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Agroforestry is the need of the day in India

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Abstract

The apparent high potential of agroforestry systems are its applicability to control soil erosion, soil improvement, creating congenial and conducive microclimate for tree and understory crops and reduction in the accumulation of greenhouse gases in the atmosphere. Agroforestry has generated rather high levels of enthusiasm in recent years concerning with rain fed land use and sustainable resource management system.Therefore, the agroforestry should be considered as a dynamic, ecologically based natural resource management system that can sustain small holder production through the integration of trees in farm and/or in rangelands for increased social, economical and environmental benefits.An alternative land use system has to be evolved to fulfilment of needs of escalating population and solve the land and climatic degradation. The agroforestry practice is the answer to release the pressure on land up to some extent. Agroforestry is a valuable and viable tool for increasing the tree cover as well as to meet the demand for wood and food.Coming to recent times, the increasing pressure on land as well as on forests, rising demand for fuel and fodder and finally the requirement of timber for multifarious purpose have reinforced, as never before, the absolute and inseparable nexus between agriculture and forestry.For his survival, man has to ensure optimum use of agriculture, grasslands, forests and aquatic bodies, including oceans. Of these, the combination of first three systems i.e. Agrisilviculture, Silvopastoral and Agrosilvopastoral are covered under agroforestry.

Key words : agroforestry, potential, demands, agriculture

Introduction

he practice of agroforestry is as simple as the term suggests – it is a system that combines agriculture and forestry, in which trees or shrubs are grown around or among crops. Combining such agriculture and forestry technologies creates a more bio-diverse, productive and sustainable land-use system.

The benefits of agroforestry are already well known – it reduces poverty among farmers through increased production of wood and other tree products for home consumption or sale. It contributes to food security by restoring soil fertility for food crops. It reduces deforestation and stabilizes the soil from erosion. In fact, an appropriate mix of

species can even enable agricultural land to withstand extreme weather events such as floods, droughts and climate change. So it can safely be touted as the most important tool to build resilience of farmers and rural people against threats of climate change and natural calamities. For India, it is also perhaps the only alternative to meeting the ambitious target of increasing forest or tree cover to 33 per cent from the present level of less than 25 per cent, as envisaged in the Indian government's National Forest Policy, 1988.

Successful examples exist among farmers who have practiced agroforestry.In Bareilly district in Uttar Pradesh state, for example, farmers who grew Eucalyptus and Poplar along with their traditional crops were able to increase their net profit by 2.5 to 3 times in a period of seven years. But then, these have been sporadic cases. Despite its relevance in almost all environments, and its potential to ease problems related to climate change, food security and rural livelihoods, farmers are still hesitant to adopt it for various reasons.

But finally,the long pending exercise of putting together a National Agroforestry Policy is underway.The Indian Council of Agricultural Research is in the process of discussing its scope and has begun collating databases from different parts of the country as policy support. After all, India falls in the region that is considered the cradle of agroforestry, and also one that has pioneered scientific developments on the subject. The time has come for this sector to be developed for income and employment generation, as it is the only practice that can achieve the 4 per cent sustained growth in Indian agriculture, and optimize farm productivity in an area when landholding size is shrinking.

Why we need Agroforestry !!

The increasing population will need a lot of household wood products, paper products, packing material and fire wood. To meet the growing demand we can't rely on the forests alone, so private agroforestry is inevitable. India's per capita consumption of paper and paperboard is less than 10kg and whereas China is 72kg. The productivity of timber in India is only 0.7 cubic meters /ha/year whereas the world average is 2.1 cubic meters /ha/year. India's forests are covered in 69 million hectares i.e. 19.5% of the country's area, the availability of forest land per person in India is one of the lowest in the world at 0.08 ha, against an average of 0.5 ha for developing countries and 0.64 ha for the world. The demand for timber was 85 million cubic meters in 2008 and now it is expected to cross 153 million cubic meters by 2020, the supply of wood from forests are projected to 60 million cubic meters by 2020. This means India needs to depend on imports or else agroforestry in private and community lands for its growing wood requirements.

Increased cost of cultivation, non availability of farm labour, higher farm wages and various reasons farmers are switching to less investment and less labour intensive farming like short term commercial crops and forestry plantations. Agroforestry system is mostly practiced by the large farmers who have alternative source of income rather than agriculture, It won't viable to small farmers since they need annual returns on agriculture for their livelihood. But some of the areas the small farmers also cultivating the agro forestry by inter cropping the food crops between the rows up to one or two years or till the trees get bigger, which is a good sign for food security and wood security.

Leucaena and Eucalyptus trees are widely cultivated in Andhra Pradesh which give the guaranteed farm income and the yield of each acre is used to be between 25- 30 tonnes for every four years as the trees are harvested only after 4 years.The wood pulp is being used in paper industry and as well as plywood, particle boards and wood veneer. The waste wood has been used in bio mass power generation plants as a substitute to coal and other fossil fuels to reduce the green house gas emission. In Prakasam district alone has more than one lakh acres have been cultivated and producing 10 lakh tonnes of wood valued around Rs 390 crores annually. The market price has increased recently up to Rs.3900 per tonn due to the shortage of wood and fair competition among the firms in industry which is a lucrative income for farmers. Most of the progressive farmers would like to adopt agroforestry model for sustainable agriculture to improve the farm productivity and profitability.

Indian has achieved selfsufficiency in food production, now we should focus on ecology, preserving our fossil fuels and also cater the growing wood demand caused by population growth and economic development. The agroforestry system is capable to sequestrate the massive amounts of carbon that helps to mitigate the danger of green house gas concentrates. We can implement this system in large barren lands, farm boundaries to improve soil fertility and water conservation. There is a remarkable scope in agroforestry to focus on the ecological issues, biomass production, cattle fodder and various outputs to industries as well as employment generation.

- To supply food to increasing population
- To increase outside forest cover
- To improve the soil productivity, reduce erosion and sustainable land management system.
- To increase the social and economic status of rural farmers.
- To maintain constant supply of raw materials to forest based industries

Agroforestry contributes to climate change mitigation and adaptation

- Integrating trees in agricultural systems can help to reduce impact of climate change on agriculture and, inversely, decrease agriculture's contribution to the phenomenon:
- Sourcing wood products from on farm production decreases the need to cut forest trees, thus reducing the rate of deforestation, which is one of the main factors contributing to climate change.
- Better management of soil nutrients reduces the need to resort to fertilizers, another significant source of GHG emissions.
- Trees planted in agroforestry systems contribute to climate change mitigation through carbon sequestration.
- By using woodfuel from agroforestry systems, people can meet their energy needs in a carbon neutral way.
- By providing shade and a cooler environment to sensitive crops or animals, agroforestry can help maintain or increase yields in the face of climate change, strengthening agriculture's resilience. Reference.

AGROFORESTRY PROMOTION:

The National Agriculture Policy, (2000) clearly states, "Agriculture has become a relatively unrewarding profession due to generally unfavourable price regime and low value addition, causing abandoning of farming and increasing migration from rural areas." Hence the Policy stresses, "Farmers will be encouraged to take up farm/agro-forestry for higher income generation by evolving technology, extension and credit support packages and removing constraints to development of agro forestry".

Rural people have been practicing tree planting in their farms and homesteads to meet household requirements of fuel, poles, timber and medicinal plants. With the advent of social forestry, diversification in agriculture was encouraged to generate high income and minimize risks in cropping enterprises.

Planning Commission, GOI, 2001 for promoting agro forestry, has recommended the following: -

- Rather than having a uniform strategy for the whole country, commercial agro forestry should be adopted in irrigated districts of the country.
- A separate strategy should be developed for rain fed areas for environmental security, sustainable agriculture (production and economy) and food accessibility.
- Suitable species for commercial agro forestry may include Acacia nilotica, Bamboo species, Casuarina equisetifolia, Eucalyptus species,

Populusdeltoides and Prosopis cineraria for different climatic, edaphic and agricultural conditions.

- Specific institutes have been identified for tree improvement and development of clones of specified species.
- Corporate private sector may be encouraged to take up research and development in tree improvement, development of better clones and micro and macro propagation of quality planting material.
- About 100 NGOs may be identified to carry out clonal propagation of seedlings for distribution to farmers at appropriate price and carrying out extension work. Extension activities should include organizing farmers, providing them training in planting techniques, protection measures and other silvicultural operations.
- As more and more farmers are taking up agro forestry, export - import policies should be modified to encourage agro forestry product marketing.
- A system of market regulation to be put in place, including a mechanism of periodic review in order to protect the interest of both producer and consumer of agro forestry produce.
- A suitable market information system needs to be introduced to inform farmers about major buyers, prevailing prices trends, procedure etc.
- All existing laws executive orders relating to tree felling transport, processing and sale should be amended to facilitate agro forestry.
- Commercial agro forestry may be planned in irrigated districts covering 10 m ha. On annual basis, one million ha should be brought under multipurpose tree species identified by the Task Force. The scheme of NABARD for farm/ agro forestry should be expanded and investment of Rs. 100 crores per year should be ensured.
- It is proposed to cover 18 million ha of rain fed areas on watershed basis under agro forestry for conservation of soil and water and plantation of hardy species such as Eucalyptus, Bamboo and Babul. On annual basis 1.8 million ha is proposed for afforestation under various schemes of Rural Development, NAEB and 'food for work' scheme. An investment of Rs. 2700 crores will be required on yearly basis.
- Major states may establish Agro forestry Cooperative Federation for

increasing bargaining powers of farmers in marketing of agro forestry products.

- Wood based industries should continue supply of quality planting material to farmers and ensure suitable buy-back arrangement.

Issues and challenges

- Agroforestry is a long term concept, but farmers are more interested in short term hassle free gains and therefore are opting more in for horticulture than the agroforestry.
- Region specific models for small, marginal and large farmers have not been developed satisfactorily.
- Not much emphasis has been placed on unique and hi-tech system like aqua-forestry.
- The government system related to agroforestry is still ambiguous and corruption rules the roost.
- Inadequate awareness and knowledge dissemination and poor policy initiatives failed to popularize agroforestry among farmers. Role of business and development sector is unsatisfactory.

Conclusion

Agroforestry system in India play a vital role for fulfilment of the basic needs of rural community. Its helped increasing overall productivity and catering the domestic needs of farmers and demands of our rising population of food grains, fuel wood, timber etc. increasing day by day and the present availability and supply are in short, Moreover, over 200 million people, mostly, are highly dependent on forests for meeting their subsistence and livelihood needs. The above needs can not fetched from the traditional farming practices. agroforestry is the only realistic approach and tool to conserve and meet the target of increasing forest cover to 33 percent from the present level of 23.81 percent.

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