A LANDUSE PLANNING METHOD FOR THE TEA GROWING AREA IN SRI LANKA

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DEVELOPMENT OF THE TEA INDUSTRY

The failure of the coffee industry in Sri Lanka led to its replacement by other crops which it was hoped prove more profitable. Cinchona was a disappointment due to the general over-production in the world, and tea was the most successful introduction.

Experiments in tea in Sri Lanka have been carried out since 1860, and there is record of a plantation of four hectares of tea in 1867. In 1887 there was 63,500 ha of tea in Sri Lanka, which increased up to 164,000 ha by 1900. With the well organized trade facilities and the constantly growing British tea market, the growth of the tea industry was very rapid, and has since become the mainstay of the Sri Lankan economy.

The plantations were largely developed by individual planters who owned the estates and who were mainly British, using their experience from Indian tea plantations. The formation of plantation companies came into operation a few years before the second world war. After the formation of the companies, most of the proprietory planters became the shareholders of these companies. Along with the development of the plantations there was a widespread development of the smallholdings owned by the peasants.

PRESENT POSITION

Some latest statistics on tea in Sri Lanka is given in Table 1. The downward trend in the production could be due to various factors. The area under high yielding vegetatively propagated clonal tea is about 40,000 ha which is less than 20% of the total tea area. Hence more than

TABLE I - *Some statistics on tea in Sri Lanka*

Year	*Area Hectares*	*Production x 1000 kg*	*Cost Rs/kg*
1973	242,302	211,346	4.47
1974	242,191	204,096	5.33
1975	241,877	213,755	6.26
1976	240,578	196,613	6.92
1977	242,012	208,571	7.98
1978	242,891	198,980	9.27
1979	244,099	206,417	13.43
1980	244,715	191,376	17.17
1981	244,918	210,148	18.73
1982	244,918	187,186	-

50 years old and are in an unproductive phase.

After nationalization, areas which were originally under tea have been diversified into various other food and minor export crops such as cloves, cardamom and cocoa, and also taken for village expansion projects. Thus a considerable area went out of tea production after nationalization.

Unsuitable climatic conditions, high prices of fertilizer and agro-chemicals and also, in some places poor and improper planning and management caused a reduction in tea production.

In addition to the decrease in production, the cost of tea manufacture also increased very rapidly during the decade, causing more pressure on the tea economy. As shown in Table 1, the cost of production has increased more than 400 per cent since 1973. The high cost of fuel, increased labour charges and the high cost of almost all items required for the manufacture of tea, caused the rise in the cost of production.

All these factors indicate the necessity of obtaining a higher production through a systematic process.

PRESENT LANDUSE PROBLEMS

Soil Erosion

The physical relief of the main tea growing area is dominated by a mountain range rising to about 2400 m (7,800 ft). These mountains consist mainly of steep land with slopes exceeding 25 per cent. The natural vegetation of the area had been thick evergreen rain forests and open grasslands known as 'Patna' lands. Very little of this natural vegetation is still preserved. Vast areas of virgin rain forest in the central hill country were cleared rapidly by the planters under the British regime to cope with the immense demand for land for coffee and tea plantations. In developing these plantations, insufficient attention was given to prevent the adverse effects of land development, particularly soil erosion.

However, in the new tea plantations, where tea is planted on the contours with appropriate soil conservation practices, the soil erosion is checked to a greater extent. But, in the recent past, more virgin jungle and uneconomic old tea areas were cleared in order to grow vegetables and other food crops like potatoes under various agricultural development schemes. Unlike the new tea plantations, there is very little soil conservation undertaken on these new agricultural lands, and they are more exposed to the hazard of erosion. Because of intensive cultivation practices followed in seasonal agricultural crops, the soil erosion takes place much more rapidly. Within a short period of time, land formerly productive, becomes riddled with rills and gullies through soil erosion. Besides deforestation and diversification of old tea lands into various other seasonal agricultural crops, other activities like new settlement schemes, road construction and forest logging also contribute to the increase of soil erosion.

The central hill country, where tea is grown extensively, also plays an important role as the major catchment area for the water supplies of the island. The influence of various activities in the hill country, which increase soil erosion, increase the amount of suspended sediments carried by the major rivers of the country.

Soil erosion from the hill country contributes to the general desiccation of the whole country by greatly accelerating free movement of water and lowering the

water-table. Countless springs and streams that once flowed strongly all the year round have now ceased to flow, or at best flow only sporadically. The rivers where clean water once flowed perennially with moderate seasonal rise and fall are now characterized by violent fluctuations in volume over shorter periods of time. Various types of activity in the hill country have therefore led to a marked decrease in the general water supply of the country. The drought periods experienced in Sri Lanka in the recent past emphasize this point. During these periods, shortage of water has become an acute problem. The supply of electricity has been reduced throughout the country because of the lack of water in the hydro electric reservoirs, and the rationing of drinking water has been made necessary in most urban areas including Colombo, the capital city of Sri Lanka.

The ultimate consequence of unchecked soil erosion will be the exhaustion of valuable natural resources. This will cause serious damage to the national economy, resulting in depletion of national wealth and lowering of living standards.

Unplanned Settlements

After the nationalization of the plantations in 1975, some of the old tea areas, where tea growing was uneconomical, were abandoned and were used as new settlements under village expansion schemes. Under these programmes many old tea areas, some on very steep land were cleared, new houses built and land given to new settlers. These lands, which were already unproductive due to their highly eroded condition or because they were very shallow stony soils, were not suitable for settlement. Attempts to grow vegetables and other home needs by the new settlers increased erosion and degraded the lands further. Selection of sites for settlements was usually done in a hurry with very little attention being given to the dangers and the effects of factors of land degradation. Thus, within a few years the new settlement schemes became unproductive, leaving settlers in a hopeless position.

Land Selection for Replanting

Yield of commercial tree crop begins to decline after a period of time. The yield of a tea bush is generally considered uneconomical after 40 years. The

majority of tea plantations in Sri Lanka are much older than 40 years and have entered the uneconomical phase of the crop. The need to undertake replanting of this old, low yielding tea, with newly improved high yielding clones, is an essential task. Although this is well recognized, there are considerable problems of implementation. Every existing old tea plantation cannot be replanted, as the conditions of some of the plantation lands are no longer suitable for tea. These lands are eroded and very badly degraded, and need improvement if they are to be put under tea again. This may be too costly and replanting thus made uneconomical. In respect of the process of land selection only a few land factors are considered at present. These include slope of the land and the amount of rock outcrops on the land. No proper land suitability survey has been done to identify the most suitable land for tea growing upon which a systematic replanting programme could be developed. Because of the lack of this correct identification of suitable land, unsuitable land is being replanted at great cost, but a good crop establishment is not achieved. On the other hand, some, land best suited for tea has been put to other uses like village expansion projects and agricultural diversification schemes excluding tea.

USE OF LANDUSE PLANNING

Importance of Planned Landuse

When considering the problems which exist in the tea growing areas, minimizing the soil erosion is of paramount importance in order to conserve the limited land resources. By selecting the best suited landuse and practising the proper conservation methods this objective can be achieved. As has been indicated there is abundant evidence of exploitation, mismanagement and destruction of land which has been brought about by ignorance of natural factors governing productivity or through economic pressures to produce more at the cost of the land.

Under such conditions, stability can only be achieved by a thorough appreciation of the natural factors governing the productivity and by the application of a well planned landuse system which ensures sustained productivity. Only through a planned landuse system is it possible to reduce soil loss to a minimum in the cultivated tea area while maintaining tea plantations in their correct ecological balance.

More than 50 years of intensive research done in all aspects of tea industry has yielded some specific cultural and cultivation practices to increase production quantitatively as well as qualitatively. The application of a correct landuse classification system and, integrating the research findings into the classification system, is now a great need. It should be based on the critical examination of all the natural factors governing the crop productivity with the application of the research findings, to ensure stability in production.

A Systematic Method for Tea Land Planning

Planning for any project is basically a clear and logical process of assembling all available factors, assessing the requirements and objectives of the project in hand and finally planning the development of the project to achieve the objectives. Landuse planning requires the planning of each unit of land in the project, within its capabilities, and its treatment in accordance with the needs it has for protection and improvement to achieve maximum sustained production. It is aimed at helping the planter to produce more crop and more money from his land while at the same time, maintaining or improving the fertility of the land. The ultimate goal of landuse planning is, therefore, conservation of natural resources while achieving high productivity and profit.

In order to achieve the above objectives a systematic landuse planning programme for tea area could be outlined with three main levels of approach involved. They are:

(a) National level landuse plan
(b) Regional level landuse plan
(c) Estate or smallholding landuse plan

(a) National level landuse plan:

This level of planning will deal with very large areas of land and would involve the entire tea growing area of Sri Lanka. It is a basic requirement to know the extent, location and the condition of any resource in order to carry out research and development planning, of that resource. This is true in the case of tea too. Hence it is vital to know the exact extent of tea lands and their locations for systematic planning or research and development. While obtaining the tea area the objective of the national level

landuse plan would be to establish a general pattern of potential lands for tea. This may be carried out by a complete, systematic and quantified processing of the available data on land suitability of the tea growing area of Sri Lanka.

(b) Regional landuse plan:

Regional planning is the second stage of the approach. Having done a broad identification of the potential tea lands of the country, more specific natural regions, such as agro-ecological zones or even smaller units or tracts of lands could be identified. At this level it is aimed to produce a landuse planning programme on a regional basis (District or AGA Division) for more specific aspects of landuse, including the identification of suitable land for replanting, area for reforestation and for pasture land, areas suitable for village expansion and crop diversification schemes and areas where land reorganization is required. When deciding the landuse requirements and specifications for tea and other crops it is useful to follow the land suitability evaluation methods described by de Alwis and Demantha (1981) in Nuwara Eliya district land suitability evaluation study. In this method land qualities like moisture availability, nutrient availability, oxygen availability, availability of solar radiation, temperature regime, frost and flood hazards, pests and diseases related to land, availability of space for optimum planting density are identified as land qualities which effect directly to the production of crop while other land qualities like resistance to erosion, availability of a dry period for harvesting (for paddy) and accessibility affect the performance of the crops by influencing management of the cropping enterprise.

A detailed analysis of aerial, photographs combined with a more intensive field work programme to carry out a systematic semi-detailed soil and topographical survey is required at this stage. After a semi-detailed soil survey it is possible to refine the suitability criteria. When the soil is classified into various series and when physical and chemical properties of each series is known it is possible to study the suitability limitations of each series for the growth of tea and their potential for other landuse practices. It is important at this stage to outline the suitability criteria for other potential landuse in the area and also necessary to identify not only the kinds of limitations in each soil for different landuse but also their degree of hazard for erosion.

Therefore it could also be used to plan conservation measures required to maintain the existing land suitability class or to improve it. The use of land as a renewable resource which could be managed for sustained production indefinitely, become easier to achieve when the conservation needs can be defined this way.

After such a survey it is possible to produce suitability maps for various land uses for each district or AGA Division, which could then be used for planning and management purposes.

(c) Estate or smallholding landuse plan:

Under the estate or smallholding planning a practical landuse programme could be drawn up which should be exercised in individual estates and small tea lands owned by individuals. This landuse programme should be aimed at helping the individual estate and the small farmer to develop the land to its maximum potential but at the same time it should ensure the conservation of the natural resources to their optimum levels. Classification of land into various suitability units within an estate should be based on the information and data obtained under the regional landuse plan.

After the preparation of estate or smallholding landuse plan, all the future developments such as soil and water conservation work, replanting of tea, timber plantations, establishment of pasture for dairy development projects, allocation of land for workers for vegetable cultivation for their home needs, new buildings and road works, *etc.*, could be planned accordingly to its best suitability of each use.

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