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ABSTRACT

One of the main products of the Regional Workshop for the Development of Packages of Adequate Learning Requirements in Population is this prototype package of curricular materials on population education. The package emphasizes that population content should be treated as an integral part of the school curriculum rather than spread thinly among many school subjects. This package contains: (1) a report on the pre-testing of the sample materials; (2) guidelines for the development of a good package and for the use of learning materials; (3) a proposed secondary school population education curriculum based on the population program's information, education, and communication (IEC) core messages; (4) teacher's guides, with test items to assess knowledge gain, attitude change and behavioral intent, and (5) learning materials for students (i.e., textual materials with appropriate illustrations). (RSL)

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CONTENTS

INTRODUCTION

About the package

This prototype package of curricular materials in population education is one of the main outputs of the Regional Workshop for the Development of Packages of Adequate Learning Requirements in Population, which was organized by the Unesco Regional Office for Education in Asia and the Pacific, in collaboration with the Ministry of Education, Thailand. Held in Chiangmai, Thailand, from 17 to 30 July 1984, the Workshop was organized in accordance with one of the recommendations of the 1982 Regional Consultative Seminar in Population Education, which noted *inter alia* that one of the shortcomings of country programmes in population education is that the population content integrated in school subjects is quite inadequate in bringing about desired attitude changes regarding population issues and problems. This is largely because population concepts tend to be spread too thinly in too many school subjects. In so doing, the message tends to be diluted and rendered less effective. The participants of the 1984 Regional Workshop developed prototype packages of learning materials in population education for the formal education system in an attempt to remedy the situation.

The participants strongly felt that when population content is treated as an integral part of the school curricula and textbooks, the teachers would teach topics with all the needed seriousness. The teachers will have no fear that they might be teaching some far fetched content or sensitive issues included under population education. In addition, the teacher will cover these topics in the class as part of the textbook, because they would also be part of the examinations both internal and external, periodic and annual; and local and national.

It was pointed out that while in some countries of the region, many teachers have been trained, and teachers' guides and learning materials, (including audio-visual aids) have been developed in population education, the actual teaching and learning of population education left much to be desired. It was revealed that in countries where population education contents are integrated in the textbooks, those contents were taught and learned.

In citing social studies and science as broad areas for incorporation of population content, it is not the intention to prevent Members States from integrating population education messages in other subjects, such as home economics or health education. However, concentrated core messages will acquire greater feasibility for integration, if only two to three school subjects are utilized. It should also be noted that the materials in this package are intended for secondary school students. Again, the inclusion of population education content at the first and tertiary levels of education is not precluded. The decision to focus on this level is based on the recognition that the majority of country programmes in population education in the region are targeted at this level.

This prototype package consists of (i) a report of the pre-testing of the sample materials; (ii) a set of guidelines for its development and use; (iii) a proposed secondary school population education curriculum based on the population programme's Information, Education and Communication (IEC) core messages; (iv) teachers' guides, with test items to assess knowledge gain, attitude change and

behavioural intent; and (v) learning materials for students (i.e. textual materials with appropriate illustrations).

Pre-testing of the sample materials

Two sets of the sample learning materials were translated into Thai, and pre-tested at the Yupparaj Wittalayai Secondary School in Chiangmai, Thailand. The purposes of the pre-test were (i) to determine potential effectiveness in terms of comprehensibility, interest, appeal and acceptability; and (ii) to identify specific parts/sections that have to be revised and/or elaborated on. It is expected that the same process of adaptation and experimental-trial use will be done in the countries for all the sample materials prior to wider dissemination and use.

Guidelines for the development of a good package

1. Define the goals of population education with reference to the country's population policy and educational policy.
2. Identify the core messages of the IEC component of the national population programme.
3. Develop the population curricular content based on the core messages.
4. Develop a scope and sequence of population education.
5. Develop learning materials focused on major population content.
6. Try out the learning materials, evaluate and revise.
7. Integrate in the relevant subjects at different grade levels.

Guidelines for the use of learning materials

The success of population education learning materials depends on how effectively the concerned curriculum offices and agencies of the Member States integrate the core messages into the curricula of science, social studies and related subjects and incorporate chapters in the appropriate subject areas and grade/year levels.

A basic problem is that a lot of population content is spread too thinly even within a textbook of a given subject. Hence, its visibility is low and the impact of the messages is quite meagre and inadequate. The discussion and presentation of population content should zero in on a basic or key population education mes- and should preferably constitute a chapter or two of the textbooks of ar school subjects, rather than dispersing isolated population concepts all o textbook.

In many countries, the Population Education Programme exists parate independent offices which are not attached to the curriculum centres of th. Ministry of Education. This makes it difficult for population education to get into the curriculum and be made an integral part of student textbooks. The problem is compounded in some countries where the preparation of student textbooks is not

undertaken by the curriculum offices of the ministry but by outside writers, and private publishers who are provided writing guidelines by the curriculum offices, that include minimum learning requirements of the subject areas for which they are writing textbooks.

The following general guidelines or strategies are proposed to maximize the use of the materials and facilitate the acceptance of the approach in developing school curriculum and textbooks.

1. Adapt the materials to national needs and conditions. The content, information and activities may have to be revised to conform to local needs and situations. The countries should also prepare more materials on the content of the core messages for different grade levels.

2. Pre-test the revised learning materials with a sample target audience. This will provide more information on the suitability of the materials. Make the necessary revisions on the basis of pre-test results.

3. If there is ongoing curriculum revision and textbook writing at the secondary level, efforts should be made to have the core messages integrated into the curriculum and the content in the textbooks; particularly science and social studies.

4. If there is no ongoing textbook writing project, each Population Education Programme can undertake the production and distribution of the textual materials to supplement the textbooks in appropriate subjects.

Proposed population education curricula (Secondary school level)

The proposed contents listed in the following pages are based on some core messages of population education. Instead of merely listing or outlining the topics, statements or generalizations about population concepts are given, with the aim in view of focusing on each of the core messages.

It is not always necessary to treat every aspect of a topic under the heading of population education. Take the case of the generalization, "Unplanned population growth tends to hamper socio-economic development". To fully cover this topical area, one has to discuss the following:

1. What is development?
2. What is economic development?
3. What is social development?
4. What is unplanned population growth?

However, in an economics course the first three topics are generally already covered in other chapters, and hence need not be covered in a chapter on "Population Change and Socio-Economic Development".

Similarly, with the topic, "Population Change and Environment" under the core message, "Population Change and Resource Development", the following major content areas can be covered:

Learning experiences in the formal education system

1. What is environment?
   a) What is social environment?
   b) What is natural environment?
2. Ecosystems and the biosphere.
3. Natural resources – renewable and non-renewable.
4. Balance in the ecosystem.
5. Impact of man on the environment.
6. Effects of environmental pollution on:
   a) man,
   b) the ecosystem.
7. Conservation of environment and resources.

The topics 1 to 4 are generally covered in the biology/integrated science curriculum, but topics 5 to 7 are not fully discussed. Therefore, the population education materials should be focused on these population related concepts.

The following proposed population content may have to be modified in the light of the policies, needs and priorities in the countries.

Core Messages	*Social Studies*	*Science*
1. Family size* and family welfare	**Civics** – Family size affects the provision of basic needs of the family such as food and nutrition, health care, shelter, clothing, education, etc. – Population size affects the provision of basic needs of the community and country.	
2. Delayed marriage	**Civics** – Emerging marriage laws tend to increase age at marriage. – In many countries, there are still customs and traditions which tend to contribute to the perpetuation of early marriage despite the existence of laws to the contrary. Increased level of education, especially of women tends to delay marriage. – Delayed marriage has many advantages for the individual, the community and the nation.	

* Family size in the demographic sense refers to the number of children. In general, small family size refers to having one to three children. The operational definition of small family size will, however, vary in different countries.

Core Messages	*Social Studies*	*Science*
3. Responsible parenthood.	**Civics or sociology-oriented social studies course** – A responsible parent is knowledgeable about his/her roles and responsibilities, including planning and improving quality of life for family members.	**Integrated science/biology** – Boys and girls undergo different physical, physiological and emotional changes during puberty. – The understanding of the process of human reproduction is necessary for planning the size of the family. – Fertilization can be averted by different means to prevent conception. – The understanding of eugenics can help in improving the inherited qualities of children.
4. Population change and resource development.	**History** – World population growth started very slowly but in the course of time, doubling time for the world's population has become consistently shorter. – Population/demographic theories explain how population change in the past followed certain patterns. **Geography** – A country's population size, structure, distribution and dynamics (growth, migration/urbanization) affect the country's development. **Economics** – Rapid population growth tends to hamper socio-economic development. – Well-planned population change tends to enhance socio-economic development. – Socio-economic development. tends to reduce fertility rate.	**Integrated science/biology** – Man has adversely affected his environment by his rapid growth and wasteful consumption. – Rapid population growth contributes to environmental pollution which in turn creates many problems, among which is the disruption of the ecological balance. – Environment can be saved from further degradation by reducing the growth of human population and judicious use of resources.
5. Population-related beliefs and values.	**Civics or sociology-oriented social studies course** – In many countries pronatalist beliefs and values which have contributed to the perpetuation of population problems may be obviated through population education. – Socio-cultural restrictions that discourage women to work outside the homes slow down development and raise fertility rate. – Education enhances opportunities for women to work outside the home. This has an important influence on population growth – since working women usually have fewer children.	

Learning experiences in the formal education system

Priority in this package has been given to the development of textual materials for students. They are developed in such a way that each set could logically fit in as a chapter of a textbook in either social studies (e.g. civics, history, economics, geography) or science (e.g. integrated science and biology). However, in countries where the existing curricula and textbooks are not yet due for revision, it is suggested that the textual materials developed be used as prototype supplements to the textbooks.

Textual materials were developed on the following population concepts:

a) Population Change, Food and Nutrition

b) Marriage: The Founding of a Family

c) The Impact of Population Growth on Environmental Pollution

d) World Population Growth

e) Population Change and Socio-Economic Development

f) Socio-Cultural Values and Family Size.

The population education concepts chosen for the development of sample textual lessons are those considered of general applicability in the region; and those that could easily be logically fitted in the existing syllabuses of social studies and science courses at the secondary level.

SAMPLE LEARNING MATERIALS

POPULATION CHANGE, FOOD AND NUTRITION

TEACHERS' GUIDE

Placement: Subject Area: Science, home economics and/or health Grades/Age: VII or VIII, age group 12 or 13.

Message: Family size and population growth affect food supply and nutrition of the family and nation as a whole.

Overview: This textual material should be considered as a chapter in science, home economics and/or health in the first and second year. Alternatively, it could be a required supplementary material in those subjects. The purpose is to focus on the population education message regarding family size and family welfare.

Objectives: After reading the chapter, the student should be able to:

1. Identify the right kinds of food the body need to maintain health;
2. Discuss how family size affects the adequacy and quality of food for the family and the consequent effects of these adequacy and quality on the family members;
3. Plan a balanced diet for the family;
4. Analyze the causes of food shortage in the world;
5. Discuss the effects of population growth on per capita food supply; and
6. Engage in activities that will help solve problems related to food and nutrition.

Teaching hints

1. Students report on specific topics previously assigned. Class discussion follows.
2. Lecture-discussion with visual aids. Tables and figures have to be enlarged and used as springboard for discussion. There should be maximum student participation. The teacher is merely a facilitator. (Do not talk too much. Ask questions rather than give the answers.)
3. Group work on actual planning and preparing a balanced meal for a small and a large family.
4. Group work on actual projects on food production.
5. Field trip to market, government and private food production projects and other similar places.
6. Resource person may be invited, if felt necessary.

Test items

I. *Cognitive*

Direction:	Draw a circle around the letter beside the correct answer. The first question is done for you.

1. For an individual to be healthy, he must eat the:
   a) most expensive food
   b) right kind of food
   c) right kind and amount of food
   d) right amount of food

2. Carbohydrates, proteins, minerals and vitamins are examples of:
   a) food
   b) nutrients
   c) calories
   d) ingredients

3. People who do not get the right kind of food that the body needs are:
   a) undernourished
   b) malnourished
   c) well-nourished
   d) none of the above

4. How does family size affect the adequacy and quality of food for each member?
   a) Member of small families have a better chance of receiving adequate and right kinds of food
   b) The number of members is one of the factors to consider in planning a balanced diet for the family
   c) A large family has many problems related to food, nutrition and health
   d) All of the above

5. When planning a balanced diet for the family which factor is the least important?
   a) Number of family members
   b) Kind of food
   c) Composition of the family
   d) Food likes and dislikes of family members

6. Lack of food supply in the world is due to:
   a) economic imbalances among and between nations
   b) biological constraints
   c) rapid population growth
   d) all of the above

7. Which of the following statements is *false?*

   a) Rapid population growth puts pressure on agricultural land and food supplies

   b) Rapid population growth causes food shortages

   c) Rapid population growth stimulates food production and tapping of new sources of food

   d) Rapid population growth has no effect on food production and supply.

8. Which of the following does not show the relationship between population growth and per capita food supply?

   a) When population growth lags behind food production, per capita food supply decreases

   b) When population growth is rapid, it should be slowed down

   c) When population growth is faster than food production, per capita food supply increases

   d) When population growth is just equal to food production per capita food supply neither increases nor decreases

9. What do you think will help solve food shortage?

   a) Improve economic conditions

   b) Reduce population growth

   c) Opt for small family size

   d) All of the above

Answers

1. (c)
2. (b)
3. (b)
4. (d)
5. (c)
6. (d)
7. (d)
8. (b)
9. (d)

II. *Affective*

Direction: Read the following statements carefully and put a tick (√) to express your position regarding each of the following:

	Strongly Agree	*Agree*	*Do Not Know*	*Disagree*	*Strongly Disagree*
1. Everyone in the family should have the right amount and kind of food to ensure good health.					
2. Food and nutrition problems are not directly related to family size.					
3. Food supply is depleted by rapid population growth.					
4. The problem of adequate food supply cannot be solved by reducing population growth.					
5. Developing countries should reduce their population growth.					
6. Developed countries should reduce their food consumption to help solve food problems of the world.					

Population change, food and nutrition

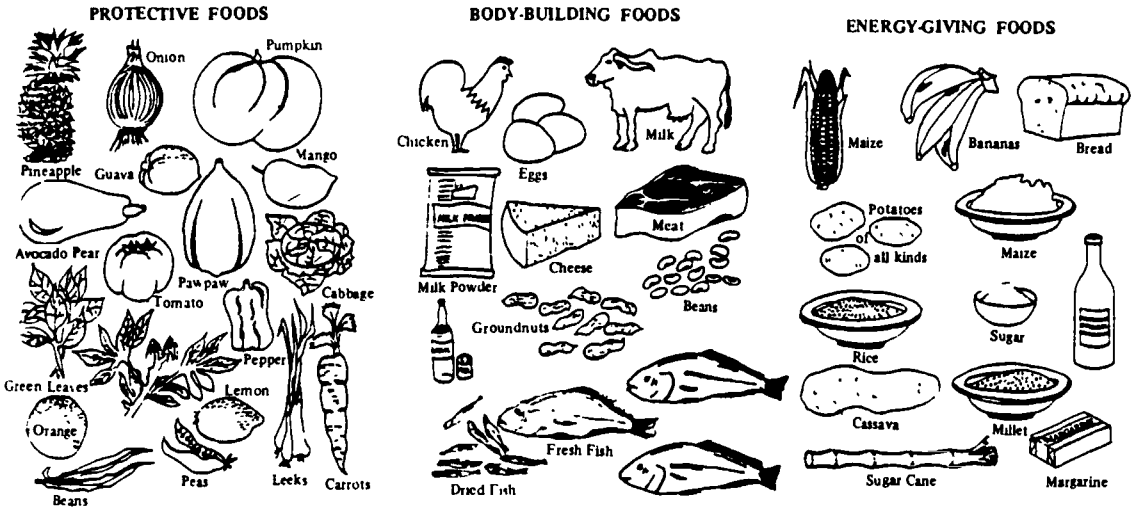
Food is needed in order to live. Just to live, however, is not enough. Individuals must eat the right amount and kind of food to maintain a healthy body. Healthy members of the family make up a healthy community and healthy communities make up a healthy nation. It is said that health is wealth. This is because a healthy family can earn more and spend less for medical expenses and a healthy population can effectively contribute to the development and progress of the nation.

In this chapter, discussion will focus on the effects of family size and population growth on food and nutrition.

Effects of family size on adequacy and quality of food. Individuals require different amounts of a variety of food to maintain health. Every person needs food for body building, energy, and regulation of body functions. One should have a balanced meal every day to meet these needs (Figure 1).

Figure 1. Balanced Meals for Health

TWO EXAMPLES OF FOOD GROUPS CHARTS
FOR PLANNING FAMILY MEALS



PROTECTIVE FOODS (Vitamin-rich fruits and vegetables)				*BODY-BUILDING FOODS (Protein-rich)*		*ENERGY-GIVING FOODS (Fat, carbohydrate-rich foods)*		
Orange	Grapefruit	Spinach	Green leaves	Milk	Legumes	Pototoes	Cereals:	Oils
Lime	Avocado	Cabbage	Tomatoes	Eggs	Peas	Yams	– Rice	Fats
Lemon	Papaya	Carrots	Pumpkin	Cheese	Beans	Sweet potato	– Wheat	
Guava	Pineapple	Kale	Cowpea, and	Meat	Ground nuts	Cassava	– Maize, corn	
Mango	Breadfruit	Pumpkin	Bean leaves	Fish	Grams, pulses	Breads	– Millet	

Source: Integrated Planning for Improved Living : a Teaching Manual for Home Management Technicians by Bureau of Agricultural Extension, Department of Agriculture. Manila, 1975.

From the figure, it can be seen that for body building we need to eat any of the following food: meat, chicken, fish and other sea food, peanuts, beans, cheese and drink milk. For energy, one should have any of the following: vegetable oil, coconut, bananas, butter, sweet potatoes, bread, flour, rice, noodles, breadfruit and taro. For body regulation, one should eat fruits like papaya, pineapple, oranges, water melons, mangoes, grapefruit and vegetables like cabbage, lettuce, carrots, cucumber, tomatoes, green beans and taro leaves.

Do you find these foods in your community? What other foods are available in your community under each of the food groups?

Body building foods contain protein which is used to build up the body (bones, teeth, hair,) and replace worn out tissues. Energy food contain carbohydrates and fats which provide energy to the body to maintain its functions. Body regulating foods contain vitamins and minerals to regulate the body functions. These are nutrients needed by the body to be healthy.

Food needs of a family. The following chart shows the recommended balanced diet to meet the dietary requirements of the body. This may serve as a guide in planning a balanced diet for one's family.

The chart gives the recommended amount of foundation foods under each group for a balanced diet. It is to be noted that regarding milk intake, more is recommended for children, teenagers, expectant and lactating mothers than for the average adult.

Young children require the same nutrients as adults but in different amounts and combination. Adolescents, growing at a rapid rate, using lots of energy and undergoing many physical and emotional changes require more nutritious food than older people although the latter continue to need a nutritionally adequate diet. Sometimes older people need special diets because they may be suffering from an illness, poor teeth or other physical disorders. Their occupation or work also determines their dietary needs.

RECOMMENDED BALANCED DIET

	Foundation foods
Milk and dairy group:	3 or more glasses milk–children (1 glass equals 8 oz., or 1 pt.) 4 or more glasses milk–teen-agers 2 or more glasses milk–adults 3 or more glasses milk–expectant' mothers 4 or more glasses milk–lactating mothers Cheese, ice cream, and other foods made with milk can supply part of the milk requirement
Meat, fish and poultry group:	2 or more servings (a serving is 3 oz.) cooked lean meat, fish, poultry, glandular meats; 2 eggs; 2¼ oz. cheddar-type cheese Dry beans, peas, nuts as alternates.
Vegetable and fruit group:	4 or more servings (a serving cooked is ½ cup; or 1 whole potato, ear of corn, orange, or banana, etc.). A dark green or deep yellow vegetable at least every other day A citrus fruit, tomato, raw cabbage or other vitamin-C rich foods A potato or equivalent Other vegetables and fruits
Bread and cereal group:	4 or more servings a day according to need (a serving is 1 slice bread, or 2/3 cup cooked cereal, or 1 oz. or 1 cup of ready-to-eat cereal) Whole-grain or enriched or restored
	Additional foods
Fats:	Some in the form of vegetable oil high in linoleic acid to season food
Sweets.	To make the diet more palatable and satisfying in proportion to individual need.
Vitamin D:	In the form of fortified milk or vitamin concentrate, under direction of physician during growth, pregnancy, and lactation–400 I.U. daily

Source: Handbook of Home Economics, Lesson Incorporating Family Planning, Population Education and Quality of Life, Washington, D.C. 1974. p. 176.

The composition of the family as to age, sex, occupation or activities of each member and number of members will determine the amount and kinds of food needed by the family. They are factors to consider when planning a balanced diet for the family.

Look at Figure 2. What does it show? All other things being equal (socio-economic status, educational background, and income) which of the two families will have a better chance of providing an adequate balanced diet for its members? In what way or ways does family size affect the adequacy and quality of food for its members?

Figure 2. Family size affects the adequacy and quality of food for each member.

A study undertaken in the Philippines in 1975 which was cited in *Population Change, Food, Nutrition and Health,* Unesco, 1982, showed that adequacy of food intake suffers with large family size. As may be expected, the study found that larger families buy more and spend more for their food, than smaller families. However it also disclosed that the quality of food purchased by larger families tends to be inferior in terms of nutritional value.

The adequacy of food intake by family size is reproduced as follows:

Family Size	*Adequacy of Intake*	*Shortage*	*Total*
1-3 children	74.5%	25.5%	100%
4-6 children	68.1%	30.9%	100%
7-9 children	64.7%	35.3%	100%

The data show that adequacy of food intake decreases as family size increases. The study also mentioned that this finding may be applicable to families belonging to the relatively poor socio-economic level. With the rising cost of food and other commodities, however, this may also be applicable to the middle level income group or even the upper middle level group to a certain extent.

It appears that the capacity of the family to buy the needed food is an important factor in determining the nutritional status of the family. However, there are other factors like: (a) availability of the needed food in the locality; (b) capacity of the family to produce food supplements through home gardens, for example; and (c) nutritional knowledge and utilization of this knowledge in meal planning and food production.

The food energy requirements are expressed in calories. A formula is suggested for determining calorie requirements on the basis that 75 per cent of energy consumption is directly related to body weight and the remaining 25 per cent is independent of body weight:

$$\text{Man} : E = 815 + 36.3\,W$$

$$\text{Women} : E = 580 + 31.1\,W$$

where 'E' is the energy requirement in calorie and 'W' is the weight in kilograms. (Unesco, Teacher's study guide on biology of human population: Asia, Paris, 1975, P. 245 in Population Change, Food, Nutrition and Health, Unesco, 1982.)

While calorie intake is a good quantitative indicator of food consumed, the protein intake is the key indicator of quality, as it affects physical development and probably the mental development of the individual.

Considering that protein food sources are expensive, it is not surprising that shortage of protein in the diet is common especially among the low income families. This shortage would be further aggravated if the family is big.

The problem of under-nourishment and malnutrition is inevitable in the face of the family's inability to provide adequate balanced or nutritious food for its members. Under-nourishment is poor nourishment of the body as a result of inadequate quantity of food while malnutrition is poor nourishment of the body resulting from inappropriate (usually deficient) supply of essential nutrients. While under-nourished individuals get too few calories to maintain normal weight and

normal activity, malnourished persons on the other hand, may get enough calories, but not the right quantities of nutrients such as body building and regulative food. Under-nourished persons are malnourished also, but the reverse is not necessarily so. The ones most critically affected by malnutrition are expectant mothers, lactating mothers and young children.

Obviously, the health and welfare of the family is seriously affected when food is inadequate and of poor quality.

Things to do:

1. Make a survey of the food available in the market. Ask the cost of each item.
2. Make a list of inexpensive but nutritions food.
3. Plan a one-day and/or one-week balanced diet for your family. Compute the total cost of the meals. Compare your plan with the plan of a classmate who belongs to a bigger family than yours and to another one who belongs to a smaller family than yours. What can you say about family size and the plan for a balanced diet for the family? All other things being equal, which family would require more food and hence spend more?

Effects of population growth on food and nutrition. At present, lack of food in the world is due to economic imbalances among nations and within nations and to a certain extent to the biological limits of food production. There is unequal distribution of food among countries. Some countries like the United States, produce far more food than they can consume. They also consume far more food than other countries do because the people can afford to buy it. Some countries like Bangladesh or Tanzania, have to spend 80 per cent of their export earnings on food. Should world food prices rise sharply, such countries could face disaster. In some countries, food production has lagged behind population growth.

Within countries, rates of food output vary. Not all areas have fertile soil, flood control, drainage and irrigation systems. Similarly, the rate of consumption of food varies widely within countries according to the purchasing power of its citizens.

In developing countries, rapid population growth puts pressure on agricultural land and food supply causing food costs to shoot up. It also weighs down on governmental efforts at industrialization and modernization of agriculture because governments first have to provide for the population's basic necessities so that it becomes almost impossible for them to accumulate enough money for investments. Rapid population growth greatly increases the number of the poor. Because of poverty, millions of people lack an adequate diet.

Shortage of food is also due to biological constraints brought about by rapid population growth. The growing population puts pressure on arable land for other purposes to meet its increasing needs. Residential, industrial, commercial and recreational uses, transportation, mining and preservation of natural habitats all compete with agriculture, pasture and forestry uses. Urbanization alone occupies

millions of acres of land yearly which could otherwise be used for agricultural purposes. This forces farmers to use marginal lands which require expensive inputs like fertilizers and irrigation to make them productive.

As forests are cut down to give way to more land for agriculture and to get lumber and other forest products, watersheds are destroyed causing floods during rainy seasons resulting in soil erosion. Worldwide loss of productive soil leads to reduction in crop yields and need for more expensive inputs to make the soil productive again.

Irrigation of farmlands to increase food production has given rise to other biological problems such as increase in salinity and alkalinity of the soil. It has also led to an increase of water-borne diseases such as schistosomiasis in developing countries. The amount of arable land has been reduced. Some studies suggest that land degradation due to overuse of pesticides could result in the loss of one third of currently arable land by the year 2000.

Rapid population growth has increased food consumption and at the same time caused impediments to accelerated food production, particularly in developing countries.

Let us see the food output by major world regions during the period 1960-1980 as shown in the following chart reproduced from *Food and Population: A Global Concern*, Population Reference Bureau, Inc., 1984. p. 4.

Growth Rates of Food Output by Major World Regions, 1960-1980

	Food Output			
	Total		*Per Capita*	
Region and Country Group	*1960-1970*	*1970-1980*	*1960-1970*	*1970-1980*
Developing countries[a]	2.9	2.8	0.4	0.4
Africa	2.6	1.6	0.1	1.1
Middle East	2.6	2.9	0.1	0.2
Latin America	3.6	3.3	0.1	0.6
Southeast Asia	2.8	3.8	0.3	1.4
South Asia	2.6	2.2	0.1	0.0
Southern Europe	3.2	3.5	1.8	1.9
Industrial free market countries	2.3	2.0	1.3	1.1
Nonmarket industrial countries[b]	3.2	1.7	2.2	0.9
Total world	2.7	2.3	0.8	0.5

[a] Excluding China.

[b] U.S.S.R., Poland, Bulgaria, Hungary, Czechoslovakia, East Germany.

Source: The World Bank, World Development Report 1982 (New York; Oxford University Press, 1982), Table 5.1, p. 41. Reprinted with permission.

Per capita food output is calculated by dividing food production by population size. In the decades described in the table, increases in food production were offset by increases in population resulting in a much smaller gain or loss in per capita food production. This illustrates the effect of rapid population growth on per capita food supply.

With inadequate per capita food supply, under-nourishment and malnutrition are prevalent especially in developing countries. The World Development Report for 1980 issued by the World Bank states that "the estimates of food consumption by different income groups normally shows that in all but the rich developing countries, consumption by large sections of the population is well below what is needed for a minimally satisfactory diet".

Malnutrition adversely affects the physical and mental development of people, their productivity and span of working year, thus undermining the quality of life of the people and the development and progress of the nation.

Cognizant of the dangers posed by malnutrition to the well-being of people and nations, governments are exerting efforts to combat the problem. The world's hungry people must be fed adequately to solve the problem of malnutrition. What is being done at the global level? At the national level? At the community and family level?

Solutions to food shortage. The World Food Conference in 1974 recommended the establishment of an international wheat reserve system. The Food and Agricultural Organization (FAO) and other food groups advocate an international food security reserve of 9 to 18 million tons to help stabilize prices during food shortages. While food aid is important, most experts say that the only lasting answer is an increase in food production in the developing countries.

The United Nations, the World Bank, the United States Agency for International Development and other international donors and lending institutions are now supporting projects which increase a country's level of food production technology.

Governments have their own food production programmes. The Philippines for example, has launched the "Masagana 99" (Progress) Programme to increase rice production; a project to increase corn production; and the "green revolution" to encourage planting of fruit trees and vegetables. The backyard gardening project is on the community and family levels where families use their backyards to plant vegetables and fruit trees, raise ducks, chicken, goats, hogs, cattle, or raise fish in ponds.

In Viet Nam, the government promotes family economy with focus on "VAC" Plan: raising poultry, fish in ponds, and growing fruit trees.

These activities are also done in Afghanistan, India, Pakistan, and Nepal.

In addition to increased food production, new sources of food may also be tapped whether from the sea or from items not previously viewed or used as food. The potential of sea food is still in the exploratory phase. Other sea products aside from fish can be utilized as food like algae, echinoderms and other invertebrates.

Relatively low cost protein sources can be utilized to solve acute shortage of protein like developing plant foods rich in protein, i.e. soya bean and protein meal from oil seeds, cotton-seed, and peanuts after the oil has been extracted.

Incaparina, a new vegetable-protein mixture has a nutritive value similar to milk both in amount and quality and is relatively cheaper than milk. One pound of *Incaparina* is equivalent to eighteen glasses of milk. Fish and fish protein concentrate are other inexpensive protein sources.

While efforts at food production should be intensified, efforts at slowing down population growth should also be pursued vigorously. More families should be encouraged to opt for small family size to give time for agricultural reform, relieve pressure on land, and reduce the poverty of individuals and nations.

Things to do :

1. Make a list of the food production activities being undertaken in your neighbourhood.
2. Enumerate some new sources and/or unconventional sources of food in your community.
3. List all the ways by which food and nutrition problems in your community can be solved.
4. What activity or activities can you engage in to help solve problems related to food and nutrition in your family and/or community?

MARRIAGE: THE FOUNDING OF A FAMILY

TEACHERS' GUIDE

Placement: Subject area: Social studies/civics
Grade/Age: Grade IX, age group 14 or 15.

Message: Late marriage is in the interest of the health and welfare not only of the would-be mother and her children but also in the interest of the family, community and society.

Overview: Late marriage presumes fuller growth of a woman in terms of her physique. She is more mature physiologically, mentally and emotionally to understand and respond more effectively to the needs of a baby before and after delivery. An educated woman is economically self-reliant and better equipped to enrich family life socially and culturally. She can contribute more to the society through her active participation in social, cultural, economic and political activities Simultaneously, late marriage helps to reduce the effective marital fertility span, better space the births and contribute to the reduction of fertility rates of society.

Objectives: The textual lesson/chapter/unit will be able to:

1. Realize the importance of family as the basic unit of the society;
2. Recognize the universal concern for strengthening and protecting this social institution;
3. Realize the disadvantages of early marriage with a possible risk to the life of the mother, the baby or even to both of them;
4. Explain the concept of fertility span of a woman and possible reduction of marital fertility span through delayed marriage;
5. Conceptualize the message of case studies of countries like Sri Lanka where fertility has been reduced through late marriage;
6. Explain how education can help in delaying marriage and consequent reduction in total fertility rates;
7. Show evidence that late marriage may help to reduce maternal and infant mortality rates;
8. Explain how educated mothers can contribute to the quality of life of the family as a whole;
9. Describe how, in addition to bearing children, many women today can do work previously reserved for men;
10. Recognize the need on the part of males to change their attitudes towards women, their aspirations and changed role;
11. Realize that males by delaying marriage can better qualify themselves to choose better partners in life; and
12. Recognize that by delaying their marriage both the males and females can help their family and share the burdens of their parents.

Learning experiences in the formal education system

Children should be helped/to:

1. Form opinions, views, values and attitudes favourable to late marriage;
2. Appreciate the changed roles and aspirations of women as individual members of the society;
3. Believe in equality of sexes and equal freedom in choosing their life partners, and
4. Develop habits of sharing domestic responsibilities with women in everyday life.

Teaching hints: The teacher may select some teaching techniques from the following:

1. Begin by discussing with children, marriages taking place in their locality, the way life partners are selected, the age at which boys and girls marry and the relation between marriage and family.
2. Draw students' attention to the importance attached all over the world to the universal declaration of human rights in this regard.
3. Encourage children to think about their expectations in regard to their life partner. This may provide ground to bring in the idea of adequate preparation for marriage and hence the need to delay marriage. This can be done better through (a) mixed; and subsequently, (b) separate groups of boys and girls to ensure their fuller participation and involvement in the subject.
4. One group may then be required to discuss advantages of late marriage and another group disadvantages of early marriage. The third group may suggest ways and means to ensure late marriage and needed changes in the values and attitudes of both males and females.
5. Use newspaper items, cartoons, slides, posters, charts and diagrams to make discussion more tangible and keep within the scope of the lesson.

Test items

I. *Cognitive*

Direction: Tick (√) the correct or the most appropriate alternative in each of the following 10 items:

1) If a woman marries at the age of 15, her reproductive period would be about:
   a) 20 years
   b) 25 years
   c) 30 years
   d) 35 years

2) If a woman marries at the age of 28, the effective fertility span would be:

   a) 27 years
   b) 17 years
   c) 22 years
   d) 32 years

3) The surest way to ensure late marriage is through:

   a) legislation
   b) punishment
   c) education
   d) reward

4) The marriage is considered a great occasion in one's life because:

   a) it is celebrated with great pomp and joy
   b) it is the most important landmark
   c) it strengthens the basic unit in society
   d) in its absence the society might not grow

5) "A healthy mother is a cornerstone of a happy family." Which of the following is not associated with this?

   a) delivering babies each year
   b) spacing of children
   c) having fewer children
   d) minimizing infant mortality

6) In certain societies, there is a practice of arranged marriages because they think:

   a) it is not merely a union of two persons but of two families
   b) partners cannot be expected to take objective decisions
   c) marriage or family is a social institution
   d) it ensures adequate dowry from the other side

7) Of the four alternatives provided, which one is less significant? Late marriage is desirable because it ensures:

   a) adequate time to receive education
   b) economic independence
   c) less number of children
   d) freedom to choose one's partner

8) Early marriage has disadvantages such as (i) risk to life during first delivery; (ii) too many deliveries in quick succession; (iii) less time to receive adequate education; and (iv) deprivation of economic independence. Which one of the following is correct?
   a) (i) and (ii)
   b) (ii) and (iii)
   c) (iii) and (iv)
   d) (i), (ii), (iii) and (iv)

9) Infant mortality refers to the:
   a) number of children who die before reaching the first birthday
   b) number of deaths of children in a given community
   c) the number of children who die before reaching the age of five years
   d) the number of still births

10) Which of the following is not common to both females and males:
   a) earning to support a family
   b) headship of a family
   c) bringing up of children
   d) bearing children

Answers

1. (c)
2. (b)
3. (c)
4. (b)
5. (a)
6. (a)
7. (d)
8. (d)
9. (a)
10. (d)

II. *Affective*

Direction: Read the following statements carefully and tick (√) the appropriate column to express your position correctly.

	Strongly Agree	*Agree*	*Do not Know*	*Disagree*	*Strongly Disagree*
1. One must marry not below the age of 25.					
2. Selection of life partner is solely one's personal concern.					
3. Early marriages should be prohibited by law.					
4. Rearing of children is the exclusive responsibility of women.					
5. Working of women outside the home is desirable.					
6. Men and women have equal rights to marriage, during marriage and its dissolution.					

Marriage: The founding of a family

The universal declaration of human rights includes the clause. "The family is the natural and fundamental group unit of society and is entitled to protection by society and the State". [Article 16 – (iii)] From the words 'universal declaration', it is clear that all countries of the world agree with this statement.

Marriage and family. The family is a social institution or a unit whose core consists of a man and woman who commit themselves to live together and share all their joys and sorrows. They want to perpetuate themselves and their happiness through the children they bear and rear. Children become instrumental in strengthening the bonds of love and affection between parents who no longer remain only husbands and wives but also become fathers and mothers. Very often, in moments of depression, parents think that life is worth living for the betterment of their children, if not for themselves alone.

A family is formally founded when a grown up man and woman begin to live together as a husband and wife. The formal declaration of this solemn resolve by

the two to the society is called *marriage*. Since this is an important decision and a landmark in the life of the partners with a great social import, this occasion is celebrated in various ways, very often with pomp and joy in different societies.

In many societies, it has been customary to have marriages arranged by elders namely parents, relatives, neighbours and friends. To them, marriage is also a union of two families. They would arrange marriages of the young boys and girls with great care taking into account various pros and cons. Over a period of time, this practice came to be supplemented by consulting would-be husbands and wives and seeking their consent before finalizing the marriage proposals.

In many Asian societies, there is a growing awareness of the fact that young adults, given a chance, can make right decisions in choosing their life partners. While doing so, they can keep in mind their own temperament and expectations. Whatever the mode of selection of partners, the families have to perform the same functions to the best of the ability of both the partners.

When to marry. In India, according to the scriptures, some two to three thousand years ago, among the Aryans, both men and women used to spend almost 25 years in equipping themselves adequately before they married and founded families. There has been an equally long period where it was thought desirable to enter into marriage at as early an age as possible. Even girls of eight to ten years used to be "married off". Grown up daughters perhaps came to be looked upon as a social and economic liability.

In view of the above, we need to consider the question of age at marriage more systematically and in the context of entirely changed circumstances, in the present day world.

The law makers in India passed a law about 50 years ago, to ensure that parents did not marry off their daughters before they were 14 years of age and boys were 18. Only a few years ago, the situation was reviewed and amended so that girls may now marry only when they are 18 and boys at least 21. What has prompted and compelled Indian legislators to arrive at this decision? Let us consider the rationale.

Responsible parenthood. Marriage in every society is a great personal and social responsibility. One of the natural results of founding a family is the bearing and rearing of children. It is a joint responsibility of both the parents to plan things beforehand and make every provision for the future. Have you noticed how the male and female birds build their nest together before the female lays eggs? Have you observed they hatch them together taking turns? Have you noted how both of them feed their young ones?

Source: Teacher's Guide on Population Education Trade 1 (Revised for Muslim Filipinos). Ministry of Education & Culture. Population Education Programme Manila, 1978.

Healthy mother, a cornerstone of a happy family. A would-be mother should be physically fully grown up and healthy enough to shoulder the arduous responsibilities of pregnancy and rearing a baby. It is generally believed that this can be expected after a girl is 20. Physical fitness alone is not enough. Mentally, she should be mature enough to understand and respond to the needs of the baby, before and after its birth. The physical and mental conditions of a mother have a profound influence on the health and temperament of the child in her womb. Hence the would-be mother should have the emotional balance which comes only with age and maturity.

Dangers of early marriage

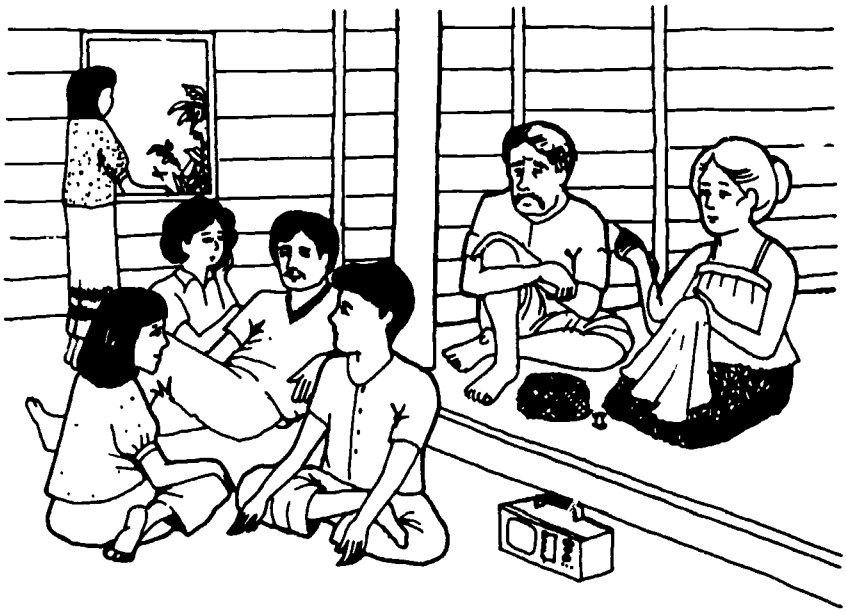
A girl who happens to marry at an early age runs the risk of developing complications during her first delivery. This may affect both the mother and the child, and the consequences could be fatal to either or both of them. Thus, in the interest of the mother and the child to-be, it is essential that the age at marriage is not lowered.

Women who marry early run another risk. The period during which women are capable of bearing children is known as the fertility span. It generally ranges between the age of 15 to 45 years. Within this total fertility span, the earlier years carry greater potential for child bearing as compared to the years towards the end of this period, say after 35. In view of this biological reality, it would be most desirable, personally and socially, to enter into marriage reasonably late.

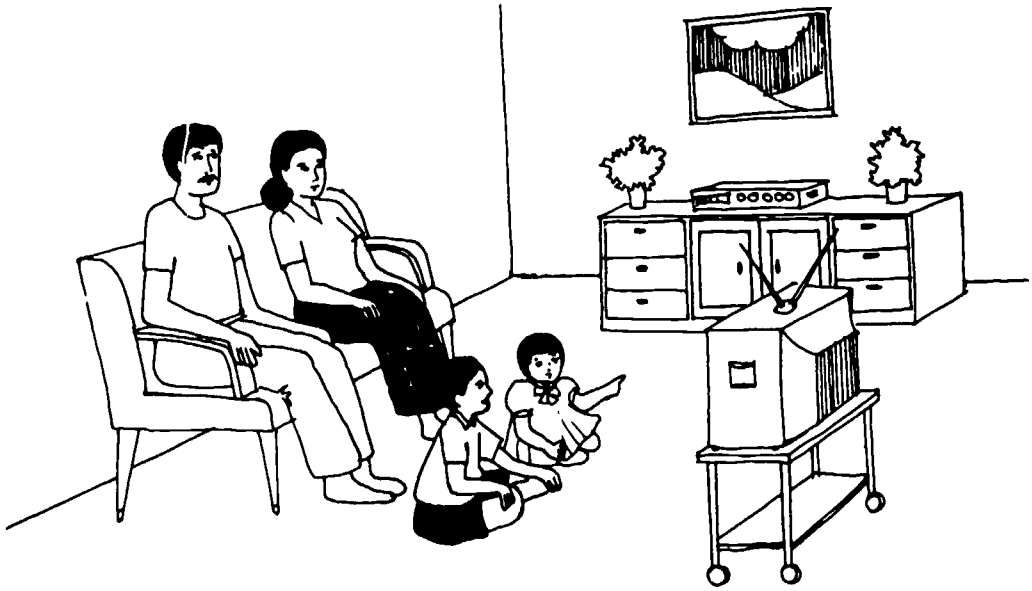
Let us follow in part the life stories of two women, Siriporn and Ladda in our neighbourhood. Both of them were born in 1934. It means that both of them are now 50 years old. Ladda from the village Sankamphang, after completing five years in schools had to marry. This happened when she was hardly 15. On the other hand, Siriporn who was born in Chiangmai and became a university graduate married in 1959. She was then 25. Two years after her marriage, she was blessed with a baby.

By this time, Ladda was a mother with five living children. Her first child had died soon after birth. It was, indeed, a very, very painful and sad experience for her and the entire family.

Today, both Ladda and Siriporn have a completed family. While Ladda, with great difficulty, managed only to stop after five living children; Siriporn took a wise decision to stop after two children. She found no difficulty in obtaining her husband's consent. Look at the pictures of the completed families of these two women.



Ladda and her family. Why do Ladda and her husband look so worried.



Siriporn and her family. What must have helped Siriporn to keep herself in the best of spirits and health? Compare her with Ladda.

Why marry late? Compare these two families. List the similarities as well as the differences between the two. From the above story, do you think that it is in our hands to cut down the effective fertility span? As Siriporn has shown, one practical way to do it is to marry late. What Siriporn practised owing to facilities available in urban areas some years back is also possible today in rural areas. Don't you think that health and well being are of equal concern no matter whether you live in a city or a village?

Let us have a look at the experience gained by an Asian country, Sri Lanka. The majority of Sri Lankans are Buddhists. Knowing the significance of late marriage, Sri Lanka has shown that it is possible to encourage more and more girls and women to delay their marriage. In the Table below, one may see the difference brought about in just 25 years.

Year	*1945*	*1971*
Age group 15-19	23.9%	10.3%
Age group 20-24	68.4%	45.9%

As a result of this rapid change in Sri Lanka the mean age of marriage is 23.5 for females and 28 years for males. Don't you think that Sri Lanka has been moving in the right direction?

Impact of late marriage on the population situation. What is the impact of this on the population growth of Sri Lanka? The overall growth rate of population came down from 2.7 in 1963 to 1.4 by 1974. The reasons for this success are due to two factors: One is the postponement of marriage by actual increase in the age at marriage. The other is the efforts by married couples to have less children through the use of various family planning methods. It is interesting that 60 per cent of the success is attributed entirely to raising the age at marriage. Owing to this the deaths of women during delivery have also been halved from 2.4 to 1.2 per thousand. This phenomenon of mothers' deaths during deliveries is called *maternal mortality*. It is expressed per thousand deliveries per year.

The proportion of females in the total population for the last several decades was unfavourable in Sri Lanka. In 1871 there were only 46.9 per cent females. This was because their life expectancy at birth was very low compared to that of the males. The female population rose to 67 per cent in 1976 and their life expectancy at birth to 65. Thus, it is now women who live longer than males.

Late marriage also helps to a certain extent in reducing infant mortality. This is, of course, not the only factor, but it is interesting to note that the infant mortality rate which was once 141 per thousand live births has drastically come down to only 45 in 1975, and 37 in 1981.

Mothers who plan and space births. Women who produce less children certainly help their countries or societies which cannot afford big populations and high

population growth rates. But more importantly, such women help themselves and their families. They run less risk to their lives, health and well-being as against those who undergo a series of deliveries in quick succession.

Pregnancies, deliveries and nursing of babies one after the other without a reasonable break or a pause expose these women to various health hazards. They run the risk of becoming victims of various ailments and disease like malnutrition, anemia or nervous breakdown. These in turn lead to further complications in many cases. Such sickly women fail to contribute fully towards the happiness of their family.

So far only one aspect has been considered, namely the health of the mother and its impact on nursing children. This is because "health is wealth". The health of the pregnant and nursing mother lays the foundations for the health of the new generation.

Women are also individuals and equal partners. There is another problem. A girl who gets married at an early age loses almost all her options but to be a housewife. Her life is confined only to being a wife and a mother. These roles are certainly very important, but in addition, women can do much more. They can pursue habits of their choice and cultivate skills that give them occasions to express themselves provided they receive adequate education. Such educated and knowledgeable women develop confidence in themselves. They are able to share their domestic and family responsibilities in a more effective manner. They can discharge their role as wives and mothers more creditably. Their knowledge about personal and social hygiene, sanitation, nutrition and common diseases help them to take care of themselves and their infants and toddlers. To this extent, they can lay the basic foundations of happiness one expects to derive from family life.

Correspondingly, the society would be able to avoid the great human wastage that otherwise takes place in societies like ours. For example 120 children out of every 1,000 born in India do not survive to celebrate their first birth anniversary. In Thailand, 54 children out of 1,000 live births die in their first year. How does it compare with Sri Lanka? In many industrially advanced countries it is less than ten per thousand.

Women now participate in every walk of life. They work in educational institutions, dispensaries, hospitals, courts, factories, farms and plantations, shops and business establishments, police services, in civil aviation and also in civil and defence services. They have reached the poles and climbed Mount Everest, the highest mountain peak in the world. They have travelled even in space. Think of a few great names like, Florence Nightingale, Madam Curie, Mother Teresa, Lady Baden Powell, Smt. Indira Gandhi and many others.

Today, working women help in increasing the income of their families, opening up new avenues for the family members. When both the adult family members – mother and father – earn; it increases the total income of the family. More importantly, the per capita income of the family, and to that extent that of the country, also goes up. This is their contribution in raising the standard of living of the society as a whole.

Women with their enhanced economic worth and independence grow in social status as well. This opens up new vistas for them to contribute in social, economic, political, cultural and other spheres of life. They thus become equal partners in social, economic, cultural and other development at every level – individual, family, community, society or country and the world at large. Even if it is so, perhaps the most significant thing in this regard is the acceptance of a woman as a person and an entity in herself and not a mere appendix to her husband or a family.

What is expected of husbands. When women marry late after adequate education and preparation for life, it goes without saying that men too have to follow suit and utilize this extended time to prepare themselves to shoulder manifold family life responsibilities. Such a long preparation would enhance their capabilities to have better socio-economic prospects in life and also a matching life partner.

It is, indeed, very good that wives are expected to take up a new role of working outside the home. Thereby, they can contribute materially to the well-being of the family and society in various ways. This, they are supposed to do, by and large, in addition to their traditional role of bearing and rearing children. Would it be wrong if one expects husbands as well to change their outlook and habits? They can and must help women in various ways both in and outside home.

Husbands must realize that working wives are expected to do domestic work in the home before they leave for their places of work. After their working day they are again expected to look after their husbands and children at home the moment they step into the house. Is it not fair that husbands share various things which traditionally wives were expected to do in the past? For instance, this may include, among other things, preparing children to go to school on time. Fathers can lend a hand in helping their children do their homework for example.

Late marriage on the part of elder children would also help them share their parents' responsibilities and economic burdens, particularly in helping young brothers and sisters receive a better education.

Exercises

1. Answer the following questions:
   a) What constitutes the core of a family?
   b) In what ways do the birds care for their young?
   c) What is the natural expected culmination of a marriage?
   d) Why do parents aspire for children?
   e) What role do small children play in respect of family ties? Explain.
2. Things to do and find out:
   a) In spite of state laws regarding minimum age at marriage, find out why many persons marry much earlier.

b) Collect three or four case studies of those who married at a very early age some 15 to 25 years back. How do they compare with those who married late?

c) What do you think about the universal declaration of human rights' article about family and marriage?

d) If you are a boy, find out what qualities would make you a good husband and a good father. If you are a girl, find out what qualities would make you a good wife and a good mother. You may do this in groups and then arrive at a consensus in your class.

3. To think and ponder over:

a) Of the two parents in a family, whose role, in your opinion, is more important and difficult?

b) At what age would you like to marry?

c) What conditions would you like to fulfil before you decide to marry?

d) Do you think that States should pass laws to lay down a minimum age at marriage for boys and girls? Why?

e) Write an essay on equality of sexes expressing your honest opinions freely and frankly.

f) The article No. 16 of Universal declaration of human rights states:

i) "Men and women of full age, without any limitation due to race, nationality, or religion, have the right to marry and found a family. They are entitled to equal rights as to marriage, during marriage and at its dissolution."

ii) "Marriage shall be entered into only with the free and full consent of the intending spouses."

Either hold a debate on these issues in your class, or write your comments putting across your views clearly.

g) Do you think arranged marriages would be necessary when people go in for late marriages?

THE IMPACT OF POPULATION GROWTH ON ENVIRONMENTAL POLLUTION

TEACHERS' GUIDE

Placement: Subject area: General science or biology
Grade/year: Grades VIII or IX, age group 13 or 14

Message:

1. Man has adversely affected the environment by growth of human population, affluence and industrialization.
2. Environmental pollution has, in turn, created many problems for man himself and the eco-system.
3. Environment can be saved from further degradation by reducing the growth of human population and judicious use and conservation of environment and resources.

Overview: The textual material highlights the inter-relationship between population growth and industrialization on the one hand and environmental pollution on the other. This is not to give the impression that industrialization, which is needed by developing countries for their economic development, should be discouraged. What is hoped for is that by demonstrating the adverse effects of rapid population growth and industrialization on the physical environment, the students may be motivated to do something now and in the future to plan and regulate both; in order to avert what could be catastrophic consequences of extreme environmental degradation and ecological imbalance.

Adaptation of contents and activities to local conditions is suggested to make the material meaningful for the students and relevant to their community. Additional related reading materials and audio-visual aids may also be used to enriched the lessons.

Objectives: At the end of the lessons the students are expected to be able to:

1. Discuss the different kinds of environmental pollution;
2. Explain how population growth, and industrialization contributed to environmental pollution in the past and continue to do so at present;
3. Perform experiments to show the effects of man's growth and industrialization on air and water;
4. Discuss the effects of water, soil and air pollution on plants, animals and man;
5. Offer ways and means to prevent or minimize environmental pollution; and
6. Take immediate actions and adopt measures for pollution control and prevention.

Teaching hints: Before the lesson, assign the students to read the chapter at home.

1. Present charts, photographs or slides showing the population growth of the community for the last ten years or so.

2. Discuss the population growth of the world, its effects on the environment in the past and at present; in the developed and developing countries.
3. Identify and discuss the types of pollution and their sources through the use of enlarged pictures/photographs in the textual material or other sources.
4. Show enlarged chart of Figure 1 and ask students to explain the relationship between population growth, industrialization and environmental pollution from what they understand of what they read in the text.
5. Have the students perform activities and experiments in the chapter to show the link between population growth, industrialization and water, air, soil and other environmental pollution, (e.g. noise).
6. In small group sessions, let the students discuss the effects of pollution on plants, animals and men.
7. Observations of the environment and experiments such as those suggested in the chapter should be made to show adverse effects of environmental pollution on living things including man.
8. Brainstorm on ways and means to prevent and minimize pollution.
9. Motivate students to take some immediate actions that will contribute to pollution control and prevention.

Test items

I. *Cognitive*

Direction: Encircle the letter beside the correct or best answer in each of the statements below.

1. One of the serious problems in the world today arising from the effects of man's activities on his environment is:
   a) migration to urban centres
   b) hunger and poverty
   c) environmental pollution
   d) population growth
2. Environmental pollution may be classified into land, water, air and:
   a) industrial
   b) noise
   c) agricultural
   d) mental
3. As population grows rapidly:
   a) sewage and solid wastes disposal becomes a big problem

b) the demands for food, clothing and other needs increase correspondingly

c) more factories and industrial plants have to produc· :ore food and other needs have to be built

d) all of the above

4. Sewage and industrial wastes are the main sources of:

a) soil pollution

b) air pollution

c) water pollution

d) noise pollution

5. Some of the effects of air pollution are:

a) growth of plants becomes stunted

b) lung and bronchial ailments are aggravated

c) buildings and things easily get dirtied

d) all of the above

6. The use of fertilizers to increase food production for the growing population results in a high concentration of fertilizers in streams, lakes and rivers. This ultimately results in:

a) abundar· plants and animals in rivers and lakes

b) the mass death of animals in rivers and lakes arising from depletion of oxygen in the water

c) the drying of rivers and lakes

d) none of the above

7 The use of pesticides and insecticides in agriculture causes disease and death in many species of animals thus resulting in:

a) ecological imbalance in the eco-system

b) increasing cost of food production

c) mass poisoning of people.

d) none of the above.

8. Although man has always polluted his environment, pollution was not a major problem in the past because:

a) Most people lived in uncrowded areas and the pollutants they produced were widely scattered

b) Population size and growth were not as big as it is today so there were less polluters

c) There were no pollution-causing vehicles and factories

d) All of the above

9. One of the means to control and prevent environmental pollution is to:
   a) plan and control population growth
   b) stop building factories
   c) stop using fertilizers, pesticides and insecticides
   d) none of the above
10. Students can help solve the problem of environmental pollution by:
   a) taking actions to prevent and minimize it
   b) leaving it up to the adults pollution control and prevention office
   c) expecting the government to solve the problem
   d) none of the above

II. *Affective*

Direction: Read and study each statement carefully. Indicate what you think about it by putting a check (√) in the column that expresses your opinion.

	Strongly Agree	*Agree*	*Do Not Know*	*Disagree*	*Strongly Disagree*
1. Population growth should be controlled to prevent or minimize environmental pollution.					
2. Environmental pollution is an unavoidable by-product of industrialization.					
3. Stop industrialization to prevent or lessen pollution of the environment.					
4. The only means to increase food production is to use chemical fertilizers, pesticides and insecticides.					

	Strongly Agree	*Agree*	*Do Not Know*	*Disagree*	*Strongly Disagree*
5. Students can and should do something to help solve the problems of environmental pollution.					
6. Unless something is done now to slow down the further deterioration of the environment, man's survival and existence will be greatly endangered.					

Answers

1. (c)
2. (b)
3. (d)
4. (c)
5. (d)
6. (b)
7. (a)
8. (d)
9. (a)
10. (a)

Impact of population growth on environmental pollution

During ancient times man depended solely on his environment for his survival. He browsed in the forests for food; hunted the animals and fished in the rivers. In most of history, man maintained a balance with his environment because the population grew slowly. Later on, man's ingenuity began to develop further. He found hunting and gathering cumbersome. So he developed and practised agriculture using the tools he had invented.

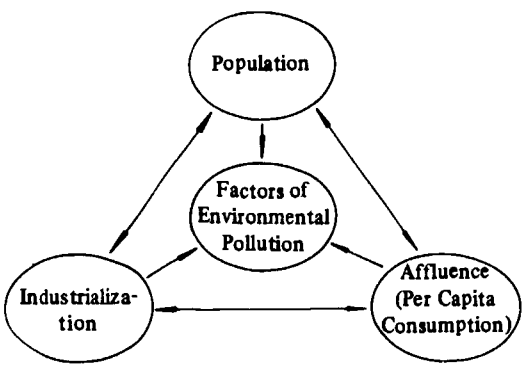
He ploughed the land, irrigated the fields, and grew crops which he consumed. By doing so, he was assured of steady supply of food. By domesticating animals he did not have to hunt for his food so he forsook his nomadic existence and started to settle in one place. With more food and settled life, his population

started to increase. He also had more time to devote to other activities. Today, man has advanced tremendously in every field. In trying to improve himself and to cope with the increasing demands of a rapidly growing population, he has influenced the environment either directly or indirectly through his activities.

Man has always polluted his surroundings. But throughout much of history, pollution was not a major problem. Most people lived in uncrowded areas and the pollutants (waste products) they produced were widely scattered. People had no pollution-causing machines or motor vehicles.

Today's world is facing at least half a dozen problems of crisis dimension; and environmental pollution is one of them. This problem is at present more visible in technologically advanced countries than in the developing countries which consider environmental pollution the result of affluence. They believe that the most serious problems of environmental pollution are among the affluent nations because they are the heavy consumers and polluters. Progress and affluence in the technologically developed countries has been schieved at the expense of depletion of natural resources and deterioration of the environment at the global level. Because developing countries have not reached the Western levels of industrialization, it is often argued that they have little need for concern about the environment as they do not have the kind of environmental problems recently identified in the developed countries. The main problems in the developing countries are the provision of the basic physical and social needs of the people such as food, shelter, clothing, education, health and employment. It is argued by some countries that at present the problems of environmental deterioration in the developing countries is not due to industrialization but due to their poverty and lack of development.

However, although many people in the developing countries attribute environmental pollution to affluence and industrialization, there is no way to cancel the number of people from the equation as shown in the following figure:



Of the three factors responsible for environmental pollution viz. population growth, increase in affluence, and industrialization, the impact of population growth on environmental pollution is discussed here.

Population growth and environmental pollution. There are direct as well as indirect effects of population growth on the pollution of the environment. Other things being equal, the greater the population, the more sources of environmental

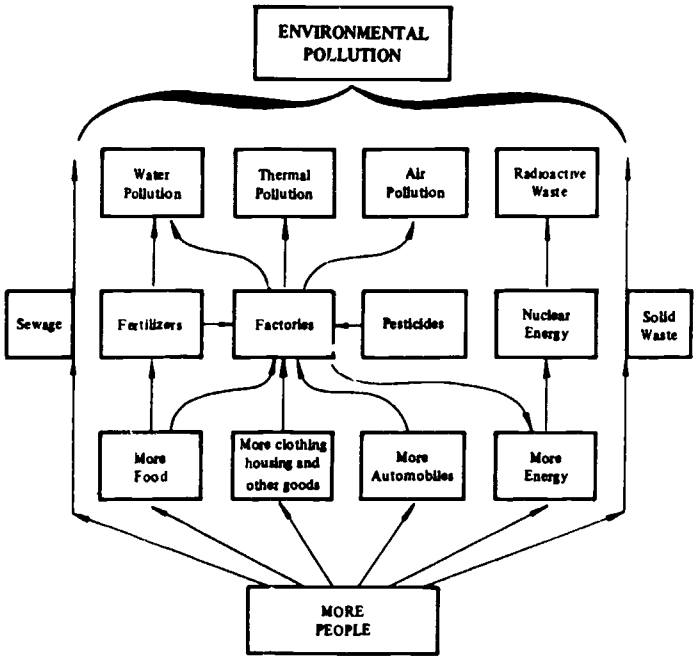
pollution. More people make more demands on food, energy, housing, clothing and transportation, all of which could cause environmental pollution. The problems of domestic sewage and solid waste disposal are directly related to the number of people. As the number of people increases, the space per person for waste disposal decreases. Thus, small mountains of dumped waste or garbage are common sights in almost any crowded urban area.

Water pollution resulting from sewage and industrial waste provides a clear example of the effect of rapid population growth on the environment. The carrying and the decomposing capacities of the rivers are strained to their maximum by increases in urban population and by the development of industrial complexes leading to the disturbance of river eco-systems.

As an example, in India, 13 million people are added each year to the country's population. To meet the basic needs of these additional people one needs to provide each year, about 2,125,000,000 kg (at ½ kg/day) of additional food, 2,509,000 additional houses, 126,500 additional schools, 372,500 additional teachers, 188,774,000 extra metres of cloth and 4,000,000 additional jobs. This has not only had an impeding effect on social and economic development activities in India but also an adverse effect on the total environment. The cases of other developing countries which have high rates of population growth are comparable.

The following figure illustrates the relationship between increasing population and environmental deterioration.

Figure 1. The relationship between population growth and environmental pollution



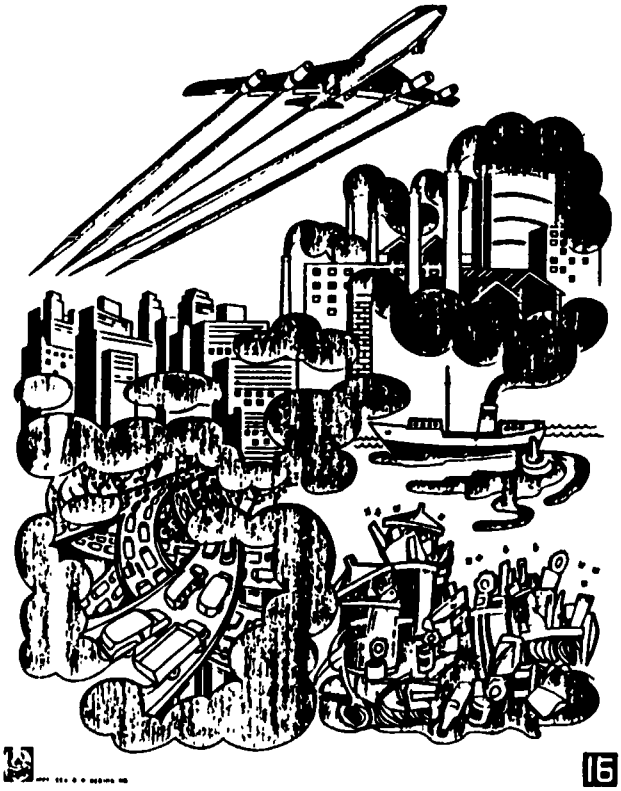
Source: R.C. Sharma. Population trends, resources and environment: Handbook on population education. New Delhi. Dhanpat Rai and Sons, 1975.

From the figure, it can be seen that more people need more food; more clothing, housing and other goods; more automobiles; and more energy. To meet these growing needs, fertilizers, factories, pesticides and nuclear energy are utilized. In the process of their utilization, they give out as by-product, water, thermal, air and radio-active wastes which, together with the sewage and solid wastes of people, are sources of environmental pollution, Apparently, more people means more sources of environmental pollution.

Do you know

- automobiles are the major source of air pollution?
- approximately 90 per cent of the carbon monoxide contamination of the air is produced by exhaust from motor vehicles?
- during a typical day in New York city, a resident breathes in air pollution the equivalent of about 38 cigarettes a day?

POLLUTION-RESULT OF OVERPOPULATION



Source: Population Growths Its Causes and Effects. (Chart 16) International Planned Parenthood Federation London.

Activity

1. Make a survey of how your community disposes of its waste. How does it affect the environment?

   Arrange a visit to the town or city sewage treatment plant. In what ways does population increase add to the sewage treatment problem?

2. Hang a greased paper or a piece of cloth about 5 to 6 feet above the ground and observe particulates and dust particles every 24 hours for about a week. What kind of particulates are present in the air? How do they affect health?

The effect of rapid population growth on food, which is one of the most important basic needs of man, contributes to environmental pollution. If there are more people, more food will be needed. There are estimates that population growth alone will call for increases in food supplies of 120 per cent over the period 1965-2000. Considering the need for better nutrition and the effect of increasing income on food demand, the actual increases in food supplies called for will be much larger. It is estimated by the Food and Agricultural Organization (FAO) that in order to provide sufficient food for the growing population and to progressively m. t the needs of the vulnerable groups of the population for better quality of diet, the total food supplies of the developing countries will have to be increased by 225 per cent over the period 1965-2000.

In order to get more food we need more water for irrigation, more fertilizers, more pesticides, more fuel, all of which have a deleterious effect on our environment. Depletion of the ground water supply used for irrigation often creates the problem of salinization of soil thus making it unfit for cultivation. The building of dams, canals and ponds for irrigation poses its own problems in addition to defacing the landscape.

Some of the fertilizers used in agricultural production are washed away into the streams and lakes. The increase in the concentration of fertilizers in water leads to what is called 'eutrophication'. The higher concentration of these fertilizers encourages abundant growth of algae and other water plants. When the plants die, the oxygen needed by fish and other water animals is used in the decaying process. The result is the mass death of animal life in rivers and lakes.

In fresh water reservoirs, there is additional danger of dissolved nitrates in drinking water. Nitrates in the fertilizers change into nitrates in the human intestinal tract, which is a serious poison and is more hazardous to infants. A number of cities in regions of extensive modern farming have higher than recommended concentration of nitrates in their drinking water.

The use of pesticides and insecticides not only disturbs the ecological balance in an eco-system but has been the cause of disease and death in many species of animals, especially birds. One commonly used pesticide is DDT.

The spread of DDT and other pesticides in the environment has resulted in alarming population declines among woodcock, grebes, various birds of prey and seabirds, and a number of fish species, principally the sea trout. The oceans are the ultimate accumulation sites of DDT and its residues. As much as 25 per cent of DDT compounds produced to date have been transferred to the sea.

Something To Do

1. Experiment to show the link between population, industrialization and water pollution. Take samples of water from different sources (wells, rivers near factories, slum areas) and do some of the following experiments:

   a) Half fill each of the containers with samples of water from different sources and let them stand for a couple of hours. Compare the colour of water suspended particles and particles at the bottom in each test tube.

   b) Boil about 100-200 cc of water from different sources in separate test tubes. Observe any kind of impurities left after water has completely evaporated.

   c) Observe a drop of water under the microscope from different sam ples. Look for any algae, micro-organisms, etc.

   d) Find out the pH of different waters with pH paper or litmus paper. (Blue litmus paper turns red in acidic water, red turns blue in alkaline water and no change of colour in neutral water).

2. Make a survey of flora near some factories. What are the effects of pollutants on the plants?

3. Do some experiments on the effect of fertilizers, detergents, soaps, pesticides, etc., on water pollution.

   Hint: Take three jars: A, B and C. Put a tablespoon of detergent in A and a tablespoon of fertilizer in B. Leave jar C as it is. Pour water from a pond containing some algae in each. Which jar shows the greatest growth of algae? Why?

Pollution control. Everyone wants to reduce pollution but the problem is as complicated as it is serious. It is complicated because much pollution is caused by things that benefit people. For example, exhaust from automobiles is a major cause of air pollution. But the automobiles provide transportation for millions of people. Factories discharge much of the materials that pollute air and water. But factories provide jobs for people. Too much fertilizer or pesticides can ruin the soil. But fertilizers and pesticides are important aids to the growing of crops.

Pollution can be gradually reduced in several ways. Scientists and engineers can work to find ways to lessen the amount of pollution. Government can pass and

enforce laws that require business and individuals to stop, or cut down on, certain polluting activities. Individuals and groups of people can work towards action in reducing pollution.

New technological developments do much to control pollution caused by older technology. For example, several types of devices have been developed to prevent particulates from leaving industrial smokestacks. These devices include filters that trap particulates that would otherwise be released into the air with gases.

Devices have also been invented to reduce the pollution that comes from automobile engines. These devices work to allow engines to burn fuel containing little or no lead, and to make the combustion processes more complete.

An important development in agriculture is the use of biological controls instead of pesticides. It involves the use of various types of insects and bacteria to control pests. Other new developments have improved the effectiveness of water treatment facilities and provided various ways to dispose of solid wastes.

Many kinds of wastes can be recycled or reprocessed. Cans can be melted down and used to make new cans. Old newspapers can be turned into pulp and made into clean newsprint. Glass bottles and automobile tyres can be used for other purposes. Ground-up glass can serve as ingredients in road-building materials. Old tyres can be melted down in a special process in which they give off valuable chemicals, such as oil and gas.

More importantly, efforts must be made on the part of policy-makers to de-emphasize the trends towards huge urban concentrations, to strive for better planned communities and maintain an optimum population size and thus minimize environmental pollution.

Conclusion. Although increasing population, rising affluence and industrialization are responsible for environmental pollution, population growth is one of the major catalysts for creating environmental problems. Not only are there more people today than ever before and not only is the world population growing at an unprecedentedly rapid rate but also millions of people throughout the world are aspiring for a better life, with more material goods and modern conveniences. In view of the fact that the earth and its resources are finite it is unlikely that the expectations of the developing countries will be realized.

In their anxiety to achieve a higher level of industrialization to raise the standard of living, developing countries might be tempted to regard ecological problems as having relevance only for the developed countries. This may create, in the near future, severe problems of environmental deterioration which will be beyond the economic capacity of many developing countries to solve.

The developing countries with their high rates of population growth are potentially destined to suffer severe environmental problems. At the present moment, since the main problems of the developing countries are to feed their people and to eradicate poverty, their developmental patterns have to be different from those of industrialized societies keeping in view the resources and environmental implications.

WORLD POPULATION GROWTH

TEACHERS' GUIDE

Placement: Subject area: History/social studies
Grade/Age: Grade X, age group 15 or 16

Message: The population of developing countries is rapidly increasing. The governments of these countries have to take action to slow down population growth in order to generate enough resources to provide a better quality of life for the people.

Overview: Since the concept of time is difficult for the child, different methods (parables) may have to be used to teach the concept of time. The concepts of BC, and AD, also have to be taught clearly. It may also become necessary to explain demographic concepts like birth rate, death rate and growth rate.

The following are the main points in the lesson. The history of man is very short when compared to the history of the earth; and the written history of man is shorter still. Scientific and technological development is confined to the past couple of centuries only. Human population has been increasing in geometric progression. As a result, the time taken to double the population each time is becoming shorter and shorter. The developed countries are supposed to have gone through four distinct stages in population change. This is called, "demographic transition", and reached the stage of low fertility and low mortality. The developing countries are still experiencing high fertility and low mortality resulting in high growth rates.

The activities should be useful for the teacher to elucidate facts and to maintain the interest of students.

Objectives: The children will be able to:

1. Explain that the history of man is very short compared to the history of earth;
2. Appreciate that even in such a short span of history man succeeded in imposing a threat to his own existence through multiplication of numbers;
3. Conceptualize the exponential growth of population;
4. Compute doubling time;
5. Explain demographic transition;
6. Analyse population situations and their implications for development; and
7. Take rational decisions in regard to population related issues.

Teaching hints: Being a history lesson, the importance of developing time sense and appreciation of sources and their reliability are very important.

The class may be divided into four groups and each group could be allotted a time span as follows to list out the monuments and identify events belonging to the particular period.

Group 1 – Pre-Buddhist, etc.

Group 2 – AD 1 to 12th century.

Group 3 – 13th century to 18th century.

Group 4 – 19th century to present day.

The teacher may direct the group discussion by asking questions such as given below:

1. How was the information collected?
2. What were the sources?
3. Were they direct/indirect, primary/secondary sources?
4. How did they satisfy themselves about their authencity?

After each lesson, the teacher can prescribe the relevant portion from the student material.

The lessons that follow could be built on feedback obtained through simple oral questions. In the course of the lesson:

i) Graphs – to show demographic transition.

ii) Maps – to show the new world could be used.

Once the content in the student material is complete, the test can be administered to the students.

Test items

I. *Cognitive*

Direction: Tick (√) the correct or the most appropriate alternative in each of the following items:

1. It is said that the demographic transition has taken place when there is:
   a) high fertility and high mortality
   b) low fertility and low mortality
   c) high fertility and low mortality
   d) low fertility and high mortality

2. Of the four stages in the demographic transition (as stated in item 1 above), most developing countries are still in the:
   a) first stage
   b) second stage
   c) third stage
   d) fourth stage

3. The present rate of population growth of the world is 1.7 per cent. Around what year will the population double?
   a) AD 2000
   b) AD 2010
   c) AD 2025
   d) AD 2030

4. Death rates in developing countries declined rapidly due to:
   a) use of science and technology
   b) economic development
   c) better status of women
   d) improvement in literacy

5. In which one of the following countries do you observe lower fertility rates not accompanied by economic growth?
   a) Japan
   b) Singapore
   c) India
   d) Sri Lanka

6. For the next few decades the world would be adding to its total population in larger numbers because of:
   a) increased growth rate
   b) enlarged population base
   c) improved health and nutrition
   d) better status of women

World population growth

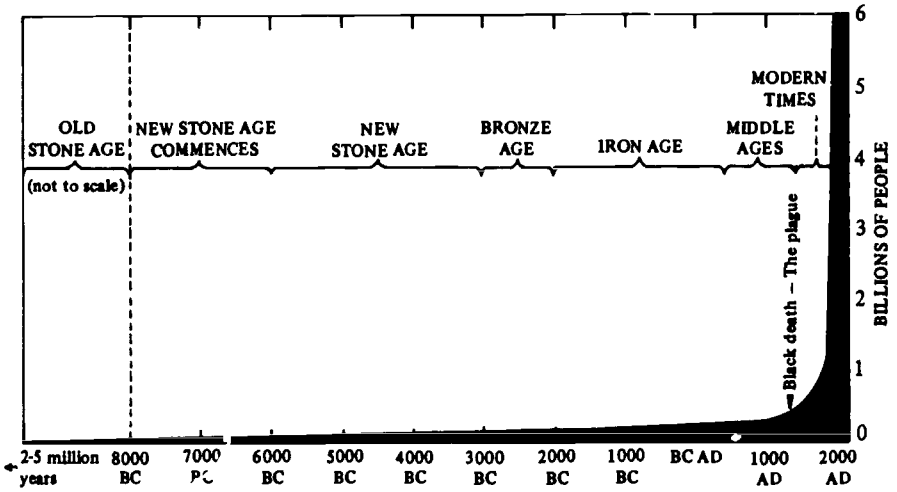
This planet earth has been the home of the human race since its origin and could continue to be so for many many millions of years more. Yet, today it appears that the speed at which the human race grows might endanger its very existence.

History of population growth. The history of earth dates back about 4,500 million years. As this may be a little difficult to visualize, let us compare the age of the earth to 24 hours or one day. Life appeared on earth only during the last five minutes and man, it is believed, has been on earth only during the last two seconds of the day. In other words, if the history of earth is 24 hours, the history of man is only two seconds.

Although the history of man is very short compared to the history of the earth, the period which has seen the development of scientific knowledge is still shorter. Within that short time, man's growth in numbers has started causing a threat to his very existence.

In 1984, the world population was estimated to be 4,762 million. This is believed to be about 600 times the population of the old stone age when the man was a hunter and food gatherer two million years ago. During the old stone age, the world population probably never exceeded 10 million.

Figure 1. World population growth



Source: Population Reference Bureau.

Activity

Note that old stone age shown on the graph, of 2 to 5 million years, is too long to draw to scale. If it were drawn to the above scale how long would it be in cm?

Over a period of several hundred thousand years man changed over to food growing. This was a big leap forward and a landmark in human survival and progress. This landmark also corresponded with a considerable rise in population.

It is estimated that there were about 300 million people, by AD 1, or 30 times more than the highest estimated number during the old stone age.

Activity

Refer to Figure 1 and try to imagine the length of time from old stone age to 1 A.D.

The change from the wandering to living in settlements as a result of taking to farming eventually led to the rise of towns and cities and new kinds of co-operation. Man thus changed from a nomad to a sedentary life.

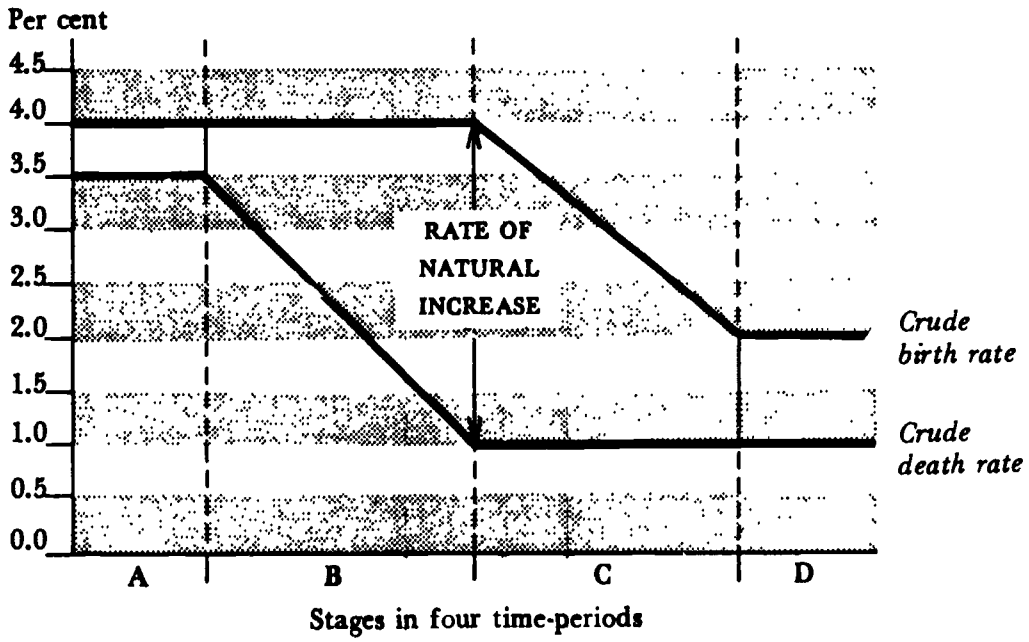
In the eighteenth and nineteenth centuries with the industrial revolution in Europe, there was a second big increase in world population.

At that time, new agricultural techniques boosted food supplies. Improved transportation systems meant that food and agricultural raw materials could be

shipped more readily from one place to another where they were needed. The danger of famine was lessened and individual nutrition improved greatly. The process of industrialization was accelerated through the discovery of new lands, their colonization, and resultant international trade. Both increased availability of food and nutrition meant increased resistance to infection and a far greater likelihood of surviving contagious diseases. In addition, living conditions gradually improved and industrialization raised personal incomes. Better housing reduced the incidence of diseases associated with crowding and improved hygiene also helped to reduce the spread of disease. It may also be noted that pressure of population growth was eased considerably as most European countries encouraged emigration of their people to newly discovered lands.

Stabilization of populations – experience of developed countries. In the latter half of nineteenth and twentheieth centuries, improved public health measures and medical advances added to the decline in mortality rates. Much of the decline is reflected in the greater survival of infants and young children who in earlier times would have died of infectious diseases. Life expectancy correspondingly rose. With the spread of education and rapid advances in medical science, death could be postponed more and more effectively. As a result, death rates were the first to come down. It was not so easy to bring down birth rates and hence there was a natural time lag. This led to population explosion because of the gap between steady birth rates and rapidly falling death rates. With the rise in standards of living the birth rate also began to drop. Such a shift from high birth rates and high death rates to low birth rates and low death rates is called the "demographic transition".

Figure 2. The model of demographic transition: the stages in population stabilization.



It is said that the population of Europe went through four distinct stages (Figure 2).

Stage A. Birth rates and death rates are both relatively high. Population growth, if any at this stage, was very slow.

Stage B. Birth rates continue to be high but death rates decrease, resulting in a high rate of natural increase.

Stage C. Birth rate decrease considerably while the death rate continues at a low level, resulting in a progressive decrease in the growth rate.

Stage D. Birth and death rates are both relatively low, and therefore, the rate of natural increase is low; hence the trend is clearly towards population stabilization.

Answer the following questions:

1. Why is the rate of population increase so small during stage A?
2. How will you account for the decrease in death rate during stage B?
3. In this process of demographic transition, where does your country stand?

Experience of developing countries. The theory of "demographic transition" explained above took place only in the developed countries. In the developing countries, the third and the most dramatic population increase also called "population explosion" has taken place. Here, after World War II, the death rate dropped very rapidly. Unlike the mortality decline in the West which was gradual and accompanied by social and economic improvement, the developing world's mortality decline was rapid due mostly to improvement of medical and public health facilities. Among these were the antibiotics, immunization, eradication of small pox, sanitation, and use of insecticides such as DDT to combat malaria carrying mosquitoes (anopheles).

With rapid improvement in means of transport and communication and increased mobility of people, the spread of new ideas could be accelerated. The changes took place in decades rather than in centuries. Easy availability of food saved lives during famines. However, the reduction in birth rates is a long social process and takes time to adjust sufficiently to the rapid decline in death rates in developing countries. Yet countries like Sri Lanka and the State of Kerala in India have been able to bring down birth rates through education, better health facilities and equitable distribution of basic requirements of living through social welfare measures. This was so even when economic development had not taken place to such a level as to be accompanied by low birth rates also called low fertility. However, in the majority of the developing countries the populations have increased rapidly for want of adequate spread of education, health and other social measures.

See Table 1 regarding birth rates, death rates and life expectancy at birth in the following countries. Can you divide them in two groups? What conclusions would you arrive at?

Table 1. Birth and death rates in a few Asian countries.

	h Rate	*Death Rate*	*Life Expectancy at Birth*	
			Male	*Female*
1. China	21.1	7.8	65.5	68.4
2. Japan	16.5	4.9	72	77.8
3. Republic of Korea	22.6	6.0	65.6	72
4. India	32.9	13.2	53.2	52.2
5. Sri Lanka	26.8	6.6	66.2	69.2

Source: 1983 ESCAP Population Data Sheet.

Activity

1. Find out the death rates in your country from 1980 onwards and as they were in the 1950s.
2. Do the same in regard to birth rates.
3. Do you see any trend towards minimizing or widening of the gap between the two?
4. When in your opinion will population begin to stabilize?
5. Would it be early or late? What reasons would you forward in your support of your view?

Today, the rate of world population growth is slowing down; the growth rate peaked in the mid-1960s and declined from a high rate of 2 per cent to 1.8 per cent a year. Birth rates have begun to fall moderately in many developing countries due to economic and social development together with family planning programmes. Nevertheless, birth rates far exceed death rates. We are currently adding about 80 million to the world population each year. By the year 2000 the growth rate is projected to be 1.5 per cent a year but we will be adding over 90 million a year. In other words, by 2000 we will be adding a population nearly equal to that of Pakistan, as it is today, each year. This is because there will be larger proportions of population in the reproductive age group. This would be understandable if you note the proportion of population that is below 15 years of age today.

Progressive increase of population growth. The population of the world has been increasing faster and faster. Look at the following table carefully.

Table 2. Progressive increase in population growth

Period	*Time*	*Population*
1. Stone age to Birth of Christ	10,000 years	to reach 300 million
2. Birth of Christ to AD 1650	1,500 years	to reach 500 million
3. AD 1650 to AD 1850	350 years	to reach 1,000 million
4. AD 1850 to AD 1925	75 years	to reach 2,000 million
5. AD 1925 to AD 1962	37 years	to reach 3,000 million
6. AD 1962 to AD 1975	13 years	to reach 4,000 million
7. AD 1975 to AD 1985	10 years	to reach 5,000 million

Source: Judith M. Schultz and Hubert Coon, *Population education activities for the classroom.* Eric Ohio State University, 1977, p. 1>.

Here you will realize that the time taken to add each 1,000 million population is not constant. The period of time is getting shorter and shorter; hence the figure of speech *exponential growth.* It means that the population increase follows the principle of compound interest and not simple interest. Instead of following the arithmetic progression, i.e. 1, 2, 3, 4 and 5, it follows geometric progression, i.e. 2, 4, 8, 16 and so on.

Doubling time. Demographers pointed out that at a growth rate of 1 per cent it takes 70 years for a population to double. A simple mathematical formula to calculate doubling time is to divide the number 70 by the growth rate.

$$\text{Doubling times} = \frac{70}{\text{Growth rate}} \quad \text{e.g.} \quad \frac{70}{1.7 \text{ (growth rate of world)}} = 41 \text{ years}$$

Table 3. Doubling of world population

Year	*Population (in thousands)*	*Doubling Time (years)*
AD 1650	500,000	–
AD 1850	1,000,000	200
AD 1925	2,000,000	75
AD 1975	4,000,000	50

Source: Educational Resource Centre, *Population Issues.* New York: Teacher College Press, Columbia University, 1981.

Activity

The following question (riddles) could be used to teach exponential growth and doubling time.

1. Give the option of selecting one of the following which will be more beneficial to you:

   a) to receive 300 dollars as a monthly wage

   b) to receive one dollar on the first day and one dollar more each day than the previous day (i.e. 1, 2, 3 etc.)

2. A lily pond contains a single leaf. Each day the number of leaves double – two leaves the second day, four the third day, eight the fourth day and so on. If the pond is half full on the 29th day, how long will it take to cover the remaining half.

3. Find out the current population growth rate of your country and work out the number of years it would take to double itself.

Your children or the next generation will have to live with a larger crowd. For them, the world will be much more competitive than it is today. They will have to share the resources of their country with double the present number. Does it not mean that they would have to be both more competitive and more co-operative? Is it an easy task? At the national level it also means the governments of the countries will have to take intelligent policy decisions to ensure stabilization of population as early as possible in order to be able to generate enough resources to provide better quality of life for all.

Exercises

1. Answer the following questions:
   a) What is the life span of our planet earth?
   b) When did life start on our earth?
   c) When did the man appear on the planet?
   d) How many years did man take before he could develop sufficient knowledge and technology to change his environment to serve him better?
   e) Which countries have reduced their population growth rates through the spread of education and health facilities?
2. Explain the model of demographic transition with special reference to your country.
3. Do you think that the doubling time of the population is significant? If so, in what ways do you think it can help governments to plan for the future? How is doubling time arrived at?
4. Hold a debate in your class on the need to stabilize population and the suitable policies and programmes to realize the same.

POPULATION CHANGE AND SOCIO-ECONOMIC DEVELOPMENT

TEACHERS' GUIDE

Placement: Subject area: Economics or economics-oriented social studies course

Grade/Age Level: Grades X or XI, age group 15 or 16.

Message: The main message of the textual material is that population change and socio-economic development are two interactive forces – each one having an impact on the other. Rapid population growth tends to hinder socio-economic development. However, if population change is planned, and if natural resources are abundant, population growth could hasten socio-economic development. Socio-economic development on the other hand could be one of the best contraceptives.

Objectives: After studying this chapter, the students will be able to:

1. Distinguish between economic and social development;
2. Realize how population size affects per-capita income;
3. Explain how rapid population growth hinders socio-economic development;
4. Show evidences that well-planned population change could help hasten socio-economic development;
5. Explain how socio-economic development could be one of the best contraceptives; and
6. Reason out why some developing countries cannot afford to wait for development to bring down population growth rates.

Teaching hints: The textual lesson provides a number of activities within the chapter. It is suggested that these activities be done by the students, with the teacher as facilitator. This means that the teacher could use the following teaching techniques:

1. Read, explain and discuss sections of the chapter.
2. Encourage students to do research in the library to find additional evidences of what is being asserted in the chapter.
3. Motivate students to undertake a mini-survey (e.g. family income) in their community (e.g. survey of income distribution).
4. Analyze the charts, tables and maps given in the chapter.

Test items

I. *Cognitive*

Direction: Place tick (√) beside the best possible answer.

1. Which of the following is generally regarded as the worst stumbling block to economic development?
   a) rapid population growth
   b) lack of natural resources
   c) lack of manpower

2. Under what circumstances may population growth enhance economic development:
   a) when a country has vast natural resources
   b) when many of its workers can be employed in other countries
   c) when a country has a lot of capital resources
3. Chart 1 shows that:
   a) the bigger the population, the bigger the Gross National Product (GNP)
   b) the bigger the population, the smaller is the GNP
   c) the bigger the population, the smaller is the per capita income
4. The indicator of social development which is more directly related to decline in birth and fertility rates is:
   a) equitable distribution of income
   b) equal distribution of wealth and income
   c) equitable distribution of income and wealth
5. Table 1 shows that in the Philippines:
   a) 11.6 per cent of the people who are poor are receiving 40 per cent of the total income of the country
   b) 40 per cent of the people, who are poor are receiving only 11.6 per cent of the total income of the country
   c) 53.8 per cent of the people, who are considered rich are receiving 20 per cent of the total income of the country
6. Table 3, shows that:
   a) the higher the population growth rates, the higher will be the per capita income
   b) the higher the population growth rate, the higher will be the rate of growth of per capita income
   c) faster population growth rates tend to cause slower per growth rates of per capita income
7. In the "race" between developed and developing countries:
   a) developing countries tend to move faster towards economic development because they have more manpower
   b) developed countries tend to move faster towards economic progress because they do not carry a heavy load of people
   c) neither (a) nor (b) applies)

8. Table 4 shows that economic development is more likely to happen when:
   a) the growth rate of per capita income is much higher than the rate of population growth
   b) when the GNP is bigger than the total population
   c) when the population growth rate is higher than the growth rate of per capita income

9. In the map on page (00)
   a) Japan has a growth rate lower than 1 per cent
   b) China, Australia and Indonesia are the only countries whose rate of population growth is between 1 per cent to 1.9 per cent
   c) The Philippines, Thailand and Pakistan are the only countries whose rates of population growth is between 2 per cent to 2.9 per cent

10. Which of the following is not correct:
   a) rising income tends to cause a decline in birth rate
   b) the use of modern technology in farms and cottage industries tend to cause a decline in birth rate
   c) birth rate can only decline after a country reaches a certain level of development

Answers

Cognitive

(1) a
(2) a
(3) c
(4) c
(5) b
(6) c
(7) b
(8) a
(9) a
(10) c

II. *Affective*

Direction: Read the following statements carefully and put a tick (√) to express your position regarding each of the following.

	Strongly Agree	*Agree*	*Do not Know*	*Disagree*	*Strongly Disagree*
1. Rapid population growth should be regulated.					
2. Population growth should be encouraged in developing countries to hasten economic development.					
3. Social development should be preferred rather than economic development.					
4. Development should be the only contraceptive that ought to be encouraged					
5. Some countries cannot get out of the poverty trap unless something is done to control their rapid population growth rate.					

Answers

Affective

(a) SA
(b) D
(c) A
(d) SDA
(e) SA

Population change and socio-economic development

Introduction. How is your country classified – developed, developing or underdeveloped? Countries that have attained a level of development such as those of Australia, Japan, New Zealand and Singapore are considered developed. In these countries, the average income of the people is very high. In addition, the provision of social services is very conducive to the promotion of quality of life for most, if not all the people.

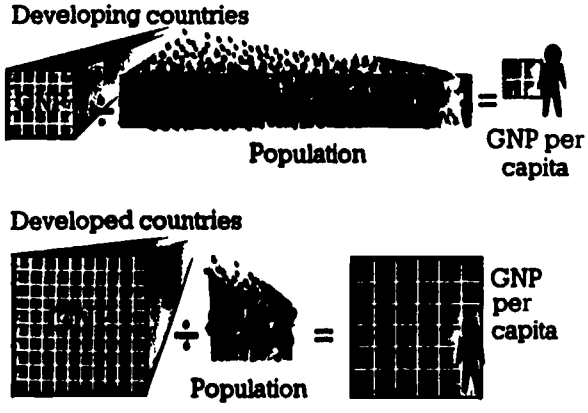
Are the above-mentioned countries more developed because they have vast natural resources vis-a-vis the population size? In the case of Australia and New Zealand, it is so. But Japan and Singapore have very limited natural resources. What then is the secret formula for development?

In this chapter, attempts will be made to examine how population change affects socio-economic development and how socio-economic development affects population change.

What is economic development? A Unesco publication defines economic development as a process that draws a greater proportion of the people into more productive and often different activities. Raising the overall productivity or output of the population is one key to economic development; and this output in terms of goods and services, must rise faster than population increase if individual well-being is to improve.

To measure the total national output or production or the total wealth of a country, the concept of Gross National Product (GNP) is used. GNP is the sum of all the goods and services produced by a nation in a given year. GNP, divided by the total population, gives the per capita income or the wealth per person of the population in a country; the bigger the population, the smaller will be the share of each individual. This concept is illustrated in Chart 1 below.

Chart 1. GNP per capita in developing and developed countries



Source: World Bank: *The Development Data Book, 1984.*

To understand the concept of GNP and per capita income, let us do the activities listed below:

Activity
1. Find out the GNP of your country.
2. Determine the total population.
3. Divide the GNP by the total population.
4. Compare your country's per capita income with those of selected countries in Asia.
5. Arrive at a conclusion and propose a course of action.

What is social development? In many countries, the gross national product is increasing every year. At the same time, even in many developing countries, the rates of population growth are declining. Under such condition, an increase in per capita income is to be expected. However, in many of the non-socialist countries, increasing per capita income does not always lead to improvement in the living standard of the majority of the people. This is because there tends to be unequal or mal-distribution of income and wealth. An ILO report illustrates this (Table 1).

Table 1. Income shares of decile groups.

Country and year	*Entire economy*	
	Poorest 40 per cent	*Richest 20 per cent*
Bangladesh (1963/64)	18.0	44.5
India (1963-65)	16.0	52.0
Malaysia (1970)	11.6	56.0
Pakistan 1963/64)	17.5	45.4
Philippines (1971)	11.6	53.8
Sri Lanka (1973)	15.1	45.9

Source: ILO Poverty and Landlessness in Rural Areas, 1977, p. 19-20.

Table 1 shows that the poorest 40 per cent of the people in Bangladesh received only 18 per cent of all income, while the richest 20 per cent received 44.5 per cent of the country's entire income. This means that the other 40 per cent who were neither rich nor too poor received 47.5 per cent of the total income of the country.

One of the main characteristics of a country that has attained a fair level of social development is that income and wealth are equitably distributed (i.e. not

equal but the disparity of income and wealth is not too wide). In such a country, the provision of health services, education, housing and other basic necessities are at a higher level.

Studies have shown that it is equitable distribution of income and wealth of the nation that often leads to a decline in birth and fertility rates. This is shown in Table 2.

Table 2. Crude birth and fertility rates in selected Asian countries.

	Crude Birth Rate	*Total Fertility Rate*
China	21.1	2.5
Republic of Korea	22.6	2.6
Singapore	17.3	1.7
Japan	12.9	1.8

Source: 1983 ESCAP Population Data Sheet.

It is to be noted that the highest crude birth and fertility rates in Asia and the Pacific is 49.4 and 6.9, respectively (i.e. Afghanistan). The average crude birth rate is 27.7 and total fertility rate 3.5 in the region. The crude birth rate and total fertility rates in China, the Republic of Korea, Singapore and Japan are much lower and in these countries income and wealth are equitably distributed.

Activity

Make a survey of the family income of students in the class. Make a tally of the income ranges (without mentioning family names). Prove that income is not equally distributed among the parents of class members.

Population change and socio-economic development. Poverty is a reality in many countries of Asia. The World Bank estimates that one-half of the people in absolute poverty live in Asia, mainly in India and Bangladesh. About one-sixth live in East and South Asia. But what is absolute poverty? The World Bank says absolute poverty means not only low income, but malnutrition, poor health and lack of education.

Activity

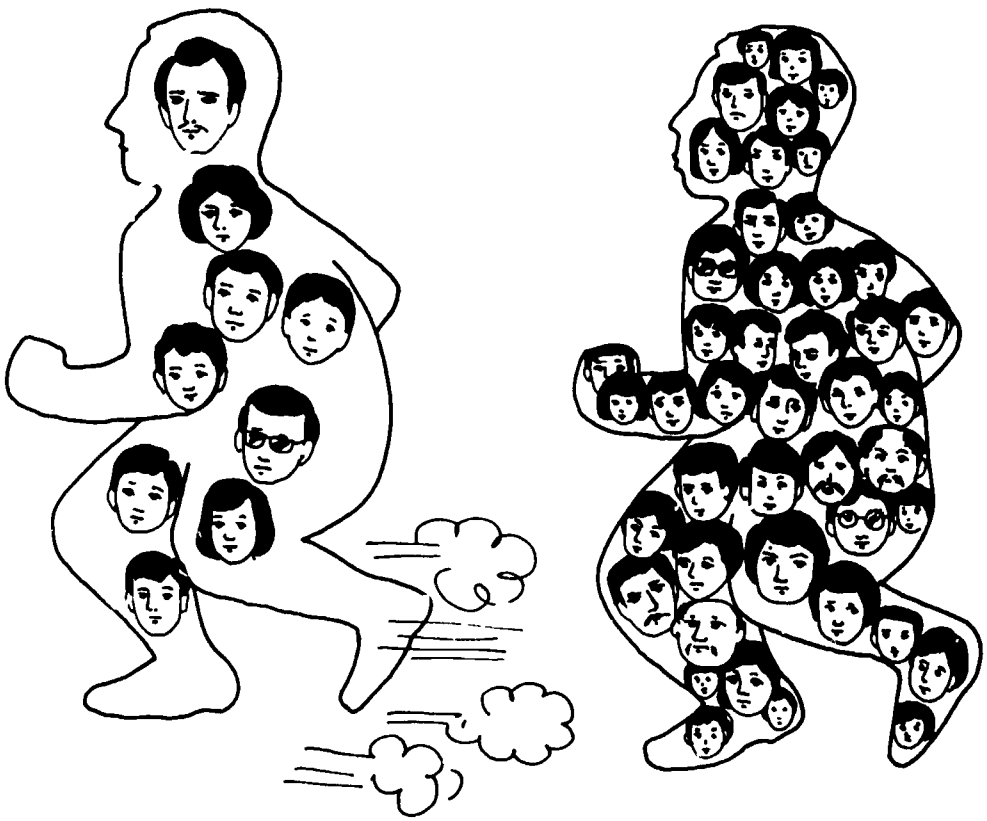
1. Find out how many people are in absolute poverty in your country.
2. What is being done by the Government for them?

Among the countries with sizable population living under conditions of absolute poverty are Bangladesh, Bhutan, India, Nepal and Pakistan. Why is this so? Could rapid population growth be one of the factors adversely affecting socio-economic development in these countries? See Table 3.

Table 3. Rate of population growth compared with GNP per capita

Country	*GNP per capita (1981) US$*	*Growth rate (1970-80)*	
		Population/GNP	*Per Capita*
Bangladesh	140	2.5	1.4
Bhutan	80	2.1	0
India	230	2.0	1.5
Nepal	150	2.6	0.3
Pakistan	350	3.1	1.0

Source: 1983 World Bank Atlas.



It is to be noted that in none of the above-mentioned countries is the rate of increase in GNP per capita higher than the rate of population growth. As the World Bank rightly pointed out, developing countries are like long distance runners. In their race against time to eliminate poverty rapid population growth is an additional burden which, regardless of their inherent strengths, slows them down.

On the other hand, take a look at Table 4.

Table 4. Growth rates of population and per capita income

Country	*GNP Per Capita*	*Growth Rate (1970-80)*	
		Population 1970-80	*GNP per capita 1970-80*
Japan	10,080	1.2	3.4
Singapore	5,240	1.5	6.7
Republic of Korea	1,700	1.7	7.5

Source: 1983 World Bank Atlas

It is to be noted that the rate of growth of per capita income in these countries is much higher than population growth rate, and these countries are economically developed.

On the other hand, the rates of population growth in the developed countries in mid-1983 are lower, as shown below:

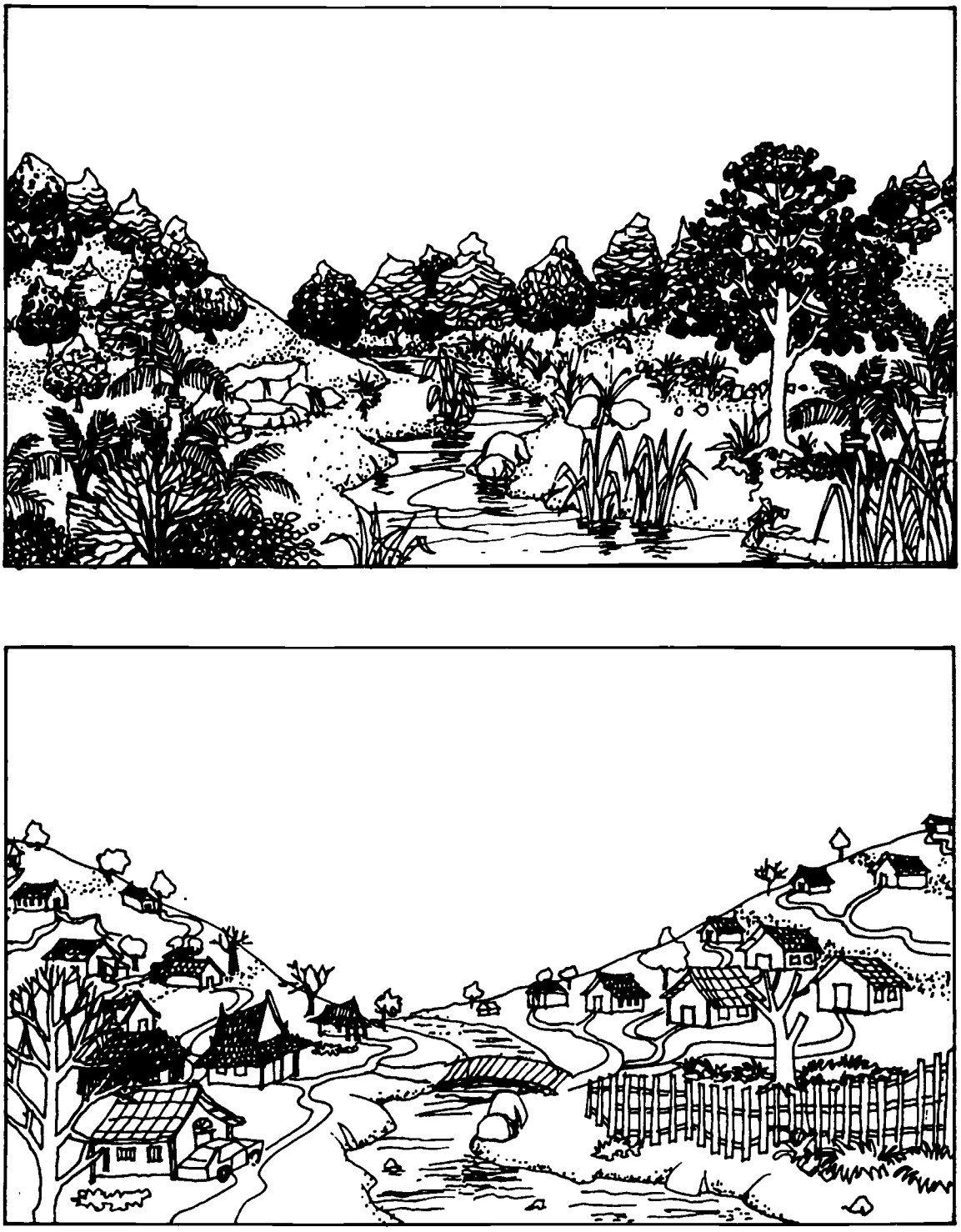
Australia	–	1.58 per cent
Japan	–	0.68 per cent
New Zealand	–	1.41 per cent
Singapore	–	1.2 per cent

Source: 1983 ESCAP Data Sheet.

Activity

In the attached map, compare the rates of population growth in selected countries in Asia. How does population growth rate affect rate of growth of per capita income

Population growth does not necessarily hinder socio-economic development. Very often population growth leads to the development and utilization of a country's natural resources. For example, largely through population growth, jungle land along the hundred mile course of the Friendship Highway in Thailand was transformed into highly productive, prosperous farms. The production of crops such as sugar cane, bananas, and corn tripled, the bulk of which was exported to other countries.



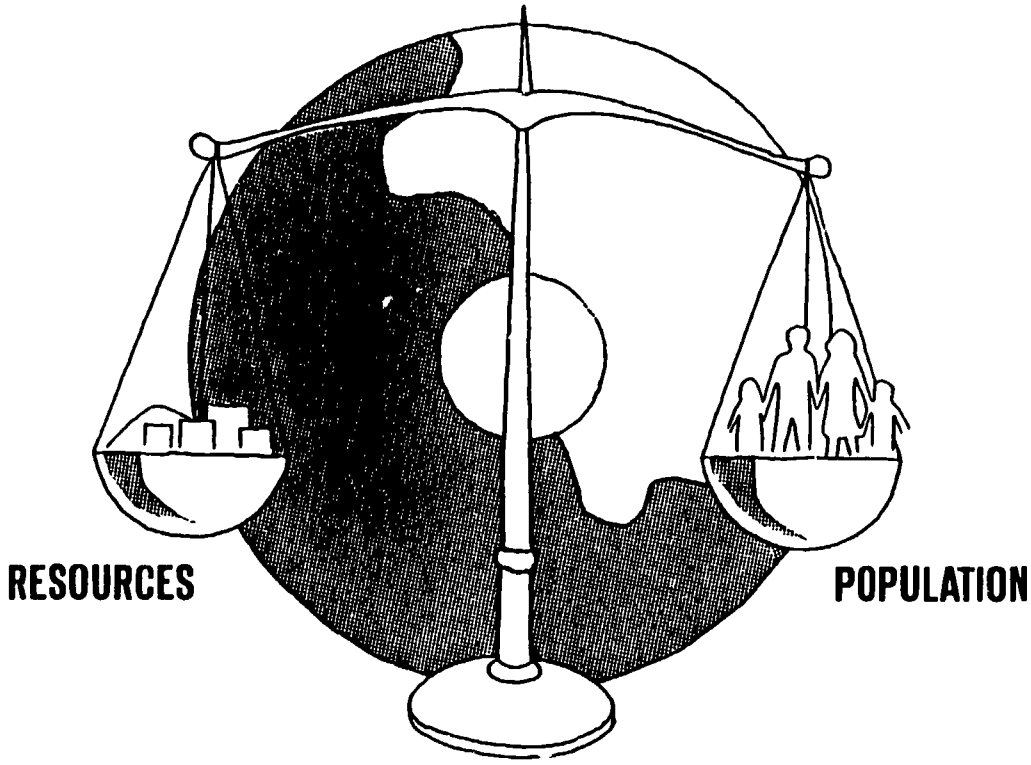
Effects of Development on Environment.

In the Philippines, population growth was one of the main factors that led to the settlement of the vast virgin land in the hinterlands of Mindanao in Southern Philippines. As settlements grew, the need for roads and bridges had to be met. With the construction of a network of roads and bridges the production of export crops – coconut, sugar cane, abaca (Manila hemp) and bananas increased. With economic development also came social development.

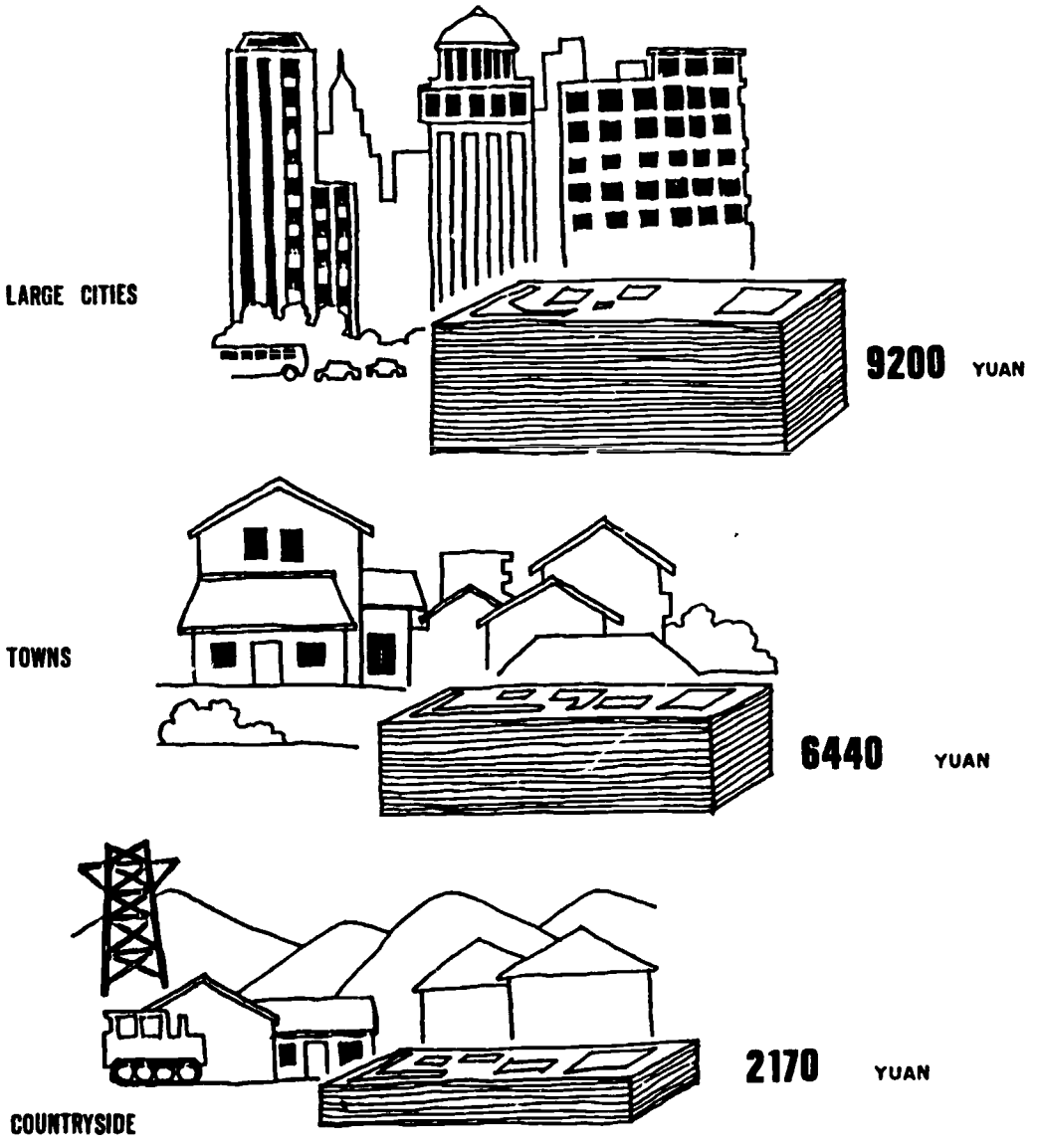
Activity

Undertake a mini-research in your library. Find more evidences or studies to show that population growth could lead to socio-economic development.

In general, whenever population growth is planned vis-a-vis available resources, good effects may be expected. On the other hand, unplanned population growth tends to have negative effects on development. Rapid population growth tends to limit the recources available to people, and can intensify under-development.



Effects of population growth on economic progress. China is among the countries which have recognized that rapid population growth is not beneficial to the accelerated speed of a capital accumulation. In 1982, it was estimated that to bring up a child until the age of 16 when he or she can join the work-force, costs approximately 2,170 Yuan (US$ 1 = 2.04 Yuan) in communes and production brigades, 6,440 Yuan in country towns and 9,200 Yuan in cities. (These figures include education costs at primary and middle school level). It is calculated that the



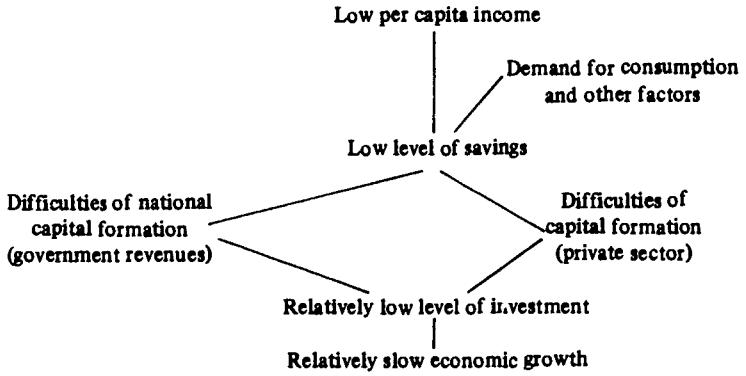
Source: Population Education Programme, People's Republic of China

total costs of bringing up those born since 1949 have absorbed approximately half of the cumulative total of the country's consumption fund. It is estimated that 2,950 billion Yuan for the expenses in bringing up children could be saved if births are decreased by 100 million.

A monograph published by the Economic and Social Commission for Asia and the Pacific (ESCAP) points out that in Nepal, the existing standards of living are already too low and even the maintenance of the low level will be a difficult task in the face of a rapid increase in population. Any population growth requires some investment of available capital just to maintain the same level of per capita GNP. 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.

Michael Todaro, a prominent economist, says that capital accumulation results when some proportion of present incomes is saved and invested in order to improve future outputs and incomes. It involves saving or the postponement of direct consumption, and using money for investment purposes such as buying a hand-tractor or even fertilizer and insecticides instead of goods like food and clothing. Such investment becomes impossible when a family with many dependent children is poverty stricken. In such a situation, the interrelationships of income, savings, investment and economic growth illustrated in the following diagram are likely to occur.

Diagram showing some interrelationships amongst income, savings and investment



Source: Unesco Regional Office for Education in Asia. Population Education in Asia: A Source Book. 1975.

Activity

Write a case study of a community or nation which illustrates the ideas in the above diagram.

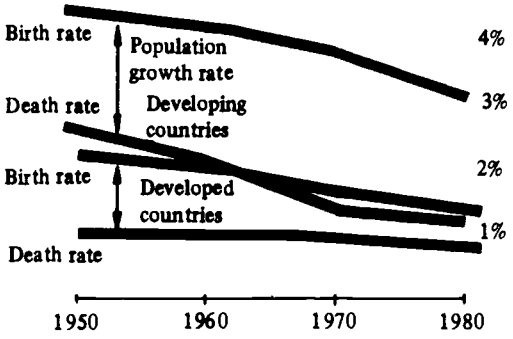
Effects of socio-economic development on population growth. As a country reaches a certain level of development, there is a tendency for birth rate to decrease. This has been the experience of the developed countries of the region. As mentioned earlier, those countries are enjoying very high per capita income, i.e. US$ 11,080 in Australia, US$10,080 in Japan, US$7,700 in New Zealand and US$5,240 in Singapore. As a result, the crude birth rate in these countries compared to selected less developed countries is low (see Table below).

Table 5. Crude birth rates of developed vis-a-vis less developed countries.

Developed		*Less Developed*	
Japan	12.9	Bangladesh	44.5
Singapore	17.3	India	32.9
Australia	15.8	Nepal	41.5
New Zealand	16.2	Pakistan	42.3

Source: 1983 ESCAP Population Data Sheet.

The trend of the birth and death rates in the developed vis-a-vis the developing countries is illustrated in the graph below.



Source: World Bank, *The Development Data Book*, 1984.

It appears that development is quite an effective contraceptive. This, however, does not necessarily mean that rising income directly causes a decline in the birth rate. Rather, the processes and conditions which lead to, and result from an increase in per capita income usually cause a number of changes in attitudes which in turn bring about an eventual decrease in the birth rate. As a family earning reaches a certain level of living, that family can afford to send their children for higher education, which invariably leads to a later age at marriage. Likewise, the family members are likely to acquire knowledge about family planning, and more importantly to avail themselves of family planning services when they get married.

A study of Father Frances Madigan in the Philippines also showed that economic development resulting from rural electrification, influences fertility behaviour. He found evidence that electrification led to better employment and higher income, which in turn, led to substantial decrease in birth rate. It was shown in the study that rural electrification stimulated businessmen to transfer to the community which was provided with electricity. Such businesses led to increased opportunities for employment and increased income. In the homes, electrification was regarded as satisfying a felt need, which the people had thought would never be met in their lifetime because of the expense, but which in fact had been met. Electrification of their homes required that families obtained loans from banks, relatives, or other sources. These loans were, in many cases, supplemented by the installment buying of some simple electrical devices such as an electric iron for ironing clothes. Regular monthly electricity bills were another commitment which these households had to meet from their limited cash resources. Pregnancy and another child at that time was seen as an event which would compete for the scarce resources available to repay credit installments for electrical goods and the monthly electricity bills.

Likewise, parents who had to work at home making such things as handicrafts for extra income, found that electricity made it possible to do so at night. Having a baby was seen as an obstacle, so most married couples voluntarily sought the family planning services available in their community, with a resulting drop in the birth rate.

A similar study carried out by Suchart Prasith-rathsint in Thailand showed that the use of modern technology such as fertilizers and pesticides, which is to some extent, a measure of development, is negatively related with fertility and the demand for children.

Activity

Undertake a mini-research in your library. Write a paper on "The Effects of Socio-Economic Development on Population Growth".

Many countries, however, cannot afford to rely only on socio-economic development to arrest rapid population growth. This is especially so in countries where even vigorous development efforts are being held up by unplanned population growth. Many developing countries with rapid population growth are already realizing that they have to try so hard even only to maintain the same low level of socio-economic development.

Sri Lanka has shown that it is not economic development alone which can contribute to the slowing down of population growth. Sri Lanka's birth rate was down to 29 per thousand by 1981 and 26.8 by mid 1983, and the annual rate of population growth had dropped. And yet the country is still economically less developed, with a per capita income of only US$300. The World Fertility Survey attributes the drop in fertility rate to the high level of education, especially among women; and the consequent higher age for marriage among them. The age at marriage in Sri Lanka is among the highest in the developing world – 28 for men and 24 for women.

Source: ESCAP Asia-Pacific Population Programme News. Vol. 12. No. 1. 1983.

Learning experiences in the formal education system

China is one country that is determined to speed up socio-economic development partly through population growth control. China did realize that it cannot wait for socio-economic development as a check to rapid population growth. And now that the crude birth rate has dropped from 45 per thousand to 21.1 per thousand in mid 1983, per capita income has risen by about 30 per cent.

Conclusion. Perhaps, the statement of Sun Jingzhi, a distinguished Chinese demographer provides a most apt conclusion to this chapter. He says that "The population problem is a socio-economic one, and economic conditions are determining factors in regard to changes in population patterns. Population growth and economic development are complementary, interdependent and act as constraints on each other.

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SOCIO-CULTURAL VALUES AND FAMILY SIZE

TEACHERS' GUIDE

Placement: Subject area: Civics or sociology-oriented social studies course.
Grade/Age level: Grades IX or X, age group 14 or 15

Message: Population-related beliefs and values. In many developing countries, socio-cultural beliefs and values which have contributed to the perpetuation of the large family size norm may be re-oriented or changed through population education.

Overview: This textual material deals with economic and cultural values in the Asian region that promote large family size. It also discusses what should be done about such beliefs and values in order to solve the problems arising from large family size and rapid population growth. It is not the intention of the chapter to alienate the students from their cultural heritage but to provide insights on aspects of that culture that present an obstacle to the attainment of quality of life and welfare.

It is strongly suggested that in taking up this chapter, emphasis should be laid on content that has relevance to local situations. Where inadequacies of the content are noted in the chapter, local additional information should be gathered to remedy them.

The study of the textual material may be divided into two lessons: lesson 1 – to cover economic and cultural values; and lesson 2 – values of large and small families. A lesson may take up one or two periods depending on the pacing of the learners and activities to be undertaken.

For purposes of determining the knowledge gain and attitude change of students after the study of the chapter, the accompanying test items should be given to the students before and after the study.

Objectives: At the end of lesson 1, the students will be able to:

1. Explain how certain economic values and other socio-cultural beliefs and practices related to children, marriage, son preference and role of women influence decisions on family size;
2. Analyze such beliefs and values in the light of present needs and conditions to determine whether they are still valid and relevant; and
3. Give their views on certain beliefs, practices and values related to family size.

At the end of lesson 2, the students will be able to:

4. Discuss the different values given to large and small families;
5. Weigh the advantages and disadvantages of having a large or a small family; and
6. Conclude that socio-cultural beliefs and values related to family size which do not contribute to family and national welfare and quality of life should be rejected and changed.

Learning experiences in the formal education system

Teaching hints:

Lesson 1

1. Assign students before the lesson to collect local beliefs, practices, sayings, songs related to fertility.
2. Discuss in class how these beliefs and values contribute to large family size.
3. Have students role-play situations depicting such beliefs, customs and traditions.
4. Let students analyze the merits and demerits of different beliefs and values.
5. Have students write on any of these topics:
   a) What I think of son preference,
   b) Women's place is in the home,
   c) Having many children is a sign of manliness,
   d) Marriage without children.

Lesson 2

6. Assign students to conduct a community survey to find out reasons for having large or small families and discuss findings in class.
7. Discuss advantages and disadvantages of a large or a small family.
8. Hold a class debate on: A small family is better than a large family.
9. Ask students to prepare posters counter-acting the influence of pronatalist beliefs and values.

Test items

I. *Cognitive*

Directions: Encircle the letter of the correct or best answer.

1. Which of the following beliefs is likely to influence couples in having many children?
   a) Three sons or daughters in a row followed by another offspring of opposite sex will bring luck to the parents.
   b) Marriage is a lifetime commitment.
   c) One who is not grateful to his parents will not prosper in life.
   d) None of the above.

2. One who believes that "The more the children, the happier the family", will:
   a) only have one or two children
   b) have as many children as he can have
   c) limit the size of his family
   d) marry late
3. Couples who want to have many children because they believe that children are security in old age may be convinced to discard such belief by giving the following argument:
   a) Children do not always turn out to be assets to parents; they can be liabilities even after marriage and have families of their own.
   b) One need not have so many children to be assured of security in old age; a few but well-brought up and educated children can help more their parents in old age.
   c) Many children will mean more sacrifice on the part of the parents.
   d) Many children will give husband and wife little or no time for each other and their children.
4. The son preference of a couple will:
   a) make the couple adopt a son after they have three daughters in a row
   b) make the couple keep on trying until they beget a son although they already have several daughters
   c) strain the relationship between husband and wife
   d) none of the above
5. Believing that manliness is demonstrated by a big number of children will make the husband:
   a) want more children in the family
   b) adopt family planning
   c) seek the assistance of a physician
   d) have affairs with several women
6. One of the advantages of a large family is:
   a) children will be better educated since they will be able to learn from each other
   b) it is cheaper to raise children by the dozen to help
   c) the family's health is preserved
   d) father and mother will have many helpers at home and in the field

7. A small family is better than a large family because:
   a) bearing only a few children will not disfigure the mother.
   b) the mother's and baby's health are preserved.
   c) parents of small families are given rewards by the government.
   d) many children die in their infancy.

8. The belief "children are security in old age" means that:
   a) children will make their parents beneficiaries of their insurance
   b) children will have to guard their parents when they become old
   c) children will look after their parents when they are already old and can no longer take care of themselves
   d) all of the above

9. Which of the following beliefs is the least likely to be true?
   a) Getting childless persons as wedding sponsors will make the newly wed barren also.
   b) It is necessary to have many children to ensure that at least one will survive to adulthood.
   c) An only child can become spoiled.
   d) Large families are happy ones.

10. Beliefs and practices which do not contribute to family and national welfare should be:
    a) rejected
    b) accepted
    c) preserved
    d) none of the above

II. *Affective*

Direction: Put a tick (√) in the column that best describes your feeling and opinion about each of the statements below

	Strongly Agree	*Agree*	*Do not Know*	*Disagree*	*Strongly Disagree*
1. A son is better than a daughter.					
2. A large family is happier than a small family.					

	Strongly Agree	*Agree*	*Do not Know*	*Disagree*	*Strongly Disagree*
3. A woman's role is only that of child-bearing.					
4. A childless marriage is not a successful marriage.					
5. A man can only be considered manly if he has a big number of children.					
6. A small family has more advantages than a large family.					
7. A person would only have the number of children that he can decently bring up.					
8. Many children are a sure guarantee that parents will be looked after when they grow old.					
9. Parents of small family have more time to bring up children better.					
10. Women should not be allowed to work outside the home.					

Socio-cultural values and family size

Introduction. In the past, population growth was considered a natural phenomenon like birth and death. Child-bearing was considered a God-given gift and a sacred duty and, therefore, something that should not be tampered with. Hunger, poverty, pestilence were accepted with resignation. The idea that the very same people who were the victims of hunger, poverty and other deprivations were also one of the causes of such deprivations because of their unplanned and uncontrolled growth came much later. As reliable and adequate information on the size and growth of population and its implications to socio-economic development became available, governments of developing countries started to realize that un-

planned population growth resulting in rapid population increase poses a big stumbling block to their progress and development. For most of these countries, a lower rate of population growth becomes a shared and desirable goal.

As early as the 1960s, the governments of 16 developing countries in the Asia and Pacific region adopted population policies which discouraged large family size and rapid population growth. However, in spite of their avowed commitment and efforts to reduce the rapid population growth of their countries, not much substantial gain has been achieved towards this end except in China, Republic of Korea and Sri Lanka.

One of the reasons for the continuing momentum of rapid population growth in most developing countries are the socio-cultural beliefs and values that promote large family size. These beliefs and values will be the focus of this chapter. For purposes of discussion they will be loosely and broadly grouped as economic values and cultural values.

Economic values. A common value among the developing countries in Asia is one that deals on the economic benefits of children. People are often heard to say that "More children means more helping hands at home and in the field", "Children are the security of parents in old age", and that "More children means more income for the family".

In the rural areas especially, children are used as helpers on the farm as early as age nine if not earlier. They help in planting, weeding and harvesting agricultural products. At home, they look after their younger brothers and sisters, take care of the elderly, help in the household chores such as cooking, cleaning, fetching water. In small family businesses, such as stores, restaurants, and handicraft making, they serve as valuable helpmates to supplement the family income. In the Philippines, for instance, teenage girls and boys from rural families are employed as house helpers so that they can help their families financially.

Child labour on the farm

In Asia and the Pacific where few countries provide adequate pensions for old people and where only those employed by the government and big business and industrial firms get this pension, parents expect their children to provide for them in their old age. The more children they have, the more they are assured of economic support, physical care and attention when they are old and can no longer earn and take care of themselves. Consequently, children are never looked upon as a financial burden. For many parents, the idea that children have to be fed, clothed, sheltered, educated and provided other needs for 10 to 15 years or so before they can become producers and earners is seldom considered. Parents rarely also take into account the fact that opportunities of children to get higher education and thereby improve their earning capacity become limited as the number of children in the family increases, given the limited income of that family.

Cultural values. Countries in the region share cultural beliefs and values that promote large family size.

Preference for sons. A common cultural value that is typically Asian is son preference. In China, sons are preferred over daughters. "No sons begets many children" runs a Chinese proverb. A family that cannot beget a son has to keep on trying for a male child. This is because the sons in China are the ones expected to take care of parents in their old age. Daughters upon marriage leave their parents and are not duty bound to look after them. Sons are also preferred in order to prepetuate the father's name and burn incense before his tablet after his death.

In the Philippines, sons are desired for the continuity of the family name. Daughters when they marry drop their family names and acquire the family names of their husbands.

An Indian woman in order to achieve status and power must have at least a son but preferably several. Sons in India are needed to continue the family, provide protection and perform religious rites for the father's soul in accordance with the Hindu religion. Sons also bring in dowries, and in the rural areas provide free labour for parents.

The Sri Lankan preference for sons stems from the desire to have someone carry on the family name and inherit the ancestral property.

No wonder families in the Asian region especially those in the rural areas keep on trying to have at least a son no matter how many daughters they already have. The boy preference, though, appears to be fading in the Philippines. This is largely due to the emanicipation of women from the traditional roles of wife and mother. Now you can see many women occupying positions that were once solely men's such as working in the office, engaging in business and becoming politicians. In Sri Lanka, son preference is also fast waning. Daughters have proved to be equally useful in many ways. In many instances, they have demonstrated that they are even better than sons in taking care of parents in their old age.

Marriage-related beliefs. There are many beliefs related to marriage which promote large family size. In the Philippines, the newly wed couple is showered with rice as they leave the church door or as they go up the house after the marriage

ceremony. This is to insure prosperity and many children. In some places, the bride is spoon fed boiled bean seeds in the hope that this will enable her to beget many children. Couples who are barren are not selected as wedding sponsors. It is feared that the young couple might take after them and become childless, too. A marriage is not considered successful if it does not produce children so that a childless couple is looked down on and pitied. Relatives and friends also expect a young couple to have a child within the first year of marriage. Not to conform to this expectation exposes the husband to ridicule and to being branded as inept and less of a man. A man is generally considered a weakling and not manly if he has only one or few children.

Showering rice on a newly wed couple in the Philippines.

In Sri Lanka, the main event at a Sinhala wedding is the "Paruwa Ceremony". The bride and groom are led on to a low platform, beautifully decorated, and sprinkled with rice while the traditional marriage rites are performed. Spreading rice on the *paruwa* is done to signify prosperity and many offspring for the couple.

All of these beliefs and values tend to encourage couples to have many children in order to live up to the expectations of relatives, friends and society.

Beliefs related to the role of women. The traditional role of women favours having many children. Women's place is believed to be in the home and her main role is to beget and raise children. In some Muslim countries, women who cannot bear children can be divorced by their husbands. In India, brides are greeted with the traditional wish, "May you be the mother of eight sons". And in order to demonstrate her value to the extended family, an Indian wife must bear and raise a large number of children.

Activity

1. Compile a list of beliefs, practices, songs and sayings in your community that are related to family size, children, marriage, son preference, and role of women. You can ask your parents and the old people in the community about them.
2. How do they promote large family size?
3. Do you believe in these beliefs?

A closer look at family size-related values. Values are developed over time and handed down from one generation to another. They are learned from the social environment – from parents, relatives, neighbours, friends, the school, the church and the community. However, values should not be accepted just because they were found useful in another time or place. Values may have to be changed or modified if they are to serve the useful purpose of guiding behaviour for the better because behaviour, particularly fertility behaviour should respond to the needs and conditions of families and societies. Family and societal needs and conditions seldom, if ever, remain the same over a period of time. Correspondingly, values and behaviour should be adapted to changed needs and conditions. It is in this light that values related to family size should be closely looked at and examined to determine if they are consistent with the demands of new needs and conditions. If found contributing to individual, family and societal welfare, they should be accepted and maintained. If found adversely affecting the quality of life of families and communities, they should be rejected.

Oftentimes, value conflict arises when there are different models of values to choose from, like, for instance, when one value is taught in the school, and another at home. Conflict also crops up when one is faced with a decision to select from two good values. One way by which to resolve such conflict is to examine and weigh alternative choices by bringing out their advantages and disadvantages, their desirable and undesirable aspects and their consequences to one's self, one's family and one's community or nation. This exploration can provide the basis for decisions and subsequent action.

Let us take a closer look at the following values attached to a large and a small family. This is an example of two sets of values perceived to be equally good. These values are presented to show the two sides of a small and a large family. The advantages of one become the disadvantages of the other. By weighing the pros and cons of these values a decision on which family size to choose and accept can be reached.

Reasons for large families	**Reasons for small families**
Health values	
Since many children die in their infancy, it is necessary to have many	The mother's and baby's health is preserved. Father's health is also main-

children to ensure that there will be someone to survive.

tained because he need not work so hard. Both mother and father will also have time and resources to look after the health of their children.

Economic values

Children add to the income of the family and will be the support of parents in old age.

Living expenses will be less for a small family. The family will have enough to buy the comforts of life and still save for old age.

Family welfare values

The larger the family, the more chances to learn from each other, and the more there will be to help the members. Furthermore, larger families are happy families.

Parents can have more time and attention to rear or bring up children better. There is no tension brought about by insufficient resources in the family. So the family is happy and well-cared for.

Marriage-related values

A marriage is not considered successful without children. An only child or few children in the family are likely to get spoiled and less likely to adjust easily with their future spouses.

Children from smaller families are less likely to suffer tension while being brought up, hence, are likely to have cheerful dispositions even during marriage.

Personality-related values

The more children they have, the more husbands are able to demonstrate their manliness.

The less the number of children the more chances the wives and husbands will have to engage in activities that will give them self-satisfaction and enjoyment.

Moral values

Many children in the family are God's blessings.

A person who has more children than he can decently bring up is morally irresponsible.

Cultural values

"Parents of the Year" awardees are those who have many successful children.

Parents with large families are likely to add to social problems.

Activity

1. Make a list of other advantages and disadvantages of a small and a large family to add to the list presented in the chapter.
2. Which family size would you like to have, a small or a large family?
3. Conduct a survey to find out the number of large and small families in you community. Ask their reasons for having large or small families. Discuss the findings in class.

Conclusion. In the countries of Asia and the Pacific, socio-cultural beliefs and values related to benefits of children, preference for sons, marriage, and role of women are up to the present exerting an influence in promoting large family size. Although the influence of some of these beliefs and values is waning in one or two countries, these beliefs and values still appear to be playing a major role in the decisions of many families and couples regarding family size. To help governments of developing countries to be successful in curbing the rapid growth of their population, there seems to be a great need to change or re-orient prevailing socio-cultural beliefs and values that influence decisions and subsequent behaviour on family size. Values are embedded in a people's culture so that they cannot be changed overnight. Value reorientation on family size is a long and difficult process, but it has been demonstrated in a number of countries in the region that it can be done. And the time to start doing that is now.

APPENDICES

Appendix A

Yupparaj Wittayalai School

Two lesssons, one in social studies and another in science, were tried at Yupparaj Wittayalai School in Chiangmai, Thailand. It is the first Government school in the city and was founded in 1899. It was established to serve as a demonstration school for training young people in the northern region. Chiangmai, in which it is located, is the most important hill resort of the country and is the second largest city, next only to Bangkok. One of the aims of the school is to encourage the individual to be a diligent, disciplined and faithful citizen with a wholesome, law-abiding approach to life.

Yupparaj (which means Prince) Wittayalai continues to reflect the national policy and hence its objectives to provide:

1. General education for every student, to teach them to be good citizens, able to live happily and co-operatively in a complex society;
2. Higher education for students wishing to further education to tertiary level; and
3. Vocational education, developing students skills in different vocational subjects according to each individual's aptitude, attitude and interests.

The school imparts instruction at the secondary level i.e. grades VII to XII. It has 60 sections. The school has spacious premises – 12 acres in all. Mr. Somchai Nopecharoenkul is the current school director. The school faculty consists of over 180 with about 2,800 students.

The participants of the Workshop visited the school on 19 July 1984 and observed its daily activities including the flag hoisting and singing of the national anthem, religious prayer and so on. The school hours are from 08:15 a.m. to 03:45 p.m. for the youngster and from 5 to 9 p.m. for the adults.

Appendix B

OBSERVATION GUIDE

Name of Observer: _____

Class Level/Grade Observed: _____

Subject Area: _____

School: _____

Title of Textual Supplement: _____

_____

1) What were the objectives of the lesson?

_____

_____

_____

2) Did the objectives reflect the core message(s) in the textual supplement?

_____ Yes _____ No

3) How was the textual supplement material used?

_____ read during the lesson

_____ read as an assignment before the lesson

4) Did the teacher prepare enlarged charts for the illustrations and figures in the material?

_____ Yes _____ No

5) Did the teacher use other charts, posters etc., to supplement the textual material?

_____ Yes _____ No

6) Did the teacher use other reading materials?

_____ Yes _____ No

If yes, what were these?

_____

_____

_____

_____

7) Did the teacher follow all the suggested activities in the material?

_____Yes _____No

If not, which were not followed and why?

_____

_____

8) Which of the ideas or concepts in the lesson in your opinion were more important?

_____

_____

9) Which of these ideas were developed effectively?

_____

_____

10) Which of the ideas were not developed effectively?

_____

_____

_____

11) Which of the ideas were developed ineffectively owing to their difficulty and irrelevance?

_____

_____

_____

Appendix C

EVALUATION QUESTIONNAIRE FOR PRETESTING OF SUPPLEMENTARY READING MATERIAL

Name of Tryout Pre est Teacher: _____

Year/Grade Level of Pretest Class: _____

School and Address: _____

_____

Title of Material Pretested: _____

_____

A. **Title**

1. Did you find the title of the material suitable to the content?

_____ Yes _____ No

If not, what title would you suggest?

_____

_____

_____

B. **Content**

2. Did you find the content of the material useful suitable for the needs of your class?

_____ Yes _____ No

If not, why not?

_____

_____

_____

3. Did you find the content suited to the interest level of maturity of your students?

_____ Yes _____ No

If not, which parts were too difficult to understand?

_____

_____

4. Did your students find the content interesting?

_____ Yes _____ No

If not, which are not interesting?

_____

_____

_____

5. Is there any information or facts in the content found not to be true, accurate and up-to-date?

_____ Yes _____ No

If yes, which ones?

_____

_____

_____

6. Is there anything in the content found to be objectionable or unacceptable?

_____ Yes _____ No

If yes, which ones?

_____

_____

_____

7. Did you find the content adequate enough for the topic theme of the material?

_____ Yes _____ No

If not, what additional contents would you want included?

_____

_____

_____

C. Activities

8. Did you find the activities adequate?

_____ Yes _____ No

If not, what other activities can you suggest?

9. Did you find the activities practical and easy to do?

_____ Yes _____ No

If not, which ones?

What activities can you suggest to replace them?

D. Illustrations and figures

10. Did you find the illustrations and photographs suitable?

_____ Yes _____ No

If not, which ones and why?

11. Did you find them accurate and factual?

_____ Yes _____ No

If not, which ones?

12. Did you find the figures and diagrams easy to interpret?

_____ Yes _____ No

If not, which ones?

13. Did you find the need for additional illustrations and diagrams?

_____ Yes _____ No

If yes, what would you suggest?

E. **Vocabulary/Language**

14. Did you find the vocabulary in general to be appropriate to your students?

_____ Yes _____ No

If not, why not?

15. Are there words or terms which your student found difficult to understand?

_____ Yes _____ No

If yes, which ones?

F. Others

16. Did you find the format or physical lay-out of the materials attractive?

_____ Yes _____ No

If not, why not?

17. On the whole, what other suggestions can you give to improve the material?