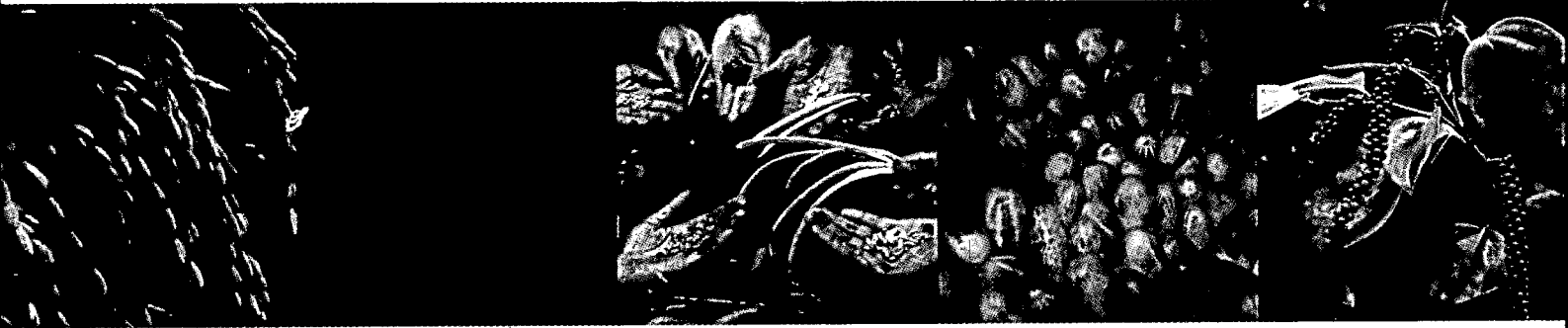


Crop Diversity and Tribal Empowerment



**Policy Makers' Workshop &
Panel Discussion**

XIII Swadeshi Science Congress

November 6 - 8, 2003

**M. S. Swaminathan Research Foundation &
Swadeshi Science Movement**

Acknowledgement

We would like to express our sincere gratitude to the many individuals and the organisations who provided support for successful convening of the XIII Swadeshi Science Congress. Our thanks are also due to Drs. S. Balaravi, Sudha Nair, Arivudai Nambi and Ms. Mina Swaminathan who had helped in bringing out this document, which is primarily meant for benefiting the policy makers and the various concerned departments of tribal and agricultural development. We thank Prof. M. S. Swaminathan for his guidance and support to convene the policy makers workshop and panel discussions on the theme of XIII Swadeshi Science Congress - *Crop Diversity and Tribal Empowerment*. The financial support from SDC - New Delhi, Department of Science and Technology is greatly acknowledged.

MSSRF/ CABIC Team

PROCEEDINGS OF THE XIII SWADESHI SCIENCE CONGRESS 2003 (CROP DIVERSITY AND TRIBAL EMPOWERMENT)

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FOREWORD

The Community Agrobiodiversity Centre of M. S. Swaminathan Research Foundation, Kalpitiya, had the privilege of hosting the 13th Swadeshi Science Congress in November 2003. The focal theme for the Congress was *Crop Diversity and Tribal Empowerment*. The dialogues and recommendations in the policy makers' workshop and panel discussions held in connection with the XIII Swadeshi Science Congress were edited by Dr. N. Anil Kumar and form the basis of this publication.

The following two Acts have profound significance for conservation and sustainable and equitable use of biodiversity and for recognising and rewarding the valuable contributions of tribal women and men in the area of genetic resources conservation and enhancement.

- Protection of Plant Variety and Farmers' Rights Act, 2001
- Biodiversity Act, 2002

The discussions covered a wide range of issues relating to both basic and applied aspects of *Crop Diversity and Tribal Empowerment*. The emphasis was on work which can make a difference in the lives and the livelihoods of tribal families. I hope the book will be useful to scientists and policy makers and used to improve the productivity, profitability and sustainability of the major farming systems of tribal families.

25-05-2005
Chennai


M. S. Swaminathan
Chairman
M. S. Swaminathan Research Foundation

C o n t e n t s

POLICY MAKERS' WORKSHOP AND PANEL DISCUSSION

Policy Makers' Workshop on Crop Diversity Enhancement and Empowerment

(Nov. 6, Parallel Session I, Chair: Dr. S. Balaravi, M. S. Swaminathan Research Foundation)

**Panel Discussion on Agrobiodiversity Conservation and Enhancement
Gender Roles and Tribal Empowerment**

Panel Discussion on Herbal Wealth and Medicinal Rices in Rural and Tribal Livelihood Security

(Nov. 7, Technical Session III, Chair : Prof. M. S. Swaminathan, M. S. Swaminathan Research Foundation)

Panel Discussion on Poultry Farming in Rural and Tribal Livelihood Security

(Nov. 6, Parallel Session II, Chair: Dr. Jalaludeen, Kerala Agricultural University, Thrissur)

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(Nov. 7, Parallel Session I, Chair: Dr. Krishna Sreenath, Central Institute of Fisheries Technology, Cochin)

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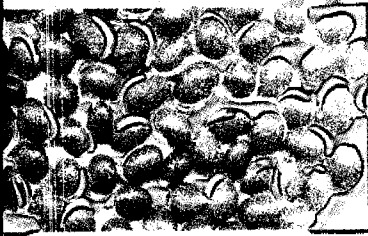
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Agrobiodiversity, particularly the crop diversity plays a major role in the sustainability of agricultural production and livelihood security of the poor. The tribal men and women have not only conserved such genetic wealth, but have added value to them through selection and information.



CROP DIVERSITY ENHANCEMENT AND TRIBAL EMPOWERMENT



Agriculture comprising crop and animal husbandry, inland and marine fisheries, forestry and agro-forestry, agro-processing and agribusiness, constitutes the backbone of the livelihood security system of India, particularly in rural areas. Our agriculture is still 'farmers' farming', and not 'factory farming' as in industrialized countries. This is our great strength, since the health of plants and animals and other hazards associated with factory farming are now becoming evident. Therefore, jobs/livelihoods for Indians must be the bottom line of all our economic and development policies.

-M. S. Swaminathan

CROP DIVERSITY ENHANCEMENT AND TRIBAL EMPOWERMENT

Session Chair : Dr. S. Balaravi; *Keynote Speakers* : Dr. Suman Sahai, Dr. K.K.N. Kurup; *Presentations* : Sri. P. Balan, Sri. G. Girigan; *Panel Discussants* : Dr. Indira Balachandran, Dr. Koshy John, Dr. P.K. Muraleedharan, Sri. P. Kesavan, Sri. Palliyara Raman, Sri. P.M. Nanda Kumar, *Rapporteur* : Dr. Arivudai Nambi

Introduction

Within the broad area of biodiversity, the emphasis now is on plants, animals and micro-organisms of current and potential economic value. This segment of biodiversity is conveniently called as *Agrobiodiversity*. *Agrobiodiversity* provides humanity all of its food and many medicines, industrial products and a wide range of goods and services, plus genetic materials for agriculture, medicine, and industry. *Agrobiodiversity*, particularly the crop diversity plays a major role in the sustainability of agricultural production and livelihood security of the poor. The tribal men and women have not only conserved such genetic wealth, but have added value to them through selection and information.

Wayanad - an agrobiodiversity rich site is designated as a "hottest biodiversity spot" of hotspot- Western Ghats. The pace of erosion is alarmingly high in all spheres of biodiversity, especially the agricultural- both genetic and landscape diversity -in the district. The shift in cropping pattern from subsistence to mono cropping has led the fast erosion of crop diversity. The plant genetic resource has

undergone a rapid declining with the introduction of modern varieties. The change in land use pattern is one of the major reasons that led the erosion of agrobiodiversity. A Study by MSSRF (2002) shows the Paniya tribal women and men in Wayanad know about 265 different species of wild food and many of such foods have been collected from a diverse kind of habitats of which paddy fields and associated ecosystems like marshy areas, waysides and plantations gains much significance. Paddy cultivation replacement by banana and ginger crops has posed serious threats to the typical wetland eco system of the district. It has irretrievably altered the habitat of many species. The waterfowl, water snake, apple snail etc. is a lost sight now. All which were the indispensable part of the paddy ecosystem, which kept checking and balancing the system of paddy pests and diseases to a greater extent. In addition, paddy fields harboured innumerable number of medicinal plants, which were being used mainly by women for home remedies. Paddy fields act as small reservoirs and help the percolation and aquifer recharge. It helps to maintain the water

Wayanad - an agrobiodiversity rich site is designated as a "hottest biodiversity spot" of hotspot- Western Ghats. The pace of erosion is alarmingly high in all spheres of biodiversity, especially the agricultural- both genetic and landscape diversity -in the district.





table of the wells of its influencing area un-sinking even during summer. The invasion of cash crops in place of paddy cultivation accompanied with the liberal use of chemical inputs annihilated the soil micro flora and fauna. The neck deep marshy lands, once or twice cultivated with paddy now become a tractor ploughable field. Such swift surface water depletion and draining is taking place, when banana or Areca nut palm cultivation is made. The continuously five year cultivated banana field become unproductive, uncultivable land and becoming irrecoverably lost, which pose threats to food security as well as the ecosystem security of the poor ecosystem dependant communities. For instance, Wayanad once harboured 100 and odd local paddy varieties have now been confined to 10-15 varieties.

A participatory and integrated approach is needed for a better way of addressing the issues of tribal empowerment. One of the areas of approach should be the protection and enhancement of crop and breed diversity of the tribal and rural communities.

On the backdrop of these issues, the subject of crop diversity and tribal empowerment has been discussed in this session with an objective of deriving some "doable action plans" at local and state levels.

The tribals of Wayanad, who were the descendants of Neolithic settlers, earned their livelihoods as hunters and later as food gatherers. From these stages of human civilization, they were gradually exposed to the process of peasantisation.

Discussion

Dr. Suman Sahai

The public domain knowledge and materials were used effectively for the present day agricultural and biological development. This

knowledge and materials, particularly that related to the agrobiodiversity (the economically known and otherwise useful biodiversity) are contributed by the tribal and rural communities. We owe to them for the development of many of the high yielding varieties of crops, breeds, many modern medicines and food. First priority therefore, should be given to restore the prestige of such traditional knowledge. Legislation of the protection of the rights of knowledge holders like farmers and healers is also to be initiated. For avoiding the "Biopiracy", State and National Governments along with international community should act as protectors of indigenous knowledge related to biodiversity. Now it is mandatory for the member countries who have signed the agreements like CBD and GAAT to protect their biological resources and plant varieties through patent or through independent *sui-generis* system or combination of there of. Subsequently, Govt. Of India enacted a legislation called *Plant variety Protection & Farmers Rights Act 2001* to recognize farmers' contributions. The Indian Parliament is also passed *Biological Diversity Bill 2002* to protect and use country's various biological resources in a sustainable manner. There is an urgent need to protect the traditional knowledge and it needs national and international level

efforts. The tribal and rural communities will have to "Claim their Rights to get their Rights - Be proactive - to be aggressive"

Dr. K. K. N. Kurup

Most of the tribal communities belonged to the category of landless agriculture labourers whose empowerment was marginalized or abrogated in the context of new economic policies. The recent incident of Muthanga is the symbol of their frustration and keen desire for possession of land. The tribals of Wayanad, who were the descendants of Neolithic settlers, earned their livelihoods as hunters and later as food gatherers. From these stages of human civilization, they were gradually exposed to the process of peasantisation. Each community had its own natural settlements in the forests. The arrival of Britishers, introduction of cash crops like coffee and tea, migration etc paved the way for alienation from their original habitats. Revising the economic policies, providing land, capital and technology for cultivation and increase in the efficiency of government departments connected with tribal development are the crucial issues. Immediate steps are needed to educate them to bring them into the main stream and also to create new employment opportunities.

Sri. P. Balan

Following are the key issues in tribal development from the perspective of an *Adivasi*.

1. Malnutrition and health problems
2. Declining employment opportunities
3. Land alienation
4. Food insecurity and reduced food basket
5. Lease farming
6. Exploitation from middlemen
7. Erosion of traditional knowledge

Hence, any policy framework should be made in the context of these concerns. Our current needs and requests are:

- Provide basic amenities in tribal hamlets
- Skill training in livelihood improvement

- Permit to collect the NTFP from forests
- Awareness generation on sustainable collection and processing
- Renovate traditional crafts and industries
- SHG formation in tribal hamlets
- Increase the credit access
- Cultivable land distribution and infrastructure development
- Adopt Community led Participatory Forest Management
- Ensure Premium price for products produced by Tribes under traditional methods
- Chronicling of TK for scientific validation and for sustainable utilisation with our proper involvement - protect the rights of tribes through recognition and rewarding

Sri. G. Girigan

One of the major thrust areas of MSSRF is conservation and enhancement of biodiversity, particularly the agrobiodiversity, which have been developed and conserved by the farm communities. This agrobiodiversity is now viewed as the intellectual contribution of farmers, and protecting the rights of those farmers is considered necessary for allowing them to continue their essential role in conserving and enhancing genetic resources.

The Community Agrobiodiversity Centre (CABC) of MSSRF is supporting farm communities by providing training and assistance in the conservation, enhancement and sustainable use of traditional crop varieties. Centre took interest in promoting traditional paddy cultivation through diversification of rice varieties which are economically profitable in order to protect the paddy ecosystem and supporting the farmers in seed production and distribution of specialty rice varieties like *Navara*, *Veliyan*, *Gandhakasala*, *Kalladiyan* and *Chennellu*. It



Several species have got high demand, for example, Kacholam has an annual demand of 748956 kg, in Malabar region alone. Likewise, Chengazhi (17487 kg), Kasthuri Manjal (13271kg) and Vayambu (89875 kg) are used heavily in Kerala.

also undertakes capacity building programmes for women in income generation activities by cultivating native vegetable crops as well as utilizing locally available natural resources in a sustainable manner, and student, youth and NGOs for widening their knowledge base and skills in biodiversity conservation. However, the challenging problems for our intervention are:

- Erosion of crop and breed diversity and TK
- Unemployment in tribal and rural sector
- Decline in natural resource base
- Health related problems in tribal areas
- Degradation of Agriculture land

With an aim of increasing the livelihood security of the farm -women and men, two programmes have been launched in the district by CABc - one is on promoting traditional primary health care practices, and the other is on experimenting LEISA (Low External Input Sustainable Agriculture) activities meant for more income from less land. The activities of the health care programme called, "Green Health Campaign", which meant for using both medicinal plants and the knowledge of communities, particularly the traditional healers and women associated with it, to improve both their health as well as the economic status. This programme includes awareness campaigns, trainings, plant exhibitions, ethno-botanical surveys, establishment of community -level herbal gardens, and community-level marketing of the herbal products. Hither to about 200 families have been brought under this programme. This has evoked a wide interest among the people.

Dr. Indira Balachandran

There are several indigenous plant species that have high commercial demand which are still collected from the wild and are becoming very rare, but not successfully introduced in cultivation. The National Medicinal Plant Board has recommended 32 species of medicinal plants for large- scale cultivation, out of which 20 species can be cultivated in South Indian habitats. The cultivation of medicinal plants should be encouraged among tribes. There must be some mechanisms to transfer of modern technology and skill up gradation among the rural and tribal farmers.

The herbal market in the State today is unorganized due to various reasons. The nature and dynamics of this domestic trade, is far from simple. It involves central and regional markets through a number of private dealers and agencies, government controlled cooperatives. All having upstream linkages with numerous local and "road-head" markets, which in turn have myriad middlemen, petty shopkeepers and agents feeding them with primary supplies. Proper marketing strategies have to be worked out for marketing the medicines and herbs in appropriate values.

We have to give more emphasis on TK based development of medicines. Patenting the innovations of tribal communities especially those connected with respect to traditional health care practices. Developing databases on the threatened plants conserved by the tribal communities of Wayanad district is also very important.



Dr. Koshy John

Original habitats of tribal communities have to be protected and empower them to cultivate the crops that they like and restrict the encroachment to their lands. Also what needed now is synergy of traditional knowledge with modern technologies. We must encourage ethnic foods of tribes with a proper brand name. In India, Kerala has high potential to produce diverse organic products, including textiles, furniture, cosmetics, wines (e.g. palm toddy), vegetables, fruits, pet food, baby food and even organic water at community level, but with proper skill training and quality education. Therefore, we must encourage organic cultivation by taking into consideration of TK and traditional skills of our tribal and rural elders.

Dr. P. K. Muraleedharan

A study by KFRI shows that only seven percentage of total consumption of raw drugs in Kerala is met by the cultivation, while 93 percent is still through collection from the wild. The situation thus, warrants the supply of good quality raw drugs cultivated and marketed by ensuring relevant quality control measures. Several species have got high demand, for example, Kacholam has an annual demand of 748956 kg, in Malabar region alone. Likewise, Chengazhi (17487 kg), Kasthuri Manjal (13271kg) and Vayambu (89875 kg) are used heavily in Kerala. Intermediary play a significant role in the trade, but unfortunately it is largely secretive in nature as there is no declared market for raw drugs or fresh picks from herbal gardens. Therefore, we should explore proper

Land problem is a major issue and society should act for materializing the dreams of tribes those who were once the owners of the Wayanad. Forest department must keen to engage tribes as forest protectors and jobs associated with forest.

marketing strategy for NWFPs as well as cultivation of traditional crops like rice is an important step towards this direction. Tribals should get permission for the collection of NWFPs which is a major source of income for them. We must ensure they get fair price for the produces collected. Joint Forest Management programmes should by all means be a joint venture wherein tribal communities and forest department play equal roles.

Sri. P. Kesavan

Tribal communities are the part and parcel of forest ecosystems. They have never gone beyond the interest and existence of forest ecosystems. This approach must be the crux of the forest mangement effort. They also hold knowledge, which have a positive bearing in the protection of forest and conservation of biodiversity and live in close harmony with forests. Their right to live in the forest should not be denied. The local community, if empowered, they will be able to even directly manage the forests with their traditional wisdom and by the guidance of Forest Department and other experts.

Sri. Mohan Kumar

The non-tribal people should change their attitude towards tribal communities and we should address the development of tribal communities from their perspective. Land problem is a major issue and society should act for materializing the dreams of tribes those who were once the owners of the Wayanad. Forest department must keen to engage tribes as forest protectors and jobs associated with forest. We should see that people tribal development programmes are chanelised through them only.



Open Discussion (Tribal Leaders and NGO's)

Sri. Mukundan

The historical status of tribal communities of Wayanad could be recognised in the folk songs. (A song orated by him explained the historical journey, the pathways of changes that occurred in the course of time from the king to the slave). The tribes should have the right for a decent life in their soil.

Sri. Kalhan

The tribes of Wayanad were once treated as slaves. The government banned the slave trade however, they are yet to rehabilitate the tribes in a proper manner. What needed are: proper education, revitalization of traditional crafts and industry and new employment opportunities. They also should get land entitlement.

Government should ban the application of chemicals and pesticides in and around the tribal lands. The indiscriminate use of chemical fertilisers and pesticides poses a number of problems at present

Sri. K.C. Vellan

There is an urgent need for documentation of food habits and traditions of each tribal community. Efforts should take to link the ethnic food of tribal communities with market. Government should ban the application of chemicals and pesticides in and around the tribal lands. The indiscriminate use of chemical fertilisers and pesticides poses a number of problems at present. The chemical inputs used in the uplands reach the low lying area through run off water and leaching in and contaminate the streams and rivulets in valleys. Policy makers should consult the tribes before making policies and implementing of projects in their areas.

Sri. Arimula Raghavan

There is a need for a detailed multi disciplinary study about the the culture, traditions and status of tribal communities. There should have attempt to address the newly emerging problems. The money allotted for the development of tribal communities must spend properly in a transparent manner and by consulting with the tribal leaders and social workers.

Smt. Santha

The tribal healers are facing lots of problems like - poor market price for their products; less availability of medicinal plants, little encouragement from the part of Government and so on. The invaluable treasure of indigenous knowledge passed on to successive generations mainly through word of mouth is getting eroded beyond the limit of setting the pace. Therefore, activities should be promoted for regaining the lost and fading

traditions by inculcating habit to foster a sense of kinship with nature.

Smt. Rugmini Bhaskaran

The access to agriculture land and right over it by women is the most crucial issue among the tribes. The illicit liquor making and its effect on tribal communities is another big problem. Stringent actions must be taken against those who have involved in atrocities against tribal women. Educated youths of tribal communities should get employment in government services. There should not be any discrimination against tribal children. Education/awareness programme involving of tribal representatives is very important to reach the tribal men and women.



Sri. P. K. Kelu

The nexus of politicians and beurocrats is the issue in alienating the tribes. The fund allotted for the development of tribes should spend only for them and a unity among tribes is required to fight for the rights of tribes.

Sri. Unni Naikkan

The basic amenities like drinking water, sanitation facilities etc should be given to tribal communities. Government should keep their promise of distributing the alinated land.

Sri. N.K. Babu

The educational programme among the tribal communities must be strengthened with the right participation of government. Basic facilities must be provided to tribal hamlets and colonies. PDS programme should reach to them effectively. Organise meetings in village levels to understand the tribal problems and possible solutions from their own perspectives.

Sri. Palliyara Raman

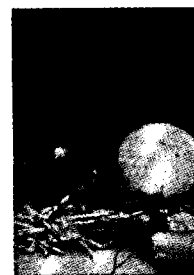
Organise trainings and capacity building programmes, campaigns in the tribal hamlets to increase the confidence and help them to enter in new employment opportunities. Representatives of tribal farmers, women and conservers, and scientists should come close together and form a powerful body to finalize the research, extension and action programmes

In Wayanad district (a high land agro-biodiversity hot spot in Kerala) the pace of erosion of biodiversity is alarmingly high in all spheres of the agro-ecosystems. The shift in cropping pattern from subsistence to mono cropping has led to rapid loss of crop diversity at both species and genetic levels

needed for substainable development of Wayanad district in particular, and the State in general. The actions evolve by this way should be in tune with the needs of the poor farm communities.

Sri. P. M. Nandakumar

Capacity building of local institutions - the Community Based Organisations, NGOs, Line Departments and tribal and rural families in the area of Eco-Agriculture - an integrated field of Agriculture and Conservation through training and education should be our focus. The central objective of any programme on sustainable agriculture and associated NRM systems must embrace and enhance productivity, livelihoods, ecosystem services and biodiversity. In Wayanad district (a high land agro-biodiversity hot spot in Kerala) the pace of erosion of biodiversity is alarmingly high in all spheres of the agro-ecosystems. The shift in cropping pattern from subsistence to mono cropping has led to the rapid loss of crop diversity at both species and genetic levels. A holistic approach is needed to address tribal empowerment. Co-ordination of government, NGOs and social workers is the need of the hour to reach the goals set in tribal empowerment.



RECOMMENDATIONS

1. Recognise and reward the contributions of tribal communities

- Tribal communities (men, women & communities) have a rich traditional ecological knowledge base (agrobiodiversity, healing systems, ethnic foods, folk taxonomy, landscape and ecosystem management, arts and crafts...)
- They have been the primary conservers of the agro-biodiversity. They have a right to better living standards (water and sanitation, higher education, health security, food and nutrition security)
- They also need a space in this developmental paradigm (access to technical education, technology, skill empowerment and economic empowerment) and

We need to recognize and reward them (local, national and international level) for their invaluable past and present contributions to biodiversity and ecosystem management and enhancement.

This can be achieved by a participatory approach (with the tribal people) in terms of drawing up targeted programmes, implementations and monitoring with adequate policy support.

2. Develop a Proactive State Policy

- The State must continue to play their role in public investment (Infrastructure support to education, health and environmental sanitation, skill and economic empowerment, liberalized credit support for agricultural operations and entrepreneurial activities) in protecting and enhancing the lives and livelihoods of those, particularly poor and land less tribal and agricultural labour communities.

3. Encourage Sustainable Land Use

- Encourage research on the valuation of ecological services of different ecosystems including forests, agricultural lands etc..
- Impose restrictions in the form of cess to discourage unsustainable practices. The money generated could be channelized to tribal farmers practicing sustainable agriculture/ utilization of natural resources as incentives.
- Attention to be paid to ecological foundations - soil health care, efficient use of biodiversity, agrobiodiversity, ethnic food diversity and water.
- Prevention of conversion of paddy fields - There is an Act (Kerala Land Utilization Act -1956) that imposed restrictions in converting ecologically important landscapes like paddy fields, which needs to enforce strictly.
- Regulate the introduction of 'Alien' and 'Exotic' species to the agricultural and forest landscapes to help in conserving native biodiversity.
- Consider the management of tribal dominated areas in the way of "Man and Biosphere" approach.
- Kerala is an ideal leader for Organic Farming and therefore, should promote organic farming to occupy a unique niche in the agrimarket.

4. Set Conditions for Creating Sustainable Livelihood Options

- Provide education, skill training, access to information and technologies.
- Encourage bio-resource based micro-enterprises through easy credit- linked policies.



- Establish market linkages and support such activities through timely provision of infrastructure (drudgery reduction, value addition, appropriate technologies) and information (sourcing of material and markets).
- Re-organise Tribal co-operative societies as centres for herbal raw drug medicine units based on local resources.
- Quality literacy programmes for producers and gatherers to enhance quality and competitiveness in the market by enhancing backward and forward linkages.
- This can be achieved by setting up village level Knowledge Centres (which will provide access to information, development of entitlement data-bases, etc.)

5. Revitalise appropriate Local Traditions

- The state must take efforts to revitalize folk and herbal medicine practices, ecological foods as well as the practice of conservation of sacred groves, sacred trees and ponds.
- Enlarge the food basket by revitalization of the use of traditional food crops like millets and tubers.
- An expert committee to study the possibilities of revitalizing appropriate local traditions (arts, crafts and skills and conservation of sacred groves) may be constituted.

6. Protect and Enhance Crop Diversity and Co-ordinate the efforts in Documentation of Local Resources

- The State should take necessary steps to generate awareness about PPV&FR and Biological Diversity Acts and provisions related to the registration of traditional varieties under PPV&FR Act.

- Local Panchayats should be encouraged to organize Biodiversity Management Committees and prepare Biodiversity Registers – within a time frame (with a gender sensitive approach)
- Promote Genetic and Computer literacy among students particularly of rural and tribal areas through Genome clubs.
- Build the capacity of farmers through local Panchayats in registering traditional varieties for materialising the provisions of rewarding and recognizing the contributions of tribal and rural communities in conservation.
- Farmers have to be mobilized to register their varieties (Farmers' varieties), locally used medicinal plants, wild foods and other important bioresources through the preparation of Peoples, Biodiversity Registers.
- Promote seed exchange systems between farmers and communities through conducting Seed Fairs and Fruits/flowers exhibitions.
- Establish seed village and encourage farmers' participatory breeding and technology development programmes.
- Conduct education and awareness programmes on Biodiversity, Farmers' Rights, Intellectual Property Rights etc for panchayath authorities farmers, NGOs and Youth on a regular basis.
- Establish a local level Gene Fund to give incentives to farmers and conservers by pooling donations from individuals and institutions. Contributions to such fund should be exempted from the income tax.
- Develop computerized database on a common format about the Farmers' varieties, locally used medicinal plants, wild foods and other important bio-resources and may encourage local and regional networks after considering the IP issues.



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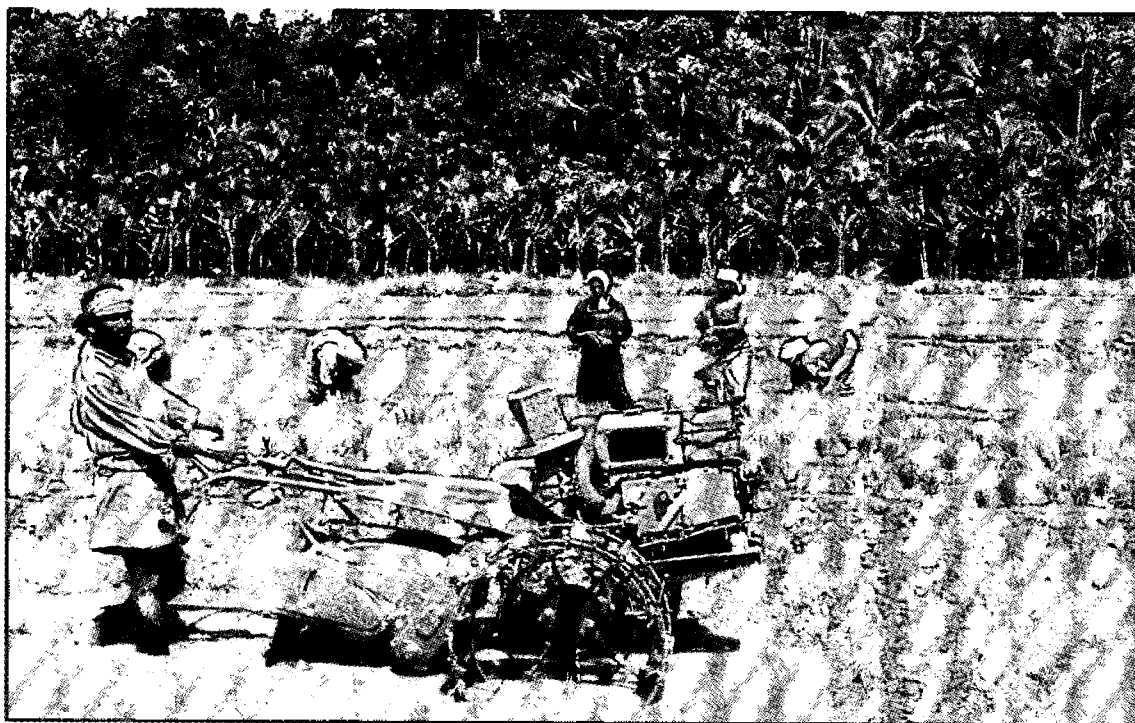
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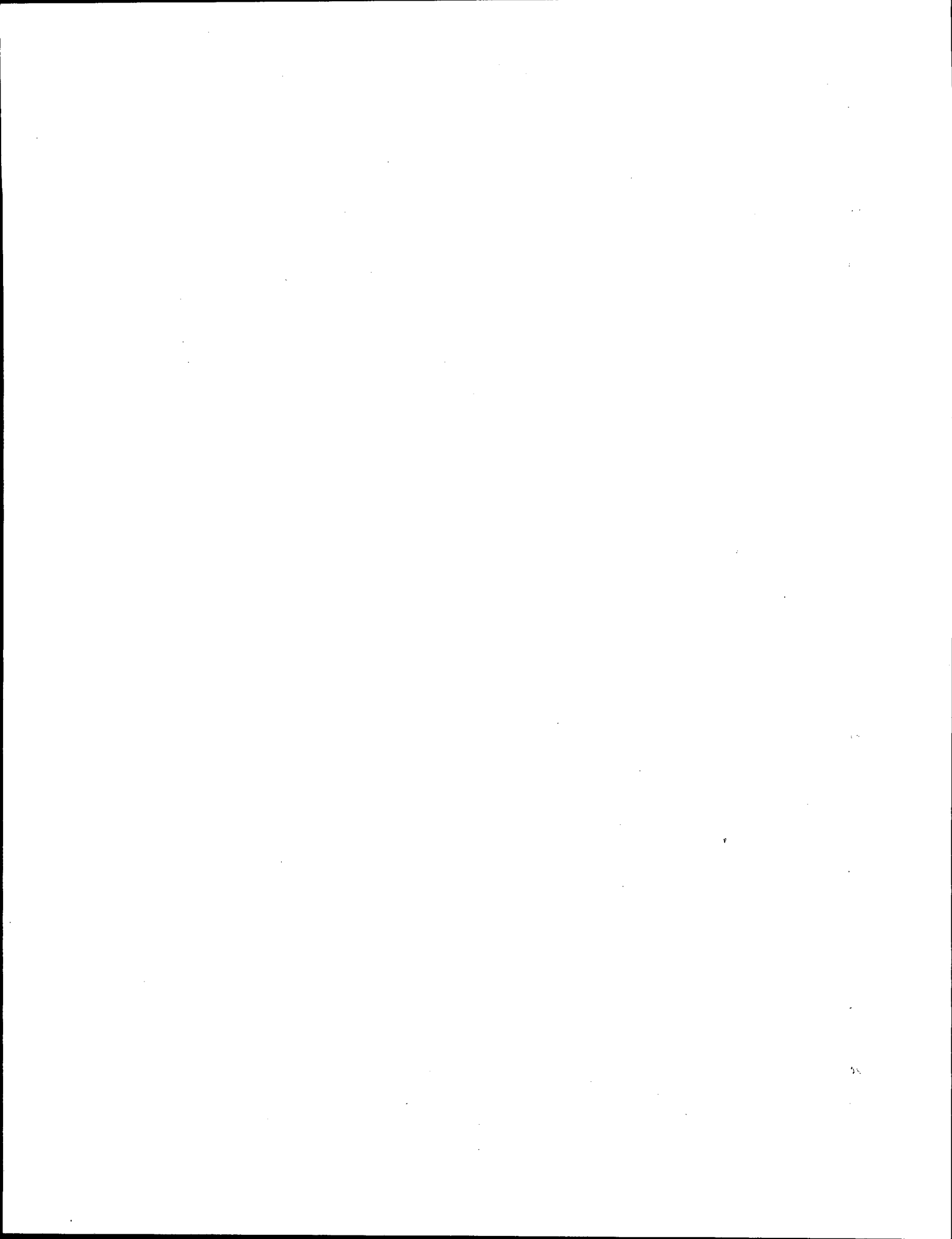
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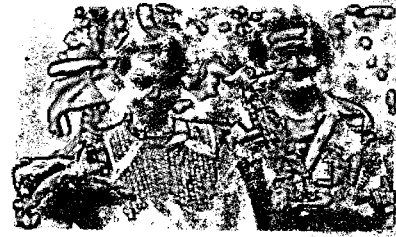
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**AGROBIODIVERSITY CONSERVATION
AND ENHANCEMENT:
GENDER ROLES AND TRIBAL EMPOWERMENT**



About a half a billion people are believed to be at nutritional risk because they have limited access to a balanced diet. FAO (1989) estimated that the number of people with consumption levels below the critical threshold value is likely to increase from the present 510 million to 630 million in 2000. A recent report from the World Bank defined poverty as the inability to attain a minimum standard of living. It has been estimated that 1.3 billion people are struggling to survive on less than \$ 1 per day (UNDP *Human Development Report 2000*). About three-quarters of these poor, about 800 million people, live in Asia, primarily in Bangladesh, China, and India.

AGROBIODIVERSITY CONSERVATION AND ENHANCEMENT: GENDER ROLES AND TRIBAL EMPOWERMENT

Session Chair : Dr. Krishna Sreenath; *Co-Chair*: Dr. Sudha Nair;
Presentations : Sri. K.K. Annan, Dr. P. S. Geethakkutty, Sri. M.K. Ratheesh Narayanan, Sri. G. Girigan; *Panel Discussants* : Smt. Ajitha, Smt. T. Omana, Dr. T. Ravisankar, Sri. Louis B. Figaredo, Dr. Celine Sunny, Prof. Sarada Rajeev, Smt. Elyamma Vijayan, Dr. Meera Devi.

Introduction

Study conducted by FAO on rural women recognizes that the rural women in Asia play a key role in biodiversity conservation as seed selectors, managers of home gardens and as holders of traditional knowledge associated with food crops, medicinal plants, wild foods, forest products and about various landscapes and natural resources. It is the women who conserve, preserves the valuable plant genetic resources and series of genes conferring valuable traits— such as disease resistant, salt tolerance, resistance to drought or water logging etc. for commercial and domestic use. The intricate knowledge involved in performing this task used to be transmitted from women to women. Most women in rural societies worldwide are often primarily responsible for ensuring household food security, health and family continuity.

Traditionally men controls the resources, take decisions regarding land use and neglect the opinion of women. They are the policy makers and since women are not the decision-makers in many social and political forums or not in position to influence decisions, their concerns and constraints does not get reflected. Their

Most women in rural societies worldwide are often primarily responsible for ensuring household food security, health and family continuity.

voices and opinions have to be heard and included in the agenda of the Biodiversity Conservation strategies and the support needed for women in conserving biodiversity has to be worked out. The “Gender blindness” and the consequent “invisibility” of women’s role in biodiversity and food security will disappear if their contributions in these areas are well documented.

MSSRF’s studies (Girigan & Anil Kumar 2002; Ratheesh & Anil Kumar 2003) in Wayanad show that changes in cropping patterns (rice to banana; rice to areca) have affected the employment prosperity of women and deprived their social and economic status. And the tribal women are responsible for the collection, conservation and utilisation of wild food species in and around their vicinity and fighting against starvation by playing multiple roles as gatherers of food, wage labourers and managers of the home gardens. It shows that they play a crucial role by providing their labour (unpaid family labour), conserving seeds of traditional varieties of food crops, gathering and processing wild food, preserving and storing the food for meeting future



The irrational developmental activities in agriculture and allied sectors that paved the way for the current problems like crop diversity erosion and tribal/women disempowerment.

contingencies etc. Balakrishnan *et.al* (2001) described the role of Kattunaikka women as folk taxonomists in identifying wild tubers in a study conducted among them. These studies in general emphasize the contributions of women in the conservation and sustainable utilisation of agrobiodiversity. But, unfortunately, the pivotal role of women in conserving biodiversity is not yet been received the attention of policy makers because of lack of gender sensitive approach and the consequent "invisibility" of women's role in agrobiodiversity conservation.

The session has to discuss these issues and make a wider audience to understand the perception of women in conservation of biodiversity and catalyze to frame a policy strategy sensitive to women.

This has been discussed at length and derived few conclusions and recommendations. We hope the conclusions and recommendations emerged out of this workshop will enable the concerned to prepare a policy framework for gender sensitive development strategies in conservation and management of bio-resources.

Presentations & Panel Discussion

Sri. K. K. Annan

Tribal communities have many problems in terms of their livelihood security ranging from health related problems in general to problems pertained to poverty. The increasing cost of formal health care systems and declining popularity of traditional health care practices affect the rural and tribal women. There is increase in health problems among women and it is aggravated by the lack of traditional health

care remedies which in turn due to extinction of medicinal plants from their common surroundings. Changes in agricultural practices have its own effect in the health status of women. It is high time to popularize the traditional health care practices among poor and the needy people.

Sri. M. K. Ratheesh Narayanan

The gender roles in the management of wild foods and issues related to the conservation and sustainable utilization of wild food species is an issue while dealing with the forest resource management. Women play a crucial role in the food security of tribal communities, for instance, Paniya play a major role in protecting many of wild edible greens. Habitat destruction, landscape conversion, indiscriminate use of chemicals and pesticides are some of the present threats to women and food security of the poorest of the poor communities who are quite often the ethnic groups like *Paniya*, *Adiya* and *Kattunaikka* in place like Wayanad.

Sri. G. Girigan

The impact of conversion of paddy fields on gender roles and relations among different communities of Wayanad is an issue that to be understood at policy level and address on an emergency basis. The lack of access to agriculture land, lack of decision making capacity, lack of property rights and lack of economic freedom among women are some of the reasons that pave the way for conversion of paddy fields. The results are: gender displacement, poverty, malnutrition and men focused power relation changes in the family.



Smt. Ajitha

Tribal communities in general and women in particular conserve the biodiversity. However, they are facing lots of problems and alienated away from their original habitats and environments and thereby endangering the existence of tribal communities. Land entitlement issues to be addresses first. The irrational developmental activities in agriculture and allied sectors that paved the way for the current problems like crop diversity erosion and tribal/women disempowerment. The export oriented cash crop production in agriculture is one of the major threats to employment security. The fluctuations in the international market affect the agrarian economy of Wayanad. Lack of enough employment opportunities in traditional sectors compel women to depend on low paid and high risk jobs (risk in terms of sexual exploitation). Consumerism is also a threat to women empowerment. The products of women SHGs face lack of market due to the influence of MNCs through media. The possible effect of tourism is a matter of serious concern. A movement against globalization for protecting the rights of common people especially tribal and rural women is the need of the hour.

Smt. Omana

Women especially tribal women are the worst sufferers of ecosystem destruction, monocropping, de-forestation and such negative actions. The destruction is the outcome of changes in lifestyle and human culture. trend to imitate cinema, liquor are also seriously affecting the lifestyle of tribal communities. We must provide basic necessities to tribal women and at the same time their natural environment and habitats should be entitled to them.

Study in a fishermen village shows that women spend approximately 18 hours a day on household relative activities. The importance of gender sensitive approach is thus very important.

Dr. T. Ravisankar

Biodiversity and cultural diversity are the two interlinking aspects when we speak about management of biodiversity. Biodiversity is either getting degraded or getting more species specific by way of evolution and also through invasion of aliens. Cultural diversity is the knowledge associated with the biodiversity. Both are interlinked, if you don't have the BD you will lose the cultural diversity on the biodiversity. The cultural diversity (about edible plants, traditional crops and so on) is available with both men and women. But the knowledge possessed by the men only is being recognized whereas of women by and large is poorly recognized. The non-recognition is the cause of destruction. If we don't recognize this, we will lose the biodiversity even before understanding the value of biodiversity.

Women play a crucial role in conservation of valuable plant genetic resources by possessing unique knowledge associated with the seed selection, cultivation, processing and utilization, storage etc. This knowledge is then passing over to the next generation women and thereby playing an important role as the conservers of biodiversity. Apart from all the agricultural operations they perform like their male counterparts, they also have to spend more time on reproductive household activities, which affect the health security of women. Study in a fishermen village shows that women spend approximately 18 hours a day on household relative activities. The importance of gender sensitive approach is thus very important. Therefore, there should be interventions to reduce the time spend by women so as to get them time for developmental activities otherwise their burden may get increased and pave the way for much gender inequality.



Gender mainstreaming is very important, otherwise it will affect the health security of women and then to children and so on. There need gender mainstreaming at class level, caste level and age level. The strategies followed in India may attract the South-Asian attention so we must come up with gender mainstreaming strategies and policies for a larger section of people in the world.

Another aspect that need attention is translation of guidelines of JFM, Legal measures for the conservation of biodiversity and gender roles and relations in local language. This is to be done and circulated widely on a high priority basis.

Bio resource and local knowledge based developmental projects are suitable for Wayanad (eg. Fodder grass and livestock rearing). The role of both men and women should be clearly defined in the projects

Sri. Louis B. Figaredo

A major tool for empowerment is knowledge. There are lots of research works about gender aspects going on. however, the results of research restrict to very limited people. As far as Kerala is concerned, the traditional society belongs to heterogeneous groups-in hunting/gathering society, their major concern is food and women play a crucial role in the collection and processing of food and that is why women get a respectable position and economic dominance among those communities. When we consider an agriculture society – there are two types of communities – horticulture oriented society and intensive agriarian society. In horticulture society, they use simple tools for agricultural operations. In agricultural society they perform intensive cultivation with the help of mechanical/ animal power. When we consider the position of women in both classes we can see the dominance of women in agricultural operations and they are

getting respect among them. In agriculture society, the contribution of women is comparatively less. Declining biodiversity is the major reason for the subordinate status of women in the society. This variation can be viewed when we move from hunting/gathering society to intensive agriculture society.

Recognizing the value (use value or economic value) of biodiversity is one of the ways to conserve biodiversity. There also need proper mechanisms for benefit sharing. The documentation of gendered knowledge in biodiversity will help us to recognize their contributions more explicitly.

We also should look into protection of common properties like streams and canals with the help of local organizations and women groups.

Dr. Celine Sunny

We are working for the application of technology for the socio-economic development of tribal women and men at Rajagiri Institute of Research in Gender and Development in Kalamassery. The programme started with a socio-economic survey to analyse the intensity of economic difficulty and their survival strategies, farming periods etc. Strategies were developed according to their needs and skills they possess. In lean periods (about three to four months) they spend their time idle and they do not go for the collection of forest produces because of many reasons including the shortage of MFPs. The survey also found that both the men and women possess skill in handicrafts. During the





participatory planning it was decided to revitalize the traditional arts and crafts with the help of modern technology. They are producing wonderful handicrafts out of bamboo and other species. In the initial stage it was women who participated in the training and later on men also took part in the training and handicraft production. Additional income from the handicrafts helped women to increase their self confidence and it also increased the esteem of both men and women

However, these people have problems like market access, access to raw materials etc. Marketing of products produced by women groups/ co-operatives/ federations is a big problem to be addressed properly. There need support from the part of government and other agencies working in the area of marketing.

For further intervention, we began to document the knowledge of both men and women in bio-resource utilization in the form of Community Biodiversity Registers. I feel, preparation and gendered documentation of Community Biodiversity Knowledge may help women to get recognition in the society.

Prof. Sarada Rajeevan

Folk songs, often indicate the disappearance of diversity – diversity of paddy fields, diversity of human culture, biodiversity etc. What needed is mental empowerment (self confidence) among women to get ready to take part in developmental process. The people including both women and men of each locality should decide the kind of development required for their area. The projects and developmental interventions for the socio-economic development should have adaptability to the local conditions, sensitive to gender and ethnic diversity. Bio resource and local knowledge based developmental projects are suitable for Wayanad (eg. Fodder grass and livestock rearing). The role of both men and women should be clearly defined in the projects.

Gender sensitive human resource development strategies have to be developed. Women friendly, eco friendly, home friendly and location specific technologies have to be developed with the participation of women. Awareness, and Action of has to be the focus of our intervention.

Smt. Eliyamma Vijayan

The question of why we should conserve biodiversity depends upon the perception on development. As per the present development strategy, biodiversity is just a raw material for development. Should we approach biodiversity conservation in this perspective or whether we should change our approach and consider biodiversity as an alternative development model for enhancing life supporting and livelihood options of the society, is the basic challenge of humanity? The existing development models are basically export oriented and oriented towards profit motive. We also look conservation of biodiversity in the background of genetic engineering, Patents and IPR regimes in which MNCs are exploiting biodiversity rich third world countries as a source of raw materials. In this context, biodiversity conservation is a serious matter of concern.

It is high time to change the perception of development and approach towards biodiversity conservation. In the past, biodiversity was conserved by the community in total by sharing knowledge, skills and resources for ensuring the well being of the society and by protecting the resource base. We also should develop a lifestyle that respects the diversity of thoughts, culture, beliefs etc.

Women are the worst sufferers of the destruction of biodiversity and that is because of the modern developmental strategies we followed. Changes from agriculture to agri-business led to the alienation of tribal communities, unsustainable land uses, undoing of land reforms, production



insecurity, consumption insecurity etc. When the issue of biodiversity conservation emerges it becomes the sole responsibility of women and ethnic people. The male dominated policy makers argue that women have an inborn affinity towards nature and biodiversity. By glorifying these qualities of women, the responsibility of biodiversity conservation is passing on to the shoulders of women. There is no inborn affinity towards nature among women, but they are very close to the nature during the course of their life and that is why they nurture and care biodiversity and natural resources and the existing gender roles shapes the women as the conservers of biodiversity. Accordingly, both men and women are equally responsible for the conservation of natural resources. There also need the revitalization of community management practices of bio-resources with the active participation of both men and women. We need a movement that supports the conservation of native diversity and protecting the interest of women and weaker sections.

I also refer in this context, that a Manual for Panchayath representatives about development (Guidelines for development) that do not disturb the native biodiversity and landscape complexities is needed. The Manuel can be circulated among Panchayth members that will help them to understand consequences of the destruction of biodiversity. Initiating Community Seed Banks and genetic literacy campaign in all Districts of Kerala is also an immediate need.

Dr. Meera Devi

Wayanad is blessed with biodiversity and traditional knowledge; however, both men and

The male dominated policy makers argue that women have an inborn affinity towards nature and biodiversity. By glorifying these qualities of women, the responsibility of biodiversity conservation is passing on to the shoulders of women.

women could not convert it into livelihood options in a sustainable manner. The panelists to look into how the Public Distribution System is functioning among tribal women and men to strengthen the food security.

The rural people in Wayanad possess rich knowledge, rich biodiversity, and skill in converting them into various products. But they lack marketing skills and inputs for marketing. When they go for large scale production they have to compete with local producers and MNCs. There is a big gap between MNCs and local herbal knowledge and marketing skills. So the policy must be framed to promote the local industries and de-promote the MNCs. This is a big challenge that has to be addressed at policy level. For starting a micro level herbal processing centre, there need license and lots of investment that SHGs/ tribal women can not do. So the issue is how to de-promote the mono-culturing factors. These kind of issues need policy level attention and intervention.

Women have to come forward to raise their voice against the developmental demerits to convert it into gender sensitive sustainable development. All forums – Gramasabhas/ Panchayath – have to be used for influencing the policy makes from locally to nationally and internationally.

Open Discussion (Local women and men SHG leaders)

Smt. Annakkutty Paul

After the indiscriminate use of chemicals and pesticides in banana fields, there witnessed a

sharp increase in health problems among tribal women in Wayanad. Malnutrition coupled with the impact of pesticides make the scene worst in most of the tribal colonies. The lack of access to hospitals, due to many reasons, compels tribal women to continue to suffer and gradually it paves the way for serious problems and reduces their longevity. The problems like poverty, malnutrition, sanitation, health care etc are to be addressed with prime concern. Revitalization of their own health care traditions, provision of quality seedlings of food crops, provision of skill training and education, generation of employment opportunities are the possible solutions.

Women should get power in economic resources like land and other properties. The most important intervention is awareness to indicate the mismatch between social roles and responsibilities entitled to both men and women.

Smt. Mahitha Moorthy

The women labourers in plantation sector suffer a lot. The serious issue is the employment fluctuation and uncertainties faced by women in the plantation sector. A detailed study on the occupational hazards among plantation workers is needed and so is the need for awareness generation among women about their rights, gender issues etc. The priority must be given to rehabilitate the unemployed plantation workers and women by forming their SHGs and also by providing vocational training.

Smt. Bharathiyamma

The pesticide application and unsustainable land uses are the primary issues related to women. The present development strategies, not only

destructured the biodiversity but also the social harmony. We also should be concerned about the declining sex ratio, rehabilitation of aged people, health problems of women, an also growing atrocities against tribal women. Creative support from the concerned Organisations for the development of women of the weaker sections should be extended.

Smt. Visalakshi Prabhakaran

The approach of the society on gender issues is to be changed. Women should get power in economic resources like land and other properties. The most important intervention is awareness to indicate the mismatch between social roles and responsibilities entitled to both men and women.

Sri. Arimula Raghavan

The SHG movement is really worthy, as observed in some of the tribal colonies, women could interact freely with non-tribal women and it indicates the self-confidence among tribal women. We may promote Kudumabasree and SHG movements to cover all the tribal groups in a phased manner. Reservation in Govt. phased services for tribal women is also implemented.

Dr. Sudha Nair

Dr. Sudha Nair summed up the on-going debate on gender issues and briefed the modalities and requested the participants to suggest specific recommendations looking in to a holistic dimension.



RECOMMENDATIONS

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1. Recognise the Gender roles in conservation

- Women of the tribal and rural communities play a predominant role and they possess enormous knowledge in conservation, management and use of bio-resources, which needs to be documented, recognized, and properly evaluated.
- Gender differentiated contribution exists in the agrobiodiversity conservation and traditional knowledge systems and practices.
- Women and Men have the right to better living standards, water and sanitation, technical and higher education, health security, food and nutritional security and that to be heard and participate in developmental programmes.
- There is a pressing need for revitalization of the traditional systems related to the reproductive health care practices, homestead gardens, medicinal herbs, food crops which they use in there everyday life.

2. Develop a pro-active State Policy

The State must play a pro-active role in bringing the tribal and rural women into the mainstream of development through appropriate policy support and enabling mechanisms (access to higher and technical education, health and nutritional security, skill empowerment, credit, employment and economic empowerment). There should be targeted specific action plans drawn up to address these above mentioned points and pave the way for their effective participation.

3. Extend Institutional Support

- Existing national/state level institutions like Women Commissions, Commissions for Backward classes, Minorities, Scheduled Communities should address the gender related issues in natural resource management, biodiversity conservation and development.
- Local level institutions like women SHGs/ Co-operatives/ Gramasabhas / Panchayats etc must be strengthened in order to address the issues related to gender sensitive development approaches in biodiversity conservation and utilization.
- The role of women in the management of common property resources like PFM, Water Users Group, Conservation programmes etc need to be strengthened and their capacities need to be built to enable an effective participation, revival of communal rights, inclusive of women, living within the forest ecosystems and hot spots.

4. Provide Better Living Standards

- Health clinics and health camps for women and children need to be conducted in regular intervals at panchayat levels in tribal concentrated areas. Health insurance schemes for tribal men and women are a must as they are highly vulnerable to diseases. De-addiction centres for men need to be set up to get rid of their alcoholism and counseling centres for women to enhance their self confidence to face developmental challenges.
- Research should look into the needs of women in conservation, management and developing appropriate and local specific

technology to reduce drudgery in performing the respective roles - as gatherers, cultivators and seed conservers, homestead managers, healers etc.

- Ensure the extension of the PDS system to food insecure tribal groups in remote areas.

5. Improve Sustainable Livelihood Options

- There is a need to revitalize local artisans, skills, local food culture by supporting women SHGs involved in eco-enterprises through capacity building in terms of value addition, marketing skills, institutional support for production and market outlets. Special government employment schemes are required for women in off season related to their skills and available resources (e.g. bamboo based handicrafts).
- Promotion of indigenous knowledge system and practices through various media to recognize and understand the gender differentiated contribution to the BD conservation and enhance their status and promote their basic human rights.
- Special efforts need to be undertaken by the State to mobilize tribal women and create awareness on their legal rights and their role in conservation and value of agrobiodiversity and facilitate networking and linkage among different tribal and non tribal women's federations. They also should be encouraged to be part of local tribal movements and federations.
- The Community Biodiversity Registers acknowledge the gender differentiated knowledge systems derived out of their gender roles and should include the documentation of women's knowledge and their contribution in conservation, management and sustainable usage to

enable them to acquire rewards and equal sharing in benefits. Guidelines for development with gender sensitive approach for panchayaths- inclusive of community seed/food banks, legal and genetic literacy, CBR etc are to be provided.

- Extension of the Kudhamsree, IT enabled development like Akshaya programme etc, should be extended effectively to tribal women.



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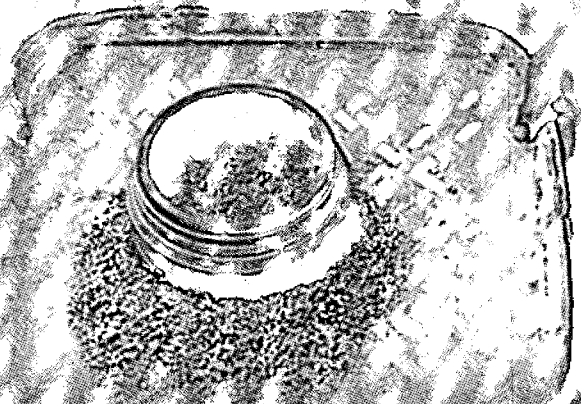
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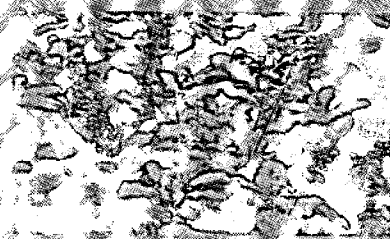
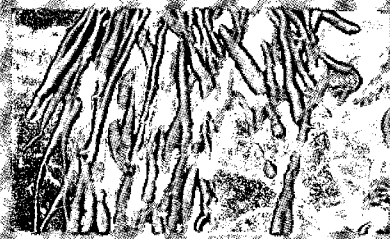
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**ROLE OF HERBAL WEALTH AND MEDICINAL RICES
IN TRIBAL AND RURAL LIVELIHOOD SECURITY**



2009
GARDENS
CALALAN
CUBAN
P.O. BOX 1

Article 8 (j) of CBD calls on the contracting parties to respect, preserve, and maintain the knowledge, innovations, and practices of indigenous and local communities embodying traditional lifestyles. It also calls for the equitable sharing of benefits arising from the utilization of such knowledge, innovations, and practices. The issue of integrating equity principles to benefit sharing arrangements has been under the consideration of the contracting parties since 1996. The absence of an internationally agreed methodology for sharing economic benefits from the commercial exploitation of biodiversity with the primary conservers and holders of traditional knowledge and information is leading to a growing number of accusations of bio-piracy committed by business and industry in developing countries. Bio-piracy can be converted into bio-partnership only if the principles enshrined in article 8(j) of CBD are adopted both in letter and spirit by public and private sector institutions and commercial enterprises.

ROLE OF HERBAL WEALTH AND MEDICINAL RICES IN TRIBAL AND RURAL LIVELIHOOD SECURITY

Session Chair : Prof. M. S. Swaminathan; *Key note Speaker* : Dr. N. Anil Kumar; *Presentations* : Sri. V. Saji Kumar, Sri. N.K. Mahadevan, Sri. K.B. Ramesh Kumar, Ms. Sunitha Bhaskaran; *Panel discussants* : Dr. Leena Kumari, Dr. C.R. Elsy, Dr. Abdul Nizar, Sri. Radha Krishnan, Sri. Abdul Kareem, Sri. K.V. Divakaran; *Rapporteur* : Dr. A.B. Ramashree

Introduction

According to 2003 Human Development Report, Kerala has health indicators similar to those of USA - despite a per capita income 99 percent lower and an annual expenditure on health of just \$28. How is it achieved, even with its high density of population? Three reasons could be attributed - the strategic geographic position of the State, which helped it to possess rich biodiversity and a salubrious climate; its longest and more or less unbroken herbal based health care traditions, especially in terms of household remedies and the Ayurvedic system of medicine; and the collective reforms that took place in societal and individual life of *Malayalees* through their cultural, spiritual and political strengths.

It is high time to take advantage of these achievements of the State to develop the health care system to lead the way for its economic prosperity. The comparative advantage of Kerala in the global scenario of herbal medicine is not only the existence of a wide variety of Medicinal Plants and traditional health care systems like Ayurveda, but also its diverse ethnic - herbal knowledge. Kerala can capture this opportunity as it is endowed with a rich genetic wealth- a capital wealth for its economic prosperity and play a major role, if its political machinery finds innovative partnerships in R & D for sustainable use of the herbal wealth of the State.

Six major steps are needed for the sustainable use of medicinal resources of the state. These are: (1) *Genetic Resources Conservation & Sustainable Use*, (2) *maintaining the Purity and Authenticity of Ayurveda*, (3) *establishing Growers Associations for medicinal plants*, (4) *establishing Herbal Sanctuaries*; (5) *establishing Herbal bio-valley* and (6) *educating the public about the Protection of Plant Varieties and Farmers' Rights and Biodiversity Acts*. It would be desirable to develop the region extending from the Silent Valley Biosphere Reserve up to Wayanad as a Herbal Bio-Valley, on the model of the Silicon Valley of USA for Computer Software. The herbal bio-valley should provide the biological software essential for a dynamic medicinal plant industry. Development of a dynamic medicinal plant industry requires an integrated approach in addressing all these six components.

Keeping this rationale in mind, the session has reviewed papers presented and discussed the immediate actions needed in this sector. We hope these recommendations will be of help to the concerned authorities and policy makers to take a strong decision for sustainable utilization of the herbal wealth of the State.



Some Objectives of concern in Medicinal Plant Sector (Open discussion)

1. Genetic Gardens for Medicinal Plants

Although farmers are interested in the cultivation of medicinal plants, there is no ready supply source for planting materials for the species in demand as of today. There is a dearth of availability of good quality planting materials. Therefore, the farmers and women SHGs will have to be encouraged by providing good quality mother seeds/planting materials and the infrastructure needed for rapid multiplication through competent technical

Products like honey, amla, wild pepper, both the cultivated and wild turmeric and ginger collected from the forests of Wayanad are characteristically different in properties from such products obtained from other geographic locations

institutions in the district. This would help in the timely availability of planting and seed materials. In this context, plant nursery units at centralized and village levels be initiated. Setting up of tissue culture labs at district level attached with KVK or such kind of organisations will certainly help to solve the problem of large-scale supply of planting materials.

2. Research Initiatives for establishing Geographic properties of Medicinal Plants

The geographical advantages of highlands reflected in the properties of several medicinal plants cultivated in hilly areas, are to be investigated in a scientific manner. Products like honey, amla, wild pepper, both the cultivated and wild turmeric and ginger collected from the forests of Wayanad are characteristically different in properties from such products obtained from other geographic locations. Studies should taken up to understand the genetic variability of the different species of medicinal plants and the

result of such studies are to be correlated with the knowledge associated with such materials in the realm of ethnic medicine, ayurveda and modern sciences.

3. Initiatives to Promote Herbal Tourism

Herbal or Ayurvedic Tourism has high potential in the state, thanks to its salubrious climate and rich herbal wealth. The landscape diversity that varies from forests, bushes, thickets, rocky grasslands, fallow fields, springs, streams, canals and wetlands- a fine example of a heterogeneous ecosystem as well as the rich ethnic diversity with unique health care knowledge and practices, provide an ideal situation for Herbal tourism.

This potential could be utilised in a scientific and more efficient manner.

4. Herbal Parks for Herbal Production

A sizable percentage of income of rural house holders is spent towards health care needs, thus along with the education and awareness programmes, the production of herbal products at community level by ensuring all quality parameters could be encouraged. Good quality production and storage measures have to be ensured in case of these products in a cost-effective manner at community level. The women SHGs are to be trained by skillful and qualified herbal practitioners in such ventures to enable them to produce simple primary health care nutraceuticals and diverse kinds of cosmaceuticals.

5. Networking of Partner Institutions and Linkages with PRIs

The responsibility of conservation and enhancement of the Herbal wealth of Kerala is shared by several institutions, notably,



TBGRI- Palode, AVS- Kottakkal, KFRI- Thrissur and a number of new pharmaceutical firms in private and public sector. Networking of such R&D institutions and their linkages with the Panchayath Raj Institutions after identifying the area of collaboration is an effective strategy for achieving the goals set in this sector. For instance, the Community Agrobiodiversity Centre of MSSRF is working

for the revitalization of primary health care traditions for a long period of time through a networking approach with NGOs, University/Govt. Extension services, Forest Departments and PRIs. The Centre has taken up the current subjects - legislations in Biodiversity and Plant varieties' conservation as their focal theme for education and training in the sustainable use of the herbal resources.

Table-1. Medicinal Plants with domestic and export potential suitable for cultivation in Kerala & South Indian region.

Local Name	Botanical Name	Local Name	Botanical Name
Ashokam	<i>Saraca asoca</i>	Kacholam	<i>Kaempferia galanga</i>
Pathimugham	<i>Caesalpinia sappan</i>	Brahmi	<i>Bacopa monnieri</i>
Koovalam	<i>Aegle marmelos</i>	Pachila, Pachauli	<i>Pogostemon pachouli</i>
Palakappayyani	<i>Oroxylum indicum</i>	Koova	<i>Curcuma zeadaria</i>
Kumizhu	<i>Gmelina arborea</i>	Kanikkonna	<i>Cassia fistula</i>
Shathavari	<i>Asparagus racemosus</i>	Nellikka	<i>Emblica officinalis</i>
Chittaratha	<i>Alpinia galanga</i>	Savam naari	<i>Catharanthus roseus</i>
Neelayamari	<i>Indigofera tinctoria</i>	Paal Muthakku	<i>Ipomoea digitata</i>
Thippali	<i>Piper longum</i>	Kurangu Manjal	<i>Bixa orellana</i>
Iruveli	<i>Coleus zeylanicus</i>	Thulasi	<i>Ocimum sanctum</i>
Adapathiyam	<i>Holostemma ada-kodien</i>	Vellakunni	<i>Abrus precatorius</i>
Kattupadavalam	<i>Trichosanthes cucumerina</i>	Nagadandi	<i>Baliospermum montanum</i>
Amukkuram	<i>Withania somnifera</i>	Trikolpakonna	<i>Operculina turpethum</i>
Ramacham	<i>Vetiveria zizanioides</i>	Chittadaladokam	<i>Adhatoda beddomei</i>
Nannari	<i>Hemidesmus indicus</i>	Kattoor vaazha	<i>Aloe vera</i>
Naykkuruna	<i>Mucuna pruriens</i>	Vayampu	<i>Acorus calamus</i>
Koduveli	<i>Plumbago indica</i>		

The National Medicinal Plant Board has recommended 32 species of medicinal plants for large-scale cultivation, out of which 20 species can be cultivated in South Indian habitats. These species and medicinal rice varieties like *Navara*, *Chennellu* and spices like wild pepper and orchids like *Nervilia* are a few among the plants with potential for large-scale cultivation.



RECOMMENDATIONS

1. Conserve Medicinal Plants and Medicinal Rices

(Key note address: Dr. N. Anil Kumar; Panel discussants: Dr. Leena Kumari, Dr. C.R. Elsy and Dr. Abdul Nizar)

1(a). Conserve Rare Groups of Medicinal Plants

The Genetic Resources of the State are becoming rare and threatened. For instance, the medicinal orchids like *Cymbidium aloifolium*, *Dendrobium ovatum*, *Eulophia nuda*, *Flickingeria nodosa*, *Luisia zeylanica*, *Malaxis acuminata*, *M. rheedi*, *Satyrium nepalense* and *Vanda testacea* that are employed for a variety of therapeutic uses are now become highly endangered. The National Medicinal Plants Board listed all the medicinally important orchids as very rare or endangered and disqualified such collections from the wild for exporting. Another such banned species for export is *Cycas circinalis*, which is a gymnosperm plant with varied uses as medicine, food and decoration for its seeds, pith and leaves. Such critically endangered species that are listed in various Red Lists should be multiplied in mass numbers using tissue culture and other rapid seed multiplication techniques.

1(b). Develop Medicinal Rices and Herbal Foods

Among the rice varieties known, some are with the qualities of a drug and are used internally in ailments like diarrhea; diseases of the urinary organs and occasionally in catarrh; also externally as an application to muscle wasting, burns and scalds. *Navara*, *Chennellu*,

Erumakkari, *Kazhungum puthada*, *Karutha chembavu*, and *Kunji Nellu* are few of the rice cultivated entirely for the medicinal purpose in Kerala. But except *Navara* and *Chennellu* others are not now known in cultivation.

At least half- a -dozen rice varieties with medicinal value are known to be in use in Kerala, but cultivated largely at household level for some special purposes. Wider cultivation of such rice varieties can be promoted after establishing the 'specialties' of such varieties. To cite an individual case as noted

in this context is *Navara* - a rice variety, which is widely used in Ayurveda for curing various ailments. *Navara* is a very early maturing type of rice, which is harvested within a span of 60 to 90 days. Two clearly distinguishable forms exist in this variety - one with black glumes and other with golden - yellow glumes. Within the strain there are two more different forms - one with awn and other without awn. Thus, the variety is existing in four morphologically distinguishable strains, but adapted to same kind of agro-ecological conditions.

Amongst the two strains, the black coloured strain without awn is claimed to be the genuine variety and considered to be medicinally more useful according to the farmers and healers of Malabar region. Whereas for the farmers of Thrissur and Palghat region, the black glumed spike with awns are the real *Navara*. In south and central Kerala, but farmers do not even know there is a strain of *Navara* with black glumes. Theirs is the slender, golden- glumed beautiful grain without awn. Still farther, towards south, the farmers and healers

It would be desirable to develop the region extending from the Silent Valley Biosphere Reserve up to Wayanad as a Herbal Bio-Valley, on the model of the Silicon Valley of USA for Computer Software. The herbal bio-valley should provide the biological software essential for a dynamic medicinal plant industry.



cultivate and use the golden - glumed - awned type. Yet all these are being used in local health care systems as well as in Ayurveda for many of the ailments. Navara was never been in use as a food grain for regular consumption by the farmers of this region, and because of this reason there were no large- scale cultivation. It is however, recommended to feed the newborn babies in the form of a dish- 'angri' made of navara flour and dried powder made of a banana variety called 'kunnan" much before their first feeding ritual. This rice is said to be very nutritious, balanced and safe food for babies. It is recommended for consumption for the people of all ages to increase the vitality, and as a natural energiser. The rice is better when used in raw. Therefore, the immediate actions to be taken are:

- Initiate studies involving scientists from different disciplines –biochemists, ethnobotanists, medico botanists, and medical doctors- to reveal scientifically the qualities of Navara for making it to enter the herbal and food market.
- Take steps for the validation of local use of *Navara* rice using conventional and modern techniques.
- Conduct product development research by giving priority to medicinal rice like *Navara* and *Chennellu* for producing nutritious food like Baby Food and other such Value added products.
- Since 2004 is UN International Year for Rice, take immediate efforts to begin a holistic approach to Navara rice-Project by integrating different studies from agronomy to molecular biology.
- Encourage Students to start Agri-clinic and Farming to produce commodity and products with the guidance of NABARD and/or such set- ups for agricultural and rural development..
- Give priority to Red Data Book species and Endangered plants for *in-vitro* and Seed

propagation. Mass propagation, and establishing nursery centres of medicinal plants need urgent attention.

- Promote both In-situ and Ex-situ conservation of economically important but threatened or rare medicinal plants.

2. Initiate Organised Cultivation of Medicinal Plants

(Panel discussants: K. Radha Krishnan, Abdul Kareem and K.V. Divakaran)

Medicinal Plant cultivation is becoming popular among the farmers, especially in Ghat regions, which are rich in natural resources and biodiversity. However, a careful analysis reveals that a majority of cultivated medicinal plants are exotic, which otherwise are not available in wild to meet the demand of the industry. For example, now famous medicinal or aromatic plants among the farmers of Kerala and Karnataka like Annatto (*Bixa orellana*), Stevia and Peppermint (*Mentha piperita*) are not indigenous to India. At the same time there are several indigenous plant species that have high commercial demand which are still collected from the wild and are becoming very rare, but did not successfully introduced for cultivation. The National Medicinal Plant Board has recommended 32 species of medicinal plants for large- scale cultivation, out of which 20 species can be cultivated in South Indian habitats. These species and medicinal rice varieties like *Navara*, *Chennellu* and spices like wild pepper and orchids like *Nervilia* are a few among the plants with potential for large - scale cultivation . Therefore following steps are to be undertaken immediately.

- Address the problem of Planting material scarcity by setting-up village level Seed Production Centres (nurseries) of commercially viable plant species. Educated youth can start this as an enterprise as a part of the Agri-Clinic.
- Set up the infrastructure needed for large-scale medicinal plant cultivation. For example, Tissue Culture Lab; Drying Yards,





Raw Drug Processing Unit etc. at district level in the places identified for this purpose.

- ❑ Formation of Medicinal Plant Cultivators Groups -(Self Help Groups of Women and Farmers) in the model of Sanjeevani (AVS, Kottakkal) and link them with the pharmaceutical enterprises.
- ❑ Organize the National Medicinal Plant Board's efforts more farmer-friendly. The State unit of Board may have to strengthen their out reach to farmers with less hazles in medicinal plant cultivation.
- ❑ Promote Organic cultivation through Group Farming. Production Centres for organic inputs are to be established at Panchayath level by piling inputs raised at *in-situ* level.
- ❑ Offer institutional back up to farmers, for

About 450 raw drugs are used in the manufacture of 500 Ayurvedic medicines on a commercial basis in Kerala with an annual trade in Ayurvedic medicines about Rs. 200 crores.

the production of quality seedlings of selected plants and provide useful information about plant species, their cultivation, storage, and marketing methods.

- ❑ Introduce certification process for proving the authenticity of the medicinal plant produced and the method of cultivation followed for its production.
- ❑ Carry out an economic analysis of cultivation of the species of high commercial demand.

3. Conduct Periodical Studies of Raw Drugs Market Dynamics

(Panel discussants: K. Radhakrishnan, Abdul Kareem and A.B. Rama Shree)

The herbal market of the State today is

unorganized due to various reasons. The nature and dynamics of this domestic trade, is far from simple. It involves central and regional markets through a number of private dealers and agencies, government controlled cooperatives all having upstream linkages with numerous local and "road-head" markets, which in turn have myriad middlemen, petty shopkeepers and agents feeding them with primary supplies. There are also contract farmers who regularly supply bulk quantities of raw drugs to established Institutions like AVS. About 450 raw drugs are used in the manufacture of 500 Ayurvedic medicines on a commercial basis in Kerala with an annual trade in Ayurvedic medicines about Rs. 200 crores. A study by KFRI shows that only seven percentage of total consumption of raw drugs in Kerala is met by the cultivation, while 93 percent is still through collection from the wild. The situation thus warrants the supply of good quality raw drugs cultivated and marketed by ensuring relevant quality control measures. Several species have got high demand, for example, Kacholam has an

annual demand of 748956 kg, in Malabar region alone. Likewise, Chengazhi (17487 kg), Kasthuri Manjal (13271kg) and Vayambu (89875 kg) are used heavily in Kerala. Intermediary play a significant role in the trade, but unfortunately it is largely secretive in nature as there is no declared market for raw drugs or fresh picks from herbal gardens. Therefore, the Recommendations are :

- ❑ Study the genuineness of Raw drugs through morphological, taxonomical and molecular methods.
- ❑ Conduct a thorough market study ranging from the harvest to market and consumers' table and publish the prices of plants traded directly by the user companies.
- ❑ Small- scale Raw Drug Collection Centres at Panchayath level may be promoted, and

collections from such centres could be pooled at few semi- processing units equipped with good storage facilities in some selected localities depending upon the degree and level of cultivation of medicinal plants. A central processing unit cum export facility also may be started at the district or zonal level with all modern facilities. This Central unit can function as a supply unit for exporters/ domestic markets and the manufacturing industry.

4. Coordinate attempts in Documentation of Traditional Knowledge

(Panel discussants: Dr. C.R. Elsy, Dr. Anil Kumar and K.B. Ramesh Kumar)

One of the primary aims of any research on the genetic wealth is to give effect to the provisions of the recent legislations of India viz. Protection of Plant Varieties & Farmers Rights Act 2001 & Biological Diversity Act 2002. Setting examples for benefit sharing arrangements with the knowledge providing communities is imperative for conserving their dying traditional wisdom as well as the plants valued for their uses. This critically depends on the ability to link such knowledge with the innovations in the biotechnological discoveries based on prior knowledge of its uses. The steps such as mobilising communities/ individuals to register Claims of Knowledge, documentation of such knowledge on Ethno-medicine and building databases, and employing relevant methods for its validation are to be taken, if the tribal men and women could be benefited by the provisions of the two Indian Acts. Very diverse folk medicinal plants are found in many remote areas in Kerala. However, their documentation is becoming a confusing exercise as a given species may bear different vernacular names in different places. We should not shy away from utilizing such kind of knowledge in a wider way, but of course with the consent of the knowledge holders of

such genetic wealth. The steps needed in this direction are:

- Establish Medicinal Plant Knowledge Centres at district or zonal level for dealing with Farmers' Rights and to give all the details from seed collection to value addition and marketing to the farmers.
- Prepare Panchayath level Medicinal Plant Registers by involving local traditional healers, elderly men and women, herbal collectors, raw-drug dealers and ayurvedic doctors.



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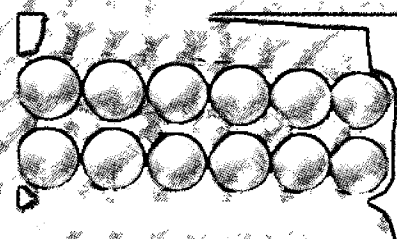
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POULTRY FARMING IN RURAL AND TRIBAL LIVELIHOOD SECURITY



According to IFPRI, global demand for cereals is projected to increase between now and 2020 by 41 percent and for meat by 63 per cent. The 'food gap', i.e., the difference between production and demand for food could more than double in the developing world in the next 25 years. The world watch institute predicts that India my have to import more than 40 million tones of food-grains by the year 2030. It has been predicted that China will also have to import more than 200 millicn tonnes by 2030. Where will all this food come from?

POULTRY FARMING IN RURAL AND TRIBAL LIVELIHOOD SECURITY

Session Chair : Dr. Jalaludeen, KAU; *Keynote Speaker* : Dr. L. R. Gopinath; *Panel Discussants* : Dr. Radhamma Pillai, RARS, Ambalavayal, Mr. Manjunath, Venketasa Hatcheries; *Rapporteur* : Smt. Elsy Mathew.

Introduction

Both Agriculture and Animal husbandry are important when agricultural development of any state is concerned. Poultry figures one of the major activities in Animal husbandry in India. Our state's average growth rate in poultry is 5.8% for the last few years. Though average growth rate in poultry is reasonable, the cost of production of egg as well as processed chicken is very high and only way to bring down the cost of production is enhancing the production efficiency. Major share of the expense in poultry production goes to poultry feed. In our state it is estimated that on average 70 – 75% is spending for poultry feed.

Composition of poultry feed is different for production of egg and dressed chicken. The energy supplying portion and protienaceous portion are the two important compositions to be considered when feed formulations are consulted. Maize, jowar, rice bran are the major energy suppliers whereas oil cakes like ground nut oilcake, gingelly oil cake, soybean meal, dry fish are the protein source. Energy supplying portion consists of 64–89% for general feed, feed for 9–19 months old chicks respectively—s mainly used are maize or jowar, consists about 50% of the feed. A model broiler starter feed has 50% of its composition is maize where as in feed composition for finisher broiler feed it will be 55% and small chicks the maize (broken) content will be 45%.

Per capita consumption of poultry products in Kerala is comparable to developed countries in Europe and so there is a big scope for its further development.

Per capita consumption of poultry products in Kerala is comparable to developed countries in Europe and so there is a big scope for its further development. But climatic condition, population density of the state, average land holdings, availability of raw materials for the production of poultry feed are the major hurdles for the breakthrough in this direction. To make headway in poultry production is in the neighboring states, the R&D has to find out alternate source for energy supplying materials. Tropical tuber crops, mainly cassava or perhaps yams can be considered as a candidate. Moreover, peoples participatory approach / joint farm can be exploited in enhancing the production of poultry feed.

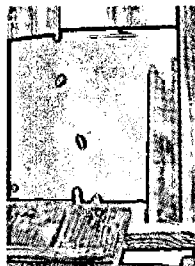
Keeping this rationale in mind the panel has discussed the problems and prospects in poultry farming in Kerala. The panel has unanimously agreed that the poultry farming is an important area for improving the livelihood options of tribal and rural communities. Following are the recommendations to set up an economically, socially and environmentally viable poultry industry for the state of Kerala.

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RECOMMENDATIONS

1. As there are no exact data available on the egg and poultry meat in the State, a detailed survey on the volume of poultry activities should be taken up urgently. Panchayath level recording of such data on yearly basis is necessary.
2. Efforts should be made for the intensification of Rural Poultry Production Programmes in every panchayaths of the state with the help of Kudumbasree women groups.
3. Conservation of Desi Found breeds/germplasm in Kerala has to be initiated and strengthened. Tribal areas of the State has to be given priority in such interventions.
4. Considering the role of poultry in poverty alleviation, nutritional security and providing employment, industrial poultry production need to be strengthened in the State.
5. As Kuttanad ducks are potential egg producers of very large size compared to all other native ducks in India, measures to enhance its productivity and its popularization may be taken up-urgently.
6. Small -scale poultry Dressing Plants/Meat-Processing Plants may be set up in Panchayath/ Taluk levels for clean meat production.
7. As farmers are not getting remunerative prices for their products, steps should be taken for better marketing efforts and effective distribution systems (for eggs and chicken in urban -rural area.)
8. Empowerment of rural women through small-scale programme at urban level should be explored. Efforts should be made for the popularisation of other species of poultry, viz. chicken, guiniie, turkey etc.
9. A Poultry Development Board may be set-up at National Level with region wise-representation.
10. Emphasis may be given for the production of poultry feed grains by assuring remunerative prices through Government as well as NGOs.
11. Financial support may be given for NGOs and co-operative societies for establishing small feed-mixing plants (custom feed mixing).
12. Efforts may be taken for the commercial production of local breed poultry eggs.



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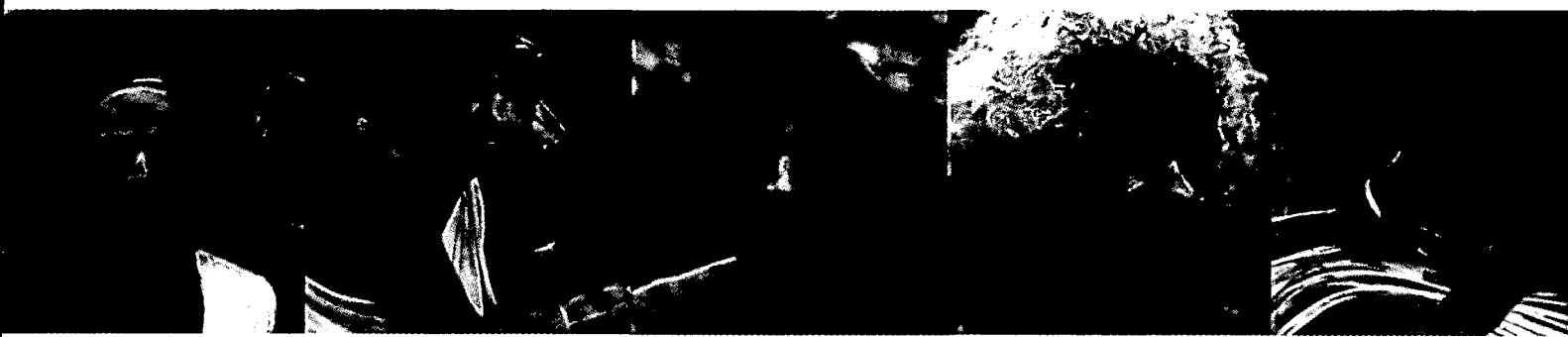
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M.S.SWAMINATHAN RESEARCH FOUNDATION COMMUNITY AGROBIODIVERSITY CENTRE

M. S. Swaminathan Research Foundation established Community Agro biodiversity Centre (CABc) in 1997 in Wayanad - an agrobiodiversity hotspot in Western Ghats to promote community centred natural resource and agrobiodiversity management systems. This institution is also to serve as a Centre of Excellence for facilitating field level implementation of the provisions relating to Farmers' Rights in the Protection of Plant Varieties and Farmers' Rights Act and the Prior Informed Consent and Access & Benefit Sharing provisions of the Biodiversity Act of India.



THE SWADESHI SCIENCE MOVEMENT

The Swadeshi Science Movement is a National Science Organisation, which takes the spirit of Swadeshi from the freedom movement along with the ethos of Bharateeya culture and welds them on to science, engineering and technology. The aim is to evolve a comprehensive policy framework for national development, and this would naturally depend on a coherent and compatible system of education, science, technology, industry and economic activity. In order to encourage our scientists and researchers to propagate and publish their scientific findings, the Swadeshi Science Movement has been organizing the Swadeshi Science Congress every year since 1991, coinciding with the birthday of Sir. C. V. Raman.