ROLE OF GARDEN LAND MANAGEMENT IN MAXIMIZING AGRICULTURAL PRODUCTION

K. V. AHAMED BAVAPPA, Director, Central Plantation Crops Research Institute, Kasaragod, Kerala

THE garden land is traditionally defined as "the land cropped with the help of water raised by lift irrigation to supplement rainfall to the extent necessary but not liberally as for wet land." However, in the humid tropics having adequate availability of water, we may classify all the cultivable land other than wet lands as garden lands. These humid tropics characterised by high rate of population increase, have considerable pressure on arable land and the consequent fragmentation of holdings is a normal phenomenon. The pattern of size of land possessed by the households in two villages as revealed by a survey is given in Table I.

The distribution of land is extremely uneven and those households possessing less than 0.25 ha (62 cents) constitute 40 and 63.5 per cent in the two villages of Muttathody and Krishnapuram, respectively. A typical household in the size group 0–0.10 has a mean area of 0.06 ha (15 cents) of land with a hut and about six coconut trees in it. Along with this base crop of coconut are present other perennial tree species as well as annuals in various proportions which in many cases compete with each other for their sheer existence and do not produce anything worthwhile. One or two animals and a few poultry birds are generally maintained in these households. Thus, these garden lands have very special features peculiar to them. Extensive areas in the States of Kerala, West Bengal and Assam and coastal areas of Karnataka, Andhra Pradesh and Orissa, have such garden land systems. In Kerala garden land occupies about 70 per cent of the cultivated area.

It is now well known that a higher efficiency in crop production will be possible if only there is full and efficient utilization of the soil, the air space above and the solar energy. Water which is reckoned as an important input in the garden lands is available almost throughout the year. In view of the limited size of the holdings, mechanisation is almost out of question. In this context the manpower available in this zone may have to be considered as a boon. Thus a very favourable agro-climatic - human -animal-plant infrastructure exists in the garden lands of the tropics for enhancing production.

Maximising Production

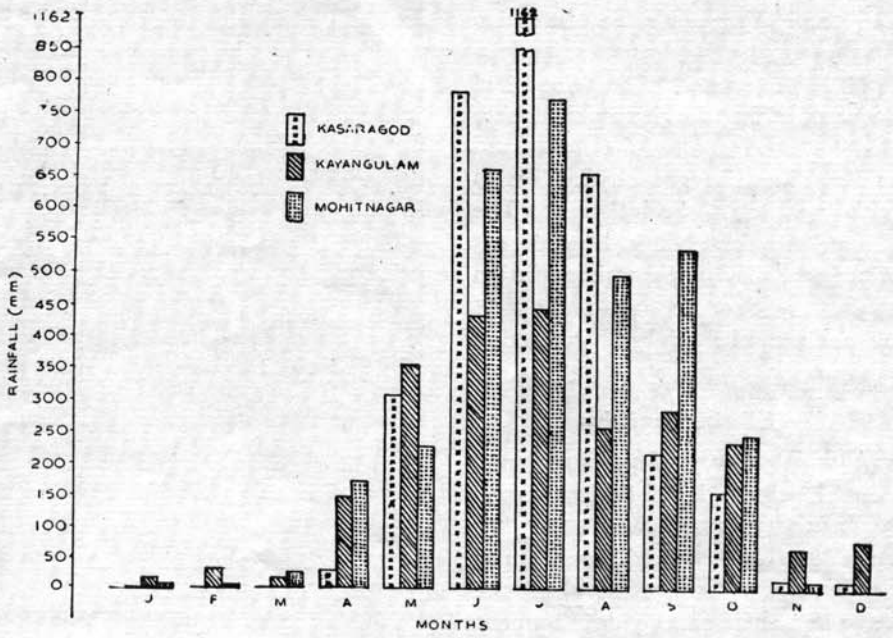
Any effort to maximise the production should in the ultimate analysis give the farmer the highest net return. In view of the very favourable climatic conditions prevailing in the garden lands, perennials such as coconut, arecanut, cashew, cacao, etc., have already come to stay in the fields which can withstand not only high precipitation but also a partial drought in the event of a monsoon failure. To this background of the garden land one has to include other perennials and annuals that will efficiently utilize the soil on both area and depth basis, the air space above the soil as well as the solar energy that is received. If the choice of crops for developing different cropping systems is made on considerations such as different nutrient and moisture requirement, varied feeding zones in the soil profile, different growing seasons for enabling the utilization of natural precipitations, variable morphologic frame for fitting into the air space available and tapping the solar energy, varied life span which will make rotations possible and differential light requirement for the highest utilization of solar energy a highly efficient crop community that can produce larger quantities of biologically useful products per

TABLE I. DISTRIBUTION OF HOUSEHOLDS AND LAND ACCORDING TO SIZE OF LAND POSSESSED

Size of land possessed (hectares)	*Percentage of households*		*Percentage of total area*	
	Muttathody (Healthy)	*Krishnapuram Root (wilt) Disease affected)*	*Muttathody*	*Krishnapuram*
Less than 0.10	21.6	43.3	1.7	10.1
0.10 - 0.25	18.4	20.2	4.3	13.0
0.25 - 0.05	23.0	19.7	11.5	29.2
0.50 - 1.00	18.3	14.2	17.5	33.3
1.00 - 2.00	10.3	2.0	20.5	10.4
Above 2.00	8.4	0.6	44.5	4.0

unit area of land and inputs can be evolved.

As a garden land crop the response of coconut under good management is something substantial. In a management system involving fertilizers, irrigation and organic matter recycling through growing other crops, the yield increase was of the order of 105 per cent. This behaviour coupled with choice of appropriate crop combinations could increase the net return of Rs 3,900 from one ha of pure coconut plantation to Rs 17,230 in a crop mix consisting of coconut, cacao, pepper and pineapple. A similar or still higher response may be possible in the garden land holdings where not only organic wastes from plants but wastes from animals and human beings can go in the recycling process along with every drop of water which the family uses for its daily need.



Average monthly rainfall—1971–74

Stabilised Economy

Unlike annuals most of the plantation crops are in the field continuously for decades together. This will mean that a given crop is subjected to the strain and stress of climatic parameters over years. To this extent the physiologic adaptability of these crops is much better as compared with the annuals, and consequently the crop losses that are met with in plantation crops are of a lower magnitude as compared with the annuals. The continuous income obtained from crops, such as coconut, is also a point in favour. The situation can be further improved by mixed and inter-cropping patterns and mixed farming techniques all of which will considerably help to minimize the risk involved due to the market fluctuations and losses due to pests and diseases. In addition, there can be considerable saving in the cultivation expenses of these crops which will contribute substantially to give a higher net return. Besides, the income gets evenly spread over the months. In certain months of the year high investments are required for manuring and other cultural operations. If additional income is generated from a number of crops of varied duration, the farmer will not feel the stress of such expenses. For example crops such as sweet potato come very handy in October.

It is, therefore, evident that garden lands with their potential for intensive management probably represent one of the best avenues for increasing production and stabilising income.