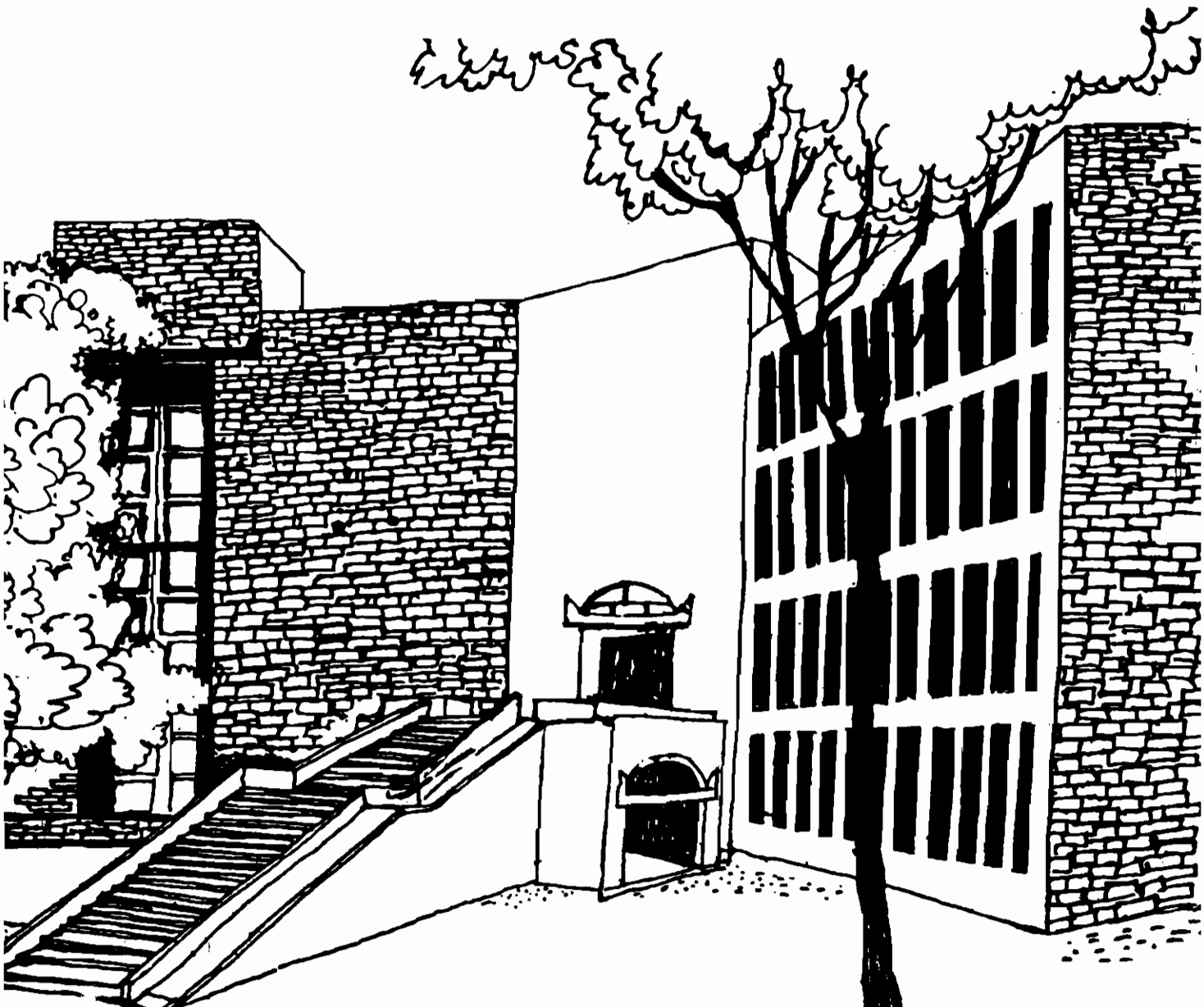




# Working Paper




**BLOWING TEN MYTHS ABOUT AGROFORESTRY:  
RESTORING THE PRODUCTIVITY OF MARGINAL  
DRY REGIONS**

By

Anil K. Gupta

W P No. 1235  
February 1995

WP1235  
  
WP  
1995  
(1235)

The main objective of the working paper series of the IIMA is to help faculty members to test out their research findings at the pre-publication stage.

INDIAN INSTITUTE OF MANAGEMENT  
AHMEDABAD - 380 015  
INDIA

**PURCHASED**  
**APPROVAL**  
**GRATIS/EXCHANGE**  
**PRICE**  
**ACC NO.**  
**VIKRAM SARABHAI LIBRARY**  
**I. I. M. AHMEDABAD**

# **Blowing Ten myths about agroforestry : Restoring the productivity of Marginal Dry Regions**

**Anil K Gupta<sup>1</sup>**

I discuss ten myths about why agroforestry systems may or may not work in a particular manner. It is obvious that while blowing these myths I may have caricatured the reality a bit too harshly. The purpose only is to stress that there is no substitute to restoring the place of agro-forestry systems in any scheme of rehabilitating degraded lands in arid and semi-arid regions and other marginal regions. Not only that, even conservation of non-degraded lands would require recognizing the potential of agroforestry systems. The lack of attention to its role in most watershed programs only highlights the enormous task of educating policy planners lying ahead of us. I also argue that we would not be able to do very much if we do not draw upon indigenous knowledge systems, local cultural and ecological basis of historical evolution of agroforestry and agro-horticulture systems. The need for strengthening some of the top level land use planning and implementation mechanisms cannot be over stressed. After all certain kinds of changes require greater degree of unlearning at top level than at the lower level. People at grassroots level have known about the importance of the agroforestry and agro-horticulture systems for a long time. If they have not persisted with it in many areas, reasons must not be traced in their ignorance or 'improvidence'. The macro-level policies of tenure, harvesting rights, technological back stopping, market incentives etc., will have to be put properly in place.

---

1. Professor, Centre For Management in Agriculture, and Coordinator, SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) and Honey bee network, Indian Institute of Management, Ahmedabad-380015, email: anilg@iimahd.ernet.in

1) *Privatization of common lands leads to sustainable agroforestry based land use.*

Large number of studies of common property resource management tracing their intellectual roots to Hardin's Tragedy of Commons have argued that privatization invariably leads to optimal land use. Most of these studies have ignored the empirical reality about private wastelands. The conditions of private wastelands is often worse than the common lands. Studies by Gupta <sup>2</sup>(1984,1987, 1985) and Shingi and Patel (1994)<sup>3</sup> indicate that private wastelands are not any better than CPRs. There are many reasons why it so happened. The cost of restoring productivity of private wastelands in the early stages is often quite high. Most watershed development programmes require cost to be borne by owners of the land either completely or

2. Various papers of mine which have been drawn upon in writing this paper are listed below:

Socio-Ecology of Grazing Land Management, Rangelands: A Resource Under Siege, Proceeding of the Second International Rangeland Congress, edited by P.J. Jose, P.W. Lynch and D.B. Williams, Australian Academy of Sciences, Canberra, 1986, (IIM Working Paper No. 524,1984), pp.288-291.

Socio-Ecology of Land Use Planning in Semi- Arid Regions", September 1984, IIM Working Paper No.525, p.33, Commonwealth Workshop on Land Use Planning in Tropics, BARI & IIMA, Jan 28-Feb 2, 1984, Ahmedabad.

National Grazing Policy : Incorporating the Victim's Point of View, Rangeland Resource and Management, Range Management Society of India, IGRI, Jhansi, Nov. 1988, pp 453-457.

Agenda for Research in Dry Regions: Socio- ecological perspective, IIM Working Paper No.537, 1984.

Socio-Ecological Paradigm for Analyzing Problems of Poor in Dry Regions, Ecodevelopment News, (Paris) No.32-33, March 1985,pp 68-74.

On Organising Equity: Are Solutions Really the Problem?, Journal of Social and Economic Studies, Vol.2, No.4, October 1985, pp 295- 312.

Small Farmer Household Economy in Semi-Arid Regions : Socio-Ecological Perspective CMA Project Report Based on Field Survey in 1979- 80 and 1982-83, Centre For Management in Agriculture, IIM, Ahmedabad, Mimeo. pp.452.

Sustainable Institutions for Natural Resource Management: How do we participate in people's plans? 1993, Fourth draft of the paper for an UNDP supported research project on "Building Operational Strategies of Sustainable Development Upon People's Initiatives: Development and Management of Local Resources" coordinated by APDC, Kualalumpur.

3. Shingi, P.M. and M.S. Patel, 1994, Afforestation of Privately Owned Wastelands: A Model of Maharashtra Agroforestry Federation, CGWD, CMA, Ahmedabad:Indian Institute of Mangement.

partially for any restoration activity. Given state of technology requires everybody's cooperation and even after that offers only marginal returns at least in the short-run. Many owners of the land do not find such returns attractive and thus do not participate in a programme requiring them to bear a cost. Shingi and Patel (1994) found that about 1 Lac hectare of privately owned wasteland was available in Nasik district.

The distribution of these lands was not biased in favour of only small or large farmers. More than 48 per cent of the wasteland was of less than two hectares in size. In contrast, a study in Bangladesh revealed that cultivation of *D.sissoo* and *A.heterophyllus* were concentrated far more on the fields of medium and large farmers (Aktar, Abedin, and Quddus, 1989)<sup>1</sup>.

Maydell (1982)<sup>2</sup> also stressed that the importance of agroforestry system in semi-arid mountain regions increased with the decreasing size of land holdings. In Costa Rica, agroforestry systems involving coffee, cocoa, banana and other crops are grown under a light shade of important species such as *Cordia alligatora*, *E. poeppingiana*, with hedges of *Erythrina* spp. etc. However, when poor people have to rely in dry mountain regions on animals, the pressure of their (livestock's) density, composition of herds and excessive grazing exacerbates the erosion problems compounded by burning of dry pastures. Further it was noted that the density was high among the farms of medium farmers and large farmers but lower among tenant farmers who had greater compulsion to show higher crop productivity. When age composition of different species was taken into account, it was noticed that in recent years, more *D.sissoo* had been planted. Interestingly, the sample small farmers were found not to have trees older than ten years.

-----

1. Aktar, M.S., Abedin M.Z. and M.A. Quddus, 1989, Why Farmers Grow Trees in Agricultural Fields: Understanding Farmers Decision Making in Agroforestry System. Paper presented at the Regional Symposium on the Tree Plantations in the Humid and Sub-humid Tropics in Asia, 5-9 June, 1989, Malaysia.
2. Maydell, Hans-Jurgen von, 1982, Possibilities of Increasing the Human-Ecological Carrying Capacity of Semiarid Tropical and Subtropical Mountain Regions by Agroforestry Land-use Practices, Applied Geography and Development, Vol. 24, pp.121-130.

Another study noticed that the probability of sole orchards (i.e. without any crop though with grass cover) was much higher at the holdings of bigger farmers compared to smaller ones. Similarly, the uses of trees in the cultivated fields also varied across classes and gender. The use of palm leaves for mat making was an occupation of women from poor households. Among other reasons, application of forest laws to plantation on private land was found to be one major deterrent for development of these lands. The laws on harvesting trees grown on private lands have been modified in some states so far.

Agro horticulture is changing the profile of economic returns in some agro ecological regions and inducing private participation. The common lands play an important role in the sustainability of private lands and yet most agro forestry research focuses on crop-tree interaction only on private lands. The trees in the common lands can provide precious fodder for maintaining bullocks and other animals during drought periods. Some of the trees provide leaves used for green manuring and twigs used for heaping in the cultivated lands in a criss-cross manner to avoid wind erosion. Trees in the form of shelter belts on common lands as well as private lands also help in checking wind erosion.

Thus not only that privatisation is not the complete answer. The agro forestry systems should include interactions of cropping system with trees not just in the field but also around the fields.

2) *Poor people have shorter time frame and have lesser trees in and around their fields*

Many researchers have believed axiomatically that poor people being resource constrained must not be able to afford trees on their lands. When we undertook an empirical study (perhaps the first one in India) to look at tree density on cultivated fields in 1979, we found following situations in Western Haryana:

In dry villages the marginal and small farmers had higher tree density than the bigger farmers. In irrigated villages the pattern was reverse. Inverse correlation between land size and tree density in dry villages is quite understandable, given the fact that small farmers have much greater reliance on livestock for their livelihoods and tree loppings are an important source of animal feed, particularly in drought years. Another reason for higher tree density in dry regions is that it is possible to by-pass the spontaneously sprouted tree seedlings when fields are ploughed by bullocks/camels. But, it is not possible to do so when fields are cultivated by tractors. In irrigated villages the small farmers intensify the cultivation, often rent in the tractors and therefore do not have many trees in the field. Their reliance on livestock is also lesser. On the other hand, the bigger farmers have several more plots, some of which are of low fertility and thus they have more trees on an average. Even otherwise, they can afford to spare land covered by trees more than the marginal farmers.

In some of the dry regions of south India, there is a forward trade in trees. The buyers visit village to village and offer money to the people in need of the same in lieu of the right to harvest their trees. Once the deal is done, the buyer would come at his leisure and harvest a tree even after a few years. Till then, the owner acted as a mere protector of the tree. Since trees were economic asset and were crucial for survival, poor people planted them on the lands near the homestead.

3) *Poor people need fast growing species because they cannot wait for too long*

This is one of the most popular myths about agroforestry. Poor people not only have more trees but often of slow growing high value species because of the need for getting returns at a particular time. Their household budget is often in deficit and thus their ability to save is



limited. Under such conditions to save money for daughter's marriage or other such social compulsions is an extremely difficult proposition. Slow growing species maturing after 15 to 18 years offer a possibility of getting money just when it is required<sup>6</sup>.

4) *Agroforestry can survive entirely through market incentives*

The fate of most social forestry, farm forestry and agroforestry projects in Punjab, Haryana, southern states and western India including Gujarat and Maharashtra has been very depressing. The economic returns which farmers expected have not materialised (Shingi and Patel, 1994). While market orientation is necessary, by itself it has not been able to clear the demand and supply at attractive terms to the farmers. One of the reasons is continued access of major industrial consumers to very cheap and subsidized sources of pulp and wood from forest department and corporations. Further the technological support in terms of quality seedlings and other requirements has not been organised systematically. There is a need to look at the missing links in the chain of producer to local as well as external consumers. At the same time, public policies which distort either the incentives to plant or harvest, or reduce returns because of bias in favour of large plantations or imported pulp etc., should be modified.

5) *Capital support for undertaking agroforestry is adequate, the basic problem is lack of demand*

Central financial institutions and banks have been claiming that there is no inadequacy of institutional credit for farmers, who would like to borrow for agroforestry plantations. Nothing could be farther from truth. There are several reasons why banks have not been very supportive of credit for agroforestry purposes. They don't have much familiarity with this field.

---

6. Also see, Chambers, Robert J.H., 1988, *Trees As Savings And Security For The Rural Poor*, IIED, Gatekeeper Series No.SA3, London.

They are highly rigid and do not realise the need for location-specific adaptation. In one of the south Indian districts, a District Oriented Monitoring Study by NABARD brought out a very interesting paradox. The farmers who were financed for casurina plantation were advised to follow a spacing eight feet by eight feet and harvest the same after eight years. Many farmers realised that market opportunities suggested a change in this pattern. They reduced the spacing to four by four feet and harvested the trees after four years. Total biomass at the given price seemed to have given the farmers a return which was far more attractive than the return possible with recommended spacing and tree life. The study by NABARD noted that farmers had violated the conditions of the sanction. The officer who felt that this was a desirable adjustment by the farmers was apparently pulled up. The message was clear. Follow the guidelines even if they don't make business sense. Should one be surprised if demand for credit for agroforestry remains sluggish because of such an attitude of the supply side.

6) *Agroforestry is a new concept and, therefore, farmers need to be trained and motivated*

In 1856, there was an Agro-horticulture Society of India. The minutes of the conference of this society till 1862 are available in Asiatic Society library, Calcutta. What do these minutes signify. Even during British period, there was some consciousness about the need for understanding the local agroforestry and horticultural practices and propagate the best local practices. Prizes were given for identifying the best local practice. It is true that major focus was on cash crops. Indigo was being introduced in a big way and energy was required for processing it. But that was not the only reason for their attention. In fact one of the commissioners, after learning about the importance of large sacred groves, did a small survey asking all district officers to identify similar sites in their regions.

Mr. K.M. Munshi, Indian cabinet minister for food and agriculture during early 50s, was very conscious of the need for ecological balance. In one of his lectures, he looked at the nutrient cycle, hydrological cycle and village institutions to argue for a comprehensive plans for land transformation. It was he, who developed the concept of land army of rural youth which was

supposed to transform the land-use in a sustainable direction. The Vana Mahotsav (forest festival) was introduced by him. The point I am trying to make is that people have known agroforestry and agro-horticulture for as long as one can remember. And yet, we have very few studies, which have systematically documented the logic of farmers' own agroforestry arrangements.

The author had initiated studies aimed at understanding women's ecological knowledge and homestead utilisation in 1985 in Bangladesh. It was found that site, season, specie and the inter-cultivation were carefully worked out by the women who had as small as 0.5 acre land to subsist on.

7) *Agroforestry systems can be designed primarily on the basis of soil physical properties independent of local socio-cultural traditions and values.*

If this myth was not true, one would have expected most studies to have acknowledged the role of cultural factors in the evolution and management of agroforestry systems. Such unfortunately is not the case.

It is truism to say that trees have been worshipped in almost all societies from time immemorial. It is a different matter that this respect coded in cultural values has not prevented denudation of trees around the home stead, in and around the fields and in the forests. But another way to look at the situation is that it is not the economics alone which explains whatever extent to which trees still find a place in crop based farming systems. Culture can constrain and also create space for creative experimentation of different resource use strategies.

In some parts of Kenya, among luryi tribe, women were prevented from planting trees. It was considered a curse. Even today if one enquired about whether women planted trees or not most women would reply negatively. And yet culture being dynamic in nature exists sometimes in contradictory forms at surface and below surface. Once the male emigration to

Nairobi and other cities started from rural Kenya where this tribe lived, their responsibility of women increased manifold. They had to not only take care of agriculture but also plant trees for meeting energy, fodder and other needs of the household (Lusigi, 1994, pers. comm.). A cultural transition has taken place. It remains to be seen how changed gender roles have influenced choice of tree species, and their interactions with crop, livestock and other survival systems.

Similarly, women were not supposed to touch roof but once the men out migrated, women had to overcome this taboo too. Roof construction, management and repairs thus became an activity no more out of domain of women. This role invariably linked with the earlier change in the role regarding trees.

In Uganda, Masogas believed that when one died, the spirits lived not too far from the ground. In summer, when the air rises, the spirits also rise and rest on the trees. Thus they believed that if one did not have trees around oneself, the spirit of ancestors would not be around to help them (Paul, 1994, pers. comm.). It is true that this belief may explain only part of the variance in tree planting behaviour. But to the extent it does, we have to understand the role of such beliefs and incorporate cultural dimensions in choice of technology, design of institutions and organisation of access rules.

In India, there are many examples of cultural beliefs associated with different tree species. There are communities like Bishnois who would neither allow cutting of trees nor killing of wild life. The villages inhabited by them can be distinguished by highly vibrant and robust agroforestry and village woodlot systems. There are trees of which wood cannot be used for funeral pyre purposes. Similarly, there are trees which are never uprooted even if their growth disturbs one's own living structures.

There are informal common property resource institutions governed by very strong cultural norms, rules and sanctions influencing the conservation of woodlots as well as trees in the cultivated fields.

In Bhutan, I came across a very interesting institution of collecting shingle wood from the forest demonstrating multifunctional characteristics of a cultural institution. This example is being recalled here because we need similar examples for agroforestry systems. Unfortunately the research on institutions has focussed far more on common property resource institutions identified by the separate physical boundaries and much less on overlapping private and common institutions. For instance, certain uses of trees even in private lands may be governed by rules which are collectively designed, managed and regulated through social cultural and economic sanctions.

For instance, right of resting under a tree for a migrating livestock herd in a fallow field is negotiated sometimes in advance and sometimes concurrently. In Andhra Pradesh, a study had shown that an advance party of shepherds negotiated with the village elders about the fields on which the sheep will be penned for enriching the soil fertility. In return part of the money which farmer would pay to the shepherds would go to village common fund. It remains to be studied as to what extent the tree cover in a field influenced the choice of shepherds and the terms of contract. In the herds of camels and goats, the role of trees may be even more pivotal because the loppings constitute an important share of the animal feed. We do not have many studies which show the range of rules as well as sanctions which govern the negotiations between farmers and pastoralists. Within these negotiations, we know still less about the role tree specie mix, density and geometry play.

Obi (1988)<sup>7</sup> provides an insightful account of how the rights in the customary law regarding economic trees vary among the Ibo tribe of Nigeria. If economic trees are self sown i.e. spontaneously sprouted, then the rights belong to the owner of the soil on which they grow. But if the trees are planted by man, they become the property of the person who plants no matter on whose land. The sale and transfer of the land does not necessarily carry with it the right or interest in economic trees growing on such lands.

Thus the cultural factors influence the gender roles; intersectoral exchanges for instance, among cultivators and pastoralists; tree cover and density for not just utilitarian but also spiritual purposes; and functional aspect of tree planting and management in arid and semi-arid regions. Since culture subsumes values, beliefs and ideologies, one has to appreciate that there are several cross-currents that characterised a cultural landscape. The dynamism of culture means one should not look at the explicit and formally articulated meanings but also study and understand the counter currents which are often not made explicit for want of sufficient social legitimacy. The role of cultural symbols and institutions in communicating scientific and technical information about agroforestry is an issue not sufficiently explored. How cultural factors can influence the assumptions that scientists have to make both about species and their interactions with different components of farming system also remains to be properly studied and analysed. The neglect of cultural factors is most evident in the research design of ICRAF which has in turn influenced the design of agroforestry research programmes in various developing countries (example of this neglect is Raintree, John B., 1984)<sup>8</sup>. Malhotra and Bharara (1988) provide a review of traditional agroforestry practices in dry regions and highlight the role of cultural and sociological factors. And yet, the formal scientific research is focussed

- 
7. Chinwuba Obi, S.N., 1988, Rights in Economic Trees in Fortmann, Louise, and John W. Bruce, eds. *Whose Trees? Proprietary Dimensions of Forestry*, Boulder, CO: Westview Press. (ILL: Univ. of Notre Dame).
  8. Raintree, John B., 1984, *Designing Agroforestry Systems for Rural Development: ICRAF'S D&D Approach*, Nairobi: ICRAF.

much more on identifying optimal crop tree combinations rather than understanding how those communities which have maintained viable agroforestry systems can become agent of diffusing the cultural context of technological solutions devised by them. Perhaps a very different approach to extension would be needed while dealing with agroforestry systems.

8) *The model of green revolution in wheat and rice can be replicated in the agroforestry systems as well.*

The example of green revolution demonstrates how success can become a reason for failure. Many scientists engaged in agroforestry research look for short-term high return oriented tree crop combinations disregarding the risks, the long-term ecological and economic changes and thus the possible social and environmental consequences. The introduction of so called magic plants has been guided by such an assumption without any concern for genetic diversity and location-specificity. Thus in comparative terms one could hypothesize that research on exotic species is far more than on native species. Such an approach is bound to fail as is evident from the experience so far. Even more pathetic is the situation of the research focus on on-station research ignoring the potential of on-farm research. A global review of forestry research showed universal neglect of agroforestry research by the forestry scientists as well as the other scientists (Mergen, et. al., 1988)<sup>9</sup>.

9) *Viable agroforestry systems require emphasize on `Multi-Purpose Tree Species' (MPTS)*

It is unfortunate that scientists from developing countries not only latch on to the bandwagons initiated by western scholars but even internalise the terms which may lack precision or even any specific utility. MPTS is one such example. I am yet to find a tree which has single use.

---

9. Mergen, Francois, Evanson, Robert, E., Ann Judd, M., and Putnam, J. 1988, Forestry Research: A Provisional Global Inventory, Economic Development and Cultural Change, pp.149-171.

In such a case, what is the point in using a term like MPTS. I can understand that predominant use of different trees may vary in different regions, seasons, among social classes and even sometimes among male and female. But, that should not detract our attention from the fact that each tree has multiple uses. The weights of different uses in the portfolio of the households may vary on account of access, assurances, abilities and attitudes of the households vis-a-vis ecological resources, institutions, technologies and cultural aspects of resource management systems. A proper theoretical understanding of the way different classes of households attached different weights to various uses of each specie used in agroforestry systems should pre-suppose that all trees have multiple purposes. Having said that it should be useful to analyse how generating opportunities for intensifying different uses may empower certain social groups or weaken their relative power.

10) *National land-use policies and institutional arrangements are robust and conducive for promotion of agroforestry systems in marginal as well as other regions*

Nothing could be more ironical that an institutional arrangement with very high espoused priority should meet such a poor fate as has been the case of National Land Use and Conservation Board. Prime Minister was supposed to Chair the National Land Use and Watershed Council (NLU&WC). Three boards namely National Wastelands Development Board (NWDB), National Land Use and Conservation Board (NLUCB) and National Afforestation and Environmental Conservation Board were supposed to work under NLU&WC. The NLUCB which was primarily concerned with agroforestry and watershed development was supposed to be chaired by Deputy Chairman of Planning Commission. Under NLUCB, state land use boards chaired by respective chief ministers were supposed to be constituted.



What has been the fate of these bodies. Mohan Dharia (1987)<sup>10</sup>, former cabinet minister and coordinator of a voluntary organization viz. VANRAI, lamented the defunct nature of land use boards in whichever state they were constituted. Recently, a committee of secretaries from four important ministries and Planning Commission was constituted by government to look at the present institutional arrangements for land use planning. Author was shocked to see the background note prepared by the committee which reflected considerable satisfaction with the existing arrangements. When author enquired in the consultation, as to whether NLUCB and various state land use conservation boards and other bodies had ever met or not, the reply was obvious. Government seemed to have been satisfied with the arrangements that never worked. Participants from most states present in the meeting acknowledged that state land use boards had never met or had served no purpose. Similarly, Prime Minister seemed to have found no time for such a subject. Either the subject was not important or the leadership did not appreciate its responsibility towards conservation of the most precious natural resources. Given such arrangements, it is not surprising that agroforestry research, action and programmes have received very poor attention in various policy planning fora.

There is no point in deriving any satisfaction with the present institutional arrangements. The alternative is either to reorganize these bodies and make them functional. Or peoples' organisations will have to provide their own momentum to this programme disregarding the policy and institutional support. The latter would require social movements - not an easy alternative. The former is feasible but unlikely to happen unless scientific and administrative leadership can make the political leadership realise the precarious nature of marginal lands particularly in dry regions. Even the watershed development programmes have not given agroforestry based land use systems, the deserved attention.

---

10. Dharia Mohan, 1987, *Afforestation in India*, Pune:VANRAI (Peoples' Movement for Green India).

In this paper, I have tried to deal with ten myths regarding agroforestry policies, research, programmes and activities with particular reference to marginal lands in dry regions. I am not saying that these were the only ten myths that needed to be blown. I have chosen my pick essentially guided by the prevalent dogma among the policy makers. I have not critiqued many other fads of the agroforestry researchers and planners for want of space. I may conclude that time tested practice of integrating agroforestry systems with livestock, craft and other economic enterprises in dry regions remains the only viable and sustainable way of restoring productivity of fast degrading lands. Mechanization, and intensification of cultivation of crops in these regions is a manifestation of misguided priorities. As a knowledgeable friend had observed years ago, we seem to prefer growing trees where crops should be grown and growing crops where trees should be grown. Such is the paradox of farm forestry vis-a-vis agroforestry. But market is a great leveller. The declining profitability of sole tree crops in green revolution regions is a signal we cannot ignore. It will be unfortunate if this signal deterred the dry farmers also from strengthening agroforestry or agro-horticultural systems. Perhaps in the new economic policy environment, entrepreneurial spirit of outward looking farmers will find a better fit between land use and ecological economic returns than any policy supported by weak or defunct institutions could ever achieve. Since one should not throw a baby with bath water, I hope that we will strengthen the institutions for policy, research and extension before blaming the farmers or the markets.

