# LAND AND LAND USE IN SRI LANKA

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# யாழ், மாநகர சபை

# முக்கிய அறிவித்தல்

**பொதுசன நூலகம்**

**யாழ்ப்பாணம்.**

நீங்கள் எடுத்துச் செல்லும் புத்தகத்தில் கீறுதல் வெட்டுதல் கிழித்தல் அழித்தல் அழுக்குப்படியவிடல் மற்றும் ஊறுபாடுகளை செய்ய வேண்டாமென மிகத் தாழ்மையாகக் கேட்டுக் கொள்கின்றோம். புத்தகங்களை நீங்கள் எடுக்கும்போது இப்படியான குறைபாடுகளைக் கண்டால் நூலகப் பொறுப்பாளருக்கு உடன் தெரிவிக்கவும். அல்லாவிடில் நீங்கள் எடுத்துச் சென்ற புத்தகம் நல்ல நிலையில் இருந்ததெனக் கருதப்படுவதுடன் ஊறுபாடுகளுக்கு நூலகப் பொறுப்பாளரினால் விதிக்கப்படும் தண்டத்தை நீங்கள் ஏற்கவேண்டிய நிர்ப்பந்தமும் ஏற்படும்.

# LAND AND LAND USE IN SRI LANKA



*Papers Presented at the Symposium*

*March 15th & 16th 1991*

*At Centre for Society and Religion*

## INTRODUCTION

In this issue of LOGOS we publish the papers presented at the symposium on "Land and Land use in Sri Lanka" organised by the Centre for Society & Religion on the 15th.& 16th. of March 1991.

The rationale for having this symposium

1. Land is vital for human existence - for cultivation, for housing. Civilization and culture are also intimately connected with land, ecology and nature.

2. Human beings suffer much due to lack of land for their needs.

3. Land so vital for humanity can be improved or its usefulness reduced and even destroyed by human activity.

4. Land, water, environment so important for human life, is so often not given adequate importance in government policy and planning.

5. Land is considered a primary right. Ownership of land is said to give a people a right over the ground under it, the space above it and the seas adjoining it.

6. Many conflicts and disputes have occurred within nations and among nations over land, water and ecology. Colonial empires were a grabbing of land by the more powerful nations, with a consequent domination over weaker peoples. World wars 1 and 11 had much to do with colonization and the possession of land and resources by the big powers.

7. National resources inherent in land, in the seas have been the cause of many disputes and also abused by humanity.

8. Despite the importance of land for human life, its global aspects hardly enter the content of economics, ethics, philosophy and theology.

9. The present control of land by the nation states leaves little room for a just distribution of land among the world's population.

10. International migration is an important means of bringing about the redistribution of land among the peoples of the world. During the period 1492 to 1945 the Europeans peoples took over the land available for cultivation. They implemented immigration laws that were in favour of the White races. The post World War 11 world order is based on this expansion of the white races into the rest of the world. This system is now held up by the world powers as the international order. Is this a just order of land distribution? How was it brought about and how is it maintained today?

*11. At present the prevailing positive international law is concerned with the maintenance of this present land distribution among nations rather than with its equitable use and distribution among nations according to human needs and ecological considerations.*

*12. The United Nations and the US system is not geared towards bringing about a just distribution of land in the world. Its role is more the preservation of the world order as it emerged after world War 11.It has been concerned with de-colonization, but not with a remaking of the map of the world according to the needs of the world's population. The UN agencies such as the Security Council, the International Monetary Fund (IMF), the World Bank for Reconstruction and Development, the General Agreement on Trade and Tariffs (GATT) and even the UN Conference on Trade, Aid and Development are not geared towards the solution of the global problems of land. The General Assembly of the UN is incapable of dealing with the disputed issues on land on the basis of justice. The big powers still dominate the UN, as they did the League of Nations.*

*13. There is no internationally accepted means of bringing about a just distribution of land to population. Nor is there a means of correcting the injustices or settling disputed issues that flow from the world order set up after colonialism. Thus the problems of Goa, Timor and the Falklands (Malvinas) have been resolved by arms. The issues of Hong Kong are being settled by big power negotiation between Britain and China without the people of Hong Kong having a real say in*

*the decisions. Gibraltar and Aden remained unsettled. The future of Kuwait and the Gulf region is now being fought out in the Gulf War. This is a major lacuna in international law and relations.*

*14. Religions too have not given much attention to these issues*
*There is some reflection on land ownership and use within countries but not at global level.*

*This particular symposium held in March was a part of a larger and on-going programme of the CENTRE to focus on this important issue of Land, locally and internationally.*

*These papers presented at the symposium and now printed in this LOGOS issue, we hope, will be valuable and helpful for the Sri Lanka preparation for the World Conference organised by the UN to be held in Rio de Janeiro, Brazil in June 1992 - "The United Nations Conference on Environment and Development."*

# LAND AND JUSTICE

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## 1. LAND

In classical economics the factors of production are land, labour, capital and organization. Of these, the factor which is basically limited is land. While capital (money) has been increasing, technology has been developing and the world wide population has been growing, the land available for human use is limited. It may even be said to be decreasing qualitatively due to environmental pollution, and proportionately to population due to the increase in population in many parts of the world.

Land is extremely important for human life. Housing, food production, and resources depend on the quantity and quality of land that a community possesses. The land base is the initial given for a people's standard of living and way of life. Land-population relationship is a primary factor in human relationships. Population changes have an impact on this ratio and on international relationships. There have been no peaceful means of adjusting globally the earth's land to the needs of changing populations. Issues of land are ultimately resolved by force. Hence those who have physical power have the advantage in land ownership and use.

Many of the world's conflicts have been related to land - thus the wars of territorial expansion and the World Wars I and II of this century. The population without land tend to move to the land available for cultivation. Peoples who are powerful tend to take over the lands of others, as has happened historically on all continents and is happening in the Gulf region today.

## Quality of the land

The direct usefulness of land for human habitation and living depends on the quality of the land. In some countries much of the land may be desert as in Australia or the Sahara. The area that has to be left for forests, though necessary, may also not be directly available for cultivation. It is thus possible to speak of the land that is cultivable. The water required for cultivation depends on natural sources such as rainfall, the rivers and lakes and the ground water. The irrigation policies of a country may increase the quantity and quality of cultivable land; they may alter the pattern of cultivation as well as the regional distribution of population.

Industry also uses the resource base of a land. Some lands such as the Middle East or Siberia may be richer in known resources than other lands. Industrial development has transformed agriculture through mechanization of farm equipment and consequent increase in the size of the farm. Industry also affects the quality of land through its supply of inputs, (such as fertilizers, weedicides and pesticides), its processes, use of resources, effluents and waste.

The significance of land for people has changed with the development of the processes of production. Land for hunting did not mean stable private ownership. Land in agricultural societies led to private ownership. Land in industrial society is the basis of resources. The importance of land in an urban area may be primarily for human habitation. The modern electronic revolution in industry is reducing the need of land and even labour for production.

Some issues relevant to justice are:

| | | |
|---|---|---|
| land availability | land ownership | land use |
| land development | size of holdings | food production |

## Land and culture

A people identify their national interest and their future as a community with the land that they have been occupying for generations. For many peoples land is sacred. It is considered God-given and inalienable. Hence it is not a marketable quantity. It is priceless. It is the burial place of the ancestors; the receptacle of the remains of the present and future generations. It is said to be marked with the blood of the people, improved by their sweat. Land thus becomes the native land, the motherland from which a person is born and to which one returns after death. The Native Americans considered themselves as belonging to the land, and not the other way round of the land belonging to them.

> *"This shining water that moves in the streams and rivers is not just water but the blood of our ancestors. The water's murmur is the voice of my father's father. The red man has always retreated before the advancing white man, as the mist of the mountains runs before the morning sun. But the ashes of our ancestors are sacred. Their graves are holy ground, and so these hills, these trees, this portion of the earth is consecrated to us.*
>
> *We know that the white people do not understand our ways... They leave their ancestors' graves behind, they do not care. ...They treat their mother, the earth, and their brother the sky, as*

*things to be bought, plundered and sold like sheep or bright beads. Their appetite will devour the earth and leave behind only a desert."*

(from Speech given by Chief Seattle in 1854)

Land is the mother that nourishes a people from generation to generation. For the defence of their land people give their lives. The young, especially males, are motivated towards this.

This attitude and claim is seen in the attachment to the land - of the Aboriginal peoples in Australia, of the Maoris in New Zealand, of the Native Americans in the USA and Canada. Hence their claim and struggle for land rights even today

The social relations among persons and communities also relate to land ownership and cultivation systems. In feudal society status was very much dependent on the relation to land Rights of ownership were said to be conferred by kings to the nobles in return for services. The landowners were also the feudal lords. The landless workers lived more or less for the landowners In Sri Lanka, temple lands are said to be land grants of rulers The British made gifts of land to their supporters. The landlord class is thus of historical origin. The power of the modern multinational companies is partly due to their worldwide ownership of land

Modern industrial and urban culture neglects the land and subordinates it to processes that damage the land in its fertility and potential for life sustenance. This approach to land is exploitative of nature, tends to harm the natural processes of the eco-system that are self-balancing, healing and self-sustaining. The mere capitalistic approach to land does harm to the land as well as the future of humankind. The ecological negligence of the industrial culture is one of the gravest injuries that humanity does to itself and to nature.

Religions have developed thinking and practices that safeguarded the land for present and future generations. A study of the religions is important to understand the approach of peoples to land. Religions have concepts of justice in relation to land ownership and land use. Thus the Jews had the Bible teaching of the jubilee year when the lands were expected to be returned to their original owners in case they had lost them due to indebtedness. The Bible has very critical passages about rich persons who add land to land to the detriment of the poor. The prophets were strongly against such injustice. The land is believed to be given by God to the whole of humanity for their common good.

The Buddhist attitude towards land is informed by the general Buddhist approach of non-attachment to all material reality. The Buddhist lay person should share of what one owns if others are in need · *dana*. One must be prepared to deprive oneself of one's excess. Hence land reform is an ethical act. Exploitation is unethical in the cultivation of land also. Land ownership should be ethical and free from exploitation. What is important is not the system of land ownership or use, but the ethics of consequent relationships. (cf.Dr.Chandima Wijebandara: On Buddhism and Land; text of a lecture at CSR on April 19, 1991 MS.)

The Marxian critique of property ownership has been influenced by the Jewish biblical tradition. Private property is regarded as theft. The Marxist prescription is collective ownership of land.

## 2. JUSTICE

Justice can be understood as a right to obtain one's due. This right may be derived from the positive law of a given community. In this perspective the demands of justice in relation to land would depend on the letter of the law and its interpretation

by the courts of law. Law, in this sense, is what has been enacted as legislation by the law-making authority such as Parliament. The supreme authority in a state is presumed to be the residuary of the people's sovereignty and hence capable of making laws that are binding on them. Rights can be derived from such positive law. In the absence of positive law the courts may have recourse to concepts of common law to decide disputed issues concerning land ownership and land use.

The justice that flows from positive law generally favors the powerful of a community. Laws are designed by them and usually foster their advantage. In a democracy it is possible that the majority of the people, bring about changes in the patterns of land ownership and land use through democratic means such as land reform legislation. Then the justice of the resulting order would depend on the law and its implementation which is oftentimes in the hands of the officials. Justice before the courts of law depends on the law as well as the argumentation of the lawyers, whose services may be available for a fee to those who can afford to pay it. Such legal justice need not necessarily be morally just.

The inequality in land distribution that prevails in a country may be justifiable according to its prevailing positive law. The system of law and order also helps in its maintenance. Much of the activities of the courts of law, of judges and lawyers is concerned with the administration of justice on matters of land according to the prevailing law. Hence they can be understood as a force that conserves the given order of a society in this regard.

There is a legal dictum that land belongs to the first occupant/s. Another saying is "melius is positio possidentis" i.e. the position of the possessor is better (in law) or privileged. One of the principles invoked by colonial invaders for taking over the lands of colonized peoples was that of "terra nullius","no one's land" as in Australia.

Justice can also be understood in terms of natural law or ethical norms derived from moral considerations of right relationships among persons, communities and of humans towards nature. Philosophers and religious thinkers derive norms of justice from their basic tenets concerning human life and its purpose. The United Nations charter of human rights and covenants on civil and political rights and social and economic rights are thus derived from the consensus of the states that participated in their formulation. Common law is considered an elaboration of the principles of natural law that are inherent in people's consciousness.

Justice can be in the relationship of

- individual persons among themselves, inter-class or caste
- gender justice: between the sexes
- of the state and the individuals or communities,
- inter-community or among ethnic groups within a country, - internationally, among countries
- as well as of human persons and communities and nature
- inter-generational: between the present and the future

The rights of intermediate groups, national or ethnic communities and of nature are areas of law that are very important in relation to land and justice. This is partly a debate on who is the subject of rights and of sovereignty.

## 3. LAND AND JUSTICE

We can elaborate Some basic principles based on natural law or ethics.

1. Since human life comes from the earth and depends on it for its sustenance. The land in the world should be for the livelihood of all humanity, present and future. The human right to equality should extend to the right to land also. The rights of institutions such as nation states is subordinate to the prior human right of all to life and the means of livelihood. Likewise within a country, its land should be for all its inhabitants present and future. The basic rights of all to the use and usufruct of the land must be provided for before the superfluities or luxuries for a few. Private ownership to be stewardship, subject to prior duty of using land for common good of all. Hence in many situations the need of land reforms.

2. One of the primary human responsibilities is to care for the land. Pollution of the earth, the seas and the air is a crime against humanity, for human beings depend on the earth and its fruits for existence itself. Further the quality of human life is related to nature. Public authority should take the necessary steps to care for nature and prevent its pollution, the extermination of species of life and the exhaustion of non-renewable natural resources like oil. Nature too may be considered a community of interlocking relationships having its rights. Nature reacts strongly when it is abused beyond a certain point. Nature has a capacity of self-renewing itself;but beyond a certain point,this too may be affected and rendered ineffective.

3. Human beings have a right to life. Human life depends on food, water, air and a climate that can sustain human, animal and plant life and the other natural resources needed for these. The right to life is meaningless without the right to food. The right to food is,therefore, one of the most basic of human rights. Food is derived from land, (and the seas,and air). The production of food depends on the use of land. Hence the land use, and the care of the land are primary factors in justice concerning land.

4. Some relevant and important questions in relation to land and justice are :

- what is produced, by what means, by whom, for what, its cost?
- is food produced for the people's need,
- or is land used for export crops? If so, how much of it, and who controls the production, processing and marketing of these crops. Is this the best use of land in terms of the people's long term common good?

The alienation of land in Sri Lanka for plantation crops in British times and for sugar cultivation in the 1980s raises issues of justice in regard to land ownership and use.

5. Land ownership is a major factor in the issue of justice in relation to land. What is the pattern of land ownership in a country, and in the world? In many countries, as in most of Latin America, much of the land is owned by a few families or companies. In many poor countries this is a fundamental cause of poverty and malnutrition of the many.

Land ownership is one of the means of access to other forms of wealth, to social status as well as to power, including political power. The distribution of the ownership of land can be a significant indicator of the economic, political, social and cultural power in a country or region. Thus in modern Sri Lanka the land owning class came to power with the grant of universal suffrage in 1931. In India and the Philippines the landowning classes can effectively block efforts of governments to carry out progressive land reforms.

Land is a major issue in international relations. The land base has a determining influence on the development pattern of a nation.

The number and size of land holdings depends not only on the population and the land area available for cultivation but

also on the impact of political and economic policies. These may favour small farmers or accumulation of land by the bigger land owners. The state policies may determine the relationship between land owners, farmers, tenant farmers and agricultural workers. Land reforms are generally carried out to help the smaller farmers and workers. But actual policies may have the contrary effect of leading to accumulation of property by the bigger landowners.

6. The equitable distribution of food depends, in addition to land ownership and use, on the distribution of incomes in a country especially under a so called "free market" system. There is enough food in the world, and even in poor countries such as India. But the distribution of incomes in the world and within countries does not enable the poor to buy the fruits of the land to meet their essential need This is due to unemployment, the low wages of workers, high food prices and the unfair terms of trade within nations and in international trade Mass unemployment may exist with uncultivated land because adequate resources are not diverted to the infrastructure for farming or due to the mechanization of agriculture as in Australia and other more developed countries with large land masses

Famine in the world is due not to the inadequacy of the land or over-population in absolute terms, but to injustice in the distribution of land and in land use as in some African countries. Land may be used for cash crops for export by MNCs when people do not have enough food.

In such situations important questions arise - as to who really benefits from such ventures.

- Has the condition of the peasantry improved?
- Is it the local elite and foreign companies that benefit from the earnings of profits and of foreign exchange.
- Are the costs of inputs covered adequately by the returns?

- Who meets the costs of the degradation of the land or the risks of producing for a fast changing world market?

The foreign companies may quit if they find the enterprise is losing. The local elite decision makers may recommend movement to other lines of production to keep up the foreign exchange earnings. Can the poor farmers and the country face such issues without too much difficulty and loss?

7. Housing, clothing, and recreation facilities also depend on the land use in a community. Urban slums and shanties in many of the large cities of poor countries, such as Manila, Calcutta, Nairobi, Mexico City and San Paolo, show the desperate conditions in which human beings live in our most modernized times. The priorities in the use of land in urban areas are also a matter of justice in relation to land. Underdevelopment in the rural areas can lead to the push from the villages and pull to the cities in search for work and even housing. The value of urban land may be beyond the means of such helpless migrants to the city. Here too justice demands that the basic needs of all be provided before the luxuries for a few.

The use of land in the cities too should be a matter of public policy. Parks and open spaces are required in the cities. But the provision of spaces like golf links for the elite and tourists is an unjust use of land when the poor families have mere hovels to live in conditions worse than what is provided for vehicles and dogs in the homes of the affluent. The "market system" fails to solve the problems of housing even in the world's wealthiest cities such as New York, and Washington D.C.

8. <u>The Multinational Corporations and Land</u>

In the post colonial era the multinational corporations have become the big owners and users of land. Controlling as they do the "free Markets" for many commodities, they are able to determine the use of land and the prices that are paid for products.

They are the new imperial powers. They get the benefits of land without having the burdens of the exercise of political responsibility or having to pay the price of their pollution of the environment.

Nowadays they prefer not to have even the burden of cultivation but only to buy, process and market the products. They get third world countries and small farmers to do the hard and risky work of ensuring the output of what they want. It is called an out-growth system. The MNC do not own the land but supply capital, fertilizers and do the processing and marketing of products. The out-grower farmers own the land but they have to produce what the company wants and accept their norms concerning methods of production and pricing of inputs and of the product. the big companies often act as a cartel to determine these prices.

Third world governments fall in line and advance these proposals as a new relationship in which the country and the farmers benefit. Often the farmers become, in effect, wage earners of the company though they have legal ownership of the land. the country may thus neglect production of its essential needs such as food and gear itself to the volatile world market dominated by the big companies and the governments of the rich countries.
(cf. Note on Agribusiness)

9. Internationally, the distribution of land in relation to population among the nations is a global indicator of justice and injustice. Apartheid in South Africa was a means of ensuring separate and inequitable distribution of land and resources and unequal development as between the privileged and powerful Whites and the poor oppressed Blacks. There is a similar inequitable distribution of land and resources at the world level based on nation states and races; the Whites especially of Western Europe and the USSR having the advantage. World Apartheid is a sad and tragic reality.

Just as we have to understand the social system in a country to know how its social classes are advantaged or disadvantaged, the analysis of the distribution of the earth's surface among the peoples of the world is a fundamental prerequisite for the understanding of the world system, as well as for the evaluation of its justice or injustice. The land of the world belongs to all humanity. Community function of property is prior to individual use and profit. The basic needs of humanity have a prior right above the waste and superfluities of some even beyond or irrespective of national frontiers. This is a principle of right. But unfortunately, at the global level, it is the rule of might that has prevailed, and still prevails.

International law in relation to land has been developed to safeguard the sovereignty and territorial integrity of nation states. The nation states are presumed to be sovereign. They are considered the owners of the land which is said to be their national territory. They can control the disposal of what belongs to the country, or nation state including everything on the land, below it, above it in space, and the adjoining seas.

They can determine who can live in their territory. They decide matters such as immigration and emigration. Through the laws of migration the state determines the population composition of a country. The relationship between land and human beings (the land / person ratio) is determined by the population changes within a country. This depends on the births and deaths and the movement of persons due to immigration or emigration.

The international distribution of land is the result of history. The right of first possession is claimed to give a prescriptive right to land. However the main frontiers of nation state as they exist at present have been generally been determined by armed conflicts during the past five centuries. The map of the world has been drawn with the sword and the gun.

The desire for land has been a major motivation of people's movements in human history. There have been centennial trends according to the rise and fall of peoples, population and power. European colonialism and imperialism were for the sake of land and the resources it implied. The colonies in which the Europeans settled down became the new countries of the United States of America, Canada, Australia, New Zealand and the countries of Latin America. The European wars of the 18th and 19th centuries were in the search of colonies as were the two World Wars of the twentieth century. The map of the world was decided by these wars as well as by the expansion of Russia to the East to the Pacific Ocean.

The empires provided living space for European peoples, cheap raw materials, lands for plantation with cheap labour, if not slaves, and markets for industrial products. These enabled the owners of capital in European countries to increase their wealth from the surpluses accumulated both in the metropolitan countries and the colonies. The working classes of both were exploited but those of the European homelands were coopted to join in the exploitation of colonies by being given a share of the spoils and a greater chance of upward mobility in expanding empires and economies Culturally they were made to feel that they were bringing civilization and Christianity to the poor, ignorant pagans.

The New International Economic Order spoken of in 1976 did not contain proposals for the redistribution of land among the needy peoples of the world. The world's landlords were not prepared to countenance any dilution of their claims to sovereign rights to the lands acquired by conquest and genocide, but now legitimized as the world order.

The unification of Europe is leading to a tightening of the conditions for migration of third world persons to Europe. After World War 11, Western Europe countries permitted and welcomed migrants from the third world as they needed labour for their economic rebuilding. They gained much from the brain drain of

qualified persons also. With their modernization of production the demand for labour is decreasing leading to regular unemployment in Western European countries. They are now trying to send back the non-white foreign labour, or at least to restrict the entry of such new migrants.

This however goes on along with their multinational companies buying the production units, especially lands, of the poor countries and modernizing production. This tends to cause some unemployment in those countries too. This in turn leads to a demand for migration to the richer countries. All these lead to a global dysfunctioning of the relationship of land to population.

Now in 1991, U.S. President Bush speaks of a New World Order which seems to have to do mainly with the settling of the land problem in the Gulf region, especially of the Palestinians, Kurds and Israel. It may be an effort to consolidate the gains of the victors of the Gulf War against Iraq.

Land rights is a cause of much conflict; a means of provoking local conflicts. Thus there have been over 125 wars in the third world since 1945. Land is a cause and sign of division of countries such as of Korea, Vietnam, and Germany after World War 11. The theory of Low Intensity Conflict has much to do with conflicts over land.

The April 1991 visit of Mikhail Gorbachev to Tokyo brought up the issue of the four islands close to Japan occupied by the Soviet Union since World War II. The USSR is one of the greatest landowners of the world, while Japan has a 120,000 million people in its small land space of 143,818 sq. miles. Japanese investment or aid is sought by the Soviet President in their hour of need. But the Japanese insisted on the return of the islands for any economic assistance. The dialogue ended in a deadlock, revealing that even for the most advanced country that Japan is, land is very important.

The care of the land, its fertility, and environment is the responsibility of the nation states.

10. What is produced and how it is distributed depends very much on the economic policies of the country and the world. The so called "free market", within a system of world oligopolies, does not bring about a production of what is needed by people, or an equitable distribution of the things produced. It does not bring about a fair distribution of land, or guarantee the rights of the small farmers, tenant farmers and agricultural workers.

Nor does the "free market" care for the protection of nature or the safeguarding of resources. Under the global "free market" system the social costs of pollution and of the exhaustion of resources are not borne by those who cause the damage, unless positive legislation and state action sees to it. In any case at the world level there are no such safeguards, as the Bhopal and Chernobyl accidents showed.

On the other hand the socialistic economies too had (have) their grave deficiencies both in relation to economic life and political freedom. Production was low in the public sector. They had such grave problems of management and technological improvement that they could not tackle and keep pace with world competition. The cold war was too expensive an item for the USSR at a time when consumer demands were growing. All property being owned by the State reduced the areas of freedom of the citizens. Many socialist countries are trying various forms of mixed economies. China and Cuba are apparently holding their own on the economic front.

Hence the need is seen today of evolving forms of ownership and distribution of the products in such a way that there is adequate room for private initiative as well as a safeguarding of the rights of all to food and human quality of life. This is an issue of values, priorities,relationships, and structures now facing almost all the countries of the world.

11. The long term sustainability of the pattern of land use and of modern methods of cultivation, is also important for inter-generational justice. Our generation should not use the land in such a way as to harm the land in the future. Already the plantation crops have resulted in the ongoing loss of the top soil due to soil erosion. With the increased use of chemicals and a too intensive cultivation there could be a depletion of the natural fertility of the soil. Chemicals may contaminate the waterways.

The giving up of organic farming may increase the returns in the short term, but in the longer term the wealth of the country may be decreased due to the degradation of the land, the loss of pest resistant varieties as in paddy cultivation. The reliance on oil may mean a greater foreign exchange requirement that will make a country more dependent on imports and thus susceptible to world market fluctuations.

The reduction of the livestock due to dependence on the tractors and chemical fertilizers and slaughter for food is a decrease in the national capital of livestock. It also reduces the contribution to the organic richness of the soil due to animal fertilizers.

A movement "away from monocultural, high-energy, petrochemical techniques to more emphasis on organic processes, mixed crops, local markets, permacultures," subsistence gardening, integral use of land and use of natural processes are positive trends today. It is necessary to have recourse to technologies that mutually enhance both the human community and the earth process. The spontaneities of nature need to be fostered not exterminated. "Such timely agricultural processes involve a sensitivity to natural forces, which carry out their work spontaneously and freely. The worms work for free and with delight, the sun pours out its light and warmth and energy in abundance, seeds sprout of themselves if given a chance. Ecosystems evolve." [Thomas Berry: The Dream of the Earth, Sierra Nature Club and Natural Philosophy Library, San Francisco 1988 pp.63 - 64]

The present pattern of industrial production and consumption and waste is also a matter of inter-generational justice. How long and at what price can the present industrial production dependent on oil be maintained in the situation of dwindling natural resources especially of oil, and ecological pollution? The consequent degradation of life systems is a global hazard:

- the forests are declining on every continent, including tropical rain forests
- the soil is eroded, poisoned with chemicals
- declining urban infrastructures even of rich countries,
- generation of thousands of hazardous toxic waste sites, poisons inserted into the environment and fed back into the system including human beings,
- acid rain,
- contamination of the rivers,
- the death of lakes,
- seas endangered
- the dying of fish and birds,
- rapid elimination of species
- the paving of increasing areas of the land,
- transfer of pollution-intensive industries to poor countries

Industry is not taking care of the waste that it generates, nor does it accept responsibility for the social costs of pollution that it causes. These do not enter the cost-benefit analysis of the economic activities. The exhaustion of the planet is an exhaustion of the economy as well. This industrial bubble cannot long endure in its present mode of functioning. "...The planet cannot long endure present modes of human exploitation."[ibid p.74]. Humans are committing planetary suicide, through ecocide, biocide, and geocide. It is to be feared that nature itself will retaliate by making the environment less suitable for human habitation and production.

Unfortunately the captains of the big corporate enterprise think that they are developing the world into a new mystique of unprecedented growth. Advertising spreads the seductive appeal of such growth and consumption throughout the world.

Recognizing that the earth system is the primary functional context of life in all its aspects, right relationships need to be established with nature for the sake of life itself. There is a need of healing of the earth and the fostering of more functional modes of food and energy production. Economic systems, both capitalist and socialist, have been hitherto largely anthropocentric and exploitative of nature in their programs. The natural world is considered a resource for human utility, not a functioning community of mutually supporting life systems within which the human must discover its proper role. Alternative programmes are needed as the current industrial pattern is dysfunctional. The urban traffic jams are indicative of this, even without mentioning the emitting of poisons into the air. "Automobiles are now inefficient in the cities, poisonous to the air, deadly to the forests, subversive to neighborhood community, and prohibitive to other modes of travel such as walking or bicycling" [Cf. Thomas Berry : ibid pp. 62-63]

The Gulf war is a consequence of this dependence of the industrialized powers on oil. As James Baker explained candidly to the American people the war was for the American way of life, for jobs, for oil. Or as the Washington journalist George Will explained, President Bush is fighting for his principles, and principles are spelt "p-e-t-r-o-l-e-u-m" [10th Aug.1990]. Such wars are the consequence of the industrial plundering of the earth that looks for more and more victims to continue this process instead of reversing this death giving system.

## 4. SOME CHALLENGES FOR REALISING JUSTICE IN RELATION TO LAND

The land-human relationship should not to be based on money or ruthless exploitation of the land for power or profit but on a right relationship of loving care towards this source of human life and of our cultures.

We need to evolve a system of social relations and laws, and their implementation, with reference to land and land use, so that there is a care of-

1] the right of all to the land and its fruits
2] the care of land, its fertility, top soil, forests, waters and of all Nature
3] the provision of essentials of food, clothing and housing for all before providing for the luxuries of any
4] a fair return to those who work on the land
5] a just distribution of the land and of the return from land
6] ethnic justice in land distribution and land development
7] gender justice in land ownership, rights of succession, reward for work,
8] global justice in land ownership and use of resources

9] overcoming racism and building of just and peaceful multi-ethnic and multi-cultural communities and nations to meet the changing racial balance in world population.
10] overall eco-justice caring for the earth, the home of all life.

## Notes 1. Agribusiness

Agribusiness is a group name for transnational companies involved in industrial farming. Applying the principles of capitalist business enterprise to agriculture, these TNCs seek to maximize profits by integrating, vertically and horizontally, the different processes of production and distribution involved from the farm to the consumer. Agribusiness involves all those individuals and

organizations engaged in the production, supply of seed, fertilizer, pesticides, machinery, credit, production on farm, and post harvest industries such as research, processing, transport, storage, financing, regulation, marketing and distribution of the world's food and fibre supplies. Through this organizational structure corporate firms progressively integrate family farm agriculture into the wider urban - industrial economy, extending its tentacles to a global dimension. Instead of running the farms, agribusinesses leave it to farmers to carry the risks of production while they take the profits.

An agribusiness can be seed company, a fertilizer manufacturer, a food processor, a commodity trader, a bank or it can be all these things, and more, at once. It means that food production is being taken over and controlled by big business in the interests of their profits rather than for the human common good. On the production side this has undesirable effects on peasants in poor countries and the small farmers in rich countries. Agribusiness avoids competition by forming oligopolistic combines in any line of business. They are so powerful through their networking that they can pressurize governments and even the United nations and other world organizations.

The local elites of third world countries are often the intermediaries who facilitate this new exploitation; e.g. 'The ultimate result is a corporation such as Tenneco in the USA which farms its own land, using its own machines, fuel, and labour. Crops are sprayed with Tenneco insecticides and pesticides. The food produced is processed in its own plants, using Tenneco chemical colours, flavours and preservatives. the food is packed into containers made by Tenneco taken to Tenneco warehouses by Tenneco trucks, and finally to supermarkets and stores." (AWD, Sydney Australia dossier on Agribusiness.) cf. also TNCs such as Nestles, Unilevers, Tobacco and food combines... Brooke Bond ...

Agribusiness is a major cause of the growing gap of the rich and the poor countries and the global debt. "Although the economies of scale of agribusiness make them superficially

attractive, there are many long term drawbacks; the bulk of the money earned goes to the city shareholders rather than back into the land, it concentrates both land ownership and wealth, with the emphasis on profit rather than farming, it tends to encourage exhaustive farming practices which permanently damage Australia's fragile farm lands." Australian Consumers' Association, Dec 1986.

## Footnote with reference to Land and Justice in Sri Lanka

1 ) In Sri lanka the land-people relationship has worsened since the last century. In 1830 the population was estimated to be about 962,155 and the land/man (sic) ration 6.83 hectares per person. In 1901 the population was 3,565,954 and the land/man ratio 1.84 hectares per person. By 1981 had increased to 15,012,610 and the land/man ratio declined to 0.44 hectares per person. (cf.S.Berugoda: Present Pattern of Land Use and Policy Planning; found in this issue)

| | Population | land/person ratio |
|---|---|---|
| 1830 | 962,155 | 6.83 hectares |
| 1901 | 3,565,954 | 1.84 |
| 1981 | 15,012,610 | 0.44 |
| 1991 | 17,500,000 | ).37 |

In 1991 the population is estimated to be above 17,500,000. With the same land space of 65,000 sq.km, 6.500,00 hectares or 25,000 sq.miles and 16,000,000 acres, the hectares per person is now less than 0.37 hectares per person.

Fortunately we have increased the area available for cultivation especially during the past 60 years. On the other hand the land use pattern was changed by the British during their rule

by beginning the coffee and later tea plantations. The population mix as well as its distribution was also permanently affected by the British importation of indentured labour from India, and the marginalization of the up-country Sinhala villages to the areas outside the estates.

The population density partly accounts for the revolutionary tendencies in the South West of Sri Lanka as in 1818, 1848, 1971 and in the 1980s. It has also a significance for the ethnic conflict since the 1970s. Similar trends were seen in the Indian states of Kerala, and West Bengal.

2) The theory of "waste lands" as propounded by the British in Sri Lanka in the 1840s was also related to this concept or presupposition. The concept of "crown lands" is also a relic of the theory of all land belonging to the king, the crown and later the State. The situation of most of the land in Sri Lanka being still, in some way owned, by the State is due to these historical factors and the land reforms of 1972 and 1975. Our country is thus interestingly socialistic in its land ownership due to the heritage of feudalism, local and British rulers and the nationalization of the assets of the British companies and of the lands of the local elites.

3) In Sri Lanka there have been different trends in this regard, due to the government policies. The Land Development Ordinance of 1935, proposed by D.S.Senanayake as the Minister of Agriculture and Lands, laid down the definite policy for the alienation and development of crown lands including the terms of tenure, the support for farmers, succession and eviction of persons who violated the terms of land alienation. This and the Free Education Ordinance of 1943, are considered to be two of the most far reaching laws enacted by the State Council during its existence from 1931 - 1947.

The land reforms initiated by Philip Gunewardena in the S.W.R.D Bandaranaike regime from 1956 to 1959 were intended to favour the tenant farmers giving them security of tenure and

limiting the rent due from them to the landlord. The farmers were to have their own organization in the cultivation committees. There was fierce opposition to these proposals. Their implementation was greatly impeded by the landlords. Within a few months the Minister was expelled from the government. The assassination of Prime minister Bandaranaike himself may have had connections with his more progressive policies in favour of the masses of the people.

The land reforms of 1972 and 1975 carried out by Colvin R.de Silva in the Sirima Bandaranaike government of 1970 - 1975 were directed towards getting back the plantation lands into the hands of the state, and placing a ceiling on the ownership of land: to 25 acres per family for paddy and 50 acres per family for other crops. The aspect of redistribution of lands thus acquired by the State was neglected at this stage. At that time the accent was on the state ownership of the plantations and estates, as a step in the path towards a "socialistic society". The State became the principal owner and manager of the plantations. This change in management was not successful both due to political interference and the inefficiency of the state management of these century old establishments in a world of competitive markets.

The policies of the UNP governments since 1977 have tended to increase the holdings of the bigger farmers in paddy and to permit larger holdings for families by allowing 50 acres per person, and not family as earlier. Once again land has been made available to foreign companies such as to the Pelawatte Sugar Company. The Accelerated Mahaveli Development project carried out by the J.R.Jayewardena government after 1977 increased the area of land that was available for cultivation. There was not much development of processing since 1977. The open market policies of the government and the development of the state owned plantations were not easily harmonized for the benefit of the country. The conditions of the plantation workers were relatively improved. Their citizenship rights issue has been dealt with more humanely largely due to the efforts of the Ceylon Workers

Congress led by S.Thondaman, a minister of the UNP government, as well as to the activities of the non-governmental organizations and the general improvement of ethnic relations in this regard.

The latest phase of changes in land relations is in the Report of the Land Commission of 1987 and in the proposals of the Presidential Task Force on Land Utilization and Distribution.

Land policies may reduce or aggravate the social tensions among people or communities in a country. Thus the Southern youth insurrection of 1971 and 1980s as well as the ethnic conflict of the 1970s onwards can be understood as caused partly by the land hunger in the country. Many social, political and military conflicts in the Asian region relate to land and the claims of different groups to land rights, a relative autonomy or even sovereignty.

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# LAND FOR THE LANDLESS

# BUILDING SELF-RELIANCE

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Sustained productivity and conservation of the land resources can be guaranteed only through scientific evaluation and rational allocation of land. Rational allocation of land can only be made possible if the basic human needs of the community at large are met.

Having recognised the unequal distribution of ownership of productive assets such as land, within different segments of our population, His Excellency the President appointed a Task Force to initiate an accelerated programme of Land Re-distribution. The presidential Task Force on Land Utilization and Distribution provided the base for the 'take-off' of a massive re-distribution programme of state-owned lands. In the allocation of land, the Task Force was able to furnish guidelines for the classification of land according to its suitability for a particular use and to facilitate selection among alternative land use possibilities and predicting conservation needs. These efforts were pursued to achieve the objective of optimal utilization of land resource on a sustainable basis.

Command over resources to enjoy a decent standard of living is now considered one of the essential pre-requisites in the process of development. My Ministry, the Ministry of Lands, Irrigation and Mahaweli Development, which is charged with the responsibilities of management and sustainable development of the resources of land, water and forestry including wildlife has consciously followed the path that access to resources should be widely and equitably distributed and that the basic needs of the population should be safeguarded in our development efforts.

The Land Commission Report of 1987 mentions that 82.3 per cent of the total land area is under some form of State control. However, it should be pointed out that 82.3 per cent includes land alienated by the Government from 1935 onwards, land vested in the Land Reform Commission, land already protected or to be protected such as forest and wildlife reserves, mangroves, marsh and swamps, water bodies etc. Thus the availability of State land is reduced from 82.3% to a mere 48 per cent. The bulk of the land area is in the dry zone.The availability of water would determine the potential of such lands. This shows that the availability of land alone does not mean that they are alienable or developable.

One should also be mindful of the conditions of the resource base particularly in the Wet Zone. Conservation of the watershed should be of utmost priority in any development effort. The present situation is far from satisfactory as only 9% of the total land area in the Watershed is under forest cover. There is an urgent need to adequately conserve our stream and river reservations to prevent irreparable losses and damage to fertility by degradation of our soils, through soil erosion, surface run-off and reduction in the dry weather flow.

Commencing from the early 1930's, the socialist piece of legislation that was introduced into our statutes, the Land Development Ordinance of 1935 brought about a radical change in the ownership of land in the country in favour of the peasant class. To date, over 2.9 million acres of land have been distributed under this piece of legislation, which has brought some degree of relief to the problems of landlessness, unemployment and resultant

poverty. Projects such as the accelerated Mahaweli Development programme have helped over one hundred thousand families up to now. However, the magnitude of the problem is far from comprehension - How could one propose pragmatic solutions to these issues?

We have a population of approximately 17.7 Million people and a land area of 16 Million acres. 78.5% of the population live in rural areas. We have a literacy rate of over 85% and nearly 67% of the population is below 30 years of age. The Sri Lanka census of agriculture 1982 indicates that 42% of all agricultural holdings were under 1 acre in size. 63.5% of the holdings are less than 2 acres. There has been no recent survey of landlessness in the country. However, the findings of the survey of landlessness in 1951 is a good indicator wherein it was found that 27% of the peasant households were landless. Needless to say, that with population expansion the landlessness is much more prevalent than in the past.

In 1985 the share of income accruing to the richest deciles was nearly 50% of the total income receivers' income which has increased from the respective share of 34% in 1981. A decline in the share of income accruing to the poorest four deciles can also be seen. This decline is from 16.3% in 1981 to 7.1% in 1985.

I have given the above indicators which reflect the prevailing social conditions in the country.

What transpires in this complex situation is the inadequacy of our programmes of development to cater to the growing population. The poorer segments of our society are seeking sustenance on the available resource of land for survival. This programme attempts rational allocation of land for sustainable productivity and will also guarantee conservation of natural resources by meeting the basic human needs of the community at large. Therefore, I firmly believe that it will have great impact on rural life by improving significantly the living conditions of the masses.

Agricultural production requires land for those who are inclined to engage in such ventures. The Presidential Task Force on Land Alienation has a target of one million acres to be distributed among the most affected groups in society. Nearly 800,000 acres of land have been identified as suitable for alienation and 250,000 acres have been distributed up to now. It will cater to the needs of agriculture, housing, cottage industries and commercial ventures. 87% of the land thus far alienated is for agriculture. The programme envisages the creation of self-reliant people who would, through their own efforts, generate adequate income through agriculture, small scale industries and commercial ventures.

This could only be achieved if the process of land alienation is coupled with an effective extension service provided through the Ministry of Agriculture whereby people could obtain the technical know-how, inputs, marketing facilities, credit etc., to have their newly obtained land geared to full production. Maximization of productivity of such alienated blocks of land is essential for the success of this programme. Our ultimate objective is not only to boast of a land-owning class of people but a land-owning class of individuals who could sustain themselves without being dependent on the State or any form of subsidies.

Let me at this stage give you a summary of proposals made by the Presidential Task Force on National Land Utilization and Distribution.

## *Programme 1 - Land Alienation Programme at the Level of Divisional Secretaries*

This is a programme of alienation of suitable State land under the direction of the Chief Ministers to be implemented at Divisional Secretaries' level (AGAA), in accordance with a Land Use and Alienation Plan (LUAP) formulated at the Divisional Level. Keeping within the broad guidelines issued by the Task Force with regard to:

(a) Selection of alienable lands;
(b) Unit of alienation; and
(c) Criteria for selection of recipients of lands;

Already over 768,000 acres have been identified under this programme.

*Programme II - Land Reform Commission owned lands*

This programme is to alienate LRC owned lands on similar lines as Programme I. Over 20,000 acres of land belonging to the LRC have been identified for distribution.

*Programme III - Lands belonging to Plantation Boards\Corporations*

This proposal envisages:

(a) distribution of land identified as marginally productive for tree crops through District\Divisional authorities.

(b) adoption of measures to maximize productivity of land through intensification of crops, intercropping and live-stock and vegetable farming etc. in order to enhance employment generation.

(c) implementation of a Village\Estate integration Programme to provide benefits to the villages surrounding plantations; and

(d) development of a system of **Managed Small Holder Plantations** by alienating land from the Estates to **Outgrowers'** to be selected from among landless villagers and plantation workers on the

basis of the provincial ethnic ratio and to provide these outgrowers, facilities to develop commercial crops by making available management, extension and marketing inputs by the Estate.

Even though the proposals would have improved the living conditions of both plantation workers and the villagers in the upcountry area in particular, satisfactory progress has not been made on account of problems relating to the release of estate lands.

## *Programme IV - Paddy land vested with LRC*

The Paddy Lands Act of 1958, which was a significant piece of legislation brought by the then Government, was enacted with the objective of establishing security of tenure in paddy lands. This Act falls into the policy model of tenure reform (intervention - regulatory model), whereby security of tenure is attempted to be established through supervision and intervention in tenurial relations through reduced and regulated rents.

Even though the objective of the intervention-regulatory model was a system of tenure reform where the terms on which non-owning cultivators who hold the land are re-adjusted, the absence of political will on the part of the then Government to implement this legislation as envisaged, resulted in a large number of tenants being evicted by the landlords. The Sri Lanka experience with a carefully planned and seriously implemented tenure reform model shows that such tenure reforms do not provide benefits to the tenants unless such tenants become the owners of the land.

This proposal envisages the conferring of ownership to Ande Cultivators under the LRC. This is in line with the new thinking of **'Land to the Tiller'**.

*Programme V - Development of village tanks and construction of dug wells for the purpose of irrigation in the dry zone*

The Task Force proposed an action programme to rehabilitate village tanks and establish dug wells in suitable areas to facilitate the distribution of land in the dry zone. Three lead projects, the Major Irrigation Rehabilitation project (MIRP) the Irrigation Systems Management project (ISMP) and the village Irrigation Rehabilitation project (VIRP) are being implemented to rehabilitate selected irrigation schemes and to obtain optimum benefits by the involvement of farmer organizations in the systems management. A feasibility study for the rehabilitation/restoration/ improvement of irrigation works, lift irrigation, agri-wells in the North Western province has been undertaken. 12 Irrigation Projects in NWP have been undertaken for rehabilitation with EEC assistance.

A World Bank Mission has also agreed to finance a National Irrigation Rehabilitation Project the total investment of which will be in the region of Rs.2000 Million. Over 1000 small tanks and 70 medium/major tanks will be taken up for rehabilitation.

*Programme VI - Outgrower system in future commercial plantation.*

The Task Force recommended to the Government that the present policy of leasing out land to local or foreign investors for commercial cultivation in the dry zone and intermediate zone be reformulated incorporating the requirement that a substantial part of the land proposed for development should be operated and cultivated through outgrowers selected from among landless of that area.

The basic principle of this reform is the target oriented approach. The target group would be the landless poor. There will be no large scale alienation of land to foreign companies or local big business. If foreign Companies and local big businessmen are interested in investing in agro-based ventures, they are welcome to do so, but with the out-grower concept which would form the future policy for large scale investment in the agricultural sector. A system of out-grower blocks would replace all direct planting undertaken by such Companies. People of the area would own the out-grower blocks and work under the supervision, extension and technical facilities provided by the Companies. This change in policy would provide better income to a larger number of allottees at present and will help to reduce inequalities. The concept promoted here is the 'big investor-small producer' notion.

## *Programme VII - Underutilized private land.*

This is a programme to implement the provision of the Agrarian Services Act by issuing Supervision Orders in respect of under utilized private land if no development is made within a six months period and to make such land available for development through leasing or any other appropriate methods. The number of reports of neglect\under utilization to-date is 83,838, out of which 77,842 show cause notices have been issued. 39,575 lands have been placed under Supervision Orders and 28 owners have been dispossessed.

## *Programme VIII - Mahaweli Highlands*

This is a Programme of alienation of highlands under Mahaweli specially to the second and third generation of settlers. The lands earmarked are above the command area of the reservoirs. Over 1,675 acres have been distributed up to date.

***Programme IX - Lands that are voluntarily surrendered.***

The Task Force recommended a scheme to be executed by the Commissioner of agrarian Services to enable persons willing to surrender agricultural land to do so and to compensate such donors in a manner that could facilitate investments and make available such land for alienation. However, to-date there has been no response to this proposal.

***Programme X - Extension, input supplies, credit and other support services.***

The Task Force also recommended a separate programme to provide back up services of agricultural extension, input supplies, credit and other support services required for a large scale land distribution and agricultural productivity enhancement campaign to be spearheaded by the Ministry of Agricultural Development and Research.

These identified programmes, if carefully implemented, will enable the poverty stricken groups to attain a better quality of life with a reasonable level of income. Such efforts would automatically reduce the social tensions and agrarian discontent.

What I have described earlier is the programme under the Task Force. Let me now place before you the policy framework. Having recognised the concerns regarding the management of natural resources of land, water and forests, including wildlife, an approach was made regarding conservation and management of natural resources by placing the policy framework on a scientific and rational basis. The Government for the first time spelt out the concepts of and the rationale for natural resource management. The principles identified to form the basis of the strategy were as follows:

(a) that the resource of the natural environment must be seen to belong ultimately to the whole nation and must be devoted to the national welfare;

(b) that there is an obligation on the social democratic State to erect an institutional structure by virtue of which such resources may be located, evaluated, conserved and distributed, so that they may be utilized on a sustainable basis and to the greatest national advantage;

(c) that as land provides the conceptual and operational plane of contact between national and environmental resources this institutional structure should be framed in terms of land policy and land use planning;

(d) that land policy and planning should be rooted in scientific knowledge of bio-physical processes and in a deep understanding of economic progress and of socio-political change; that they should be comprehensive and closely integrated but sufficiently flexible to permit and promote the operation of the State, corporate and private sectors in a mixed economy.

(e) that the objective must be that the nation should learn to live in productive equilibrium with natural resources, that access to resources should be widely and equitably distributed and that basic needs should be safeguarded for all citizens.

Let these concepts of natural resources management be known to a wider audience, so that a determined effort is made to adhere to the policies spelt out. They are essential ingredients of scientific and rational management of natural resources and are indispensable for the benefit of our nation to get over the divisive policies of the past.

Land alone is not the answer to the problems facing the people of our country. The more we reduce pressure on land, I am certain we will be able to achieve sustainable development which assures environmental protection. What is required at the present moment is to develop the other sectors such as industry, services, fisheries, commerce and non-agricultural sectors to absorb the large number of unemployed persons who are now turning to land for survival. The industrial policy of the new Government is a good example in the right direction.

The Government is looking afresh at demands of equity, social justice, and problems of unemployment, landlessness and resultant poverty. The ultimate cause of the very unequal distribution of personal incomes in most Third World countries is the very unequal and highly concentrated patterns of asset ownership within these countries. The ordinary population does not own or control the productive resources especially physical capital and land.The more important line of policy to reduce poverty and inequality is to focus directly on the concentrated control of assets, the unequal distribution of power and the unequal access to educational and income earning opportunities that characterize many developing countries. The programme of the Task Force is designed to transform those rural poor into a land-owning community, and to cater to their particular needs for agriculture, housing, small industries or commercial ventures. They in turn will contribute their lot for the attainment of peace and harmony in our motherland.

# PRESENT PATTERN OF

# LAND USE AND POLICY PLANNING

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1.1 "Land is the source of all material wealth. From it we get everything that we use of value, whether it be food, clothing, fuel, shelter, metal, or precious stones. We live on the land and from the land, and to the land our bodies or our ashes are committed when we die. The availability of land is the key to human existence, and its distribution and use are of vital importance".(1)

1.2 Thus to a great extent, the quality of life of man will depend on the degree of efficiency with which the available land is utilized by him. The need for efficient use of land will be felt more as the land/man ratio decreases. In Sri Lanka, the land man ratio has decreased over the years as given in Table 1.

## Table 1 - Land/man ratio Sri Lanka 1830-2001

Total land area : 65,000 sq.km.
(6.5 million Hectares)

| Year | Population | Land/man ratio |
|---|---|---|
| 1830 | 962,155 | 6.83 Hectares |
| 1901 | 3,565,954 | 1.84 " |
| 1950 | 7,647,000 | 0.86 " |
| 1981 | 15,012,610 | 0.44 " |
| 2001 | 21,073,685 | 0.31 " (Projected) |

(2)

1.3 The land\man ratio in Sri Lanka can be compared with the world setting as given in Annex 1.

1.4 The efficient use of land involves the utilization of land on the basis of sustainable development taking into account the needs of the future generations.

2.1 The present land use, land holding and ownership patterns are illustrated in Tables 2,3,4 and 5.

Table 2 - Status Land Use in Sri Lanka 1988

| | | | % | |
|---|---|---|---|---|
| Forest cover | - | 1.6 million Hectares | 24 | |
| Wild life reserves | - | 0.7 " " | 11 | |
| Chena cultivation | - | 1.0 " " | 15 | |
| Highland annual crops | - | 0.1 " " | 2 | |
| Grassland and scrub | - | 0.5 " " | 8 | |
| Water bodies, swamp, marsh | - | 0.2 " " | 4 | (10) |
| Tea, rubber, coconut | - | 1.0 " " | 15 | |
| Paddy | - | 0.8 " " | 12 | (3) |

Table 3 - Land holding pattern - Small holdings sector

| Category | Number | Area in Ha | % | Area in ha per Unit |
|---|---|---|---|---|
| (a) Home gardens | 1,333,070 | 358,829 | 25.3 | 0.3 |
| (b) Other high lands owned by operators | 621,180 | 542,098 | 32.4 | 0.9 |
| (c) Other high lands owned by others | 155,730 | 114,878 | 8.1 | 0.7 |
| (d) Paddy lands owned by operators | 534,130 | 555,089 | 25.0 | 0.7 |
| (e) Paddy lands owned by others | 265,150 | 129,679 | 9.2 | 0.5 |
| (f) Unspecified | 5,290 | 711 | - | 0.1 |

(4)

Table 4 - Land holding pattern - Estates sector

| Type of management | Number of estates | % | Area in Ha | % | Area in Ha per Unit |
|---|---|---|---|---|---|
| 1. Total | 9291 | 100 | 540,663 | 100 | 58 |
| 2. Private - Total | 7349 | 79 | 168,644 | 31 | 23 |
| Private - individual | 5469 | 59 | 91,163 | 17 | 17 |
| Private - company | 1880 | 20 | 77,482 | 14 | 41 |
| 3. Government - Total | 1942 | 21 | 372,019 | 69 | 192 |
| S.P.C. | 646 | 7 | 153,712 | 28 | 238 |
| J.E.D.B. | 483 | 5 | 127,857 | 24 | 265 |
| L.R.C. | 369 | 4 | 20,235 | 4 | 55 |
| Others | 444 | 5 | 70,215 | 13 | 158 |

(5)

Table 5 - Land ownership pattern

| Type | Hectares | % | Ref... |
|---|---|---|---|
| (a) Total land area | 6,570,134 | 100 | (6) |
| (b) Total area under agricultural holdings | 1,952,709 | 30 | (7) |
| (c) Area under urban uses | 131,400 | 2 | (8) |
| (d) Land alienated by the Government (1935-1985) | 830,833 | 13 | (8) |
| (e) Land vested in the L.R.C. | 419,101 | 6 | (9) |
| (f) Total Private land (b + c - d - e) | 834,175 | 13 | |

2.2 A consideration of the terrain of the land will indicate that the area of land over 1500 meters (m) above mean sea level (MSL) amounts to about 75,000 Hectares. A considerable area of land between the elevations of 1500 m - 2000 m in the Nuwara Eliya District is already being used for various forms of agriculture.(11)

2.3 The following are some of the deductions that can be made from a study of the above patterns.

(a) The major land holder of the country is the state. (The lands under private ownership are mostly within the densely populated south western sector of the country. These lands are subject to various forms of tenurial problems such as co-ownership in uneconomic units).

(b) Out of the area under agricultural holdings, nearly 20% form estates under the control of the state.

(c) 72% of the area under agricultural holdings is in the small holding sector.

(d) 59% of the area under the small holdings sector are lands alienated by the state and hence can be subjected to suitable land use control without difficulty. (However this facility appears to get reduced with the issue of Swarnabhoomi Grants under the Land Development Ordinance).

(e) The balance 41% of the area under the small holdings sector will be subject to various constraints in different degrees in implementing land use plans due to the tenurial problems mentioned above.(13)

2.4 Sri Lanka's position in land use management has been stated in the following words:

"Ceylon is a good example of a tropical country with almost every advantage for good land - use management. There are well developed technical services based on an advanced educational system, ... a highly developed cash crop industry, ... great reserves of uninhabited land...with good overall water resources ... yet, inspite of all these advantages, Ceylon is caught up in a major struggle to control land use problems created by its violent population expansion."(12)

2.5 There are several statutory provisions that stipulate the responsibilities of individual institutions which affect land use. Some of these are listed below:

Land Development (Amendment) Act, No.27 of 1981
Crown Lands Ordinance, Cap. 454, LE. 1956 Revision
Agrarian Services Act, No.58 of 1979
Irrigation Ordinance, Cap. 453 LE. 1956 Revision
Soil Conservation Act, Cap. 450 LE. 1956 Revision
Forest Ordinance, Cap. 451 LE. 1956 Revision
Fauna and Flora Protection Ordinance, Cap. 469 as amended by Act No.44 of 1964
Coast Conservation Act, No.57 of 1981
Urban Development Authority Law, No.41 of 1978 and subsequent amendments
Tourist Development Act, No.14 of 1968
National Housing Development Authority Act, No.17 of 1979
Municipal Councils Ordinance, Cap. 252 LE. 1956 Revision
Urban Councils Ordinance, Cap. 255 LE. 1956 Revision
Development Councils Act, No.35 of 1980
Greater Colombo Economic Commission Law, No.4 of 1978
Mahaweli Authority Act, No.38 of 1979
Housing and Town Improvement Ordinance, Cap. 268 LE. 1956 Revision
Town & Country Planning Ordinance, Cap. 269 LE. 1956 Revision
National Environmental Act, No.47 of 1980
Flood Protection Ordinance, Cap. 449 LE. 1956 Revision
Sri Lanka Ports Authority Act, No.51 of 1979
Railways Ordinance Cap. 200 LE. 1956 Revision
Industrial Development Act, No.36 of 1969

Water Resources Board Act, No.29 of 1964
Ceylon Tea Board Act, No.15 of 1970
Sri Lanka Land Reclamation & Dev. Corporation 1968
Rubber Control Act, (1956)
Rubber replanting (subsidy) Act, 1953
Tea and Rubber Lands Fragmentation Act, (1958)
Tea Control Act (1949)
Coconut cultivation Board Act
Sri Lanka Cashew Corporation Act
Sri Lanka Sugar Corporation Act
Agricultural Development Authority Act
Thirteenth Amendment to the Constitution
Provincial Councils Act, No.42 of 1987

3.1 This will show that there is a need for the co-ordination of the several activities pertaining to land use planning being handled by several institutions at present. The Land Use Policy Planning Division of the Ministry of lands, Irrigation and Mahaweli Development (LUPPD) has been created for the purpose of achieving that degree of coordination & for promoting & carrying out scientific land use planning.

3.2 The concepts that guide the activities of this Division have been formulated after a series of studies. These concepts can be spelt out in the following words:

* That the resources of the natural environment must be seen to belong ultimately to the whole nation and must be devoted to the national welfare;
* That there is an obligation on the social democratic state to erect an institutional structure by virtue of which such resources may be located, evaluated, conserved and distributed so that they may be utilized on a sustainable basis and to the greatest national advantage.
* That, as land provides the conceptual and operational plane of contact between nation and environmental resources, this institutional structure should be framed in terms of land policy and land use planning;
* That land policy and planning should be rooted in scientific knowledge of bio-physical processes and in

a deep understanding of economic progress and of socio-political change;

* That they should be supported by reliable, qualitative and quantitative data;
* That they should have a positive development orientation and that they should be comprehensive and closely integrated, but sufficiently flexible to permit and promote the operation of state, corporate and private sectors in a mixed economy;
* That the objective must be that the nation should learn to live in productive equilibrium with natural resources;
* That access to resources should be widely and equitably distributed ; and
* That basic needs should be safeguarded for all citizens.(14)

3.3 The LUPPD will be guided by these concepts in promoting the functions of identifying resources, formulating land use plans to support sustainable development and implementing such plans. A core group is now functioning for the establishment of a comprehensive inventory of land resources in the form of a computer based Geographical Information System / Land Information System (GIS/LIS). The core group consists of the Survey Department for the collection of topographic and land use data as well as data pertaining to the land parcellation and occupation of the country, the Irrigation Department to provide data pertaining to soils and land quality and the LUPPD to collect the other data relevant to land use planning. All data will be stored in the GIS/LIS and will be available for those interested. This data base management activity will be strengthened by introducing registration of title to land based on the Cadastral Survey carried out by the Survey Department. Other institutions that will support this activity are the Commissioner of Title Settlement and the Registrar General.

3.4 The land use planning activity will be handled at different levels by multi-disciplinary committees representing the

relevant disciplines and institutions. The different committees that function on this basis are as follows:

(a) ***<u>At the National Level</u> - National Land use Planning Committee consisting of the Secretaries of the following Ministries:***

Lands, Irrigation and Mahaweli Development (Chairman) * Policy Planning and Implementation * Fisheries and Aquatic Resources * Tourism and Rural Industrial Development * Ports and Shipping * Industries, Science and Technology * Transport and Highways * Housing and Construction * Agricultural Development & Research * Environment and Parliamentary Affairs * Public Administration, Provincial Councils and Home Affairs * Plantation Industries * Cultural Affairs and Information * Power and Energy

(b) ***<u>At the Provincial Level</u> - Provincial Land Use Planning Committees consisting of the following for each Province:***

* Chief Secretary (Chairman)
* Provincial level Officers of the relevant Government Departments and Institutions

(c) ***<u>At the Divisional Level</u> - Divisional Land Use Planning Committees consisting of the following for each Division:***

* Divisional Secretary (Chairman)
* Divisional Level Officers of the

relevant Government
Departments and Institutions.

(d) ***<u>At the Village Level</u> - Village Land Use Planning Committee consisting of the following for each Grama Niladhari Division:***

* Grama Niladhari (Chairman)
* Village Level Officers
* Representatives of land holders

(e) ***<u>At the Plot Level</u>*** -

* Grama Niladhari
* A member of the Village Level Committee
* Land holder

These different committees are expected to establish a dialogue and a process of continuous planning and review.

4.1 The activities of the Presidential Task Force on Land Utilization and Redistribution envisaged distribution of a large extent of land which was at the disposal of the state. The LUPPD provided certain guide lines for the identification of land for redistribution. It has been found that towards the end of the year 1990, all available land had been identified for redistribution.

4.2 Assuming that all land needs of the population as at end 1990 had been met by this exercise, an attempt was made to study the sufficiency of the balance available land to meet the basic needs of the increasing population during the period 1991-2001. Only two basic needs (viz. housing and agriculture) were taken into account. The land needs were worked out assuming that the present ratio of employment in the agricultural sector and that the present model of land needs for housing would continue. A study shows that the present models of employment and

housing have to change in view of the anticipated shortage of land. Some of the solutions to remedy this situation will be diverting a higher percentage of the labour force on employment outside agriculture and promoting housing in forms other than detached housing units.

4.3 It may also be necessary to increase the output from the present extent of land devoted to agriculture without over looking the need for introducing development on a sustainable basis. Introduction of registration of title to lands is expected to help in this process by providing state guaranteed title and thereby increasing credit - worthiness of such land. A further aspect that would need consideration in this respect is the introduction of procedures for land consolidation (ie. rearrangement of properties) where necessary.

4.4 One of the very important decisions to be taken from a conservation point of view will be on the locations for forest cover. This forms one of the recommendations of the 1985 Land Commission.(15) Apart from identifying the land required for the preservation of the sources and courses of streams and canals, it will be necessary to leave steep land (eg. those over 60% slope) permanently under forestry.

4.5 The development of the infrastructure to support the planned land uses will form an integral part of the land use planning and implementation process.

4.6 It will also be necessary to provide supporting legislation to ensure co-ordination of this activity. Draft Action Plan of the National Conservation Strategy envisages such a procedure.(16)

5. The above are only a few of the aspects that will have to be considered in formulating land use plans to support development. The LUPPD will be following this activity as an exercise in integrated planning by multi-disciplinary

teams working at different levels and encouraging popular participation at each level.

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# PADDY LANDS TENURE AND REFORMS

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## 1. INTRODUCTION

### 1.1 The historical background

The advent of the plantation economy from the mid 19th century did not affect or alter the traditional agricultural practices of the peasantry. Sinhala villages were established in the Wet Zone with the de-population of the original areas of development in the North central and South-eastern regions, but the pattern of land-use of the peasantry was not changed. Paddy cultivation which was the basis of the village economy, was confined to the 'deniyas' (narrow valleys running up between the spurs of a range of hills). Just above the paddy land was the settlement, with the small homestead garden of each family, while hill slopes were jungle and waste, providing pastures for the village buffaloes and chenas where a shifting cultivation (chena) of maize, millet and pulses was undertaken.

With the rapid increase of the acreage under plantation crops and particularly with the leasing out of the hill slopes by the Colonial Government to Estate companies for this purpose, the peasants lost a vital area of village communal lands, which was essential to the established pattern of peasant agriculture. Land for

'chena' cultivation, the grazing grounds for village cattle and the jungle which provided the village timber and fuel needs were lost.

Meanwhile with the collapse of the irrigation systems the Dry Zone had become more and more uninhabitable and permanent cultivation, particularly of paddy, was not possible. The jungle choked up access to the land, with mosquito-infestations bringing wide spread disease, Malaria. There were thus no avenues to sustain the natural increase of the peasant population. The service industries generated by the plantation economy had little or no place for the peasantry, though it could absorb educated middle class Sri Lankans and labour having particular skills (truck drivers, dockyard workers etc.). Land was extremely limited for traditional agriculture to expand itself to accommodate the increasing peasant population.

This then was the agrarian situation in the 1930s, an ever increasing pressure on the land aggravated by a sharp rise in the annual rate of population growth largely as a result of efficient medical services throughout the island. Consequently the results of the problem were an increase in landlessness, excessively fragmented and uneconomic holdings, unsatisfactory conditions of tenure, poor supply of production capital and rural indebtedness. The 1950 Economic Survey of Rural Ceylon (data collected from 106 villages considered to be representative of the various Revenue Divisions of the Island) disclosed that 26 percent of the agricultural families had no land at all, 16 percent had half acre or less. 26 percent owned half to 1 acre of land and 16 percent 1 to 2 acres. This survey also showed that 31.7 percent of the agricultural families were in debt. The average debt being Rs. 225/46.

## 1.2 Land settlement schemes

The chief method of land alienation in the Dry Zone was the establishment of major colonization schemes. Under these schemes Government opens up and develops new land, provides irrigation facilities, social welfare infrastructure, and settles the land

on selected peasant allottees under the provisions of the Land Development Ordinance. Each settler receives 3-5 acres (later reduced to 2 acres) of paddy land and 1-2 acres of highland, which is his homestead garden. The settlers are selected from among landless peasants in over-populated villages.

The other Scheme of land alienation namely village expansion schemes are operated by Government to relieve the problem of landlessness among the peasants.

Under the above schemes, the settlers are given their allotments on the basis of tenure under the Land Development Ordinance No. 19 of 1935. The land is first alienated on a permissive sort of tenure (on a permit under the Land Development Ordinance) under which the allotment can be withdrawn for failure to develop the land within a stipulated period, or for violation of any of the other conditions of the permit. After development, the settler is given a grant or Swarnabhoomi award under the Land Development Ordinance, which provides for what amounts to a lease in perpetuity, which while providing security of tenure and other rights of ownership (including the right to transmit ownership to a single heir within certain degree of blood relationship) is subject to certain other restrictions, the most important of which are:

(a) Prevention of sub-division and fragmentation;

(b) The devolution of title on death to only one of certain specified relatives;

(c) Prohibition of lease, mortgage, disposition, sale or transfer of any kind; and

(d) Permanent residence on the holding (in the case of highland allotments given for dwelling purposes).

It will be seen therefore that tenure under the Land Development Ordinance falls considerably short of outright

ownership based on free hold title, except under a "Swarnaboomi" grant. The purpose of introducing this restricted or protected tenure is to ensure that adequate incentives are provided for the development of these lands, while at the same time ensuring that the maintenance of productivity will not be endangered by sub-division of the land, or the purpose of the tenure (namely the creation of an independent peasantry) defeated by the sale or disposition of the land to non-peasants. It is however questionable whether the aim of adequate incentive has in fact been provided. The Land Commission Report (Sessional Paper 10 of 1958), recommended that ultimate free hold title be conferred on the beneficiaries.

## 2. REVITALIZATION OF PEASANT AGRICULTURE

In Sri Lanka, paddy cultivation is synonymous with peasant agriculture. As the eminent historian Codrington noted in his "Ancient land Tenure and Revenue in Ceylon' (Ceylon Government Press - 1938), "the center of the village is the paddy land, of which the highland is considered to be appurtenance." It is inevitable, therefore that Sri Lanka's first programmes of Land Reforms had to pay special attention to paddy lands.

The first systematic study of the problems connected with paddy cultivation indicated that it was an unpopular occupation with low income. The main problems which retard agricultural productivity were:

(a) Irrigation and drainage problems;
(b) Lack of pasture grounds and consequent shortage of cattle;
(c) Insufficient labour; and
(d) Uneconomic size of holdings.

The 1928 investigations revealed that paddy cultivation is conducted mainly on the tenant system. Up to 35 percent of the area in any district is owned by landlords who lease the fields for

cultivation. The chief exceptions to this were the Kurunegala and Mullaitivu districts where owner-cultivated land predominated. This situation seemed to have changed considerably by 1952 when statistical investigation of paddy cultivation showed that 55 percent of the paddy lands in the island were owner cultivated.

Two main systems of tenancy are reported: the share system and the fixed rent system. Except in Jaffna and Batticaloa districts where the fixed rent system prevailed, the most general form in all other districts was the share system. The share to which the tenant is entitled and the conditions on which the share system is worked varies in the different districts. The general principle was the half - share basis and it was customary for the landlord to contribute to the cost of some of the items needed for cultivation.

In nearly all cases the tenant obtains his field direct from the owner. But in the Hambantota district and a few other isolated areas, fields belonging to absentee owners or to temples are sub-let to or managed by agents (Gambarayas) and it is from these persons that a tenant obtains the right to cultivate.

At the time only a few districts suggested the need for providing a better security of tenure. It was observed that in general, tenants continue to work the same fields for a number of years, until either the owner or the tenant becomes dissatisfied; the former on the score that the tenant is not doing his best for the field, the latter that he finds the particular field not sufficiently productive.

A factor that has been stressed by the Committee is that insufficient co-ordination and co-operation exists between the various public services maintained for the benefit of the cultivator. The Committee concludes that the cultivator has need of the guidance and supervision of a trained representative of a centralized body whose business it should be to consider his requirements and help obtain their provision. The question of pure-line seed and manuring, water and drainage requirements, animals, fence sticks, pasture etc. are all vitally interwoven, but

each is provided for by a different branch of the public service, represented to the cultivator by a different, and in many cases, a non-locally resident person. The essential co-ordination to make the business a success is then almost an impossibility.

## 3. THE NEED FOR REFORMS

Just over 20 years after the 1928 investigation, when the Kandyan Peasantry Commission held its sittings, the socio-economic position of the share-tenant cultivator of paddy land had changed considerably. The build up of pressure on the land with increasing population deteriorated his position. As has been already pointed out, the percentage of owner cultivated lands rose from less than 25 percent to 55 percent.

The Commission pointed out that in the Central and Uva Provinces the nature of tenure was precarious. The tenancy generally lasts only for a year and sometimes less. The owner is in a position to change his tenant every year. The dominant position the landlord held enabled him to demand of the cultivator various services (Madaran) unconnected with the tenancy of the paddy land in consideration of a grant of tenancy for the following year. The precarious nature of the tenancy also results in indifferent cultivation.

The Commissioners therefore recommended that "the time has come for securing to the tenant fixity of tenure and for the abolition of 'madaran' (a gift in money and kind which the tenant had to offer the landlord before he received the land for cultivation each season) and free services."

### 3.1 Tattumaru Kattimaru and fragmentation

There were other tenurial factors which prevailed in the Wet Zone districts, the most important being the current inheritance procedures. In actual fact, five laws operate with regard to inheritance in Sri Lanka. These are the Islamic law, the

Tamil Thesawalami, Kandyan law, the Roman dutch law and for state grants the land Development Ordinance of 1935. The Roman Dutch which covers the major Wet Zone areas, makes the surviving spouse entitled to half share and the children to equal shares of balance share. There is a universal desire to be fair to all children. This has led to smaller and smaller sub division of privately owned land. Leading to increased fragmentation. The Co-ownership of undivided shares has multiplied due to the inability of the courts to keep pace with the volume of partition actions.

The incidence of undivided shares has shown a steady increase in the Wet Zone. All this in the paddy sector has led to the high incidence of Tattumaru and Kattimaru type of traditional land tenure. Tattumaru and Kattimaru is an attempt to adjust cultivation rights to meet the scarcity of land by way of working an economic extent periodically. Its main purpose is to prevent further sub division of the operational units while allowing the family tree to claim ownership to the ancestral paddy land. The tattumaru system combined with undivided shares has led to many a complication in the rural areas and a large number of disputes which are hardly adjustable. Although the incidence of Tattumaru is not that high throughout the country its impact on paddy cultivation in the Wet Zone is definitely enormous. The Tattumaru lands farms 36.8% in Kegalla, 36.1% in Kalutara 33.9% in Ratnapura and similarly high in Galle, Matara too).

## 4. TENURIAL REFORMS

### 4.1 The Paddy Lands Acts of 1953

Corrective legislation to arrest the deteriorating position of the tenants was introduced in the form of the Paddy Lands Act of 1953. This act required that tenancy agreements should be documented and registered with the 'proper authority.' During a period where such an agreement is in force, ejectment of a tenant was only possible by means of a decree from a competent court

and that too for prescribed causes only. The maximum rent which could be demanded by a landlord of a tenant cultivator was also laid down.

The provision of this Act was brought into operation in two districts of the island. The experience gained here was to be used to modify the Act, if necessary, after which it has intended to introduce the Act to all parts of the island. However, the 1983 Act was never implemented in the spirit it should have gone into. Thus it ended a dismal failure.

The Government Agents of the Districts submitted Reports evaluating its implementation. As this Act was based on a kind of voluntary Contract between the landlords and the tenants its implementation was not a success.

Furthermore, the provisions of this Act were difficult to implement for the following reasons:

i) It needed a Contract between the landlord and the tenant and it was acceptable only when it was registered;

ii) There was no compulsion to register the relationship. Therefore, landlords did not take action to initiate such an Agreement. The tenants, on the other hand, had no power to insist on this.

iii) Even the existing tenants were liable to be evicted for any reason by the landlords during the first year of operation of the Act. In fact, the Act provided that they could be evicted within three years for certain specified reasons like delaying the payment of rent or allowing the field to lie fallow.

## 4.2 Land Tenurial Status in 1955

The tenurial status of paddy lands in 1955 is shown in the following schedule:

i) Owned and Cultivated : 55%

ii) Share cropped : 28%

iii) Leased : 13.7%

iv) Thattumaru : 5%

On the above basis it was found that nearly 32% of the paddy lands in this country were cultivated by non owners that is by "Ande" Cultivators. The normal pattern of the division of share between the landlord and the tenant was the traditional one based on half share or "hari ande" basis. If the landlord provided the seed and fertilizer (bone meal), he could recover same with interest from the tenant. This practice of half share often resulted in immense hardship to the tenant. He was often left with a very little amount of paddy after the deductions by the landlord. The time had therefore come for a change in this relationship and this had to be legalized like all other traditional relationships that existed in the country.

With regard to the management aspect of paddy cultivation there was also a breakdown as a result of a large number of absentee landlords and the low emphasis placed on paddy cultivation by the Government. The traditional "Vel Vidane" system had also deteriorated as commented by the Buddhist Commission in their report of 1955. The high incidence of Thattumaru and Kattimaru in the wet zone districts had also contributed to the low yields and the poor management of paddy lands. Therefore there was not only stagnancy, there was also a lack of incentive and initiative in the paddy sector of the county. There came a political change in 1956 when Mr. S.W.R.D.Bandaranaike supported by a group of radical politicians came into power and introduced a

number of far reaching changes. Mr. Phillip Gunawardane who was the minister in charge of Food and Cooperatives, wanted to bring about a radical change in the agricultural sector and this resulted in the introduction of the Multi Purpose Cooperative Society Act, the new Paddy Lands Act of 1958 and a draft Cooperative Bank Act.

## 4.2 The Paddy Lands Act of 1958

The Paddy Lands Act of 1958 was a revolutionary piece of legislation as compared with the earlier Act. The economic background that preceded the Paddy Lands Act of 1958 greatly influenced its spirit.

By 1955 the rural economy of this country was in a state of stagnancy. The total asweddumized area between 1940 and 1955 increased by only 15 per cent, while the increase in application was 30 per cent. The per capita extent of asswedumized paddy lands was 14 acres in 1946 and by 1955 this had decreased to 11.2 acres. Even the increased paddy yields were not in keeping with the requirements of the country.

In 1945 the average yield per acre was 27.5 bushels while in 1955 this had risen only to 32.5 bushels per acre. In addition, there was the increasing pressure of population on available land.

In the Paddy sector this came to be visible as a result of the very high incidence of evictions. In fact, the paddy lands Act of 1953 was itself a superficial solution to overcome this problem, as this Act had no impact. The rate of evictions continued and the landlords were making high demands of rents, thus resulting in much distress to the tenant cultivators of the country.

The Paddy Lands Act of 1958, as its Preamble explains, is an Act:

'To provide security of tenure to tenant cultivators of paddy lands, to specify the rent payable by tenant

cultivators to landlords, to enable the wages of agricultural laborers to be appointed as tenant cultivators and collective farmers; to provide for the consolidation of holdings of paddy lands;the establishment of collective farms for paddy cultivation and the regulation of the interest on loans to paddy cultivators and the charges made for the hire by paddy cultivators of implements and buffaloes; to make provision for the establishment of Cultivation Committees to specify the powers and duties of such Committees, to confer and impose certain powers and duties on the Commissioner of Agrarian Services, to abolish the liability of proprietors within the meaning of the Irrigation Ordinance to pay remuneration to Irrigation Headmen, to control the alienation of paddy lands to persons who are not citizens of Ceylon, to repeal the Paddy Lands Act of 1953 and to provide for matters connected or incidental to matters aforesaid."

In summarizing the main objectives of this Act one could say it aimed at the following:-

a) To provide permanent and heritable rights of tenancy with retrospective effect from 12th April 1956. As from that date any paddy land which was tenant cultivated carried with it a permanent encumbrance affecting traditional rights of ownership and tenancy:

b) To limit the rent payable by a tenant-cultivator to his landlord. The maximum limit was fixed at 25 per cent of the share of the produce or fifteen bushels per acre per season, (this differed in different Districts). whichever was less.

c) To cater to the Managerial and Organizational needs of the paddy cultivating peasantry by the setting up of village level institutions known as the Cultivation Committee members of which are to be elected from among actual cultivators.

d) A host of other objectives of a very radical nature like fixing the wages of agricultural labour, the establishment of collective farms. Due to implementation difficulties many of these objectives could not be properly achieved.

## 4.3. Implementation of the Act

The Paddy Lands Act of 1958 was statutorily brought into operation in all the 22 Districts of the Island commencing from March 1, 1958. By July 1, 1962, 13 Districts had come within the provisions of the Act and in the balance Districts the Act was enforced on February 1, 1963. Due to a large number of operational and legal problems this Act had to he amended five times, that is, by Amending Acts No. 30 of 1958, No. 61 of 1961, No.11 of 1964, No.25 of 1966 and No.2 of 1970. Of these the most important Amendments were those of 1961, 1964 and 1970.

From the very beginning the Act had to face a large number of difficulties. In the very first year of its operation there were 14,500 cases of reported evictions. Very little progress was made and only 25 cases were filed in Court. Some of the problems that arose were regarding the usage and definition of such terms as "tenant cultivator" and "eviction." For example, the term "eviction" was interpreted by Courts to mean forcible and physical ejection of tenants from paddy fields. The jurisdiction of the Board of Review and the refusal of the landlords to obey the Orders of Vacation served on them. Most landowners making use of these drawbacks circumvented the Act by giving the land to others. Handicapped by economic and social difficulties the tenants hardly had the power to fight back as a class.

In 1964 a major legal issue arose, namely: that the Assistant Commissioners of Agrarian Services, not being Judicial Officers, had no power to hold Inquiries or give decisions. This issue held up all evictions till 1970. By this time the total number of complaints received from all Districts since the inception went up to 47,288. Of this nearly 10,000 were outstanding. The long Court procedure made it difficult for the tenants to get their lands

back. As a result, the effectiveness of the tenancy provisions of this Act was nullified to a great extent. The Special Provisions Act (Paddy Lands) of 1970 was a bold step towards solving this problem.

This piece of legislation was more or less implied as an Amendment to the Constitution and provided easy restoration. However, before the effectiveness of the Amendment was tested in Court the Act was repealed by a subsequent Government, and the new Agricultural Productivity Law of 1972 and the Agricultural lands of 1973 were introduced in its place.

As regards the Rent provisions of the Act, it envisaged that a stipulated rent should be paid to all landlords by tenant cultivators, and this again, was an issue that was hotly contested by landlords. In a large number of Districts the tenants who paid the stipulated rent in accordance with the law were often evicted by the landlords. On the other hand, the Government was not in a position to introduce sufficient sanctions to stop this trend. The defects of the law, therefore, made the landlords powerful enough to continue to take the traditional half-share of the harvest except in certain specified Districts like Matara, Kalutara and Hambantota. In spite of the actions of the Government it was not possible to break a "patron-client" nexus that had existed for generations. The provision of security of tenure and rent regulation were often related to each other. Due to the pressure of population on land especially in the Wet Zone and the Kandyan areas, the tenants were at the mercy of landlords to accept the conditions given by them. During the history of the whole operation of the Paddy Lands Act there is not a single instance where the landlord was prosecuted for demanding high rent.

## 5. THE CULTIVATION COMMITTEES

The establishment of Cultivation Committees is one of the most advanced steps resulting from the Paddy Lands Act. The Cultivation Committees were democratically elected by the

cultivators themselves. This institution is a recognition of the need to involve the cultivators themselves in development and management decision - making on a scale never done in the country to date.

The Act provided outstanding powers to these Cultivation Committees amongst which are the following:-

(a) To fix wages of agricultural laborers

(b) To collect rents and other payments

(c) To develop and maintain irrigation works

(d) To promote and develop the cultivation of paddy and other crops

(e) To exercise and perform the powers of Irrigation Headmen

(f) To make rules for the development of paddy cultivation within the Act's area of operation

(g) To prepare and maintain a Register of Paddy Lands which was legally accepted.

The Cultivation Committees were not able to function properly because their very legality was challenged from time to time. They were also handicapped as a result of the virtual non recognition of them by the Government Agencies, not having sufficient funds to pay for a full-time Administrative Secretary and for other development objectives. At the beginning they were excluded from the provisions of the Land Development areas. The fact that the Cultivation Committees did away with the Vel-Vidanes and were granted Statutory powers under the Irrigation Ordinance created a certain amount of confusion at the village level. On the one hand there were no Vel-Vidanes and on the other hand the Cultivation Committees were unable to perform the functions.

However, the Irrigation Ordinance was amended in 1968 and this situation was remedied.

The implementation of some of the other objectives of the Act like, for example, the fixing of wages of agricultural laborers, also the consolidation of holdings of paddy lands, the establishment of collective farms, the regulation of interest on loans to cultivators and charges for the hire of implements and buffaloes was not fully effective. Some of the main reasons for the drawbacks of the Act were analyzed by Mr. Ameer Raza, FAO Consultant in an Evaluation study of the working of the Paddy Lands Act in 1970. Some of his observations were:

(a) The Paddy Lands Act is a far-reaching measure of reform which one would ordinarily expect to go far towards achieving its objectives. But the Act suffered from one vital defect,namely, that it did not break the landlord-tenant relationship and it is this which has rendered it largely ineffective in its implementation.

(b) The failure of this Act to break this relationship enabled the landlords to organize resistance to the Act on a massive scale to evict tenants and extort from most of them the customary half-share of the produce.

(c) This Act provided for the preparation of a scheme for the purpose of transferring the ownership of land from the landlord to the tenant cultivator. The throne speech of 1965 substantiated these sentiments. However, due to ineffective implementation this matter was postponed.

(d) The Act conferred permanent, heritable, secure right of tenancy on all existing and future tenant-cultivators. However, these aspirations were never fully realized. With only a few decisions in favour of tenants in Court it is not surprising that the tenants' confidence in the ability of the

Government to withstand power of the landlords is negligible.

(e) There were protests from the Temples that their lawful incomes were reduced as a result of this Act. He therefore suggested that an additional grant be paid to the Temples to overcome this reduction in their incomes.

(f) The Paddy Lands Act made an attempt to prevent the future sub-division and fragmentation of holdings of tenant-cultivators. However, this was not effectively implemented.

(g) An accurate Register of Lands was considered a pre-requisite to the consolidation of holdings and he suggested a Cadastral Survey to be undertaken by the Government.

(h) Although there was provision for the transfer of tenancy there had been no instances where this has been actually exercised by tenant-cultivators. He suggested that tenant-cultivators who are to become owner-cultivators should be assisted to obtain long-term credit according to their needs by hypothecating their Title.

(i) In order to stop further fragmentation and sub-division of holdings provision should be made that in the case of transfers, new holdings below one acre in extent should not be created.

(j) That no special instructions should be placed upon tenant-cultivators who could pay compensation for the purchase of land from the owners.

(k) In order to facilitate the working of Cultivation Committees he suggested that the Government

should assist them to build Offices. He was also satisfied with the working of the Cultivation Committees.

Due to the ineffectiveness of the legal provisions safe guarding tenancy rights the provisions of the Paddy Lands Act regarding rent have also proved to be by and large ineffective. A tenant cultivator cannot be expected to insist on paying a lesser amount as rent if he cannot be sure that his rights on tenancy are secure. Observations in the field seem to indicate that the traditional half share of the produce is yet to be paid to the landlord as a rule and the payment of the rent stipulated in the paddy lands act is more an exception.

As against this, there is no doubt that there has been a noticeable change in the attitudes among the peasantry. The conferring of a right of tenancy succeeded in bringing about a greater sense of freedom even though efficient implementation of the provisions was not possible. Maybe the relationship which existed between the landlord and tenant deteriorated.

The traditional role of patronage assumed by the landlords towards their tenants has to a large extent disappeared with the implementation of the Act. The tenants had been so used to depending on the landlord to assist him not only in financing his cultivation but also helping him in his needs in between seasons. These services were obtained by a tenant cultivator from his landlord only after conceding to the landlord the tenant's obligation of servitude. Many landlords may not have demanded of the tenant cultivator personal services, but it was implicit that he could do so if he wanted to. With the landlord's refusing to play this role any longer, the tenants were left to fend for themselves. This no doubt may have placed them in a much worse situation economically but even unconsciously they have achieved strength of character in developing self-reliance and a greater sense of independence.

A survey of paddy lands done during late 1985 shows that of the total 3,68,000 tenant cultivators nearly 38 percent cultivate

extents below 1/2 an acre allotments and nearly 71% cultivate extent less than 1 acre showing that tenancy of paddy lands is limited to very small blocks of land.

Taking the tenure of owner cultivators we again see a similar pattern where out of a total 1 million nearly 61 percent cultivate extents of less than one acre.

There are hardly any tenants cultivating extents of more than 5 acres and only about 5000 owner cultivators cultivate extents of over 10 acres. District-wise we also note that in the districts of Colombo, Gampaha, Kalutara, Kandy, Matale, Nuwara Eliya, Galle, Matara, Jaffna, Kurunegala, Ratnapura and Kegalle most tenant cultivators cultivate extents of 1/2 to 1 acre.

## 6. PADDY LANDS TENURE IN SETTLEMENT SCHEMES

The situation of tenancy in settlement schemes is quite different from the rest of the country. Equal allotments are given and to start with all settlers are considered as equal. But soon things began to change. Most settlers brought to these settlements come from the poorest landless villages and they soon fall prey to more powerful forces. Due to various reasons mortgaging of the land becomes a regular feature. As this is considered illegal the whole operation is done underhand and the authorities too look the other side because any attempt to recognize the new relationship may lead to a number of complications. Recent surveys reveal the incidence of such mortgages being as high as 40% even in Mahaweli areas like System H.

Another significant feature is the authorized sub-division of allotments within settlement schemes. Although the standard practice is to pass down the allotment to one nominated successor, this practice is rarely followed.

The local traders (Mudalalis) and other entrepreneur including lesser grade officials do make use of the open land market available in all settlement schemes, to cultivate varying extent on seasonal basis by leasing the land. It also goes on where persons who provide loans, continue to cultivate the land in lieu of interest until such time is the loan paid in full.

In almost all these cases the allottee very often becomes an agricultural laborer, sometimes in his own land. The incidence of this type of illegal mortgages continues undeterred and no one has yet taken this matter up in a serious manner. In fact there is no account even of the rate of such mortgaging in settlement areas. An attempt has been made through the farmer organizations in Polonnaruwa District to redeem some of the mortgages.

## 7. LAND REFORM AND PADDY LANDS

With the passing of time and the emphasis towards paddy lands tenure becomes poorer and poorer. The land reform laws of 1972 did not bring about any impact on the paddy land tenure of the total 559.000 acres of land that came to be vested with the Land Reforms Commission (LRC) only 16.270 or 3% were paddy lands. Most had tenants and the others were part of the Estate itself. Wherever tenants were there, they were made owner cultivators and the balance was distributed amongst the landless.

The importance given by the Department of Agrarian Services to the implementation of paddy tenure could be seen by the 1984 report of the commissioner which does not carry any data on the implementation of the tenurial reforms. However the 25 Assistant Commissioners who were appointed to the Districts to inquire into complaints of evictions continued to function till the end of 1990. All of them have now ceased to function and there is presently a vacuum in the field.

# AMENDMENTS TO THE AGRARIAN SERVICE ACT

The Agrarian Services (Amendment) Act of No. 4 1991 which was passed amidst much uproar on 19th February, 1991 included a number of new features to the Agrarian Services Act. On the one hand this Act in a retrograde step or it has taken some of the rights conferred on them by this Paddy Lands Act of 1958 but on the other hand it has made a realistic approach towards some of the unsolved issues facing the smaller landlords in the paddy factor. The other important aspect of this amending Act is the pressure brought by lending institutions to get the farmer organizations legalized, to enable them to manage water issues, collect operation and maintenance dues from cultivators and to prosecute the defaulters if the necessity arises. Amongst the other main changes are the following:-

1. The tenancy provisions of the Act will not apply to lands alienated under the Land Development Ordinance.

2. Any Viharadhipathi of a Temple, Priest of a Kovil, Church or Mosque can request that land up to 2 acres be exempted from the tenancy provisions of the Act.

3. Any tenant who fails to perform a service or pay a determined amount in lieu of such service to a Temple, Church, Kovil or Mosque is liable to be evicted.

4. Persons who worked as tenants under leases of Paddy Lands will not be entitled to any tenancy rights.

5. Any tenant who fails to get a yield less than the average yield of the District is considered to have neglected his land and is therefore liable to be evicted.

6. Some of the clauses that directly benefit the smaller landlords and tenants may be summarized as follows:-

All appeals from decisions made by the Commissioner now go to the Provincial Boards of Review and not to the Appeal Courts.

1. A landlord who wants to sell his land should first offer such land to his tenant. In case of any disagreement over the price, the Agrarian Services Committee can intervene and fix a reasonable price. Any violation of this transfer procedure shall result in the transaction being declared null and void and render the occupier to be evicted.

2. Any small landlord whose sole source of income is the rent from his paddy land, can request that up to one acre of his land be given back to him although this may mean the tenant losing his right to cultivate.

3. The successor on the death of a tenant cultivator will be his spouse or child and that too provided they are not permanently employed their main occupation is paddy cultivation.

4. Compensation will be paid by the tenant to landlords in case of willful neglect.

5. Speedy recovery of arrears from tenant cultivators.

## Issues for Reform

1. Continuation of share cropping is considered a constraint towards productivity. Safeguarding the rights of tenants through legal provisions needs continued use of resources both manpower and money. Thus an alternative approach like the transfer of ownership to tenants may be a desirable answer. But in a country like ours where over

70% of landholdings are less than 2 acres, is such a transfer even possible without alternative solutions. Payments of compensation will not be an answer.

2. What are the measures available to solve the high incidence of Tattumaru and Kattimaru which affects productivity in most wet zone Districts. How far could a Rural renewal programme as spelled out by Dr.West, our FAO Consultant bring about a solution to the problem.

3. How far can small parcels of land distributed all over a tract under each minor tank be brought together for a more rational form of cultivation. Can a voluntary land consolidation programme without proper legal backing be a sustainable solution to such problems.

4. In a country like ours where land is the only source of collateral for Agricultural Credit how can we develop a dynamic productive base as long as we have tenurial problems like undivided shares litigation, co-ownership, rotation of owners and plots, fragmentation and inheritance issues. Can we introduce a comprehensive system of registration of title as a strategy to overcome at least some of them.

5. How can we solve issues like mortgaging, hidden tenancies and high exploitation like usufructuary mortgaging in settlement schemes including Mahaweli. Is exemption of such lands from the tenancy provisions the answer to such issues. Is not the time ripe to take stock of the situation and look for the root causes and thereafter take some positive steps towards solving such issues.

6. Should we not look into some of the more basic issues like how sustainable is our whole paddy based economy for the small holder peasantry specially in the context of increasing cost of production as against static yields and see whether alternative solutions are needed.

7. Amongst the solutions we can look for are :-

a) A planned approach towards crop diversification and the development of high value export crops through a nucleus farming system to create a greater demand of both male and female labour and greater incomes to the family labour. Outgrower principle.

b) The establishment of a dynamic rural Industrial policy which will absorb some of the rural labour force thus creating a better environment to solve some of the tenurial problems.

8. The need for a strong farmer organization that can withstand bureaucratic and political pressures would in no small way be the answer to some of the attempts to use the farmers to satisfy state needs while at the same time very little attention is paid to the ever increasing tenurial problems of the peasantry.

# ISSUES OF LAND USE

## RELATING TO AGRICULTURAL DEVELOPMENT

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## Introduction

The general criteria used in land use assessment are :
- environmental soundness
- maximum contribution to socioe conomic development
- retaining greatest possible element of future flexibility

When one speaks of land use in agriculture one always means land and water use. This simple fact is ignored at times and as a result one ends up with land use plans where well drained soils and ill drained low humic gleys are treated alike. Likewise, rain fed and irrigated lands are lumped together in the allocation of land for settlement. The other main issues that are lost sight of in land use relating to agricultural development are agroclimatic conditions, soil properties, watershed management, grazing reservations and fuel wood source to dwelling place distance.

## Land use in traditional agriculture

The important criteria mentioned earlier were taken care of in traditional agriculture based on small village tank ecosystem, where chena-paddy combination was utilized to achieve a

sustainable interaction between upland and lowland agroecology for the benefit of man and nature. The use of draft animals made grazing land an important feature in the system and the small catchment area of the village tank made careful management of watershed a must. The importance of maintaining the distribution network and drainage system for timely cultivation was well understood by the village community. Therefore when land use was considered in the past an holistic approach was adopted incorporating the ecological and biological systems to meet man's needs.

## Land use in modern agriculture

The large scale plantations of tea and rubber in the wet zones brought about the first change in land use pattern where a new form of cultivation was introduced. These plantations were made viable by use of labour intensive methods using workers with little knowledge of agriculture, employed under very poor working conditions. The village surrounded by tea plantations had to give up the balanced approach and concentrate on the paddy lands.

In the dry zone the development of massive irrigation tanks, at the expense of the village tanks, compelled the farmer to lose sight of the interaction of issues involved in land use for agriculture. For instance, watershed management has now become an issue to be handled by upstream dwellers of the reservoirs and the maintenance of distant distributary network is no longer their concern.

The land under gravity command became too precious to be left for grazing and browsing. This was mainly due to the heavy water losses in conveyance over long distances in RB soils.

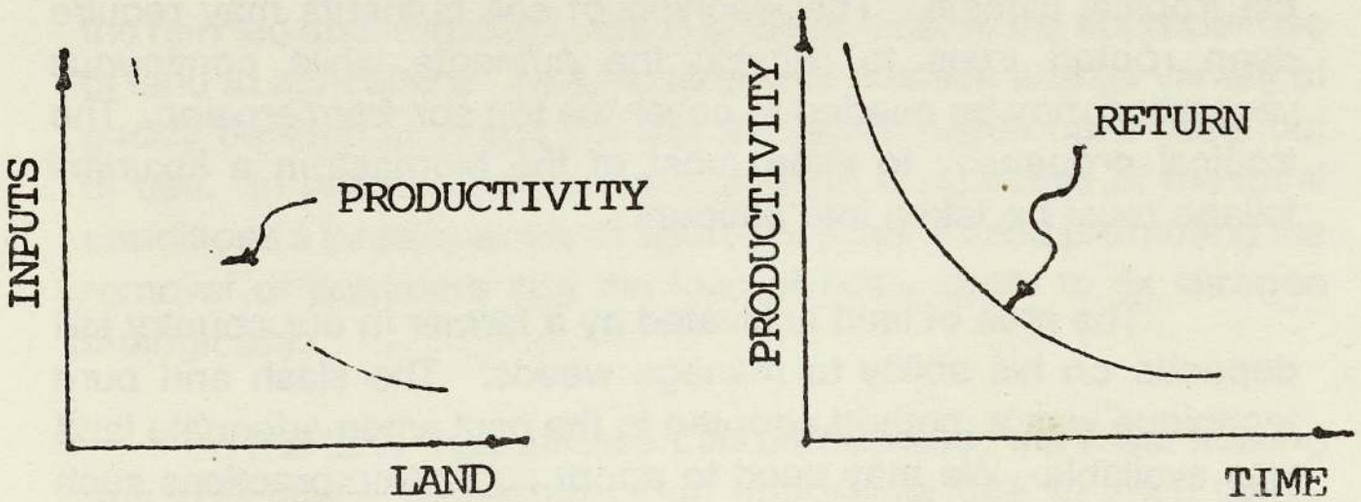
A complete change of attitude toward land use came about with the advent of agrochemicals and power implements for land preparation. The organic processes involved in agriculture which called for careful management of land now became mostly an

inorganic process to be manipulated with mechanical precision to such an extent that oil became more important than soil in farming.

## The options available

The chena-paddy cultivation based on small village tank ecosystem was a sustainable form of agriculture when land was freely available and man's needs were limited. The intensive agriculture based on agrochemicals was suitable for countries endowed with fossil fuel deposits and when unlimited energy is available. In the tropics, management of weeds and soil conservation are two primary requirements in agriculture. The allocation of land for monoculture farming on large extents is definitely not an option in this situation. Our complete dependence on imports for technological inputs required for intensive monoculture makes one take a fresh look at land use strategy.

The production function based on two inputs of land and capital utilized in agriculture illustrates the techno-economic options available to us. What is not very apparent is the fact that one option calls for quick returns which have a detrimental effect on the land.



The degree of capital investment, in the technological era that we are in, could vary from farming in green houses to cultivation on conveyor belts under simulated conditions. But no serious thought will be given to these options which do away with nature at an enormous energy cost.

## Our situation

The land distribution pattern in Sri Lanka will show present land availability after the introduction of industrial plantations of tea, rubber and coconut.

| | | |
|---|---|---|
| Natural forest | 1,650.000 ha | 25.1% |
| Forest plantation | 75.000 ha | 1.1% |
| Industrial plantation | 1,000.000 ha | 15.2% |
| Paddy land | 500.000 ha | 7.6% |
| Scrub land | 625.000 ha | 9.5% |
| Chena land | 1,000.000 ha | 15.2% |
| Others | 1,710.000 ha | 26.0% |
| Total | 6,560.000 ha | 100 % |

The country's endowments are varying soil formations, diverse plant species, bimodal rain, little cloud cover, and over 60% of the population engaged in agriculture. These features call for a different approach to land use in agriculture, best suited to the tropical climate. The leaching of soil nutrients may require deep rooted trees to recycle the nutrients while continuous vegetation may be needed to cover the top soil from erosion. The tropical propensity to keep most of the biomass in a luxuriant foliage must be taken into account.

The area of land cultivated by a farmer in our country still depends on his ability to manage weeds. The slash and burn technique was a method adopted in the past when adequate land was available. We may need to adopt cultivation practices such as zero tillage, relay cropping and hedge rows, and organic farming may be needed to minimize soil erosion. These methods

are best applied to small holdings and as such new concepts in land use must be developed.

The importance of soil development and maintenance of humus to promote soil microorganism will be valued only by farming over a long time an extent large enough to devote personal attention to the land.

## Changes in land use

The farmer's familiarity with the soil, seasons, crops, insects and predators must be maintained at all cost during period of relocation under massive land resettlement schemes. New crops must be introduced once the familiarity is re-established in the new terrain. The lack of this understanding will give rise to uncertainty in farming compelling the farmer to aim at quick returns.

Any sustainable farming or rearing of animals will not take place under such uncertain conditions. The recent crop failures in potatoes and gherkins are symptoms of this situation. When land is opened up in new territories for new crops a careful assessment must be done to blend the existing skills.

The cultivation of the same high yield variety of paddy in the rain fed and irrigated lands is another facet of the improper use of land in agriculture. As a result of this practice a large variety of paddy developed to suit specific locational needs have gone out of use. In order to achieve a high yield irrespective of the local conditions a large quantity of agrochemicals is used promoting the removal of predators and the loss of soil's ability to fix nitrogen biologically.

The land thus abused can be degraded very fast making any agricultural development an impossible task in such lands. Already signs of water logging and salinity build up in newly developed land in Mahaweli areas are seen and in Kalpitiya ground water contamination due to excessive use of fertilizer is recorded.

In introducing intercropping to existing land to make use of different soil layers and sunlight at different levels, adjustments must be made to accommodate the growth stage of the plants. If this is not carried out yields drop and the soil will deplete faster.

When changes are planned in land use patterns in agriculture, a clear distinction must be made between profits gained and wealth generated. The abuse of land can generate profits while degrading the land which is definitely a loss of national wealth. For instance the loss of grazing and browsing land will deplete the livestock but generate cash gains by the slaughter of animals as done in the dry zone.

## Land use and interrelated issues to agriculture

At the present inefficient method of burning firewood, 78% of the country's energy consumption is derived from fuel wood and 64% is consumed in domestic needs. Any land development which does not provide for fuel wood requirement of the dwellers is bound to fail as alternate sources of energy are not available freely at a price that is within the farmer's income.

Reforestation to improve infiltration and reduce surface run off is a very important aspect in land use plans. It is estimated that if adequate measures are not taken the large reservoirs will silt up in less than half the time allowed for in the designs.

Forest reservations will become an important feature in agricultural development not only to preserve plant species but to allow for coevolution of predators to keep pests at manageable levels. These reservations will also provide trap crops to lure the pests away from cultivations and will also act as buffer zones in the event of a pest outbreak.

When land is opened up for agricultural development provision must be made to maintain corridors for migration of animals. The instances of trapped elephants causing damage to crops is so common that one cannot be blind to this reality.

The spread of disease in newly developed lands due to water borne parasites and malaria vectors is a serious challenge to agricultural development and needs radical solutions. Better methods of building up resistance and immunity among the newly settled farm families is a must if land use in agriculture is to build a healthy nation. The design and maintenance of water ways must take adequate precautions to prevent breeding of malaria vectors.

The problem of fragmentation of land after a few generations seems to be considered a distant problem but the traditional methods of tackling the problem, either by community or family customs may help to keep the land holdings at viable sizes.

## Conclusion

Land use in agricultural development means selection of the right crop, management of water requirement and adoption of farming practices that will not quickly degrade the soil.

The tropical rains compel one to rely on an array of means to retain soil fertility and some of which are labour intensive. Farm animals are an integral part of the biological methods that can be used for productive use of land in agriculture. In order to use land to obtain long term benefits one must have a longer time frame for agricultural development which is lacking in our plans.

Nature sets limits to agricultural development but some of the limits can be exceeded at enormous energy costs which we cannot afford. Use of animals for draft power and fertilizer may be a soft option we can make use of by providing grazing land. Further, a better appreciation of the interaction between plant, animal and man can be achieved through live stock development. This perception is a vital factor in developing sustainable agriculture suitable to the tropical climate.

Land use in agricultural development plans which do not make provision for grazing, browsing, fire wood and watershed

may not be selfsustaining. If a fine balance between lowland and upland cultivation is not envisaged in the plans, such development plans may not take root in our country. Large farms with monoculture may give immediate cash gains but at the expense of degradation of land and disrupting food security, which are very important issues in a poor country grappling with poverty.

In the light of many foreign advisors we have on agriculture, it may be relevant to quote an ancient sage's comment on another form of cultivation, namely cultivation of the mind.

> "In carrots the best part is buried; few know - except the farmer - by the green that there is orange underground; if you do not work for it, it will deteriorate; there are great many donkeys associated with it."

# CAN CONSERVATION FARMING ENSURE SUSTAINABLE LAND USE?[1]

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## 1. INTRODUCTION

### 1.1 Background

The word 'sustainability' is being heard in several places and echoed more now than before. It became known after the famous World Commission on Environment and Development, better known as the Brundtland report, was out. However,it gives a different meaning to different people. Sustainability is a process rather than a product. As argued by Shanmugaratnam (1990), the term is already suffering from overuse and facing the danger of becoming yet a another hackneyed phrase.

For the purpose of this paper, 'sustainability' is defined as a process by which the objectives of land use are achieved and, maintained at a high level over a long period of time. Therefore, it is pertinent to examine what the objectives of land use are and how they can be achieved satisfactorily over a long period. The

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objectives of land use are again varied from purpose to purpose and place to place. This paper concentrates on land use for agricultural purposes and hence the focus is rural areas.

## 1.2 Agricultural land use

The objectives of agricultural land use and the means to accomplish such objectives are therefore a starting point of this paper. The objectives themselves can be divided into two groups namely, short and long-term objectives. They can also be divided into ultimate objective and intermediate objectives. The intermediate objectives are usually short-term while the final objective refers to the long-term vision. The final objective of any agricultural land use programme is to improve the standard of living of the people.

The people themselves are seen in terms of several concentric circles; the inner most circle refers to the people who are directly involved in agriculture such as the farmers. The next is the agricultural workers assisting the farmers. These two categories form the primary target group of land use. They are based in villages and form the rural society. A cluster of rural societies forms a village and several villages form a division; several divisions add up to a district and so on until they aggregate at the country level. Depending on the focus of people, the objectives could be defined as long or short-term. A short-term objective of land use therefore is to improve the standard of living of people involved in agriculture. The ultimate objective may be to improve the standard of living of the people in the country at large. Hence, the ultimate objective of agricultural land use of the country is the improvement of the standard of living of the people of Sri Lanka.

## 1.3 Means and techniques of production

Agriculture's role in improving the standard of living of people is primarily through increased agricultural production and income. This should be done in an equitable manner since the objective of land use is to improve the living standard of all the

people. The increased production and improved income can be achieved by a combination of several means such as provision of better services, improved education, better market, attractive prices, organizing farmers, etc. The techniques through which increased production can be brought about are mechanization, high technology farming, commercial farming, high input farming, conservation farming, etc. These different techniques have their own merits and demerits.Here, I will confine the discussion in the paper to conservation farming.

## 1.4 Conservation farming

The term 'conservation farming' has attracted the attention of several practitioners as a method of sustaining agricultural production. What is meant by conservation farming? What are the main features of this technique of farming? How is it different from other techniques of farming; there are some relevant questions which must be understood. The International Institute of Tropical Agriculture's (IITA's) definition for conservation farming is that it is a technique which minimizes soil disturbance, energy, time and protects soil fertility.

Sustainable agricultural land use can be defined as a process which embraces the use of land while maintaining the biological and economic productivity at a high level with social justice over a long period of time. Whenever the social demands are higher than what the system can generate, the sustainability of the system becomes weak. Therefore, one important component of sustainability is that it refers to a time series rather than a point of time. The biological productivity means dry matter production while the economic production refers to profitability. The term social justice means wider issues such as social, cultural, political and institutional aspects of land use. Therefore, a system of land use where biological productivity and the profits are high with equity in income and social welfare can be identified as sustainable.

Let us see the local land use pattern and examine the question whether it is sustainable.

## 2. LAND USE IN THE COUNTRY AND ITS SUSTAINABILITY

### 2.1 Land use

The total agricultural land area out of the land mass of the country is 30 % (1982). The main forms of land use are arable farming, permanent and temporary crops farming and plantations. Table 1 indicates the main types of land use of the country over two agricultural censuses. Based on the data shown above, two main observations can be made. First, agricultural land area is just a fraction of the land area available in the country. Second, it shows that the area under different types of land use has increased over the last 20 years except for the area under plantation crops which has in fact come down by about 11 %.

Table 1: Change in Land Use, 1962-1982

| Land category | 1962 | 1982 |
|---|---|---|
| Agricultural land (ha) | 1,888,528.1 | 1,973,839.7 |
| Arable land (ha) | 527,526.5 | 752,046.1 |
| Aswedduмized (ha) | 459,404.3 | 556,993.5 |
| Land under temporary crops (ha) | 68,122.2 | 195,052.6 |
| Land under permanent crops (ha) | 1,070,173.6 | 974,624.8 |

Source: Report of the Land Commission - 1987

## 2.2 Sustainability

The sustainability of the system of land use in the country is the next question. Let us examine this issue in terms of biological, economic and social dimensions associated with sustainability mentioned above. For this purpose, crop yields, their economic returns and social aspects will be compared. The analysis is confined to paddy, tea, rubber and coconut which together accounts for over 75% of the agricultural land area of the country.

Figure 1 at end of article indicates the movement of output of the four crops over a 10 year period. Tea and coconut production have fluctuated around a static level while the paddy output has registered an increase during the study period. The rubber out put is coming down.

In terms of yields, it has registered a steady increase of 2.1 to 2.4 MT/ha in 1976 to a high level of 3.6 MT/ha in 1983. Thereafter, the level of yield is fluctuating which has gone down also. It is believed that the paddy yields in some high potential areas have reached a plateau and any yield increase has become impossible. Average yield levels and its movement for other crops is not available for the country (Central Bank, 1987).

The above picture must be compared with the yield potential of what is cultivated. In the case of paddy, there are varieties capable of yielding up to 7 MT/ha while the yield achieved on farmer's plots is about 2 MT/ha. It is only 28% of the potential yields which are realized. In the case of tea, there are clones yielding up to 7 MT/ha made tea when the average yield of plantations is about 4 MT/ha.

The above figures show that the yield actually realized is just a fraction of the potential yield. Therefore, it may be concluded that in terms of biological productivity, it has reached a level of stability although the actual yield potential of the crops is higher than what is achieved.

Let us see the economic sustainability of the land use system, specially the cultivation of paddy as an example. In this connection, three items must be considered namely, yield, price of inputs and the output price. In general, the input prices have increased by several folds; price of urea fertilizer has registered an increase in the producing countries from US $ 80 per ton in 1985 to as high as US $ 120 in 1989. This will have a triggering effect on the local price of fertilizer. In the 1979/80 Maha season, the labour cost for production of a bushel of paddy was Rs. 12 which has increased to Rs. 30 in 1989/90 representing nearly a 3-fold increase. The price: yield ratio of paddy in 1979/80 in a high potential area was 1:2 which has come down to 1:1.4 by 1989/90. The picture is the same in respect of all agricultural commodities leaving less returns for the farmers who cultivate them. The level of profitability of paddy seems to have been eroded over the years. Therefore, in economic terms, the present land use system specializing on the monocrop cultivation is not attractive.

However, agriculture keeps the farmers employed and is considered as a means of employment for the farmers although at subsistence level. As pointed out in the Land Commission report, the objective of land distribution for agriculture under the colonization schemes has been to allocate the available farm land to landless and relatively poor people with the prime objective of keeping them gainfully engaged in some possible economic endeavour in the absence of any meaningful alternatives outside agriculture. Although agriculture seems to be less profitable, it is a source of employment for a great proportion of the workforce. This trend will have implications on the social sustainability of the land use system reviewed below.

Turning to social justice, evidence indicates that the income disparity has been widened; land distribution has become inequitable; landlessness increased; operational size of holdings reduced; various forms of tenure have emerged; and the agricultural income has dwindled. The institutional support to agriculture such as extension, rural credit, supply of other inputs, etc. has weakened.

For instance, in the rural sector, which is predominantly agricultural based, there has been a slight shift in average monthly income from Rs. 169 to Rs. 233 in real terms between the period of 1981 and 1985 respectively. However, the income distribution has become adverse with the respective gini-coefficient values of 0.31 in 1981 which has increased to 0.41 in 1985. Larger the value of the ratio, greater the disparity in income.

The agricultural landless is at a high level of about 20 % and as indicated by FAO, quoted in the Land Commission report-1987, the landless is accounting for 19% of the population. There is no time series information to show the growth in the landless in the agricultural sector. Settlement studies indicate that the holding size in the dry zone has come down from 1.34 ha in 1962 to 1.00 ha in 1982. The reduction in land size in the wet zone is 1.09 to 0.81 during the same period (Wanigaratne, R.D, 1990). The same author indicates a secular tendency to fragment the holding and a shift towards micro-holdings as the existing large holdings are fragmented to accommodate more people or because of inheritance. Various forms of tenure such as mortgage, lease, rent, share cropping, etc. have emerged during the last four decades. In some settlement schemes, the operation of various forms of tenancy is as high as 30% (Land Commission report-1987).

The sum total of all these land use arrangements is that social problems with regard to the use of the land have become more acute and varied in number compared the past. Hence, one may wonder whether the land use system itself is socially sustainable?

Therefore, the agricultural land use system of the country has reached crossroads with constant levels of agricultural production, declining farm income and ever widening social problems involved. Continuation of these propositions may reach a point where the sustainability of the land use system may be in danger.

## 2.3 Why Land Use is Unsustainable?

There are several reasons for poor sustainability of the present land use system of the country. Among them are, low level of fertility due to soil erosion, the heavy dependency on external inputs due to the loss of inherent capacity of the soils, decrease in land:man ratio and the resulting need for land fragmentation, increase in price of inputs compared to price increase of agricultural products, and a weak institutional system.

### 2.3.1 Soil erosion

The Table No.2 shows the soil loss in Nuwara Eliya district which is critical in terms of its high elevation and hydrological features.

Table 2: Land Use Category and Soil Erosion, Nuwara Eliya District

| Type | Total area (ha) | Total erosion % | Kg. erosion per Rs.1,000 income |
|---|---|---|---|
| Estate Plantations | | | |
| Seedling tea | 25,469 | 3.4 | 97 |
| Seedling tea, poorly managed | 28,903 | 55.3 | 2,810 |
| VP Tea | 8,409 | 0.1 | 5 |
| Rubber | 353 | 0.1 | 155 |
| Potatoe farm | 489 | 0.1 | 10 |
| Village agriculture | | | |
| Paddy | 5,535 | 0 | 15 |
| Mixed gardens | 8,023 | 0.9 | 290 |
| Chena | 11,049 | 21.2 | 4,748 |
| Tea smallholdings | 3,463 | 6.7 | 11,323 |
| Coconut | 216 | 0 | 138 |
| Market gardens | 3,098 | 4.2 | 111 |
| Woodlands and Patana | | | |
| Dense forest | 28,625 | 0.1 | n.a. |
| Degraded forests | 19,269 | 4.8 | n.a. |
| Scrub | 8,744 | 2.7 | n.a. |
| Patana | 13,057 | 0.3 | n.a. |

| | | | |
|---|---|---|---|
| Non-agriculture | | | |
| Settlements | 3,138 | 0* | n.a. |
| Reservoirs | 3,434 | 0** | n.a. |
| Unproductive | 3,217 | 0.2 | n.a. |

Source: IRDP, Nuwara Eliya, 1989.

n.a.- Not available/

* Author does not believe this figure. It may have been under estimated.

** What is applicable here is siltation which has not been estimated. Author believes it to be high based on his field observations in the district.

Soil erosion is a serious threat to agricultural productivity in the Nuwara Eliya district with its high rainfall and the sharp terrain. As seen in the above data, poorly managed seedling tea accounts for as much as 55% of the total soil erosion of the district. These soils have completely lost their biological capacity and soil conservation will pay high dividends on such lands. On these soils, 2,813 kg of soil is lost for each Rs. 1,000 income earned.

As seen in Table 3, soil loss is directly related to the slope of the land as well as the manner by which the land is managed. Most of the hilly slopes in the mid and up-country are cultivated with crops which require soil disturbance and the erosion loss aggravated inevitably. On the other hand, tillage has a significant impact on soil loss, the degree of which increases with the slope of land. Use of better land management practices such as mulching reduces soil erosion (Table 3).

**Table 3: Effect of Ground Cover, Tillage and Slope on Run-off and Soil Losses**

| | Slope category (%) | | |
|---|---|---|---|
| | 1 | 10 | 15 |
| Soil loss (t/ha) | | 232.6 | |
| Bare | | | |
| Mulched | | 0.2 | |
| No-till | 0.03 | 0.08 | 0.14 |
| Ploughed | 1.2 | 4.4 | 23.6 |

| | |
|---|---|
| Run-off (% rainfall) | |
| Bare | 42.1 |
| Mulched | 2.4 |

Source: After Lal, 1976 ) Quoted in Wijayawardena and Wiadyanatha, 1989

After Greenland, 1975 )

Blank spaces indicate data gaps

## 2.3.2 High external inputs

Over the years, the main measures adopted to make the land sustainable is the application of fertilizer. The consumption of plant nutrients in the form of fertilizer has increased from 68 kg/ha of arable land in 1982/83 to as high as 101 kg/ha in 1986/87. The picture in some selected countries in the Region is given below and compares with the local scene.

Table 4: Fertilizer Nutrients Consumption per Unit of Arable land under Permanent Crops in Selected Countries and the World

| Country | 1982/83 | 1983/84 | 1984/85 | 1985/86 | 1986/87 | Increase (%) (1982/83-1986/87) |
|---|---|---|---|---|---|---|
| Bangladesh | 5.7 | 6.3 | 7.1 | 8.9 | 10.6 | 86 |
| China | 150.3 | 180.6 | 193.5 | 164.8 | 176.2 | 17 |
| India | 34.1 | 39.3 | 47.3 | 50.3 | 57.1 | 23 |
| Indonesia | 74.4 | 74.5 | 89.9 | 94.7 | 98.0 | 32 |
| Pakistan | 53.1 | 58.6 | 59.4 | 73.7 | 86.2 | 62 |
| Sri Lanka | 68.4 | 74.0 | 76.8 | 88.7 | 101.5 | 48 |
| World | 78.3 | 85.1 | 85.4 | 87.1 | 90.4 | 15 |

Source: ESCAP, 1988

It is seen that the level of application of plant nutrients through fertilizer is highest in Sri Lanka after China. The level surpasses the average for the world. In China, the population is highest in the world with 1.03 billion (1990). The growth rate of nutrient application has also been escalating over the 5 year period

reviewed. It is much higher in Sri Lanka compared to the growth rate for the world. It is likely that a high rate of application such as found above may not be sustained over a long period with the rise in price of fertilizer. In Sri Lanka, fertilizer was subsidized for a long period which may have been a reason for high level of application in the past. The subsidy is no more and the farmers may find it difficult to maintain a high level of application.

Furthermore, when the land is susceptible to soil erosion and loss of organic matter, a greater part of the applied fertilizer is lost from the soil mass finding its way to water courses resulting in increased water pollution.

The reasons for stagnation in crop production have not been evaluated adequately. Among the possible contributory factors are soil erosion and the resulting loss of soil fertility, lack of technical know-how, lack of agri-support services, land tenure problems, small sized plots, etc.

### 2.3.3 Land:Man ratio

The increase in population and the constant level of agricultural land area has pushed up population density on agricultural lands. The present land:man ratio is 298 persons per sq. km. in 1990 compared to 125 persons per sq. km. in 1953. Because of the increase in population and lack of opportunities for employment, people are forced to remain in agriculture. This has resulted in the fragmentation of allotments originally allotted. In many of the settlements, operational size of the holding has come down to as low as 50% of its original size. When the holding size reduces beyond a certain minimum level, land management practices such as water management, adoption of desirable cropping patterns, etc. become not only inconvenient but also difficult. These will have repercussions on the productive capacity of the land. This situation has already been reached in many of the old irrigation settlements of the country.

### 2.3.4 Weak institutional system

The most important institutional system for educating the farmers is extension service which is not in operation now at the field level. The number of departments and agencies supporting agriculture have increased by several folds but the co-ordination among them is reduced. In the meantime, the number of individual operators of agricultural lands has doubled during 1946 and 1982 (Agricultural Census, 1982). The soil conservation act is not in operation. The inadequacy of the institutional mechanism and the increase in number of operators have led to a series of problems affecting the operators of agricultural lands.

## 3. SUSTAINING LAND USE

The next question is what can be done to sustain the use of agricultural land and what is the role of conservation farming in this connection? These issues are examined in this section. Let us first see the types of conservation farming practices and their main characteristics.

### 3.1 Conservation farming techniques

Some important conservation farming techniques and their salient features are found in the following Table.

Table 5: Conservation Farming Practices and Their Features

| Practice | Features |
|---|---|
| 'No-till' farming | No tillage or minimum tillage; use of small quantities of herbicides to kill weeds; injection planting technique with dead weeds unremoved; |

| | |
|---|---|
| Farming with mulches | Live mulches such as leguminous cover plants or dead mulches such as straw, scraped weeds; seeding and inter-cultivation practice while keeping the mulch; |
| Avenue cropping | Planting tree fodder in wide rows of 4-5 m and planting crops between the rows; frequent lopping trees and use as green manures; |
| Inter-cropping | Planting selected crops in between another crop. This promotes nutrient re-cycling, conserves soil and moisture and reduces weed growth |

The above techniques can be adopted either separately or in any combination. When all three practices are adopted in combination, the land and water use are found to be better.

## 3.2 Effects of conservation farming

Experiments show greater returns to conservation farming compared with the traditional farming methods. The adoption of conservation farming practices reduces weed growth, minimizes soil loss due to erosion, conserves soil moisture, adds organic matter into the soil, increases earth worm activity and thereby creates a porous soil which is conducive for root growth, encourages nutrient re-cycling, and reduces soil loss by the wind. The nett effect of them is the increase in the dry matter production with low level of applied nutrients, labour and water. By proper selection of crops, the amount of water used in crop production could be reduced. The water thus saved could be applied elsewhere where the water is in deficient supply.

As shown in Figure 2 at end of article, by switching to low-water demanding crops, the amount of water that can be saved is high. Therefore, the use of appropriate water conservation

practices and selection of appropriate crops is most important. At present, crops are selected without considering the actual water consumption.

## 3.3 Dry matter production

The following Table gives evidence to sustained increase in dry matter production (up to 2 dry and wet seasons) with no-tillage compared to the traditional method of farming.

Table 6: Effect of Tillage on Crop Yield (Kg/ha)

| Tillage | 1980/81 Maha C | 1980/81 Maha M | 1981/81 Maha C | 1981/81 Maha M | 1981 Yala C | 1981 Yala M | 1982 Yala C | 1982 Yala M |
|---|---|---|---|---|---|---|---|---|
| No-till | 1258 | 2978 | 528 | 549 | 706 | 474 | 844 | 670 |
| Tilled | 1256 | 2409 | 348 | 366 | 467 | 150 | 854 | 394 |

Source: Weerakoon, W.L., 1983
C - Cowpea
M - Maize

## 3.4 Returns to conservation farming

The monetary returns to conservation farming have been evaluated for an 8-year period. The returns are compared with exploitative methods of farming and the data are found in Table 7.

Table 7: Returns to Exploitative and Conservation Farming Over Time

| Farming system | YEAR 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 8-years |
|---|---|---|---|---|---|---|---|---|---|
| Exploitative | 1160 | 1036 | 712 | 636 | 567 | 507 | 361 | 320 | 5289 |
| Conservation | 491 | 438 | 392 | 350 | 879 | 786 | 701 | 626 | 4663 |

Source: Adapted from Suraweera & Wickremasinghe, 1983

Note: All values are discounted to year one at the discount rate of 12%

The main conclusion is that returns to conservation farming are at a low level at the beginning compared to exploitative farming. The trend reverses in the long-run. For a period of 8 years studied, total discounted returns are high for exploitative farming and low for conservation farming. No data on returns are available beyond 8 years. The returns are low compared to exploitative methods of farming. Under the above scenario, it is certainly a disincentive for farmers to adopt conservation farming since the short-term returns are small. A farmer is particularly interested in how much he can get today for his investment.

It is postulated that adoption of conservation farming techniques gives low yields in the initial years followed by increased yields in the subsequent years, up to year 8. Similar data must be developed for arable systems of farming involving long-term experiments. The evidence to-date is based on experiments continued up to 8-10 years and hence, there is a knowledge gap.

The above mentioned techniques are adaptable to farming conditions in the country. The adoption of these techniques will result in minimized soil erosion, improvement in soil fertility, moisture conservation within the root zone of crops, nutrient balancing, and requires less labour for land tilling. The end result would be less need for application of artificial fertilizer and cut down on expenditure on labour and the sustained increase in yields.

## 3.5 The adoption problem?

Then the question is what ails adoption of conservation farming methods? Why conservation farming techniques are not adopted by the majority of the farmers?. For instance, most farmers prefer to burn straw than to re-use it in paddy farming practices; they tend to use more fertilizer without controlling soil loss due to erosion; they tend to bare-weed the land which increases soil erosion. The number applying organic manure on arable and paddy systems is a bare minimum. The only exception is the vegetable grower in the upcountry areas who applies

organic manures on a systematic basis. In turn, his yields are also high.

There are several reasons for not adopting conservation farming techniques. The first is lack of knowledge on the part of the farmer on appropriate conservation farming methods and specific practices. Some of the knowledge gaps are: What are the different cropping practices which would suit various types of holdings located in different agro-ecological zones? What are the details of specific agronomic and management practices required? What is the level of income that can be obtained from different sizes of holdings with conservation farming? What are the long-term effects of this system of farming on crop yields? The present experiments have not gone beyond 8-10 years.

Second is the low initial yield resulting from the adoption of conservation farming practices. This is important since the average farmer is motivated to quick profits; he cannot wait for years since he requires immediate cash for family sustenance. Many farmers cannot wait until the crop is matured in the field and they harvest the crop even when it is un-matured in order to settle off debts. Under the prevailing socio-economic circumstances in the farming areas, it may not be possible to encourage farmers to adopt conservation farming unless the state bears the cost during the initial years of production. Another factor which is a corollary to this issue is that the income from a micro-holding where conservation farming is adopted may be still low compared to high-technology using farms. This is another disincentive for the adoption of conservation farming.

Third, the level of labour input required in the early years of conservation farming is high, which will not give any returns to compensate for his labour. Moreover, many farmers cannot cope with the present high labour prices and tend to resort to labour-saving devices.

Finally, encouraging farmers especially the subsistence farmers to adopt conservation farming is a difficult task which would require a high level of motivation. At present, there is no

mechanism to provide this high level of motivation since extension service is totally disrupted at the field level.

Therefore, the adoption of conservation farming practices in the agricultural land use of the country under the present socio-economic and political atmosphere poses some serious questions. On the one hand, the available packages have not gone to the farmer while the user requires funds, knowledge and motivation in order to adopt them on the other. Some of these practices may not be adopted as individual and group farming methods may prove to be advantageous.

## 4. CONCLUSION

In conclusion, it is to be pointed out that the sustainability of the present agricultural land use system of the country is questionable. In the case of ecological, economic and social justice aspects, it is certainly seeming to be unsustainable. Adoption of conservation farming practices is seen as a possible way to improve the sustainability of agricultural land use. However, its adoption is subject to three basic questions. First, the available packages to improve land use have not gone to the farmer. With the removal of the field level extension system, a vacuum has been created in the transfer of technology. Second, the socio-economic and political atmosphere appears to be not conducive to the application of this technique of farming on holdings which are small in size. With the ever decreasing size of operational holdings, it may prove to be difficult to adopt conservation farming techniques on such holdings. Third, available evidence indicates that crop yields attributable to conservation farming are low in the initial years and it takes several years before the yields attain a level which is comparable to exploitative plots. This long period of gestation is a definite disincentive for the farmers to adopt these techniques since he is interested in the quick returns to his investments. Therefore, unless incentives are available such as subsidy, adoption may be far below the desired level even if the farmers are trained in various packages. Finally, there is a

knowledge gap with respect to optimum crop and livestock combinations, evidence for sustained yields over a long time period and the details of possible returns over this period. We also lack experimental evidence relating to the size of a holding which would lead to optimum returns for land and water conservation embodied in conservation farming.

Although conservation farming appears to be a technique for sustainable land use, its adoption on Sri Lankan agricultural holdings is indeed an unresolved issue. However, the desirability of conservation farming methods in conserving our limited agricultural land area while continuing production cannot be under estimated. In this respect, it is seen that the future of the country may be determined by the extent to which conservation farming is adopted on agricultural holdings of the country, which in fact has been in existence in various forms, since ancient times.

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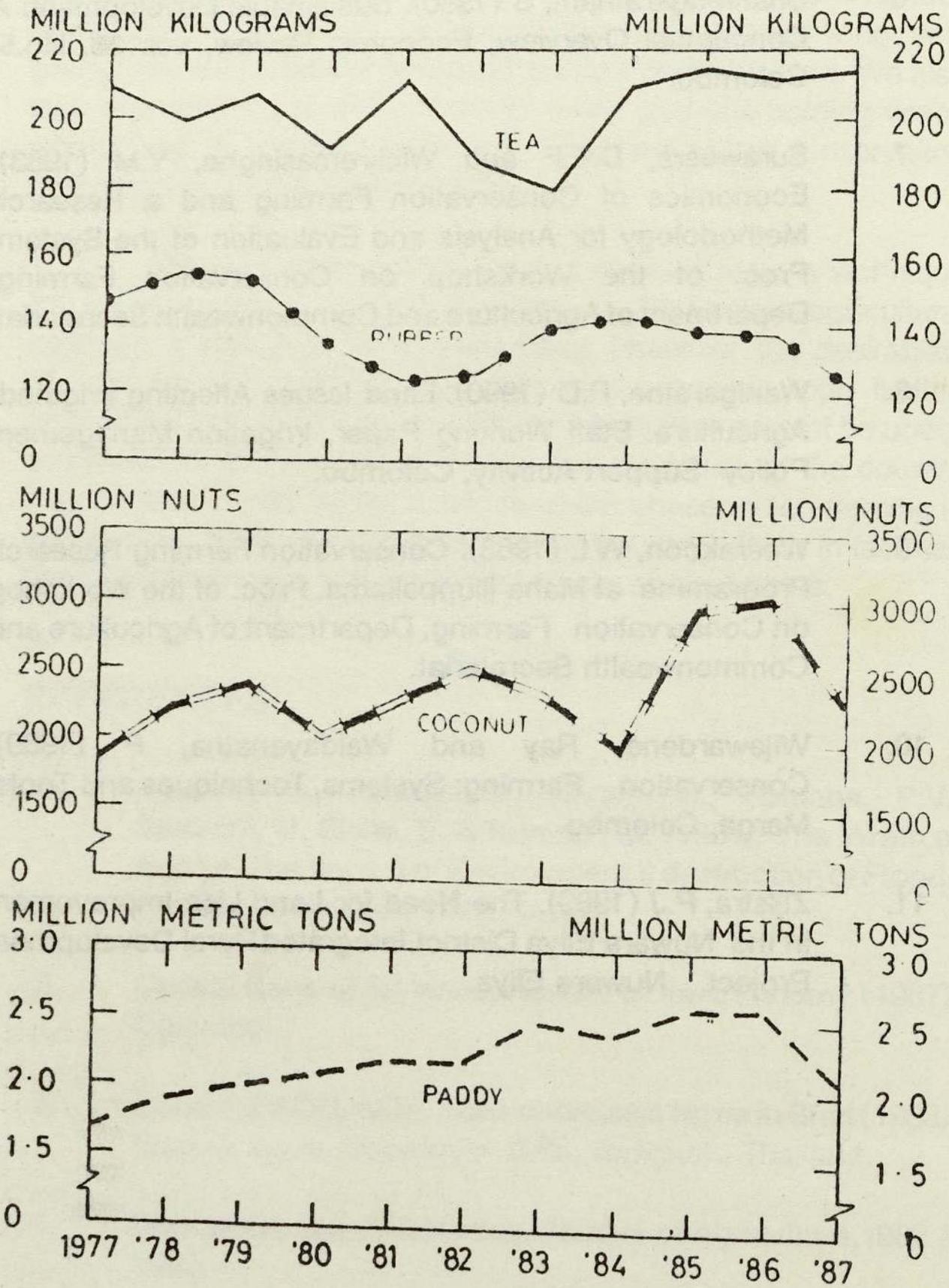


**Figure 1: PRODUCTION OF PRINCIPAL AGRICULTURAL CROPS**

**(Source: Central Bank, 1987)**

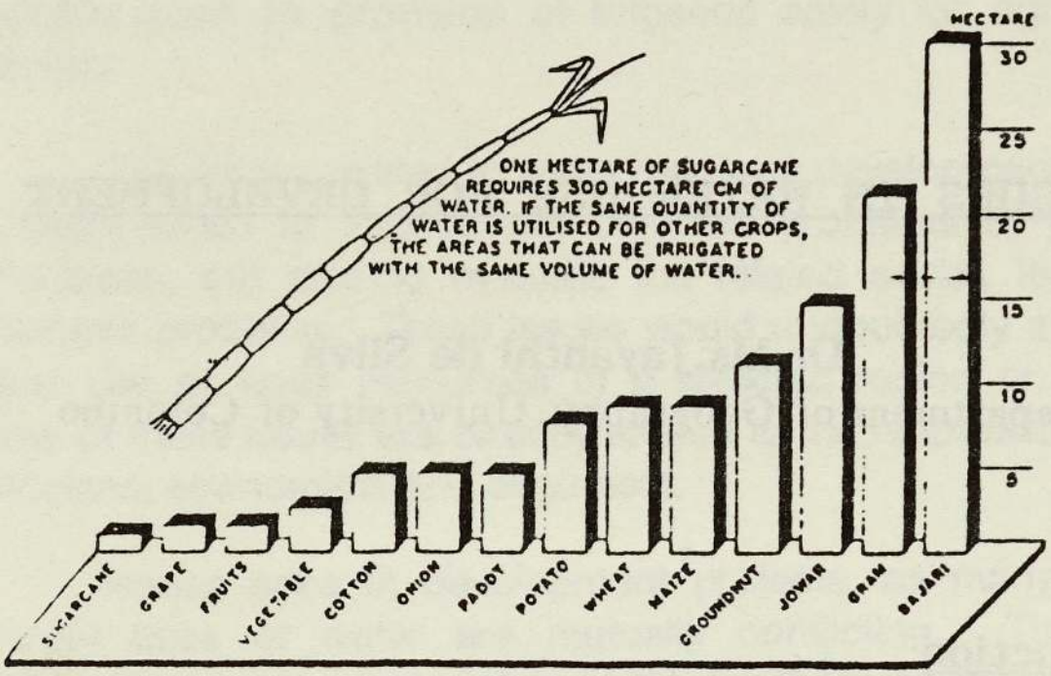


Figure 2: Potential increases in area cultivated by switching from crops with a high demand of water per unit of biomass produced to crops with a low demand. (Jowar is sorghum and Bajari is pearl millet) Source: Agarwal et al. 1987.

# ISSUES IN WATER USE FOR DEVELOPMENT

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## Introduction

Water has been the common base which has had the greatest effects on the progress of mankind throughout the long history of development of civilization. The early human settlements along river banks were determined purely on the accessibility to water resources. In Sri Lanka civilizations flourished in the Dry Zone, depending upon irrigation based water supply.

Water has many uses. Some are consumptive such as irrigation while other are non-consumptive such as navigation, hydro-electric power generation, flood control, recreational uses, salinity control, waste disposal and industrial uses. Many uses of water are not entirely compatible, which leads to conflicts of degrees.

The primary objective of water resources planning should be optimum conservation, control, development and utilization of the available water resources to meet all needs. In Sri Lanka water resources planning and development have taken place under the auspices of the Government. An evaluation of irrigation systems in Sri Lanka clearly indicates that, the increase of population and the influence of modern technology have made water resource development a complex task. Thus in the mid 20th century the

multipurpose irrigation projects gradually replaced the former concept of water resource development to achieve a single objective such as provision of irrigation solely for agricultural activities.

The issues related to water resource development should be approached to include not only the problems of physical formulation, but also to evaluate the related social, legal and economic problems. These issues would undoubtedly affect the actual use of water resources of a selected region or locality. Some of these issues are directly related to the responsibilities of politicians, economists and engineers.

Issues arise in development projects, as many of the different uses of water are mutually conflicting. Thus, the multipurpose project concept must resolve these conflicts, so that the maximum integrated contribution to the regional economy results from the construction and operation of the project.

## Issues related to irrigation activities

Among the many utility functions of water, irrigation is an important component. In Sri Lanka in the small, medium and large scale projects, the highest proportion of consumed water supply is generally devoted to this purpose. There are approximately 10,000 reservoirs scattered in the Dry Zone of Sri Lanka representing a total area of 1250 square kilo metres. It is estimated that the total number of tanks in use and abandoned exceed 12,000 (Madduma Banda 1989).

Two major issues in regard to irrigation water supply are quality and quantity of water. The quantity of water needed varies with Yala and Maha Seasons, crop type and cultivation method.

In an irrigation system the quality of reservoir and canal water is an important factor as settlers depend entirely on canal water. Deteriorated water quality in canals and reservoirs can be identified by the following characteristics.

(a) low degree of transparency in canal waters.
(b) water pollution due to usage of chemical inputs on cultivated lands.
(c) the spread of human settlements and its impact on water pollution.
(d) Water pollution due to animal husbandry.

The low degree of transparency or turbidity is caused by soil erosion processes prevalent in freshly ploughed paddy fields and unprotected canal bunds. It has been revealed that the low degree of transparency in canal waters facilitates the rapid growth of bacteria which could cause health problems to consumers. (De Silva J. 1990)

The widespread usage of chemical plant inputs has a tendency to pollute canal waters, as farmers do not adhere to proper methods of usage. Chemically polluted canal waters are a common phenomenon on the lower reaches of the canal system particularly during the Dry Yala Season. Numerous examples could be cited from large scale irrigation projects such as Gal Oya, Uda Walawe, and Mahaweli where use of chemical inputs have become a threat to the environment. (Ibid, pp. 8-10).

One of the objectives of water development projects is to facilitate land settlement. It is expected that one million families would be settled with the completion of the accelerated Mahaweli programme. As human settlements advance, it has adverse impact on the environment particularly on water. Reservoirs and canals are used for bathing, washing clothes, bathing of animals cleaning tractors, sprayers, and household garbage dumping grounds. The stagnant water bodies particularly during the Yala season are common in Area H in the Mahaweli Development Project.

In minor and major irrigation schemes draught animals and cattle are reared primarily as a source of farm power. Cattle sheds that are located in close proximity to canals and tanks pollute water as the organic waste is high in oxygen demanding material. Particularly during the dry Yala season, draught animals

live on canals and tank edges whereby water is polluted by animal dung.

## Issues related to water use for municipal requirements

In any water development programme due consideration should be given to the provision of municipal water ample in quantity and suitable in quality. Municipal water uses fall into both consumptive and non-consumptive uses, such as domestic, communal and industrial requirements. Of the many Municipal water uses, the demand for domestic requirements is relatively high throughout a day. However this is one of the water uses where at least a minimum supply must be available for delivery to the consumer at all times.

Issues in regard to Municipal water uses are likely to crop up as the demand for the quantity of water varies with the size of community, climatic conditions, specific locations and living conditions. Therefore future demand for Municipal uses depends on population growth and per capita consumption rate. In the city of Colombo from 1881 to 1981 the total population increased from 110,502 to 587,647. On the other hand,population density has increased from 4,516 per square kilometer to 15,759 per square kilo meter. Nevertheless scant attention has been paid to the improvement of municipal water supply scheme in the city. In general the quality of domestic water is a vital parameter whilst for industrial uses, the importance of quality depends on the type of the ultimate product.

In industries water is used as an essential component in processing cooling and other plant requirements. Industry must have an assured supply of water on adequate quantity and of satisfactory quality. In Sri Lanka there are numerous examples in the District of Colombo where industrial requirements involve competition with other uses, such as residential and recreational water uses. The location of industrial establishments in the Ratmalana and Mount Lavinia residential area provide an excellent example. The problem of water pollution is a common

phenomenon in industrial locations. Chemical water pollution is widespread in the vicinity of industries both in the city of Colombo and Ratmalana, Mount Lavinia and Moratuwa. On the other hand thermal pollution is associated with thermal electric generating plants and in manufacturing industries. In Sri Lanka large scale State sector manufacturing plants are dispersed outside the city of Colombo e.g.: Cement Factory on Kankasanturai and Galle, Paper Manufacturing in Embilipitiya and Vallachchenai, Sugar production on Kantalai etc. Irrespective of the production capacity of an industry, provisions for elimination of pollution, and adequate means of waste disposal should be provided.

## Issues related to water use for flood control

The control of floods plays an important role in water development programmes. It involves the contribution of reservoirs to impound flood waters, and deepening of canals to facilitate smooth functioning. Operation of a water development project is somewhat adverse to other objectives. Flood control requires periodic draining of water impounded in reservoirs to provide space to accommodate forthcoming floods. On the other hand Irrigation, power generation, recreation require the conservation of water resources to fulfil human needs. In the Galoya, Uda Walawe, and Mahaweli Development Programmes the flood controlling component has been given less importance. It should be mentioned that the Kelani, Kalu and Nilwala Projects of which some have already commenced resource allocation, have been made with flood control in mind.

## Issues related to water use for power generation

The generation of hydro power has become an important use of water with widespread technological development. It is not a consumptive use and has no permanent harmful effects on water quality.

In Sri Lanka, generation of power from water resources is generally an integral part of multipurpose projects which

commenced with the initiation of the Gal Oya Project in 1951. The component of power generation in a water development project, is basically inconsistent with other components. Power generation requires the retention of water in the reservoir below a given elevation in order to produce the required pressure for turbine operation. Unlike for irrigation the physical quality of water is important, as high suspended matter in water would affect the proper functioning of machinery.

## Issues related to water use for recreation purposes

In Sri Lanka, in the planning of a project, recreation has been considered as an insignificant use. In developed countries the allocation of water resources for recreation is a common phenomenon. Recreation is a non-consumptive use of water. It is dependent on water quality and obviously requires strict sanitary regulations. Boating, fishing, swimming are some of the uses that can be made on large reservoirs throughout the year particularly in the accelerated Mahaweli Project.

## Issues related to water development for fisheries and wild life

In many large scale water development projects. the fisheries sector has been integrated as an economic activity. ie. accelerated Mahaweli Project, Parakrama Samudraya, Uda Walawe Reservoir. Reservoirs designed for flood control, power generation, Municipal Water Use could at times be detrimental to the fishing industry. Conflicts tend to rise as fishing activity demands specific water depths, chemical and physical characteristics and water temperature levels.

In the reservoir constructed for flood control the water levels tend to fluctuate drastically. On the other hand stable water levels is a prerequisite for the development of fisheries. Interference with the natural regime of the stream may have serious effects on the supported fisheries and wildlife. According to the evaluation reports of TAMS (1980) the present 128,000

hectares of "Villus' on the lower Mahaweli will be reduced by 50% after the completion of the accelerated Mahaweli Project. This would directly bring detrimental effects on wild life, birds and fisheries that depend entirely on "Villu" eco system. It has also been predicted that felling of trees for large scale irrigation projects will bring detrimental effects on endangered species such as elephants, leopards and monkeys.

## Issues related to water development for waste assimilation

Increasing human population and multiplicity of human activities tend to increase the demand for this purpose. The design of the existing sanitary condition and treatment provided by industries and Municipal Councils are some of the vital factors that should be considered by a planner.

## Recommendations & conclusion

In an agricultural country like Sri Lanka, an increase in population will demand increased food production, which in turn will demand intensified and widespread irrigation projects. On the other hand in intensely populated areas, a substantial percentage of agricultural land may be required for residential, and for the development of other services. It is important to appraise all economic, social and other factors that will determine the relative priority that irrigation should have in respect to other water uses in an area. A clear assessment should indicate the present and future demands for agricultural products, and alternative ways on which the future demand may be set.

Particularly in developed countries treatment and reuse of the effluent in Municipal water is a common practice. If economically viable, such methods should be adopted in Sri Lanka with a view to solve future urban water requirements. The future plans for Municipal water development should evaluate the present conditions and the future needs.

Possible population shifts, changes in urban growth, improvement in living standards, should be considered as basic parameters in fulfilling Municipal water needs.

The planner must also be concerned with water quality for the future. Increased settlements, housing density and congregation of industries pose problems that are of importance. In fulfilling these demands particular attention should be paid to the quality of water.

The allocation of resources for flood protection should depend on reliable hydrological data, history and frequency of occurrence of floods and potential flood damages.

The conflicts that are likely to occur in a development project by integrating power generation components. can be resolved by locating power plants at a considerable distance downstream from the dam.

In Sri Lanka plans for water development should include adequate provision for recreational uses. The demand for recreational facilities increases as the country advances in technology. Particularly in urban areas increasing demand should be foreseen and provisions made, adjacent to reservoirs.

The planner should consider the possible feasible sources for future water supply particularly in a developing country like Sri Lanka where the probable population in the year 2000 has been projected as 20 million.

Obviously the primary water sources to be considered are surface water from streams and lakes and ground water from wells and large springs. The development of appropriate technology and availability of financial resources play an important role as water needs of the Dry Zone can be fulfilled by impoundment and efficient distribution. In an agricultural country like Sri Lanka it is clear that there is a high demand for industrial development. Industrial peak demands and related water needs tend to fluctuate to a great extent, dependent upon the type of

industry and the seasonal aspect of operating. Quality considerations however must be resolved even after treatment, in water discharged from urban areas. Urban discharges are quite likely to contain a large percentage of dissolved minerals, many of which are harmful to agriculture.

An efficient plan of water development must give adequate consideration to urban requirements in both the present and the future.

The provision of adequate flow in river channels to meet the requirement of fish and wild life is an important project consideration. Drainage of wet and swampy lands has been harmful to wild life. Thus planners should consider in allocating adequate provision for wild life refuges, wild life corridors, fish ladders, hatcheries etc.

The use of water for the disposal of industrial and Municipal waste is an important component in water resource development. The smooth functioning of this activity requires reliable information on future trends in population, industrial growth, different degrees of sewage and waste treatment methods. Lakes, streams with low quality (alkali) water or saline water may well be needed for pollution abatement.

It is obvious that in development planning attention is paid to the quantity of water but quality could be neglected. Poor quality may occur due to natural and man-made causes. Intrusion of saline water, high content of suspended matter, in water, are some of the natural causes that could affect the quality of water in a development project. Similarly evaporation of surface water, seepage losses are natural processes responsible for water losses.

In planning water resources, it is best to reduce the water surface areas as much as possible by concentrating in a limited number of deep reservoirs. Particularly in the Dry Zone such deep reservoirs would tend to have less evaporation than shallow layer reservoirs.

In developed countries technological innovations are utilized to arrest evaporation. i.e. the use of plastic tube for diversion of water and application of monarticular films. On the other hand lining of canals has proved positive results in controlling seepage. Excessive loss by seepage may perhaps be caused by factors such as insufficient research on soil and geologic conditions.

Issues related to the quality are more widespread in Sri Lanka. Water contamination in large scale development projects maybe caused by inorganic chemical inputs.

Both in urban and rural areas, bacteriological contamination is largely an act of man. Proper sewage treatment techniques provide the basic answer to such issues.

In Sri Lanka reuse of water should be actively practiced to keep pace with increasing demand. Particularly in the urban sector water needed for industrial cooling and waste disposal recycling of used water is an important aspect.

Water resources development should be planned so as to make optimum use of water resources giving appropriate unbiased weight to all uses not only in the near but also in the distant future.

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(TIPPETTS, ABBETTS MC CARTHY STRATTON)

# ENVIRONMENT AND ECOLOGY

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At the outset, I would like to place in perspective some of the basic concepts regarding Ecology and Environment, so that land use, pollution, environment, could be understood correctly. These two words Ecology and Environment are used basically for the same thing, but has two different meanings.

"Ecology" in its definition is really the science of studying the environment around you. "Environment" is also the study of what is around you. But there is a basic difference, in the approach. To commence a study of anything you have to first identify an object or define a concept or a principle or hypothesis. When you make that centralization, in Ecology, you centralize around the biotic components. In other words, the living components are in the centre of the study. This can be considered as a bio-centric approach. This study of what is around you putting life in the centre and in most instances, as at present, we try to put man in the centre; this is not what we really should be doing. But, that is what the society builds and caters for. Then one is said to be studying Ecology.

On the other hand, if you look at any text book of Environmental Science, it starts with Air, Water, Soil and Climatic factors into which you place the organism. This is a slightly different approach to the same subject. An environmental scientist will place the abiotic component in the middle and study the

environment or study what is around it to find out, to seek information, to solve problems.

Ecology, if broken down to its roots, is Oikes and Logos. Oikes is the house and Logos is to study. So, the study of the house of the living organisms. As you will notice this has been practised by man from the time he was created or from the time he evolved. Either way because he had to visualize and analyze things and make certain decisions, predictions to live in that system. As such, from the time he was created or evolved, he was an ecologist. The difference being that today certain guiding principles are laid. Ecology is not as yet a fully fledged science as Physics or Chemistry. We do not have rules as such. We still have a lot of hypotheses and very few rules compared to physics and chemistry. Therefore, ecology is still placed under what is called a "soft" science, not a "hard" science. All those things like technology, electronics, physics and everything that comes out of physics and chemistry, are considered as hard science while ecology is still considered as a soft science because most of the concepts are still theoretical hypotheses.

In environmental science, you will find a slightly more dogmatic or a stronger sector of the hard sciences coming in. If you look at the study of pollution, which is done mostly through the environmental science stream, you are dealing with hard sciences. Therefore, your basis will be stronger. The environmental scientist therefore in terms of an ecologist is more a hard scientist than an ecologist, who is more of a soft scientist. These are some general ideas that one should keep in mind.

We are always trying to understand what is around us and for that process we have developed a scientific method used in the classrooms. We first hypothesize and then we experiment, observe, analyse and make a conclusion and decide whether that hypothesis is correct or wrong. This is only one method of science. There are other methods of science which are not generally taught in school but which are also true. So it is whether you accept the scientific truth or the absolute truth that you have to decide on. Thus, natural history which people have observed

right through their life-time, if we add the concept of science it becomes ecology.

We have first of all the two basic components which are the biotic component and the abiotic component. That is, the living and the non-living components; and land is one of the abiotic components and the production you get from this abiotic component eg. paddy and food production is biotic. Thus, we are looking at both biotic and abiotic components. The interaction of these two is the basic fact in nature. They do not live in isolation. The net result is what will sustain itself or destroy itself. In fact, what we have done over a million years, since man evolved on this planet, is to be a part of this interaction, but gradually because of certain capabilities which were not found in other organisms, it conceptualized or visualized and thought to rule nature and became the ruler.

Experience today has proved that we have done the wrong thing. So the hypothesis that man will rule nature is not possible and therefore have to re-do an experiment to find out where man is going. During this process, he studies nature, he manipulates nature and thereby uses the interacting process which is natural between the abiotic and biotic. We have categorised parts of nature as natural resource, artificial resource and human resource. In the true sense of ecological and environmental concepts one cannot separate it into such components. It is one and if we try to break up, we will face the consequences which we are facing today.

The experiment has proved that we cannot break up these interactions. In fact, we should try to live within these interactions and not break out of these interactions. It has taught us the need to consider the total system in one approach. This systematic approach of all components together, rather than as individual components, is considered today most important.

Considering land by itself is nothing, if we do not consider it also with water, air and the biotic components. We have to start thinking not of compartmentalising the system, but of a systems

approach as in the science of ecology and environment. The systems approach takes into account the ecosystem.

What is the ecosystem? The ecosystem takes into account the sustaining interactions of abiotic and biotic components. This makes self sustaining of the system an important aspect. You can build an ecosystem today, even in our homes. If you want the fish tank in your home to be self sustaining and to remain with the least amount of energy input, you are gradually building a sustainable ecosystem. In this fish tank you will put your fish, your plants, it will have abiotic components, the water, some rock and soil and aeration for making it work. Without reaction you can maintain that fish tank, provided you have the right number of fish and the right amount of plants. The tank can be sealed to prevent evaporation and still retained as an unit functioning, self sustained. Of course there are limits to this. However, you can do it for some limited assigned period and during that period this is defined as an ecosystem where it is self sustaining and is able to run on its own steam.. It does not have to be made to work. The only thing that will have to come from outside is energy.

In the same way the entire biosphere runs. The only component that comes to earth is energy. It comes as sunlight. Everything else is here and if we continue to survive then we have to sustain ourselves, using the single component energy, that come from outside. The energy will come into the system and make the system work.

Thus, it is ultimately energy that keeps order, that which tills your land, or would make the land sustainable and provide continuously. Human beings try very hard to do this but they fail. Nature also does this and though it may fail too, nature is able to maintain it - that is the difference. Man wanted to be above nature and this is where the mistake was made. However, in the process a lesson was learnt as to what this system is all about and this knowledge is what is known as environmental science and ecology.

The experiment has given us results, and it is only in looking at these things clearly that we will understand, how we can continue to use land or water or air. In the natural process there are cycles - materials cycle either as a closed system or as an open system. The only substance that cycles in an open system is energy, everything else cycles as a closed cycle, mineral cycles especially are closed systems. The produce is consumed and decomposed. Bacteria, fungus are the ones that decompose what the consumers build from the abiotic components of the soil. This decomposition reverts the components of the land and more basically the elements of soil and water.

Thus, the cycle between abiotic and biotic components are maintained by the decomposers. We have also learnt that material is limited. Therefore, we cannot think of unlimited resources as we did in the past. There are renewable resources. A renewable resource is something that can renew itself, so most living organisms can renew themselves. Most land can renew itself, but the time scale for this has to be taken into account to consider it a renewable resource. In fact, it is said that one of the solutions for the greenhouse effect today is to rebury the trees without burning them because that is the carbon that we are taking out from the soil as oil or charcoal and burning.

Hence, we have renewable resources and non renewable resources. Fossil fuel, gas is renewable, provided we wait for millions of years. It is not renewable within the human life cycle. So what we define as renewable and unrenewable is within the age span of man. Therefore, if we can produce more trees and not use them but bury them, we may be able to balance the excess carbon that is carbon dioxide that is in the air and if we repeat it over and over again within a period of 20 or 30 years, we can bring back the carbon dioxide concentration to levels that were there before the pre-industrial era.

This is not an easy task, but that is what we are asking today. This is in addition to cutting down the present consumption by 20%. But, if we bury all that we produce we are going to have a reduction in the use of timber for other things.

There are other materials that can be renewed within a short period. These are for example, plastic. Within our age or within two or three days you can collect all the plastic and send it to a factory and bring it back. It comes recycled. Then there is artificial material.. It can be argued that these artificial materials are being produced out of natural material for instance plastics are produced out of fossil / fuel or from natural carbon dioxide, hydrogen, oxygen and the minerals that are available. From them we produce substances that are not found naturally. That is why we call it artificial. This material therefore will not be subject to the natural cycle of nature which is the breaking down process, but takes longer.

Nothing is non-renewable for everything has to break down in nature and it will happen but the only difference is the time it takes to breakdown. So the styrofoam cup that you use today if thrown away, 800 years later it will still be there. Take polythene - an average polytene will last 80 years before it can break down. By this we learn that when you begin producing artificial materials all you are doing is increasing non-degradable material in the environment.

During the Gulf War, there was no huge oil spill, large quantities of oil were released to the ocean. Bacteria was brought in and put in there to start eating those oil spills, but it will take so many years for it to do so. This cycle process has shown us that if we are to live within nature, we must live within this cycling process and not outside it. But, unfortunately, we have broken up this cycling process by producing artificial material.

The more you produce, the more you accumulate because even though nature has a process, nature cannot cope with the amount of material that is built up. The industrial world should share the guilt. The garbage produced in France per person per day is 1.7 pounds, in Japan 1.9 pounds, in West Germany 2.3 pounds and in the United States 3.5 pounds. Take for instance in Sri Lanka when you approach the city you see a lot of garbage but not so in the villages. This is not because the villages do not produce garbage but the garbage produced in the villages is

compatible to nature and it can break down faster, because the amount of artificial material in this garbage is less compared to what is found in the city.

In the city you have a lot of people, a lot of garbage and a lot of this garbage is artificial. This accumulates and creates a problem. Thus, we have a better insight into the cycling process. We also learn that the environment is never static. We often speak of preservation but can we preserve? In nature you cannot, that is why we need more energy to preserve.

Take for instance a Documentation Centre. If you want to preserve the material here you must build a system that will not subject the material to the natural process of breaking down. Termite, bacteria, fungus, all these things are the components that break it down. Similarly, with cultural material such as paintings and monuments. Preventing this is an expensive process. Similarly in nature, protection and preservation is not a natural phenomenon but an artificial one and therefore also an expensive exercise.

However, if you can work with the system, you may probably be able to retain what you want, but in the long term you have to understand that you will not probably have it. In five generations from now you may not have the books, the cultural monuments that you have produced today. This is something that man has to accept if he wants to live with nature.

Similarly, land use will change from time to time as nature is dynamic. If you want land use to become sustainable, to give the productivity that you want it to give continuously, then you have to understand that there is a dynamic process working within nature. If you do not understand this, you will only try to get the maximum out of the system by putting in as much energy as possible. Today, so much of fertilizer is added because the productivity of the soil is going down. The more you add fertilizer the worse it becomes and when you stop the fertilizer you will get absolutely nothing back. But if you allow it to work on its own, you will get your productivity but probably not the amount

you want, because you just cannot demand everything from the natural system, just because you need it. It cannot provide beyond a certain amount.

This is what we have to accept about nature. It has in excess only what nature produces and not in excess as man requires it. This is included in the concept of growth in nature. There is a growth potential in nature and an enhanced potential of growth too. We can reap the benefits at certain points in nature and if we know how much nature can give us, then we can benefit by using it. But unfortunately we want more than what nature can give. This is the problem man has to comprehend - first in willing to live with what he gets and not trying to live with more than he can get. This is what creates problems.

Another factor is that we think that some things are obsolete, but it is not so. For instance some may ask why do we need wild life, and why do we need trees and ask that they be cleared. The problem we have is that, we plan on a flat surface and does not note the role of other components.

In most of our projects, even the Mahaweli Project planning was done on the table. We must plan on the dimensions that are already there. In reality, what happens is that plans are made on the table and to implement this plan on the table you have to clear everything, have a flat surface. The first thing that the plan implementation programme did was to send a bulldozer and clear all the forests, then you plan structures, put your farms on it and then reforest it simply because man does not think it necessary to identify what nature itself is capable of doing.

The role of each species in nature is best understood by the concept of "niche". In this concept it is considered that every organism on earth today has a function and if that organism is not protected, if that organism does not function well, then the system will have problems. To understand "niche" is difficult - perhaps it could be explained as follows - it is difficult for two people to do the same thing unless the two people have an agreement between them. If they do the same thing, without an agreement it will give

rise to competition where one wins and the other loses. This is also true in nature.

In order to survive we must try as far as possible to make the system work. The catchword today is "sustainability", and we have had in the early 1980s the World Conservation Strategy on which the National Strategy was drawn up, and for the 1990s a new plan for caring for the world, has been put forward.

The new plan has eight principles of sustainability:

1. Limit human impact on the biosphere to a level that is within carrying capacity.

2. Maintain the stock of biological wealth.

3. Use nonrenewable resources at rates that do not exceed the creation of renewable substitutes.

4. Aim for an equitable distribution of the benefits and costs of resource use and environmental management.

5. Promote technologies that increase the benefits from a given stock of resources.

6. Use economic policy to help maintain natural health.

7. Adopt an anticipatory, cross-sectoral approach to decision making.

8. Promote and support cultural values compatible with sustainability.

# LAND, WATER, PEOPLE AND LAND USE IN SRI LANKA : SOME ISSUES FOR THE 21ST CENTURY

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## Introduction

Land has many characteristics that makes it different from other basic factors in economy and society. The highly composite nature of most land includes a whole bundle of things, among them space and raw materials, fund resources and flow resources, energy resources, supply limitations (because the earth is finite and not man-made) and often unclear borders between natural and man made components of real estate.

The use of land is primarily for production, to provide goods and services required to treat human needs and to satisfy economic demand. The systems or patterns of land use in a country or region may be characterized in two ways:

(a) by the variety of uses that occupy some part of the available area and the share each use has in the area.

(b) by the total degree of intensity with which the land area is used.

## Land in Sri Lanka

Sri Lanka is 65,610 sq.km in extent with a maximum length of 435 km and a maximum width of 225 km. The continental shelf excluding, forms a narrow ledge of about 20 km along the western, southern and eastern coasts. Towards the north and north west it broadens out to merge with the Indian Continental shelf.

Sri Lanka has a coastline about 1700 km.long which is characterised by numerous bays, lagoons, estuaries, salt marshes and mangrove swamps. In the north west and south east sand dunes and spits are well developed. Coral reefs are found off the southern, south western and eastern coasts.

About 9/10th of the island is composed of highly metamorphosed Crystalline pre-cambrian rocks which include crystalline limestones, dolamites, quartzites, quartz and gneisses. The remaining 10% includes miocene limestone, sand stone granites and shales.

## Water resources in Sri Lanka

Sri Lanka has 103 district river basins. The principal rivers all originate in the central highlands. Most rivers flow towards the sea in a radial direction in relation to these highlands. The Mahaweli Ganga (330 km long) however, flows in annular pattern in relation to the central highlands before discharging into the sea near Trincomalee on the east coast. The locations where the river flows over hard rock ground over escarpments are the sites of beautiful waterfalls.

Large inland water covers over 1600 sq km representing more than 2% of the country's total land area. These inland water areas are composed largely of small, man made reservoirs constructed for irrigation and/or for hydro generation.

## Natural resources of Sri Lanka

Fund and flow resources in the land include non-renewable and renewable natural resources and flow resources are rivers and water bodies. The renewable fund resources include the land, water, air, flora and fauna and ecosystems of the country's total land area of 6.5 million ha. 5.5 million ha. which have good arable soils. The soil types conform broadly to the pattern of the major climatic and agro-ecological zones of the island. Sri Lanka has a wide range of soils covering all the 10 orders in soil taxonomy. The principal types have been described as follows.

"The well drained Reddish Brown Earths in association with poorly drained low Humic gley soils in the valley bottoms are the predominant soils of the Dry Zone. Well drained, deep, red, yellow podzolic soils are the dominant soils in the wet zone. Red Yellow occur in a narrow belt in the North Western and Northern region. Sandy Regosols occur right round the coastal regions. Alluvial soils occur in the flood plains of the rivers and streams. (S. Dimantha - 1986)

Soil erosion is the major cause of land degradation. The soils in the dry zone are by their nature highly erodible although they occur on gentler slopes. On the other hand most of the intrinsically more stable soils in the wet zone are found in lands which vary in topography from rolling to steep slopes. Their situation, therefore, makes the soils in the wet zone susceptible to erosion. Depletion of nutrients and organic matter, water logging, and salinization are also major causes of soil improvement.

More than 3000 species of flowering plants have been identified and classified in Sri Lanka. About 830 of these species are endemics mostly located in the Wet zone forests. The commercial crops include tea, rubber, coconut, spices such as pepper, cardamoms, cinnamon and cloves and essential oil bearing plants like citronella, vetiver, lemon grass. Palmyrah provides several needs of the inhabitants of North & East Sri Lanka. The jak tree (Artocarpus intergra) provides food & timber.

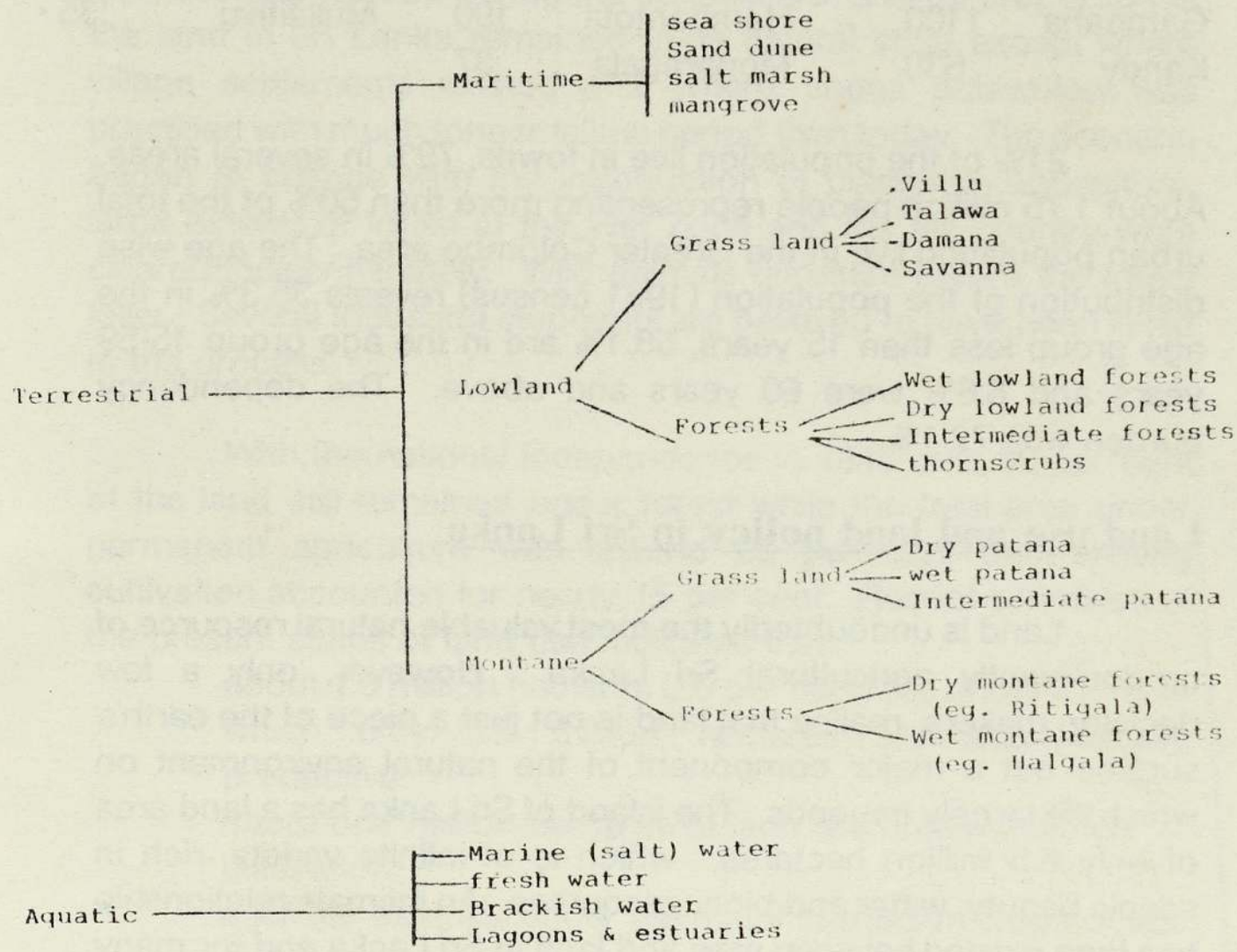
Common fruit plants include many varieties of banana, citrus, mango, pineapple, avocado and passion fruit. Timber species include teak (Tectona grandis), Dipterocarpus, Mesua, Doona, Vitex and Felicum of the wet zone forests and Manilkara, Diospyros (ebony) and Berry of the dry zone forests. More than 600 plant species are used in traditional ayurvedic medicine. Many of them are difficult to find. Mangorves and salt marsh plants belong to unique plant communities. They are also being gradually destroyed. Sea grass beds found off the North West coast are the habitat of the dugong, a protected sea Mammal.

The fauna of Sri Lanka has been described as a "relic" fauna. They include:

- 85 species of mammals of which 10 are endemic
- 165 resident species of birds of which 21 are endemic
- 140 species of reptile which many of them endemic
- 32 species of frogs & toads, 15 of which endemic
- 59 species of fresh water fish 16 of which are endemic

A high percentage of the endemic species is found in the low country and montane Wet zone regions.

Sri Lanka supports a wide variety of both natural and agricultural ecosystems. This is due not only to the considerable variations in topography, climate, environment altitudes & soils within its edapic heterogeneity but also to the remarkable diversity to its flora and fauna. These represent rich and diverse gene banks which are of immense importance to agricultural and livestock development. The major natural ecosystems in Sri Lanka are as follows.




## Population

The country's population at the end of 1987 has been estimated at 16.36 million and the natural increase in population 1.6% (down from 2.5% two decades ago). The number added to the population each year has however been consistently around 400.000. The density of population is about 240 per sq km. 57% of the total population live in the wet zone which covers only 23% of the total land area.

Sharp differences exist in population densities per Sq Km between different districts.

| | | | | | |
|---|---|---|---|---|---|
| Colombo | 2800 | Nuwara Eliya | 300 | Mannar | 60 |
| Gampaha | 1100 | Hambantota | 190 | Mullaitivu | 35 |
| Kandy | 630 | Monaragala | 37 | | |

21% of the population live in towns, 79% in several areas. About 1.75 million people representing more than 50% of the total urban population live in the Greater Colombo area. The age wise distribution of the population (1981 census) reveals 35.3% in the age group less than 15 years, 58.1% are in the age group 15-59 years and 6.6% were 60 years and above. The dependency burden was 72.1%

## Land use and land policy in Sri Lanka

Land is undoubtedly the most valuable natural resource of predominantly agricultural Sri Lanka. However, only a few decision makers realise that land is not just a piece of the earth's surface but a major component of the natural environment on which life largely depends. The island of Sri Lanka has a land area of only 6.5 million hectares, which is of infinite variety, rich in scenic beauty, water and biotic resources. An intimate relationship has long existed between man and land in Sri Lanka and for many people in this country particularly in the rural interior, land engenders an emotional response. From the land they not only derive their sustenance but also many other aspects of indigenous culture.

The general nature of land in Sri Lanka is reflected by the extents under different topographic classes given below.

| Topographic classes | Slope range (%) | % of total extent |
|---|---|---|
| Flat to undulating | 0-8 | 67 |
| Rolling | 8-30 | 11 |
| Hilly and mountainous | 30-60 | 21 |
| Extremely steep | 60 | 01 |

This indicates that over 2\3 of the land in Sri Lanka is flat or undulating. Nevertheless 1\5 is hilly and mountainous and in urgent need of watershed management. Before the advent of plantation agriculture during the colonial era, a large proportion of the land in Sri Lanka remained in its natural state except where village settlements existed and where chena cultivation was practised with much longer fallow period than today. The scenario began to change with the introduction of plantation agriculture; large extents of forest in the Wet Zone and the hill country were cleared indiscriminately. Wild animals retreated before the forest feller. Several thousand elephants are believed to have been killed in the process.

With the national independence in 1948 over 50 per cent of the land still remained under forest while the total area under permanent agriculture was around 25 per cent and shifting cultivation accounted for nearly 15 per cent. Recent estimates of the present status of land use indicates that:

- about 1.6 million hectares (25 per cent) are under forest of which only 0.5 million hectares are economically productive.
- about one million hectares of land are under shifting cultivation.
- a similar extent is under the major plantation crops of tea, rubber and coconut.
- 0.6 million ha. are under paddy.
- 0.7 million ha. under wild life reserves.
- 0.5 million ha. under grassland and scrub, and
- 0.1 million ha. under highland annual crops. The changing trend of land use under the major crops during the last four decades is given below in millions of hectares.

| | 1946 | 1962 | 1982 | Inter-censal change 1962 - 1982 (%) | |
|---|---|---|---|---|---|
| Tea | 0.215 | 0.231 | 0.207 | - | 10.04 |
| Rubber | 0.233 | 0.229 | 0.171 | - | 25.47 |
| Coconut | 0.433 | 0.466 | 0.416 | - | 10.75 |
| Paddy | 0.370 | 0.459 | 0.499 | + | 08.73 |

The increasing conversion of plantation lands of homesteads, and the new aswaddumized paddy lands under Mahaweli and other major irrigation projects are bound to accentutate the 1962-1982 trend further. Thus the extent of land under homesteads has increased from 0.557 million ha. in 1968 to 0.970 million hectares in 1984. It appears that the extent of land under shifting cultivation had also increased from 1.00 million ha. to 1.12 million ha. during the same period, despite the ban declared on it.

In terms of total extent, forestry and wildlife are the largest users of land in the country, followed closely by agricultural enterprises. Nearly 40 to 50% of the extent of land coming under the Accelerated Mahaweli Programme is also set apart for forest and wild life reserves. Much of the land under wild life reserves is however found in the semi arid regions of the southeast and the northwest part of the country where water is a limiting factor for agriculture as well as for wild life. The percentage of land under wild life reserves in Sri Lanka is the highest in Asia except for Bhutan where much of the land is not arable.

It is also estimated that some 0.639 million hectares of land are under natural forests with good soils suitable for agriculture. Therefore the competition for land particularly between agriculture on one hand and forestry and wildlife on the other will become more acute by the 21st century. This is where the need for scientific landuse planning and rationalization of land use is more urgently felt than ever before.

What is meant by "rationalization" of land use or "scientific land use planning" is the formulation of land use policies based on objective reasoning supported by a reliable and systematized data base. This could lead to a satisfactory resolution of competing demands between different uses. In the context of Sri Lanka where there is a problem of landlessness and acute land hunger among the peasantry a recurrent question is how much of land should be allowed to remain as forest and wild life reserves and how much should be under agriculture.

Similarly, it is well known that a considerable proportion of land in the plantations is in a marginal and unproductive condition. The Tea Commission in the late 1960s estimated the extent of such marginal unproductive land to be around 30 per cent of the total tea acreage. Although positive price fluctuations can make some of these lands "economic", the question remains as to what the rational use of such lands should be. Should they be reverted to forest, or should they be alienated to the landless peasantry who in fact pose a threat of encroaching upon them.

If this is not resolved in the 21st century people who have no land would forcibly occupy their traditional homelands in the Kandyan areas. Therefore the concept of plantation agriculture will have to change by the 21st century if it is to survive. It must also be remembered that such marginal lands not only record the highest rates of soil erosion, but also form a major factor in the high cost of production of tea and other crops.

Ideally, many issues in land use have to be resolved within a broad framework of land policy, which can also give rise to other problems of land use when introduced indiscriminately. The British land policy which was implemented through the Crown Lands Encroachments Ordinance (CLEO) of 1840, declared that "all forest, waste and unused or unoccupied land belonged to the crown where title could not be established as stipulated." This converted over 90 per cent of the land area of the country to state ownership overnight and paved the way for large scale acquisition and sale of land for plantation agriculture.

It also brought about harmful large scale changes in the ecology and economy of the island from which she has never recovered. Even today most of the land area of the country falls under the ultimate ownership of the government. This imbalance between state and private ownership of land is a primary factor in the high incidence of encroachments in the country today. The Presidential Land Task Force has tried to change this imbalance to some extent.

The national survey of encroachments conducted in 1979 indicated that nearly a million acres (6 per cent of total land area) had been encroached on by some 0.6 million encroachers. Nearly 30 per cent of this area had been under crops other than paddy, with paddy itself accounting for 25 per cent. This indicated to a certain extent the relationship between encroachments and chena cultivation. This is also clear from the fact that the highest extents of encroached lands were found in the Dry Zone districts of Kurunegala, Anuradhapura, and Monaragala where some 85,857 ha. were encroached on by some 40.688 encroachers. Since 1979 encroachments have kept on increasing because of increasing land hunger aided at least indirectly by the liberal policy of the government on encroachment regularization.

The rate of increase has varied from province to province from nearly 40 per cent in the Central Province to 2 per cent in Sabaragamuwa Province where land that can be encroached upon is extremely limited. The most disturbing aspect of the pattern of encroachments is that over 55.000 ha. of them were on road, canal and stream reservations. In most parts of the country stream reservations are not properly demarcated and therefore the extent of encroachment cannot be estimated even roughly.

The continued government policy of regularizing encroachments in the belief that encroachers are also good farmers developing land without state assistance, is only a politically and administratively convenient policy. In general it has been the antithesis of scientific land use planning. It may be noted that out of the total extent of land alienated by the government between 1935 - 1985 almost 25 per cent constituted encroachments that have been regularized.

## Land Alienated by Government (1935 - 1985)

| | |
|---|---|
| Major colonization schemes | 175,941 |
| Village expansion | 357,238 |
| Highland settlement | 13,565 |
| Youth settlement | 7,964 |

| | |
|---|---|
| Regularization of encroachments | 205,762 |
| Middle class allotments | 55,018 |
| Land grants (special provisions) | 9,979 |
| Rained farming settlements | 5,363 |

The present government policy of regularization of all encroachments except those on reservations is bound to make encroached lands the major category of alienated State lands. Tenurial status of encroached lands also poses certain problems of land use. Since encroachers do not have any legal document to prove their occupation of land they are not eligible to receive any State assistance or extension services. Even if their lots are regularized, the permit they receive under the Land Development Ordinance (LDO) is not a total freehold, which would enable them to raise bank loans to develop it. The status nearest to a freehold is that granted by Swarnabhoomi deeds which are only conditional freeholds often not accepted by banks as security.

On the other hand conferring legal status on encroachments can encourage them further in that direction eventually making land use planning a futile exercise. The best option available to the government under these circumstances is to develop land use plans for each district or province and to treat them as part of the land law. This can be achieved to a certain extent through the reintroducing provision for mapping out of state lands under LDO. For coastal areas there is a need to investigate the tenurial status of land particularly in the thickly populated South Western sector for effective management of such lands.

As a result of the well intended but hastily introduced and implemented land reform policies of the 1970s where upper limits of 50 acres for highlands (plantation lands) and 25 acres for paddy lands were enforced, many private owners lost interest in the upkeep of their properties. Such lands have become degraded tea lands or have reverted to patana lands as can be sen in many parts of the hill country and elsewhere. Although laws are available to deal with private land owners who neglect their lands, they have never been enforced. Any programme of developing these lands will not only increase their economic productivity, but

would also go a long way towards achieving soil and environmental conservation. This must apply to state plantation and the private sector owners.

The recent policy of the government includes allocation of large extents of land for private sector investment projects. At Monaragala where two major multi-national sugar companies operate sugar plantations, this policy has led to much criticism. One allegation is that their activities cause environmental degradation. At Pelwatta, a catchment area of a tank was felled by one company and no effective remedial action has still been taken. The system of encouraging out-growers to produce sugarcane in their lands has serious repercussions.

The same system is adopted by the tobacco companies which collect their leaf from out growers. New companies are introducing new crops like gherkins, in Mahaweli and outside often polluting the soil with high percentage of agro-chemicals. Such out growers often use encroached lands for this purpose with hardly any interest in soil conservation, despite some occasional efforts made by the companies. The commercial exploitation of land resources on a profit maximization outlook will continue to hinder conservation efforts unless these companies are compelled to use a stipulated minimum percentage of their incomes on soil conservation and watershed management. This must be made mandatory for investment planning in any agri-business.

# HOUSING AND LAND

**M.A.P.Senanayake**
Deputy General Manager
National Housing & Development Authority

I think what is important is to give a picture of what the National Housing Development Authority (NHDA) is doing and what we hope to do and our strategies on land for housing. It is obvious that housing is one of the important requirements. Like food, clothing, education, health etc - housing we could say is supplementary to all other basic things, in fact very basic. When we speak of housing, maybe in the urban, rural or plantation areas, the key factor, the basic factor, which determines housing is land.

The policy of our country and in many other countries developed and developing, is towards a house for every family and now this has become the slogan. If land is a very important factor for housing development, we should take land supply and strategy for housing together.

## Today's housing programme

In the urban sector, there is a big demand for housing plots. Everyone talks about it. It is discussed in the buses, trains, in the streets - the land prices, lack of housing plots, rising prices of housing material in the midst of increasing transport costs and the rising cost of living.

Of the Urban sector, it is the poorest-of-the-poor group, those living in shanties and slums that should be considered first. In Colombo about 45% of the population is living in slums and shanties, that is about 50,000 families (around 300,000 people) in Colombo alone. Then there are the low middle income categories living within and in the peripheral areas of Colombo. These are mostly employees of the private and public sector. The 3rd category is the rich or the elite class, having better salaries and doing business in Colombo.

The State cannot think of only one stratum, though however the focus should be and is today more towards helping the lower income group.

I will place before you the strategies we have adopted from 1984. The regularisation of the land of squatter settlements is very important. We have about 176 shanty settlements in the Colombo Municipality area. Out of the 176 we were able to attend to 70 settlements during the last 8 years. The method we adopted to give land to these people was through a survey. We found that only some of the land belonged to the C.M.C. while the rest was owned by private landlords. We did not wish to disturb the community life of the dwellers by shifting them away from the privately owned land - they were rooted in that place for either economic or educational reasons or because their jobs were in that vicinity. Thus we acquired the privately owned land and the dwellers were given 2 or 3 perches each.

Giving of the land was the first asset, the basic factor which helped to mobilise the family's enthusiasm, strength and labour. Loans were given, the amount depending on their affordability level. The maximum being Rs.15,000. Technical advice on building was also given. About 80% were able to complete their houses, the rest due to poverty fell on the wayside. There were also some infra-structure problems, particularly sanitation.

We also began work on 76 settlements along the canal banks of Colombo. There are about 10 to 12 canal stretches draining the Colombo city's rain water from the catchment area.

We have just completed this survey too, totalling 6750 families living along the canal banks. In certain places along the canal it was possible to regularise because there was enough reserved land.But in some cases the families were living on a stretch of land 10 to 12 feet wide and these families had to be re-allocated elsewhere. We are hoping to give them alternate land, most probably in the peripheral area of Colombo.

Our next step is the Land Sharing Concept. There are many gardens in Colombo as well as in the big towns and the U.C. areas where land belonging to private owners is occupied by squatters and the owners too cannot make use of it. These families have been occupying these lands for a long time and being poor they have not been able to build houses. In this instance we have intervened as a catalyst. We spoke to both parties and by agreement we acquired the land, giving thus a clear title to the land and the land was divided between the owners and the squatters. Naturally the more valuable and attractive area was given to the owner as this was really his land. However both parties were ultimately happy.

This type of giving out land was done in towns other than Colombo. We have requlariseد 3 settlements so far - in Matara. Kandy and some areas in Jaffna, also under the Gam Udawa Project. This concept of land sharing we hope to apply islandwide.

Then we have the re-adjustment policy. This is something like a Urban Renewal Programme. We identify a very under-developed area which has buildings but inadequate sanitation. Such areas are difficult to upgrade or improve and the only alternative is to re-do it. This kind of 'land re-adjustment' as it is termed was done at Manning Town, Colombo 8.

Manning town land was recently gazetted in the Housing section. We had about 8 or 9 acres with very low densities with houses here and there. We were able to put up a unit of 48 flats and move these families into the flats and by this we were able to save about 7 1/2 acres. On this 7 1/2 block we hope to build 309

houses and sell them to low middle and middle class income groups of the public sector.

This is an important strategy for there are many such under-utilised lands in Colombo of say about 50 to 60 gardens. One such area is along the Dehiwela canal where you get a thick Banyan tree. Close to this there are about 25 to 30 acres belonging to the Municipality, but having some 50 to 60 single storey houses. We have made arrangements to re-adjust this land too. This type of land re-adjustment must be done as land is limited in Colombo.

As far as housing development goes the state has given up the idea of urban boundaries. The reality is that the people, the workers or the informal sector population travels from outside into the city. Thus, as far as housing is concerned, but not for voting purposes or administrative or legal purposes, but only for housing, the peripheral belt around the town is included in the government's housing development programme. Along this belt you get so many unserviced neighborhoods, under-utilised land, semi-marshy land that can be developed subject to other ecological and environmental considerations. This kind of strategy of including peripheral areas was carried out in Kurunegala and in Peliyagoda.

Thus, in terms of Social Justice, the State's policy has been a strategy, as stated above, through its various programmes, to serve the interests of the poor, low and middle income groups particularly of the public sector.

# A MEMORANDUM

# TO THE CHANDRA BANDARA COMMITTEE

**H.M.Wikramanayake**
Actuary

## LAND USE PLANNING

1.1 All development within an unit-of-devolution must be within the parameters of national goals, national policies and national strategies. The thirteenth Amendment to the Constitution, Appendix II very correctly provides in sub-paragraphs 3.1, 3.3 and 3.4 that

"3. National Land Commission

3.1 The Government of Sri Lanka shall establish a National Land Commission which would be responsible for the formulation of national policy with regard to the use of State land. This Commission will include representatives of all Provincial Councils in the Island.

3.2 ....

3.3 National policy on land use will be based on technical aspects (not on political or communal aspects), and the Commission will lay down general norms in regard to the use of land, having regard to soil, climate, rainfall, soil erosion, forest

cover, environmental factors, economic viability, and

3.4 In the exercise of the powers devolved on them, the powers shall be exercised by the provincial Councils having due regard to the national policy formulated by the national Land Commission."

1.2 It is for the central government to decide how State land should be used, what land should be reserved to forestry, for national parks, for national game sanctuaries and corridors, and for army barracks. The central government can even acquire private land for a public purpose.

1.3 The dictates of international trade could well compel the central government to restrict the total acreage under tea and even decide on tea acreage limits within each unit-of-devolution and/or within each catchment area. But the National Land Commission should not have a monopoly over land use planning.

1.4 What is land use planning? Briefly, it is the matching of land use requirements for a particular crop with land qualities. The outputs of land suitability evaluations are tables giving land suitability ratings such as 'very suitable', 'suitable', 'marginally suitable' and `not suitable'.

1.5 Domestic Agriculture is an unit-of devolution subject. At unit-of-devolution level, the objectives of land use planning are

to identify the crop options.
to put land to the best possible use,
to achieve high productivity levels and high incomes,
to promote integrated rural development embracing agriculture, horticulture, irrigation, social forestry, animal husbandry, inland fisheries, agro-based industries etc.
to promote self-reliance of the people within each unit-of devolution,

to pass land from generation to generation in the best possible condition.

1.6 Incidental to these objectives are
to determine the location of potential areas for expansion,
to identify areas that could supply inputs for agro-based industries,
to identify areas where changes in current management practices are necessary,
to eliminate harmful and sub-optimal use of land,
to develop recommendations for improved management,
to explore possible improvements in the land by means of iterative adjustments and combat limitations of certain land units at village or farm level,
to match by mutual adjustments of both land use requirements and of land qualities in order to optimize suitability classifications.

1.7 As a consequence of land use planning, it becomes possible to make enlightened estimates of vocational training skills needed and also to make adjustments in family planning in consonance with the diminishing land-man ratio.

1.8 Whether an unit of land should bear a crop of brinjals or a crop of tomatoes is hardly a matter that the unit-of devolution should be called upon to refer to the central government for a policy decision.

1.9 The central government stipulation of only paddy during the paddy cultivation season on "paddy lands" must be repealed. The initial cultivation with paddy could have been a blunder of the central government and the unit-of-devolution should not be expected to perpetuate a blunder to its detriment. The objectives set out in paragraph 1.5 might be better fulfilled by an use other than paddy cultivation.

2.1 Page 45 of the National Atlas depicts the 24 Agro-Ecological Regions. Page 29 depicts 26 soil types including landscape facet. The Atlas also has Maps on

Relief & Drainage, Rainfall, Ground Water, Irrigation Schemes, Temperature, Climate, General Pressure and Winds, Natural Vegetation, Present Land Use, etc. This makes it possible for an evaluator (having say Botany Honours with Chemistry subsidiary) to prepare for each catchment area or for a group of catchment areas a Ready Reckoner of suitability or unsuitability of a crop on a given soil type in a given agro-ecological Region. For illustration, one such Ready Reckoner is attached hereto.

2.2 In the Ready Reckoner, only about one-third on the land use requirements relating to a crop have been taken into account. Of the balance, about half are not of significance in evaluations at project level. This leaves about 3 or 4 or 5 requirements per crop to be matched with an equal number of land qualities for decision-making at project level. In some evaluations, economic and social analysis can be a major activity comparable in importance to matching in physical terms. After economic and social analysis, there is a review and field check in which earlier provisional results are revised against judgement, common sense and experience. The outcome of the steps is then brought together in a land suitability classification. Evaluations at project level ought not to be a central government function.

2.3 Sub-paragraph 3.2 of Appendix II of the thirteenth Amendment provides that :

"3.2 The National Land Commission will have a Technical Secretariat representing all the relevant disciplines required to evaluate the physical as well as the socio-economic factors that are relevant to natural resources management."

Land evaluation and land use planning are a part of evaluation of the physical and socio-economic factors that are relevant to natural resources management. The maintenance of a Technical Secretariat should not be the exclusive prerogative of the National Land Commission. The unit-of-devolution must also be given appropriate cadres.

2.4 Proper research information on land qualities is needed for land suitability evaluation and land use planning. For this too, the units-of-devolution should be given adequate funds. The research includes research on processes leading to soil erosion, soil oxygen depletion, soil nutrient availability, soil salinisation, soil toxicity, pesticide accumulation and deterioration of soil structure.

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