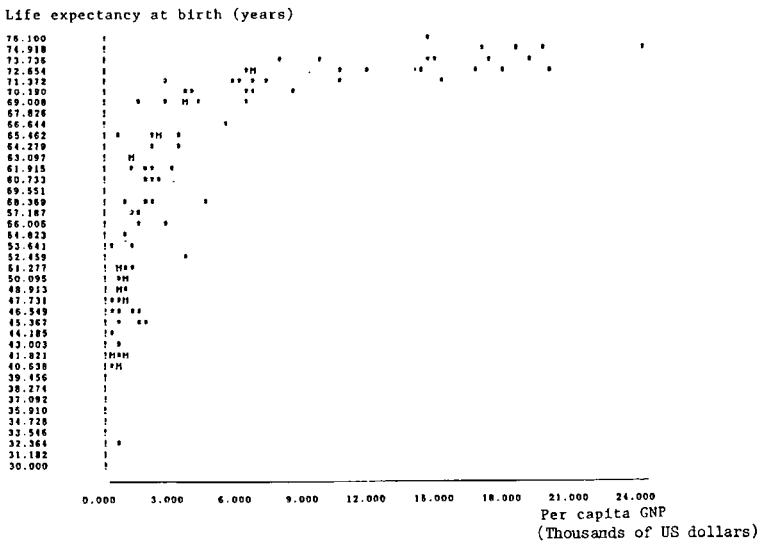
(iv) Mobility tends to undermine the high status of the aged;

(v) The status of the aged is high in societies in which the extended form of the family is prevalent and tends to be lower in societies which favour the nuclear form of the family and neological marriage.

Insofar as the interrelationships between modernization and the economic well-being of the elderly are concerned, the following generalizations have been included in the Cowgill-Holmes hypothesis:

(vi) The status of the aged is high in primitive societies and is lower and more ambigious in modern societies;

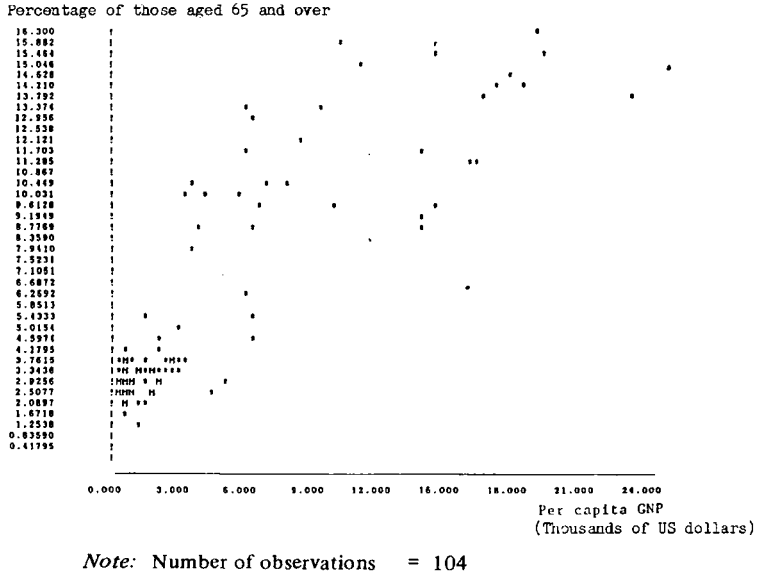
Figure IV. Relationship between economic development and life expectancy at birth



Note: Number of observations = 104

Simple correlation = 0.721

Figure V. Relationship between economic development and proportion of those aged 65 and over



Note: Number of observations = 104

Simple correlation = 0.605

(vii) The status of the aged is high in societies in which there is a high reverence for or worship of ancestors;

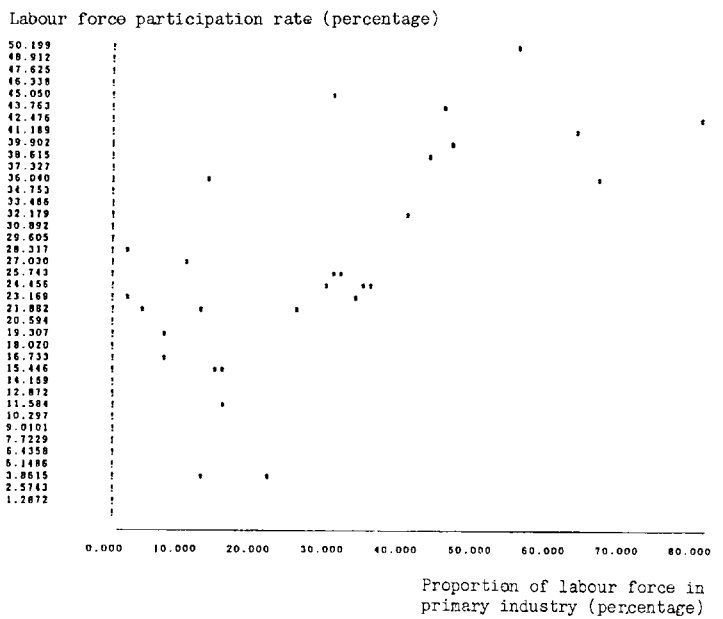
(viii) The status of the aged is inversely proportional to the rate of social change;

(ix) The status of the aged tends to be high in agricultural societies and lower in urbanized societies;

(x) Retirement is a modern invention, and it is found chiefly in modern high-productivity societies.

As for generalization (ix), we have plotted in figure VI the relationship between the proportion of the labour force allocated to primary industry and the labour force participation rate for those aged 60 and over. The positive correlation between these two variables implies that the labour force participation rates for the elderly are high in agricultural societies. Evidence of the relatively strong economic position of the aged in primitive agricultural communities has been

Figure VI. Relationship between proportion of labour force in primary industry and labour force participation rates for the elderly

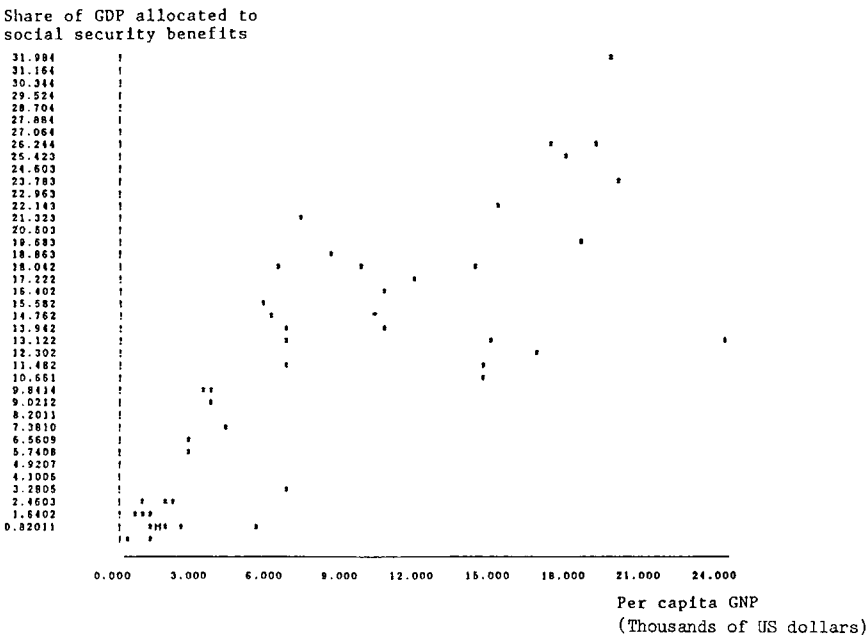


Note: Number of observations = 29
Simple correlation = 0.670

assembled in some of the previous studies (Petri, 1982); one important factor is that the economic value of knowledge and experience relative to physical progress is generally high in stable agriculture. In addition, work in agriculture involves a wide range of activities and thus permits greater specialization among individuals between light and heavy tasks. Although the relative economic status of the elderly in agricultural societies is high as compared with that of their younger counterparts, it should be mentioned that because of inferior working conditions and low earnings in primary industry, the economic status of aged workers in developing countries is severely limited when judged by international standards.

Cowgill and Holmes have also pointed out that with modernization the responsibility for the provision of economic security for the dependent aged tends to be shifted from the family to the State. In other words, the source of old-age security for the aged is likely to be switched from the family support system to the public support system, or from personal transfers to public transfers. Clearly, the data shown in figure VII point to an increase in the importance of the role of the public support system as the level of economic development is heightened. In this graph, it is indicated that the share of GDP allocated to the provision of social security benefits rises with economic progress. The com-

Figure VII. Relationship between economic development and share of GDP allocated to social security benefits



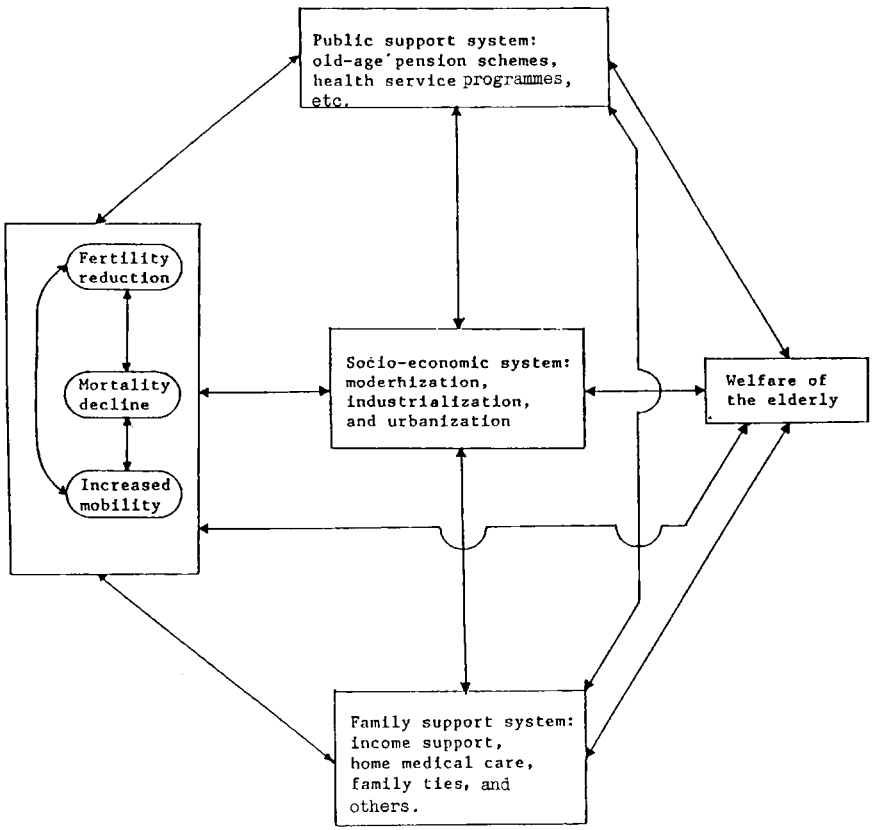
Note: Number of observations = 46
Simple correlation = 0.808

puted correlation between the two variables is 0.808, which is the highest among all the graphical analyses presented in this section.

Although the number of observations contained in each graphical exposition varies considerably owing to the limited availability of data, all the results seem to suggest that the modernization hypothesis is highly applicable to the data set utilized in the present study. It should be emphasized, however, that because this finding has been derived only on the basis of cross-sectional information, it does not necessarily imply that the economic status of the elderly in contemporary developing countries will become comparable to that of the developed countries in the course of economic development.

On the basis of the above theoretical discussion and empirical results, we can perhaps formulate, as shown in figure VIII, a simplified conceptual framework for analysing the plausible interrelationships between population change

Figure VIII. Schematic framework for analysing the interrelationships between population change and the welfare of the aged



and the welfare of the aged. Although the modernization hypothesis refers only briefly to both family support and public support systems, the role of these two systems in supporting the elderly is extremely important, as is widely documented in the literature. For this reason, we have explicitly added these two systems to the above schematic chart. In view of the importance attached to such systems, therefore, we will discuss some of the main problems involved in these systems in the Asian region.

C. PUBLIC AND FAMILY SUPPORT SYSTEMS IN ASIA

In figure VII presented in the previous section, we have observed that the proportion of GDP allocated to the social security benefits is positively related to the level of economic development. Owing to their low levels of development, the relative share of the social security expenditure in GDP is extremely low in most of the Asian developing countries. In 1980, for instance, it was 1.0 per cent for Malaysia, 0.6 per cent for the Philippines, 3.9 per cent for Singapore, and 1.7 per cent for Sri Lanka. In Asia, however, Japan is an exception; 10.9 per cent of its GNP was allotted to the social security programme in 1980.

The validity of the above observation is further substantiated by the following micro-level data. According to recent WHO surveys on the elderly cited earlier, 30 per cent of the Korean respondents thought that their income was not sufficient; the corresponding figures for Malaysia and the Philippines were 8 per cent and 43 per cent, respectively. Data gathered in the same surveys showed that in all of these countries, the chief source of their income was their families. In the case of the Republic of Korea, the sources of their income were family (67 per cent), work (19 per cent), pensions (6 per cent), and others (8 per cent). For the Malaysian respondents, the percentage distribution of these responses was 62, 19, 14 and 5 per cent, while it was 54, 22, 13 and 11 per cent for the Philippine elderly. These results indicate that in these Asian countries, most old-age support comes from traditional sources rather than public transfer programmes.

In most countries of Asia, public pensions, which are one of the core components of the public support system, are available to only a small proportion of the elderly in urban areas. In Singapore, the Central Provident Fund, which was established in 1953, covered 36 per cent of 54-year-olds in 1983 (Jones, 1985). This system has been under operation with the principle of equity; each individual has his or her own account. The contribution rate is very high, namely, 25 per cent of the employee's salary from both the employer and the employee, although in 1986 the employer's contribution was reduced for two years to 10 per cent. A lump-sum payment is made at age 55, although members can borrow some of the funds at an earlier age (Martin, 1987).

In Sri Lanka, a provident fund scheme is available. In 1979, almost half the work force was enrolled in the Employees' Provident Fund with contribu-

tion rates of 6 per cent from the employee and 9 per cent from the employer. In Malaysia, the provident fund, which was instituted in 1952, covered approximately 73 per cent of the work force in 1981. Contribution rates were 9 per cent by the employee and 11 per cent by the employer (Jones, 1985). In India, in 1978, 9.4 million out of more than 200 million workers were contributing to the provident fund 6.25 to 8 per cent of their wages, as were their employers (Petri, 1982). In other Asian countries, provident funds are also in operation, but on a more limited scale. These countries include Indonesia and Nepal. In both Pakistan and the Philippines, social insurance schemes are available, though they are at a premature stage. In Thailand, the existing old-age pension plans cover government employees, state enterprise employees, and private enterprise employees (Kiranandana, Wongboonsin, and Kiranandana, 1988). In 1985, it was estimated that only 7 per cent of the elderly aged 60 and over received benefits from these highly urban-based pension plans.

In China, in 1981, 45 per cent of urban retirees were pension recipients, as opposed to 1.5 per cent of rural retirees. Because of such limited coverage in rural areas, the rural aged continue to work as long as their physical condition permits. In some urban areas, the average amount of the annual pension benefit per recipient in urban areas is 660 yuan, which is 4.5 times as high as the government expenditure allocated for the average child (Wu and Xu, 1987). This implies that the resources saved from fertility reduction have been substantially eroded by the requirements of the elderly. To make up the rural welfare system, each rural work team or brigade provides the five guarantees (food, clothing, medical care, housing and burial expenses) for those who are destitute and childless.

The above cursory overview of pension programmes currently available for the elderly in the Asian developing countries attests that both the scope and depth of income provision is limited by the overall level of socio-economic resources and competing demands upon these resources by different social groups. In contrast to these developing countries in Asia, Japan is substantially more advanced in the development of the public pension programme. In Japan, the universal pension system was established in 1961. This system is comprised of three major schemes covering different occupation-specific groups. Out of these three schemes, the Employee's Pension Scheme (ESP) and the National Pension Scheme (NPS) cover approximately 90 per cent of the population. One of the major differences between these two leading schemes is that paid employees are enrolled in ESP, whereas farmers and self-employed workers are members of NPS. Moreover, under ESP, 12.5 per cent of each worker's salary is contributed to the Government, and it is shared by both an employee and his or her employer on an equal basis, but under NPS, a flat contribution is collected by the Government from each member. The former has a relatively strong financial base with the young age structure, but the latter which has a rapidly growing number of recipients has already been confronted with serious financial difficulties. Because each occupational category has a different level of aging, these eight fragmented pension schemes are affected by demographic changes in a different fashion and to a different degree. Moreover, although all of these

pension schemes started on an equity basis, as a consequence of a series of benefit improvements, some of these pension schemes are virtually operating on a pay-as-you-go (PAYG) basis. In the case of PAYG financing, demographic changes directly affect the benefit-contribution pattern, thus posing in an aging society like Japan formidable problems such as intergenerational conflicts in sharing the financial burden. Changes in financing schemes affect the economic well-being of the elderly as well as that of the young. In this context, these Japanese lessons may provide a useful base for development planners of the developing Asian countries when they implement a universal pension system in their own countries in the future.

In addition to public pensions, the governmet medical service programme is a major component of the social security system. Reviews of health programmes and planning in world perspective document pronounced differences in approaches. In the United States, for instance, market forces are stressed in the development and allocation of health resources. In contrast, the welfare of socialist states hinges upon centralized national health planning. Between these two extremes lie most countries in both developing and developed countries; the extent to which these considerations are reflected in the health programme of each of these countries is heavily dependent not only upon its economic and demographic development but also on cultural, historical and ideological factors.

It is the case in virtually all populations that older age groups experience more illness and need considerably more health services than younger age groups. Owing to limited access to health care services in both public and private sectors, however, the health condition of the elderly in developing nations is generally less favourable than in developed nations. Moreover, when the process of population aging advances, health care should be redirected away from prenatal and pediatric care toward a greater emphasis on geriatric medicine.

As compared with pensions, health care is more widely available to the elderly of Asia. However, the adequacy and accessibility of health care differs from country to country as well as within each country. In China, for example, urban elderly retired from state-owned enterprises receive free medical care services, whereas the medical care costs of all other urban elderly are paid by municipal governments. In rural areas, most brigades have co-operative health plans (Martin, 1987). In Singapore, a part of each person's account in the Central Provident Fund has been used for the Medisave programme since 1984. In Malaysia, comprehensive health and medical services have been available to the general population, but not specifically for the elderly. It should be noted, however, that the share of the total government medical expenditure in GNP increased from 1.51 per cent in 1970 to 3.53 per cent in 1980. As a result, the Malaysian Government has recently started exploring the possibility of privatizing medical care services (Ogawa, 1985).

In Thailand, the Government has been playing an almost exclusive role in providing health services to the people except in the Bangkok metropolis where the private sector has also been playing a significant role. From 1979 to 1983, total government expenditures measured in terms of 1983 constant prices

increased from 0.98 billion to 1.30 billion baht. These expenditures relative to real GNP were 1.17 per cent in 1979, but grew to 1.43 per cent in 1983. On a per capita basis, they rose from 212 to 263 baht over the period in question (Ogawa, Poapongsakorn and Mason, 1988). In the public sector, the main supplier of health services has been the Ministry of Public Health.

In the recent past, a health study commissioned by the National Economic and Social Development Board was conducted to estimate the Ministry of Public Health's future financial requirements for medical care services (Ogawa, Poapongsakorn and Mason, 1988). This study has shown that the number of outpatients served by the Ministry's health facilities will grow from 28.0 million in 1980 to 40.4 million in 2015. Similarly, the number of inpatients will increase from 2.3 million in 1980 to 4.0 million in 2015. It is important to note that the age structure of these patients changes rapidly over time; the proportion of outpatients aged 0-14 will diminish steadily from 53.5 per cent in 1980 to 30.6 per cent in 2015. In parallel with the growth of the number of patients and their age compositional shifts, The Ministry's total recurrent costs at 1980 constant prices will increase by 6.5 times during the 35-year period, namely, from 3,506 million baht in 1980 to 22,780 million baht in 2015.

In this health sector study, the household projection package, HOMES (Mason, 1987), has been utilized to analyse the changing allocation pattern of the Ministry's future medical resources by household type. One of the interesting findings of this HOMES-based analysis is that roughly 42 per cent of total recurrent expenditure is directed to those patients belonging to intact households with their heads aged under 40 years old, although this percentage diminishes slightly over time. Another interesting finding is that an increasing amount of MOPH's recurrent costs is allotted to households with older heads. This population aging effect, coupled with higher medical costs at higher ages, is the most pronounced among one-person male households, followed by one-person female households, single male households and single female households. Findings of this nature provide instructive information when public health policies are changed. In Japan, for example, the public free medical service programme for those aged 70 and over was abolished in 1983. In the following year, the government free physical examination programme for those aged 40 and over was implemented. Evidently, because the age structure of each household type was considerably different, these age-specific policy changes affected the allocative pattern of public financial resources among various households differently, thus arousing much controversy from a welfare point of view.

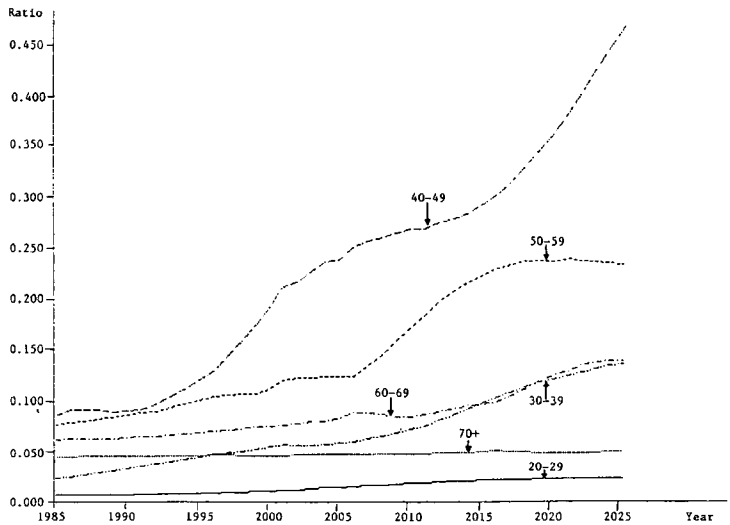
Because of the high cost of hospital use and technology in the care of an ever-increasing elderly population, growing attention has recently been directed toward the role of families in supporting the health of their aged parents in both developing and developed countries. It is worth noting, however, that owing to intercountry differences in the family structure, the extent to which aged parents have access to their informal support varies substantially between developing and developed nations. According to one of the international comparative surveys conducted in 1981 covering five countries, in a developing

country like Thailand, 38.9 per cent of the elderly at ages 60 and over were living in a three-generation arrangement. In contrast, it was only 0.6 per cent in the United Kingdom, 1.6 per cent in the United States, and 3.5 per cent in France. Although highly industrialized, Japan showed a high percentage of extended families; 36.9 per cent of the elderly sampled were living in three-generation households.

Despite their unique pattern by international standards, in the next few decades Japanese families are likely to face an extremely fast growth in the number of aged parents who need intensive care. These elderly parents in need of such care include those suffering from senile dementia and those who are bedridden. The projected number of senile dementia cases among the population aged 65 and over rises phenomenally from 691,000 in 1986 to 2,165,000 in 2015. Similarly, the total number of bedridden patients among the population at ages 65 and over is projected to increase from 681,000 in 1986 to 1,960,000 in 2025.

Owing to the wide prevalence of extended families and the limited availability of institutional care, the majority of these aged persons are looked after at home in contemporary Japanese society. More importantly, it is middle-aged women outside the labour force who usually assume this responsibility. In view of this, the ratio of non-working women at various ages, compared with the bedridden or senile elderly persons, has been projected over the period 1985-2025, as shown in figure IX. As can be observed from this graph, the

Figure IX. Change in the ratio of non-working housewives at various ages to the aged population suffering from senile dementia or being bedridden, 1985-2025



probability for full-time housewives at ages 40-49 having to take care of these elderly patients is 0.083 in 1985, but rises to 0.189 in 2000, and to 0.471 in 2025.

In an aging society like Japan, however, it is conceivable that owing to a growing scarcity of the overall labour supply, labour demand for the women of this age group would increase gradually. For this reason, the availability of institutional care as an alternative to home care should be urgently expanded to alleviate the heavy burden on these middle-aged women taking care of elderly patients. It should be borne in mind, however, that the provision of such care in institutions gives rise not only to higher health care costs but also to the deterioration of the psychological and emotional well-being of the sick elderly.

The foregoing review suggests that although family support is a distinct preference in taking care of the elderly in virtually all the countries in Asia, many of the Governments acknowledge the necessity of providing public support to needy older persons. In fact, the crucial question facing these Governments is the extent to which they should assist the elderly families and the level of resources to be allocated.

D. NEWLY-EMERGING ISSUES AND FURTHER RESEARCH AREAS

In the past two decades or so, a number of developing countries and areas have achieved new prominence in economic growth performance. Some of the developing countries and areas in Asia are typical examples. For instance, since 1960, the market economies of East Asia including the Republic of Korea and Taiwan (a province of the People's Republic of China) have been growing at average annual rates of 6 per cent or more on the basis of per capita income. Only slightly lower economic growth rates have been recorded by China and several South-East Asian countries during the corresponding period. One of the main propellants for the fast economic growth of these Asian countries is active international trade. As displayed in table 7, these Asian developing countries and areas have very high export-to-income ratios. In 1985, the ratio of exports to GNP in the ASEAN countries ranged from 14.7 per cent for the Philippines to 120 per cent for Singapore. The corresponding figure for Hong Kong was 87.3 per cent, while it was 34.2 per cent for the Republic of Korea. In most of these countries and areas these ratios have been rising over time. It is interesting to observe that the ratio of exports to GNP for Japan was 12.9 per cent in 1985, which was considerably lower than that of most of the countries listed in table 7. In the decades of rapid growth, the ratio for Japan was approximately 10-11 per cent, although there were noticeable fluctuations from year to year.

A brief comparison of these statistics indicates that the economic performance of the ASEAN countries and Asian newly industrializing economies is greatly affected by external factors through their international trade. The

Table 7. Ratio of exports of goods and services to GNP of selected countries and areas in 1985

Country/area	*Ratio (%)*
ASEAN	
Indonesia	21.5
Malaysia	49.1
Philippines	14.7
Singapore	120.2
Thailand	17.3
Other Asian developing countries and areas	
Hong Kong	87.3
Japan	12.9
Rep. of Korea	34.2

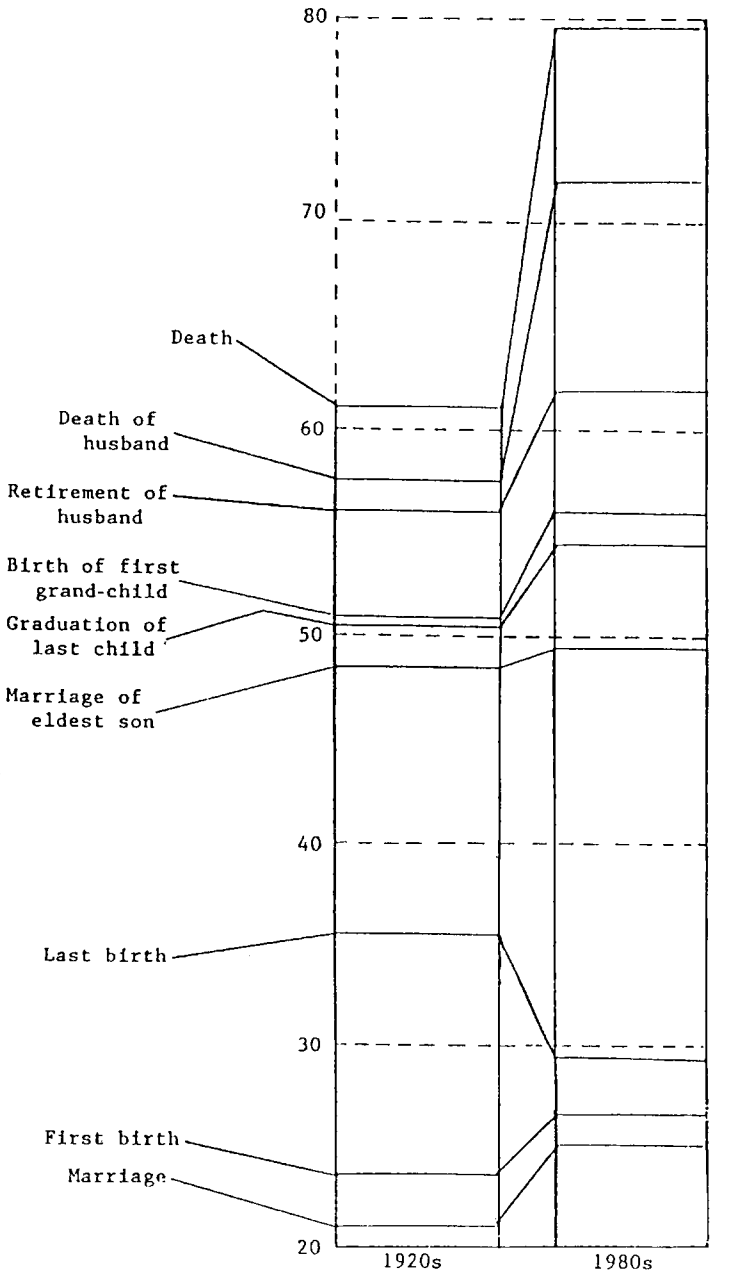
Source: World Bank, *World Development Report 1987* (Oxford University Press, 1987).

future economic growth of these Asian developing countries and areas is highly dependent upon that of developed countries such as Japan and the United States. This suggests that the feasibility of public policies being implemented for the aged population by contemporary developing countries and areas is subject to external factors through international trade. Because there are various uncertainties involved in these external factors, long-range planning for the provision of income and medical care services for the elderly through the public support system is an extremely difficult task.

In addition, changes in external factors are also likely to call for a series of structural adjustments in the developing countries and areas in Asia. These structural adjustments may affect the agricultural sector to a substantial extent, thus depriving the elderly of their employment opportunities. The welfare of the elderly in the rural economy may be seriously jeopardized. To analyse these effects, a CGE-based analysis seems to be extremely useful.

In the past two or three decades, mortality improvements in the developing Asian countries and areas are remarkable. The extension of life for the elderly affects their retirement plans. Moreover, fertility has also been declining in these economies. As a result of these demographic changes, the life cycle pattern of the elderly in Asia has been changing quite rapidly. As indicated in figure X, the life cycle pattern of Japanese people has changed dramatically in the last 60 years. To minimize planning difficulties for the elderly as well as the

Figure X. Change in the life course of Japanese women in the 1920s and 1980s



Source: Population Problems Council, *White Paper on Population of Japan* (1984).

young, more research efforts should be directed to an analysis of the effect of changing life cycles upon household formation in Asian countries and areas. The application of sophisticated household projections such as HOMES will be a useful tool for such research.

REFERENCES

Andrews, Gary R., Adrian J. Esterman, Annette J. Braunack-Mayer, and Cam M. Rungie. 1986. *Aging in the Western Pacific: A Four-Country Study,* World Health Organization Regional Office for the Western Pacific, Manila.

Choi, Hoil. 1985. "Selected characteristics on population and aging in the Republic of Korea", paper presented at Workshop on Population Aging, Sixteenth Summer Seminar on Population, East-West Population Institute, Honolulu.

Cowgill, Donald O., and Lowell D. Holmes. 1972. *Aging and Modernization,* Meredith.

Jones, Gavin. 1985. "Socio-economic consequences of the aging of the population", Phase III ASEAN Population Project, Inter-country Report.

Kiranandana, Thienchay, Kua Wongboonsin, and Suchada Kiranandana. 1988. "Population aspects of development in Thailand: health/nutrition, education and old age security", report prepared for ESCAP in connection with the project "Development of analytical framework for population and development research and planning", Bangkok.

Leete, Richard. 1987. "The post-demographic transition in East and South Asia: similarities and contrasts with Europe", *Population Studies,* vol. 41, No. 2, pp. 187-206.

Martin, Linda. 1987. "The aging of Asia", paper presented at the annual meeting of the Population Association of America, Chicago.

Mason, Andrew. 1987. "HOMES: A household model for economic and social studies", papers of the East-West Population Institute, No. 106, Honolulu.

Ministry of Health and Welfare. 1986. *Kosei Gyosei Kiso Chosa (Basic Survey for Welfare Administration),* Tokyo.

Myers, George C. 1988. "Demographic aging and family support for older persons", paper presented at the Expert Group Meeting on the Role of the Family in Care of the Elderly, Mexico City.

Ogawa, Naohiro. 1985. "Population growth and the costs of health care: the case of Malaysia", EPU Discussion Paper No. 13, Prime Minister's Office, Government of Malaysia, Kuala Lumpur.

Ogawa, Naohiro, Yasuhiko Saito, Shuben Yao, and Qin Xu. 1985. "Population projection for China 1985", Research Report No. 1, JOICFP, Tokyo.

Pernia, Ernesto. 1987. "A demographic perspective on developing Asia and its relevance to the Bank", Asian Development Bank Economics Office Report Series No. 40, Manila.

Petri, Peter A. "Income, employment, and retirement policies", in *International Perspectives on Aging: Population and Policy Challenges,* edited by R. Binstock, W.S. Chow, and J. Schultz, United Nations Fund for Population Activities, Policy Development Studies No. 7, New York, 1982, pp. 75-125.

Qu, Haibo, 1984. "Analysis of status of aged population", paper presented at the International Symposium on Population and Development, Beijing.

United Nations. 1956. *The Aging of Populations and its Economic and Social Implications,* Population Studies No. 26, New York.

United Nations. 1986. *World Population Prospects: Estimates and Projections as Assessed in 1984,* Population Studies No. 98, New York.

United Nations. 1987. "Global trends and prospects of the age structure of population: different paths to aging", *Papers and Proceedings of the United Nations International Symposium on Population Structure and Development,* New York, (forthcoming).

Wu, Yuanjin, and Qin Xu. 1987. "The impact of an aging population on socio-economic development and families in China", in *Aging China: Family, Economics, and Government Policies in Transition,* edited by James H. Schulz and Deborah Davis-Friedmann, The Gerontological Society of America, Washington, D.C., pp. 19-35.

V. POPULATION CHANGE AND ENVIRONMENT

ESCAP Secretariat

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INTRODUCTION

Environment is a development issue which is receiving increasing attention in the world and particularly in the ESCAP region. The region todays faces major problems of deforestation, desertification, air and water pollution and other environmental degradation. In the context of population and development integration, environment problems cannot be separated from population problems. Population increase and economic development to raise standards of living or welfare frequently involve depletion of resources and degradation of the environment. In turn, depletion of resources and environmental degradation adversely affect development, welfare and population trends. Yet, to view the problems of environmental deterioration as a consequence of growing populations and rising subsistence requirements is to oversimplify and, in some ways, to mistake the real situation. In many countries, the problems are considerably worse than would follow from the increase in numbers. It is not just population growth that is putting pressure on resources: rather, population growth in conjunction with other processes is leading to much more rapid depletion.[1]

Therefore, a review of the interrelationships between population variables and environmental conditions is essential for attempts to solve environmental as well as population problems. An understanding of the interrelationships will be useful for the formulation of guidelines for taking curative measures where deteriorating conditions exist and for the preparation of preventive measures to forstall the development of environmental problems. At the same time, an understanding of the interrelationships will also be useful in developing the type of population policies and related activities to assist in improving environmental conditions, the welfare of the population as well as the regulation of population trends.

The purpose of this paper is to provide a broad conceptual framework of the interrelationships between population and environment to serve as a guideline for further discussion.

The paper consists of three major sections. Section A presents a review of the regional situation regarding environment problems including resource depletion. In section B, a framework of the interrelationships between population and the environment is discussed. Some policy implications of the interrelationships are given in section C.

For the purpose of this paper, the "environment" is defined in a broad context covering natural resources and the physical environment or ecosystem

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[1] Robert Ropetto and Thomas Holmes, "The role of population in resource depletion in developing countries", *Population and Development Review,* vol. 9, No. 4, December 1983, p. 609.

which both supplies resources and acts as a repository for the wastes generated by consumption and production. The physical environment may be classified into (a) the "atmosphere", comprising such elements as air, space, weather and climate; (b) the "hydrosphere", involving water; (c) the "lithosphere", including land and soil, and fuel and non-fuel minerals from the land and from the sea; and, (d) "new energy resources", comprising such non-conventional sources as solar, geothermic, tidal and atomic energy.[2]

A. ENVIRONMENTAL PROBLEMS IN THE ESCAP REGION[3]

The ESCAP region occupies an area of about 31 million square kilometres or 23 per cent of the world's area, excluding Antartica. In 1987 the total population of the region was estimated to be approximately 2,805 million, more than half of the world's population. The population density in 1987 was 89 persons per square kilometre. Apart from the high population density, more than 90 per cent of the population in the region lives in countries termed as either "under-developed" or "developing" where the living standards of the vast majority are relatively low. About 72 per cent of the population is rural, of which 54 per cent depends on agriculture and the rest on livestock-based activities.

Perhaps the most serious environmental problem facing the region is the exhaustion and degradation of terrestrial ecosystems. Deforestation is occurring at an alarming rate, destroying top-soil and genetic diversity, exacerbating flooding and drought, silting up lakes and reservoirs and undermining local and regional economies. Similarly, "desertification", (generally defined as a man-made or natural process which reduces the productivity of land and increases social distress) is another problem which is threatening the lives of millions of the poor people in the region.

A third major environmental problem of the region is the degradation of the aquatic environment and related ecosystems (for example, mangroves and corals) from the onslaught of environmentally unsound development activities. Over the past decade, the aquatic environment has been degraded owing to the discharge of pollutants through the rivers into coastal areas, the promotion of coastal tourism, the discharge of oils and toxic chemicals from onshore and offshore sources, and the exploration and exploitation of sea-bed resources. Similarly, the stability and productivity of the marine environment have been disturbed by the large-scale destruction of mangrove forests and coral reefs in the

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[2] United Nations, *The Determinants and Consequences of Population Trends*, Vol. 1, (Sales No. E.71.XIII,5), New York, 1973, p. 373.

[3] This section is mostly excerpted from United Nations, Economic and Social Commission for Asia and the Pacific, *Review and Appraisal of Environmental Situation in the ESCAP Region*, Bangkok, 1982, pp. 12-24.

Asian and Pacific region owing to coastal mining, tourism development, extensive commercial fishing and extraction of fuelwood and corals for commercial purposes.

Last, but not least, is the problem of the impairment of human health due to environmental pollution and lack of adequate water supply and sanitation facilities in both rural and urban areas.

These problems are all complex and interrelated. For example, to tackle the problem of deforestation, it is necessary to understand the dynamics of forest ecology, local and regional land use for agricultural purposes, human settlements and industrial development, the socio-economic considerations of the people who raise livestock and cut fuelwood and forests, and the international as well as domestic market structures of forest products. As an example of the intricate interrelationships involved in the problem, it could be mentioned that environmentally unsound management of terrestrial ecosystems is also bound to degrade the marine environment. Large quantities of silt (of the order of billions of tons per year) carried by many of the rivers into the coastal areas primarily originate from large-scale deforestation and desertification activities upstream. Similarly, the impairment of human health is primarily the result of environmental pollution due to industrial and urban waste discharges into water courses, automobile exhaust in major cities and lack of adequate supplies of potable water and sanitation facilities. Some of these aspects will be dealt with below.

1. Deforestation

Tropical forests in the ESCAP region are estimated to occupy around 300 million hectares and are regarded as being the most productive in the world. During the last decade or so, tropical forests have been one of the major bases of economic development in many countries of the region but have been disappearing at an alarming rate. According to one[4] estimate, the projected loss of tropical forests by the year 2000 would vary between 72 and 280 million hectares in the best and worst case scenarios respectively. Considering the estimated total area of tropical forests, this will mean that the region will probably lose approximately 70 per cent of its total present forest areas by the end of the century unless appropriate measures are taken to ensure their long-term sustainability. It has been estimated that the average rate of deforestation in the ESCAP region is approximately 2 per cent per year. However, the rates of deforestation in some countries of the region are considerably higher, as can be seen from table 1. This indicates that, although the percentage rate of deforestation is highest in Malaysia (8 per cent), followed by the Philippines (7 per cent), Sri Lanka (5 per cent), Thailand (5 per cent) and Nepal (3 per cent), in absolute terms it is largest in Indonesia and Thailand (approximately 1 million hectares per year), followed by the Philippines (0.5 million hectares per year) and Malaysia

[4] *Ibid.*, p. 12.

Table 1. Status of tropical forests in selected countries of the ESCAP region

Country	*Present forest area (hectares)*	*Rate of forestation hectares/year)*	*Number of years to total depletion*
Indonesia	85 000 000	1 500 000	57
Philippines	10 000 000	700 000	14
Malaysia	6 307 200	525 600	12
Thailand	29 000 000	1 400 000	21
Sri Lanka	3 610 000	190 000	19
India	65 698 400	–	–
Burma	10 995 100	141 700	78
Nepal	1 728 700	43 200	40
Afghanistan	1 983 800	39 700	50
Total	214 323 200	4 540 200	

Source: United Nations Economic and Social Commission for Asia and the Pacific, *Review and Appraisal of Environmental Situation in the ESCAP region,* 1982, p. 14.

(0.4 million hectares per year). These figures indicate that if the tropical forests of the region continue to decrease at the present rate, the entire forest area in some countries may be completely denuded within a period of 12 to 50 years.

The loss and degradation of tropical forests in the region have caused numerous socio-economic and ecological problems. Intensified seasonal flooding with loss of lives and property, water shortages in dry seasons, accelerated erosion of agricultural land, siltation of rivers and coastal waters and the disappearance of plants and animal species are but a few examples of the effects of deforestation. The major causes of deforestation appear to be shifting cultivation (slash-and-burn agriculture), human settlements, commercial logging, pasture farming and collection of fuelwood. Shifting cultivators traditionally clear patches of forests, burn the native vegetation and use the ash as fertilizer. When the nutrients in the ash are exhausted, the farmer and his family move on, leaving the used crop land fallow for 10 to 15 years. In view of rapid population growth, increasing pressure on land area and competing demands for large plantations or industrial forests, shifting cultivators in a number of countries are reportedly shortening fallow periods to three to five years. In view of the increasing demand for timber, both within and outside the region, commercial logging has been gaining momentum in the past few years. It is estimated that, at present, 70 per cent of the world's tropical wood exports originates from the

Asian and Pacific region. The rate of deforestation, due to massive commercial logging practised in South-East Asia alone, amounts to 1-2.7 million hectares per year, leaving, on average, between one third and two thirds of the residual trees effectively destroyed.

2. *Desertification*

According to the World Map on Desertification jointly prepared by FAO, WMO and UNESCO, some 378 million people living in an area of about 21 million square kilometres are threatened by the process of desertification in the ESCAP region. This implies that in terms of both population and area, the ESCAP region is the most affected by desertification. Four distinct types of desertification problems are encountered in the region. They are discussed below. The countries affected have undertaken several positive measures to combat desertification within the limitations of their resources, although the degree of implementation and scale of operation are very limited for various reasons.

(a) Aridity and semi-aridity

Desertification occurs under pastoralism in arid and semi-arid areas where irrigation has not been introduced. In large areas of China, India and the Islamic Republic of Iran, and parts of Afghanistan and Pakistan, pastoralism is the traditional land-use system in dry lands. The resources have been over-exploited, particularly with regard to vegetation, as a result of the increasing human and livestock population. China has made significant progress in combating desertification in considerable areas of the arid regions by the application of traditional knowledge and experience and large-scale public participation. In India and the Islamic Republic of Iran, a number of programmes are in progress for the reclamation of such degraded areas, to improve their productivity as part of the activities to implement the Plan of Action to Combat Desertification, which was unanimously adopted by the United Nations Conference on Desertification in 1977 and subsequently endorsed by the United Nations General Assembly.

(b) Deforestation

Degradation of the environment and land productivity as a result of deforestation is reported from Indonesia, Nepal, the Philippines and Thailand. In recognition of the seriousness of the problem, action has reportedly been taken by these countries to implement the relevant recommendations of the Plan of Action. Since the results and impact of afforestation programmes take a long time, the size of the programme and its area coverage seem inadequate.

(c) Waterlogging and salinity

The introduction of irrigation in the arid regions of Afghanistan, Pakistan and the USSR has caused waterlogging and soil salinity, resulting in degradation

of the biological productivity of the affected areas. The USSR has successfully reclaimed and developed large areas affected by salinity. Pakistan has also attempted reclamation, and this activity is being strengthened as part of the over-all development plans of the country. Afghanistan has initiated a few activities for combating desertification in areas affected by salinity.

(d) Hydrological quandary

Bangladesh has desertification problems resulting from what is called the "hydrological quandary" in the river valleys.

3. Degradation of the marine development

The aquatic environment has functioned for ages as the ultimate receptacle for all unwanted waste material. But, as a result of increasing habitat destruction and waste deposition, the aquatic resources, especially in the coastal waters, have been adversely affected recently. At the same time, animal protein from the oceans forms a major portion of the national diet in a number of countries in the region. About 30 million tons of marine catches are landed in the ESCAP region every year, which is about 40 per cent of the total annual world catch. However, these figures do not correctly reflect the actual situation as the bulk of the catch goes to a few selected countries with modern fishing fleets. The per capita consumption of fish in the ESCAP region, which has 55 per cent of the world's population, is far below the world average. Considering the anticipated population increase and a moderate increase in the present animal protein consumption of 15 kg per capita per year, it is estimated that, by the year 2000, fish production in the region should increase to 54 million tons.

Dramatic growth in coastal zone development has been witnessed in recent years: population pressures have led to rapid rates of coastal settlement, rivers emptying into estuaries have been dammed for development, coastal industrial facilities have expanded and offshore sea-bed exploitation of oil, natural gas and minerals has increased measurably. Estuaries, salt marshes and mangroves, which are widespread in the region, contribute to coastline stabilization, while providing the ecological habitat for highly productive fishery resources. But, as already mentioned, the efforts of development have reduced the stability, productivity and species diversity of the marine environment. Mangrove communities have been destroyed to make way for urban development, fish pond construction, industrial establishments and coastal mining, and there has been rapid and widespread degradation and destruction of extensive mangrove areas along the coasts of Australia, India, Indonesia, Malaysia, the Philippines, Thailand and Viet Nam.

In the ESCAP region, out of a total of 44 members 39 are maritime, where the problem of protection of the marine environment exists in some form or another. Many of them seem to experience similar problems owing to the fact that their coastal zones are located in areas subjected to heavy rainfall within

typhoon or monsoon belts. Siltation of river mouths and coastal channels is a common problem in such countries as Bangladesh, India, Pakistan, the Philippines and Thailand. During dry weather periods, they also experience problems of salinity intrusion. Pollution of water (both inland and marine) in Hong Kong, India, Malaysia, Singapore and Thailand, for example, due to industrial and urban wastes is also rather common.

In all these countries or areas, the coastal lagoons with other related ecological systems have been threatened and, in many instances, actually damaged by human activities such as land filling and reclamation, felling of mangrove trees for firewood, charcoal and chipboard manufacture, and urban waste dumping. Some of the forests have been cleared to construct fish ponds and human settlements, as in Indonesia, Malaysia, the Philippines and Thailand.

The coral reefs of the region serve as habitats for marine life, as buffers against destructive ocean waves and as land-builders by virtue of their lime secretions. The ecosystem is threatened owing to fishing by destructive means, commercial mining, siltation and recreational activities in such countries as Indonesia, Malaysia, the Philippines and Thailand. In the Philippines, for example, it has been estimated that more than 8.6 million cubic metres of corals were exported through the port of Zamboanga alone during 1979.

Oil represents is an important cause of marine pollution and originates both from onshore and offshore sources, such as urban and industrial discharges through inland waters, coastal refineries, reception facilities and ports, and oil spills from ships, as well as offshore drilling activities. According to a global study, of a total of 6.1 million tons of hydrocarbons discharged into the oceans, 35 per cent is contributed by the land-based sources and 31 per cent by offshore sources, primarily ships. Despite the concern which the countries have felt for a long time over the problem of marine pollution from land-based sources, measures with regard to the control of wastes discharged into rivers, and eventually into the seas, do not appear to be adequate. Hong Kong and Singapore have made considerable progress in this respect, probably by virtue of their having the advantage of being compact and small in size, while Indonesia, the Philippines and Thailand have programmes to cope with the problems in the light of the present socio-economic situations prevailing in those countries.

A common problem of oil pollution experienced by the countries is oil slicks, especially where intensive offshore exploration is carried out or where there is heavy traffic of ships, for example, in the Hong Kong and Singapore harbours. One of the constraints experienced by many members of ESCAP in tackling this problem is that the areas involved are often so large that they exceed their surveillance capacity. In addition, contingency plans to combat oil pollution are mostly only in the stage of formulation, and there is a lack of trained manpower, equipment and technology.

As far as reception facilities are concerned, the Hong Kong Government is considering the installation of a complete system, while Malaysia is equipping

three ports at Penang, Klang and Jahore Bahru with such facilities. Indonesia and the Philippines already have some facilities installed at most of their oil handling ports. Only a few countries have domestic waste collection and treatment systems, but mostly these are overloaded owing to rapid population growth and urbanization. The problem is further aggravated by the development and expansion of industries. Thousands of cubic metres of hazardous industrial effluents are being constantly discharged into the Bay of Bengal and the Arabian Sea through a number of rivers and from non-point sources along the coast of India.

In the case of Thailand, the Chao Phya River, which empties into the Gulf of Thailand, carries heavy loads of pollution, 70 per cent of which comes from domestic sources. In Thailand, heavy metals have been reported in fish and benthos, although they are generally within the safe limit for human consumption. However, this situation may not continue for long if the present trend of marine pollution prevails. The same is also true for Hong Kong and India, where toxic substances such as cadmium, chromium, cooper and zinc have been detected in marine fish and other organisms.

In Metro Manila, such rivers as the Pasig are badly polluted. The waters in many areas where circulation is limited are generally black and malodourous, with gas bubbling from anaerobic decomposition of organic matter, and are contaminated with metals and pesticides. The problem of aquatic pollution in Malaysia is primarily attributed to the palm oil industries and tin mining activities. In Bangladesh, the use of insecticides to combat heavy infestation by flies during fish drying becomes a potential source of insecticide pollution of water courses and the sea.

Only a few countries in the region, such as India and Pakistan, operate nuclear power stations, while a nuclear power plant is currently under construction in the Philippines. However, because of adequate safeguards and the continuous monitoring programmes adopted in these projects, it has been possible to prevent contamination of their water courses and the sea. The island nations of the South Pacific subregion are, however, becoming increasingly concerned about environmental hazards owing to radioactive waste dumping and other factors.

It can be generally concluded that the marine environment and related ecosystems of ESCAP members in the region are confronted with threatening forces of nature and human activities. In the forefront are siltation, pollution from domestic and industrial wastes, heavy metals, agro-chemicals (particularly pesticides), petroleum products and mining activities. The ecosystems of mangrove forests, coral reefs and intertidal flora and fauna are threatened by land reclamation for multipurpose uses and recreational activities.

4. Pollution

The nature and magnitude of the pollution problems vary from one country to another. For example, in Bangladesh, water pollution is caused mainly by

discharges of effluents from pulp and paper mills, tanneries, slaughter-houses and the fertilizer industry, while the soil pollution problem is due to improper handling and disposal of human wastes.

In Thailand, uncontrolled discharges of industrial waste water mainly from breweries, distilleries, sugar refineries and the tapioca industry, as well as from urban drainage, causes a severe problem of water pollution. Air pollution from mobile sources is well known in Bangkok, coming from approximately 500,000 automobiles plying the city roads. According to the National Environment Board of Thailand, the average carbon monoxide concentration in Bangkok varies between 13.9 and 32.4 parts per million (ppm), whereas the standard set by WHO is only 9 ppm.

Nearly 23 per cent of India's entire industrial belt lies in Maharashtra state, with 60 per cent of the industrial units concentrated in and near Bombay, where air and water pollution has given rise to definite health hazards. Whereas the primary sources of air pollution are industrial chimneys and the emissions from nearly 300,000 automobiles, water pollution along the coastline of Bombay is mainly caused by over 300 million gallons of untreated industrial waste water discharged daily, posing health hazards to those using the water and causing fishkill. The air pollutants consist of 38.4 per cent carbon monoxide, 33.4 per cent sulphur dioxide and 9.8 per cent nitrogen oxides, the remainder being a variety of other gases. A survey undertaken by the Government of India at Chembur in Bombay showed that an average of 190 tons of sulphur dioxide were emitted into the atmosphere every day and that residents in the area were suffering from coughing, constant sneezing, asthma, bronchitis, chest pain and fatigue.

The urban areas in the Philippines suffer from shortages of basic amenities such as water supply, sewerage, drainage and solid waste disposal facilities. The existing Manila and suburban water works have a capacity of 185 million gallons per day, against the requirement of 280 million gallons per day. At present, 75 per cent of Metro Manila's 8 million people do not have potable water and 90 per cent of its homes are not connected to sewers. The population of Metro Manila produces 3,200 tons of garbage and 200 tons of litter daily. Collection and disposal of these solid wastes are inadequate; 319 garbage trucks transport the wastes to 11 major dump sites, which are threatening the health of city dwellers and are also polluting Manila Bay. Only 18 per cent of the rural population in the country have access to a steady source of water supply; 76 per cent do not have access to potable and safe water supply; and 45 per cent have no sanitation facilities.

It is reported that the Mahaweli-Ganga water resources development project in Sri Lanka has been threatening the people living in the project area with environmental health hazards (for example, malaria and water-borne diseases). According to the *World Environment Report,* 40 per cent of Japan's rivers, lakes and seas do not meet the environmental standards set by the country. It is also reported that although mercury pollution did not exceed environmental

standards, one river in Tokyo and another in Osaka were found to be polluted with cyanide and 10 other rivers were found to be contaminated with polychlorinated biphenyl.

The environmental problems of the Republic of Korea are principally water and air pollution due to domestic and industrial operations, automobile emissions and extensive use of a heating system burning low-grade coal. Although statistical data on the effects of these operations on human health are not available, there are increasing reports of the prevalence of pulmonary diseases among the exposed population in addition to the destruction of fisheries and other resources. Such problems will no doubt intensify as the country's long-term plan for heavy and chemical industrial development is fully implemented.

B. INTERRELATIONSHIPS BETWEEN POPULATION AND THE ENVIRONMENT

The interrelationships between population and the environment have been recognized for a long time. Throughout history, people have been concerned with the relationship between themselves and the land and other natural resources available to them. The possible implications of population increase for the population-resource relationship were stressed poignantly in the writings of Malthus about a century and a half ago.[5] In the early 1950s there was considerable fear of natural resource scarcity in the developed countries. By the mid-1960s, the concern shifted from resource exhaustion to environmental problems such as the cleanliness of the air and water, the effects of excessive use of pesticides upon soil and water, the availability of suitable surroundings for outdoor recreation and the effects of urban living upon the human body and spirit.[6]

Basically, the environmental and natural resource problems that afflict most countries of the ESCAP region are caused by human activities, often arising from the needs of growing populations for land to cultivate subsistence crops. These include the farming of marginal land, particularly on slopes; insufficient fallow periods; the clearing of forest land for agriculture; and the felling of trees for firewood and timber. Water pollution, air pollution, deforestation and desertification are related to human activities. It should be emphasized, however, that it is not just population growth that is putting pressure on resources; rather, population growth in conjunction with other processes is leading to much more rapid deterioration.[7]

In order to have a clearer idea, a simple framework of the interrelationships between population and environment is drawn. The purpose of this

[5] United Nations, Department of Economic and Social Affairs, *The Determinants and Consequences of Population Trends,* Vol. 1, Population Studies, No. 50, New York, 1973, p. 365.

[6] *Ibid.*, p. 367.

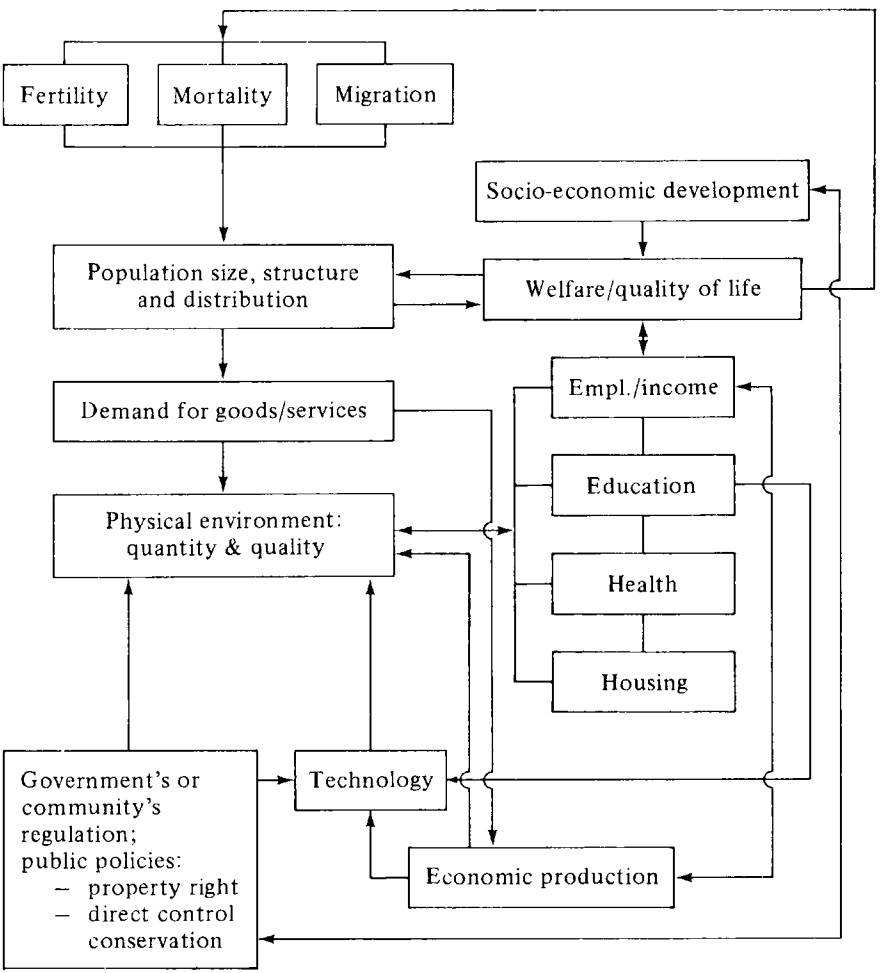
[7] Repetto and Holms, *op. cit.*

framework is to identify or speculate on how population variables affect and are affected by environment and how intervening factors or policies and measures could be introduced to cope with environmental as well as population problems.

1. A General Framework

According to the framework depicted in figure 1, the three basic demographic variables, fertility, mortality and migration, determine demographic

Figure I. A conceptual framework of the interrelationships between population and the environment



outcomes such as population size, age structure and population distribution. A population demands goods and services which can be met by two major means, from nature and from commodity markets or economic production. Both means affect the physical environment quantitatively and qualitatively.

From the developmental point of view, the welfare of the population and the quality of life is the ultimate goal of development. In this respect, population plays an important role in determining society's demand for employment, education, health services and shelter. The demand for and supply of goods and services as well as other related economic activities, which will involve resource depletion or degradation, are positively related to the size of the population. The distribution of population also plays a significant role in determining resource allocation and utilization.

On the other hand, the effects of the environment on population could also be identified. The quality of the physical environment affects the quality of life variables (health, housing, education, employment and income) directly and indirectly. They in turn affect demographic variables. For example, polluted and contaminated water could cause diseases and lead to higher mortality incidence. These interrelationships will be discussed later in this section.

The role of government, public policy and technology could also be discussed under this framework. The issue of property rights, under which it has been argued by many economists that cost distortions lead to a more rapid rate of environmental deterioration, could be introduced under this framework. Technology is another issue that could be brought in, since it helps to increase the efficiency of resource use and to substitute one resource for another. Based on his study of the United States, India, Indonesia, Colombia and the Philippines, Ronald G. Ridker concluded that the impact of technology and per capita income on environment is more than that of population growth.[8] It may be possible, however, to argue that government intervention, technology or per capita income all are influenced by population pressure.

2. *Effect of Population Change on the Environment*

Population size and its distribution could affect the environment in a number of ways. In subsistence societies, it has been observed that population pressure contributes to the deterioration and depletion of important natural resources.[9] Growing rural populations and rising subsistence demands have

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[8] Ronald G. Ridker, "Resource and environmental consequences of population and economic growth", in Phillip M. Hauser (edit.), *World Population and Development: Challenges and Prospects,* Syracuse University Press, 1979, pp. 99-123.

[9] G.O. Barney (ed.), *The Global 2000 Report to the President of the U.S.,* Pergamon, New York, 1980; P. Kunstadter, E. Chapman, and S. Sabharie, *Farmers in the Forest,* University of Hawaii Press, Honolulu, 1978; US Department of State, *The World's Tropical Forests: A Report to the President by an Interagency Task Force,* Washington, D.C., 1980; H. Le Houerou, "The Nature and causes of desertification," in *Desertification,* ed. Michael Glantz, Westview Press, Colorado, 1977; E. Eckholm, "The deterioration of mountain environments," *Science* 189, September, 1975, pp. 764-770.

resulted in the expansion of cultivation onto increasingly marginal soils and have shortened fallow periods, leading to erosion and the loss of soil fertility. The search for more fodder and forage for livestock, more fuel for cooking, and new lands to farm has reduced forested areas.[10] Deforestation in turn has other consequences such as soil erosion, siltation, and flooding in river basins, changes in micro-climate, and loss of habitat. Efforts to intensify production on existing agricultural areas have encountered other problems: increased run-off and ecological hazards from agricultural chemicals, reduced genetic diversity in the plant population and waterlogging and salinity from irrigation.

Environmental problems are not confined to rural areas. Industrialization and urbanization have already led to severe air, water, and noise pollution in many cities. Industrial wastes are a source of increasing concern in developing and more developed countries. The rapid growth of cities due to increasing population has placed serious strains upon inadequate urban water supply and sewerage systems, while air pollution is increasing particularly because of the increasing number of cars, buses and trucks.

In fact, as developing countries proceed to achieve economic development, the combination of expanding populations, greater concentration of those populations in urban places, especially big cities, and increasing industrialization threatens to raise the problems of resource depletion and waste disposal to unmanageable proportions.

More specifically, the effect of population on the environment can be identified as follows:

(a) Water pollution and shortages

Man needs water for drinking and cleaning and to carry off his waste; in rural areas, irrigation consumes a major proportion of available water resources. In most cities of the region, the large population and industrial activity have already led to a demand for water in excess of the supply. Shortages in total supply and deficiencies in the distribution system often result in the use of unsafe water. Shortages are compounded by pollution of rivers and lakes by domestic and industrial wastes, owing to expanding population and manufacturing activities, and inadequate waste disposal systems. Increasingly, rural water supplies face similar threats, being particularly affected by uneven distribution and growing demands as efforts are made to put more land under cultivation and to introduce multiple cropping.

(b) Waste disposal

Population increase in cities has been too rapid to permit adequate development of sewerage facilities. Even in affluent Tokyo, only 36 per cent of the

[10] Jean-Paul Lanly, *Tropical Forest Resources,* FAO Forestry Paper No. 30, Rome, 1982.

city is connected to the sewerage system and in Manila, only 12 per cent. Inadequate facilities lead to the fouling and pollution of land, water and air, and often to epidemic and chronic diseases, and even death during epidemics. The problem of rural sanitation, particularly with reference to the disposal of human excreta, requires urgent attention.

(c) Land subsidence

In some countries, excessive pumping of ground water and underground natural gas has either created or threatened to create land subsidence, causing serious problems for the big cities affected.

(d) Disposal of refuse and other solid wastes

The big cities especially are confronted by major problems in the daily disposal of the thousands of tons of household and industrial wastes. A shortage of equipment and facilities often leads to accumulations which become the breeding places of rats, pests, and insects, creating health hazards in addition to other nuisances. Increasingly, rural areas are being confronted with similar problems as the consumption patterns of rural households more closely resemble those of the cities, as the population increases and as industry begins to locate its plants in rural places. If incineration is practised, air pollution replaces disposal as a problem.

(e) Air pollution

Population growth and industrialization, through the increase in motor vehicle traffic and manufacturing plants, combine to pollute the air of urban places. In Japan and to a lesser degree in the developing countries, the problems of air pollution are now spreading into rural areas, reflecting the rather recent trend of building large-scale industries away from urban areas of high population density. As greater decentralization of industry occurs, that trend can be expected to increase, which again emphasizes the need for preventive measures.

(f) Soil pollution

Continuing population growth has recently led to efforts to enhance the quantity and quality of crops, through intensive use of fertilizers and pesticides on portions of about 20 per cent of arable land under irrigation. That in turn has led to both land and water pollution where those chemicals have been wrongly used. Moreover, infrastructure such as irrigation dams and highways established to provide services to the growing population change the surface of the land, all too often causing erosion, deforestation, and eventually land and water pollution.

(g) Housing

One of the greatest needs created by rapid urban population growth was that for housing. It was repeatedly observed that the pressure of urban population growth had resulted in the appearance of massive squatter areas, where people lived under marginal subsistence conditions without adequate protection from the elements and without sanitary facilities. As a result, such areas were major sources of pollution, foci of epidemics and, in some cities, centres of criminality.

Yet, from the point of view of many of the squatters themselves, the conditions were equal to or better than those in the village. Moreover, a number of their communities displayed a considerable degree of social organization, suggesting that the community might provide a bridge between the village and the big city. If so, the answer might lie not in eradicating squattér areas, but in providing them with basic services, security of tenure and access to building materials, thereby improving the environmental situation and facilitating their adjustment to urban life.

It has been argued, however, that pollution problems are not caused significantly by population growth as they are solved largely by government policies correcting market weaknesses.[11] This view is largely based on "the property rights" argument. The rationale is simply that if we can make the polluters pay for the costs of pollution created by them, the environment will be less polluted. In other words, the problems of pollution often occur because no individual has property rights over the environment, such as air or water. If property rights are in existence, individuals or communities have legal recourse for damages sustained through the misuse of their property. This argument can be challenged on two grounds: first, in the developing world, property rights are difficult to assign or maintain; and second, if there were no population pressure, there would be less need for the assignment of property rights.

3. Effects of Environmental Change on Population

Environmental deterioration can have a feedback effect on the population itself by possibly contributing to poorer physical and mental health and to accidents, and by interfering with man's economic productive capacity and with his capacity to enjoy the benefits and amenities of a clean environment. A deteriorating environment can detract from the enjoyment of recreational space and leisure time, interfere with religious practices, and contribute to increased migration as persons try to escape from areas experiencing deterioration. Also,

[11] National Research Council, Working Group on Population Growth and Economic Development, Committee on Population, *Population Growth and Economic Development: Policy Questions*, National Academy Press, Washington, D.C., 1986, as cited by Allen C. Kelly, "Review Symposium, '*Population and Development Review*, Vol. 12, No. 3, September, 1986, p. 563.

in areas subject to earthquakes and typhoons, high population density may lead to great loss of life and physical destruction.

Three immediate results of population growth in a given territory are: (a) to reduce the amount of space per capita, (b) to decrease the per capita availability of natural resources, and (c) to reduce the potential influence of each individual in governmental decisions. Those results in turn provoke a variety of other changes which directly or indirectly affect the physiological and psychological characteristics of the population. Nevertheless, some knowledge is available, and it may be useful to attempt a framework to portray the main paths by which environment affects populations.

(a) Morbidity and mortality

Changes in morbidity and mortality seem obvious effects of environment on population. In figure 1, it has been shown that the environmental conditions are linked to quality of life indicators (including health) which in turn are linked to mortality. Indeed, there are a large number of paths linking environmental conditions and mortality and morbidity. One of these is that environmental problems lead to intergroup conflicts, to an increased incidence of war, and then to change in morbidity and mortality. Another is the linkage between reduction in material resources per capita and changes in the satisfaction of material needs, leading to psychic stress and hence to changes in morbidity and mortality. Other indirect paths include the linkage between morbidity and mortality and fertility.

The indirect linkages between a change in morbidity and mortality and deterioration of the physical and biological environment are probably of greater importance than the direct linkage. Nevertheless, since, more is known about the direct ones, much of the discussion is concerned with the direct effect of air, water and soil pollution on human morbidity and mortality.

It has been recognized that the air becomes polluted by a variety of substances, such as sulphur dioxide, nitrogen oxides, hydrocarbons, carbon monoxide, and various types of particulate matter, each of which might be harmful to human health. Moreover, *"acute air pollution"* should be distinguished from *"chronic air pollution"*. Periods of acute air pollution, such as occurred for a short time in London in 1952 led to a temporary very sharp rise in mortality.[12] However, the overall effect of episodes of acute air pollution might be of less importance than the chronic continuance of air pollution of much lesser magnitude. Since most of the population of the ESCAP region lives in rural areas, air pollution does not as yet present a serious threat for most of the region. On the other hand, in Japan, which is heavily urbanized and densely populated and has a high level of economic development, air pollution is regarded as one of the

[12] United Nations, Economic Commission for Asia and the Far East, *Report and Selected Papers of the Regional Seminar on Ecological Implications of Rural and Urban Population Growth,* Asian Population Studies Series No. 10, Bangkok, 1971, p. 18.

most distressing hazards to health. However, even for urbanized areas, the point is made that the harmful health consequences of air pollution might have been exaggerated by many persons. Although many specific cases of morbidity caused by urban air pollution could be cited, the contribution of air pollution to the total death rate is not yet known precisely.

In contrast to air pollution, the pollution of water presents health problems both to rural and to urban communities. Biological contamination of drinking water, common in many rural portions of the ESCAP region, has been the origin of many endemic infectious diseases such as cholera, dysentery, typhoid and paratyphoid fever, infectious hepatitis and poliomyelitis. In Japan the water has sometimes been contaminated by mercury or cadmium. Severe illness in Japan has resulted from persons eating fish containing excessive amounts of mercury and from persons consuming rice with excessive amounts of cadmium.[13]

The land might become polluted through organic wastes, such as sewage, or through various metals harmful to human health. In Tehran, ground water is polluted because sewerage is disposed of in cesspools and the effluent finds its way into the ground water and eventually into drinking water wells.[14] Organic solid wastes also stimulate the growth of fly and mosquito populations, which serve as vectors for a large number of human diseases, and also the growth of fungi capable of causing human disease. A new problem is contamination of the soil with pesticides. They present an especially severe problem when they are not biodegradable and can thus remain in the environment for many years.

(b) Change in genetic composition

A variety of environmental agents are capable of causing genetic mutation in human beings. Mutation might be induced either by ionizing radiation or by chemical compounds. Mutagens might have three possible effects on the organism: (a) significant chromosome aberration, in most cases lethal and hence not inheritable; but which, if transmitted to progeny, would cause definite deleterious effects, and (c) undetectable genetic damage which might be inheritable and hence affect many generations of progeny.[15]

The prospective increase in the use of nuclear energy would increase substantially the risk of genetic mutations caused by increased radioactivity. Moreover, genetic change might be occasioned from chemicals used in insecticides, herbicides, food additives, drugs and cosmetic compounds.

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[13] *Ibid.*

[14] *Review and Appraisal of Environmental Situation in the ESCAP Region, op. cit.*, p. 23.

[15] D.M. Heer, "Effect of pollution and altered environment on psychological and physical characteristics of the population", *Asian Population Studies Series No. 10, op. cit.*, p. 18.

(c) Fertility

The relationship between the environment and fertility may be less obvious or complex. According to our framework, the linkage between the environment and fertility could be through the effects of the environment on the quality of life, such as employment and income, health, housing and education. These factors in turn affect fertility. More specifically, human fertility could be affected by way of three separate mechanisms: (a) change in biological fecundity; (b) change in the incidence of exposure to sexual intercourse, and (c) change in the practice of voluntary birth control by marital partners.

In pre-industrial Europe, a link between changes in population density, the ratio between population and environment, and fertility change was found through a change in the age at marriage. If a sudden rise in mortality created a negative rate of population growth, more sons would inherit farms from deceased fathers; thus they would be free to marry at an earlier age, and hence would have a larger number of children. On the other hand, when low mortality occasioned a positive rate of population growth, inheritance and marriage would take place at a later age and fertility would be reduced. However, those homeostatic mechanisms will fail to work whenever reduction in material resources per capita occasioned by population growth is compensated by technological improvement, since in that case population growth will not cause a reduction in the level of satisfaction of material needs.

Deteriorating environmental conditions in the form of declining living space or a decreasing ratio of environment to population can affect decisions concerning the desired number of children within marriage. An increase in population density can be associated with a reduction in fertility, either through the facilitation of the information flow concerning family planning[16] or the relatively higher cost of living space in more densely settled areas, an important component of the cost of child-rearing.

Other studies of differential fertility have revealed that a decline in the material standard of living, which is a possible result of environmental degradation, may, all other factors being equal, result in fertility reduction. In the usual case, however, all other factors are not equal so that high fertility is generally associated not with affluence but with poverty.

It has also been noted that a reduction in mortality, which may be the prime cause of an increased rate of population growth, may eventually motivate a population voluntarily to reduce its fertility. The reasoning is that only under conditions of low mortality can married couples assure themselves of the survival of a definite number of progeny to adulthood, without bearing excess children simply as insurance against later possible child loss.

[16] *Ibid*, p. 147.

Continued population growth in a closed population will inevitably bring about an eventual rise in the death rate, unless technological development allows a population to subsist despite declines in resources per capita, or unless fertility decline can be achieved. Among animal populations, fertility decline and mortality rise are predictable reactions to continued population growth. By way of contrast, human behaviour was much less stereotyped and much more flexible. The relative inflexibility of animal behaviour may have a certain advantage, because it could definitely preclude the possibility that the species would outgrow its food supply. Nevertheless, although fertility may be less automatically related to population density in human beings than in other animals, there is every reason to believe that, in the former, it can be more intelligently related. This is so because a conscious decision to curtail fertility in order to enhance the quality of life could result in a better adjustment to the environment than a series of mechanisms which automatically change fertility under predetermined circumstances.

(d) Changes in satisfaction of material needs

Unless there are improvements in technology which contribute to a more efficient use of resources, a decline in the material level of living could result from population growth. However, as is well known, technological improvement has been a very striking feature of human history, particularly within the last few centuries. Hence, both developed and developing nations have succeeded in increasing their standards of living in recent years. The major question is, of course, how long can technological improvement make up for the decline in material resources per capita. If population growth can not be reduced through fertility control, there may come a time at which technological improvement can no longer cope with the reduction in resources per capita, and then the material level of living would fall. Furthermore, once the satisfaction of material needs fell below a given level, the death rate would inevitably rise.

(e) Change in the level of psychic stress

There are also many different possible paths relating population growth to changes in psychic stress. One of the most important might be the path linking a reduction in material resources per capita to a change in the level of conflict, and from there to an increased incidence of war and violence. Alternatively, the increase in level of conflict might be settled through further development of legal procedures. In that case, the increase in psychic stress would be very much diminished.

John Calhoun's experiment showed that a group of Norway rats living in a very crowded condition displayed a variety of pathologies indicating large-scale psychic stress, despite the fact that all necessary amounts of food and water were provided.[17] Calhoun's results are suggestive for human beings,

[17] John B. Calhoun, "Population density and social pathology", *Scientific American*, 206, 1962, pp. 139-148.

although it is obviously not proper to infer that the reaction of human beings would necessarily be identical with that of rats.

What effect would a reduction in the extent of individual participation in government, occasioned by population growth, have on the level of psychic stress? It would be plausible to argue that high population density causes Governments to be less responsive to individual needs, and hence increases psychic stress. On the other hand, it can be argued that, in a more populous nation, the number of independent interest groups increases and the danger of polarized conflict leading to violence thereby decreases. Clearly more research is needed to elucidate that relationship.

(f) Change in the level of aesthetic satisfaction

Deterioration of the physical and biological environment reduces the possibilities of aesthetic satisfaction. The extinction of many varieties of plants and animals make life less interesting. Even if plant and animal species are not destroyed, over-urbanization implies that many persons will have little contact with nature. Thus many children living in cities have never seen a horse or a cow except on a television screen.

Air pollution is a major factor reducing aesthetic satisfaction. The unsightliness of smog is not confined to Los Angeles. It is equally prevalent in Tokyo. There, smog often obliterates the inspiring vista of Mount Fuji, Indeed, even in such a relatively small city as Taipei, the smog makes it impossible on most occasions to see the many mountains surrounding the city.

The littering of the landscape with trash and other forms of solid wastes is also an important factor in reducing aesthetic satisfaction, particularly in urban areas.

(g) Effect on the working force

The effects of pollution and an altered environment on the work force is worth mentioning. Environmental conditions at the place of work, whether, for example, in industry, mining or agriculture, tend to aggravate the effects referred to in the preceding paragraphs concerning the general population.

As a result, workers are often subjected to excessive physical and mental stress which may lead to increased absenteeism, lowering of work morale, and occupational accidents and diseases, and so to lower productivity.

4. Conclusion

The interrelationships between population and the environment are complicated. The framework which has been discussed is only a part of the possible interrelationships. Many more issues could be raised. The interrelationship

between migration and the environment is an issue that deserves consideration; the issue of property rights and resource conservation, the role of commercial environmental exploitation, technology, the time horizon of resource depletion and recovery and even the role of women with respect to resources and the environment require much more discussion and research. The framework which has been put forward in this paper could be extended further to include these interrelationships.

C. SOME POLICY IMPLICATIONS

First, while environmental problems are increasingly visible and serious, we have to admit that not enough is known about the complex interrelationships between population and the environment, especially in Asia and the Pacific. Thus one of the priorities for population and development planning in this region will be action-oriented research into the linkages, to guide national and regional development policies. In the ESCAP region, there is a serious gap in knowledge on environmental conditions and problems, particularly as they relate to population change. Much of the evidence presented is fragmentary or based entirely on speculation. There is, indeed, an inadequate data base of environmental information collected on a regular basis, with sufficient coverage and scale, to support research work in this area.

For the time being, a deduction based on the available evidence, a conceptual framework and the existing studies lead to the conclusion that population factors have a distinct impact on the environment and *vice versa*. In the ESCAP region, in spite of a slow decline in the rate of population growth to 1.8 per cent, population growth is still a threat to the region, particularly in terms of environmental deterioration.

Second, while the ultimate goal of development is the welfare of the population or the improvement of the quality of life, it is also a philosophy of development to maintain the dynamic equilibrium between population and its environment. Thus both population and environmental concerns must be integrated into social and economic development plans in order for development to be sustainable.

Third, to achieve these goals rapid population growth must be slowed down and eventually stabilized while strategies on optimal population distribution should be formulated. Concomitantly, environmental conditions must be maintained or improved through reversing deforestation and erosion in major watersheds; checking the spread of deserts; introducing sustainable water management; reducing acidification and hazardous waste; developing and introducing environmentally safe industrial processes; eliminating hunger through sustainable agriculture; finding new and renewable sources of energy and increasing energy efficiency; and protecting species and preventing further loss.

Fourth, the interrelationships between population and development are complex and dynamic. The lack of a clear understanding of them could lead to

a policy which may worsen the situation. For example, policies on rural development designed to improve the quality of village life, to relieve environmental and other rural problems, to relieve the pressure of rural-to-urban movement and to relieve the environmental problems in big cities, may themselves bring new environmental problems to rural areas. The use of fertilizer, building more roads leading to rural areas, decentralization of industrialization, among other measures carry the threat of polluting the rural atmosphere and upsetting the crop cycle and the environment. Moreover, by contributing to environmental deterioration in rural areas, such development may, in turn, increase the rate of migration to cities rather than reducing it. To avoid the possible negative consequences, balanced development in an integrated fashion is called for.

Finally, as far as environmental problems are concerned, there is a growing need for the planning mechanism to take demographic variables into account in a more integrated way than has been done in the past. To date, most planning exercises have utilized a time horizon of no more than five years – a period sufficiently short that at least fertility and mortality, if not migration rates as well, can be projected independently of economic development. Certain environmental problems may not be visible in that short period of time. Thus, for the purposes of environmental and population planning a longer-term approach should be taken, in addition to the five-year plans.

Using a similar framework, the United Nations Environment Programme, in 1985, made useful recommendations for action at the national and the international level, and for different time horizons. The recommendations are presented as an annex to this paper.

In conclusion, it is important to note that Recommendation 4 contained in the World Population Plan of Action, 1984, addressed Governments as follows:

> "In countries in which there are imbalances between trends in population growth and resources and environmental requirements, Governments are urged, in the context of overall development policies, to adopt and implement specific policies, including population policies, that will contribute to redressing such imbalances and promote improved methods of identifying, extracting, renewing, utilizing and conserving natural resources. Efforts should be made to accelerate the transition from traditional to new and renewable sources of energy while at the same time maintaining the integrity of the environment. Governments should also implement appropriate policy measures to avoid the further destruction of the ecological equilibria and take measures to restore them.

Annex I

RECOMMENDATION FOR ACTION BY THE UNITED NATIONS ENVIRONMENT PROGRAMME,* 1985

Action at the National Level

Action in the short term

Public works programmes which will generate employment and, simultaneously, enhance the availability and productivity of natural resources need to be designed and implemented in rural areas experiencing acute environmental stress and population pressures. The potential of food-for-work programmes needs to be fully realized in this undertaking. Such initiatives may include the reclamation of cropland and grassland; the plantation of wood-lots and forests; building canals, wells, dikes, reservoirs and water catchments; and terracing, bundling, levelling and draining land.

Efforts by governmental and voluntary organizations aimed at awareness-building and the popularization of family planning need to be reinforced, at the community level, by information on the nature and prospect of environmental degradation, its relationship to population pressures, its likely impact on people's lives, and how local action can improve the situation. Such an extension of population programmes will help place them more firmly, in the minds of the people, in a perspective of sustained, environmentally sound development.

Priority attention needs to be given to establishing programmes of basic education for women, especially in areas that are undergoing acute environmental stress. Women must develop a full awareness of the choices available to them as regards family size and life-style in their own environment. Legislative support needs to be provided, as appropriate, to facilitate the observance of women's rights. Improvement in the social status of women can play a pivotal role in accelerating the progress of societies towards their desired population, environment and development goals.

* United Nations Environment Programme, *The State of the Environment 1985*, Nairobi.

Action in the medium and long term

Developing countries need to identify critical areas which are experiencing or are likely to experience acute population pressures on environmental resources, in both rural and urban contexts. Specific development plans should be prepared and implemented for such areas, priority attention being given to the elements of population distribution and natural increase, capital investment to restore natural resources and develop infrastructure, and community-level involvement to improve health, sanitation and other environmental conditions.

Monitoring and forecasting of changes in the status of key natural resources, e.g. cropland, grassland, woodland, forests, ground water and surface fresh water, need to be undertaken with particular reference to the critical areas. In addition, economic and social appraisals of the anticipated changes in key natural resources must be fed back into national and subnational development plans, especially with regard to the allocation of public investment capital and expenditure among sectors and among geographical areas.

Physical planning *(amenagement du territoire),* with a view to bringing about a balanced, and broadly based, distribution of the benefits of development, should be given priority attention. correspondingly, incentive systems for the appropriate location or relocation of industries, resettlement from fragile and vulnerable ecosystems, the development of intermediate-sized towns and the environmental management of desired modifications to relatively undisturbed ecosystems should, where warranted, be given close and careful attention.

Countries experiencing severe environmental stress connected with population growth and distribution need to re-examine carefully their commercial, technological, pricing and taxation policies, with particular reference to their bearing on sustained agricultural development. Factors such as the replacement of cash crops for export by food crops for subsistence, the use of efficient input mixes in agriculture (for example, optimum use of the biological fixation of nitrogen for fertilizing purposes, employment-generating methods of tilling, sowing and harvesting rather than the use of big machines) and agricultural prices designed to ensure a reasonable return to the small farmer rather than the provision of unwarranted subsidies prompted by an uncritical urban bias, should be looked at again in the light of the impact that past policies have had on the patterns of population distribution, the use of natural resources and environmental stress.

Tenurial reforms to improve the access of the poor to land must be legislated, where needed, and implemented with clear intent to sustain the quality and availability of key natural resources for the well-being of populations at the projected levels

Research and development, industrial licensing, product pricing, import taxation, economic and technical co-operation and economic incentive systems

for producers and consumers need to be so designed, co-ordinated and monitored that high levels of efficiency in the use of scarce natural resources can be attained. They should actively encourage consumption and production patterns that would, for example, promote recycling, multiple uses, minimum recourse to non-renewable resources, and high efficiency in energy use.

Efforts need to be intensified in all developing countries, at both governmental and community levels, to effect sustained improvements in both drinking-water supply and sanitation facilities, especially in markedly deficient areas.

Private enterprise, and industry in particular, may identify practical ways of strongly supplementing, and complementing, governmental efforts aimed at realizing the full potential of the inherent supportive relationship between population and environmental programmes.

Action at the International Level

Bilateral and multilateral development assistance agencies need to take into consideration the implications of their programmes for natural resource regeneration, environmental improvement and population growth and distribution, prior to determining their composition and location. Especially in areas experiencing environmental stress and population pressures, such programmes should provide for built-in mutual support between the elements of population, natural resources, the environment and development.

International economic and monetary problems, which have aggravated recessionary conditions in many countries, need to be addressed urgently in a spirit of global interdependence. This will facilitate achievement of the demographic transition, especially in geographical areas that are experiencing extraordinary population pressures and environmental stress. Sustained development of these areas will, in turn, further accelerate world economic development.

International agencies which provide support to population activities in developing countries need to give priority attention to those geographical areas which are likely to suffer acute environmental stress in the next 20 to 30 years. In addition, they should promote awareness of the linkages between population and environmental factors and the need to design and execute population programmes which would respond effectively to such linkages.

International support to programmes aimed at arresting environmental degradation (for example, desertification control) needs to be urgently intensified, with special emphasis on areas which are experiencing or are likely to experience acute population pressures. The success of environmental programmes in these areas would help ensure the success of the corresponding population programmes.

Annex II

RECOMMENDATIONS BY THE EXPERT GROUP ON POPULATION, RESOURCES, ENVIRONMENT AND DEVELOPMENT GENEVA, 25-29 April 1983*

The Expert Group reiterated the full validity of the principles and objectives of the World Population Plan of Action. Among those particularly relevant to its work were: (a) "The principle aim of social, economic and cultural development, of which population goals and policies are integral parts, is to improve levels of living and the quality of life of the people"; (b) "Population policies are constituent elements of socio-economic development policies, never substitutes for them"; and (c) "In the democratic formulation of national population goals and policies consideration must be given, together with other economic factors, to the supplies and characteristics of natural resources and to the quality of the environment . . . . ."

Resources and the Environment

Governments should adopt and fully implement the provisions of the FAO World Soil Charter.

Since most of the remaining agriculturally underutilized land reserves are in the high rainfall tropics, and the proper development of these lands would require the intensive application of both technical and managerial inputs, the Expert Group recommends that the Governments concerned should create the economically and socially effective institutions required to support sustainable agricultural activity.

In order to reduce erosion and meet future needs for timber and firewood, the process of deforestation should be controlled and in certain areas stopped altogether. It is recommended that the Governments concerned should either initiate or expand well-designed large-scale reafforestation programmes and that where possible the growth of trees should be integrated into regular farming practices.

The Expert Group recommends that water development plans should reflect carefully the needs of increasing populations, particularly with regard to food.

* United Nations, *Population, Resources, Environment and Development,* Proceedings of the Expert Group on Population, Resources, Environment and Development, Geneva, 25-29 April 1983, New York, 1984, pp. 41-46.

In view of the importance of maintaining and protecting the resource base and the quality of the environment, while at the same time meeting the demands of present and future populations, the Expert Group recommends:

(a) That environmental impact statements should be established on large-scale development projects;

(b) That there should be proper management and disposal of hazardous industrial and agricultural wastes which have deleterious health and environmental effects;

(c) That irreversible changes in resource productivity should be prevented, particularly with regard to renewable resources;

(d) That pollution control mechanisms should be established in order to minimize the negative negative environmental effects of water and air pollution and to maximize the quality of life;

(e) That genetic diversity should be protected in order to prevent the loss of potentially valuable genetic material.

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VI. POPULATION CHANGE AND EDUCATION

S. Selvaratnam

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INTRODUCTION

Population and education are both linked to the processes of ensuring the persistence or continuance of a society. Education is usually viewed as the process by which a society transmits its values and accumulated knowledge from one generation to the next. Population study is concerned with the process by which a society maintains, increases, or decreases its number over successive generations.[1] Apart from this parallelism, population and education are also closely interrelated; population trends affect educational development, and educational development affects population trends. Thus, each is to some extent a determinant and consequence of the other.

Changes in the age-sex composition of the population influence the size of the school-age cohort for whom educational facilities and services have to be provided. The geographical distribution and density of the population determines the physical spread of such facilities and services within a country. The size and rate of growth of the population is an important factor determining the share of the resources to be allocated for educational development, as well as the achievement of national enrolment targets and other educational objectives.

Education has a strong influence on the components of population change: fertility, mortality and migration. Various studies have clearly established that the educational attainment of the people is an important determinant of their fertility and mortality levels. Education, which parents expect or desire to give their children, strongly influences the number of children they ultimately have. The availability of better educational facilities for children and of employment opportunities for educated parents in the urban areas are important motivating factors behind rural-urban migration in a large number of countries in the region.

However, the mutual interrelations between population and education are not in all cases direct or simple. Despite the numerous investigations and analyses, there is as yet no full and clear understanding of these interrelationships. This is because a host of interdependent and intermediate factors determine the cause-effect relation between population and education. Further, the nature and extent of the interaction of these factors may be different in different cultural and socio-economic contexts. All these circumstances render the interpretation of the empirical relationships between population dynamics and education difficult and hazardous.[2]

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[1] Helmut V. Musham (ed), *Education and Population: Mutual Impacts*, International Union for the Scientific Study of Population, Dolhain, Belgium, Ordina Publications, p. 1.

[2] *Ibid.*, p. 6.

A. IMPACT OF POPULATION ON EDUCATION

The rate of growth of the population has both direct and indirect implications for the educational development and literacy of the people. A high growth of the population, in particular of the school-age population, causes a rapid expansion of educational requirements. To the extent that high rates of population increases are associated with young age distributions, providing for education of the school-age population imposes a heavy strain on the limited resources of most developing or low-income countries.[3]

An almost immediate effect of population increase due to high fertility and low or declining mortality is the distortion in the age-structure of the population, with the younger age-groups expanding faster than the older ones. This in turn means an equally rapid expansion, with appropriate time lags, in the population of school-going age, viz, 5-14 years and 15-19 years, which more or less correspond to the first and second level school enrolments. The higher the fertility at a given level of mortality, the larger is the proportion of the child and youth population (and therefore of the school-age population) relative to the total population and that of the working age.

In the developing countries of the Asian and Pacific region, the unprecedentedly high rates of population growth which have occurred since the early 1950s as the result of sharp reductions in mortality and constant high fertility resulted in an even faster growth of the young age population in the 1960s and 1970s. In most of these countries, the proportion of children aged 0-14 years constituted nearly 40 to 45 per cent of the total population during these two decades, compared to about 25 to 30 per cent in the three developed countries, Australia, Japan and New Zealand. The population of working age, 15 to 64 years, constituted only around 55 per cent in the developing parts compared to about 60 to 65 per cent in the developed countries. Consequently, the child dependency ratio has been higher in the developing countries than in the developed ones. Although there has been substantial slackening in the population growth rates of many developing countries in recent years owing to decline in fertility, yet today, the proportion of children aged 0-14 years in these countries is still very high, and much larger than those for the three developed countries in the 1960s (table 1).

The demographic trends observed in the developing countries affect educational development in two ways. Firstly, the substantially large annual increases in school-age population results in an increase in educational requirements. This would mean provision of additional schools and class-rooms, books and equipment, as well as recruitment and training of additional teachers even if enrolment rates are to be maintained at current levels. But if enrolment

[3] For adequate discussion on this aspect, see for example, Gavin Jones, *Population Growth and Educational Planning in Developing Nations,* A Population Council Book, New York, Irvington Publishers, Inc., 1975.

Table 1. Age structure and child-dependency ratio for selected countries in the Asian and Pacific region, 1960, 1970 and 1985

Country	*Population 0-14 years as percentage of total population*			*Population 15-64 years as percentage of total population*			*Child dependency ratio*[a]		
	1960	*1970*	*1985*	*1960*	*1970*	*1985*	*1960*	*1970*	*1985*
Afghanistan	43.2	43.9	43.9	54.4	53.7	52.6	79.4	81.8	83.4
Australia	30.1	28.8	23.5	61.4	62.8	66.4	49.0	45.9	35.4
Bangladesh	40.9	45.4	45.1	55.1	51.1	51.8	74.2	88.8	87.1
Burma	39.1	41.9	39.0	57.5	54.6	57.2	68.0	76.7	68.2
China	38.9	39.7	29.7	56.3	56.0	65.0	69.1	70.9	45.7
Fiji	48.0	43.0	36.8	49.5	54.0	59.7	97.0	79.6	61.6
India	40.6	42.4	37.5	55.4	54.8	58.5	73.3	77.4	64.1
Indonesia	40.2	42.3	38.9	56.5	54.7	57.6	71.2	77.3	67.5
Japan	30.2	24.0	21.7	64.1	68.9	68.2	47.1	34.8	31.8
Lao People's Democratic Republic	41.2	41.8	41.9	56.4	55.7	54.7	73.0	75.0	76.6
Malaysia	44.9	44.6	38.1	50.9	51.9	53.1	88.2	85.9	65.6
Nepal	38.4	41.3	43.5	57.7	53.5	53.7	66.6	77.2	81.0
New Zealand	32.9	31.7	24.7	58.5	59.8	65.3	56.2	53.0	37.8
Pakistan	43.7	46.3	42.5	51.9	53.7	54.6	84.2	86.2	77.8
Philippines	46.9	45.5	41.1	49.5	51.9	55.5	94.7	87.7	74.1
Republic of Korea	41.7	42.0	31.1	55.1	54.8	64.7	75.7	76.6	48.1
Sri Lanka	42.7	39.6	33.9	52.7	56.3	61.5	81.0	70.3	55.1
Thailand	43.4	44.5	36.3	52.6	51.9	60.1	82.5	85.7	60.4

Source: UN-ESCAP, *Population Projections and Demographic Indicator by Country as Assessed in 1986*, Bangkok (print-out).

Note: [a] Number of persons aged 0-14 years per 100 persons aged 15-64 years.

ratios are to be further improved, as is the policy of most governments, then the increase in educational requirements will be still larger than those created by demographic factors.[4] Increasing educational requirements mean an automatic increase in the share of the national resources devoted to educational development, which most developing countries can hardly afford. In these countries, the burden of children to be educated at present by far exceeds the level of economic development.[5] For example, in respect of India, the second most populous country, it was noted that its rate of population increase "coupled with the attempt to enrol all school-age children, means an increase in the teaching, physical and administrative capacity of the educational system far beyond what can be financed with the resources likely to be available".[6]

Secondly an increase in the ratio of school-age population to working-age population means that a decreasing proportion of the working-age population will have to bear the burden of educating and maintaining an increasing proportion of school-going children.[7] Raising the levels of education may have the additional effect of reducing or eliminating the participation of the school-age population in economic activity, thereby increasing the cost of education while limiting the capacity to pay for it.[8] Thus, the paradox of the age-structure resulting from high fertility is that while on the one hand it creates a demand for substantial expansion in available education facilities and services, on the other it restricts the capacity for supplying the increased educational needs.

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[4] For instance, in many developing countries of the region, the enrolment ratios for girls are far below the rate for boys at all levels of education. The need for eliminating these disparities will require not only additions to existing educational facilities and services, but in some societies, the provision of new facilities and services exclusively for females.

[5] Alain Girard, "The effect of demographic variables on education" in Helmut V. Mushan (ed), *Education and Population: Mutual Impacts, op. cit.*

[6] Commission on International Development (Lester B. Pearson, Chairman), *Partners in Development,* Praeger Publishers, 1969, in footnote 3, pp. 292-3.

[7] The actual burden, however, is considerably higher than is usually shown by the ratio of number of children to number of persons in the working age because not all persons in the working age are actually at work. In countries where the education system is well developed, a substantial proportion of the children in the age group 15-19 years are full-time students and have therefore to be counted as dependants. In most countries, and particularly many Muslim countries, participation of females in the labour force is comparatively low, and hence the bulk of the women in the working ages have to be reckoned as dependants. Further, due to lack of employment opportunities, a sizeable proportion of males and females in working ages are unemployed. For these and other reasons, the proportion of those actually employed, and therefore able to contribute to children's education, is very much smaller than the number of those referred to as "population of working age".

[8] J.E. Vaizey, "Demographic considerations in integrate planning of educational levels", United Nations, *Proceedings of the World Population Conference, Belgrade, 30 August – 10 September 1965, vol. IV, Selected Papers and Summaries,* New York, 1967.

Variations in the rate of population growth, particularly those resulting in "bulges" in the age-structure, may also present problems in regard to educational planning. Such effects assume importance especially in societies where primary education is compulsory, because the training of teachers should often start even before the children they have to teach are born. "Bulges" in the age-structure do not very much affect post-primary education because a longer period is available within which suitable adjustments could be made. Moreover, at post-primary levels, it is not the number of potential students but the enrolment rates that are the main determinants of educational needs. This is also true where primary education is not compulsory or less than complete.[9]

The sex composition of the population also plays an important part in planning for educational development, particularly in those countries where there are wide disparities in school attendance and educational attainment between the two sexes, and where national policies give priority to enhancing women's education. In many areas, the relative under-representation of girls in the educational system is compounded by an over-all scarcity of resources, placing them at an even greater competitive disadvantage. This scarcity is often greater where population pressures are most acute.[10]

The geographical distribution, density, degree of concentration, and the pattern of settlement of the population have an important bearing on the development of educational facilities and services as well as on the educational attainment of the people.[11] A low density of population, or its scattered nature over large areas very often renders expensive and uneconomical the provision of educational facilities and services or their planned expansion. This is particularly true of elementary schooling which is essentially a neighbourhood service and should be adjusted to the geographical distribution of the population.[12] For instance, in Pakistan where over 20 per cent of the rural population live in settlements of less than 300 persons each, or in India where nearly 13 per cent of all settlements have less than 500 persons each, an adequate numerical base does not exist for maintaining an elementary school in each of these small and often widely dispersed settlements. In Nepal, the difficult geographical terrain and inadequate communication and transportation systems are additional factors which limit and complicate the delivery of educational services to the population settled in the mountains and hill regions of the country.

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[9] Alfred Sauvy, "Social factors in educational plans", in UNESCO, *Economic and Social Aspects of Educational Planning,* Paris, 1964.

[10] United Nations Secretariat, "Women's rights and fertility" in United Nations, *The Population Debate: Dimensions and Perspectives,* Papers of the World Population Conference, Bucharest, 1974, vol. II (ST/ESA/SER.A/57), New York, 1975, p. 371.

[11] United Nations, *National Programmes of Analysis of Population Census Data as an Aid to Planning and Policy-making,* Population Studies No. 36, (ST/SOA/SER.A/36), New York, 1964.

[12] Helmut V. Musham, *op. cit.*, p. 8.

In practically all countries, considerable differences exist in regard to the availability of educational facilities and services as well as the level of educational attainment and literacy in the rural and urban areas. In most countries rural areas are neglected in regard to developmental activities while urban areas are often the beneficiaries of disproportionate political patronage, Educational development in rural areas is often handicapped because of inadequate facilities, poor staffing, insufficient equipment and materials, as well as by a lack of incentives for education on the part of the rural population.[13] Consequently, literacy levels are low in rural compared to urban areas. These differentials are of course not due to the pattern of settlement *per se* as much as the priorities in national social and economic development.

Components of population change also have an impact on educational development at the micro- or household levels. The high fertility patterns obtaining in most developing countries of the Asian and Pacific region means a large family or household size. High fertility, and thus large family size, is a phenomenon usually associated with low-income groups in the society. In countries where education is not free, low-income families often find it difficult to educate all their children even minimally. Given the limited incomes and resources, the tendency among the poor in most societies is to favour male children over female children with regard to schooling.[14] Apart from the traditional preference for male children which exists in many societies, the social perception of the role of female as being only that of wife and mother is also a factor influencing the priority accorded at the household level to the education of boys, and at the national level to the provision of better facilities for the education of boys.[15] For instance, it was reported that in India, the education of girls is sacrificed in favour of boys, and there is a lurking fear that education may alienate girls from their roles and expected submissive behaviour.[16]

The size of the family has also an important effect on the duration of the children's education. The larger the family size, the greater the possibility of an early withdrawal of the children from the educational system. This is because the parental demand for education will be reduced as a result of the depressive effect of every new addition to the family on the family's per capita income.[17] In other words, the chances of access to higher education are decreased with an increase in the size of the family. Thus, the child of a labourer cannot expect

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[13] United Nations, *The Determinants and Consequences of Population Trends: New Summary of Findings on Interaction of Demographic, Economic and Social Factors,* vol. I, New York, 1973 (ST/SOA/SER.A/50), p. 616.

[14] ILO, *World Labour Report,* vol. 2, 1985, p. 218.

[15] Jan L. Sadie, "Demographic factors and the structure of education" in Helmet V. Musham (ed), *Education and Population: Mutual Impacts, op. cit.,* p. 94.

[16] Indian Council of Social Science Research, *Status of Women in India,* New Delhi, Allied Publishers, 1975.

[17] Jan L. Saide, *op. cit.,* p. 96.

to go very far in the education process unless that child comes from a small family.[18] Also, the chances of early withdrawal from the educational system is greater for girls than for boys. For instance, it has been reported that in China, girls are withdrawn from school more readily than boys to help in household tasks.[19]

The age at marriage also has an important effect on the education of children, particularly female children. Among many communities in some developing countries of the region, very early age at marriage has for long been an important factor inhibiting educational development, especially that of girls. In several Muslim cultures and in some areas of India and Nepal, social values and customs still favour the marriage of girls when they are young.[20] The younger the average age at marriage, the earlier the girls terminate their education. It has been noted that in societies where girls often marry and bear children at ages below that of graduation from high school, secondary level enrolment is generally very low.[21] However, in several developed countries, although it used to be the practice in the past not to marry before completing one's studies and attaining a position, today there appears to be an increase in the number of married students particularly at the tertiary levels of education.[22]

The lack of adequate educational facilities in the rural areas often results in out-migration of the children of well-to-do families to urban areas to seek further education.[23] The number of such migrants as well as their educational requirements and aspirations will have an effect on the demand for education.[24] At the point of origin, that is the village, the emigration of a substantial number

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[18] Alain Girard, *op. cit.*, p. 32.

[19] W.L. Parish, Jr., "Socialism and the Chinese peasant family", *Journal of Asian Studies,* vol. 34, 1975.

[20] For example, in India, it was for a long time considered a sign of ones's affluence, influence or status to get one's daughter married before she reached the age of puberty. (See K.M. Kapadia, *Marriage and Family in India,* Bombay, Oxford University Press, 1966). However, in recent years there has been a tendency towards increasing age at marriage owing to changes that have occurred in socio-economic, cultural and behavioural attitudes in many parts of the country. For instance, a recent study reported that even in rural areas, the concept of childhood, dependency and immaturity have currently gained great importance. Parents and family members are apprehensive about their sons marrying girls who have not attained menarche, or those who have done so only recently, on the grounds that they are too immature to play the role of wife, mother, and daughter-in-law (see J.C. Caldwell, et.al., "Demographic change in rural South India", *Population Studies,* vol. 37, No. 3, pp. 343-361). In Bangladesh, girls marry between 12 and 16 years, with restrictions on their movement from the age of 10. See Tahrunessa A. Abdulla, *Village Women as I Saw Them* (Bangladesh Academy of Rural Development, Comilla, 1976).

[21] Helmet V. Musham, *op. cit.*, p. 11.

[22] Alain Girard, *op. cit.*, p. 33.

[23] Graeme J. Hugo, Terrence H. Hull, Valerie J. Hull, and Gavin W. Jones, *The Demographic Dimensions in Indonesian Development,* East Asian Social Science Monographs, Oxford University Press.

[24] Helmet V. Musham (ed), *op. cit.*, p. 17.

of children of school-going age may result in a wastage of already established facilities, while at the destination, the city, there will be a need to expand existing capacities to accommodate the in-migrant children. On the other hand, if the rural-urban migrant stream consists largely of those who have completed their education, then such migration will not result in any noticeable reduction in the number of pupils in the schools of the out-migration region, because migrants are by and large unattached young adults. However, it is likely that out-migration of a large number of persons with a certain type of education may increase the demand for this type of education in the place of origin as more youngsters would like to acquire the same education with the intention of migrating later in their turn.[25]

B. IMPACT OF EDUCATION ON POPULATION

The educational attainment of the people has an important bearing on the components of population change: fertility, mortality and migration. However, in view of the increasing concern with the high levels of fertility in many developing countries and the consequent growing interest in understanding the determinants of fertility levels and trends, most studies relating to the interrelationships between population and education have been devoted to an analysis of the effect of education on fertility. Only a few studies have focused on the effect of education on mortality or migration.

1. Education and Fertility

It has often been argued that the educational level is the best single variable for explaining variations in fertility. In particular, it is pointed out that the educational level of the women, more than that of men, is one of the strongest factors affecting fertility especially in high fertility countries. Hence, it has been claimed that level of female education is the strongest and most consistent predictor of fertility.[26] It has also been argued that women's educational level is the most visible and quantifiable element in a cluster of interdependent forces affecting fertility.[27]

Several studies undertaken in the 1960s and 1970s came to definite conclusions that there was an inverse relationship between education and fertility;

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[25] Gunar Fongstedt, "The effects of demographic factors on the demand for education in view of manpower requirements", in Helmet V. Musham (ed), *Education and Population: Mutual Impacts, op. cit.*, p. 49.

[26] For example, see William W. Murdoch, *The Poverty of Nations: The Political Economy of Hunger and Population* (Baltimore, The Johns Hopkins University Press, 1982), World Bank, *World Development Report 1984* (Oxford University Press, 1985).

[27] United Nations Secretariat, "Women's rights and fertility" in United Nations, *The Population Debate: Dimensions and Perspectives, op. cit.*

that is fertility decreased with increase in educational level.[28] Based on the results of these studies, it was asserted that "the evidence that education is linked to lowered birth rates in poor countries is ubiquitous and powerful"[29] However, a 1979 review of available studies concluded that while many of the analyses relating national and regional levels of education and fertility showed significant inverse relations, many others showed no significant relation, or mixed evidence of significantly inverse and significantly direct relations, or evidence only of positive relations. This review also indicated that the inverse relation in aggregate data was stronger for countries at the middle level of development. Furthermore, the review showed that the inverse relation at the individual level for developing countries was much more consistent for female than male education, and for urban than for rural areas.[30]

Yet another review of the findings of the World Fertility Survey (WFS) data for 38 developing countries throughout the world, including 10 countries in the Asian and Pacific region, concluded that there was an overall pattern of declinig fertility with increasing education. Generally, women with four to six, and seven or more years of education had substantially lower fertility than those with less education, but the range of values varied from country to country, the differential being smaller in the least developed countries and larger in the relatively more developed ones. This review also noted that uneducated women in some countries had lower fertility than highly educated women in other countries; and that, by and large, educational differentials in marital fertility were similar within rural and urban areas.[31]

The WFS data for the 10 countries in the Asian and Pacific region participating in the Survey (table 2) revealed that:

(a) Educational differentials in total marital fertility existed in nine of these countries, the only exception being Indonesia where no difference was reported between the fertility of women with no education and women with seven or more years of education. This anomalous relation may be due to the

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[28] For example, see United Nations, *The Mysore Population Study: Report of a Field Survey Carried Out in Selected Areas of Mysore State, India,* Population Studies No. 34 (New York, 1961); William P. McGreevy and Nancy Birdsall, *The Policy Relevance of Recent Social Research on Fertility* (Washington, D.C., Inter-disciplinary Communication Programme, Smithsonean Institute, 1974); Julian L. Simon, *The Effects of Income on Fertility* (Chapel Hill, North Carolina Population Center, 1974); Karen Mason et. al. and others, *Social and Economic Correlates of Family Fertility: A Survey of Evidence* (Research Triangle Park, N.C., Research Triangle Institute, 1971).

[29] William W. Murdoch, *The Poverty of Nations: The Political Economy of Hunger and Population, op. cit.*, p. 41.

[30] Susan Hill Cochrane, *Fertility and Education: What Do We Really Know?*; World Bank Staff Occasional Paper No. 26 (Baltimore, Johns Hopkins University Press, 1979).

[31] Mary Beth Weinberger, "The relationship between women's education and fertility: selected findings from the world fertility surveys", *International Family Planning Perspectives,* vol. 13, No. 2, June 1987, pp. 35-46.

Table 2. Total marital fertility rate (TMFR)[a] for marriage durations of 0-24 years by number of years of women's education in 10 countries of the Asian and Pacific region

Country	Years of education				Col (1) minus col (4)
	0 (1)	1-3 (2)	4-6 (3)	7 (4)	(5)
Bangladesh	6.1	6.3	6.9	5.9	0.2
Fiji	5.0	5.1	5.2	4.6	0.4
Indonesia	5.0	5.5	5.5	5.0	0.0
Malaysia	6.2	6.0	5.8	4.0	2.2
Nepal	6.0	6.8[b]	6.4[b]	4.0[b]	2.0
Pakistan	7.0	6.2	7.0	5.1	1.9
Philippines	6.7	7.4	6.9	5.0	1.7
Republic of Korea	6.2	5.6	5.0	3.8	2.4
Sri Lanka	5.6	5.3	5.3	4.3	1.3
Thailand	5.5	5.7	5.4	3.2	2.3

Source: Mary Beth Weinberger, "The relationship between women's education and fertility: selected findings from the the World Fertility Surveys" *International Family Planning Perspectives*, vol. 13, No. 2, June 1987.

Notes: [a] The TMFR represents the average number of births a woman would have 25 years after her first marriage if she were subject to the marriage-duration-specific fertility rates observed during the five years preceding the survey.

[b] Values are based on fewer than 500 woman-years of exposure in all or fewer than 20 woman-years of exposure for any marriage-duration group under 15 years.

fact that, for purposes of the survey, years of exposure to religious education (in *Madrasa*) was equated with years of formal school education, and it is considered that the longer the duration of religious education, the more conservative and traditional will be a women's values and attitudes.[32]

(b) The magnitude of the differentials between women with zero and those with seven or more years of schooling varied from country to country, being in most cases smallest in the least developed countries and largest in the relatively more developed ones. But in Nepal, a least developed country, the differential was almost the same as that in Malaysia, a relatively more developed country. This may be due to the fact that, as explained in the footnote to

[32] This explanation has been advanced informally by some researchers in Indonesia.

table 2, the values in columns (2), (3) and (4) have been based on small sample size and may therefore not be comparable with the corresponding values for other countries.

(c) In most countries, the inverse relation between education and fertility did not operate throughout the education continuum, but became effective at a different point on the continuum. The expected negative relationship did not occur until a woman had completed four to six years of education in Bangladesh, Fiji, Indonesia and Pakistan. In these countries, small amounts of schooling appeared to increase, and larger amounts tended to depress, fertility. Consequently, in these countries, highest fertility was often found not among uneducated women but among those with a few years of schooling.[33]

In addition to the World Fertility Survey, studies undertaken in several countries of the Asian and Pacific region confirm the overall pattern of declining fertility with increasing education. For example, in Bangalore City (India), women with high school or university education were found to have fewer children, on the average, than women with lesser educational attainment.[34] A World Bank survey of 3,000 households randomly selected from three districts of Kerala State (India) showed that the average number of children ever-born was lower for the better educated than for the illiterate (2.1 for women with ten or more years of schooling, and 4.5 for women with no schooling). This survey also showed that average completed fertility (number of children ever-born to women married 25 years or more) of the highly educated was 1.4 children less per woman than for their counterparts with no schooling (4.4 and 5.8 children respectively).[35]

A recent study for China indicated that in 1981, the proportion of high order births was much less for women who had completed senior middle schooling and higher education than for women with lower levels of education. The difference in fertility of junior-middle-school-level and primary-school-level women was also very large. The study also reported that junior-middle-level education was most effective in reducing mean parity.[36] Another study

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[33] Similar findings have been reported by, for example, Constantina Safilios-Rothschild, "Sociopsychological factors affecting fertility in urban Greece: A preliminary report", *Journal of Marriage and the Family*, vol. 31, August 1969; Susan H. Cochrane, "Effect of education and urbanization on fertility" in Rudolfo A. Bulatao and Ronald D. Lee (eds), *Determinants of Fertility in Developing Countries*, vol. 2, New York, Academy Press.

[34] United Nations, *The Mysore Population Study, op. cit.*

[35] K.C. Zachariah, *The Anomaly of the Fertility Decline in India's Kerala State: A Field Investigation*, World Bank Staff Working Papers No. 700, Population and Development Series No. 35 (Washington, D.C., World Bank, 1984).

[36] Jiang Zhenghua, "Reasons for fertility decline in China", paper presented to the *Seminar on Fertility Transition in Asia: Diversity and Change*, Bangkok, 28-31 March 1988, jointly organized by the Committee on Comparative Analysis of Fertility and Family Planning, International Union for the Scientific Study of Population and Institute of Population Studies, Chulalongkorn University.

reported that women with college education had on average 2.8 fewer children than women with no education.[37]

A study based on the data collected from two districts each in the Hill and Terai regions of Nepal during 1975-1978 showed that the mean number of children ever-born declined with increasing level of household education in the Hills, the largest difference being observed among women aged 25 years and older whose husbands had received middle-level education. Compared to the findings for the Hill women, the fertility of Terai women showed an increase with increase in husbands' education. This was particularly so for women whose husbands had received high school education.[38] Thus, these findings are not consistent because husbands' education was inversely related to fertility in the Hills but positively asscoiated in the Terai.

Education, particularly of women, influences fertility through at least three mechanisms: delayed marriage or non-marriage; reduction in desired family size; and exposure to knowledge, attitudes and practices favourable to birth control, including better husband-wife communication enabling their actual reproductive performance to be consistent with their desired family size.[39]

(a) Education and marriage

In developing countries, age at first marriage of females usually has an inverse relationship to fertility, because the reduces the time-span of exposure to the risk of pregnancy and also because it is correlated with the factors that independently tend to reduce the supply of, or demand for, children.[40] The World Fertility Survey data indicated that compared to women with no education, the singulate mean age at marriage (SMAM) was considerably higher for women with seven or more years of education. The reported differences for countries in the Asian and Pacific region were: Bangladesh, 4.5 years; Malaysia, 3.6 years; Pakistan, 6.8 years; the Philippines, 1.3 years; and the Republic of Korea, 2.5 years. In Malaysia, the Philippines and the Republic of Korea, the marriage age for uneducated women was higher than that for those with a few years of schooling. Though in most cases this difference was small, in the Philippines it was as high as 2.5 years.[41] The Kerala study, referred to earlier, reported a monotonic increase in average age at marriage for women with

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[37] China Population Information Center, *Analysis on China's National One-per-Thousand Population Fertility Sampling Survey*, Beijing, 1984, p. 87.

[38] J.M. Tuladhar, J. Stockel and A. Fisher, "Differential fertility in rural Nepal", *Population Studies*, vol. 36, No.1, March 1982, pp. 81-86.

[39] United Nations secretariat, "Women's rights and fertility", *op. cit.*

[40] Karen Oppenheim Mason, "The status of women", paper prepared for the Population Sciences Division of the Rockefeller Foundation (Population Studies Centre, University of Michigan), 1984.

[41] Mary Beth Weinberger, "The relationships between women's education and fertility . . .", *op. cit.*

increasing educational levels, the difference between illiterate women and those with at least 10 years of schooling being as much as 4.3 years.[42] For China, it was reported that mean age at first marriage for middle school graduates was much higher than for illiterates.[43] In Thailand, the differences in the singulate mean age at marriage between those with no schooling and those with primary schooling were small, but higher levels of education were associated with considerably later ages at marriage.[44] The contribution of female education to marriage delay has been confirmed in multivariate studies for the Republic of Korea[45] and Malaysia[46] and appeared to become stronger over time in studies relating to Sri Lanka.[47]

Several competing reasons have been advanced to explain the effect of education on females' age at first marriage. Firstly, it has been argued that since education in general increases accessibility to jobs in the modern sectors with better remuneration, educated women may opt to work for some time before marriage, thus postponing it.[48] This is particularly true in settings where marriage requires a woman to quit work.[49] Also, in many developing countries of the region where unemployment rates are high and opportunities for women's employment limited, the time lag between finishing school and securing a job is considerable, thus delaying her marriage if she wishes to work before marriage, secondly, women who are educated would like to marry a man with at least equal educational qualifications. This not only narrows the range of potential marriage partners, but may also require a long waiting time to find the suitable partner.[50] This delay is relatively greater in societies where a substantial dowry has to be given to a groom with higher education and better employment; marriage must be delayed until the girls' parents can accumulate a sufficient

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[42] K.C. Zachariah, *The Anomaly of the Fertility Decline in India's Kerala State, op. cit.*

[43] Jiang Zhengua, "Reasons for fertility decline in China", *op. cit.*

[44] John Knodel, Apichat Chamratrithirong, Napaporn Chayovan, and Nibhon Debavalya, *Fertility in Thailand: Trends Differentials, and Proximate Determinants* (Washington, D.C., National Academy Press, 1982).

[45] B.S. Lee and A.M. McElwain, *Development of an Econometric Fertility Model for Less Developed Countries: An Examination of Fertility, Age at Marriage, and Female Labour Force Participation in Korea,* Office of Population, U.S. Agency for International Development.

[46] K.H. Anderson, *Age at Marriage in Malaysia,* Paper presented at the Annual Meetings of the Population Association of America, 1981.

[47] James Truesell and D. Bloom, *Estimating the Covariates of Age at Marriage and First Birth,* unpublished paper, Princeton University, Princeton, N.J.

[48] Susan Hill Cochrane, *Fertility and Education: What Do We Really Know?, op. cit.*

[49] Peter C. Smith, "The impact of age at marriage and proportions marrying on fertility" in Rodolfo A. Bulatao and Ronald D. Lee (eds), *Determinants of Fertility in Developing Countries,* vol. 2, (New York, Academy Press, 1983).

[50] M.C. Keely, "The economics of family formation", *Economic Inquiry,* vol. 15, 1977.

dowry.[51] Indeed, in many families, the girl herself may have to work to accumulate the needed dowry. Thirdly, education is also considered to modernize women's views of the family, something that tends to promote a desire to marry romantically rather than by arrangement.[52] In fact, in many societies education has been found to be negatively correlated with arranged marriages, which tend to go along with a young female age at marriage.[53]

It has also been argued that education affects not only the age of marriage but also the probability of ever marrying. While for men, increased education means increased incomes and hence a wider choice of partners, for females, education increases the alternatives to marriage and also reduces the pool of suitable marriage partners.[54] It has also been suggested that increased female education tends to reduce the benefits of the traditional complementary division of labour by which a male specializes in market production and a female in home production, and thus either delays marriage or reduces its prevalence.[55]

(b) Education and desired family size

The findings of the World Fertility Survey (table 3) indicate that the mean desired family size generally decreased with increasing levels of education in all 10 countries. In most of the 10 countries, women with seven or more years of education wanted, on the average, one child less than women with no education; in the Philippines this difference was 1.5. It will also be noted from table 3 that even in countries with lower fertility desires, the desired number of children is still well above replacement-level fertility, even for highly educated womrn.[56] For example, in the Republic of Korea, women with seven or more years of education desired to have on the average, 2.8 children.

The study for Kerala State (India) also showed that education had a negative relation to desired family size; that is, educated women desire fewer children than the less educated or illiterate. According to this survey, the average desired

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[51] K.C. Zachariah, *op. cit.*

[52] John C. Caldwell, "Direct economic costs and benefits of children", in Rudolfo A. Bulatao and Ronald D. Lee (eds), *Determinants of Fertility . . ., op. cit.*

[53] For example, see Ruth B. Dixon, "Women's rights and fertility", *Reports on Population/Family Planning,* No. 17, January 1975; Tim Dyson and Mick Moore, "On kinship structure, female autonomy and demographic behaviour in India", *Population and Development Review,* vol. 9. No. 1, March 1983, pp. 35-60.

[54] Susan Hill Cochrane, *Fertility and Education: What Do We Really Know?, op. cit.,* p. 73.

[55] G.S. Becker, *A Treatise on the Family* (Cambridge, Mass Harvard University Press), 1981.

[56] Mary Beth Weinberger, "The relationship between women's education and fertility: selected findings from the World Fertility Survey", *op. cit.*

Table 3. Mean desired number of children among ever-married women aged 15-19 by number of years of education for 10 countries in the Asian and Pacific region

Country	Years of education				Col (1) minus col (4)
	0 (1)	1-3 (2)	4-6 (3)	7 (4)	(5)
Bangladesh[a]	4.1	4.0	4.1	4.0	0.1
Fiji	4.4	4.4	4.3	3.9	0.5
Indonesia	4.1	4.3	4.1	4.0	0.1
Malaysia	4.6	4.4	4.3	3.9	0.7
Nepal	3.9	3.7	3.6	3.1	0.8
Pakistan[b]	4.2	3.7	3.6	3.3	0.9
Philippines	5.4	4.9	4.6	3.9	1.5
Republic of Korea	3.6	3.5	3.2	2.8	0.8
Sri Lanka	4.2	4.0	3.9	3.3	0.9
Thailand	3.9	3.9	3.7	3.2	0.7

Source: Mary Beth Weinberger, "The relationship between women's education and fertility", *International Family Planning Perspectives,* vol. 13, No. 2, June 1987.

Notes: [a] Non-numeric responses greater than 10 per cent.

[b] Desired family size questions are non-standard.

number of children decreased monotonically from 3.8 for women with no schooling to 2.47 for women with 10 or more years of education.[57]

There are several reasons why education, particularly of women influences desired family size. Firstly, it has been argued that education reduces preferences by changing traditional values, and increasing awareness of alternative sources of satisfaction.[58] Secondly, education tends to reduce the perceived returns from children usually provided through unpaid labour in family-operated enterprises and provision of security to parents in old age. Since education results in a shift of occupation from the traditional self-employment in agriculture to paid employment in the modern or urban sector, child labour becomes less important within the family. Further, particularly in the case of women, since education assures them of regular well-paid employment and thus the

[57] K.C. Zachariah, *The Anomaly of the Fertility Decline in India's Kerala's State, op. cit.*

[58] Susan Hill Cochrane, *Fertility and Education: What Do We Really Know?, op. cit.*

ability to support themselves, they need not depend on their children for support.[59] It has also been suggested that education influences the opportunity costs of children: the higher a women's potential wage level, the more money she foregoes when she takes care of her children instead of engaging in productive work.[60] Conversely, a high level of education may not motivate a woman towards a smaller family if her training does not lead to active participation in employment outside the home.

Thirdly, education also tends to raise the perceived costs of children by raising parents' aspirations for their children, particularly in regard to the children's education. For example in Kerala State (India), it has been reported that the adoption of education as an important criterion for recruitment to non-agricultural occupations has enhanced the economic value of education and raised parents' aspirations for their children's education. Indeed the aspirations of mothers in respect of their children's education have been reported to be very high compared to their own educational attainment. The illiterate women desire that their children should be educated up to senior high school, that is, a shift of ten years on average in one generation. The best educated women want their children to be educated up to the degree level, that is a shift of three or four years in one generation. Since most Kerala families could not have the necessary means to meet the increased costs of education of their children, they realized that the solution to their dilemma was to opt for a smaller family.[61] In the Republic of Korea, the high value attached to education and the severe competition to secure admissions in first rate schools and universities has been considered as important factor in the country's fertility decline.[62]

Another way in which female education may influence the cost of children is by affecting the nature of the husband-wife relationship. Some authors have argued that better educated women are more likely to establish an egalitarian relationship with the husband than are other women, and that this in turn may lead couples to place a higher value on spending time alone together, something that implicitly raises the psychic costs of children.[63] However, it has been

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[59] Adrienne Germain, "Status and roles of women as factors in fertility behaviour: A policy analysis", *Studies in Family Planning*, vol. 6, July 1975, pp. 192-200.

[60] Karen Oppenheim Mason, *The Status of Women, op. cit.*, p. 63. But Krean argues that the assumption that women cannot easily work and rear children simultaneously is questionable, because even women employed in relatively well-paid modern sector jobs often have servants or relatives who can care for their children while they are at work.

[61] K.C. Zachariah, *op. cit.*

[62] Kwon Tai Hwan, *Explaining Socio-Cultural Explanations of Fertility Transition in Korea*, Paper presented to the Seminar on Fertility Transition in Asia: Diversity and Change, Bangkok, 28-31 March 1988. Jointly organized by the Committee on Comparative Analysis of Fertility and Family Planning (International Union for Scientific Study of Population) and Institute of Population Studies (Chulalongkorn University).

[63] For example, see John C. Caldwell, "Direct economic costs and benefits of children" in R.A. Bulatao and R.D. Lee, *et. al.* (eds), *Determinants of Fertility in Developing Countries, op. cit.*, Christine Oppong, "Women's role, opportunity costs and fertility" in R.A. Bulatao and R.D. Lee, *et. al.*, (eds), *op. cit.*

pointed out that what appears to be at issue is the extent to which the spouses regard each other as companions, and not the degree to which the wife is economically independent of her husband. It is also doubtful whether a desire for time together will play a major role in fertility decisions in all except a very small fraction of the population in developing countries, given the powerful incentives for most couples to bear children.[64]

(c) Education and fertility regulation

Various studies have shown that there are differentials in contraceptive use between educational groups in most countries of the region. These studies also indicate that both the household's as well as the wife's education increases contraceptive use, although it has been found that this association is strongest in the case of the wife's education.[65] It has also been argued that education alone is not sufficient to guarantee high levels of contraceptive use: women with many years of education in one country may adopt contraceptive practices to a lesser extent than women with no education in another country.[66]

The results of the World Fertility Survey for 10 countries in the Asian and pacific region (table 4) show that in 9 of them, the proportion of married women practising contraception at the time of the interview was substantially greater among those with seven or more years of education than among those with no children. These differences range from a low of 13 percentage points in the Republic of Korea to a high of 37 percentage points in the Philippines. The only exception is Fiji, in which the level of contraceptive use is 7 percentage points lower for the better educated women than for those with no education. However, another study has found that the addition of more demographic control variables reverses the direction of the relationship in Fiji, although the differential remains relatively small.[67]

In Kerala state (India), there was a sharp increase in the proportion of women currently practising family planning with an increase in their educational level; from 6.3 per cent for those with no schooling to 40.3 per cent for those with 10 or more years of schooling.[68] For China, it has been reported that the birth control rate is higher for those who received a college education than for

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[64] Karen Oppenheim Mason, *op. cit.*

[65] Gwendolyn Johnson-Ascadi and Mary Beth Weinberger, *Factors Affecting Use and Non-use of Contraception,* 1982.

[66] Rudolfo A. Bulatao, *Reducing Fertility in Developing Countries: A Review of Determinants and Policy Levors,* World Bank Staff Working Papers No. 680 (Washington, D.C., World Bank), 1984.

[67] United Nations, *Variations in the Incidence of Knowledge and Use of Contraception: A Comparative Analysis of the World Fertility Survey Results for Twenty Developing Countries* (New York, 1981).

[68] K.C. Zachariah, *op. cit.*

Table 4. Percentage of currently married women aged 15-24 currently practising contraception by number of years of education for selected countries in the Asian and Pacific region

Country	Years of education				Col (1) minus col (4)
	0 (1)	1-3 (2)	4-6 (3)	7 (4)	(5)
Bangladesh	6	11	13	30	24
Fiji	46	47	39	39	–7
Indonesia	22	30	33	43	21
Malaysia	22	32	39	48	26
Nepal	2	7	11	18	16
Pakistan	4	11	10	22	18
Philippines	11	22	34	48	37
Republic of Korea	28	30	35	41	13
Sri Lanka	19	26	33	42	23
Thailand	28	32	34	42	14

Source: Same as table 2.

Note: Percentages are adjusted for the effects of age differences between educational groups.

those who are illiterate.[69] The WFS findings have also been confirmed by contraceptive prevalence surveys undertaken subsequently in some of these countries. For example, in Bangladesh it was noted that while only 27.6 per cent of ever-married women who had no education ever used at least one family planning method, the percentage rose sharply and steadily with increase in education, to 33.7 per cent for those with 10 and 12 years of education.[70] In Thailand, the percentage of currently married women aged 15-49 currently practising contraceptive methods increased from 49.0 per cent for those with no education to 61.2 per cent for those with 5 years and more of schooling.[71]

There are several reasons why there is a positive relation between education and use of contraceptive methods. Firstly, it is argued that education makes people more receptive to new ideas and more likely to approve the use of

[69] China Population Information Centre, *op. cit.*

[70] S.N. Mitra and G.M. Kamal, *Bangladesh Contraceptive Prevalence Survey 1983,* Mitra and Associate, Dhaka, 1985.

[71] Peerasit Kamnuansilpa and Aphichat Charatrithirong, *A New Decade of Fertility and Family Planning in Thailand: 1981 Contraceptive Prevalence Survey,* Bangkok, 1982.

contraception. In particular, better educated women will be more willing to engage in innovative behaviour than less educated women; and in the context of the developing countries, contraception remains an innovation.[72] Secondly, better education enables couples to acquire more knowledge of contraceptive methods and how to use them. Contraceptive prevalence surveys in various countries have confirmed that levels of knowledge follow an expected pattern when related to education.[73] In Kerala State (India), it was noted that the wife's education is the principal variable affecting the knowledge of family planning methods, and that at lower levels of women's education, an additional year of schooling increases the knowledge of family planning methods by 2.75 per cent. At higher levels, however, the improvement is marginal.[74] Thirdly, it is also argued that education increases a couple's income potential and thus makes affordable a wide range of contraceptive methods. Fourthly, increased education results in better husband-wife communication; some discussion is necessary for successful contraceptive use and also for a concensus on practising contraception.[75]

2. *Education and Mortality*

Information on mortality differentials by education for developing countries in the Asian and Pacific region is sparse. However, available evidence seem to suggest that education is inversely related to mortality. In several developing countries of the region, higher mortality appears to be associated with illiteracy, landlessness, low incomes, higher birth order and rural residence. Several studies have also indicated that parental education, especially of the mother, is a major determinant of infant and child mortality, although the precise mechanism by which a mother's education lowers the mortality of children is not well understood.[76]

A 1958 survey in Nagpur district in central India, provides data on child mortality according to educational attainment of father and mother. For husbands with no education, the percentage of their children having died prior to the interview was 40.4, and this percentage decreased, although not regularly, with increased educational achievements to 27.5 for college educated groups. The percentage of children no longer alive at the time of the interview was 39.1

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[72] See John C. Caldwell, "Education as a factor in mortality decline: An examination of Nigerian data", *Population Studies,* vol. 33, No. 3, November 1979, pp. 395-413; Tim Dyson and Mick Moore, "On kinship structure, female autonomy and demographic behaviour in India", *Population and Development Review,* vol. 9, No. 1, March 1983, pp. 35-60.

[73] For example, see Peerasit Kamnuansilp and Aphichat Charatrithirong, *op. cit.* and S.N. Mitra and G.M. Kamal, *op. cit.*

[74] K.C. Zachariah, *op. cit.*

[75] Susan Hill Cochrane, *Fertility and Education: What Do We Really Know? op. cit.*

[76] ESCAP, *Mortality and Health Issues in Asia and the Pacific,* report of a seminar held at Beijing in collaboration with the Institute of Population Research, People's University of China from 22 to 27 October 1986, Asian Population Studies Series No. 78, Bangkok, 1987.

for wives with no schooling, 34.0 for the primary school group and 23.7 for those with more than primary education.[77]

For Indonesia, it was noted that the education of both father and mother influenced child survival and that the education of the mother had a stronger effect in reducing the child mortality rate.[78] Even after controlling for other variables such as age at first marriage, occupation, income, average duration of breastfeeding, it was found that education was an important variable influencing child survival.[79] Estimates based on the 1980 census data showed that the infant mortality rate of children born to mothers who had completed upper secondary education was 53 per thousand live births compared to 127 for mothers with no education.[80]

Estimates based on the data of the Bangladesh Fertility Survey (conducted as part of the World Fertility Survey programme) showed that while post neo-natal infant and child mortality were inversely related to the mothers' education, neo-natal mortality was highest for children born to mothers who had completed secondary education.[81] Another study for Bangladesh revealed that the mother's education, more than that of the household head or the highest educational level achieved by any family member, was the most influential factor determining child mortality.[82]

Studies for the Republic of Korea also confirm the inverse relation between parents' education and infant and child mortality. For instance, the infant mortality rate of babies born to mothers with secondary education was 38 per thousand live births compared to 56 for mothers who had completed only primary education. Similarly the infant mortality rate for babies born to fathers with secondary education was 47 compared to 58 for fathers with primary education.[83] In Pakistan, the probability of survival of infants born to mothers with a higher level of education (10 classes or higher), is two and a half times the average and slightly less than double the probability for the next lower

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[77] Edwin D. Driver, *Differential Fertility in Central India* (Princeton, N.J., Princeton University Press), 1963.

[78] J.C. Caldwell and P.F. McDonald, "Influence of maternal education on infant and child mortality levels and causes" in *International Population Conference*, vol. 2, pp. 79-95, Belgique, IUSSP.

[79] Budi Utomo and S. Hatmadji, "Factors affecting child survival in rural East and West Java", *Indonesia Journal of Demography*, No. 19, June 1983.

[80] S.M. Adioetomo, *Difference in Infant and Childhood Mortality in Jakarta and Indonesia: Analysis on the 1980 Indonesia Census Data*, Jakarta, LD-FEUI, 1983.

[81] Ahmed Al-Kabir, *Effects of Community Factors on Infant and Child Mortality in Rural Bangladesh*, Scientific Reports No. 56 (July 1984), World Fertility Survey, London.

[82] Stan D'Souza and Abbas Bhuiya, "Mortality differentials in rural Bangladesh", *Population and Development Review*, vol. 8, No. 2, December 1982.

[83] Kwon Tai-Hwan, *The Trends and Patterns of Mortality and Health in the Republic of Korea*, Report of a study undertaken in the Republic of Korea under the project on Analysis of Trends and Patterns of Mortality in the ESCAP Region, Asian Population Studies Series No. 76, ESCAP, Bangkok, 1986.

education level (1-9 years of schooling).[84] In Thailand, it was found that the educational attainment of the mother has a strong influence on the mortality experience of the children. In all areas, infant mortality is several times higher for children whose mothers had no schooling than for those children whose mothers had higher education. The effect of education on mortality is consistently substantial and confirmed even when controlled for by rural-urban residence.[85]

The situation in China is similar to that observed in other countries: educational level has a negative correlation with mortality in most age groups. The death rates decreased with increase in educational levels of the people. It was also found that one of the strongest determinants of infant and child mortality is the mother's education, and resulting occupational status.[86] In Nepal, analysis of infant mortality for the period 1962-1971 indicates that children born to mothers with no education have an infant mortality rate of 166 per thousand births compared to 154 per thousand born to mother with some education. Likewise, the infant mortality rate was 170 in respect of fathers with no education as against 152 for fathers with some education.[87]

Available evidence for various countries clearly points to the major role that education, particularly maternal education, plays in determining the level of infant and child mortality. But as far as empirical evidence goes no one has explained how the schooling of a woman becomes translated into an enhanced likelihood that her children will survive to old age.[88] In the absence of any explanation, it was simply assumed that maternal education was only a reflection of or proxy for standard of living which has a bearing on mortality. However, the validity of this assumption has been challenged and plausible explanations are now being offered based on field studies conducted in the region and elsewhere. It has been strongly argued that differences in child mortality by mothers' education are not attributable simply to the better material conditions in which more educated women find themselves, and that "in terms of child mortality a woman's education is a good deal more important than her most immediate environment.[89]

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[84] Mohammed Irfan, *Mortality Trends and Patterns in Pakistan,* Report of a study undertaken in Pakistan under the project on Analysis of Trends and Patterns of Mortality in the ESCAP Region, Asian Population Studies Series No. 75, Bangkok, 1986.

[85] Yawarat Porapakkham, *Levels and Trends of Mortality in Thailand,* Report of a study undertaken in Thailand under the project on Analysis of Trends and Patterns of Mortality in the ESCAP Region, Asian Population Studies Series No. 77, ESCAP Bangkok, 1986.

[86] Liu Zheng, *Mortality Patterns and Trends of Population in China,* Asian Population Studies Series No. 73, ESCAP, 1986.

[87] Central Bureau of Statistics, *Population Monograph of Nepal, op. cit.*

[88] Robert A. Levine, "Influence of women's schooling on maternal behaviour in the Third World", *Comparative Education Review,* vol 24, No. 2, Part 2, June 1980.

[89] J.C. Caldwell, "Education as a factor in mortality decline: An examination of Nigerian data", *Population Studies,* vol. 33, No. 3, November 1979.

In the case of the Republic of Korea, two simple arguments were provided to explain the observed relationship between parental education and infant and child mortality. Firstly, more educated parents provide their children with better care, health and nutrition. Secondly, more educated Korean parents have fewer children on the average, which means in turn a wider average interval between births, and a longer birth interval is a decisive factor in lower infant and childhood mortality.[90] For India, it was argued that "literacy (education) has a two-fold role to play. On the preventive side, literacy helps to alleviate mortality by promoting social hygiene, and, on the control side, the awareness generated is capitalized by making the best use of the medical facilities provided by the health programme".[91]

A field study undertaken in rural Karnataka (India) showed that some education was essential to enable a person to be associated with modern as distinct from tranditional curative measures; and that with increased education parents were more likely to seek treatment for their sick children as well as to follow the prescribed treatment properly, and much more likely to continue sufficiently long with the treatment.[92] It has also been argued that outside the ambit of the health system, educated parents are more likely to feed their children adequately (even than uneducated parents at the same income level) and to treat them when sick in an appropriate way, particularly by letting them rest rather than work.[93]

According to the Karnataka study, which was also aimed at exploring the relation between maternal education and child survival, an educated woman is accorded higher status than an uneducated one by her husband and by her mother-in-law. Consequently, it was agreed that an educated woman was more likely to insist on the right to participate in decision making and to urge decisions. She would also ensure that greater equality is observed in allocating resources between children of opposite sex and between the older and younger generations. A more educated mother would tend to treat and feed her sons and daughters equally; is more likely to identify almost immediately when a child falls sick and to seek appropriate treatment and to persist with that treatment until the child was completely recovered. In a more general way, the educated mother would be more aware of risks and fewer avoidable accidents would occur in the household.[94]

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[90] Kwon Tai-Hwan, *op. cit.*

[91] P. Krishnan, "Mortality decline in India, 1951-1961: development vs. public health programme hypothesis", *Social Science and Medicine*, vol. 9, 1975.

[92] John C. Caldwell, P.H. Reddy and Pat Caldwell, "The social component of mortality decline: An investigation in south India employing alternative methodologies", *Population Studies*, vol. 37, No. 2, July 1983.

[93] John C. Caldwell, "Routes to low mortality in poor countries", *Population and Development Review*, vol. 12, No. 2, June 1986.

[94] John C. Caldwell and Lado T. Ruzicka, "The determinants of mortality change in South Asia" in K. Srinivasan and S. Mukerji (eds). *Dynamics of Population and Family Welfare 1985*, Bombay, Himalaya Publishing House, 1985.

3. Education and Migration

Education influences migration in two ways. Firstly, people migrate from one area to another to acquire or further their education. Secondly, educated people migrate in search of better employment opportunities or better life styles. However, adequate information on these aspects are not available for most countries of the Asian and Pacific region since such information has to be collected either through surveys especially designed for the purpose, or by including pertinent questions in other surveys.

In most developing countries of the region, the inadequacy of the educational facilities, both quantitatively and qualitatively, in the rural areas result in a movement of people towards larger urban centres where relatively superior educational facilities are located. This type of movement involves either children of school-going age only, or in some cases of entire families. But the numbers involved are usually small because of the limited capabilities of most rural families to support financially their children's education, particularly higher education, in the urban areas, and because of the difficulties of obtaining adequate housing in the urban areas even for those well-to-do rural families.

A study for the Republic of Korea indicated that 11 per cent of all independent migrants to Seoul and 43 per cent of those aged 15-19 years moved because of lack of educational facilities or the desire to continue education.[95] The same reasons were given by one-third of interviewed migrants to Kota Bahru in Malaysia.[96] Education was the second most often stated motive for migration to the Indian cities of Hyderabad, Jamshedpur, Kanpur, Hubli and Poona.[97] For Indonesia, it was reported that children of well-to-do families in rural areas who seek further education and eventually highly paid and high status jobs in the civil service or the formal sector of the urban economy move out of the village for sheer lack of opportunities.[98]

The development and expansion of education in rural areas has also stimulated out-migration by providing rural youths, especially those from the middle and upper classes, with education and also awareness of the economic and social opportunities available in urban areas.[99] Indeed, several studies show that migrants from rural areas usually differ educationally from those who stay

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[95] E.H. Choe and J.S. Park, *The Special Demographic Survey, Seoul, Korea,* cited in Leszak A. Kosinski, "Education and internal migration", in Helmut V. Mushem (ed), *op. cit.*

[96] S. Hamza, *Migration to Towns in Malaysia,* cited in Leszeck A. Kosinski, *Ibid.*

[97] N.V. Sovani, *Urbanization and Urban India,* New York, Asia Publishing House, 1966.

[98] Graeme J. Hugo, Terrence H. Hull, Valerie J. Hull and Gavin W. Jones, *The Demographic Dimensions in Indonesian Development,* East Asian Social Science Monograph, Oxford University Press, 1988.

[99] A.S. Oberai, *Migration, Urbanization and Development,* Paper No. 5, World Employment Programme (Geneva, International Labour Office), 1987.

behind in the villages, as well as from the non-migrant population in the urban centres. For example, in India, in-migrants into Bombay[100] and into Calcutta[101] had less education than non-migrants at the place of destination, but more education than the population of the states from which they were drawn. Another study showed that the educational level of the out-migrants from rural Punjab was significantly higher than that of the population of the areas of origin[102] In Bangladesh, the propensity to migrate to urban areas was much higher among the literate and the educated than among the illiterate.[103] It has been observed that, generally, the educational levels of the migrants tend to be intermediate between those of the population at the place of origin and the population at destination.[104] However, in Sri Lanka, the levels of education of migrants appear to have been higher than those of both the population at the place of origin and the destination,[105] but owing to the generally high level and widespread distribution of education in that country, this situation may be unique in the region.

A study of migrants into Jakarta (Indonesia) showed that these migrants had higher levels of education than those of the total Indonesian population of the same age group, and that although there were great variations in the educational levels of these migrants themselves, as a group they were more educated than those who remained in the place of origin.[106] Another study covering migrants into Bangkok (Thailand) showed that many of them came from families that were better educated than the average or typical rural Thai, and these migrants themselves seemed to have above-average educational attainments. The study also showed that the better educated migrant moved for educational and other reasons more than for the strictly economic or personal reasons given by the less-educated migrants. It was also noted that the male migrant stream consisted of a sizeable minority of those with below-average education, but female migrants were found to be better educated than the males at the time of

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[100] K.C. Zachariah, "Bombay migration study: a pilot analysis of migration to an Asian metropolis", *Demography*, vol. 3, No. 2, 1966, pp. 378-392.

[101] Donald J. Bogue and K.C. Zachariah, "Urbanization and migration in India", in Roy Turner (ed), *India's Urban Future* (Berkley, University of California Press), 1962.

[102] A.S. Oberai and H.K.M. Singh, *Causes and Consequences of Internal Migration in a Developing Country: A Study in the Indian Punjab* (Delhi, Oxford University Press), 1983.

[103] R.H. Chaudhury, "Determinants and consequences of rural outmigration from some villages in Bangladesh", *The Oriental Geographer*, vol. 22, 1978, pp. 1-20.

[104] E. Lee, "A theory of migration", *Demography*, vol. 13, 1966, pp. 47-57.

[105] ESCAP, *Migration, Urbanization and Development in Sri Lanka*, Country Report II, Comparative Study on Migration, Urbanization and Development in the ESCAP Region (Bangkok, 1980).

[106] Susanne Mowat, *Education and the Urban Migrant: A Comparative Analysis of Case Studies in Bangkok, Manila and Jakarta* (Bangkok, UNESCO, Regional Office for Education in Asia), 1977.

their first move and better educated than the female population of comparable age.[107]

Educational attainments also have an influence on return migration. For example, in Thailand, findings of a survey showed that individuals who had migrated to Bangkok and obtained higher educational qualifications often found it difficult to get a job in their home towns, and consequently they tended to stay longer or permanently in the capital.[108] Another study showed that return migration was slightly higher for less educated female migrants.[109]

The educational selectivity of migration has several implications. Since, as noted earlier, it is the relatively more educated who move out of the rural areas, their out-migration results in a decline of the educational levels in the rural areas.[110] Thus the flight of the educated deprives the rural areas of their potential leaders and innovators. The village, having sustained the emigrant through his years of childhood dependency, loses him when he has reached the age at which with his educational attainment he might be contributing to the common good. At the place of destination, the migrants add to the number of those with relatively lower educational attainment and perhaps swell the rank of the unemployed. Thus, the educational selectivity of migrants that occurs in most developing countries leads to a paradoxical situation whereby the rural areas are deprived of the educationally superior and the urban areas are burdened with the educationally inferior.

C. POLICY IMPLICATIONS

The discussions in the preceding sections clearly indicate that there are mutual impacts between population dynamics and educational development, and that each is a determinant and consequence of the other. Changes in size, composition and distribution of the population have a bearing on educational development. In turn, levels of educational attainment have significant impacts on fertility, mortality and migration. The available evidence also clearly shows that the educational level of the wife, more than that of the husband, is very strongly associated with a couple's fertility as well as infant and childhood mortality. This would suggest that regardless of the manner in which the causal mechanism works, development and expansion of education for females may have a greater impact on fertility and mortality than corresponding efforts in regard to schooling for males.

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[107] *Ibid.*

[108] Visid Prachuabmoh and Penporn Tirasawat, *Internal Migration in Thailand, 1947-1972*, Paper No. 7 (Bangkok, Institute of Population Studies, Chulalongkorn University), 1974.

[109] Apichat Chamratrithirong, *Recent Migrants in Bangkok Metropolis: A Follow-up Study of Migrants Adjustments, Assimilation and Integration* (Bangkok, Institute of Population and Social Research, Mahidol University), 1979.

[110] Leszak A. Kosinski, "Education and internal migration" in Helmut V. Musham, *Education and Population: Mutual Impacts, op. cit.*

A review of the situation in regard to educational development in the Asian and Pacific region indicates that although in many countries of the region there has been a considerable expansion of educational facilities during the past two or three decades, the progress made has not been sufficient to cope with the increase in school-age population. In particular, parity in education still remains an elusive goal in most of these countries. Female school enrolment rates considerably lag behind the rates of males; and disparities in access to education continue to be large between rural and urban areas, and among regions and socio-economic groups.[111] Consequently rural illiteracy, particularly female illiteracy, contrinues to be major problem in many developing countries.[112]

In addition to the demographic foctors, demand for education has been expanding, and will continue to expand, owing to rising social aspirations and the national perception of social demand. Thus, in terms of absolute numbers, educational enrolments have to expand substantially merely to maintain current enrolment levels in the face of rapidly increasing school-age population; further expansion will be needed to meet the rising social demand for education. This will mean substantially larger amounts of resources, both in absolute and relative terms, than are at present invested, will be needed to raise the levels of educational enrolments in most developing countries of the region. Thus, in the context of a rapidly increasing school-age population and rising social demand for education on the one hand, and a shortage of capital and competing demands by various sectors for the limited capital on the other, the proportion of resources to be allocated to education and the tragets to be achieved are some of the difficult issues to be resolved in drawing up programmes of economic and social development.

It is also necessary to emphasize that educational development by itself will not be adequate, and that other measures such as improvement in health and living standards of the people are essential to achieve desired demographic goals. Further, the sequence in which these measures or policies are implemented is as important as the measures or policies themselves. For example, it has been argued that the substantial decline in fertility that occurred in Kerala state (India) was due largely to the fact the policies were implimented in the right order – a reduction in infant and child mortality, accompanied or followed by an increase in female education, followed by redistribution policies, and finally by the official family planning programme. It has also been argued that Kerala's family planning programme would have had much smaller or more temporary impact if it had been introduced in advance of the substantial reduction in infant and child mortality and improvement in female education.[113]

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[111] ESCAP, *Economic and Social Survey of Asia and the Pacific 1986,* Bangkok, 1987.

[112] S. Selvaratnam, *Population and Status of Women,* background paper prepared for the Regional Seminar on Frameworks for Population and Development Planning, 6-10 June 1988, United Nations Economic and Social Commission for Asia and the Pacific, Bangkok, 1988.

[113] K.C. Zachariah, *The Anomaly of the Fertility Decline in India's Kerala State: A Field Investigations, op. cit.*

In view of the established mutual interactions between population and education, it is also very essential to integrate population factors in plans and programmes for educational development. Fortunately, at the national as well as regional level, there is increasing recognition on the one hand of the influence of demographic variables on both demand for and supply of education, and on the other of the importance of education as a major factor of many demographic variables. Consequently, demographic considerations have appeared in both regional and national plans for education. For instance, the "Karachi Plan"[114] formulated as far back as 1961, as well as the 1962 meeting of the ministers of education[115] of the countries participating in the "Karachi Plan" noted that the high rate of growth of the school-age population was an important factor in the very large increase in primary school enrolment, and stressed the need for adequate demographic statistics, studies and projections, as a basis for preparing educational plans. These concerns have yet to be fully reflected in the national plans of many countries in the region.

Since education is an important instrument for bringing about changes in attitudes and behaviour, the educational system and the educational process should be utilized for creating among students a clearer understanding of the interactive relationship between population change, development and quality of life, as well as favourable attitudes and values towards population problems and issues. Thus, it is essential that population education should constitute an important component of the curricula of various courses at all levels of education. In fact, the importance of educating children and youth about population changes and their relation to all aspects of human welfare was emphasized in 1962.[116] The failure of the school system to incorporate population content in the educational curricula was then considered as "particularly astonishing in view of the fact that the schools themselves have been hard hit by rapid population changes", and in urging immediate action in this regard it was emphasized that it was about time "for twentieth century school curricula to incorporate twentieth century demographic findings in the context of their twentieth century implications"[117]

In the Asian and Pacific region, the 1970 UNESCO Workshop on Population and Family Planning prepared a statement of objectives for population education, suggested strategies for organizing programmes and outlined content

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[114] UNESCO, *The Needs of Asia in Primary Education: A Plan for the Provision of Compulsory Primary Education in the Region*, Educational Studies and Documents No. 41, Paris, 1961.

[115] UNESCO, *Meeting of Ministers of Education of Asian Member States Participating in the Karachi Plan, Tokyo, 2-11 April 1962, Final Report*, Bangkok, 1963 (UNESCO/ED/192).

[116] Warren S. Thompson, "The population 'explosion'", *Teachers College Record*, vol. 63, No. 6, 1962.

[117] Philip M. Hauser, "Population-gap in the curriculum", *Teachers College Record*, vol. 63, No. 6, 1962, p. 425.

for incorporation into school curricula in the social sciences and the natural sciences. Since then, with the assistance of the UNESCO Regional Advisory Team, population education programmes have been established in 24 countries of the region. However, the progress achieved in regard to implementation varies from country to country. In most of these countries, the population cumponent has yet to be incorporated into the curricula of secondary and tertiary education. In all countries of the region, population education should become an integral part of the national education policy.

VII. POPULATION CHANGE AND HEALTH/NUTRITION

Alejandro N. Herrin

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A. HEALTH AND MORTALITY SITUATION

In the broadest sense, health is defined as a state of complete physical, mental and social well-being (WHO, 1978). Like the concept of development, the concept of health is difficult to capture in a single or a few measures. For purposes of international comparisons, however, the measures of life expectancy at birth and the infant mortality rate have been commonly used to provide indications of the health status of a country. Using these measures, we find wide variations in mortality levels in selected ESCAP countries. In 1986, high mortality levels persist in such countries as Afghanistan, Bangladesh and Nepal where the life expectancy at birth is still below 50 years and the infant mortality rate still exceeds 130 per 1,000 births. In contrast, mortality has reached very low levels in such economically advanced countries or areas as Australia, Japan, New Zealand, Hong Kong and Singapore, where the life expectancy at birth is above 70 years and the infant mortality rate is less than 10 per 1,000 births (see table 1). In the Asian region, mortality levels are generally highest in South Asia, followed by South-East Asia. East Asia has the lowest mortality levels.

The pace of mortality change in selected ESCAP countries has varied during the past 30 years or so as revealed in table 2. A recent review of the mortality transition in selected ESCAP countries suggests that such differential pace of mortality change can be traced generally to the differential pace of economic and social progress among countries and to the differential impact of the health care systems that have been put into place (Ruzicka, 1984). For example, it was noted in this review that in instances where the population had easy access to health facilities, either because of its essentially urban character as in Hong Kong and Singapore or because such facilities were successfully extended to the rural areas as in China, Sri Lanka and Peninsular Malaysia, mortality rapidly approached levels comparable to those prevailing in the more developed low-mortality countries. In contrast, the pace of mortality decline has slowed down in some populations, particularly in the 1970s, as in the case of Bangladesh, India and Pakistan, partly because of continued widespread malnutrition, poverty and illiteracy, and inadequate distribution of the health services between rural and urban areas.

Associated with the differential pace of mortality decline is the differential epidemiological situation among countries in the region. In countries with relatively high mortality levels, the major causes of deaths and of morbidity are still the infectious and parasitic diseases, i.e. respiratory and gastrointestinal diseases, malaria, etc., while countries that have successfully reduced mortality to very low levels are faced with such diseases as cardiovascular diseases, cancer, diseases associated with pollution, etc. Countries that are still in the process of completing the epidemiological transistion, however, face both the traditional diseases

Table 1. Levels of life expectancy and infant mortality in selected ESCAP countries or areas, 1986

Countries or areas	*Life expectancy*			*Infant mortality rate*
	Total	*Male*	*Female*	
High Mortality				
Afghanistan	40.8	40.3	41.3	177
Bangladesh	49.7	50.2	49.2	133
Nepal	47.3	48.0	46.5	136
Moderately High				
Burma	53.1	51.6	54.6	104
India	56.6	56.2	57.0	95
Indonesia	55.3	53.9	56.7	77
Pakistan	51.5	52.4	50.6	126
Moderately Low				
China	69.0	67.6	70.3	
Malaysia	69.1	67.0	71.2	27
Philippines	62.5	60.9	64.1	59
Republic of Korea	68.4	65.2	71.5	27
Sri Lanka	69.6	68.0	71.2	30
Thailand	64.3	61.3	67.3	52
Viet Nam	60.3	58.1	62.5	69
Low				
Australia	75.9	72.4	79.4	9
Hong Kong	75.8	73.0	78.5	8
Japan	78.0	75.1	80.8	5
New Zealand				
Singapore	73.1	69.9	76.2	9

Source: 1986 ESCAP Population Data Sheet.

Table 2. Level of life expectancy at birth (males) around 1950 and 1986 in selected countries or areas of the ESCAP region

Around 1950	*Around 1986*					
	Under 45	*45-50*	*50-55*	*55-60*	*60-65*	*65+*
Under 45	Afghanistan	Nepal	Pakistan Indonesia Burma	India Viet Nam		China
45-50		Bangladesh			Thailand Philippines	
50-55						Republic of Korea
55-60						Sri Lanka Malaysia
60-65						Singapore Hong Kong

Source: Ruzicka (1984) and ESCAP Population Data Sheet.

and the new ones, and they must simultaneously cope with these twin health problems under severe resource constraints.

While differential mortality exists among countries in the region, it also exists within each country. Mortality differences persist between subnational geographical regions, between rural and urban areas, and between various social groups characterized by levels of education and socio-economic status. Table 3 illustrates such differentials in selected countries as of around 1975.

In order to improve the health and mortality situation in countries with still very high levels of mortality, it is necessary to identify the major factors affecting health and survival in a manner useful for policy formulation and programme intervention. In this regard, there is a need to consider a broad conceptual framework of the determinants of health/nutrition and mortality as a basis for integrated policy for health development.

B. DETERMINANTS OF HEALTH/NUTRITION: CONCEPTUAL FRAMEWORK

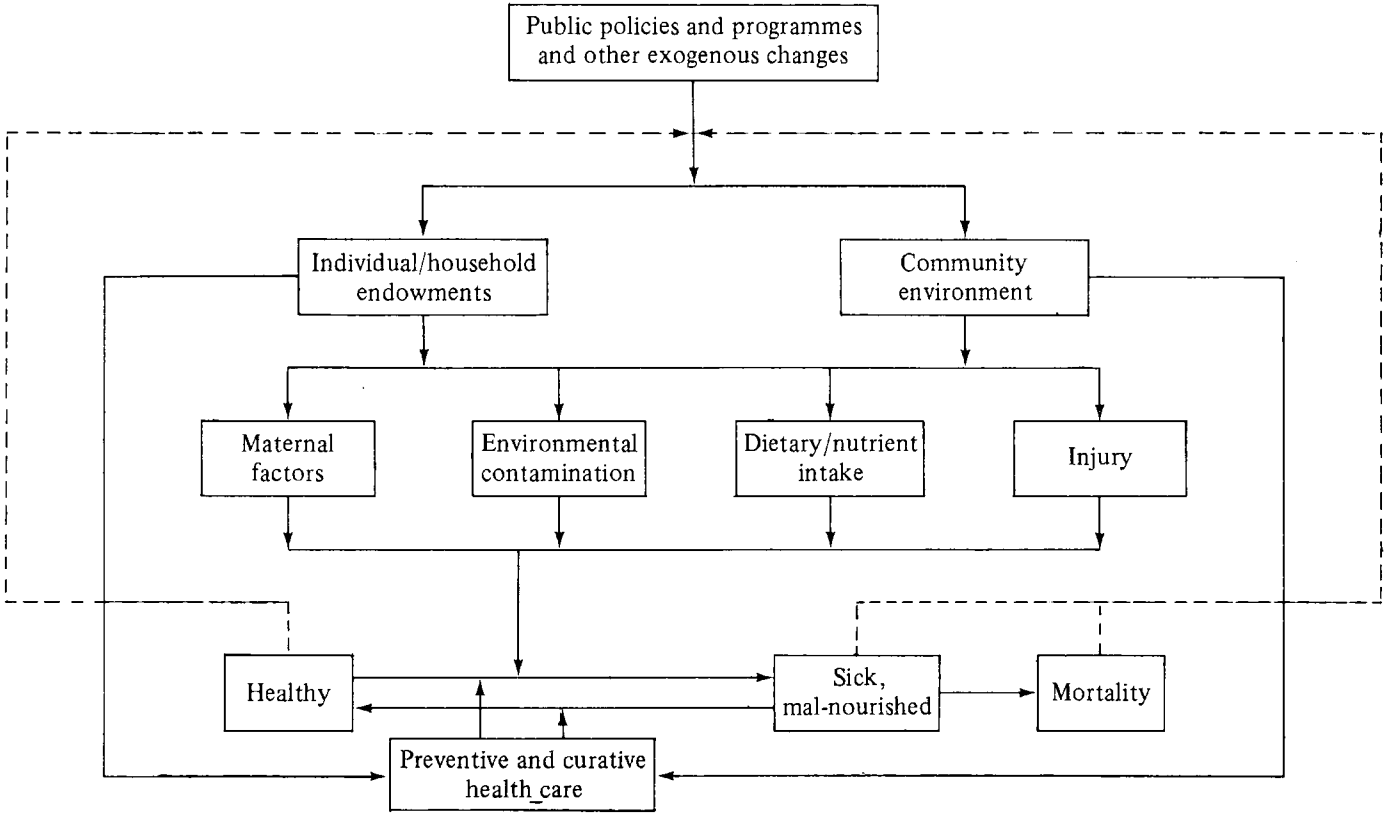
A simple framework for analysing the determinants of health outcomes and for identifying policy and programme interventions can be described with the aid of figure I. The basic components of this framework are the health outcomes, the proximate determinants, the socio-economic determinants, and exogenous factors including public policies and programmes which influence both socio-economic and proximate determinants.

Table 3. Mortality of children under five years of age in selected ESCAP countries

Socio-economic indicator	*Bangladesh (1975/76)*	*Indonesia (1976)*	*Malaysia (1974/75)*	*Nepal (1976)*	*Pakistan (1975)*	*Philippines (1978)*	*Republic of Korea (1974)*	*Sri Lanka (1975)*	*Thailand (1975)*
Total	215	180	61	259	202	90	83	84	116
Mother's education (years)									
None	222	193	67	261	208	130	107	104	145
1–3	198	194	64	(204)	(143)	118	94	97	105
4–6	186	143	56	(157)	(138)	94	80	80	110
7+	(122)	77	18	(136)	(112)	53	55	55	(38)
Husband's occupation									
Agriculture	261	182	72	258	197	106	95	102	128
Skilled and unskilled	236	201	59	330	211	82	73	75	102
Sales and services	208	190	48	(198)	205	64	77	71	83
Professional and clerical	152	100	40	(214)	188	46	70	52	(55)
Place of residence									
Metropolitan	(180)	143	42		143	57	63	71	(57)
Other									
Urban	188	137	46	(145)	174	77	87	74	(83)
Rural	218	188	68	262	216	98	90	87	122

Source: Hobcraft *et al.* (1984), as reported in Ruzicka and Kane (1986).

Figure I. Conceptual framework for analysing the determinants of health outcomes



Health is a multidimensional concept. While attempts have been made to measure various aspects of physical, mental and social well-being, most of the research so far undertaken uses the traditional indicators of health outcomes, i.e. mortality, morbidity and nutritional status. Our attention, therefore, will be focused on the determinants of these traditional indicators.

As conveniently described by Mosley and Chen (1984), based upon a careful review of biomedical literature, the proximate determinants can be grouped into five major categories: (a) reproductive factors: parity, birth interval; (b) environmental risk factors: air, food/water/fingers, skin/soil/inanimate objects, vectors; (c) nutrient intake: calories, protein, micronutrients; (d) injury: accidental, intentional; and (e) health care: preventive measures, medical treatment. The first four categories of proximate determinants influence the "rate of shift of healthy individuals towards sickness", i.e. the morbidity rate, while the last category influences both the morbidity rate (through prevention) and the rate of recovery (through treatment). Sickness either leads to complete recovery (healthy state), to growth faltering, to other disability among survivors, or ultimately to death.

The socio-economic determinants, in turn, can be classified into three major categories: (a) individual endowments: unobserved biological endowments, age, education, preference, beliefs, attitudes; (b) household endowments: income/wealth, age-sex composition and human capital of household members; and (c) community environment. The community environment includes a variety of factors. These are (a) the ecological setting and natural resource endowments: climate, soil; (b) the structure of markets and prices for products and factors of production, including labour; (c) the size and structure of the population; (d) social structure and organization; (e) physical infrastructure and economic and social services other than health; and (f) health infrastructure and services.

Exogenous changes include changes arising from external shocks and from public policies and programmes. Changes arising from external shocks include changes in the prices of export and import commodities that affect the livelihood of a large proportion of the population, the development of new health technology, and the flow of health resources from international sources. A major source of shocks, however, is the set of public policies and programmes in the field of education, health, nutrition, environmental sanitation and family planning that have a direct bearing on health, and basic economic policies that affect employment and income.

In this framework, the individuals/households, in an attempt to improve their welfare, are assumed to make various kinds of decisions subject to a set of opportunities and constraints defined by their individual/household endowments and by the community environment. Exogenous shocks affect the structure of opportunities and constraints either directly by increasing individual/household endowments, or indirectly through the community, by increasing community resources and services available to individuals/households or by modifying the

structure of economic incentives, i.e. prices and wage rates. The individuals/households are then expected to respond to these changes in a manner they perceive will improve, or at least prevent a deterioration of, their present economic and social welfare including their health status. Depending upon the nature of emerging structure of opportunities and constraints, we expect a "multiphasic response" from these individuals/households in terms of decisions regarding savings/consumption, investment in physical and human capital, time allocation and labour force participation, fertility, migration, disease avoidance and medical treatment. These decisions in turn affect the proximate determinants and, ultimately, the health outcomes together with other socio-economic outcomes, e.g. incomes, employment, education of children, etc.

1. Interactions: Proximate Determinants

In developing countries with relatively high mortality levels, infant and child mortality constitute a major component of total mortality. It is, therefore, of interest to examine the major proximate determinants of child health and mortality. The review of the proximate determinants of child survival conducted by Chen (1983) and selected studies collected in Mosley and Chen (1984) are particularly useful.

Child survival up to age 5 years is generally influenced by the five proximate determinants shown in figure I. When viewed from the standpoint of both mothers and children and viewed interactively, the five proximate determinants can be reclassified in terms of the following factors. The first is maternal factors, including age, parity, the interval between births, and maternal nutritional status. These factors are known to affect the mother's biological resources for providing adequate nutrition to the fetus during pregnancy and to the infant during breastfeeding. The second is nutritional factors which include diet and feeding variables. The mother's diet during pregnancy and lactation influence the nutrition of the fetus and the child, respectively. Moreover, the timeliness and adequacy of breastfeeding and the pattern of food supplementation are important factors affecting the nutritional status of the child. The third factor is infections which may affect the child during pregnancy and early childhood. Maternal infection during pregnancy is believed to contribute to low birth weight and high neonatal mortality. During the first five years of life, the child inevitably will experience many infections, mainly respiratory and gastrointestinal resulting from exposure to varying degrees of environmental contamination. These infections are the major causes of infant and child mortality, and have been known to interact with malnutrition. The last factor is child care, which includes the availability of child health services and child care behavior in response to illness.

In reviewing the evidence regarding the role of these proximate determinants, Chen (1983) noted the following relationships to be important and reasonably generalizable.

(1) Maternal factors: childbearing at very young (under 17) and very old (over 35) ages enhances mortality risks. Parity affects childhood mortality:

the risk associated with the first birth is high, declining during the second and third births, and usually monotonically rising thereafter. High parity implies more births at older ages and at closer birth intervals, the latter can adversely affect the index child by prematurely interrupting breastfeeding, reducing food supplementation and compromising child care time. Close birth intervals could also compromise maternal nutritional status during pregnancy.

(2) Nutritional factors: Maternal diet and nutritional status during pregnancy affect fetal growth and birth weight. Maternal food supplementation during pregnancy reduces the proportion of low birth weight infants and neonatal mortality. Breastfeeding is the optimal form of infant feeding. During the first 4-6 months it provides the following unique advantages – nutrient adequacy, sterility, immunization against infections, antiallergenic properties, psychological bonding, and low cost. Fully breastfed infants tend to have lower mortality rates than artifically breastfed infants. Part of this relationship is due to the interaction between artificial feeding, environmental contamination and nutritional intake: artificial formulae are often mixed with contaminated water in contaminated bottles, introducing orally transmitted infections; moreover, the formulae may be diluted because of prohibitive cost, thereby reducing the child's net nutrient intake.

(3) Infection and environmental contamination: maternal infection (e.g. mycoplasmal infections of the genital-urinary tract among pregnant women) is one cause of low birth weight and high infant mortality. After birth, a child cannot avoid infections, the most significant of which involve the gastrointestinal and respiratory tracts. The infection rate and its severity culminating in death is influenced by exposure to communicable pathogens, the susceptibility of the host (partly determined by nutritional status), and health behaviour in response to illness.

(4) Child care factors: many deaths due to infectious diseases and malnutrition may be either prevented (e.g. through immunization, sanitation, adequate feeding) or treated successfully with curative services (e.g. oral rehydration therapy, antibiotics and nutritional rehabilitation). Child care practices thus assume importance in determining mortality risk either in influencing exposure to infections and malnutrition or in influencing utilization of health care services.

(5) Injury: this includes birth injury, physical injury, burns and poisoning. Birth injuries can be prevented by correct delivery procedures and adequate handling of complicated cases. Accidental injuries are influenced by environmental risks. These events, however, are difficult to predict.

(6) Interaction between proximate determinants: the interaction between the proximate determinants is extremely complex, and as Chen (1983) observes, "is still inadequately documented, poorly understood, and probably variable cross-culturally" (p. 10).

2. *Interactions: Socio-economic Determinants*

The relationships between socio-economic factors and health outcomes can be examined in terms of the former's influence on the proximate determinants or in terms of the former's *net* effect on health outcomes.

The major factors often hypothesized to influence both proximate determinants and health outcomes are (a) individual/household endowments (wage rates, education, household wealth/assets or income) and (b) community environment (measures of health infrastructures and services, prices of basic commodities including health services, and indicators of the physical environment). The specific hypotheses linking socio-economic factors and proximate determinants are described as follows:

(1) Wage rate of household head and household wealth/assets: an increase in wage rate and household non-labour income increases the demand for children, nutritious food, sanitary facilities (water, toilet, housing), and preventive and curative health services.

(2) Wage rate of the wife: an increase in wage rate reduces the demand for children and the time allocated to child care and other time-intensive health-related home activities, e.g. preparing nutritious meals.

(3) Mother's education: higher education increases the productivity or effectiveness of producing health inputs, i.e. nutritious food, child care, use of health care services, and is related to preferences for small family size.

(4) Prices of health services: higher monetary and time cost of health care services reduce the demand for such services.

(5) Prices of other commodities: higher prices of food and sanitation facilities reduce the demand for such goods.

(6) Environment: adverse physical characteristics increase the exposure to the risk of infection and infestation, and affect time cost of health care services.

The hypotheses concerning the net effect of socio-economic factors on health outcomes may be described as follows:

(1) Wage rate of household head and household wealth/assets: an increase in wage rate and non-labour income increases infant/child survival rates.

(2) Wage rate of wife: the effect of an increase in wage rate on infant/child survival rate is ambiguous. It could increase survival rate through its effect on income or reduce survival rate through its effect on child care. Taking into account intrahousehold substitution, the net effect would tend to be positive.

(3) Mother's education: the higher the education of the mother, the higher the survival rate of children.

(4) Prices of commodities including health services: higher prices reduce the survival rate of infants and young children.

(5) Environment: adverse environmental conditions increase infant/child mortality.

The above hypotheses apply as well to morbidity and the nutritional status of children.

3. Some Evidence of Interrelationships

The type of evidence one would like to have to assess the various relationships described above as a guide to policy formulation are those based on multivariate analysis of national data. Such types of evidence, however, are rarely available as they relate to the specific situations in the ESCAP countries of interest, i.e. those still exhibiting high and moderately high mortality rates. The few that are available, however, confirm some of the above relationships. For example, in the multivariate study of the co-variates of child mortality in Indonesia, Pakistan and the Philippines, Martin, et. al. (1983) found that the mother's age at birth of child and birth order, both factors indicating high fertility, are significantly related to higher child mortality risks. Among the socio-economic factors, the study found that the mother's education has the greatest effect on child survival in all three countries.

With respect to morbidity, a study in the Philippines by Layo (1977) using survey data of 3,000 households examined the relationships between the number of reported illnesses in the household during the 30 days prior to interview date and a number of socio-economic and proximate variables. The proximate variables of interest are the quality of drainage, ventilation and water supply. The results show that the quality of water and the quality of ventilation are important factors in total (chronic and acute) illness incidence. These factors, together with quality of drainage are also found to be significant factors in chronic illness. With respect to other factors, the study also found the following relationships. First, age is the most significant positive factor of mobidity. For total and acute illness, the most significant positive factor was the number of children age 0-5 years. For chronic illness, the most significant factor was the number of household members age 65 and over. These results are consistent with the common age pattern of mortality and morbidity. Secondly, traditional health beliefs have a positive relationship with chronic illness. Thirdly, education of mothers beyond elementary schooling has a negative effect on total and chronic illness. Fourthly, per capita income did not have a significant effect on any of the morbidity measures. Finally, a higher morbidity rate for total or acute illness is found in urban as opposed to rural areas, a finding that is consistent with the findings of Martin *et. al.*, (1983) and Herrin (1984) for child

mortality. This particular result means that when other proximate and socio-economic factors are controlled for, the urban environment is not associated with reduced morbidity nor mortality risk. In fact, the crowding and pollution in urban areas may have adverse effects on health.

With respect to nutritional status, the few multivariate studies conducted in the Philippines on the determinants of nutritional status of pre-schoolers reveal that both demographic (fertility) and socio-economic factors are important. For example, in a study by Battad (1978) based on survey data from one province, the analysis reveals that malnutrition is higher among younger children (less than two years of age); among males; among children with mothers who have low nutritional status themselves; among children in households with low income and wealth; and among children with mothers with a low level of education. Controlling for these factors, the analysis further reveals that child malnutrition is significantly higher among children with many siblings age 0-6 years of age, indicating high parity of mothers and closer birth intervals in the recent past.

4. Using the Framework to Understand Recent Trends: An Illustration

The framework described above is also useful in organizing available data for understanding recent trends in health/nutrition and mortality improvements. In a recent review of the health situation in the Philippines (World Bank, forthcoming), it was observed that current levels and trends in both proximate and socio-economic determinants do not favour rapid improvements in health status in the medium term unless strong and highly focused interventions are implemented. Such an assessment is based on the following observations. First, fertility has not declined rapidly in the recent past, and the slowing down of fertility decline is likely to contribute to the slowing down of improvements in infant and child health, nutrition and mortality. Secondly, while indicators of environmental sanitation in terms of the proportion of households with sanitary toilet facilities and access to safe water supply have shown improvements since 1970, there still exists a large proportion of the population not having access to such facilities. Poor environmental sanitation is further suggested by the very high prevalence of infectious parasitism among preschoolers. Thirdly, data on the nutritional status of preschoolers reveal high rates of malnutrition which do not appear to show signs of significant reductions from 1978 to 1985. Breastfeeding, a major determinant of the nutritional status of infants and a major factor in infant mortality has shown declining prevalence as well as duration between 1973 and 1983. Fourthly, with respect to the utilization of health care, the data reveal that the proportion of reported deaths with medical attendance, instead of rising, has been declining. In 1983, only 30 per cent of reported deaths had medical attendance compared to 33 per cent in 1977, indicating generally poor access of the population to medical services, particularly in the rural areas. Moreover, the rates of immunization of children are still low (30 per cent in 1986).

With respect to socio-economic factors, the poverty rate rather than declining has in fact increased from 49 per cent of households in 1971 to 59 per cent of households in 1985. Moreover, little gains in overall literacy rates occurred in the 1970s. Literacy differentials also remained wide between rural and urban areas. In 1980, only 76 per cent of rural women aged 15 years and over were literate compared to 92 per cent of urban women.

All of the above proximate and socio-economic factors help explain the rather poor health sector performance in the Philippines in the recent past. The identification of the various factors that affect such poor performance through the use of the simple conceptual framework provides a basis for a more integrated approach to health development.

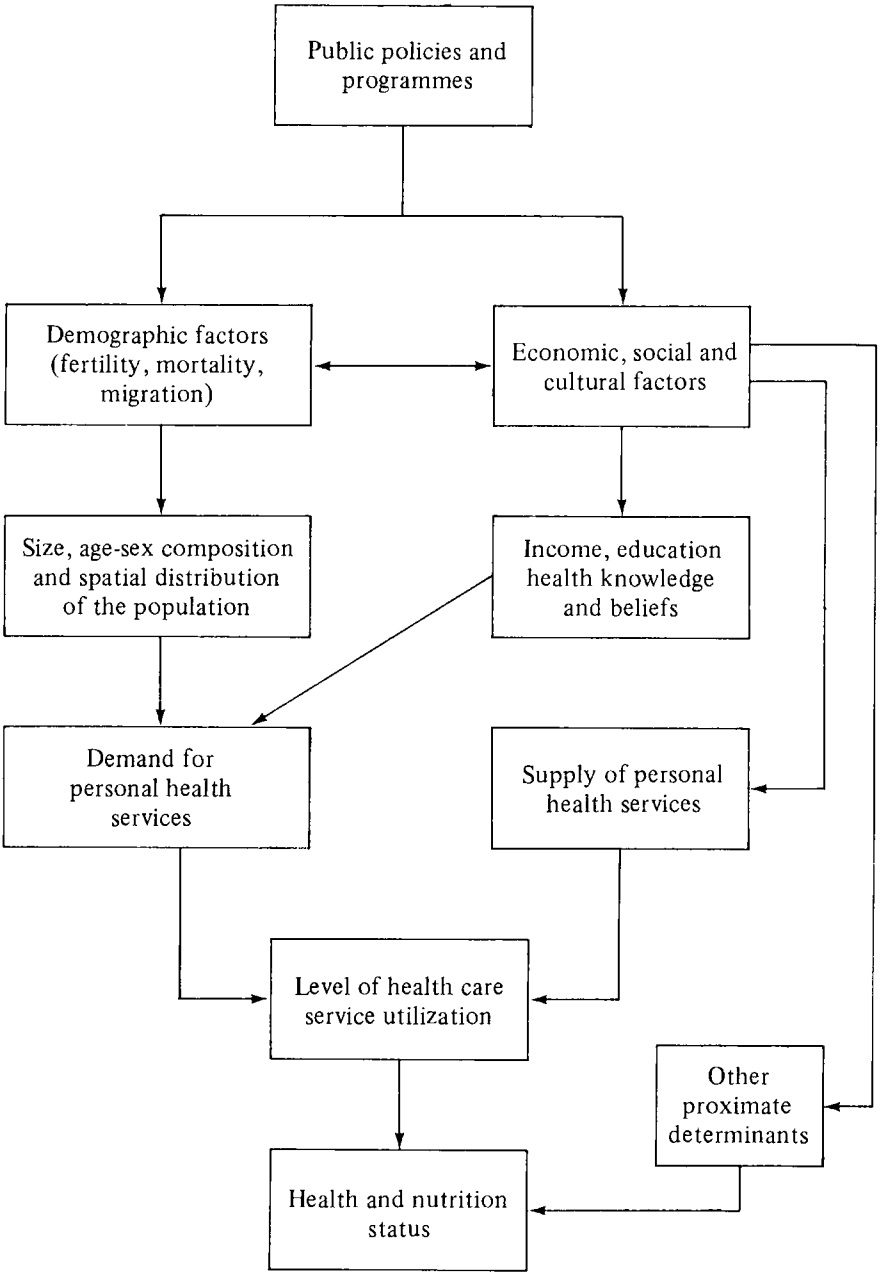
C. POPULATION CHANGE AND HEALTH SECTOR PLANNING

While various factors affect the health and nutritional status of the population, the performance of the health care sector obviously remains an important factor. When the health care sector is being planned population change as well as the evolving morbidity and mortality patterns resulting from past successes or failures in mortality and morbidity reduction need to be considered. Below we consider a framework for determining health care service utilization as a guide to planning the health care sector. Note that health care utilization is a proximate determinant of health status in our previous framework (figure I).

Figure II provides a framework for examining the relationships between population factors and health care service utilization. The level of utilization of specific types of health care services depends upon the demand for, and the supply of, such services. One important factor affecting demand is the set of demographic factors, namely the size, age-sex structure and the spatial distribution of the population. These factors might be thought of as determining the requirements for health care services from a planning standpoint. Effective demand for such services, however, depends upon socio-economic and cultural factors, e.g. income, education, health knowledge and beliefs, etc. The supply of specific health care services, on the other hand, depends on socio-economic factors such as the capacity of the economy to invest in health care facilities which are influenced by public choices and priorities. Both demand and supply factors determine the level of health care service utilization, which together with the other proximate determinants described earlier, determine the health/nutrition status of the population.

Three aspects of population change are worth considering in planning future health service requirements. One is the growth of the size of the population. Even if some of the countries in the ESCAP region have succeeded in moderating fertility in the recent past, population size is still expected to grow in the near future in view of the inherent momentum of population growth. Such increase in population size clearly means increased requirements of specific

Figure II. Conceptual framework for analysing the determinants of health care service utilization



types of health care services. Secondly, the changes in fertility and mortality in the recent past have an impact on the age-sex structure of the population. Such changed structure has a bearing on the nature of health care services that will be required. In countries where fertility and population growth have still remained high, a large proportion of the population would consist of infants and young children with peculiar health needs. Moreover, the continued high fertility means a greater demand of health services for pregnant mothers. On the other hand, in countries that have succeeded in reducing fertility, the resulting age structure is one where the proportion of older age groups is increasing. These older age groups would also have peculiar health needs, different from those of infants and young children. Thus the health structure needs to be modified to take account of this changing age structure and its associated morbidity and mortality patterns. Thirdly, changes in the geographic distribution of the population are likely to have implications for determining health care service requirements. In countries where a large proportion of the population remains in the rural areas, the task of providing greater access to health services will be more difficult. In some situations where the pressure of population growth is pushing the population to more remote areas in search of a livelihood, the provision of health care services will be more difficult. Moreover, in such areas, the population may be exposed to new types of health risks, i.e. malaria and other tropical diseases. The health needs of the population as influenced by demographic factors, however, do not automatically translate into effective demand for health care services. Income, education, health knowledge and beliefs, and the money and time costs of such services play important roles in determining demand.

On the basis of the framework in figure II, raising health care service ultilization of the population to improve health and nutrition must invariably consider both demand and supply factors. The framework clearly puts into a larger context the role of demographic factors in understanding current health problems. While a rapidly growing population directly increases the number of people requiring various types of health services, the actual use of such services will often be constrained on the demand side by low income and high costs, and on the supply side by the lack of adequate facilities and personnel, especially in the rural areas where the bulk of the population is found. Such demand and supply constraints may also be partly traced to the influence of past demographic factors through their impact on employment and, therefore, on household incomes, and through their impact on savings and, therefore, on investments, including investments in health facilities and personnel. On the other hand, might not current health problems be traced to policies influencing the present pattern and distribution of health care services, i.e. the preference for a high cost, physician-oriented, urban- and hospital-based health service structure following the health service structures of economically advanced countries?

D. POLICY IMPLICATIONS AND RESEARCH DIRECTIONS

On the basis of the above brief description, improving the health and nutritional status of the population in the ESCAP region requires an integrated approach to planning that takes into account the various factors affecting health and nutrition. Among such factors are demographic factors: past mortality experience and associated epidemiological transition, the continued growth of the population, changes in fertility and associated changes in the age structure of the population, and population movements in response to differential pace of social and economic progress between areas within a particular country. Tailoring the health sector to respond to these changes given limited resources is a major challenge for most countries in the region.

The frameworks for integrating population into health development planning are available. What is needed for policy making is accurate, timely and relevant information about the many components in the frameworks and the relative strength of the relationships between different factors. There is also a need for information on the cost of various policy options and programme alternatives to deliver basic health and nutritional services to the parts of the population who are most in need.

REFERENCES

Battad, J.R., 1978, "Determinants of nutritional status of pre-schoolers", *The Philippine Economic Journal,* 17(1-2): 154-167.

Chen, L.C., 1983, "Child survival: level, trends and determinants," in R.A. Bulatao and R.D. Lee, (eds.), *Determinants of Fertility in Developing Countries,* Washington, D.C., National Academy Press.

Economic and Social Commission for Asia and the Pacific (ESCAP), 1985, *Mortality and Health Issues: Review of Current Situation and Study Guidelines,* Asian Population Studies Series, No. 63.

Economic and Social Commission for Asia and the Pacific (ESCAP), 1986, *Mortality and Health Issues: Overview of Country Studies and Implications for Health Economic and Social Welfare Planning,* Asian Population Studies Series, No. 71.

Herrin, A.N., 1984, "Socio-economic-demographic impact: the case of rural electrification", *Perspectives for Population and Development Planning,* Manila, Commission on Population and National Economic and Development Authority.

Herrin, A.N. and M.G. Bautista, 1986, "Health and development: a review of the determinants and consequences of health improvements in the Philippines", Philippine Institute for Development Studies.

Jones, G.W., 1975, "Population growth and health and family planning", in W.C. Robinson, (ed.) *Population and Development Planning,* New York, The Population Council.

Layo, L., 1977, "Morbidity and the Philippine welfare in the Year 2000," Paper No. 1.3, Population, Resources, Environment and the Philippine Future: A Final Report, vol. IV-1.A.

Martin, L., *et al.,* 1983, "Co-variates of child mortality in the Philippines, Indonesia and Pakistan: An Analysis Based on Hazard Models," *Population Studies,* 37(3): 417-432.

Mosley, W.H. and L.C. Chen, 1984, "Child survival: strategies for research", A supplement to vol. 10, *Population and Development Review.*

Ruzicka, L.T., 1985, "Mortality trends and differentials in selected countries of the ESCAP region", in ESCAP, *Mortality and Health Issues: Review of Current Situation and Study Guidelines,* Asian Population Studies Series, No. 63.

Ruzicka, L.T. and P.S. Kane, 1986, "Mortality and development in the ESCAP region: a review", *Asia-Pacific Population Journal,* 1(2): 13-38.

World Bank, forthcoming, *The Philippine Poor: What is to be Done,* vol I.

World Health Organization (WHO), 1978, *Primary Health Care: Report of the International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978,* Geneva, World Health Organization.

VIII. RESEARCH REQUIREMENTS FOR INTEGRATING POPULATION FACTORS INTO DEVELOPMENT PLANNING

David E. Horlacher

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INTRODUCTION

The International Conference in Mexico reaffirmed the position of the World Population Plan of Action that population variables are important determinants and consequences of social and economic variables. At the regional level, the Asia and Pacific Call for Action on Population and Development in 1982 stressed that "an integrated approach should be evolved and followed in regard to population and related programmes of economic and social development".[1] However, the interactions between socio-economic and demographic factors are exceedingly complex, involving important indirect effects which can be large, and can vary both in direction and magnitude. It is therefore necessary that both population and development programmes be designed on the basis of carefully conducted programmes of research, rather than on the basis of the untested assumptions of mental models.

Ghazi Farooq has offered a model for the integration of population variables into socio-economic planning which would involve the following types of research:[2] (1) the making of detailed estimates and projections; (2) translating these demographic projections into estimates of social and economic requirements; (3) research on the socio-economic determinants and consequences of demographic change; (4) the formulation and evaluation of population policies and related measures to respond to demographically induced requirements and to influence population variables; (5) using all of the above to contribute to an overall development plan, sectoral plans and project plans with favourable demographic impacts. Thus the major research activities for integrated planning consist of: (a) preparing estimates and projections of demographic levels and trends; (b) ascertaining the nature and strength of demographic and developmental interactions; and (c) conducting various forms of policy analysis.

This paper, which attempts to bring together a variety of proposals for research in the field of population and development, is largely based on the model research programme described by Farooq. After considering how institutional arrangements might be made to promote the conduct and dissemination of research, this study will examine needs for providing planners with estimates of current demographic trends and projections of future developments under a variety of assumptions.

The following section will consider the needs for additional research to identify the impact of demographic variables on socio-economic change, thus

[1] Third Asia and Pacific Population Conference 1982, "Asia and Pacific Call for Action on Population and Development", *Population Headliners: Special Supplement.*

[2] Ghazi M. Farooq, "Population, human resources and development planning: towards an integrated approach", *International Labour Review,* May-June 1981, pp. 337, 339.

creating an awareness of the need for population-related policies and research to identify the socio-economic determinants of demographic change as a basis for developing policies to influence population trends.

The paper will then address the issue of research designed to assess the efficiency and effectiveness of specific policies and programmes designed to bring about demographic change. A separate section will be devoted to research on family planning and other development programmes and projects. The paper will conclude with a discussion of considerations for setting priorities for research activities.

A. INSTITUTIONAL ARRANGEMENTS

A major consideration in assessing research needs for integrating population into development planning is ensuring that research findings will actually be utilized in the planning process. Since research findings with little programmatic significance are not likely to be utilized policy makers and planners should be given a role in identifying fundamental research questions and in assessing research findings.[3] George Simmons argues that "it is essential that efforts be made to involve key decision makers from the relevant departments of government at all stages".[3] (Nonetheless, efforts must also be made to ensure the independence of researchers from excessive interference by planners in the definition of research questions or the selection of research procedures.)[3]

Ghazi Farooq suggests that there is a need for a permanent institution, which could take the form of a population planning unit within the planning ministry.[4] Such a unit would have the primary responsibility for programming, co-ordinating and facilitating relevant data collection and research activities. In general such units should focus their research efforts on issues that are essential for meeting the needs of policy makers. Though these units may monitor and encourage such basic research as the estimation of population parameters, this type of research should be given low priority. Examples of studies better suited to such a unit would be analyses of the economic implications of population growth, and the administrative issues relating to family planning programmes.[5]

Thailand was one of the first countries in the ESCAP region to establish a population unit within the planning agency. A population planning section was established within the Manpower Planning Division of the National Economic

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[3] George B. Simmons, *A Population Policy Programme for Egypt: A Proposal*, 1983, p. 49. See also Ghazi M. Farooq and George B. Simmons, "Towards a policy relevant framework of the study of fertility," in *Fertility in Developing Countries: An Economic Perspective on Research on Policy Issues*, 1984, p. 119.

[4] Farooq, *op. cit.*, p. 334.

[5] George B. Simmons, *The Analysis of Policy Option in the Population Sector – A Study of the Current Egyptian Capability: Report of the UNFPA Consultants' Mission*, 1981, p. 24.

and Social Development Board as early as 1969. In 1981 a population and development planning unit was established within the Socio-Economic Infrastructure Division of the Planning Commission of Bangladesh. Also in 1981, a population and development planning project was launched by the National Economic and Development Authority of the Philippines, which has resulted in the establishment of a population/development planning unit in the central office and units in three regional offices. Sri Lanka has a population division in the Ministry of Plan Implementation. The Republic of Korea has established a population and planning secretariat in the Korean Development Institute. Pakistan has a demography section in the Planning Commission.

Among the research functions of the population planning unit would be to identify requirements for additional data and to promote efforts for their collection. Other functions would include the inventory and policy synthesis of research already completed and conducting or commissioning new research to expand the knowledge base needed for integrated population-development planning. Such a unit should also be prepared to supply other substantive units in the planning structure with the demographic data and research findings needed to carry out their own planning functions. And it should also devote considerable effort to the dissemination of research findings through publications, seminars and workshops.

The research efforts of these units should involve three types of organizations. They are: (a) the statistical offices which must be responsible for the collection of basic demographic and socio-economic data; (b) autonomous research organizations, especially universities; and (c) the planning ministry itself. In most cases the population unit will assume the primary responsibility for its research, but it is also important that autonomous research institutions be actively integrated into the effort and allowed to explore independently population-development interactions.[6]

Though university research and demographic research in the various sectoral ministries can be very useful, they cannot take the place of serious and continuous research on population issues within the development planning agency. Conversely, the capacity for population-related research should also be developed in ministries, such as those of education, health and social welfare, agriculture and regional development, since a central planning agency generally will not respond as promptly or as effectively to their research needs as an in-house unit.

The research activities of the population units will give them greater credibility. Without developing convincing analytical evidence of linkages between population and development, the units may find it extremely difficult to persuade those in authority of the benefits of integration.

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[6] Walter Mertens, *Research Priorities for Population and Socio-Economic Development: Recommendations for UNFPA Inter-Country Programmes*, 1978, p. 36.

Autonomous economic and social policy research institutions, from which the population units in the planning ministry can request policy-oriented research studies, can significantly reduce the need for in-house research. Among such institutions in the ESCAP region are the Korean Development Institute, the Thailand Development Research Institute and the Philippine Institute of Development Studies, to name but a few.

The option of setting up a population research centre which would act closely with the population unit in the planning ministry has been suggested. But the unit must also maintain close ties with academics and other research institutions to benefit from the results of their work. A large number of government or quasi-government organizations also do relevant research in the normal course of their work.

B. DEMOGRAPHIC LEVELS, TRENDS AND PROJECTIONS

1. Levels and Trends

In many countries in the ESCAP region, the availability and quality of demographic data have significantly improved in the recent past. Nevertheless, the lack of accurate demographic indicators remains for many developing countries one of the most important constraints on effective development planning. Among the primary data requirements for planning are information on population size, age-sex structure and rural-urban distribution. Also needed are accurate estimates of fertility, mortality and migration rates.

In addition to the items listed here, Gavin Jones calls for regular updating of life tables, annual calculations of national increase and growth rates, including the net gain from migration, annual calculations of marriage rates and rates of conjugal dissolution. He also calls for annual calculation of the components of fertility trends (age structure, proportions married and marital fertility).[7]

The initial activities of a population unit should also include an assessment of the anticipated needs for population data. The assessment should involve a review of available data sources, data producers and users and means of access to population data. In general, planners require a greater awareness of the current state of knowledge on demographic levels, trends and relationships. In particular, planners should be provided with an inventory of available data which would include the identification of the subject matter, the source of the data, the size of the enquiry, the population covered, the organizations responsible for collecting the data, when the data was collected, its current location and the form in which it is available.[8]

[7] Gavin Jones, "Review of the integration of population and development policies and programs in Asia", *Development Studies Centre Occasional Paper, No. 30.* Australian National University, p. 41.

[8] International Labour Organisation, *Report of the Informal Interagency Expert Meeting on Methodologies for Integrated Population and Development Planning,* 1984, pp. 29, 30.

Demographic data classified by social class can be useful for policy making and development planning. They help to identify the location of social problems and can be used to analyse the costs and benefits of population policies and programmes to different social classes. They permit an assessment of the links between population policies and social mobility and they make it possible to study patterns of diffusion of new demographic behaviour among social groups.[9] In this context it would be useful to conduct research to identify the process by which the reduction of sharp differences in social class are associated with reductions in fertility and mortality.

Development plans often contain policies and programmes aimed at specific target groups such as landless labourers, urban poor, women, children, adolescents, the elderly and minorities. This will require appropriately classified data. Similarly, the introduction of regional and rural development strategies will require new forms of data for small areas. Since most development is concerned with particular (often quite small) sections of the population, population data in considerable detail by subgroups and areas are necessary.[10]

The population unit within the planning ministry should ensure that censuses, general surveys, and other data collection activities necessary for integrated planning are carried out effectively and, when necessary, commission supplementary surveys. It should ensure that the data is properly analysed, and should assist in identifying the tabulations which would be most useful to policy makers and planners. In order that they can more readily utilize this demographic information, the population unit should, whenever possible, provide planners with interactive, computer-based access to this data.

Since statistical organizations may not make data available in formats that fit the needs of planners, the population unit should draw up standardized formats for the types of information needed for development planning.

(a) Fertility and mortality

Even where there is a recognition of the need to reduce fertility rates, levels, trends and differentials in fertility are still not adequately documented in many developing countries. Furthermore, there is often a lack of information on the relative importance of each of the components of fertility determining aggregate fertility rates. Greater knowledge in this area could assist in the design of new approaches to fertility policy and assist policy makers in improving current fertility reduction programmes.[11]

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[9] Mertens, *op. cit.*, p. 62.

[10] Lin Lean Lim, "Integration of population and development in less developed countries in the ESCAP region", In *Population and Development: Frameworks for Research and Planning: Report of the Workshop on an Analytical Framework for Population and Development Research and Planning,* 16-20 February 1987, ESCAP, Bangkok, p. 128.

[11] Carmen A. Miro and Joseph S. Potter, *Population Policy: Research Perspectives in the Developing World,* 1980, p. 115.

It will often be the case that data routinely generated by the national statistical system is inadequate for research into the determinants of fertility trends. The collection of original data is particularly important because the research problems involved in the analysis of fertility often make it necessary to use data specifically tailored for that purpose.

It has been pointed out that there is a need for developing data on mortality differentials according to social class. For most countries of the ESCAP region and for regions within those countries the mortality data needed to estimate mortality differentials by socio-economic class are inadequate. Such estimates could be derived indirectly though the analysis of questions included in censuses and surveys on the proportions of children surviving among those ever born. These estimates should also make use of data on communities, families and households, collected in censuses and surveys.[12]

(b) Migration

As policy makers have begun to take a greater interest in devising means to control population distribution, it has become increasingly clear that data limitations significantly constrain research in this area. The formulation of policies and plans in the field of migration will require improved data on how many persons move, who they are, and where and why they move. In order to be useful in planning and policy making these data should be collected using appropriate time intervals, spatial units and definitions of types of movement.[13]

Research on population redistribution should be concerned with the usefulness of various migration concepts for problem identification, target setting, monitoring and evaluation. Thus the concepts of population migration need to be refined to identify each of the various types of movement which change the size and composition of rural and urban locations. Only after this is done can the types of data needed to measure these concepts be specified.[14]

Attempts to assess the determinants and consequences of migration patterns suffer greatly from the inadequacy of existing data sets. Most such sets were collected for other purposes and do not contain sufficient information. For proper analysis, such data should be collected for households in both areas of origin and areas of destination since it is important to collect the data on both the migrants themselves and their households in the areas of origin. This data should enable the policy maker to understand better whether families respond to a loss of potential labour by altering work hours, school attendance of children,

[12] *Ibid.*, p. 83.

[13] Sidney Goldstein, "Research priorities and data needs for establishing and evaluating population redistribution priorities", in *Population Distribution Policies in Development Planning*, 1981, p. 188.

[14] *Ibid.*, p. 189.

or land ownership and use. The collection effort should also include information about the initial flows of money and goods to the migrant and the later return flows of remittances.[15]

Concern for migration is closely related to efforts to control the growth of the urban population. To analyse the ways in which such movements affect locations of different size, function and type it would be desirable to collect information in terms of specific localities so that the ways in which population movements themselves differ by size of place, function and type can be studied.

In a number of developing countries international migration is also an important source of demographic change with significant socio-economic consequences. Planners in these countries would need more and better data on such movements than is usually available. Specialized surveys applied on a national basis or in selected areas can be used to determine reasons for migrating, the average length of stay, the amount of remittances, the costs of migration and the characteristics of the migrants.

2. *Projections*

Detailed population projections by size, sex-age group and location and projections for specific population groups are among the primary demographic data requirements for planning. Therefore the population unit within the planning ministry should ensure that appropriate and consistent sets of demographic projections are made available to the various ministries and that these are regularly revised to take new information into account as it becomes available. Furthermore, the data and the assumptions underlying the projections should also be provided so they can be assessed and, if desired, altered by the various ministries.

It would be confusing if different ministries prepared their own population projections. It is much better if each ministry is represented on a committee which oversees the preparation of an official set of population projections which is to be used for all planning purposes.

The population unit could review existing projection techniques, selecting the one which is most appropriate in the country context. For many planning purposes it will be necessary to have regional population projections. Projections by age and sex, but also projections of the number in target socio-economic groups, such as poor groups or minority groups may be necessary. The projection framework should be suitable for expansion either in response to the availability of new data or in response to new requirements. Ideally, the model would be adaptable for micro computers and be accompanied by software which could be made widely available to ministries and research institutions.[16]

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[15] Richard E. Bilsborrow, "Priority areas for future research on demographic-economic interrelationships", in *Population and Development Modelling*, 1981, p. 79.

[16] International Labour Organisation, *op. cit.*, pp. 26 and 30.

Research is required to develop accounting frameworks which planners can use to project population, labour force, school attendance, education attainment levels and numbers of people in need of family planning services at a disaggregated level (such as by age, sex, education and rural-urban location). Though such frameworks are now available they should be disaggregated more finely so as to enable planners to focus on specific target groups. Furthermore, these frameworks should incorporate economic-demographic interrelationships.[17]

C. RESEARCH ON INTERRELATIONS BETWEEN POPULATION AND DEVELOPMENT

In order that planners have a greater awareness of the current state of knowledge about population and development interrelations and available sources of information, the population planning unit should prepare an inventory and synthesis of already completed research along with an agenda of research priorities.

1. Consequences of Demographic Change

(a) Population growth

Studies of the impact of population growth should be a regular feature of the process of planning for socio-economic development. Furthermore, it would be particularly useful for planning if they were decomposed geographically, sectorally and according to social groups. It will be possible to choose and implement policies successfully only if these impact studies are appropriately and sufficiently disaggregated. There may be a need for special impact studies in response to specific demographic events, such as a sudden return flow of international migrants. In addition there should be occasional long-term impact studies of population trends as related to the availability and use of natural resources.

It is necessary to measure better the impact of population trends on particular sectors such as agriculture, health, education and employment. Demographic variables have important impacts on all major planning sectors but many of the linkages between socio-economic and demographic variables are indirect and not always visible to sectoral planners. Thus, research for planning should identify population needs in different social and economic areas. Wherever possible, these studies should enable sectoral planners to calculate the budgetary implications of these impacts. This could be useful in determining the allocation of resources to the sectors.

The role of population factors can be made much more evident by preparing alternative sets of projections and comparing the ability to meet plan

[17] *Ibid.*, p. 26.

targets expressed in terms of population coverage rates. These studies can also give a measure of the benefits accruing in a particular sector when fertility rates fall. This should enhance the interest of officials in the relevant ministries in effectively integrating population into sectoral planning.

In the case of education, studies should be made of the additional costs of attaining additional school enrolment ratios under different demographic assumptions. Important aspects to be considered would include changes in the age, sex and educational structure of the labour force, which in turn could be related to projections of employment structure and manpower needs.

Among the high priorities for research to aid planners in the field of population and development is an assessment of the effect of population growth (and redistribution) on agricultural production, food requirements and land ownership patterns. Research is needed on the way farm families respond to population pressures on the land. These studies should investigate the hours and months of work over the year, individual family incomes and productivity, land under cultivation and technological changes in land use. These studies should also consider the feed-back effects of agrarian structure and technology on demographic levels and trends.

It is important to assess the impact of population growth as it differently affects the interests of various social groups. The current emphasis on targets to eliminate poverty and reduce income differences reinforces the need to examine the effect of population growth on income distribution in the context of different development strategies. Nevertheless, until recently little had been done to assess the effects of population change on the distribution of income.

Though it has been widely hypothesized that a reduction in growth rates based on a decline in fertility would lead to greater income equality, recent evidence casts doubt upon this, in part because in many areas fertility decline was most rapid in upper income households. There is thus a need for research to identify the gainers and losers according to social class, rural-urban residence, region and occupation. The results of such research could indicate to planners where to allocate the greatest efforts to implement fertility policy. Conversely such studies could indicate the need for socio-economic policies to compensate specific groups for the undesirable outcomes of current fertility policies.

Manpower planning requires analyses of the types of imbalances by industry and occupation that may develop when national economic programmes and manpower policies do not correspond to demographic trends. Furthermore, this research should attempt to identify the linkages between employment and the distribution of income. It is thus necessary that the research programme examine the influence of demographic factors on both the supply and demand for labour. In particular the study of labour supply should examine how both natural increase and migration are likely to affect the size of the potential labour force, skill levels, participation rates and wage levels.

In many developing countries population factors are intricately intertwined with a number of major environmental problems which are of concern to planning. Studies are therefore required of rural environmental problems, such as soil erosion, resulting from population growth and settlement patterns. Also of importance is research on the environmental problems of low-income migrants into urban areas. The elements of such studies would probably include a set of alternative populations and a set of alternative consumption patterns, an analysis of production required to meet these needs, a translation of production levels into physical resource requirements and finally an analysis of environmental constraints.

(b) Mortality

The developmental consequences of population growth will differ depending on whether high rates of population growth are due to declines in mortality or due to increases in fertility, since they will have different effects on the age structure. Furthermore, mortality declines generally imply improved health status which is associated with increased labour productivity. Thus research on the effects of mortality decline should be conducted in conjunction with an assessment of the economic benefits deriving from greater labour productivity. Another aspect to be considered in this research should be the extent to which an expectation of longer productive lives serves as an incentive for increased investment in human capital. If major productivity gains could be demonstrated by research, this could have a considerable effect on health planning and policy formation.

Gavin Jones noted that the effects of declining mortality on family structure and economic behaviour have not yet been assessed in most countries of the ESCAP region.[18] He suggests that such studies might begin with the evaluation of the effect of declining mortality on age structure and family composition over the life cycle, and proceed to examine the effects on inheritance patterns, savings patterns and the potential for migration.

(c) Migration

Population distribution and migration have important intersectoral implications particularly on rates of urban growth, rural depletion, environmental degradation, shifts in age distribution, employment and manpower development. Migration can affect fertility directly and indirectly through its impact on the distribution of income.

Because of its relatively immediate impact on development, trends and prospects for internal migration tend to be more closely linked to the short and

[18] Gavin Jones, *Social Science Research on Population and Development in South-East and East Asia: A Review and Search for Directions*, International Review Group of Social Science Research on Population and Development, Mexico City, December 1978, p. 61.

intermediate term concerns of development planners than either fertility or mortality. Migration is also particularly relevant for policy analysis since the balance of benefits and costs as perceived by individual migrants may be quite different from the balance of costs and benefits to the society as a whole.

Research on migration should identify its effects on population growth and income distribution in the areas of origin and destination. It should give greater attention to the proximate consequences of migration, in an attempt to determine the effects on the public sector and other population groups as well as the migrants themselves. Both the populations in the place of origin and the place of destination should be considered. Among the factors which must be considered are the volume of needed public sector services, agglomeration economies and diseconomies, costs of congestion and pollution, the efficiency of education and health programmes and the subsidization of housing.[19]

It would be useful to prepare cost benefit studies assessing the consequences of the growth of a number of specific cities. Such studies should take into account both economic and non-economic costs and benefits. These studies should consider not simply the amount of growth but also the ability of urban areas to adjust quickly enough to the rapid rates of growth.

Studies which compare the relative costs and benefits of permanent migration with circular migration and commuting, could provide planners with the basis for encouraging one type of migration or the other as a way of dealing with problems of urbanization and rural development. A type of migration which has received inadequate attention is flows from urban to rural areas. It should be determined whether these represent primarily successful or unsuccessful returnees from urban places and whether these returnees provide a significant stimulus for social change and modernization in rural areas. In particular, it would be useful to determine whether the fertility patterns which return migrants may have adopted in urban places will be adopted by the rural population in the places of origin.[20]

In some developing countries research on the developmental implications of international migration should be given high priority. In particular such studies should consider the costs of international migration in terms of shortages of certain types of skilled labour and professionals, the implications of these shortages for future programmes of vocational training and higher education, and the economic significance of remittances from abroad. Research of this type may be useful in formulating measures that planners could take to reduce the costs and increase the benefits of international migration both to the migrants themselves and to the society as a whole.

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[19] George Stolnitz, "Three to five main challenges to demographic research", in *Demography*, vol. 20, No. 4, November 1983, p. 423.

[20] Goldstein, *op. cit.*, pp. 190, 191.

The remittances of migrants, both internal and international, contribute to food security, housing, form investments and in the process, alter the distribution of income. However, the role played by remittances has been inadequately studied. Such studies would be useful in planning aimed at more fully utilizing the potential of remittances to contribute to the development process.

2. *The Determinants of Demographic Change*

One important obstacle to the integration of population factors into development planning is the fact that research has not yet developed persuasive quantitative linkages between demographic trends and their socio-economic determinants. A recent review of research findings by George Stolnitz indicated that as of the present time quantitative estimates of how major development processes affect demographic trends are "astonishingly sparse".[21]

(a) Fertility

The framework developed by John Bongaarts[22] can be used for establishing the magnitudes and trends of proximate fertility determinants and to estimate and project their fertility effects. Depending on the country context, research on the prevalence of induced abortion, duration of breastfeeding and frequency of intercourse could prove particularly useful to policy makers.[23]

Since there is such a strong relationship between age at marriage and fertility levels, there is a need for further research on the factors that determine the age at marriage and related phenomena such as celibacy, divorce, widowhood and remarriage. Yet in many countries of the ESCAP region nuptiality and possible ways to influence it are among the most neglected areas of social science research related to population. A principal focus of such research should be the social factors that determine the age pattern of marriage, the supports for such traditional marriage patterns and the elements which are militating for change. Studies could be undertaken to determine whether parent-arranged marriages are more stable than those arranged by the couple themselves. Particularly important are studies to identify those aspects of development that are likely to have a substantial effect on the age at marriage.

Gavin Jones has identified several areas for research on nuptiality that may lead to policy relevant findings.[24] These include the effects of migration patterns, dowry and bride price arrangements, ethnic mixing and increased female

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[21] Stolnitz *op. cit.*, pp. 417, 418.

[22] John Bongaarts, "A framework for analysing the proximate determinants of fertility", In *Population and Development Review*, vol. 4, Number 1, March 1978, pp. 105-132.

[23] Population Council, "Research on the determinants of fertility: a note on priorities", in *Population and Development Review*, 1981, p. 319.

[24] Gavin Jones, *Social Science, op. cit.*, pp. 23 and 24.

earnings on patterns of nuptiality. He also proposes a study of the relationship between age at marriage and the proportion of women ultimately marrying.

Measuring the costs and benefits of children will provide planners with insights into preferences for family size. It will be necessary to promote the collection of data sets which include the information needed to estimate those costs and benefits. Measures of preferences might be made through a survey which asks parents questions about the trade-off between children and other things which the family may desire. Closely related to this is the suggestion that further efforts be made to measure couples desired family size.

In addition to research on parents' perceptions of the value of children, research is needed to determine the actual costs and benefits based on community studies. Among the topics of such research should be child labour and income, the direct and opportunity costs of children to their parents, the returns on investments in children, and the value of children as insurance against unforeseen difficulties, and as security in old age. Examining the potential benefits of children to the family will involve research on the economic roles of children, the relationship between work activity and school attendance and conversely the effect of children's education on their subsequent migration from (and remittances to) rural areas.

Such research should measure the contribution of child labour in the teenage years. These studies should indicate how the welfare gains from eliminating child labour in order to reduce fertility would compare with the welfare losses in families heavily dependent on child incomes.

In assessing the benefits of children, attention should also be given to their role as a form of insurance against risk. Such research should include an identification of the sources of risk to households, the variety of means by which they can insure themselves against such risk, and the role of children in mitigating the effects of the disasters which may befall families. Studies to demonstrate the quantitative significance of old age security as a motivation for large family size should be controlled for alternative forms of old age security, such as personal savings and physical assets, as alternatives to relying on government programmes or children.

In investigating the desire for children as security for old age, Walter Mertens suggested that research designs differentiate between two aspects of the question. First of all, does the evidence indicate that children really do fulfil the social security function? Secondly, what are the expectations of the parents and the children with regard to these "social security" transfers and how are these expectations affected by rural-urban migration and changes in patterns of labour force participation?[25]

[25] Mertens, *op. cit.*, pp. 66.

In many countries, programmes and policies to reduce fertility are based on the assumption that families with fewer children will have a higher standard of living. To the extent that careful research can verify or refute this assumption, planners can adopt more realistic targets for their family planning programmes and for other policies designed to limit family size. Furthermore, research on these intra-family flows of income and services may suggest to planners a variety of new approaches to influencing reproductive behaviour.

There is need to examine the linkage between fertility and the labour force participation of women which takes into account the potential incompatibility between the roles of mother and worker, the degree to which employment increases women's psychological and economic independence and finally how employment increases women's exposure to the outside world, including family planning options. Beyond this, planners may need to know the effects of particular patterns of industrialization and related changes in the geographic distribution of the population on women's productive activities. Such research should be useful in designing economic programmes to improve women's economic status and thereby contribute to lowered fertility.

Though the relationship between education and fertility is not uniformly inverse for all countries of the ESCAP region,[26] there are numerous studies linking female education to levels of fertility. Further research is needed to determine whether this effect is due to the content of the educational programme or to other factors such as that education brings together girls of the same age group. Research is necessary to determine the processes by which education influences fertility, including the complete range of causal and intermediate variables. Richard Bilsborrow suggested that six hypotheses be tested, namely that increased female education (a) delays the age at marriage, (b) increases the probability of a woman working away from home, (c) provides her with greater access to family planning information, (d) reduces infant and child mortality, and (e) changes a woman's tastes for using her time to raise children. Furthermore, research is required to determine how such contextual factors as urbanization, the availability of family planning services and the quality of transportation and communication facilities affect the linkage between female education and fertility.[27]

In general, it has been observed that fertility varies inversely with the average age at marriage and that a rising age at marriage is associated with improvements in female education and employment. Thus there is a need for research which would more clearly spell out the causal links involved in order to develop more effective population policies.

Though the significance of rural to urban migration for fertility has long been recognized, definitive research results are not yet available to planners,

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[26] Gavin Jones, *Social Science, op. cit.*, p. 34.

[27] Bilsborrow, *op. cit.*, pp. 76, 77.

largely as a result of inadequate data bases. Stolnitz has suggested that an adequate data base should include "(a) national origin-destination cross-classification of rural and urban areas, distinguished by regional size of place and socio-economic characteristics, (b) data on birthplace and on previous and current residence for all surveyed individuals in addition to fertility relevant characteristics. . . (c) fertility data in sufficient chronological detail to distinguish pre-migration from post-migration amounts of childbearing, current from cumulative fertility and temporary effects from longer-run consequences associated with migration, (d) duration of current residence among both mover and stayer groups". With such data it should be possible to convert estimated migrant-non migrant fertility differentials into national, urban and rural fertility impact measures.[28]

The possible role of agricultural change in fertility decline has been noted in many countries of the ESCAP region. Research on the effects of agricultural development patterns on fertility could be useful in planning. However, the likely effects of fertility are mediated through changing labour requirements, changing land availability and changing levels and distributions of income. Gavin Jones has suggested that one way to deal with this problem is to build such research into large-scale studies of rural change and rural dynamics.[29]

(b) Mortality

In undertaking research on health and mortality there is a need to develop appropriate frameworks for analysing the relationship between the economic situation of the family, community level variables and mortality. These analyses should identify the relative influence of regional or community level factors which affect the exposure to disease, such as public health programmes. Furthermore, the development of better conceptual models of the relationship between socio-economic, biomedical and environmental factors and mortality should provide improved guidelines for the collection of data in this area.[30]

These frameworks should incorporate biological as well as socio-economic determinants since the latter must operate through the former to produce patterns of mortality. One conceptual model would have the socio-economic factors working through maternal factors, dietary intake, environmental contamination, accidents and personal disease control factors.[31]

There is need for research to assess the relative importance of socio-economic development as compared to public health programmes in determining trends in mortality.

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[28] Stolnitz, *op. cit.*, pp. 426, 427.

[29] Gavin Jones, *Social Science, op. cit.*, p. 42.

[30] Lado T. Ruzika, "Mortality transition in the Third World Countries: Issues for Research", in *IUSSP Newsletter*, 1983, p. 72.

[31] *Ibid.*, p. 74.

There is considerable evidence to indicate that the education of mothers is a major factor in determining the level of infant and child mortality. However, for the development of policy and programmes, research is required to determine the causal mechanisms involved. Such research should consider the degree to which education provides directly relevant information to the mother, greater access to information, or greater preferences for health care for children. These issues might best be explored by examining such household-level factors as the organization of care for children, the preparation and sharing of food and forms of treatment given in cases of sickness.

The existence of large differences in mortality by social class is one of the major problems facing health planners in the ESCAP region. However, research is needed to identify the mechanisms responsible for this, such as differential access to health facilities or differences in knowledge and nutrition. Furthermore, there is need to assess whether specific development policies will widen or narrow the mortality differences by social class.

There is also a need for studies of the socio-economic determinants of mortality differentials across regions or administrative districts. In order to have the greatest value for planning and policy making, such differentials should be investigated using a combination of household survey and community level data.

Stolnitz has also suggested that it would be important to investigate ways in which health-focused interventions might be substituted for socio-economic development in achieving lower levels of mortality.[32] He suggests using regression models to identify alternative combinations of health-focused and development-related inputs which could be expected to yield a specific level of motality. Such studies could also establish thresholds whereby health interventions are likely to fail without supportive socio-economic programmes and *vice versa.*

Gavin Jones suggested two approaches to assess the relationship between public health programmes, general living conditions and nutrition in lowering mortality.[33] One approach is to test the effects of specific health interventions. The other is to conduct continuous surveillance of morbidity and mortality conditions. A good model of the latter would be the Cholera Research Laboratory project in Matlab Thana, Bangladesh.

Numerous studies have linked increases in child illness with declines in breastfeeding. It would be useful to identify the determinants of breastfeeding practices, incorporating both biological and socio-economic variables, with a view to developing policies to promote breastfeeding. It has also been proposed that there be studies to measure the mortality consequences of infant feeding practices in a variety of health care regimes and socio-economic environments.[34]

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[32] Stolnitz, *op. cit.*, 420.

[33] Gavin Jones, *Social Science, op. cit.*, p. 59.

[34] Miro and Potter, *op. cit.*, p. 84, 85.

(c) Migration

Internal migration should be given high priority in the research programmes of population units in the ESCAP region. The high proportion of its population living in rural areas and its continuing population growth mean that there is a large reservoir of potential rural-to-urban migrants. Furthermore, migration flows are more amenable to modification through government policy than other demographic variables, such as fertility. (Though the unintended consequences of policies in other spheres of planning often have a greater impact than policies explicitly directed at influencing migration).

Research on the determinants of internal migration would be useful in identifying the kinds of policies that might be effective in altering migration flows. In assessing the determinants of rural-urban migration there is a need to study the role played by inadequate education and health facilities in rural areas. Related to this is the analysis of the role that education plays in promoting an exodus of young people from rural areas. A broader research task is the analyses of the current distribution of all government expenditures between rural and urban areas and the effect this has on migration.

If the determinants of migration are to be understood, more research is required on the characteristics of the sending as well as the receiving areas. Of particular interest should be types of places that are characterized by out-migration.

Village based, micro-level studies would be useful to identify the motivations to migrate and actual patterns of movement. Especially relevant to the ESCAP region are the effects on migration of family structure and marital patterns.

In planning research on the determinants of rural-urban migration a high priority should be given to examing the role played by development policies unrelated to migration. Such policies include "agricultural price policies, fixed exchange rates, discriminatory tariffs and taxes".

D. POPULATION POLICY RESEARCH

1. Concept of Policy Research

Policy analysis differs from other forms of research in that it will generally encompass a wide variety of disciplines, involve direct communication between the producers and the users of research and will give high priority to the timeliness of the results. It must be concerned with the instruments of policy as well as the objectives. To be relevant for policy, research findings must indicate what the Government can do to achieve the demographic objective.

Though policy proposals are generally based on a relationship between two or more variables, for policy purposes it is necessary to go beyond measuring

such relationships to investigating specific programmes that can serve to bring about the desired results. Furthermore, these programmes must be analysed from the viewpoint of administrative feasibility and cost.

Farooq and Simmons have offered four guidelines for policy-relevant research. Firstly, the populations should be representative of a sufficiently large class of individuals to be of policy significance. Secondly, the research should concentrate on relationships of sufficient empirical strength to justify strong policy conclusions. Thirdly, the research framework should link the policy variables with specific governmental initiatives. Finally, the programmatic interventions suggested in the analysis should be clearly feasible.[35]

In conducting research on population-related policies, attention should be given to the following aspects of those policies: the weighing of costs and benefits, determining the likelihood that such policies will prove to be acceptable and estimating the time for the intervention to have the desired demographic effect.

Research on the cost effectiveness of alternative population activities such as incentive schemes, population education programmes and efforts to provide employment to women is essential if planners are to be able to determine whether resources can be usefully shifted from one activity to another. Furthermore, since these activities yield additional socio-economic benefits, they should be examined as an integral part of the general planning process.

In assessing the feasibility of proposed policy alternatives, research strategies should give attention to such issues as: (a) whether the necessary political consensus can be attained, (b) whether, given an adequate consensus, there is the political will to give high priority to the programme, (c) whether there are adequate public resources and whether the expected returns will justify the use of those resources, (d) whether new institutions will be required to implement the policy and whether the country possesses adequate professional and managerial skills to implement the policy. After assessing the time lags between the initiation of population policies and their effect, research efforts should be devoted to identifying organizational or structural changes which might reduce those time lags.

Walter Mertens has described four different orientations for policy research.[36] The structural approach would examine the fundamental political, social and economic structures. Such research would stress the importance of structural change for the success of a population policy. The demographic change approach to policy research would focus in a comparative fashion on regions where important demographic changes have taken place and would

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[35] Farooq and Simmons, *op. cit.*, p. 117.

[36] Mertens *op. cit.*, pp. 51-53.

utilize both demographic and socio-economic explanatory variables. The economic development approach would compare sub-regions where fast and slow economic development had occurred to assess the comparative impact on demographic variables. The political system approach would examine how population policies are related to basic ideological issues and the organization of society. An objective of policy research with this orientation would be to determine whether and under what conditions population policies and programmes are transferable to countries with different political systems.

2. *Policies to Alter Demographic Variables*

A major task of policy research would be to undertake a systematic examination of all major options for government or private action to influence population variables. There is also a need for conducting an analysis of current government policies, plans and programmes to determine how they deal with population factors, with a view to identifying areas where such factors may have been neglected.

(a) Fertility and mortality

George Stolnitz has called for research which would investigate how social, economic, political and cultural structures create fertility incentives and disincentives.[37] He holds that policy objectives can best be served by detailed analyses of the fertility incentive structures faced by different social groups and an assessment of the amenability of such incentive structures to change. And while recognizing that these structures would rarely be changed solely for demographic reasons, an understanding of fertility incentive structures may identify opportunities for intervention on demographic grounds.

George Simmons has suggested that in the context of countries wishing to slow population growth, priority might be given to a study of the relationship between declines in fertility and infant mortality and the problems that must be solved in implementing a strategy to reduce the number of infant deaths.[38]

If the reduction in infant and child mortality is an important contributing factor to declines in fertility, it may be possible to design special health and nutrition programmes which reduce both mortality and fertility. Research on such programmes should go into the technology of mortality reduction, the feasibility of applying such technology and the costs involved. Though reducing infant mortality will lower fertility in the long run, it is necessary to conduct research which will tell the planner how great the resources are that must be devoted to health interventions for mothers and children to achieve the target levels of mortality and fertility.

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[37] Stolnitz, *op. cit.*, p. 318.

[38] Simmons, 1983, *op. cit.*, p. 74.

A major contribution of research to integrated population and development planning would be to determine the cost effectiveness and likely mortality impact of health policies designed to reduce the socio-economic differentials in health status. Thus, there is a need for research on the impact of social factors on the effectiveness of primary health care systems, in particular on how social factors affect the type of health services provided, as well as the distribution of the costs and benefits of those services.

In preparing to undertake research on proposed health policies it would be useful to evaluate the impact on mortality of past health policy experience. In particular, the evaluations of these health interventions could cast light on the appropriate balance between efforts to provide primary health care to the entire population and interventions selectively to prevent or treat those diseases most responsible for high mortality.

The health system can play other roles in the reduction of fertility, particularly in the provision of family planning services and in the pattern of counselling that mothers receive. In this regard a most promising area of research in countries where traditional systems play a major role in delivering babies is in determining ways in which the indigenous system can play a more effective role in reducing marital fertility.

(b) Migration

One of the primary tasks of a population unit in relation to migration policy would be to prepare an inventory which would describe and evaluate the migration policies already in effect. It would be useful if this inventory went beyond evaluating the success of these policies in altering the spatial distribution of the population and attempted to assess their impact on social welfare.

Among the important questions for policy research is an identification of policies to influence the pace of rural-urban migration. Such research should examine the role played by the current distribution of public expenditures between rural and urban areas. It should also examine the impact on internal migration of income distribution policies, especially in regard to rural-urban equity, geographic investment policies and rural development policies.

In countries where the loss of skilled workers and professionals through international migration is a serious problems, there is a need to evaluate measures which might be taken to induce their nationals to return. Such research should indicate the design of such policies, the likelihood that they can be implemented and how they are likely to affect the parties concerned.

3. Analysis of Strategies and Plans

There is need for research on the way general development strategies influence demographic levels and trends. An example of such an analysis would

be a review of the demographic impact of a capital-intensive strategy of agricultural development. Such studies should bring out the differences between the consequences of such policies for the Government and the consequences for individuals.

Simulation approaches can be used to analyse the long-range economic and demographic consequences of alternative demographic strategies, working out the expected consequences of alternative population projections. The converse of this would be an analysis of the demographic effects of the nation's long-term development strategy.

The population planning unit could in conjunction with the sectoral ministries undertake an analysis of the population content of the current plan with a view to increased involvement of the ministries in achieving population objectives. The study should include an analysis of the demographic data used in the plans, the population problems recognized and the population policies proposed. In monitoring the development plan two issues for research are: (a) how will development projects solve problems created by demographic variables? and (b) how can development projects be designed so that they have the desired demographic impact?

4. Research on Programmes and Projects

McGreevy and Birdsall have provided a list of development programmes and projects for which it might be useful to prepare population impact statements.[39] This list includes rural development, community-based development projects, expansion of educational facilities, health programmes, sanitation and related public works projects. George Simmons would add to the list of programmes deserving study the social security system and food support programmes.[40]

(a) Family planning programmes

Among the most important research issues to be addressed in evaluating family planning programmes are: (a) an assessment of the likely fertility reduction that could be achieved by a well-designed programme, (b) an assessment of the cost-effectiveness of the family planning programmes now in operation, and (c) an exploration of whether there are other interventions that may be more cost-effective in reducing fertility than family planning.

In addition to the analysis of official statistics and surveys of the perceptions of clients, research on family planning programmes should assess the actual quality, availability and accessibility of contraceptive services and supplies in

[39] William P. McGreevey and Nancy Birdsall, *The Policy Relevance of Recent Social Research on Fertility*, 1974, p. 75.

[40] Farooq and Simmons, *op. cit.*, p. 121.

specific localities and measure clients' perceptions of the quality of such services and supplies. Studies of the delivery of family planning services should also include such administrative aspects as the work patterns of the staff. Research on family planning programmes should also investigate whether particular sets of social conditions increase the probability that the programme will be well-staffed and well-managed.

Though population planning units may find it necessary to limit their research initially to cost-effectiveness analysis because of the methodological problems inherent in cost-benefit analysis, eventually research should focus on cost-benefit studies because population programmes are in competition for resources with projects and programmes that are more amenable to calculating cost-benefit ratios.

Research is needed to measure the effects of the provision of family planning services on actual and desired family size. This would involve efforts to determine the relative impact of family planning and socio-economic development on fertility. In addition to evaluating the effect of family planning programmes on fertility, it would be useful to examine their effectiveness in bringing about social change by giving couples greater control over their futures.

(b) Development projects

Many studies done in the ESCAP region indicate that development projects, such as hydroelectric dams, irrigation canals and rural electrification, have important population impacts. Hence, the population unit should prepare an inventory of projects which relate to demographic trends. It could also have as one of its functions the monitoring of the population dimension of development projects included within the plan. It could begin by analysing some past projects which appeared to have had a significant effect on population variables. Such analyses should indicate how, by giving greater attention to the demographic aspects, the development objectives of the project might have been furthered. In order to assist policy makers and planners in the design of proposed development projects, these studies should assess their implications for demographic change as well as for the welfare of specific population groups.

Analysis of the population impact of development projects poses complex methodological issues, however, a number of promising techniques for such assessments are being developed which may provide important insights for integrated planning.[41] These studies should, as far as possible, be of a quantitative nature if they are to serve as a basis for resource allocation decisions.

It would be useful to determine how development projects at the community level can be used more effectively to attain population objectives. Such

[41] These proposed methods are discussed in *Assessing the Demographic Consequences of Major Development Projects,* United Nations, New York, 1988.

research could indicate how population objectives can be attained through progress at the project level even in the absence of rapid overall development.

There is need to identify the way women's literacy and income-generating schemes, influence such intermediate fertility variables as age at marriage and prevalence of contraceptive use. Gavin Jones points out, however, that research in this area may ignore the human dimension of these projects. He argues that in monitoring the life situation of women who find work, it is important to identify not only attitudes and practices related to family formation and fertility but also such factors as the extent of disruption of traditional social structures, and the degree of stress and tension suffered by the workers.[42] In this way the trade-offs between demographic impacts and impacts on cultural, social and family life may be highlighted.

E. SETTING PRIORITIES

Research priorities for integrating population into development planning will differ from one country to another. In some countries research on mortality and population distribution would be of great importance, whereas in others, research on fertility and population growth would warrant priority.

In establishing national priorities for research efforts in support of integrated population and development planning the following factors should be taken into account: (a) national objectives in population and development; (b) the availability of data; (c) the availability of suitable conceptual frameworks and research methodologies; (d) the prospects for using the research findings; and (e) the availability of technical expertise. Priorities could be established in terms of relevant time-frames for research, some of which would be immediate or short run and could be undertaken before studies having medium to long-term time-frames.

BIBLIOGRAPHY

Anker, Richard. Integration of population and development: some reflections on methodologically related issues. Geneva (mimeo), 1984.

Bilsborrow, Richard E. Priority areas for future research on demographic-economic interrelationships. In *Population and Development Modelling: Proceedings of the United Nations/UNFPA Expert Group Meeting on Population and Development Modelling, Geneva, 24-28 September 1979.* New York, United Nations, Sales No. E.81.XIII.2, 1981, pp. 74-87.

_____ The Integration of Population in Development Planning: Some Methodological Issues and Suggestions. In *International Population Conference, Florence, 1985*, vol. 3, Liege, IUSSP.

[42] Gavin Jones, *Social Science, op. cit.*, p. 43.

Farooq, Ghazi M. Population, human resources and development planning: towards an integrated approach. In *International Labour Review,* 120:3: 335-348, May-June, 1981.

Farooq, Ghazi M. and George B. Simmons. Towards a policy relevant framework for the study of fertility. In *Fertility in Developing Countries: An Economic Perspective on Research and Policy Issues.* Ghazi Farooq and George B. Simmons eds., London, Macmillan, 1984, Chapter 4.

Goldstein, Sidney. Research priorities and data needs for establishing and evaluating population redistribution policies. In *Population Distribution Policies in Development Planning: Papers of the United Nations/UNFPA Workshop on Population Distribution Policies in Development Planning, Bangkok, 4-13 September 1979.* New York, United Nations, Sales No. E.81.XIII.5, 1981, pp. 183-203.

Jones, Gavin. Review of the Integration of Population and Development Policies and Programmes in Asia, *Development Studies Center Occasional Paper,* No. 30, The Australian National University, Australia.

Jones, Gavin. *Social Science Research on Population and Development in South-East and East Asia: A Review and Search for Directions,* International Review Group of Social Science Research on Population and Development, Mexico City, December 1978.

Lim, Lin Lean. Integration of Population and Development in Less Developed Countries in the ESCAP Region. In *Population and Development: Frameworks for Research and Planning,* Report of the Workshop on an Analytical Framework for Population and Development Research and Planning, 16-20 February 1987, ESCAP, Bangkok, Thailand.

International Labour Office. *Report of the Informal Interagency Expert Group Meeting on Methodologies for Integrated Population and Development Planning: Geneva 21-24 May 1984,* Geneva, 1984.

Mertens, Walter. *Research Priorities for Population and Socio-Economic Development: Recommendations for UNFPA Inter-Country Programmes,* New York, UNFPA, (mimeo) 1978.

McGreevey, William P. and Nancy Birdsall. *The Policy Relevance of Recent Social Research on Fertility,* Washington, D.C., Smithsonian Institution, 1974.

Miro, Carmen A. and Joseph E. Potter. *Population Policy: Research Priorities in the Developing World,* London, Francis Penter, 1980.

Population Council, Research on the determinants of fertility: a note on priorities. In *Population and Development Review,* 7:2:311-324, June 1981.

Third Asian and Pacific Population Conference, 1982. "Asia and Pacific Call for Action in Population and Development" *Population Headliners: Special Supplement.*

Ruzicka, Lado T. Mortality transition in the third world countries: issues for research. In *International Union for the Scientific Study of Population, Newsletter,* 17 January-April 1983, pp. 60-82.

Simmons, George B. *The Analysis of Policy Options in the Population Sector – A Study of Current Egyptian Capability: Report of the UNFPA Consultants' Mission,* New York, UNFPA, Report No. 37, 1981.

_____ *Population Policy Programme for Egypt: A Proposal,* Ann Arbor, Michigan (mimeo), 1983.

Stolnitz, George J. "Three to five main challenges to demographic research", In *Demography* 20:4:415-432, November 1983.

United Nations, *Assessing the Demographic Consequences of Major Development Projects,* New York, 1988.

Annex A

RESEARCH METHODS

Very often the planner will be concerned with how economic or demographic behaviour will change over time. However the researcher often has only cross sections of individual households or spatial units with which to explore the relationships. In many cases, but not in all, cross sectional data will yield valid indications about changes in behaviour over time, but the researcher must warn the planner that there are different implications to be derived from using time-series and cross sectional data sets.[1]

Richard Bilsborrow has pointed out that since at the aggregate level fertility, mortality and many socio-economic variables are interrelated they can investigated using recursive and simultaneous equations estimation procedures. In the case of migration, where the migratory movements themselves change the socio-economic variables that determine them, it is imperative that simultaneous equation models be used in research using macro data.[2] In view of the strong linkage between household economic and demographic decisions, multi-equation recursive and/or simultaneous equation estimation techniques are necessary for statistically estimating the approximate models.

Simulation models may provide a mechanism for linking fertility research with models of economic development. These models allow the researcher to explore relationships that cannot be examined through mathematical analysis.

Wherever possible research on determinants and consequences of demographic change should take the form of causal modeling. For example, simple multivariate analysis of the impact of a variety of socio-economic variables on fertility fails to take into account the influence of feedbacks and other important causal structures.[3] Recursive or "path" models, while they are based on ordinary least squares techniques do permit the investigation of causality via multi-equation techniques.[4]

There is a shift in the focus of research from the macro to the micro level. In part because the underlying behavioural theory relating demographic parameters to social and economic variables is a micro-level theory. Furthermore,

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[1] Rechard Anker, *Integration of Population and Development: Some Reflections on Methodologically Related Issues*, 1984, p. 9.

[2] Richard E. Bilsborrow, "Priority areas for future research on demographic-economic interrelationships", in *Population and Development Modelling*, 1981, p. 80.

[3] *Ibid*, p. 86.

[4] Farooq, Ghazi M. and George B. Simmons, "Towards a policy relevant framework for the study of fertility", in *Fertility in Developing Countries: An Economic Perspective on Research and Policy Issues*, 1984, p. 104.

when these relationships are investigated at the macro level, there are usually so many possible explanations for the results that the implications for policy making and planning are not clear.

The research agenda for integrating population and development planning should include investigation into the way family decisions are made with regard to family size, migration, health care and education and how these relate to income-earning opportunities. This would help in formulating policies to break repetitive cycles of poverty within families.

The consequences of population trends at the micro level can be investigated using the life-cycle approach. The examination of the position of the family at various points in time over the life cycle may be useful in identifying the stages in the lives of families at which particular difficulties are more likely to occur as a result of fertility or mortality conditions.

Research on family decision processes should take into account the economic, social and institutional context in which those decisions are made. It should emphasize: (a) the temporal sequence of fertility decisions and the different decision-making contexts over time; (b) the scope of individual decision-making by the husband and the wife; and (c) the relative power and influence of the husband and the wife over fertility outcomes.

Research on fertility using community-level variables with complementary data at other levels of aggregation should provide planners with a better understanding of the determinants of fertility at both the family and the community levels. Community-level data should be integrated into micro-economic demographic analyses in order to investigate the impact of policy instruments that might be used by the planners. Without such community or higher-level variables included in the analysis, it would be exceedingly difficult to draw policy implications.

Multi-level analysis will often prove to be a fruitful technique for estimating population-development interrelationships. Using both household (or individual) and community (or aggregate) level data, multi-level analysis would make the household dependent variable a function of both household level and community- or areal-level variables. The household-level variables are important because they refer to decision-making units. The community- and areal-level variables make the analysis more relevant to planning since they are more likely to include policy instruments.[5]

[5] Lin Lean Lim, "Integration of population and development in less developed countries in the ESCAP Region", in *Population and Development: Frameworks for Research and Planning: Report of the Workshop on An Analytical Framework for Population and Development Research Planning*, 16-20 February 1987, Bangkok, Thailand, pp. 129 and 130.

There is a need for more critical examination of the institutional and cultural environments which impinge on fertility decisions. Research should focus on the ways in which particular sets of institutional arrangements and cultural patterns in a society influence fertility decisions. Use should also be made of quantitative anthropological studies of village systems. At the village level the costs and benefits of children are much clearer than at aggregate levels.

Annex B

POPULATION-DEVELOPMENT MODELS

Though a number of macro-economic-demographic models have been constructed in the ESCAP region, they have not been widely used in planning. Nevertheless, mathematical models of population development interrelationships can be useful in making planners cognizant of population-economic linkages. They can be used to provide a framework for studying the interrelations between population and development variables, to provide a framework in which population and economic projections are mutually consistant and to evaluate the consequences of alternative demographic and socio-economic development policies.

The results generated by such models, however, may not accurately reflect the actual situation in the country since they depend largely on the assumptions made by the model builder. Furthermore, it has been argued that the large-scale economic-demographic models which are now available are based on inadequate theoretical knowledge, are too large, too time consuming and costly to build, too demanding of data and too complicated to be utilized effectively. In a review of these models, Richard Bilsborrow argued that they are generally too complex to be "planning models" and require too many scarce human resources over too long a period of time to be practical for most developing countries.[1]

Since it is necessary to assess the way in which various socio-economic factors and governmental interventions affect demographic variables, some research efforts should be devoted to developing partial models of the determinants of demographic change, particularly in relation to particular policy instruments and programmes.

Gavin Jones has suggested five areas of analysis of interrelationships between population and development where partial economic-demographic models can play a useful role.[2] They include the following: (a) the integration of demographic analysis with educational and manpower planning; (b) the analysis of the implications of demographic trends for income distribution; (c) the estimation of cost-benefit ratios for programmes to lower fertility; (d) the evaluation of the implications of regional growth strategies for population redistribution; (e) the evaluation of the role of demographic factors in particular development problems such as balance of payments constraints.

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[1] Richard E. Bilsborrow, "Integration of population in development planning: some methodological issues and suggestions" in *International Population Conference,* Florence, 1985, Vol. 3, Liege, IUSSP, p. 362.

[2] Gavin Jones, *Social Science Research on Population and Development in South-East and East Asia: A Review and Search for Directions,* International Review Group of Social Science Research on Population and Development, Mexico City, December 1978, pp. 74 and 75.

Compared to economy-wide economic-demographic models, sectoral models have simpler theoretical frameworks and require less previous research; the interrelations are easier to formalize; the impact of demographic factors on sectoral development variables are easier to demonstrate; and the results and their limitations are easier to understand. Furthermore, the requirements for data processing equipment are simpler and allow planners to work interactively with the models on micro-computers.

It would be useful to bring together the results of research on partial demographic social and economic linkages into a consistent framework of an economic-demographic simulation planning model. Ultimately the research programme should include efforts to develop a macro-economic-demographic planning model which will treat both socio-economic and demographic variables as endogenous. It has been suggested that such models would be most useful if they were to address resource allocation issues directly and include disaggregated public sector functions. Thus, these large-scale economic-demographic models may someday be useful planning tools for analysing integrated strategies in a long-term prospective.