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FORESTRY EXTENSION:

Science and Practice for the 21st Century

EXECUTIVE JUMMARY

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SUMMARY PROCEEDINGS OF THE 2ND IUFRO FORESTRY EXTENSION WORKING PARTY (S6.06-03) SYMPOSIUM

7th-12th September, 1997,

NAIROBI, KENYA

Edited by: Alice A. Kaudia, Florence Chege, Bernard Muok and Bernard Owuor

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ACRONYMS AND ABBREVIATIONS

Geographic Information Systems GIS International Monetary Fund IMF Integrated Pest Management in Agroforestry **IPM-AF** International Union of Forestry Research Organizations **IUFRO** Japan International Co-operation Agency JICA Kenya Forestry Research Institute **KEFRI** NIPF Non-Industrial Private Forests Non-industrial private forest landowners (NIPFs) SFI Sustainable Forestry Initiative Social Forestry Training Project SFTP United Nations Conference on Environment and Development UNCED

ACRONICALS AND ARREST ACTION

BACKGROUND

During the period 7th to 11th September, 1997, twenty two (22) forestry research and extension practitioners from nine (9) countries attended the second IUFRO Forestry Extension Working party (S6.06-03) Symposium in Nairobi, Kenya. The theme of the Symposium was "Forestry Extension: Science and Practice for the 21st Century".

Focus on the 21st Century was considered a timely action. Extension practice is being revolutionized by the emergence of Information Technology. Further, there is an evident change in the perception of the role of extension agencies as suggested by the discussions during the 1st IUFRO Extension Working Party Symposium held in Freising, Germany. One of the key observations from this symposium was that extension approaches and methods should be based on scientific knowledge. Best approaches and methods should be used for defined client groups. It is therefore necessary to intensify research in forestry extension.

As a result of dwindling resources from donor and government sources, forestry extension should be self-financing This condition has implications for strategies that may be used successfully for forestry extension, particularly in developing countries.

The goal of the 2nd symposium was:

"To advance global knowledge in forestry extension and development".

It was noted that this should be a long term goal of the Working Party and that the outlined specific objectives for the symposium would guide deliberations and discussions during the meeting. The specific objectives, as presented by the symposium organizers in Kenya were as follows:

- Review the practical and research efforts in forestry extension;
- Discuss practical and research experiences in forestry extension;
- Learn the state of the art in forestry extension research and development under different ecological, economic, sociological, and cultural conditions;
- Promote global exchange of scientific and development information in forestry extension.

The Symposium program was designed to facilitate exchange of experience between participants through presentation of thematic papers, group discussions and practical observation of human and ecological conditions that present challenges to forestry extension. The practical observations were accomplished through field visits to the scenic forestry plantations in the highlands of Kenya in vicinity of the great Rift Valley. A contrasting environment in the semi-arid Kitui district was also visited. Different aspects of forestry extension needs were elicited by the visit to semi-arid areas where forestry plantations are replaced with scrub grassland and isolated trees in farm lands. The host project in this area was the Kenya/Japan Social Forestry Project; a research and extension project implemented by the Kenya Forestry Research Institute since 1985. Through this visit, participants interacted with different actors in the field of forestry extension: farmers, schools and researchers.

The symposium was opened by Dr. P.K.A. Konuche, the Director, KEFRI and closed by Dr. Kapyas, W. Kipkore, Chief Conservator of Forests, Forest Department, Kenya.

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OPENING SPEECH AND KEY NOTE ADDRESS

Dr. P.K.A. Konuche, Director, Kenya Forestry Research Institute

Ladies and Gentlemen, I am pleased to have this opportunity to address you during this 2nd IUFRO Forestry Extension Working Party Symposium. This important symposium has been organized at a time when the international community is concerned about the fate of the world's forests. The United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992, focused world attention on forest issues. However, about five years after the Rio Summit, the world community is still concerned about forest degradation in developing countries and the failure to contain the escalating rate of tropical deforestation (UNEP, 1996).

During the last 15 years, the world's forests, estimated to cover 3454 million hectares or 26.6 percent of the total land area of the world (FAO, 1997), have been shrinking at the rate estimated at 12 million ha (FAO, 1997) to 15 million (UNEP, 1996) ha per year. This rate of deforestation is about 24 ha per minute. The greatest loss is in developing countries of Latin America and Africa, where rapid population growth continues to result in conversion of forests into agricultural lands. In Africa, the annual rate of deforestation is estimated at 0.7 percent (FAO, 1997). In Kenya, for example, approximately 19000 ha (0.2 percent) of our forests and woodlands are lost per year.

Ladies and Gentlemen, the negative impact of deforestation in tropical countries has resulted in:

• Scarcity of wood products;

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- Loss of biological diversity;
- Increased desertification in drylands:
- Increased soil erosion and disruption of stream flows;
- Declining soil fertility and hence crop yields and slowing down of economic growth; and
- Increasing poverty and political instability.

The Structural Adjustment Programme introduced by the IMF has exacerbated the above problems especially increasing poverty.

In order to address the above problems, efforts on natural resources management should focus on:

- Addressing the underlying causes of deforestation and degradation by paying particular attention to socioeconomic issues;
- Developing strategies to improve utilization of forest products;
- Improving productivity of agricultural lands to reduce further conversion of the remaining forests for crop production;
- Rehabilitation of degraded forest areas using indigenous species to enhance environmental conservation values;
- Accelerate development of forest plantations both in traditional forest areas and in farmlands (farm forestry);
- Strengthening research addressing critical forest problems and issues such as participatory forest management, valuing of forest products, integrated natural forest management;

- Strengthen the capacities of institutions in developing countries to plan, manage and conserve the remaining natural forests; and
- Strengthen information dissemination and forestry extension.

Ladies and Gentlemen, may I now turn to forest extension which is the subject of discussion in this Symposium. Forestry extension involves providing information and technologies to people to assist them to carry out forestry activities (Emerton, 1996). For a long time, forest extension in developing countries was synonymous with seedling production and tree planting and little attention was given to providing information to users on other aspects of forestry, for example, utilization of forest/tree products.

Ladies and Gentlemen, I see the main role of forestry extension as being a strong bridge between researchers and users of research findings. It is expected to translate research results into more understandable forms before conveying them to the users. We must address the bottlenecks in forest extension which originate from:

- Narrow view of forestry extension in developing countries, where extension is biased toward forest production aspects, for example seedling production tree planting and not even growing. How can we correct this? Little attention is given to the management and utilization issues;
- Dissemination of information to clients is given low priority by researchers;
 - Long periods of experimentation is required in forestry research;

- The rate of adoption of technologies is low;
- Due to inadequate policy guidelines, extension messages are usually conflicting especially those relating to land use;
- Research and extension are usually carried out by different government institutions and the linkages are weak;
- Weak forestry extension agencies;
- Many NGOs with poorly co-ordinated efforts; and
 - Training of extension workers is heavily biased on biophysical or technical matters and their understanding of socio-economic issues which are more important to the clients is inadequate.

Socio-economic factors which may affect forestry extension include: cash income, food security, access to markets, labour and time availability, cultural norms and in the case of tree growing, land tenure systems.

I will now draw on our experience in forestry extension in developing countries in general and in Kenya in particular. About 30 years ago, forestry extension did not exist in many countries in Africa. What we had was a form of propaganda telling rural communities the need to preserve the state "forests to bring rain". During the 1970s, the energy crisis created an awareness on the need to promote tree planting in areas outside state forests. This is what came to be understood as forest extension in Kenya. Since then many of researchable issues have been identified.

EXTENSION RESEARCH

There are a number of research questions:

- Are community-based extension systems cheap or costeffective?;
- Can researchers double up as extension agents?;
- Can unified multi-sectoral approach to extension by government extension institutions work?;
- Are the methods used in agricultural extension appropriate to forestry?;
- Can forestry extension be privatized?;
- What would be the impact of increasing commercialization of research results?;
- Which methods of extension are most cost-effective under different socio-economic situations?;
- Can indigenous knowledge be applied in forestry extensions?; and
- What role do gender issues play in forestry extension?

Future direction of forestry extension will be to adopt the participatory approach. Extension agents will be facilitators who can help the clients to find opportunities to improve their situations. Extension will be a demand-driven service.

I believe that your deliberations will greatly contribute to advancement of global knowledge in forestry extension and development.

I would like to welcome all of you on behalf of the Organizing Committee to this symposium. I particularly would like to extend my warm welcome to the participants who have come from outside Kenya. I would also like to express my appreciation for the efforts made by the participants and the organizers to hold this symposium in our country.

You have come here to discuss how to improve forestry extension in practice but we need to recognise that it is not enough to discuss issues and problem in forestry extension without discussing global problems of forest management and conservation.

Research and development needs in the field of forestry extension are vast and challenging. This symposium has a heavy task ahead. It is my expectation that given the diversity of professional expertise of participants to this symposium, we shall cover a commedable mileage in this field. With these few remarks, it is now my pleasure to declare this symposium officially open.

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ABSTRACTS

The Sustainable Forestry Initiative and its Effect on Extension Programs in Virginia

James E. Johnson

Chair, IUFRO Extension Forestry Working Party

The Sustainable Forestry Initiative (SFI) is a program sponsored by the American Forest and Paper Association (AF&PA). Its goals are to foster the practice of sustainable forestry on industry-owned lands in the U.S., as well as lands from which member companies purchase wood. As such, the SFI, initiated in 1994, affects nearly all forest lands in the eastern U.S. In Virginia, an SFI Task Force has been created to oversee a host of educational activities targeted toward loggers and forest landowners.

During 1996 and 1997 a state-wide logger education program was initiated. Through this program, 38 educational programs also established a statewide Forest Landowner Council to oversee efforts in councils on a multi-county basis, to empower landowners locally to develop educational programs. A short course series is currently being developed, and will be initiated during the fall of 1997. Short course topics include:

- An Introduction to Woodland Management;
- Harvesting and Marketing Timber; and
- Wildlife Management.

Key Words: Extension Forestry, Forest Industry, Sustainable Forestry, Education

Gender Perspectives in Social Forestry and Strategies for Addressing Gender Issues in Rural Development

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A common element in many cultures is the traditional division of rights, roles and responsibilities which usually places women in an inferior position socially, economically, legally and politically.

In rural development, women's role in forest and tree resource cultivation, management, use, marketing and sharing of benefits that accrue have not received full attention of planners, administrators and extension agents. However, most of the subsistence tree-resource product procurement is done by women. This is often because strategies have not been devised to reach women, learn about their unique needs, motivate them to take part and ensure that they receive the benefits of rural forestry development.

Individual and organized initiatives by women have convincingly demonstrated the necessity and potential value of women's participation in rural forestry development, specially at household and community level. It is now increasingly clear that women should be supported not only in rural-forestry-based subsistence and economic activities but as key agents for innovative development of the rural forestry sector, including the growing of trees. In addressing the concerns for women in Kenya, it is recognized that, although they do most of the farm work and subsistence food production, they are under-privileged in many ways. Women often do not have rights to land ownership and control and have limited access to credit and financial support. Their literacy level is low. Their time and workload is often under valued because of inappropriate economic and government policies that focus on monetary economies and not subsistence values.

This paper highlights practical strategies for minimizing negative influences and how change-agents should remain sensitive and responsive to these issues in order to ensure that rural-forestry programmes impact fairly on all members of households. The strategies cited have contributed significantly to feasible and desirable transformations towards change for harmonious power structures and resource-equity. These dynamism and broadened horizon have worked directly towards womens' empowerment and the achievement of broader social, economic and environmental goals for sustainable development in rural areas of Kenya.

The potential influence of land tenure regimes on forestry extension strategies (approaches)

J. Anderson, FAO, Rome, Italy

Forestry extension takes place in a variety of settings and through a variety of actors. Government extension services are usually major direct players. Government forest extension strategies should reflect (be adapted to) the situation that they are hoping to address. This requires the identification of key bio-physical and socio-economic parameters and periodic reassessment of the local situation. Commonly a formal or informal analysis is done mainly of the characteristics of the "target" group and of their needs. In some cases, extension strategies which were developed for state land have been thought appropriate for other tenure regimes and applied to private or communal forest lands - with limited success. Land, forest and tree tenure is a complex subject with many nuances and cannot be done justice here. A simplified topology of four main types of tenure are presented as being relevant for forestry extension: state owned forest land, communal or tribal forest land, private and household forests, and private farmland. These categories are not comprehensive or definitive - other categories exist and land shifts between categories in time (as is the case at present in many of the transition countries). In fact in some cases the official tenure regime does not reflect actual use, excludibility and other rights at the local level. An example is the case of forest users who have no official "rights" or are illegally using land from one of the other forest tenure regimes - most often state owned forest land.

Descriptions here of elements of the extension strategy/tenure type are mainly illustrative of local tenure permutations. Hence, they need careful local analysis. Tenure is important because it is related to and influences (reflects?) other socio-economic variables of importance to extension approaches: client's objectives, their rights (power) and the way they are organized.

While having similarities, the extension strategies for these tenure regimes may differ in their emphasis on participation: local decisionmaking, mass, group or individual extension methods and local capacity building.

The main point is that extension strategies vary with the local situation and that a key guideline for developing a multi-strategy approach will be tenure regimes. The paper presents a simple matrix meant as an aide to thinking about and developing approaches for different tenure regimes.

Ecosystem Management in the Southeast United States: Attitudes and Challenges on Fragmented Ownerships

Michael Jacobson University of Florida, U.S.A.

In the Southeast United States there are an estimated 5 million nonindustrial private forest landowners (NIPFs) accounting for 70% of the forest land. Forestry extension programming in this region primarily focuses on these private landowners. Forestry in this region is evolving from a stand-level management approach towards an ecosystem or landscape-level approach. This is due to growing concerns about forest fragmentation and the resultant loss of biodiversity and forest function. For ecosystem management to work in the Southeast, cooperation across private ownerships would be essential. This paper discusses a study to understand NIPF characteristics, attitudes, beliefs, and interest in ecosystem management.

Understanding NIPF motivations and objectives is a fundamental objective of extension programming. A survey instrument and Geographic Information System (GIS) were used as tools to analyze landowner interest in ecosystem management. The study was carried out in a heavily forested region of the Coastal Plain of South Carolina. The ecosystem management objective in this region is to develop a corridor system linking habitats across ownerships. The landowners, if they participate in the corridor system, would be providing a public good. The survey results indicate that a majority of the respondents are interested in joint management. However, only one-third of the respondents were familiar with the concept of ecosystem management. Logistic regression analysis showed that incentives and attitudes were more significant than socioeconomic or land management characteristics in explaining responses to interest in joint management.

Mapping the respondents' tracts showed little connectivity among "yes" responses to interest in joint management. Protecting commodity and land values was the main concern of landowners if they were to participate in a corridor system. This study suggests that compensation and/or assistance will be the primary mechanism of involving landowners in joint management to provide land for the corridor. More specific details about the ecosystem plan will be required if alternative mechanisms or approaches such as voluntary provision for moral/altruistic reasons or landowner associations will be possible.

Farmer-designed trials in agroforestry - A methodology for three way dialouge between farmer, researcher and extensionist

Christine Holding Anyonge

Agroforestry Extension Advisor, Regional Land Management Unit, Kenya

This paper describes the experiences of implementing a specific methodology known as farmer-designed trials that enables a three way interaction between farmer, extensionist and researcher. In farmer-designed trials, farmers evaluate new species on their farms, and plant and manage the trees according to their own wishes. The paper outlines the conceptual framework behind the trial, describes methods, and summarizes the experiences of two such trials conducted in Kenya: one a component of a research programme, the other a component of an extension programme. The paper concludes that this is an effective methodology for improving the interaction amongst the three participants in the development of improved farming practices. For example, the methodology enables the incorporation of farmers' species evaluation into a research programme; and it serves to enhance greater three-way interaction, (as well as farmer-to-farmer) within an extension programme.

Key words: Farmer-designed, Trials, Agroforestry

Technology Extension for Environmental Rehabilitation of Degraded Wastelands in Uttar Pradesh Through Afforestation

Ram Jee Srivastava, P. Dubey & B.S. Burfal Forest Research Institute, Utter Pradwsh, India

The exponential increase in human population with increasing industrialization has posed a serious problem of environmental degradation. Reckless destruction of forests in the past has manifested itself in the form of scarcity of fuelwood, fodder and timber. To meet the growing demands for food, fibre and fuel, it is essential that soils are maintained in an excellent state of health.

According to available satellite imagery estimates, about 80 million ha out of 143 million ha under cultivation suffer from substantial degradation while about 40 million ha out of 75 million ha controlled by Forest Department has a land canopy cover less than 40%. Another 12 million ha of pasture lands are substantially degraded. Thus, a total of 158 million ha (about 50% of the country's land mass) constitutes the degraded and fragile ecosystems.

The state of Uttar Pradesh is bordered by the Himalayas in the north and the Vindhyan plateau in the south. The major part of the state is in the Gangetic plain which lies between the two highlands. According to an estimate, about 6.65 million ha. in this state is categorized as degraded land (Wasteland). Such type of degradation occurs due to several reasons: destruction of vegetation cover, soil alkalinity and salinity, ravines, brackish water infestation, water logging and indiscriminate disposal of industrial wastes. Trees play a vital role in mitigating the ill effects of environmental degradation and enhancing the productivity of degraded sites.

Several suitable packages of technology for rehabilitating different wastelands such as salt affected soils, dry tracts of Vindhyan region, industrial wastelands, flash dump yards through afforestation have been developed.

In this paper, sites with specific successful afforestation technologies have been described. The emphasis have been given on the need of the time to transfer the proven technologies in the field through training and demonstration, active participation of NGOs and other user agencies in plantation activities as well as dissemination of information to the people residing in the area covered by the project.

Key Words: Environmental degradation, wasteland, ravines, flash dumps, afforestation

Brick-making and Social Forestry in East Gem, South Nyakach, and North Maragoli Locations of Lake Victoria Catchment -Kenya

Gilbert O. Aluoch Friends of Lake Victoria, Kenya

A base line survey was done in three different locations within the Lake Victoria Catchment to: estimate the quantity of fuelwood used annually for making bricks, to identify the best intervention points, determine when and how to intervene to improve efficiency of brick making, reclaim degraded sites, and conserve fuelwood. The survey was done by administering pre-designed questionnaires to 210 respondents in the region. Data analysis was done by grouping questions into information batches, tally to provide summation of all similar responses, then subjecting the response to simple statistical analysis and calculations of percentages.

Results revealed that upto 6.3% of the 110,000 people in the three areas covered by the survey are directly involved in making bricks. About 1.2m³ of woodfuel is need for firing bricks. The cost of fuelwood is high, so brick makers have resorted to the use of tree stumps and fruit trees. A total of 24.06 hectares of land is used up or rendered unless annually in the survey areas because of excavating soil. However, less than 10% of brick makers reclaim the land.

Brick quality is very low because brick makers are not trained. The average production losses recorded in this region was 25%.

Alternative sources of fuel, reclamation measures, availability of cheap tree seedlings, semi mechanization of brick making process, use of permanent kilns and training of brick makers were suggested as immediate necessary intervention strategies.

Key words: Brick-making, Conservation of fuel wood, Tree Stumps, Reclamation.

Assessment of flora Diversity in Javadis and Kolli hills, India S. Balaji and D. Rahasekarr, India

Indian subcontinent being in tropical climate is endowed with more than 40,000 plant species representing nearly 12% of global plant diversity. Javadis and Kolli hills in the Eastern Ghats of South India are notable archean age hills with spectacular floral diversity comprising timber trees, medicinal shrubs and orchids. A participatory assessment of floral diversity was conducted with the help of local people having indigenous knowledge.

Based on the data collected from the field, various diversity indices were worked out. At Javadis, Shannon-Wiener index for trees and shrubs was 1.9050 and 2.5347 and Simpson's index for the same was 2.9351 and 8.4962 respectively. The biodiversity indices indicate the definite richness of trees in respect of Javsdis than at Kolli hills. Trees of economic importance, such as Sevattai (Cipadessa baccifera), Purasu (Chloroxylon swietenia), Teak (Tectona grandis) and Sandal (Santalum album) are predominant in Javadis, while endemic species of Oleacea genus such as Valichan (Ligustrum deceinsnes). Manipungan (Ligustrum perottetti) and Kayilakkan (Ligustrum alkeri) dominate at Kolli hills. The exercise brought out participatory assessment of floral diversity as an inexpensive strategy for biodiversity assessment and monitoring.

Key words: Biodiversity, India, Tectona grandis

Adaptative Research for Successful Extension - A case Study on Paulownia Agroforestry in China

Chang Fu Wang (Yun-Ying Wu)¹ and Roy P.C. Morgan² Heilongjiang Forest Industry Group, China

The study on which this paper is based demonstrated and developed an approach of adaptive research in agroforestry using Paulownia by linking scientific findings to rural socio-economic and farmers' needs. It also indicated the equal importance of each component of farmers' needs. It indicated the equal importance of each components of adaptive research approaches: identification of farmers' needs and problems, experimentation, data analysis and interpretation, and application of scientific findings. Socio-economic survey at the village or farm level is essential for identifying the needs of farmers for agroforestry under present individual responsibility system. Regression modelling is a practical, efficient, simple and easy way to interpreting and apply scientific findings to practical conditions.

Research can be successfully adopted and extended to farmers if there is close collaboration between scientists, extension agents and farmers in identifying problems for research, during implementation of the research and in delivery of suitable packages of research results. The degree of knowledge intake and interpretation by extension officers determines the success of technology transfer. Appropriate readable material for a non-professional audience must be produced from research findings for easy and efficient dissemination to users. Most of farmers could understand and use results of this study presented in diagrams and tables with text explanations. The output will help farmers optimize the trees-row spacing depending on whether their objective is to maximize production of timber or subsistence tree products. The models could also provide useful and practical technical guidance to help decision making and settle dispute among farmers and between farmers and the local authority.

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Intensive Forest Management: Opportunities for Non-industrial Forest Landowners

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Pine productivity potential is not being realized in the south-eastern United States of America (U.S.A.). Dramatically greater growth rates for pine species native to the southeast U.S.A. can be achieved in Brazil, South Africa, and other temperature locales. In part, inherent climatic differences and lack of natural pests enhance production in these locations. However, resent research has shown potential pine productivity in U.S.A. sites. Specific practices include chemical site preparation to control woody competition, soil tillage to improve rooting volume, herbaceous weed control during early stand development, and potential control of insect pest. Intensive management of study sites in Georgia resulted in loblolly pine stands producing from 2.9 to 4.7 cords/acre per year. This is a two-tothree fold increase in fibre production in land holdings which are in close proximity to mills. Increased production on shorter rotations generates attractive returns when forest management investments are weighted such as mill expansion or other corporate capital projects. Non-industrial private forest landowners (NIPF) undertake intensive increased production at costs of \$400 to \$600 per acre compared to traditional forestry practices. Our Extension programs have evaluated yield responses to herbicide and fertilizer treatments allowing NIPF landowners to optimize treatment cost and yield within their forest management budgets.

Key words: Pine plantations, Fertilization, Herbicides

Developing World Wide Web and Computer-based Forest Management Resources for Sustainable Forestry in the USA

G. Keith Douce and David J. Moorhead University of Georgia, U.S.A.

The U.S. is the world's leading producer and consumer of forest products, accounting for about one-quarter of the world's largest supplies of both hardwood and softwood lumber, softwood plywood, and composite panels. Timber is the single highest-valued forest product produced in the U.S., exceeding corn and wheat. The southern U.S contains about two-fifths of the U.S. timber land. Impacts of insects, diseases, plants and animals on the health and quality is of significant concern to forest managers. Forest pests degrade aesthetic and recreational values, reduce productivity and economic value, increase tree maintenance cost, and create potentially dangerous and costly liability problems for all users.

Of the hundreds of insect and disease organisms in forest environments, only a few are potential pests. Regardless of land ownership, use-decisions dealing with managing forests in relation to insects and disease organisms must be based upon correct ecosystem in which they operate. Our programs focus this diverse group of forest landowners, educators and land managers. We are utilizing computer multimedia, the World Wide Web (WWW) and Photo CD technology to deliver integrated sustainable forest management information, emphasizing state-of-audience. More information about the Entomology and Forest Resources Digital Information Working Group is provided at Web address: http:// www.bugwood.case.uga.edu

Key Words: Forest IPM, Sustainable forestry, Computer multimedia, Photo CD

Factors that Enhance People's Participation in Agroforestry Projects and Activities

Chege F.W

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Development signifies a qualitative change to what currently exists, making things better than the status quo. Agroforestry (AF) interventions promote development by increasing productivity at the farm level. Sustainable development through AF can be achieved through active and continuous farmer participation. This predisposes an AF project to successful local involvement. Goals and principles governing an AF project should be developed on the basis of an understanding of socio-cultural factors, economic and political situation, and developmental needs of a community. Motivation and incentives for peoples' participation is created through lead institutions demonstrating to farmers how AF leads to net benefits at the farm level. Furthermore, this practical exposure ensures that farmers are acquainted with and contribute to the development of new AF technologies before implementation.

The adaptability and adoptability of AF is enhanced through communication linkages and monitoring systems that ensure continuous incorporation of farmers ideas and practical experience into the project. Further, adequate and appropriate linkage systems and forms of cooperation for joint planning and implementation at all stages of the project cycle must be established between the lead institutions and farmers.

Key words:

Agroforestry, People participation in Agroforestry Projects and activities

Strategy and research of forestry extension development in Heilongjiang Province P.R. China

Wang Chan Fu, China

The forest industry region of Heilongjiang is the largest forest in China. The region has made great contributions to the economic development of the state. Forest quantity, quality and stand structure have been changed dramatically due to the long term over-cut and the local peoples' daily consumption. This results in not only the reduction of log harvest and economic profit, but also the increasing severe situation of the ecological environment. The reality helps people recognize the importance of forest strategies, industry structures and economic policies have been made since 1980's.

Based on the criteria and targets set for the temperate zone and boreal forest conservation and the frame work outlined in "Montreal Process", and in accordance with the "China 21 Century Forest Action Program prepared by the Chinese government in 1990's, we worked out for four criteria including "Quantity and Quality of Forest Resources", Stability and Diversification of the Forest Ecosystem", Forest Value to the Society" and "Policies of Forest Industry and Economy" and twenty-six specific targets. Under the guidelines of the principle of sustainability, we modify the forest management into division and classification system. We strengthen the forest conservation and this management. We improve management level by relying on advanced technology. All these actions make a step forward to the sustainability in the Heilongjiang forest industry region.

Key Words:

Forest industry region ecological environment sustainability forest conservation

Forestry Extension in Zimbabwe

P.C. Gondo, Harare, Zimbabwe

Forestry extension activities in Zimbabwe were initially introduced to address the perceived "fuelwood crisis" in communal areas. The general extension approach was to promote afforestation with fast growing exotic tree species mainly eucalyptus species. Experiences and developments in extension activities in the last ten years have highlighted the need to go beyond fuelwood and address the multiple functions and uses of tree and forest resources in a holistic and integrated manner. The role of the forestry extension services in Zimbabwe has since changed from "package delivery" to facilitation of forestry development activities. The key components of the facilitation process include community involvement, participation, integration, capacity building and the creation of an enabling policy environment.

Key Words: Facilitation Community Involvement, Participation.

Forestry Extension in Semi-Arid Kitui, Kenya - Approaches and Challenges

Bernard O. Muok, Alice A. Kaudia and Bernard Owuor

Forestry extension is a section under the Pilot Forestry Scheme of the Kenya/Japan Social Forestry Project (SFTP). The objective of the project was to develop model forestry extension approaches for transferring suitable tree farming technologies in semi-arid areas to farmers and other stakeholders. The project is implement in Kitui District in the Eastern Province of Kenya.

Eight extension approaches were tested. These included group approaches both on project land and private land. The groups were an entry point because the community within the project area traditionally organized themselves into groups to achieve certain tasks. Other extension approaches tested included small scale onfarm nursery promotion, model farmer, group plantation, seedling distribution, field seminars, residential training and annual competitions.

While the groups practicing small scale nursery performed quite well, those working on people's plantation on project land performed poorly. Reasons for the poor performance ranged from internal organizational problems of the groups to lack of assurance on future access to tree products from the activities. Other extension approaches tested were promising including model farmers, private plantations, field seminars and annual competition. Seedling distribution was found to discourage promotion of small scale nurseries run by farmers. Individual farmers and group planting on private land performed well because farmers were more assured of access to the products.

Several problems were identified that need to be addressed by forestry extension agents in semi-arid areas. Among these were termite, attack on trees, drought, animal damage, famine, labour and poor co-ordination between forestry extension agents. The question of giving incentives to farmers need serious address since this was found to encourage dependency on the project and undermine sustainability. Most of the problems identified can be solved by approaching extension in a multidiciplinary way. The problems touch on different fields which cannot be solved by forestry in isolation. It was also noted that promotion of tree species that produce benefits in the short run can increase the rate of adoption of forestry technologies.

Key words: Extension Approaches, Semi-arid, Kenya

SUMMARY OF GROUP DISCUSSIONS

One of the key recommendations of the 1st IUFRO Extension Working Party Symposium in Freising, Germany was that there is need for allocation of time for symposium participants to undertake detailed discussion of issues eminenting from presented papers. It was envisaged that group discussions could provide an opportunity for symposium participants to synthesize issues and draw-up recommendations.

During the 2nd Symposium in Nairobi, four groups were formed under the following themes:

- Communication and Networking
- Participatory Approaches and Gender Issues
- Institutional Arrangements and Group Promotions and Economic Issues

In the following paragraphs, deliberations by each of the groups are presented.

GROUP 1: COMMUNICATION AND NETWORKING

Group members identified three major components in Communications and Networking:

- Improve communication and linkages between Research-Extension-Landowners(end users, farmers, etc);
- Professional Networking;
- Information Technology: Development and Application.

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Recommendations

Against a background of identified constraining issues in communication and networking, the group recommended that:

- There is need for improve communication and linkages between Research-Extension -Landowners. This can be achieved by:
 - Identify and reviewing successful models which have linked research-extension-landowners in program; development and application leading to desirable impacts;
 - Preparing a bibliography of reference of Research-Extension-Landowners models; and
 - Involve graduate students in the activities.
- Professional Networks should be formed by:
 - Establishing regional work-group contacts for members to promote designed programs;
 - Update current membership list with call for connections and new members in the next newsletter; and
 - Submit stories of network collaborators with other members of the workgroup to Jim Johnson for the newsletter.
- Information technology and related applications should be developed and disseminated to achieve extensive dissemination. Therefore:
 - Computer-based applications methodologies should be prepared at the next meeting;
 - A subgroup in the working group should be formed to foster interest in the development of appropriate computer-based applications.

GROUP 2 CONSTRAINTS TO PARTICIPATORY EXTENSION APPROACHES

It was noted that extensionists continue to use top-down approach. This situation was said to be associated with a number of factors including:

Training Background

Most extension agents have been trained on the basis of instruction model. Communication has not been a strong component of curricula. Training has also tended to be discipline oriented.

Insecurity

Job insecurity has also been a factor. Extensionists have tended to implement instructions by superiors.

Value system of effective extension

Effective extension has typically been valued on the basis of number of farmers/clients contacted. This has not favoured the participatory approach which is time consuming.

Institutional isssues

There are differences in institutional priorities and mandates. The difference have resulted in weak inter-institutional collaboration and hence participatory approaches.

Gender issues and related constraints

Low involvement of women in forestry research; economic disparity between men and wemen; and stereotypic division of roles between men and women have constrained application of participatory approaches in rural extension.

The following recommendations were made by the group to address the highlighted issues.

Recommendations

- Training extension agents should be based on an integrated, trans-discipline curricula;
- The value system for judging the extension performance and impact should be refined to acknowledge participatory initiatives;
- Mandates and work plans between land-use disciplines (ministries/departments) should be harmonized;
- Equal opportunities should be given to men and women during all stages of extension cycles: planning, implementation and evaluation; and
- Self-sustaining forestry extension development programmes with in-built cash generating activities should be developed and promoted.

GROUP 3 & 4 INSTITUTIONAL ARRANGEMENTS, GROUP PROMOTIONS AND ECONOMIC ISSUES

The group observed that research issues emerge continously and key research issues should be identified and be recommended to IUFRO Working Groups. Further, governement filscal policies, structural adjustment, trade liberalization, market creation, development of small scale forest industries, cost sharing and distribution of benefits are some of the economic issues that affect forestry extension.

Recommendations

- Research to determine how extension agencies and target groups can adapt new roles in a participatory context should be done. The research can be focussed on:
 - Case studies on impact of extension services;
 - Evaluation of policy impact on management of forest resources; and
 - Identification of methodology for identifying conflicting policies and informing policy formulation agencies to influence policy.

Marketing

- Simple tools and methods for market analysis and marketing of forest and Non-timber Forest Products (NTFPs) should be developed and promoted;
- Marketing strategies through establishment of linkages and partnership among producers and processors should be developed and promoted;
- Information based on case studies and from these, developed extension guidelines for promoting smallscale forest-based industries should be disseminated:
- Re-investment in forest management as a means of ensuring sustainability should be encouraged; and
- Integration of marketing of economic forestry concerns to extension agencies be promoted.

• Cost sharing and benefits distribution

It was noted that global economic recession and adoption of participatory approach for the management of forest resources requires clear defination and equitable distribution of benefits. To do this, it is necessary to:

- Develope methodologies and tools for equitable distribution of costs and bencfits of trees and forest-related activities;
- Create a better understanding of the use of incentives in forestry and forestry-related activities and benefits through documentation of successful case studies; and
- Encourage re-investment of locally generated revenues at source (local level).

• Capacity building and training

Capacity building and training of extensionists is necessary as a remedial intervention. The group recommended:

- Improving integration of economic and financial planning in the training of extension agents and local forest producers is necessary. Practical training should be emphasized; and
- Simple tools to facilitate the making of economic decisions by extensionists and farmers/forest owners should be developed and promoted.

Institutional arrangement and linkages

In the context of participatory management of forest resources, institutional constraints identified to hinder extensions efforts include tenure, ownership and weak inter-agency linkages. The group recommended that:

- Tenure and user rights should be clearly defined and legalized;
- The role of farmers in forestry extension should be strengthened;
- Research to determine comparative advantages of decentralization and of central agencies be done; and
- Linkages between extension agencies, research and educationists in livestock, agriculture, horticulture and forestry be strengthened.

OFFICIAL CLOSING ADDRESS

Dr. Kapyas Wilson Kipkore, Chief Conservator of Forests, Kenya

The Chairman, IUFRO Working Party, the Director KEFRI, symposium organizers, Distinguished Guests, Ladies and Gentlemen.

I feel honoured to have been invited to officially close this important international symposium on "forestry extension: science and practice for the 21st century".

It is widely accepted that the future of forestry lies in people's participation, in the utilization and conservation of the natural resources.

However, the success of this new extension approach will greatly depend on availability of information and the creation of necessary incentives for tree farmers.

I believe you will agree with me when I say that much still needs to be done in the field of research for forestry technology transfer. We need to develop management strategies and techniques which would promote the contribution of forestry to the well being of man-kind including poverty alleviation.

However, as recognized in one of the presentations in this symposium, we may wish to ask ourselves what proportion of our research results ever reach the end users.

Similarly, the indigenous intrinsic skills and knowledge acquired over time through practical experience is overwhelming. There is, therefore a tremendous wealth of knowledge and its application inevitably remains localized simply because interaction and exchange of information has not been adequately facilitated. Evidently, therefore, much knowledge remains untapped and hence under utilized. Should these potentially useful skills be fully realized, social forestry would steer public participation towards improved utilization and conservation of the natural resources.

It is common knowledge that extension is becoming a tool for facilitating forest management and production principles. Forest extension also provides an effective interaction and information avenue between all stake holders specially those involved in forest management. I therefore, consider it very important that this symposium has been able to focus its theme on how forest extension would be developed into the 21st century.

The composition of participants in this symposium indicates to me that the organizers addressed the issue of diversity in all fields of forestry development. This I believe, was a purposeful move intended to allow each participant to acquire knowledge on holistic approach based on research driven forestry development.

Allow me to mention that forestry, extension is a relatively new field in Africa; inspite of the fact that farmers have been planting trees from time immemorial. We should build on farmers knowledge by supporting local tree planting initiatives and using the indigenous knowledge.

May I suggest that in future, emphasis should be placed on the practical aspects of the sciences and the role of women and the youths in forestry as it impacts significantly on their positions and situations. Likewise, problem-oriented research that compliments the local knowledge systems should be encouraged.

There is a whole range of issues to be researched, developed and practiced in relation to forestry extension. We still rely on a very narrow species based on the farms, and yet local communities are struggling to plant unsuitable trees against all odds. We should use the existing information technology to transfer knowledge, insights, and experiences globally. I believe that the fruits of this symposium and the interactive process developed will not die here with my closing speech, but will continue as we steer forestry practices into the 21st century.

Finally, I hope that this particular forum has played a significant role in the past and will continue to do so in the future by ensuring that gaps between information sources and end users is narrowed for efficient management of forest resources. I also believe that each participant has had a fruitful opportunity by sharing their experiences in the fields of research, extension and administration. Our researchers assembled here today have a better understanding of the practical problems experienced and the scope of investigations needed by implementers. Likewise, implementers have gained insight into the trend of research and the need for better collaboration among all parties concerned with forestry extension and research.

This symposium has provided an opportunity for us to analyse, assess, evaluate and eventually harmonize, principles, concepts, activities and trends of forestry extension development. This will reduce duplication of responsibilities and better still avoid the possible aspects of offering confusion and conflicting extensior information.

Lastly, I wish each one of you a safe journey back to your countrie Ladies and gentlemen, may I now officially declare this meeting closed.

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TRANSFER WORKS AND A

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