

POPULATION, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

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Introduction

When the total population of Sri Lanka was small and its rate of growth slow, it was possible to support the growing numbers of people and nature appeared to have few limits.

Today a population of over 17.7 million people uses resources and generate waste faster than ever before. Therefore, we now begin to see nature's limits. Pollution of the air and water, destruction of forests and loss of fertile soil are becoming critical issues, with consequences for health, food production, productivity and employment.

Concern about conserving nonrenewable resources such as minerals and ground water is not new. What is new is the growing recognition that essential resources once thought to be renewable such as air, fertile soil and water are threatened by the combination of population growth and increased per capita consumption of food, energy and other goods.

Thus population growth endangers the environment because each additional person adds an increment to the demand on the environment making the situation a little worse. Each person's demand is multiplied by varying degrees by his affluence or consumption and by technologies used in the production and consumption of goods and services.

For a given population size, per capita consumption of common property resources may be altered by institutional arrangements through optimal resource management. These may take the form of imposition of user fees, rationing and licensing, or outright legislated levels of use. Once this is done, however, a second problem remains. For even if the level of use is regulated for the existing population, there is still free access to the resources through reproduction. The optimal level of use per person depends on the number of people. Under optimal management, when the population is larger each person will be entitled to less use of resources. Thus the free access to resources through reproduction has been referred to as "the second tragedy of the commons" (Lee,1991).

Thus human numbers with their consumption of resources, plus technologies used to supply that consumption, are using up renewable resources faster than their rate of natural replenishment. Therefore, population control becomes an essential requirement for sustainable development.

Population Growth Trends

Since the first census taken in 1871 up to 1946, Sri Lanka's population grew at a slow pace with an average annual growth rate of about 1.4 per cent. During this period mortality levels remained relatively high and as a response, fertility levels also remained high resulting in slow growth of population. The rate of population growth would have been slower if not for the migration of Indian labour to the tea plantations that took place during the early decades of this century. The years immediately after 1946 saw a rapid growth of Sri Lanka's population. It can be seen from Table 1 that it took 75 years for the country's population to increase by about four million between 1871 and 1946. However, it took only 35 years for the country's population to add another eight million between 1946 and 1981. The doubling of population from three to six million took about 50 years, while the subsequent doubling from six to twelve million has taken only 25 years. Rapid decline in mortality resulting in widening the gap between fertility and mortality levels was the chief cause of this acceleration of population growth.

Table 1: Growth of Population, 1871-1991

Year	Population (000)	Population increase (000)	Average Annual Growth Rate (%)
1871	2,400	-	-
1946	6,657	4,257	1.4
1981	14,847	8,190	2.3
1991	17,261	2,414	1.5

*Sources: Census of Population; Population Division
Ministry of Health and Women's Affairs*

However, during the past two decades the rate of growth of population has declined mainly due to the fall in fertility and increased out-migration. Although considerable progress has been made in reducing the rate of population growth, Sri Lanka still adds more than 200,000 people to its population annually, which is about the same number that was added to the population in the 1950s when the growth rate was about 2.8 per cent. Therefore, continued growth of population even at the current rate of 1.4 per cent would double the population to 35 million around the year 2040.

It can be seen from Table 2 that the total population of the country will increase from 17.3 million in 1991 to 19.3 million by 2001 and to 23.4 million in 2026. The population size would eventually stabilize at about 25 million if fertility is brought down to replacement level by the end of this decade. On the other hand, if fertility levels

continue to prevail at current levels, population will increase to reach 19.6 million in 2001 and to 26 million in 2026 and continue to increase rapidly in absolute numbers thereafter.

Table 2: Population Projections, 1991-2026

	1991	2001	2006	2016	2026
Projection A					
Population (000)	17,261	19,337	20,332	22,129	23,385
Average Annual Growth Rate (%)	-	1.2	1.0	0.8	0.6
Projection B					
Population (000)	17,261	19,628	20,943	23,535	25,961
Average Annual Growth Rate (%)	-	1.3	1.3	1.2	1.0

*Note: Projection A assumes replacement fertility by year 2001
Projection B Assumes constant fertility as at 1991.*

Agriculture and Population Pressure

As each person in the population has minimum food requirements, growth of population increases the overall amount of food needed. However, economic factors influence both food consumption and food production. On the consumption side, much of the increase in demand depends on the purchasing power or effective demand of the consumers. On the production side, population growth can have either positive or negative effects. In sparsely populated subsistence agrarian economies, population growth can raise food production by increasing the number of agricultural workers per given area of cultivable land. However, in a given area if population density is high and population continues to grow, the amount of food produced per worker may decline.

In Sri Lanka during the past four decades population increases have outpaced improvements in agricultural technology. For instance, paddy production increased from about 300 metric tons in 1950 to more than 2,500 metric tons in 1990. An eight fold increase over a period of 40 years. However, Sri Lanka has not yet reached self sufficiency in rice. During 1950 to 1990 about 10 million people have been added to the population. It can be seen from Table 3 that despite the remarkable increase in paddy production, output per person has increased at a much slower pace.

Table 3: Growth of Paddy Output and Population, 1951-52 to 1989-90

Period	Paddy output (000' metric tons)	Population (000)	Output per person (metric tons)
1951-52	463	7,975	0.058
1960-61	901	10,032	0.090
1970-71	1,396	12,608	0.111
1980-81	2,229	14,740	0.151
1989-90	2,538	16,900	0.150

Source: Department of Census and Statistics

Paddy production has grown as a result of increase in area and productivity. The area under paddy cultivation increased as a result of colonization and settlements in the Dry Zone. During 1971 to 1982 increases in area under cultivation and yield per unit area have equally contributed to total paddy production. However, since 1986 production increases have been mainly due to the result of more area being sown. Agricultural production over the past 40 years has brought most available land under use. Therefore further increases in paddy output will have to come from increased productivity. The application of chemical fertilizer to increase productivity is a major concern.

There is no doubt that the major share of calorie requirements will continue to be provided by rice. Therefore, on the assumption of a per capita minimum requirement of 2500 calories per day and that about 60 per cent of calorie requirements will continue to come from rice, the paddy production requirements for the growing population are given in Table 4. It can be seen that with slower population growth rates, there will be less pressure on paddy production and in turn less effects on the environment.

Table 4: Paddy Output Required to Meet Basic Calorie Requirements, 1991-2026

	(000' metric tons)				
	1991	2001	2006	2016	2026
Projection A	3,985	4,465	4,694	5,109	5,399
Projection B	3,985	4,532	4,835	5,528	5,994

Note: The projections A and B are based on the respective population projections given in Table 2.

Growth of Labour Force

Relatively high fertility that was experienced in the 1970s has resulted in the labour force growing at a higher rate than the population. While the population growth rate is around 1.4 per cent, labour force increases at a rate of 2.2 per cent. This has contributed to a situation where the annual inflow to the labour force is far in excess of the outflow. Annually there are about 280,000 young people entering the labour force in search of employment and about 120,000 older people withdrawing from the labour force resulting in a net addition of about 150,000 for whom new employment opportunities have to be created. Given the backlog of unemployed of over a million people, annually about 200,000 new jobs need to be created to reduce the present unemployment rate of about 14 per cent to about 5 per cent by the end of the decade.

Therefore, excessive growth of population results in faster growth of the labour force and in turn puts pressure on the employment market. Employment creation requires increased production of goods and services. Therefore, due to the urgent need for employment creation, environmentally sound industrial planning and legislation required to protect the environment may be difficult. A case in point is the problem of erosion in the south western coast, aggravated by the mining of coral reef. There are about 3000 people engaged in coral mining and another 8000 dependent on this activity.

It can be seen from Table 5 that the net additions to the labour force would gradually decline if fertility is brought down to replacement level by the end of this decade. On the other hand if fertility were to continue at present levels, the net additions would continue to remain at an unmanageable level.

Table 5: Net Additions to the Labour Force, 1991- 2025

(000)

	Projection A	Projection B
1991	148	148
1996	151	150
2001	141	141
2006	118	120
2011	94	107
2016	76	106
2021	63	109
2026	53	110

Note: Projections A and B are based on the same assumptions as indicated in the foot note of Table 2 with regard to population.

Forest and Population Pressure

Deforestation resulting from converting forests to agriculture and residential use is becoming increasingly critical in many developing countries. Sri Lanka is no exception in this regard. In 1881, the natural forest cover was estimated at 84 per cent of the land area of the country. By 1991 forest cover has declined to about 24 per cent. Deforestation from 1956 to 1983 has averaged about 42,000 hectares per year largely due to shifting cultivation (NARESA,1991).

Population pressures have also contributed to deforestation by increasing the demand for fuelwood. It is estimated that about 25 per cent of fuelwood requirements come from high forests. The proportion of fuelwood coming from high forests is likely to increase in the future.

The wet zone which is already densely populated will have a drop in fuelwood supplies with more rubber wood being diverted for industrial use. This would increase the cutting rates of natural forests in the wet zone. It can be seen from Table 6 that in the estate sector, household requirements of firewood have increased during 1981-82 to 1986-87 period. Although the overall household requirements of firewood have declined, the demand for firewood is still substantial.

Concluding Comments

It is clear from the foregoing discussion and available research evidence that population factors have a distinct impact on environment and vice versa. In spite of the decline in the rate of population growth to about 1.4 per cent, population growth is still an important issue, particularly in terms of environmental deterioration. Thus, both population and environmental concerns must be integrated into social and economic development plans in order for development to be sustainable. As certain environmental problems may not be visible in the short run, for purposes of environmental and population planning, a longer-term approach should be taken in addition to the short term strategies.

To achieve the goals of maintaining or improving environmental conditions it is necessary that excessive population growth be slowed and eventually stabilized. It is estimated that if replacement level fertility is achieved in Sri Lanka by the end of this decade, the population will eventually stabilize at about 25 million by the middle of the 21st century. To achieve the goal of replacement level fertility, the contraceptive prevalence rate needs to increase to 72 per cent. The financial resources required to meet this goal is estimated at US \$25 million. Therefore the task before us is a challenging one.

Table 6: Quantity of Firewood Used per Household per Day by Source of Firewood and Sectors 1981-82 and 1986-87

	(grams)	
Source of Firewood	1981/82	1986/87
Urban		
Own Garden	142	134
Other Garden	125	132
Government Forest	43	31
Purchased	796	577
Other	12	43
Total	1,119	918
Rural		
Own Garden	687	615
Other Garden	451	400
Government Forest	203	183
Purchased	204	160
Other	13	22
Total	1,562	1,380
Estate		
Own Garden	148	255
Other Garden	941	1,121
Government Forest	223	229
Purchased	61	27
Other	173	167
Total	1,547	1,799
All Sectors		
Own Garden	548	500
Other Garden	427	411
Government Forest	175	159
Purchased	302	223
Other	24	37
Total	1,477	1,332

Sources: Reports on Consumer Finances and Socio-Economic Surveys, 1981/82 and 1986/87, Central Bank of Sri Lanka.

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