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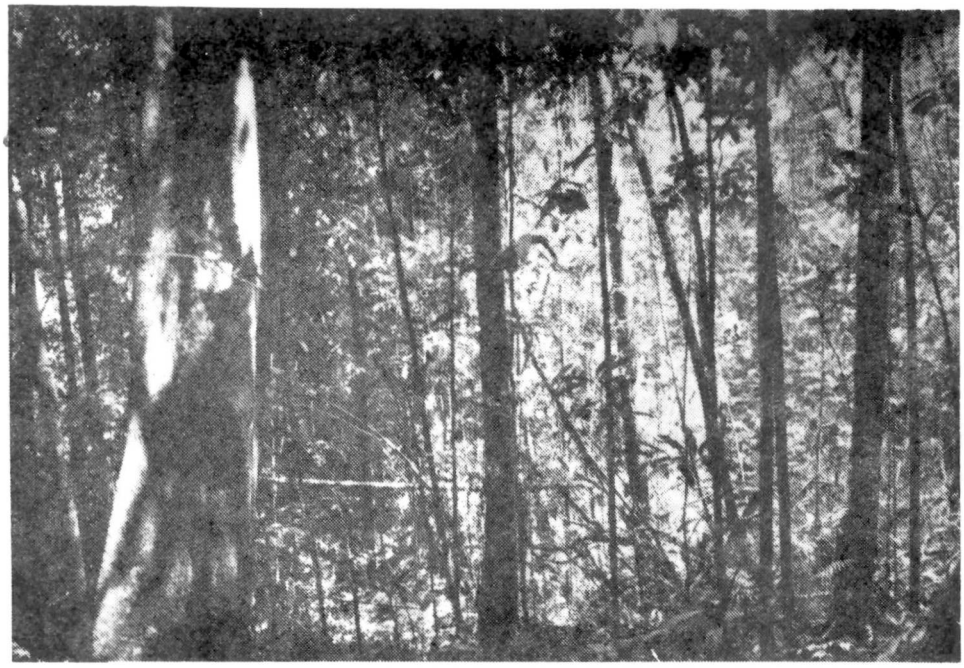

Participatory Forestry in Irrigation — The Issues and Constraints

Particiatory forestry can be any form of reforestation where both the user as well as the promotor participate in actual activities involved. Examples are social forestry and community forestry. Participatory forestry should be compared with non-participatory forestry where in the case of the latter, only the proposer himself is responsible for planting, managing and finally utilizing the benefits. Hence, the important theme in participatory forestry is that people are involved in planning, managing and utilizaing of forestry resources. Recognizing the importance of participatory forestry concept, it has now been accepted as the novel approach to reforestation across the globe. Successful experiences with participatory forestry have been recorded in Africa, Asia and Latin America in particular. In Sri Lanka, the first state-assisted participatory forestry project has just been concluded by the Forest Department. In the light of experiences gathered and benefits being realised through this project, it has now being agreed for another participatory forestry project through Asian Development Bank's funding (see separate article in this issue).

Out of the two branches of participatory forestry, social forestry is expected to meet the social needs of people while that of community forestry, the focus is on the community at large. Social and community forestry have been applied for meeting fuelwood needs and in the protection of communal land against natural factors such as soil erosion, desertificaton, etc. The concept of participatory forestry rather new and has not penetrated into areas where forestry could be applied, and irrigation is one among several others.

Role of trees in irrigation

Forestry plays several important roles in the context of irrigation development. Trees have a definite role in protecting water resources, regularizing inflow into irrigation tanks, protection of irrigation infrastructures against the action of rain, floods and even animals tresspassing over them, reinforcing

earthen structures, etc. The specific role of forestry in irrigation however, depends on several factors such as type, physical condition and location of schemes, type and nature of on-going interventions such as rehabilitation, modernization, etc., presence of livestock population in the surrounding, etc. Some general principles however, could be identified. The role of forestry in protecting earth work such as dam, channel bunds, roadways, etc. are well undestood. Trees in the catchment regulate the water regime into the tank and prevents occurence of flood during rainy season and helps maintain inflow during droughts. In the case of minor tanks in the dry zone, flow regulatory function may not be crucial whereas in the case of the Mahaweli Development Programme involving a series of irrigation reservoirs, the regulatory function is of utmost importance. Similarly in the case of irrigation schemes in the wet zone, protection of reservoir and channel bunds from erosion hazard is very important on account of the high rainfall in this zone. Control of soil erosion through planting trees is vital in the tanks located in the up-country wet zone, on account of sharp landscape and high rainfall there. Under such circumstances, forestry has to play a decisive role in protecting irrigation works. Also, in the case of a rehabilitated tank in which several earh works have been done, reforestation should be a key activity of fix newly established earthern structures. The other roles of trees which are not directly related to irrigtion are that they provide income, food, timber and fuelwood support for the people, a source of feed for their animals and, they have an aesthetic value.

In the ancient times, trees were considered an important component in the overall irrigation system. Various types of trees were encouraged within and around irrigtion schemes for various tasks. Trees were planted along the dam and dam slopes planted with grasses which protect irrigation infrastructures. Among the trees thus planted are Bo and Nuga and, statues of the Lord Buddha and Gods erected on the dam. This made people to maintain a high standard of environment near the tank and the dam. Acquatic plants such as lotuses were encouraged in the tank which purifies water. The patch of jungle within the tank-based farming system provided ground for chena farming This component has been more important when the irrigated crops failed due to poor availability of water. Cutting down trees in the catchment of a tank was considered a crime. With the deterioration of the ancient irrigation glory, trees have gradually disappeared from irrigtion works. Today's picture is that trees do not receive any important attention in the context of irrigation development both from the settler as well as from the planner. High rate of siltation of tanks, irregularity in rainfall, the need to regulate down-stream flow in Mahaweli, ever increasing demand for fuelwood, etc. are some examples which pin-point the importance of trees. With the increase in population and the resultant decrease in land: man ratio makes more and more people to settle down in hilly areas earmarked as reserves for environmental reasons. This means, lands not allenated so far may have to be occupied by people not only for farming to generate subsistence needs but also to set up their dwellings. The effects of such practices on irrigation works will be extremely harmful particularly, in the up-country areas.

Place of trees in irrigation schemes

There are three main locations of irrigation schemes where trees should occupy. First, the catchment should have a cover of trees for hydrological and biological reasons. It is ideal that the catchment is covered by virgin forest.

Second, within the irrigation channel network (command area), trees have several places. Along the dam, trees could be planted. The roots of trees protect the interior face of the dam against the action of waves of tanks such as Tissa Wewa, Basawakkulama Wewa, Kala Wewa, etc. It gives an added strength to the dam. Along distributory and field channel bunds, as well as along road reservations, trees protect them being washed away. The length of reservations wherein trees be

planted vary from 8 M (field channel) to 25 M (main channel). Animal tresspass is a common problem in most of the tanks in the dry zone. The animal hoof breaks up the soil and with the onset of rains will accelerate the process of soil erosion. Trees are ideal to halt this process. According to the the Department of Irrigation, tree species such as Divul, Ehela, Halmilla, Jak, Kohomba, Nadung, Mahogany, Mango, Mee, Nelli, Tamarind, Sapadilla, etc. are recommended for planting. Road reservations and channel reservations are to be planted with trees species such as Arecanut, Breadfruit, Halmilla, Kitul, Palmyrah, etc. The community could be mobilized to plant and manage trees on above mentioned reservations.

Finally, the homestead which belongs to the people living in a irrigation scheme deserves attention. The homestead planting can be considered as social forestry in a strict sense since such trees perform the function of meeting specific social needs of the people in their social (private) surrounding. Contrary to poor level of reforsetation in the catchment and other reservations within an irrigation scheme, planting and managing forest in the homestead is actively pursued by every settler. There is hardly any homestead without having trees. It is in fact this condition we want to simulate in other two locations of an irrigation scheme. Field observations indicate that homestead is well under various types of trees compared to two other locations. The mixture of trees found in the homestead not only perform the protective and aesthetic roles but also produce edible fruits and provide an income as well.

The State is the legal owner of catchment of a tank, feeder channel and hydrological reservations. Entry to the catchment of several important tanks is prohibited by law. Hence, responsibility of reforestation and its' management within these areas lie with the State. Reports however, indicate that ilicit timber extraction is at a high level. On the other hand, most of the catchment areas are no more covered with forest and are encroached by people. In a majority of tanks and anicut schemes in the wet zone, people have encroached upon the land down to the water level and cultivation utilizing poor agricultural practices is seen. Practically, no catchment and feeder channel are left without cultivation. The intensity as well as the quality of protective work carried out by the State however, have been not satisfactory at all.

Almost none of the channel bunds and road reservations have forest trees irrespective of the size and location of irrigation schemes. Erosion of channel bunds is severe resulting in a higher degree of siltation and weakening of the bund itself. This is quite contrary to what the irrigation department has advocated and wishes to take place.

Considering the criticality of catchment areas on the one hand, and past unsuccessful efforts of the government in re-forestation on the other, it is ofutmost importance to initiate forestry development there therefore, it is necessary to give a new outlook and a strategy in reforestation of these reservations utilizing the concept of participatory forestry. The specific components in a development strategy are enrichment planting, protection of existing forests and replacing already cultivated reservations with appropriate forest species, and halting any more unauthorized cultivation. In some areas, it is important to reclaim the area already encroached and communal forest lots established. This process requires not only silvicultural work but also a strong element of education and training for the people. It is the community who should take the initiative in establishment and management of them. Therefore, as much as possible, the channel areas should be marked out and farmer organizations encouraged to plant and manage trees on the channel bunds and road reservations.

This may be rather a difficult task to effect especially when the encroachers do not have any other allotment. This practice has been done however, on a limited scale under the Nuwara Eliya Integrated Rural Development Programme (IRDP). The lessons learned from such experiments are

vital in effecting future work in this direction.

Participatory forestry could be promoted under the freamework of participatory irrigation management policy of the government whereby farmer organizations are being encouraged in every irrigation scheme. The same farmer organization could take up reforestation of vital areas as a group such as what was carried out in a limited scale in IRDP Nuwara Eliya. The focal point of these efforts should be to get the entire irrigation-based community involved in planning and managing reforestation work. It is the people who are in the irrigation settlement which can take up this role effectively and in a sustainable manner.

Constraints

The above discussion indicates two extremes with regard to forestry in irrigation. On the one hand, the role of forestry in sustaining irrigation works is clear, and every effort be made to establish forest cover in three locations of irrigation schemes (other than homestead) is clearly seen on the other. There are several constraints in matching these two extremes and let us see what they are. It is expected that identification of constraints is important to plan strategies to develop this neglected sector in the future.

Land tenure: People are reluctant to make investments on lands which do not belong to them. The matter is still serious when such investments last over longer durations. Therefore, the land where trees are to be planted should be owned by the people if reforestation is to be successful. The catchment belongs to the government and the reservations are also the crown land. Channel bunds, roads, dams, etc. are all the property of the State. Hence, can we have any successful efforts in planting trees on them? Then the question is how to bring about the ownership with regard to the channels, etc.? According to the government's decision of participatory management, the ownership of irrigation schemes is expected to be turned over to the people; the farmer organizations (FOs). This can have very positive impact on reforestation. The primary conditions in doing so is the formation of farmer organizations in irrigation schemes. It is also necessary to turn over the ownership rights of catchment areas to farmer organizations so that they would actively participate in the management of catchment. The necessary technical advice and other assistance could be provided by the Forest Department. As discussed above, catchment development work has not been undertaken yet which makes it utmost important to turn them over to farmer organizations.

Training and education: Training and education are two important activities which would influence the success of participatory forestry. This has two main dimensions namely, creating an awareness and provision of technical knowledge. The people should be taught to be vigilant on the environment. They should be educated to inform appropriate authorities in case destruction to forestry resources occurs in the vicinity. They should be made aware of types of reforestation activities and successful past experiments. In the case of subsistence farmers whose interest is to get the possible maximum benefits with the least investment on the land, they should be enlightened on the advantages of investments on forestry. They may not be responsive to begin with but may not pause a serious problem if approached well.

It is also important that people are trained in technical skills on different techniques of planting and managing trees. At the moment, there is no linkage between the state agency (Forest Department) responsible for reforestation and the people. Non Governmental Organizations (NGOs) could assist establish this linkage and impart technical skills in them. The task may become easier with the formation of farmer organizations. The NGOs could assist farmer organizations in raising plant nurseries within irrigation schemes.

Rights to utilize trees: The present law stipulates that cutting down any tree is

prohibited. It has been found that people find it impossible to obtain permission to cut trees growing on their own compounds. The law is however, important to prevent hapazard destruction of tree resources but cannot provide room for interpretation. Therefore, it is important to introduce some legal provision for utilization of trees by the promoter. If they planted trees in irrigation schemes, the case is still severe since they are planting trees on crown lands. It is hoped that the turn over of irrigation schemes considers this aspect also in granting ownership titles to farmer organizations.

Economic factors: Economic criteria are important in any activity and participatory forestry is no exception. People cannot be motivated to undertake tree planting if there is no economic returns to their investment. The irrigation schemes are common property and no one person can benefit from the trees planted within the catchment or the command. However, with the formation of FOs they can have the group ownership. In fact, planting trees of economic importance along reservations will not only improve environment but also can provide an income to FOs. Also, it will protect irrigation work from which all the farmers in an irrigation scheme may benefit. These avenues should be made known to the people. Another possible reason which may retard people from planting trees is the lack of incentives. For tree crops such as rubber, tea, coconut, cloves, etc. there are various types of subsidy schemes, some mooted by the government in the form of cash incentives and others as low-interest loans. This definitely motivates people to plant these crops. Such incentives are all the more important with perennial crops where the gestation period is longer. The trees recommended for planting in irrigation schemes are not included in the present subsidy schemes. In the case of forest trees, there is no such motivation for planting. The only incentive is the timber which will take a long time before the people can realize its importance. One reason which might not facilitate the government to introduce such a scheme may be the rate of returns. Experiments done with tree planting in other countries indicate that the returns to investment on trees is very high even under irrigation. Some of these experiments have been under arid climates where the cost of water is much higher. Therefore, it is necessary to consider these options in the context of this country's irrigable area.

Conclusion

Trees are performing an indispensable role in irrigation schemes in this country. Its importance may be further escalated in sustaining grandiose irrigation schemes such as Mahaweli. The present situation is that people are not interested in establishing trees in irrigation schemes (except on the homestead) due to a variety of reasons mentioned earlier. The State agencies are not in a position to plant and manage trees in irrigation schemes because of lack of funds and poor sustainability of efforts. Whatever little reforestation work done by the State on irrigation schemes at the time of rehabilitation have had very poor successes. Given the axiom that people are those who live in schemes who are also the ultimate beneficiaries of irrigation development, it is strongly felt that they should be made to participate in reforestation work. They have done it very successfully on their own homestead falling within irrigation schemes. This stresses the need for people's involvement for any sustainable reforestation work.

There are however, several problems in getting participatory forestry action in irrigation work. The need for policies and strenghening of existing ones, lack of efforts to co-ordinate pilot experiments, introduction of incentives, institutional reform and further experimentation are relevant among several others. Participatory forestry may clearly benefit through the government's recent policy of establishment of FOs in irrigation schemes. It is however, important to give FOs the ownership including the rights to develop catchment of tanks not falling under strict national reserves. The prospects are good and we should follow up them. Other questions not