Agri-Horti-Forestry for Rehabilitation of tribals and small farmers: BAIF's Approach

N.G. Hegde

Agroforestry: Potentials and Opportunities. Ed. P.S. Pathak and Ram Newaj. Agrobios (India) and Indian Society of Agroforestry, Jodhpur, 2003: 319-328.

Depleting Forest Resources

Forests which form an important component of the ecosystem, are essential for the survival of the animal kingdom. Apart from providing clean air and habitat for a wide range of flora and fauna, forests are also a source of livelihood for millions of people in developing countries. In India, over 60% of the population is dependent on forests for their living. Forests generate year round employment to 20 million people, while providing a habitat for 50-60 million people representing over 250 tribal communities in the country.

Forests are the major source of fuelwood, fodder, timber, tannin, gum and a wide range of medicinal herbs. Till the middle of this century, the entire demand for fuelwood was met from the forests. However, with the increasing population pressure, supply of essential commodities from forests was not adequate to meet the needs. This led to the development of alternative sources of energy and production of biomass through village woodlots, community pastures and roadside plantations.

It has been reported that about 45 per cent of the total energy consumed in the Third World, by more than 2 billion people is met from biomass. This is equivalent to 22 million barrels of oil per day. In 1993-94, the total energy consumed in India was 8751 PJ, out of which 5822 PJ was generated from conventional energy sources and 2929 PJ from biomass. Woodfuel was the major constituent of the biomass valued at US$ 9080 million to generate 2603 PJ energy. In 1995, fuelwood consumed in the country was 162 million tons of which 51% was collected from forests and the remaining 49% from other sources. The annual increase in biomass consumption in the recent past has been around 1.6%, which is likely to grow at the same rate during the next two decades. As the existing natural forests have no potential to enhance the supply of fuelwood and other forest products, the other option is to raise tree plantations on non-forest areas. Such programmes will not only conserve the natural resources, but also reduce the drudgery of poor women who have to travel long distances in search of fuel, fodder and other tree products to meet their domestic needs.

Social Forestry Promotion

Development of fuelwood and fodder resources on community lands and private wastelands was the basic objective of Social Forestry Programmes launched by the Government of India through the State Governments during the last two decades. Based on the recommendations of the National Commission on Agriculture in 1976, the emphasis was on promotion of fuelwood and fodder plantations in every village, as it was difficult for the rural poor to meet these needs. The schemes included the development of community woodlots, decentralised nurseries for distribution of seedlings and promotion of tree plantations on private lands under agroforestry and

farm forestry. Among them, establishment of community plantations was the major activity to generate employment for the poor and landless, while developing fuel and fodder resources to meet the local needs. The Forest Department and voluntary agencies undertook the establishment of decentralised nurseries through schools and selected farmers. These seedlings were supplied to public institutions, schools and a large number of farmers either free or at subsided cost for planting in their fields as windbreaks, live hedges, block plantations or in the backyard. Among these schemes, farm forestry was the most successful, particularly because of the promotion of eucalyptus and casuarina species, which had good market as pole timber and pulpwood.

The development of community wastelands by the Social Forestry Department through local Gram Panchayats for fodder and fuelwood banks was partially successful. The initial obstacle was to identify wastelands, which were free from encroachment. In many villages where wastelands were available, there was resistance by the local communities, particularly those belonging to landless and small holders, as they were deprived of their rights to let their livestock for free grazing. In many villages where office bearers and forest officers were enthusiastic, the success in establishing energy plantations was commendable, despite poor involvement of local people as partners. These plantations provided good opportunity for the local people to earn wages during the first 2-3 years. The success of these projects was however short-lived, as there were no budget provisions either in the project or in the Gram Panchayats to provide protection after termination of financial support. This resulted in pilferage of wood and stray grazing.

Farmers who had established nurseries of fodder and fuelwood species could not sell their plants as local people were not interested in planting them. Hence, they discontinued this activity after the withdrawal of financial assistance. Many farmers who had planted saplings on field bunds could not protect them from soil moisture stress and biotic pressure during summer seasons. Those who could protect and nurture these trees were not able to fetch remunerative price for wood, either due to lack of marketing facilities or poor buying capacity of the fuelwood users.

Although fuelwood is the major source of energy for cooking, which constituted 85% in rural areas and 45% in urban areas, about 65% fuelwood in villages is being collected free of cost, from community lands, forests or grown by the families on their own farms. As most of these families do not have buying power, the market for fuelwood is limited in rural areas. However it was not easy for tree growers to transport wood to urban areas where they could have found a buyer, because of several problems. Firstly, fuelwood being a commodity closely controlled by the Forest Department, it was not easy for the farmers to transport it to cities and establish their own outlets. Secondly, as there were several restrictions on cutting of trees, transportation and selling of wood, farmers were forced to sell their wood to middlemen who were capable of managing these problems, at very low prices.

It was only a small number of farmers having close access to pole timber market and paper and pulp mills who were able to get remunerative price and earn substantial profits. Except for such beneficiaries, a majority of the farmers were reluctant to divert their lands for growing fuelwood, which was not remunerative (Hegde, 1991).

The major reasons for reluctance in growing trees were:

1. Lack of awareness on the economics of tree plantations;
2. Fear of acquisition of tree plantations by the Government;
3. Fear of not getting permission for cutting the trees;
4. Poor returns from fodder and fuelwood trees;
5. Poor connectivity with the market and consumers.

While the forest department was aiming at meeting the fodder and fuel needs, the Agricultural Scientists and Extension Officers were keen to promote agroforestry for improving soil productivity and microclimate. The most important model promoted by these agencies was alley cropping, using leguminous species. Even this programme could not enlist the participation of farmers, due to inadequate benefits and difficulty in managing tree rows in the middle of the field. Both these groups were keen to promote tree species of their choice or mandate, instead of allowing the farmers to select species based on their preference. This was an important reason for lack of people's participation in many of the social forestry programmes.

Scope for Agroforestry with Modified Goals

While there is good demand for forestry products, there are also opportunities to produce them through farmers. India has vast areas, which not optimally used for sustainable production. Presently, over 90 million ha are classified as wastelands, a part of which can be brought under afforestation. Out of 169.7 million ha arable lands, only 50.1 million ha (29.5%) are under irrigation and 60 million ha are located in drought prone areas, with primitive agricultural practices. As farmers in dry regions face various constraints, crop yields are very poor. Agroforestry has good scope for improving the productivity of dry lands. Considering these problems and opportunities, the following recommendations were made by the agroforestry scientists in India (Hegde and Daniel, 1994).

Need for Strengthening Agroforestry

1. Identification of successful traditional agroforestry models that can be adopted by the farmers on a wider scale;
2. Selection of suitable tree species and their superior provenances to enhance income, based on the profitability and marketing opportunities, without confining only to fodder and fuelwood species;
3. Development of suitable infrastructure for input procurement, marketing, sharing of information and experiences, and linkages with the financial institutions;
4. Extension and training facilities for capacity building and motivation of farmers.

Mobilisation of farmers being a critical component for success, voluntary agencies were encouraged to take active part in social forestry. The Government of India had established the National Wastelands Development Board in 1985 to promote afforestation through Non-Government Organisations. Several new schemes were also introduced to grow timber, fruits and other non-wood products. The scope for

people's participation was extended to forest lands and also through the Joint Forest Management Programme.

Role of BAIF in Agroforestry

Involvement of BAIF in social forestry was accidental. BAIF Development Research Foundation is an NGO, established in 1967 to promote rural development through sustainable management of natural resources. The major activity was to provide breeding services to produce crossbred cows. Promotion of fodder cultivation was a support activity to enhance the profitability. However, commonly cultivated fodder crops such as sorghum, maize, oats, berseem, lucerne and cowpea demanded good soils, assured irrigation and higher doses of fertilisers to produce optimum yields. Realising that such fodder crops would compete with food crops, BAIF promoted the cultivation of *Leucaena leucocephala* (Subabul) for fodder on degraded wastelands. As it was a locally available bushy variety, a search was made to collect superior germplasm. In 1976, BAIF procured Salvador type leucaena seeds from Hawaii and established the plantation at Urulikanchan. This tree type leucaena exhibited superior growth in terms of tree height, stem diameter, forage and biomass yield. The trees were fast growing, erect, hardy and tolerant to drought conditions.

During this period, the Government was trying to promote fodder and fuelwood species, while cultivation of eucalyptus was opposed by some environmentalists. Thus it was an opportunity to promote leucaena as a multipurpose tree species for wastelands development. Leucaena cultivation was promoted by many Government and Non-Government Organisations but many farmers were keen to know about the commercial use of its wood. Since leucaena wood was not in commercial use in India, BAIF provided literature on its use to leading paper mills. The pilot scale paper production undertaken by Ballarpur Paper Mills and Nepa Newsprint Mills, with leucaena wood supplied from BAIF, confirmed its superiority. A few mills were prepared to pay 30-40% more for leucaena wood. As a result, leucaena was accepted for farm forestry, particularly in dry regions of Andhra Pradesh and Karnataka.

Choice of Species

While promoting leucaena for agroforestry as an alley crop, farmers did not accept this system, as closely established tree rows in the field hindered tillage operations and suppressed the crop yields. Hence, BAIF decided to promote tree planting on field bunds and borders. In certain areas, farmers were interested in cultivating pole timber species such as *Melia azedarach, Casuarina equisetifolia, Dalbergia sissoo, Tectona grandis,* etc. which could fetch higher price, when sold as poles. It was also observed that farmers preferred fruit and timber species to fuelwood and fodder species, because of regular production, easy marketability and higher returns for the produce. Therefore, the profitability of different species was studied and disseminated in the field to motivate the farmers to grow more trees (Hegde, 1991).

Most of the farmers did not have correct information on the returns from different tree species. The agencies which were involved in promotion of afforestation also did not select the species on the basis of higher returns, but to meet their demands and targets. Hence, the popularity and preference of farmers were based on the publicity, easy marketability, price support available for the produce, availability of planting material

and the efforts required to establish and maintain the plantations.

Based on the profitability, BAIF selected 6-8 tree species to promote kissan nurseries for supporting agroforestry. These activities were certainly helpful in enhancing the farm income, but not attractive enough for small farmers to meet their basic needs, when promoted as isolated activities. Hence, it was necessary to promote integrated development activities having good potential to generate substantial income.

Creation of awareness about tree species, particularly those introduced from other regions was also difficult. To overcome this problem, BAIF decided to involve the local schools. Promotion of school nurseries, establishment of tree plantation in school premises, distribution of seedlings for planting by the students on their farms, arranging film shows and essay competitions on topics related to nature and environmental protection helped in motivating the children as well as their parents. The response from farmers improved significantly, where they had an easy outlet for marketing their produce.

Agri-horti-Forestry: *Wadi* Model

While implementing various social forestry schemes sponsored by the National Wastelands Development Board, it was observed that small farmers were not interested in planting trees for meeting fodder and fuelwood needs. This was particularly because of poor returns and a long gestation period.

In 1982, BAIF approached the tribal families in Vansda Taluka of Valsad District to develop their wastelands. The programme provided necessary inputs to poor tribal families to establish fuel and fodder species on 0.4 ha land owned by them. Although inputs to the extent of Rs.5000-6000 were to be provided to each family, they were reluctant to take part in the programme as the expected returns were low. During the initial meetings, they demanded mango instead of fuelwood species. They also wanted to reserve a part of their holdings for food crops. It was feasible to grow mango, but the funding agency insisted on fuel species. Hence, BAIF prepared a revised plan, with fruit plants in the main field and fuelwood and fodder species on field bunds. This programme needed additional support for procuring fruit plants, developing water resources and providing wage support. There was scope for inter-cropping and promoting other income generation activities.

There was difficulty in procuring grafted mango plants in the surrounding villages and the cost ranged from Rs.30-45 per graft. BAIF procured these plants from various nurseries in Gujarat, Maharashtra and Goa during the initial 1-2 years. Meanwhile, local youth, particularly the women were trained in nursery management, grafting and budding. Subsequently, they were able to raise fruit and forestry plants in their backyards for expanding their orchards and for sale.

Integrated Approach

Land development to form small plots with contour bunds was necessary to develop the hilly terrain for cultivation. Initially, both men and women of the participating families took keen interest. As hard work was a critical input for success, BAIF emphasised on regular attendance and abstaining from consumption of alcohol. Many

families were not confident about the fulfillment of these conditions and hence stayed away from the programme. Only 42 families joined the programme in the first year, but they worked hard and raised their orchards. Looking at the good performance, 400 more families joined the programme in the third year. Subsequently, over 80,000 poor families in Gujarat, Maharashtra, Karnataka and Rajasthan States have adopted this system.

Preference for Species

A typical orchard, promoted under this scheme covering 0.4 ha, had 40-80 fruit plants and 500-600 other plant species:

Fruit Species as the Main Crop: Mango (*Mangifera indica*); Cashew (*Anacardium occidentale*); Custard apple (*Annona squamosa*); Ber (*Zizyphus mauritiana*); Tamarind (*Tamarindus indica*); Guava (*Psidium guajava*) and Indian gooseberry (*Emblica officinalis*).

Multipurpose Tree Species on Borders and Bunds: Jackfruit (*Artocarpus heterophyllus*), Ramphal (*Annona reticulata*), Drumstick (*Moringa oleifera*), Subabul (*Leucaena leucocephala*), Casuarina (*Casuarina equisetifolia*), Teak (*Tectona grandis*), Shisham (*Dalbergia sissoo*), Eucalyptus (*Eucalyptus hybrid*), Chinaberry (*Melia azedarach*), Babul (*Acacia nilotica*), Bengali Babul (*Acacia auriculiformis)*, Gliricidia (*Gliricidia sepium*), Pongamia (*Derris indica*), Neem (*Azadirachta indica*), Singapore Kapok (*Ceiba pentandra*), Shevari (*Sesbania sesban*), Agasta (*Sesbania grandiflora*), Kassod (*Cassia siamea*), Female bamboo (*Bambusa arundinacea*), Male bamboo (*Dendrocalamus strictus*), White siris (*Albizia procera*) and Siris (*Albizia lebbeck*).

Apart from these plants, a wide range of medicinal herbs and other plants were planted in the available space. The participating families were encouraged to establish live fence on the field boundary by planting useful thorny plants like agave, cacti, Euphorbia, etc. for protection from wild animals and trespassers. Farmers were advised to adopt green manuring, composting, vermicomposting and mulching to improve soil productivity. Farmers called this unit *Wadi* or orchard.

Water Conservation

Water resources were developed by digging farm ponds, gully plugging and nalha bunding for watering fruit plants during the initial 2-3 years. With a view to save time and cost on water conservation, temporary bunds were installed by stacking sandbags across the seasonal rivulets. Such nalhas, which generally dry out in November, could retain water up to February–March months. The beneficiaries were able to carry headloads of water or pump it into their farm ponds and then water the fruit plants by hand. Pitcher watering was used to conserve water in areas of water shortage. In this method, an earthen pot with a minute hole plugged with a piece of cloth was placed near each plant, at about 15-30 cm below the ground level and filled with water. Water from the pitcher was released slowly into the soil around the plant. The pitcher was refilled with water once in 8-12 days. This helped in regular supply of moisture as in drip irrigation.

Involvement of Women

After initial establishment of orchards, the responsibility of day to day maintenance was with the women as the men had a tendency of moving to nearby towns and cities to earn wages or to fulfill other social obligations. Hence, this was an additional burden on women. Many women who were engaged in occasional wage earning as farm and domestic help, lost the opportunity of earning additional income. Hence women were organised to generate additional income through individual and group activities.

Wavli is a unique tribal tradition in Gujarat, wherein women enjoy exclusive rights over their income generated from certain activities such as backyard vegetable cultivation. It is their privilege to use this money as per their wish and priorities and men cannot demand their share in this earning. Appreciating this wisdom and custom, women were encouraged to grow vegetable crops in the interspace of their orchards. This ensured regular maintenance of the orchard, while women earned handsome money. They could spend this money on food and clothing for their children, purchase of ornaments and household utensils, etc. (Mahajan 1998).

Experiencing the impact of *Wavli*, several new activities were promoted through Self Help Groups of women. They were trained in fruit and forest nursery management, mushroom production, vermicomposting, share cropping on barren lands owned by non-participating families, oilseed collection, etc.

Apart from income generation activities, the groups were trained in management of community development activities. Women being active participants, it was necessary to ensure maternal and child heath care. Immunisation of children and distribution of feed supplements to malnourished children were the initial priorities. Assurance of clean drinking water through chlorination of open wells and installation of borewells with hand pumps, promotion of toilet linked biogas plants and construction of washing platforms were introduced as a part of the programme. The self-help groups took the responsibility of organising *Anganwadis* by training local girls who had studied up to secondary school. Thus, women empowerment focused on drudgery reduction, gender sensitisation and capacity building. This paid a very rich dividend in improving the quality of life.

Many schools in these tribal villages had poor attendance of both teachers and students. With awareness among the participating families, children were sent to school. A dialogue with the teachers was itself enough to improve the quality of education in these schools. Similarly, in the absence of adequate health care facilities, BAIF had appointed doctors and health guides to ensure community health. Subsequently, a rapport was established with the local primary health care centres to ensure effective services, without additional cost on the project.

Sustainable Livelihood

The *Wadis* established under this programme during 1982-83 started bearing fruits by 1987-88. At this stage, it was anticipated that the farmers would earn substantial income from their orchards. Unfortunately, this did not happen due to poor market outlet for the produce. They were approached by middlemen who contracted their

orchards at low prices. This necessitated taking up post-production activities, although this was not envisaged in the initial stage. BAIF has now promoted Tribal Cooperatives for processing fruits and vegetable. With hygienic processing of pickle and pulp, and establishing link with a supermarket in Mumbai and cities in South Gujarat, food processing became an important activity to support agroforestry.

With the development of their own land under tree based farming system, the beneficiaries were able to take up various community based development activities such as Joint Forest Protection and collection of forest products like Mahuva (*Madhuca indica*) seeds in the adjoining pastures and forests. In a village which had over 200 grown up Mahuva trees, only a few old people collected some seeds and sold them in the local market. However, this was not a remunerative activity due to very low price paid by the traders. Thus, BAIF after discussing with the local community, helped to establish an oil expeller and encouraged the villagers to collect seeds for extracting oil. With edible oil and cake for cattle, the activity became economically viable. As a result, the value of the seeds collected from one village alone increased from Rs.10,000 to Rs. 200,000 within two years. The farmers were also able to set up their consumer stores and other service facilities as part of the Self Help Group activities to generate additional income.

To overcome the problems of pests and diseases, Integrated Pest Management practices were introduced, while utilising the traditional knowledge. As the fruit plants started growing, the orchard owners started spending more time in the field. This helped in taking up intensive agriculture in the interspace, between the fruit species. Hence, the foodgrain yield increased by 50 to 200%, inspite of about 25% area being under tree cover. It was observed that on an average, the tribal families owning 0.4 ha of land used to earn a total income of Rs.8500 before participating in the programme. This included Rs.4000 from agriculture and Rs.4500 from non-agriculture, mostly in the form of casual labour. After five years of participation in this programme, these families were able to earn Rs.20,000 per annum from fruits, vegetables, food crops and wood. They did not have to leave their village in search of wages. Instead of migrating to cities, many families built houses in their orchards to spend more time in the field.

Apart from farm income, they were also able to earn additional income from nursery, food processing, dairy husbandry, collection of forest products, production of bamboo crafts and trading of these products. The programme also improved the health and literacy status in the region. Similar experiences have been recorded in Karnataka and Maharashtra states as well. These are important components of sustainable agroforestry systems, which involve multidisciplinary activities. Some of them could be introduced as entry point activities, to ensure people's participation. Generally, under the sectoral approach, the programmes lack coordination of various activities. Very often, inspite of having excellent technical back up the development programmes lack social skills to mobilise human resources. In such a situation, the voluntary agencies can play a significant role in implementing the programme successfully.

Development of People's Organisations

In the process of promoting agri-horti-forestry, people's participation was critical for

the success of the programme. This could be done effectively through People's Organisations at various levels. The formation of Self Help Groups and village Planning Committees has helped in developing better understanding and mutual co-operation among the villagers. These groups could play a significant role in motivating all the members to take active part and assist each other whenever needed. Hence, creation of awareness, transfer of technologies and programme monitoring could be undertaken very effectively. These groups also took the responsibility of procuring necessary inputs from the market and distributing among the members. As these activities were linked with micro-financing, all the participating families could procure the inputs well in time and the repayment was also effective.

In this process of capacity building, many common people, including the illiterate women emerged as community leaders and contested in the elections of Panchayati Raj Institutions, co-operative societies and took initiative in community development. They established linkages with various financial institutions and banks to meet their credit needs. These organisations are playing a vital role in sustaining the programme benefits and progress further, even after the termination of financial support from the donor agencies.

Social Development

Moral development and social empowerment were significant contributions for the upliftment of the community. While initiating the project, BAIF's team had observed that the tribals in the project areas were addicted to alcohol produced locally or bought from outside. Surprisingly, a large number of women were also found to consume alcohol. Under such a situation, it was extremely difficult to involve them in the programme. Hence, a condition was imposed to refrain from alcohol. This has brought about a very significant change in the community.

Presently, the members of the *Wadi* families do not consume alcohol. The parents approach the *Wadi* families for arranging matrimonial alliances with their daughters. Many girls and boys have completed their graduation and post graduation.

Coverage and Impact

The *Wadi* Model of BAIF which was initiated in 1982 in Gujarat has now been replicated in larger areas of Valsad, Navsari, Dangs, Bharuch, Surat, Ahmedabad, Vadodara and Junagadh districts. It has also expanded to Thane, Nashik, Ahmednagar, Jalgaon, Pune, Raigad, Nandurbar, Chandrapur, Dhule, Yevatmal, Nanded, Amravati, Gadchiroli, Nagpur and Gondia districts in Maharashtra, Mysore, Hassan, Tumkur, Dharwad, Uttar Kannada, Gadag, Chikmagalur, Chamrajnagar, Haveri, Bijapur, Gulbarga, Bellary districts in Karnataka, Bundi, Udaipur, Banswara, Baran, Bhilwara, Chittorgarh, Dungarpur districts in Rajasthan and Pratapgarh, Gonda, Kanpur (Rural) districts in Uttar Pradesh. Presently, over 100,000 families are participating in the tree-based *Wadi* programme.

The *Wadi* programme can be implemented throughout the country, where the rainfall is above 750 mm or in other areas having assured source of water. A family with 0.4 ha under orchard with reliable market outlet will be able to earn more than Rs.25,000 per annum, after 4-5 years when the trees start bearing. The gestation period is very

critical. During this period, the participating families need some support in the form of employment to sustain their basic needs. However, activities such as nursery raising, vegetable cultivation and intensive use of the interspace for production of food and cash crops are essential.

With the establishment of orchards, the beneficiaries feel secure and do not migrate to urban areas with all the members of the families. Thus, they develop an inclination to maintain various species of livestock. This is an additional source of income for the family. Thus, by participating in tree-based farming with 0.4 ha land, a family is able to come out of poverty.

Development of Community Assets through *Wadi*

With easy availability of fuel, fodder and timber, the dependency of the *Wadi* owners on the forest was reduced significantly. This resulted in regeneration of the denuded natural forests and increase in the green cover. This in turn improved the micro-climate and recharging of the ground water table. As the beneficial effects of forest conservation were realised by the local people, the village committees took more interest in motivating their members to protect the forest by not allowing outsiders to cut the trees.

During the initial period of promoting *Wadi*, BAIF officers did discuss about the protection of natural forests surrounding their villages, but the villagers did not respond positively. BAIF officers feel that initiation of Joint Forest Management at that stage would not have received the support and active involvement of the local people, because the direct return from the programme was not significant and they would not have been able to visualise the indirect impact of green cover on their agriculture and micro-climate. But with development of their own lands, which directly contributed to their livelihood, they were considerate enough to protect the forest as well.

This brings out an important message that while working with the poor communities, blending income generation of individual target families with promotion of community based development programmes such as conservation of natural forests and village commons is essential.

BAIF has gained a similar experience in Rajasthan while developing community pastures through people's participation. Prevention of free grazing on community pastures was a sensitive issue, but when linked with dairy husbandry, the farmers came forward to use a part of the pasture for regeneration. They saw the benefit in collection of grass to feed their high yielding crossbred cows, which in turn enhanced their earning. This programme could be widely replicated in 75 villages covering 3000 ha of land, primarily because it was linked with Cattle Development programme, which had helped the individual members of the community to rear good quality cows for higher milk production (Hegde, *et al*, 2003).

Wadi experiences further suggest that preference should be given to fruits, nuts and non-wood forest product species while developing community lands to boost the income and to sustain the interest of the local community.

Voluntary agencies capable of understanding the local problems and opportunities to develop a suitable strategy, will be able to implement the technical programmes very effectively. Capability to provide social leadership, technical competence to solve the problems and credibility to safeguard the interest of the communities can lead to successful implementation of such multidisciplinary projects in rural areas. This is the key to successful implementation of the programme.

References

Hegde, N.G. 1991. Fodder Production - A Case Study. Yojana 35 (16) : 27-29.

Hegde, N.G. and Daniel, J.N. 1994. Multipurpose Tree Species for Agroforestry in India. BAIF Development Research Foundation, Pune : 15-17.

Hegde, N.G., Sharma, M.S. and Rawal, R. 2003. Community Pasture Development : A Sustainable Model for Food and Ecological Security in Rajasthan. Indian Farming : 52 (10) : 26-29.

Mahajan, S.G. 1998. Integrated Rural Development for Sustainable Livelihood. BAIF, Pune : 56-59.