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NEWSLETTER OF
KERALA FOREST RESEARCH
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Address all communications to
The Editor
Evergreen
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P.V.Nair

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Need for alternatives in termite control

Successful control of termites both in agriculture and forestry has been mainly due to the use of persistent organochlorine (OC) insecticides. Concern over the health hazards, environmental pollution etc. together with ban or restriction in the use of these deadly insecticides has prompted scientists all over the world to look for alternatives.

Recently the Plant Protection Adviser, Government of India has made it clear that among the three important insecticides used in the country for termite control viz. aldrin, chlordane and heptachlor the last two have already been banned and the first one will be phased out gradually and by 1994 aldrin will not be available in the market. However, scientists have not come up with an effective alternative to cope up with the situation. The real difficulty will be felt only by 1994 when aldrin also disappears from the market.

The main attributes of an alternative termiticide are 1) it should be persistent and give effective protection for at least five years (2) it should be an environment friendly chemical and should be available at a reasonable cost 3) it should be convincingly as effective as aldrin or other OCs. Availability of a product combining all the above properties is quite difficult and this could be another reason for not making much headway in this field of research.

So what is the way out? We have information on the efficacy of a few alternative chemicals belonging to organophosphates (OC) and synthetic pyrethroids as effective termiticides. But these have not been tested in a practical way under Indian conditions. The two OCs- Chlorpyrifos and Isofenphos and the two synthetic pyrethroids - permethrin and fenvalerate have been reported to be effective for about 10 years under experimental conditions in USA. Synthetic pyrethroids are also known to act as termite repellents. Recently developed controlled-release formulations also offer prospects as alternatives. In addition to the slow release of the pesticide at a constant rate over a period of time, these formulations have also low mammalian toxicity.

Some of the microbial pathogens such as bacteria and fungi are also reported to have termiticidal effects. However, promising results based on field trials are yet to come. A bacterial preparation - Arthrobacter RRL J 3- developed by the Regional Laboratory, Jorhat, Assam is reported to have termiticidal effect.The termiticidal effect of certain plant products are also known.

Thus possibilities are many to replace the organochlorine insecticides. What we need is data based on field trials regarding the persistence, efficacy, dosage etc. of promising alternatives tested under our conditions. This would also require some kind of a healthy competition among the manufacturers to suggest alternatives, the efficacy of which will be tested by the scientists. It is quite likely that safe and reliable chemicals would be required to contain termite attack and biological means may result only in short term protection and will not be useful under all situations.

In forestry, termites are of concern mainly in eucalypt nurseries and plantations. Occasional report on termite damage in nurseries of other tree crops are also known. In addition, stored timber and timbers attached to buildings are also being attacked by termites. Most damages are due to subterranean termites.

In this context, the entomologists of KFRI are trying to come up with a suitable alternative termiticide to replace the OCs currently being used, especially for specific problems like control of termites attacking eucalypts. Aldrin is a universally accepted chemical for termite control, and what we need now is a universally acceptable replacement.

R.V. Varma
Division of Entomology

Excellent furniture from young *Eucalyptus* trees

With the alarming rate of dwindling timber resources, indigenous timbers of world repute like rosewood and teak are now beyond the reach of common man for his day to day needs of furniture and cabinets. One possible alternative is to use plantation grown timbers like eucalypts which are available in plenty in different parts of the country.

The important properties which qualify a timber for making furniture and cabinets are strength, figure of the wood (which includes its grain, texture, colour and appearance), weight (wood density), retention of shape, workability and finishing. Recent findings of Kerala Forest Research Institute indicated that eucalypts are suitable for making excellent furniture items and that they can be cut at a relatively young age, say at 16 years. This is possible because they attain the mechanical maturity and wood density requirements of the furniture items at an early age as can be seen from the following table.

How to saw small timber for furniture-making?

It is advocated that small diameter logs of young eucalypt trees should be sawn by "quarter sawing" technique because:

- quarter-sawn wood shrinks and swells less in width
- twisting and cupping due to juvenility is less
- wood behaves better in seasoning due to less surface checks and splits
- surface finishing and painting are better.

Workability of eucalypts is comparatively good. It works to smooth surface and takes good polish. The other desirable properties are their excellent appearance and figure due to pleasing colour, straight grain and medium texture (Fig. 1.) The additional processes like ammonia fumigation are stated to have desirable effects to improve the beauty and aesthetic value of furniture products. All these findings qualify the eucalypt timber for inclusion under the Super Group of Indian timbers suitable for furniture and cabinet making. One problem encountered in furniture manufacture was in nailing due to wood splitting and nail bending although nail holding power is even better than that of teak and mango wood. However, the research results from Forest Research Institute, Dehra Dun show that this problem can be overcome by preboring without any loss of nail holding power.

Cost

The cost of eucalypt furniture depends, on the availability of the timber which is controlled by the harvesting policy. For instance, eucalypts are mainly grown to meet the raw material requirements of pulping industry in Kerala where trees are cut generally at the age of 7-9 years. In many states like Gujarat, Punjab and Haryana eucalypts wood

Table 1. Comparative wood density and strength coefficient values of two eucalypts of relatively young age with mature teak as 100

Species	Age yrs.	DBH cm	Air dry density	Static MOR	Bending MOE	Compression parellel to Grain crushing stress
Eucalyptus grandis	30	45	88	86	93	66
Eucalyptus tereticornis	16	20	111	95	80	81
Tectona grandis	55	47	100	100	100	100

of older age is available in plenty which makes it very competitive in the market.

It is estimated that the cost of furniture made out of eucalypt wood is less than half that of teak rosewood, sissoo etc. In Punjab and Haryana eucalypt wood furniture is known to be sold at a much faster rate than sissoo wood furniture.

Furniture made out of *Eucalyptus* wood

Conclusion

It is clear from the foregoing account that eucalypts are suitable for high value products like furniture and cabinets. However, a word of caution is necessary in the recommendation, i.e. like any other timber eucalypt also has certain defects like growth stresses, end splitting, juvenility, tension wood, knots and kino veins. Nevertheless, these cannot be the deterrents if appropriate sawing and seasoning techniques are adopted to improve the sawn wood outturn.

K.M. Bhat
Wood Science Divison

Butterfly farming

Butterflies are objects of attraction for both children and adults alike. Manipulation of butterfly populations for educational and conservation purposes has currently drawn considerable attention from conservationists as well as environmentalists. Large-scale butterfly farms have been established in several countries including UK, New Guinea, Sri Lanka and Malaysia. Apart from the aesthetic value, these farms are also fetching very good revenue. In India butterfly farming has not been attempted on a commercial scale.

Scope for butterfly farming in Kerala

With the availability of a variety of habitats ranging from natural forests, plantations, scrub jungles and villages, Kerala is rich in its butterfly fauna. Most of about 300 species of butterflies reported from Southern India, occur in Kerala. This include several species which enjoy a wide range of distribution. Instances of local aggregations and short range migration of some of these butterflies have been reported from different parts of the State. The common tiger (*Danaus genuita*), the crow (*Euploea core*), the yellows (*Eurema blanda* and *Eurema hecabe*), the lemon emigrant (*Catopsilia pomona*) and the common rose (*Tros aristolochiae*) are some of the common species in such aggregations. All these species have a variety of larval and adult host plants and their ecological requirements are not very specialised. Captive breeding of these butterflies is fairly easy as compared to some others like the tree nymph (*Idea malbarica*), the paris pea-cock (*Papilio paris*), and the buddha *(Papilio budha*). These butterflies which are extremely beautiful require very specialised ecological conditions for successful breeding. Basic information on the habitat preferences of such species should be collected before venturing into large-scale breeding programmes.

Objectives of butterfly farming

The major objectives of butterfly farming are to maintain live populations of various butterflies, to impart information on their role in the ecosystem, to generate public awareness on nature conservation and to utilize them for the preparation of handicrafts for revenue.

Facilities required for a butterfly farm

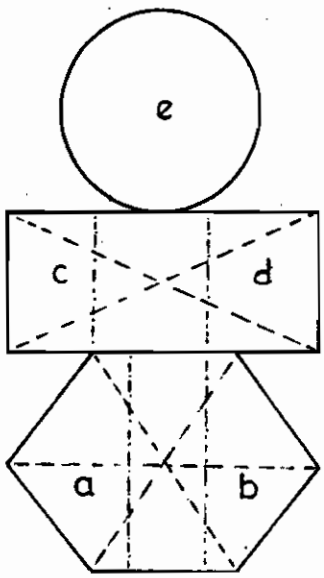
Facilities required for breeding native species of butterflies are simple. However, maintenance of sanitary conditions is essential for successful continued breeding. The essential facilities required (Fig.) are discussed below:

1. Field cage for mass rearing

Cages of approximately 5 m^3 and rooms (10 m^3 or more) with sides fitted with wire-nets are essential for undertaking mass breeding of butterflies. The cages should have double doors in order to prevent escape of insects. Appropriate host plants may be either planted inside or potted seedlings may be used.

2. Preparation room

In order to prevent possible infection of insects by fungal or bacterial pathogens, adequate precaution must be taken to ensure sanitary conditions within the rearing cage. Often it will be necessary to sterilise the host plants as well as the insects from possible contamination by pathogenic organisms. The dead insects may be made use of for preparing curios or souvenirs which will fetch revenue for the farm. A preparation room is essential for carrying out such activities.



3. Exhibit area

This should include space for displaying preserved materials, charts, facility for videogames etc., so as to entertain visitors of different age groups and tastes. Live exhibits to facilitate display of insect activities like courtship, egg laying, movement and feeding pattern of caterpillars etc. will also be interesting to visitors. There should also be provision for a separate sales counter near the entrance for the sale of posters, greeting cards, photographs and slides of insects, plastic or glass models of different organisms, souvenirs or curios made out of preserved materials etc.

4. Surroundings

The area surrounding the farm should be developed into a butterfly garden. Care should be taken to conserve typical habitats preferred by butterflies like streams with boulders, open hillocks, scrub jungles etc. In each of these habitats plants which will serve as a food source for the larvae and adults of butterflies common to that area should be planted.

Certain species of butterflies (Danaidae) prefer to aggregate on milkweeds, sunhemp, *Crotalaria* etc. Some other (Lycaenids) prefer to puddle in moist mud containing salt/charcoal. Papilionids usually aggregate in shrubby areas having *Clerodendrum viscosum*, *Lantana*, *Helicteres* etc. Manipulation of the available habitats by introduction of appropriate food plants will be useful in the development of a butterfly garden.

Returns from the farm

There is considerable scope for the establishment of butterfly houses in tourist resorts and Nature Study Centres in India. With the introduction of large and more colourful species from Malaysia, New Guinea and North America, the butterfly farms and gardens could be rendered more attractive to tourists.

Sales of colourful posters, greeting cards, glass/plastic models of animals, souvenirs prepared by embedding dead insects in mica gel, fee collected at gate etc. will be the major sources of income from the farm. In other countries such farms are self dependent and are run exclusively with revenue generated as discussed above.

George Mathew
Division of Entomology

Habitat improvement in protected areas of Kerala

Habitat is defined as the place where an organism lives, or the place where one would go to find it. At certain stage the habitat may need some intervention to improve its quality. The questions such as how to improve the habitat, when to improve and where to improve are discussed here.

Development of new water holes

Drinking water is a limiting factor in many of the protected areas during summer. Herbivores like Spotted Deer (*Axis axis*), Sambar (*Cervus unicolor*) and Elephant (*Elephas maximus*) tend to concentrate near the water holes, with the result that the range is over-used in these areas, while a lot of potentially good range remains unutilized over vast tracts of forests.

To ameliorate the scarcity of drinking water, several measures are needed. In dry sandy river beds, under-currents are found in many places. A small pit may be made in such beds, where the ground water level is high and P.V.C. pipes can be installed to drive water to a saucer (about one meter diameter). The whole setting and design of construction should merge with nature. The height of existing bunds can be increased to raise the storage capacity. Another method practised is the construction of earthen bunds in small rivulets. Silting can be stopped by planting grass in the surrounding areas.

It is better to adopt certain criteria while developing new water sources for ungulates. Water sources should be easily accessible and at least one escape route should be provided. Live stock should be prevented from using the water holes by necessary fencing. Adequate cover

should be provided around the water holes. The aim should be to distribute water in all corners of the sanctuary and make it available through all seasons.

Improvement of food availability

Pasture is defined as any land containing grass, which can be used by herbivores as fodder. In the case of moist-deciduous forests very less food is available in terms of grass. Teak leaves which are available in plenty is of no value to animals as fodder. Creation of mosaic habitats with meadows and woodlands will be ideal for moist- deciduous areas. Removal of woody growth from the 'Vayals' (grasslands) of Parambikulam Wildlife Sanctuary, is an example for the pasture management. Another method to create pasture land is creation of fodder plots by enclosing an area of 2 to 5 hectares with wire mesh so that cattle cannot enter and feed on grass. But at the same time wild animals can jump into fodder plots and graze. Fodder plots can be created in sanctuaries where pressure from cattle is high. Release of the browse species from less desirable species by way of thinning can be attempted in many of the areas.

Improvement of cover

Cover is important to wild animals like food and water, without which animals will not survive in any area. The cover should be adequate and should be properly distributed all over the area. While manipulating habitat for improvement of food and water, care must be taken to leave adequate cover and it should be sufficient in quality and quantity. Cover needed by animals can be classified into protective cover and reproductive cover.

Protective cover: Vegetation offering hiding places, or mechanical protection from driving rains, winds, the sun, protection from predators or humans serve as escape or protective cover. This type of cover should be provided near natural and artificial water holes by planting trees for the benefit of ungulates. While creating pasture lands, sufficient cover should be maintained around open areas. This type of cover is not a limiting factor in many of our sanctuaries.

Reproductive cover: Cover for nesting and reproduction is necessary for all birds and mammals. The best example for the necessity of breeding cover is the recovery of Barasingha population from extinction after providing the breeding cover in Kanha Tiger Reserve in Madhya Pradesh.

Species-specific habitats

Apart form the major plans for the whole area, species-specific habitats need special attention. This relates to certain special areas which are small in size but are critical to certain species in a large protected area. Grizzled Giant Squirrel (*Ratufa macroura*) habitat at Chinnar Wildlife Sanctuary is a typical example for this type of species-specific habitat. Riparian patches, where this squirrel inhabits, require special consideration from the managers. Evergreen forests where Lion tailed Macaques are found in Parambikulam Wildlife Sanctuary is another example for this type of habitat. Species-specific habitats in all sanctuaries can be identified and managed carefully depending on the requirements of each species.

Conclusion

At present, in the name of habitat improvement new fodder grasses are grown after removing the natural grass in many places. This has not succeeded in many cases. Scars left by the unsuccessful attempts would be visible in some places as barren areas. Another practice is to remove vegetation branded as weeds. As described earlier, it should be kept in mind that even weeds will function as cover for various biological functions of animals. Burning of grass as a habitat improvement method is not practiced in Kerala. This is very essential in areas like Eravikulam National Park, where the Nilgiri Tahr is dependent on grass as fodder. Development of pasture should get maximum priority in places like Parambikulam, Chimmony and Peechi- Vazhani Wildlife Sanctuaries, by which we can increase the ungulate population. Thus habitat improvement emerges to be a key stone for the better management of any protected area.

E.A. Jayson
Division of Wildlife Biology

A special feature

National Seminar on Socio-economic Research in Forestry
Thrissur 18-20 May 1992

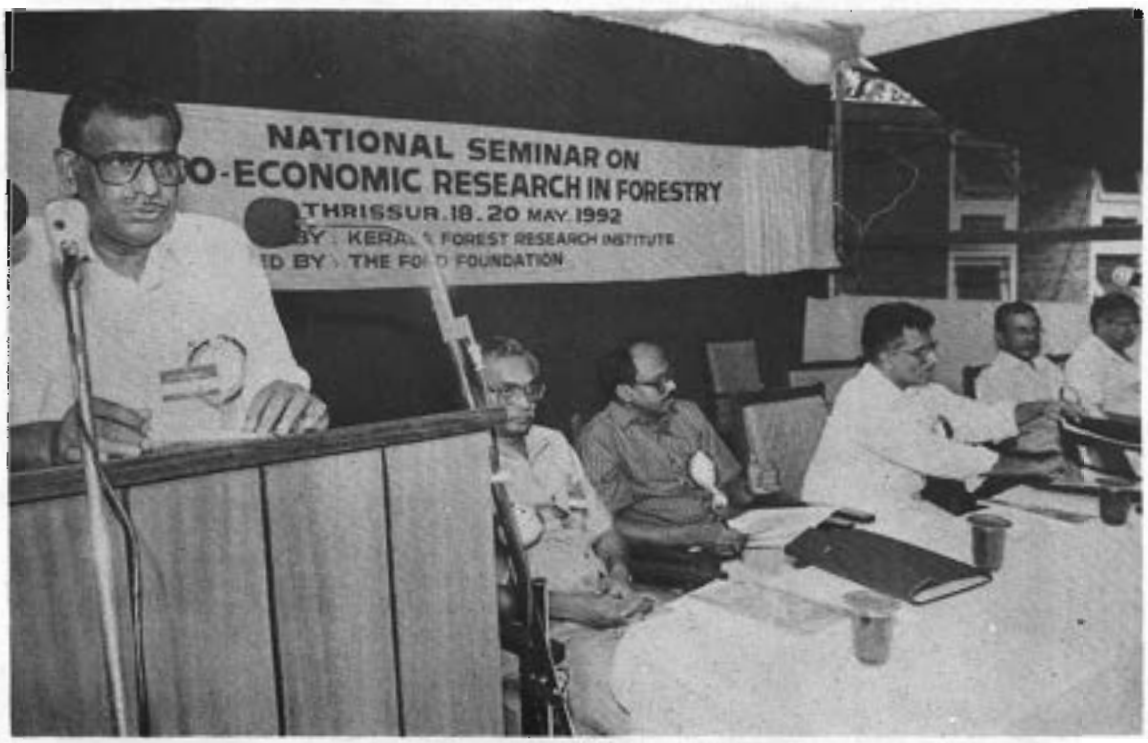
A national seminar on socio-economic research in forestry was organized by the Kerala Forest Research Institute at Thrissur from 18- 20 May 1992. The seminar was sponsored by the Ford foundation, USA. The theme of the seminar was

- Socio -economic appraisal of production forestry
- Economics of forest conservation
- Socio-economic analysis of social/agro-forestry
- Changing man-forest interaction

A total of 67 delegates representing forest managers, scientists, industrialists, rural institutions and policy makers participated in the seminar.

Inauguration

People's participation on a decentralised self help basis is required for conservation and rational utilisation of existing forest resources as well as for establishing tree cover on degraded forest lands or introducing trees into traditional agricultural systems. The wise use of renewable natural resources is indeed the common denominator to sustain the



Shri. K.P.Viswanathan, Hon. Minister for Forests inaugurating the seminar

perennial flow of benefits as an ongoing process. Forestry has an important place in programmes aimed at eradicating poverty, promoting economic growth and maintaining environmental quality. The development potential of forestry can be realised optimally through harmonious considerations of social, economic and ecological roles that forests and forestry can play.

K.P. Viswanathan
Hon'ble Minister for Forests, Kerala

At STEC, K.F.R.I is considered to be one of the best run institutions with a band of very dedicated scientists doing excellent work under the able guidance of its energetic, dynamic and genial Director Dr. Chand Basha. I am sure that this conference will prove to be of real use as a forum for the exchange of ideas and facts which would stimulate creative thinking in this very important area.

Dr. Ramachandran Nair,
Chairman, STEC

Everincreasing population and high external debt are two important problems that force the poor countries to run down on their forest resources at a rate more than that is sustainable. Be it shifting cultivation, illegal firewood collection or smuggling of timber, they are all the result of a particular milieu and thus also a reflection of socio-economic problems.

K.J. Joseph
Principal Chief Conservator
of Forests (Rtd), Kerala

The National Forest Policy, 1988 envisages that the national goal should be to have a minimum of 1/3rd of the total land area of the country under forests. To achieve the national goal intensive forestry and farm forestry activities have to be undertaken.

G. Mukundan
Principal Chief Conservator of Forests, Kerala

There should be efforts to improve the socio-economic conditions of the forest dwellers, especially those of the tribals. The ideas and suggestions put forth by seminars of this kind should be utilized for the benefit of the common man.

Therambil Ramakrishnan, MLA

A view of the participants

What the participants say?

Socio-economic assessment of production forestry

Since independence, the government has attached more importance to production forestry to meet the growing demand for timber, raw materials for industries and fuelwood. In each Five Year Plan, emphasis has been paid to bring more area under man-made forests. In spite of this, the performance of the production forestry sector in the country is not up to the mark.

C. Mohanan

Future strategies for forest development should involve a rational balance between environmental considerations and economic needs of the country.

A.R. Maslekar

Although the study suggested that teak plantations protected from insect damage can theoretically be expected to accrue in 26 years as much volume per unit area as an unprotected stand would gain in 60 years, there are several unanswered questions and constraints in achieving this target.

K.S.S. Nair

Joint forest management represents a dramatic new form of co- operative interaction between forest departments and local communities. Participatory Rural Appraisal (PRA) based methodologies, combined with longer term statistically more rigorous research, offer an attractive and innovative set of tools to deal with the challenges of joint forest management.

Jeffery Y. Campbell

Due to the awareness now created by social forestry, the importance of tamarind tree and ways to increase tamarind productivity over time and space are being thought of.

R.S. Kulkarni

Long term forecasts of paper and paper board consumption should be done by improving the existing demand functions by incorporating more relevant explanatory variables to develop a broader dynamic model and by examining and evaluating the impact of changing technological scenario upon consumption of paper and paper board.

A. Ramanathan

Pulp and paper industry constitutes one of the major forest based industry in our country. Since competition from other industries are coming up, unless and otherwise this industry takes some drastic steps towards reducing the cost of production, its future seems to be very uncertain.

P.K. Sudarsan

A declining productivity of growth in the pulp and paper industry implies that the industry uses resources more than proportionate to the increase in growth of output, reflecting growing inefficiency. A strategy of managing the forest resources on a sustainable basis is advocated to ensure a co-ordinated and stable growth of forest based industries.

K.K. Subrahmanian

Tremendous damage to eucalypts planting in India was caused by the theory of close planting, early harvest, fertilization and irrigation. This has brought eucalypts into disrepute and led to many problems, especially in Gujarat & Haryana.

A.N.Chaturvedi

A strategy of production and utilization of Minor Forest Produce (MFP) has been suggested which includes various measures which could achieve the objectives of increasing forest cover which may as well increase production of MFPs offering adequate raw material on a sustained basis for meeting the needs of industry and trade.

M.P.Shiva

Shri. K.J. Joseph, Principal Chief Conservator of Forests, Kerala (Rtd.) delivering the keynote address

Different species of eucalypts can be judiciously grown after critically examining the necessary aspects of site and climate in relation to the physiology and other requirements of the species.

S.D.Varma

Socio - economic analysis of social/agroforestry

If land owners like Panchayats are given training in raising Social Forestry plantations, it would have been more successful than such plantations raised by the Forest Department. Further, voluntary organisations with less technical background as compared to Forest Department should be made to create awareness about the Social Forestry Programme among the farmers/clients.

M.G.Chandrakanth

An evaluation of the National Social Forestry Project in Himachal Pradesh revealed that involvement of the people in protection of plantations led to a higher survival rate.

Ramesh Chand

The people's movements like Baliraja Jalsanvardhan and Vitaran Vikas Sanstha in Baliraja (Maharashtra) are successful in safe- guarding the ecological and environmental balance essential for a viable life of the masses.

V.B.Jugale

Social forestry programme in Tamil Nadu has turned, in reality, to a very much diluted effort and not much tangible benefits have percolated down to the grassroot level.

M.Mohammed Mustafa

The scope for farm forestry in Punjab depends on not only the development of appropriate marketing outlet, but also on the provision of remunerative support prices for forest produces.

A.J.Singh

Eucalyptus as a farm forestry crop finds a place in the cropping pattern of the majority of farmers in the Kolar District (Karnataka) owing to its wide adaptability in different soils, low investment and maintenance efforts.

D.Sreenivasa Murthy

A functional analysis of *Eucalyptus* + *Casuarina*, *Eucalyptus*, *Casuarina* and Babul plantations in Dindigul (Tamil Nadu) revealed that the yield of wood could be increased by increasing the number of live plants at the time of felling and decreasing the net establishment cost by optimum maintenance of spacing, since additional plants increased the establishment cost.

R.Jansi Rani

In Palakkad and Malappuram Districts of Kerala, the constraints that limit farm productivity included problems like labour scarcity and unproductive soils for large farmers, while small farmers (below 0.2 ha) encountered problems such as a scarcity of firewood, green manure, and fodder and shortage of grazing land.

B.Mohan Kumar

The changed realization of forestry resource situation and also the realisation of the need for its improvement has triggered a constructive debate in the policy making circles. Some of the positive outcomes of this debate are all the afforestation programmes that have already been started.

S.C. Tewari

A survey conducted to understand the functioning of Farm Forestry Programme in Maharashtra indicated that nuclear families are more inclined to farm forestry compared to joint families. Probable reasons for the shift from traditional farming to forest farming are erratic monsoon, increase in cost of cultivation, decreasing yield and possibility of profit from farm forestry.

J.F. Patil

Considering the long waiting time for returns, majority of the marginal and small farmers in Vidharbha are reluctant to take up agroforestry.

P.O. Ingle

There is a need for certain institutional refinements and changes in the attitude of the Forest Department to ensure better participation of women in the Social Forestry Programme.

M. Rajalakshmy

Changing man-forest interaction

Policies concerning social or farm forestry should be formulated with the help of an institutional frame in order to achieve sustainable development.

R.S. Deshpande

Sustainable landuse in so far as forests are concerned should be edaphically appropriate and biotically equitable. This implies that maximization of output per unit area of a preferred product will not be possible. A return to the comparatively non-invasive technologies adopted by tribal populations is preferable.

T. Madhava Menon

The emphasis in ecodevelopment should be directed towards developing a self-reliant eco-society by respecting ecologic, socio- economic and cultural values of the eco-system people, managing the inputs and use of ecological engineering (= ecotechnology).

V.P. Melkania

The causation for the depletion of the forest base is not mere evolutionary as argued out by few of the social scientists and acquires a 'societal character' representing mainly the intentionalities of the class who controls the social resources such as land. forest, etc.

N. Linga Murthy

Ecodevelopment strategies for disturbed forest ecosystems should include inter-phase forestry, agroforestry, sustainable arrangement of MFPs, establishment of tribal MFP co-operatives, prevention of further erosion in their culture, etc.

G. Poyyamoli

In addition to increasing legitimate demands, human greed has also been a major cause of forest destruction.

R. Swarup

In terms of income, employment and assets, the impact of Western Ghat Development Programme on the tribal women was definitely favourable. But at the same time the development programmes have greatly affected their relations with the forests.

K.R. Lakshmy Devi

In the central Himalayan region the human-use-system is dependent on forest ecosystems. A total of about 16-18 ha of forest land is needed to support one hectare of cultivated land. This dependence seems to have far exceeded the carrying capacity of the system.

Uma Melkania

Socio-economic research in forest conservation

Most activities in forestry have long-term impacts. Therefore, the term effects on society and on the ecological processes which in turn have implications on social costs are areas for socio-economic research in conservation forestry.

S. Chand Basha

In the tropics, the level of deforestation is about 7.5 million ha of closed forest and 3.8 million ha of open woodland forest each year. Among the tropical countries this reduction is about 50% in Asia and Pacific regions.

N. Manonmoney

Proper training in extension technologies, behavioural sciences and communication techniques have major roles to play in making the social objectives of forestry, easily understood to the society in general, and especially the rural masses who are not educated and are poor.

V.K. Melkani

Fully protected forests coupled with systematic working on a sustained yield basis is better for biological diversity than merely the former. This would hence render production forestry environment friendly.

S. Shyam Sunder

Because of the long - term nature of forest production patterns, and because sustained yield forestry locks up considerable amount of capital in the form of growing stock and land, forestry as a land - use option suffers from serious weaknesses in the face of competing resource uses.

P.J.Dilip Kumar

The valuation criterion of forest resources necessitated by the objective of sustainable development is fundamentally different from that implied by the objective of sustained yield. Similarly, the

preconditions of sustained yield differ fundamentally from those for a sustainable development regime

A.Damodaran

The conflicting and interacting factors like ecological balance and economic growth, land conversions, industrial and demographic growth, soil erosion, rainfall, etc. transform the whole set-up into a large complex dynamic system. Studying issues of such a system with a major social backdrop from a system perspective results in a better understanding of the system performance.

K.Shoukath Ali

The unregulated supply pattern of wood over years from the natural forests of Kerala, have adversely affected the exchequer by suppressing the unit timber prices and the volume of revenue earned. A regulated supply of timber from natural forests would have been a more prudent and feasible policy in the larger interest of preservation of precious national resources and even the maximization of revenue.

K.N.S. Nair

In spite of continued afforestation in the Tamil Nadu state, there has not been substantial increase in the forest cover. On the other hand, deforestation continued unabated to meet the requirements of fuelwood, small timber, green manure etc, besides unauthorised felling.

D.B. Varadarajan

Although Forest Acts of India do not clearly provide for a scientific based exploitation of forests with due environmental considerations,the judiciary has, generally, but within its limits, attempted to protect and safeguard environment in a number of instances.

A.Prasanna

Recommendations of the National Seminar

The National Seminar on Socio-economic Research in Forestry in its closing session made the following recommendations with regard to future course of action in terms of research and development.

1. Priorities should be given to forecast rigorous estimates of demands and supply of wood and non-wood products to identify the gaps, both at micro and macro level to formulate suitable forestry plans both in forest and non-forest lands.
2. While bridging the gap the research has to be directed towards economics of suitable species and production modules keeping in view the role of trees in rural economy.
3. Recognizing the needs for exchange of ideas on administrative suitability, social feasibility, and lessons from across States, the Government of India has to take suitable steps in this regard to highlight success stories.
4. Sufficient safeguards to ensure people's participation in forestry programmes should be made. To achieve this goal suitable social institutions may be promoted and strengthened.
5. It is recommended to analyse the dependence of different communities (especially women) on forest resources to formulate appropriate action plans.
6. All forestry programmes should have a component to examine the socio-economic impacts and provide for current adjustments.
7. Socio-economic studies in conservation oriented forest management should be taken up to analyse the value of different management options, keeping in view both equity and efficiency considerations.
8. Special attention should be given to develop transparent and flexible methodologies to bring out values for tangible (marketed and non-marketed) and

intangible effects so as to make project analysis more complete.

9. Forest privileges and raw material supplies should be properly evaluated in a visible form with no hidden subsidies to reflect replacement costs.

10. Forestry education, training and research programmes should contain a strong social science component.

11. It is recommended to form a National Network of Institutions/Individuals interested in the social science research in forestry in order to disseminate knowledge for better implementation of the programmes.

12. It is recommended to include strong social science components in Environmental Impact Assessment when forests are converted for non-forestry purposes.

13. It is recommended to establish more facilities for processing or semi-processing of non-wood forest products for maximum value addition at local levels.

14. It is also recommended that the private sector institutions and research organisations should take up socio-economic research in related areas since many of the agroforestry practices promoted by the industries have socio-economic impact on the farmers.

Papers presented by KFRI scientists in the National Seminar

Basha, S.C., Chundamannil, M. and Swarupanandan,K. Socio-economic research in forest conservation.

Nair, K.S.S. and Sudheendrakumar, V.V. Economics of pest control in forest plantations.

Mohanan, C., Muraleedharan, P.K. and Sankar, S. Production forestry in India.

Microform Reader / Printer Service

The microfilm / fiche reader-printer facility in the Institute can be availed by contacting the Librarian. Microforms can be read or printed. Prints can also be sent by post on request. The service charges are

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Address:

Librarian,
Kerala Forest Research Institute
Peechi- 680 653 ,Trichur, Kerala

Recent publications

Scientific papers

Gnanaharan, R. 1992. **Bamboo research in India in the 1980's.** In. Proc. National Seminar on Bamboos. 19-20 Dec. 1990. Bamboo Society of India, Bangalore, pp. 126-149.

Menon, A.R.R. 1992. **Vegetation maps, mapping needs and scope of digital processing on land sat TM Data in tropical region of South-West India.** International Journal of Remote Sensing, 13: 2017-37.

Menon, A.R.R. 1992. **Digital mapping of rubber areas using IRS data.** Indian Journal of Natural Rubber Research, 4: 68-71.

Mohamed Ali, M.I. and Varma, R.V. 1992. **Fungal pathogens of *Eligma narcissus indica* Roth (Lepidoptera: Noctuidae) the *Ailanthus* defoliator, with special reference to *Paecilomyces farinosus* and *P. fumosoroseus*.** Phytophaga, 4: 101-109.

Nair, K.K.N. 1992. **Phytogeographical analysis of the flora of the proposed Pooyamkutty hydro-electric project area in the Western Ghats of Kerala, India.** Journal of Economic and Taxonomic Botany, 15: 173- 183.

Sasidharan, N. and Swarupanandan, K. 1992. **A new species of *Cassine* (Celastraceae) from India.** Reinwardtia, 11: 29-32.

Sharma, J.K. and Mohanan, C. 1992. **Effect of some nursery practices on incidence and severity of diseases and growth of *Eucalyptus grandis* seedlings.** European Journal of Forest Pathology, 22: 125-135.

Sharma, J.K. and Mohanan, C. 1992. **Cultural characters and growth of *Cylindrocladium quinqueseptatum* isolates.** European Journal of Forest Pathology, 22: 257-265.

Sharma, J.K. and Mohanan, C. 1992. **Relative susceptibility of *Eucalyptus* provenances to *Cylindrocladium* leaf blight in Kerala, India.** European Journal of Forest Pathology, 22: 217-226.

Swarupanandan, K. and Mangaly, J.K. 1992. **A new species of *Ceropegia* L. from the Western Ghats of India.** Nordic Journal of Botany, 12: 699-701.

Varma, R.V. 1992. **Impact of *Atteva fabriciella* (Lepidoptera: Yponomeutidae) feeding on seed production in *Ailanthus tryphysa*.** Indian Journal of Forestry, 15: 326-328.

Research reports

Jose Kallarackal, Seethalakshmi, K.K. and Bhat, K.V. 1992. **Water blisters in Teak**. KFRI Research Report No. 82. Final Report of Project KFRI 125/1989. Division of Plant Physiology and Wood Science.

Abstract: Water blister in teak was reported as early as 1896. It is a peculiar formation wherein the healthy looking trees, mostly along the riversides, exude a straw coloured sap which leaves a black discolouration on the surface of the bark. Although the problem is not widespread it is serious enough to cause concern especially in certain localities. This investigation was undertaken to study the possible causes for development of water blisters, and the nature and extent of the resultant damage to the timber. Observations showed that the blister is restricted to tree trunk and is always caused by a radial shake in the trunk wood. The loss is serious in terms of log quality, often resulting in rejection of affected timber for high quality veneer, boards or turnery stock. The blister exudes a straw coloured fluid with a similar chemical composition as that of xylem sap. But the concentration of inorganic salts and pH of blister fluid was very high. The rate of exudation follows a diurnal rhythm similar to root pressure fluid. However, the concentration of salts in blister fluid was higher than root pressure fluid and this accounts for the relatively high osmotic pressure of blister fluid. The flow continues throughout the year and the volume of the liquid exuded depends on soil water availability.

Swarupanandan, K. and Sasidharan, N. 1992. **Regeneration studies on some important trees in a natural moist deciduous forest eco-**

system. KFRI Research report No. 83. Final report of Project 117/87. Divisions of Ecology and Botany.

Abstract: Kerala has approximately 4,100 km^2 of Moist Deciduous Forests amounting to 43.6 percent of the State's total forest area. Regeneration is heavily deficient in these forests. Thus, the project was undertaken to investigate the causes of poor regeneration in these forests with special reference to the commercially important trees. Conventional, phenological, demographic and phytosociological studies were conducted in the South Indian Moist Deciduous Forests of the Trichur Forest Division (Kerala) so as to address the problem.

Studies on the population dynamics of the reproductive life stages of the commercially important tree species of the Moist Deciduous forests showed no abnormalities. There were no significant temporal gaps in seed source. Litter trap studies showed that there were more than 124×10^0 flowers ha^{-1} yr^{-1} which were capable of producing more than 56×10^0 seeds ha^{-1} yr^{-1}. Such large quantities of flower, fruit and seed overrule the existence of any constraints in the reproductory phase of the commercially important tree species.

A preliminary survey of the seedling bank had shown an average of more than 3,000 unestablished seedlings of commercially important tree species per hectare. Studies on seedling emergence have shown that every year a population of about 10,000 new recruits enrich the existing seedling bank. Despite such a large seedling bank and annual enrichment the presence of established seedlings (240 ha^{-1}) and poles (10 ha^{-1}) was extremely low. Semilogarithmic graphs of population structure of several species like *Dillenia pentagyna, Grewia tiliifolia, Lagerstroemia microcarpa* have shown strong bimodal distributions while in other species like *Terminalia crenulata, T. paniculata* and *Xylia xylocarpa* there were strong depressions in the graphs indicating the paucity of saplings and poles. All these show that the continuity of the process of sylvigenesis is interrupted, especially during conversion from seedling to sapling and sapling to pole stages.

Biotic factors were found to be the main causes responsible for the paucity of regeneration in the Moist Deciduous Forests. Recurring fire, grazing and browsing by goats and sheep, illicit cutting of saplings and poles, charcoal making etc. are the main reasons for the paucity of regeneration. By following the life of over 4,000 individual seedlings for a period of two years, it was found that fire is the single largest factor that acts as a degrading factor in tree regeneration in Moist Deciduous Forests. Fire apparently is capable of retarding the seedling emergence rates of commercially important tree species, the diaspores being burnt. Fire is capable of accelerating the rate of mortality to several fold compared to that of natality. Enormous number of seedlings die, many loose their above ground portions. Thus, fire retards the rate of natural increase at all levels, leading to regression in the populations. As a result, the process of sylvigenesis slows down considerably leading to degradation of Moist Deciduous Forests.

Though the amount of regeneration (excluding saplings and poles) in natural Moist Deciduous Forests is not poor, the lion's share of the regeneration population in these forests has only temporary existence due to frequent outbreak of fire. The regeneration is thus not available for the process of sylvigenesis (tree building) to advance

Studies have shown that a low fire incidence frequency such as 3-year frequency would be able to shift the regeneration population from regressive to a stable structure. This would enhance the establishment of advance growth (saplings and poles) to a satisfactory level. The causes of forest degradation being fully anthropogenic,creating awareness among the user community involving them in participatory management is to be seriously considered as the adjoining villagers cannot be completely kept away from using the forests for their bona fide purposes.

Surendran, T., Chacko, K.C., Gopalakrishnan Nair, N. and Muhammad, E. 1991. **Establishment of a Bamboosetum**. KFRI Research Report No. 84. Final Report of Project Silvi. 07/1981. Divisions of Physiology, Silviculture and Botany.

Abstract: Bamboo is a valuable renewable natural resource. It has both household and industrial uses. Of about 1000 bamboo species recorded all over the world, India is endowed with more than 100 species. In order to obtain first hand knowledge about different species of bamboos, a project was

undertaken for collection and establishment of different species of bamboos. So far 20 species of bamboos have been established in the bamboosetum located at Nilambur in Kerala, India. The propagules used were offsets, culm or branch cuttings and seedlings. Hormone treatments were given in cases were induction of rooting was necessary in culm and branch cuttings. Observations on culm production and growth were recorded. A list of species with accession number and a plot chart are also provided. Botanical names, vernacular names, distribution and important uses of each species are appended.

Other Publications

BIC - India Bulletin

BIC - India Bulletin Vol.2., No.1 (January 1992) and No. 2 (June 1992). Bamboo Information Centre, Kerala Forest Research Institute, Peechi, India. The bulletin is available free of cost on request.

New research projects

KFRI 148/'92

Water relations and photosynthesis of the oil palm in Peninsular India.

Investigator: J. Kallarackal (Physiology)

Objectives: To study 1) Water relation parameters of the oil palm 2) Annual evapotranspiration from oil palm plantations 3) Stomatal behaviour in response to soil water and microclimate 4) Photosynthesis and environmental limitations to photosynthetic productivity and 5) To create models to predict the environmental interactions with trees.

Sponsored by the Dept. of Biotechnology, Govt. of India.

KFRI 149/'92

Use of mycorrhizal and nitrogen fixing symbionts in reforestation of degraded acid soils in Kerala, India.

Investigators: J.K. Sharma, K.V. Sankaran, M. Balasundaran (Pathology) and S. Sankar (Soil Science).

Objectives: 1) To identify suitable species/strains of mycorrhizal and Rhizobium/Frankia symbionts for *Acacia auriculiformis*, *Casuarina equisetifolia* and *Pterocarpus marsupium* 2) To examine the efficiency of different mycorrhizal species and nitrogen fixing symbionts individually and in combination in enhancing the survival, establishment and growth of seedlings of the test species and 3) To attempt reforestation of degraded acid soils in a pilot scale trial using the best mycorrhizal and Rhizobium/Frankia symbionts.

Sponsored by Forestry Research Support Programme for Asia and the Pacific (FORSPA).

KFRI 150/'92

Impact of upland management on downstream ecosystems.

Investigators: S. Chand Basha (Director), S. Sankar and P.K. Muraleedharan (Economics).

Objectives: 1)To analyse the vegetation in the upland of the watersheds 2) To study the soil in watersheds 3)To study the microclimate in the watersheds 4) To determine the water balance of the watersheds 5) To quantify the surface water availability in command areas and its seasonal variations 6) To quantify the ground water availability in command areas and its seasonal variations and 7) To identify and quantify the socio-economic implications like water availability, crop damage due to drought and to suggest economically viable and socially just land management practices.

Sponsored by FORSPA.

KFRI 151/'92

Soil nutrient management for teak plantations in Kerala.

Project leader: S. Chand Basha

Investigators: M. Balagopalan, S. Sankar (Soil Science), P. Rugmini (Statistics) and Mehar Singh (Kerala Forest Dept.).

Objectives: 1) To study the effect of nutrients on the growth of teak for plantation management 2) To evaluate the nutrient status in the leaves 3) To suggest nutrient conservation methods 4) To quantify the nutrient inputs and consequent higher productivity in biomass in general and timber in particular and 5) To develop a package of practices with nutrient inputs (fertilization) for higher productivity of teak.

KFRI 152/'92

Prey-predator studies in Eravikulam National Park.

Investigators: P.S. Easa (Wildlife Biology) and Asst. Wildlife Warden (Eravikulam National Park).

Objectives: 1) To prepare a key for identification of animals from hair found in scats 2) To identify prey species of the major predators and 3) To make an attempt to standardise the technique of aging the major prey species (the sambar deer) from jawbones.

Sponsored by Wildlife Wing of Kerala Forest Department

KFRI 153/'92

Survey of small mammals in Kerala with special reference to endangered species and Wildlife census in Chinnar Wildlife Sanctuary.

Investigators: P.S. Easa and James Zacharias (Research Range Officer, Periyar Tiger Reserve, Thekkady).

Objectives: To conduct survey of small mammals in the State and assess their status and to estimate the wildlife population in Chinnar Wildlife Sanctuary.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 154/'92

Status and food and feeding habits of larger mammals in Idukki Wildlife Sanctuary

Investigators: P.S. Easa and Asst. Wildlife Warden (Idukki Wildlife Sanctuary)

Objectives: To estimate the population and to study the food and feeding habits of elephant, sambar deer, barking deer and wild boar in Idukki Wildlife Sanctuary.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 155/'92

Habitat utilization by larger mammals in Chinnar Wildlife Sanctuary

Project leader : S. Chand Basha (Director)

Investigators: E. A. Jayson, K.K. Ramachandran (Wildlife Biology) and Asst. Wildlife Warden (Chinnar Wildlife Sanctuary)

Objectives: 1)To document abundance of plant resources in the area 2) To find out spatio-temporal aspects of habitat use by large mammals 3) To monitor the endangered Grizzled Giant Squirrel population in the area and 4) Establishment of a data base.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 156/'92

Habitat utilization of animals in Parambikulam Wildlife Sanctuary with special reference to Gaur.

Investigators: P.S. Easa, A.R.R. Menon (Ecology), Wildlife Warden and Senior Wildlife Assistant (Parambikulam Wildlife Sanctuary).

Objectives: 1. To monitor the population 2) To study the habitat utilization and record the activity time budget 4) To collect information on movement pattern and home range and 5) To study the impact of fire on vegetation and the animal.

Sponsored by Wildlife Wing of Kerala Forest Department

KFRI 157/'92

Status, food and feeding habits of larger mammals in Chimmony Wildlife Sanctuary.

Investigators: E. A. Jayson, P.S. Easa and Asst. Wildlife Warden (Chimmony Wildlife Sanctuary)

Objectives: This project is formulated to estimate the population and study the food and feeding

habits of elephant, sambar deer, barking deer and wild boar in Chimmony Wildlife Sanctuary.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 158/'92

Establishment of green belt around Cochin Refineries Ltd.

Co-ordinator: S. Chand Basha

Investigators: R.C. Pandalai (Silviculture) S. Sankar (Soil Science)

Objectives: 1. To select and screen plant species resistant to pollution and 2) To establish a green belt around Cochin Refineries Ltd.

Sponsored by Cochin Refineries Ltd.

KFRI 159/'92

Studies on the ecology and population dynamics of endangered primates in Silent Valley National Park.

Investigators: K.K. Ramachandran (Wildlife Biology) and Asst. Wildlife Warden (Silent Valley National Park)

Objectives: 1) To determine the distribution of primates in the park 2) To study the habitat continuity of the endangered primates 3) To study the food and feeding habits of the primates 4) To monitor the population of the primates and 5) Establishment of a data base.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 160/'92

Status survey of primates in Shendurney Wildlife Sanctuary and adjacent areas.

Investigators: K.K. Ramachandran and Asst. Wildlife Warden (Shendurney Wildlife Sanctuary)

Objectives: 1) To map the distribution of the primates in the area 2) To study the habitat continuity of the endangered primates 3) To study the food and feeding habits of the primates 4) To monitor the population of the primates and 4) Establishment of a data base.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 161/'92

Studies on man-wildlife conflict in Peppara Wildlife Sanctuary and adjacent areas.

Investigators: P. Vijayakumaran Nair, E.A. Jayson (Wildlife Biology) and Asst. Wildlife Warden (Peppara Wildlife Sanctuary)

Objectives: 1) To document the status of Wild animals in the study area 2) To record the detailed landuse pattern in the study area 3) To record the nature and extent of crop raiding by animals and 4) To document the socio-economic status of people inside and adjoining areas with special emphasis on native tribals.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 162/'92

Status, habitat utilization and movement pattern of larger mammals in Wynad Wildlife Sanctuary.

Investigators: P S. Easa and Asst. Wildlife Warden (Wynad Wildlife Sanctuary).

Objectives: 1) To estimate and monitor the population of larger mammals in Wynad Wildlife Sanctuary and adjacent areas 2) To study the movement pattern and migration of animals in relation to season, food and water availability, agriculture cropping pattern and biotic disturbances and 3) To study the habitat utilization of animals.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 163/'92

Studies on the flora of Shendurney Wildlife Sanctuary with emphasis on endemic species.

Investigators: N. Sasidharan (Botany) and Asst. Wildlife Warden (Shendurney Wildlife Sanctuary)

Objectives: 1) To study the flora of the sanctuary 2) To identify endemic plants and ascertain their status 3) To identify the exotic elements in the flora of the sanctuary and 4)To prepare a reference herbarium collection.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 164/'92

Vegetation mapping and analysis of Chimmony Wildlife Sanctuary using Remote Sensing Techniques.

Investigators: A.R.R. Menon (Ecology) and Asst. Wildlife Warden (Chimmony wildlife sanctuary)

Objectives: To map the vegetation (both small scale and large scale mapping) 2) To estimate the area of different major types 3) To prepare slope maps, drainage maps etc. of the area and 4) To study the structural aspects of permanent vegetation.

Sponsored by Wildlife Wing of Kerala Forest Department

KFRI 165/'92

Vegetation mapping and analysis of Peppara Wildlife Sanctuary using remote sensing techniques

Investigators: A.R.R. Menon and Asst. Wildlife Warden (Peppara Wildlife Sanctuary)

Objectives: To map the vegetation (both small and large scale mapping) 2) To estimate the area of different major types 3) To prepare slope maps, drainage maps etc. of the area and 4) To study the structural aspects of permanent vegetation.

Sponsored by Wildlife Wing of Kerala Forest Department

KFRI 166/'92

Vegetation mapping and analysis of Aralam Wildlife Sanctuary using remote sensing techniques.

Investigators: A.R.R. Menon, Santhosh K. John (KFRI Subcentre, Nilambur) and Asst. Wildlife Warden (Aralam Wildlife Sanctuary)

Objectives: 1) To map the vegetation (both small scale and large scale mapping) 2) To estimate the area of different major types 3) To prepare slope maps, drainage maps etc. of the area and 4) To study the structural aspects of permanent vegetation.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 167/'92

Vegetation mapping and analysis of Eravikulam National Park using remote sensing techniques.

Investigators: A.R.R. Menon, Santhosh K. John and Asst. Wildlife Warden (Eravikulam National Park).

Objectives: 1) To map the vegetation (both small and large scale mapping) 2) To estimate the area of different major types 3) To prepare slope maps, drainage maps etc. of the area and 4) To study the structural aspects of permanent vegetation.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI 168/'92:

Vegetation dynamics of the grassland forest ecosystems in Western Ghats of Kerala for afforestation programme.

Investigators: S. Chand Basha (Director), K. Balasubramanyan (Ecology), S. Sankar and N. Sasidharan.

Objectives: To ascertain whether the grassland evergreen forest ecosystem is a stable community or not. To understand the dynamics of this system, the following aspects will receive attention 1) The structure and composition of the present plant population in grasslands, ecotones and evergreen forests 2) The changes in plant composition that are likely to occur over a period of time 3) Lateral migration of species from grassland to evergreen forest and vice versa 4) Climatic parameters like rainfall, air temperature and relative humidity 5)Physical and chemical properties of soil, soil temperature and soil moisture 6) Long-term monitoring even after the completion of the project.

Sponsored by Ministry of Environment and Forests, Govt. of India.

KFRI 169/'92

Structure and function of the home garden agroecosystems and local natural forest ecosystems of Kerala.

Investigator: U.M. Chandrashekhara (Agroforestry-cum-Publicity)

Objectives: 1) To compare the biophysiological characteristics of home gardens with those of local natural forest ecosystem 2) To study the growth properties, productivity, yield and adaptability of multipurpose plants growing in or introduced into the agroecosystem.

Funded by the Institute.

KFRI 170/'92

Quantification of soil and water loss from teak and eucalypt plantations

Project leader: S. Chand Basha

Investigators: Thomas P. Thomas, S. Sankar and M.P. Sujatha (Soil Science)

Objectives: To quantity the loss of soil from teak and eucalypt plantations and 2) To quantify loss of water from teak and eucalypt plantations.

Sponsored by Kerala Forest Department.

KFRI 171/'92

Study of impact of mixed vegetation on the growth of teak in plantations.

Investigators: S. Chand Basha and S. Sankar

Objectives: 1. To investigate the growth pattern of teak in plantations with and without miscellaneous growth and 2) To evolve suitable management techniques for teak plantations with special reference to mixed growth.

Sponsored by Kerala Forest Department.

KFRI 172/'92

Harvesting and regeneration of reeds

Investigators: S.Chand Basha, R.C. Pandalai (Silviculture) and S. Sankar.

Objectives: 1) To evolve methods of artificial regeneration of reeds through rhizomes/culm cutting 2) To evolve management strategies for augmenting poor reed areas 3) To standardise the nursery techniques for vegetative propagation 4) To study and modify the harvesting practices followed during extraction of reeds 5) To conduct fertilizer trials 6) To monitor growth and other parameters and 7) To study post harvest operations leading to higher productivity.

Sponsored by Kerala Forest Department.

KFRI 173/'92

Preparation of management plan for Project Elephant Areas in Kerala

Investigator: P.S. Easa

Objectives: To prepare a management plan for the Project Elephant Areas in the State.

Sponsored by Wildlife Wing of Kerala Forest Department.

KFRI Publications

Author/Editor	Title	Price	
		India (Rs.)	Foreign(US $)
K.S.S.Nair et al.	Ecodevelopment of Western Ghats	200.00	18.00
K.K.N.Nair et al.	Tropical Forest Ecosystem Conservation and Development in South and South-East Asia.	200.00	18.00
I.V.R.Rao et al.	Bamboos: Current research	140.00	15.00
N.Sasidharan	Forest Trees of Kerala	15.00	5.00
C.Renuka	Rattans of the Western Ghats	100.00	8.00
K.M.Bhat	Structure and Properties of South Indian Rattans	75.00	5.00

For copies contact: Librarian, KFRI,Peechi- 680 653, Kerala, INDIA.

Participation in seminars, symposia and workshops

Dr. A.R.R. Menon (Ecology) attended a workshop on "Utilization of Environmental Maps Prepared using Satellite Data" organized by Space Application Centre(Ahmedabad) at Centre for Earth Science Studies, Trivandrum on 27 May 1992.

Dr. R. Gnanaharan (Wood Science) attended the brain-storming session on 'All India Co-ordinated Project on Bamboo' organised by the Dept. of Science and Technology (Govt. of India) New Delhi on 15 June 1992.

Dr. K.M. Bhat and Mr. T.K. Dhamodharan (Wood Science) participated in the IUFRO Division 5 conference at Nancy, France during 23-28 August 1992. The following papers were presented.

1. Rattan research for better furniture products of the future (*K.M. Bhat*).

2.Wood properties of 8-yr-old teak (*K.M. Bhat and P.K. Thulasidas).*

3.Deforestation and saw milling technology in Kerala (India) (*P.K. Muraleedharan and K.M. Bhat).*

4. Medicinal plants - a threatened tropical forest resource of the Western Ghats, Kerala (India) (*S. Chand Basha).*

5.Upgradation of rubberwood for better utilization (*T.K. Dhamodharan*).

Mr. Dhamodharan also attended the Centennial celebrations of IUFRO held at Berlin, Germany on 31 Aug. 1992.

Dr. S. Chand Basha (Director) attended "Farm Forestry Enhancement Programme" at the Chinese Academy of Forestry, Beijing, People's Republic of China during 6-16 September 1992 and presented a paper entitled "Agroforestry Systems in Kerala" (*S. Chand Basha*).

Smt. E.P. Indira (Genetics) attended the "National Net work Inception Workshop on Improved Productivity of Man-made Forests through Application of Technological Advances in Tree Breeding and Propagation" jointly organized by IFGTB and FAO at Coimbatore during 24-25th Sept. 1992 and presented a paper entitled "Tree improvement efforts in Kerala" (*E.P. Indira and S. Chand Basha).*

Mr. C. Mohanan (Pathology) and *Mr. E.A. Jayson* (Wildlife Biology) attended the 'National Seminar on Forest Fires' organised by the Kerala Forest Department during 29-30 September 1992 at Trivandrum. The following papers were presented.

1. Forest fire - its effect on stand productivity with reference to decay and diseases *(C. Mohanan).*

2.Effect of forest fires on wildlife in two protected areas of Kerala *(E.A. Jayson).*

Dr. K.V. Sankaran (Pathology) attended the "International Symposium on Management of Mycorrhizas in Agriculture, Horticulture and Forestry" held at the University of Western Australia, Perth, Australia during 28 September -2 October 1992. He presented a paper entitled "Selection of an efficient VA mycorrhizal fungus for *Acacia auriculiformis*" in the symposium.

Guest lectures

Dr. R. Gnanaharan gave a guest lecture to the students of the P.G. Diploma Course in Natural Rubber Production on 'Processing and utilization of rubber wood' at KFRI on 6 March 1992. He also gave invited lectures on wood preservation to the students of a certificate course conducted by the Indian Plywood Industries Research Institute, Bangalore on 2 April 1992

Mr. C. Mohanan (Pathology) gave guest lectures on 'Forest Nursery Techniques and Disease Management" to the field staff of the Kerala Forest Department (Wynad Division) at Wynad on 8 and 9 April 1992.

Dr. R. Gnanaharan and Dr. K.M. Bhat (Wood science) were the main resource persons of the 12th Timber Training Course Organized by the

National Building Organization (New Delhi) at Pune during 21-28 April 1992. They handled the following classes:

1. Physical properties of wood; strength properties of wood; wood drying and wood preservation *(Dr. Gnanaharan).*

2. Wood anatomy; practicals in wood identification *(Dr. Bhat).*

Visits

*Mr. T.K. Dhamodaran (*Wood Science) visited Oxford Forestry Institute; Dept. of Agriculture and Forestry Sciences, University College of Northwales, Bangor; Timber Research and Development Agency, Highwycomb; Timber Division of the Building Research Establishment, Garston; Paper Science Dept. of the University of Manchester; Institute of Science and Technology and Kronospan Medium Density Fibre Board Factory at Chirk (U.K.) during September 1992.

*Dr. K.V. Sankaran (*Pathology) visited CSIRO, Division of Forestry, Wembley, Western Australia on 6 October 1992.

Others

Dr. K.S.S. Nair (Entomology) was invited by the FAO Regional Office, Bangkok to join a team of Scientists from the Commonwealth Agricultural Bureau to prepare a status report on pests of the Asia-Pacific region and their management. Dr. Nair spent two weeks in the FAO Office at Bangkok in August 1992 to prepare the draft report which will be published by FAO under its Forestry Research Support Programme. The report will contain recommendations for a regional initiative to promote research and management of forest pests.

Forthcoming events

23-30 May 1993

Ecophysiology and Genetics of Trees and Forests in a Changing Environment, Viterbo, Italy.

Contact: Dr. J.G. Isebrands, USDA Forest Service, North Central Forest Experiment Station, P.O. Box 898, 5985 HWYK, Rhinelander, Wisconsin 54501 USA.

Spring 1993

Forest Operations Research for Tropical Countries, Taipei, Taiwan.

Contact: Prof. Shuen Chao Wu, Department of Forestry, National Taiwan University, Taipei, Taiwan.

25-28 May 1993

Seventh International Symposium on Wood and Pulping Chemistry, Beijing, People's Republic of China.

Contact: Prof. Xiang-Ju Zhong, c/o China Technical Association of the Paper Industry, 12 Guanghua Road, Beijing 100020, China.

7-10 June 1993

Nutrient Uptake and Cycling in Forest Ecosystems, Halmstad,Sweden.

Contact: Dr. L.O. Nilsson, Swedish University of Agricultural Sciences, Department of Ecology and Environmental Research, Box 7072, S-750 07 Uppsala, Sweden.

14-16 June 1993

Modern Methods for Estimating Tree Volume and increment, Morgantown, West Virginia, USA.

Contact: Dr. Harry V. Wiant, Jr., P.O. Box 6125, Division of Forestry, West Virginia University, Morgantown, WV 26506, USA.

15-17 June 1993

International Mechanical Pulping Conference, Oslo/Norway.

Contact: Mr. David Paterson, Technical Section CPPA, Sun Life Building, 19th Floor, 1155 Metcalfe Street, Montreal, Quebec H3B 4T6, Canada.

15-19 June 1993

International Symposium on Genetic conservation and Production of Tropical Forest Tree Seed, Empress Hotel, Chiang Mai. Thailand.

Contact: Symposium Secretariat, ASEAN-Canada Forest Tree Seed Centre, Muak-Lek, Saraburi 18180, Thailand.

26-30 July 1993

Fourth International Symposium on Windbreaks and Agroforestry, Viborg, Denmark.

Contact: Fourth International Symposium, Hedeselskabet, P.O. Box 110, DK-8800 Viborg, Denmark.

15-20 August 1993

The Biology and Control of Reproductive Processes in Forest Trees, University of Victoria, British Columbia, Canada.

Contact: Dr. Stephen D. Ross, B.C. V8W 3E7, Canada.

15-20 August 1993

Forests and Wildlife towards the 21st Century: International Union of Game Biologists (IUGB) XXI Congress, Halifax, Canada.

Contact: Dr. Jan D. Thompson, President, International Union of Game Biologists, c/o Forestry Canada, Box 6028, St. John s; Nfld.AIC 5X8, USA.

23 August-3 September 1993

XV International Botanical Congress, Tokyo, Japan.

Contact: K. Iwatsuki, Department of Botany, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113, Japan.

September 1993

Advancement in Forest Inventory and Forest Management Sciences,University Park, Pennsylvania, USA.

Contact: Dr. O-Bok Kwon, Kangweon National University, Seoul, Korea.

September 1993

Neotropical Wildlife Management Conference (IUFRO) S1.0-00), San Jose, Costa Rica.

13-18 September 1993

14th Commonwealth Forestry Conference, Kuala Lumpur, Malaysia.

Contact: Secretary General CFC-14, Forestry Department Headquarters, Peninsular Malaysia, Jalan Sultan Salahuddin, 50660 Kuala Lumpur, Malaysia.

23-24 September 1993

The Nondestructive Testing of Wood Symposium, Pullman, Washington, U.S.A.

Contact: Wood Materials and Engineering Laboratory, College of Engineering and Architecture,Pullman, Wa 99164-1806, USA.

27 September-1 October 1993

Modelling Stand Response to Silvicultural Practices, Blacksburg, Virginia, USA.

Contact: Harlod E. Burkhart, Department of Forestry, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061-0324, USA.

Campus news

Joined KFRI

Dr. U.M. Chandrashekhara joined the Institute as Scientist D in the Division of Agroforestry-cum-Publicity on 15 July 1992.

Nominated

Dr. M.S. Muktesh Kumar (Botany) was nominated as a member of the IUCN species specialist group (SSG) in the Bamboo Working Group.

Dr. P.S. Easa (Wildlife) was nominated by Government of Kerala as a member of the Kerala State Wildlife Advisory Board.

Obituary

Mr. P. Avunny, Watcher, Nilambur Subcentre (KFRI), passed away on 18 June 1992.

Mr. K.V. Narayanan Elayath, former Internal Auditor of KFRI passed away on 18 September 1992.

We convey our heartfelt condolence to their bereaved family and pray that their souls may rest in peace.

KFRI seminars

23 March 1992

Some aspects of forestry problems in Germany

Dr. Werner Zentsch, University or Dresdan, Faculty of Forestry,Germany.

14 May 1992

Cave arts in Kerala

Dr. S.P. Thampi, Archaeologist, Trivandrum.

Distinguished visitors

Mr. D. Chaffry,
Mr. I. Napier and
Dr. H. Hanley

British High Commission (ODA),New Delhi
12 May 1992

Mr. Ian Bevege

ACIAR, Canberra, Australia
2 July 1992

Dr. Frans Arentz

Project Co-ordinator, ITTO, ANUTECH Pty Ltd., Canberra, Australia
2 July 1992

Prof. W.B. Banks and Prof. A.Rew

Consultants, Overseas Development Administration, U.K.
19- 21 & 29 August 1992.

Dr. A.N. Maheswari

Vice Chancellor,Cochin University of Science and Technology
5 September 1992

Dr. D.N. Tewari

Director-General, Indian Council of Forestry Research, and Education, Dehra Dun
26 September 1992