

FORESTRY FOR RURAL DEVELOPMENT

IN ZIMBABWE

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Working Paper 2/86

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The views expressed herein are those of the authors and should not be attributed to the Forestry Commission

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Africa's forests have been reduced by half in this century due to a combination of population pressure, agricultural encroachment, fuelwood gathering, excessive livestock numbers and commercial logging. The natural forest resources of countries such as Ethiopia, Rwanda and Burundi have been almost totally depleted.

A recent World Bank report states that:

"deforestation adversely affects the quality of life both rural and urban poor. It can lead to a 15 - 20 per cent reduction in crop and livestock yields. About 50 million people (in Africa) face acute fuelwood scarcity and 5 million hectares of Africa's upland watersheds are deforested and in urgent need of rehabilitation. Soil erosion and disruption of stream flow are shortening the life of reservoirs. Deforestation is a contributory cause of the desertification process that is affecting the countries of the Sahelian/Sudanian Zone".

The level of environmental destruction in Zimbabwe is lower than that found in many other African countries, but signs of degradation were evident 50 years ago. Colonial officers responsible for administration during the 1930s and 1940s in the peasant farming areas of the upper Sabi catchment area reported population 'congestion', overstocking, gully erosion, shortage of thatching grass and difficulties experienced by people in obtaining water.

Recent studies within Zimbabwe, have attempted to quantify the extent of the deforestation and accompanying degradation of communal land areas and draw both the Government's and the public's attention towards these serious issues and the largescale catastrophic consequences they herald.

One such exercise, the "Rural Afforestation Study" conducted by the Whitsun Foundation, states:

"While there is at present a national surplus of yield over demand of 1,054 million cubic metres, 27 of the 52 districts can be considered as critically short of wood on the basis of average deficit of over 4 cubic metres per family per annum. These deficit districts cover a land area of 5,08 million hectares (32% of all communal lands) and 2,5 million people (58,3% of communal land population) live there."

The fuelwood crisis facing the country has again been clearly documented in the Zimbabwe Energy Accounting Project (Beijer Institute, 1985) which states the equivalent of 600 000 hectares of plantation will need to be planted nation wide from 1985 until the end of the century in order to keep pace with the growing population and subsequent increase in fuelwood demand.

in many of Zimbabwe's communal areas whilst some areas are on the brink of a crisis. However, the problem does not rest there, for deforestation ultimately leads to environmental degradation through soil erosion and soil loss, the siltation of rivers and reservoirs and the increased use of valuable agricultural residues for cooking and heating. The end result being not only a greatly reduced fuelwood supply, but an environment which yields less by the year of life's basic essentials (food, wood and water) for an ever increasing and essentially trapped population whose living standards steadily deteriorate.

The Sabi Catchment Area serves to illustrate one of the worst examples of deforestation and environmental degradation in Zimbabwe. Elwell and Stocking (1984) calculated the economic life of the soil in the upper Sabi catchment to be only 9,5 years until maize cropping became impossible and 28,5 years until sorghum cropping became impossible. They also calculated a value for soil loss of 80 tonnes per hectare per year. The future for such areas is extremely bleak and if remedial action is not quickly taken, it is just a matter of time before the Sabi Catchment and similar areas are characterised by desertification and starvation.

Tackling the Problem

The problem is a difficult one to solve for several reasons. Population growth, the need for additional agricultural land and increased livestock numbers defy simple short term solutions. But early attempts in Africa at devising programmes to encourage and support solutions to fuelwood shortages through community forestry tended to be based on the assumption that the fuelwood shortage itself would be sufficient to stimulate tree planting by communities and individuals. Overall however, deteriorating fuelwood supplies have provided little incentive to those involved to do something about them. It has been demonstrated throughout Africa that as fuelwood gets scarcer people who gather it carry loads of firewood over longer and longer distances and with the growing scarcity, crop residues (which should be turned back into the soil) are diverted for fuel use.

Consequently, many social forestry programmes have stumbled along and eventually faded away. The downfall of these programmes is partially a result of the isolation or non-integration of social forestry projects within the field of rural development and partially a result of implementers who did not seek the active participation and involvement of the local people. It is worth noting too that many agricultural and rural development projects have paid scant attention to forestry or failed to implement forestry components.

Recent attitudinal surveys in parts of Malawi and Nepal (where severe fuelwood shortages exist) have disclosed that people seldom isolate their fuelwood problem and often rank it behind many other pressing issues. The surveys too have revealed that trees fulfil a variety of community needs and fuelwood is often not the most important. The Nepal survey showed that the overriding concern was with tree fodder for cattle because it was more difficult to obtain than fuelwood.

Current survey information and evaluations of failed social forestry projects are now instrumental in developing a new approach, for the problems of environmental degradation, desertification and fuelwood supply, cannot be solved by reforestation alone. What is required is a holistic approach to agriculture, live stock, land settlement, forestry and energy policies, and as Arnold puts it :

"People are (therefore) more likely to respond to projects that enhance this broader set of values than to projects that try and address fuelwood alone."

Tree planting projects therefore should not be regarded as ends in themselves, with success being measured solely by the numerical targets achieved. Increasing the number of trees in an area may have little beneficial effect unless it is closely related to the needs and priorities of the people living there. Thus, the integration of trees into the farming system should arise not from an objective to grow trees but from the objective of improving the farm families' welfare which may involve, among other things, the introduction of some form of woody vegetation.

The Rural Afforestation Project

The Whitsun Foundation's Report "Rural Afforestation Study" proposed a project as the First Stage in a national programme to deal with the shortage of wood in communal areas. The project had various components which included the establishment of nurseries to supply seedlings for sale to farmers, villages and schools, and the planting of woodlots at nursery sites to provide fuelwood and poles for sale. Another major component was the provision of specialist extension services within Devag (Agritex) to encourage and advise farmers on planting, maintenance and cropping of trees.

It was further proposed that a Rural Wood Energy and Pole Division within the Forestry Commission be established to plan and manage all but the extension aspects of the project.

In accord with the objective of developing the communal lands of Zimbabwe, the Government recognised the need for such a project and the above proposals, with a few minor modifications, were accepted and provided the planning framework for the four year pilot rural afforestation Project which, with World Bank assistance, officially began in June, 1983. The Project, which is implemented by the Forestry Commission, has been designed as a modest first stage, characterised by selectivity in choice of target areas and populations within a relatively small scale of operations, and flexibility to experiment, learn and change course. Therefore, the main objectives of the current project are to:

"test a number of approaches to rural afforestation and evaluate the people's responses to these, carry out socio-economic studies, campaign to increase public awareness of the fuelwood problem, closely monitor and evaluate all field activities and emphasise improvement of the institutional framework in Government to implement rural afforestation. In this manner, Project activities should provide a sound basis for undertaking a future broader afforestation programme."

(Staff Appraisal Report, 1983)

The Forestry Commission is responsible for recruiting field staff, implementing a nursery programme and establishing rural and urban fuelwood plantations. The second half of the Project is the development of Forestry extension, which in collaboration with the Forestry Commission was largely the responsibility of Agritex (the national agricultural extension agency). Forestry extension has not been effective because the Forestry Commission,

being essentially a commercial concern, has very little to offer on forestry extension. Furthermore, Agritex has been unable to fulfil its role in developing forestry extension because of a lack of resources. Thus, forestry extension in Zimbabwe is still inadequate although the key to successful rural afforestation is a strong forestry extension service. This message was a major finding of the Baseline Survey and of a subsequent survey undertaken by the Monitoring and Evaluation Unit in the Rural Afforestation Project.

A Strategy for Future Development

The Final Declaration of the Seventh World Forestry Congress (Buenos Aires, 1972) centred its attention on the responsibilities of governments. It said:

"Recognising that in many countries, declared forest policies are not in accord with new knowledge, new preoccupations and new aspirations, the Congress considers it is now urgent to redefine forest policies in view of these new circumstances."

Westoby notes that few countries have responded to this call to define or review their forest policies, and also argues that a commitment to rural development on the part of the foresters will be of no avail unless there is a first commitment on the part of governments. Westoby states too that a policy should serve as a guide, not only to the forest services, but to all agencies and departments, national, regional or local, having a measure of responsibility for implementing the policy.

The scope of the national forest policy should not be unnecessarily restrictive, and where appropriate, the policy should accord special emphasis to the role of forests, woodlands and trees in:

- i) providing support services to agriculture,
- ii) contributing to appropriate agroforestry systems,
- iii) specifically promoting the welfare of the rural poor,
- iv) contributing to the fuel and energy needs of both rural and urban people, and
- v) rehabilitating marginal lands.

The forest policy should be arrived at through a widespread and democratic process of consultation and therefore much of the value of preparing a policy statement is in the dialogue that is demanded by the preparation of it.

Thus, a prerequisite for a social forestry programme is a sound national forest policy backed by political support and a firm commitment on the part of the government to provide adequate resources on a sustained basis to meet the broad objectives set out in the policy statement.

Fuelwood Strategy

In developing a fuelwood strategy the overall objective has to be twofold, first to increase supply and second to reduce consumption.

a) Wood Supply

On the question of supply, broadly speaking there are three major options, first to establish urban energy plantations, second to get farmers to plant trees, and third, to manage and utilise existing resources. Invariably, past programmes have attempted to implement the first and second options and ignored the third.

Government sponsored urban energy plantations (1) have proved costly to establish and, coupled with the fact that growth rates have not met expectations in many areas, fuelwood prices have had to be heavily subsidised. Even then, it is only the more affluent urban dweller who can afford and has access to this type of fuelwood, and in order to supply a total city's needs, thousands of hectares of land must be freely available.

Fuelwood plantations may still have a role to supply urban energy needs, but governments should consider alternative and more cost-effective ways of producing the wood by offloading the responsibility of growing the trees to farmers and councils around urban centres. This approach leads to the second option of encouraging farmers to grow trees.

Problems of "rural" tree planting have already been described, but since the ultimate answer to deforestation problems lies with farmers, the major component of a supply strategy must be the mobilisation of this target group to plant trees. There should be three major thrusts to this component. First, the development of a forestry extension service; second, the implementation of an appropriate research effort; and third, increased land allocation.

1) See Appendix I

Looking at forestry extension, the planting of trees on farms is not fundamentally a forestry issue, it is a farm system and social issue and therefore there is a need for an extension approach which treats trees as one of many potential productive activities that must be incorporated into the farm system. It is difficult to conceive of this working through a separately operated extension service focusing only on trees, and in doing so raises important institutional and organisational issues. In Malawi, where a social forestry programme has been implemented over the past five years, it has been agreed and accepted that, for the future development of forestry extension, forestry subject matter specialists will be fully integrated into the agricultural extension system.

The integration and development of forestry extension within the agricultural service is now gaining wider acceptance and support. Forestry extension staff will not generally be in contact with farmers but operate with and through agricultural extension staff. This intermediary role therefore calls for quality rather than quantity of forestry staff and emphasises the need for suitably qualified foresters in the disciplines of agriculture, soil conservation, land management, farm systems and extension methodology. Thus, the design of appropriate courses and where these should be located are issues of prime importance to be tackled in the development of social forestry programme.

One of the major problems in social forestry is the rather limited availability of appropriate technology and therefore the implementation of a research component, the second thrust, is of vital importance.

Malawi, recognising the need for more packages or appropriate technology, has recently established an agroforestry research unit within the Department of Agricultural Research. This development has also included the post of research/extension co-ordinator in agroforestry extension which should ensure a smooth functioning of the research/extension link.

Thus, to launch a programme whereby farmers are to be encouraged to grow trees, necessitates the design and implementation of both an extension service and a research programme. The third element of this approach is the sensitive issue of land allocation. Where the land is all privately owned, the farmer must be convinced of the financial returns to tree planting. If he is able to obtain wood supplies more cheaply from other sources it would be irrational to allocate land, labour and capital to raising trees. Poor control of state tree resources and subsidised wood, are strong disincentives. Where the land is communally owned it becomes necessary to consider the management and allocation of the trees planted after the community has been persuaded to allocate land. If the heaviest user obtains maximum benefit with no costs, the exercise will be futile.

2)

2) Readers are referred to Project Campfire (Communal Area Management Programme for Indigenous Resources) as one method of managing forests, grazing areas and other communally-owned resources.

The third option of the fuelwood supply strategy is the management and utilisation of existing resources, and up to recently only a few forestry programmes have investigated the potential of both indigenous woodlands and existing exotic plantations. In Zimbabwe, initial attention should perhaps focus upon the considerable amounts of wood residues generated by the commercial forestry operations. One entrepreneur is already considering the conversion of wattle stems, originally grown for bark tannin, to charcoal for sale in the major urban markets of Zimbabwe.

The remaining indigenous woodlands and forests in Zimbabwe can generally be placed in one of four groups. Firstly, there are the relatively large tracks of protected forest reserve controlled by the Forestry Commission, second, the indigenous woodlands found in the commercial farming areas, third, the woodlands of the communal areas and fourth, the indigenous woodlands controlled by the Department of National Parks and Wildlife. Woodland in all four groups, through correct management on a sustained yield basis, could play a significant role in both an urban and rural fuelwood supply programme as well as fulfilling an equally important conservation function.

Exploration of the possibilities of controlled utilisation of indigenous woodlands raises the issue of fuelwood pricing, especially when a commodity such as indigenous wood has been collected free of charge for generations.

Where resources are a common property there is a tendency towards overexploitation. In an optimal regime for renewable resources, price equals marginal extraction cost plus royalty; in an unrestricted common-property regime price equals average cost. 3) If overexploitation is to be avoided a management scheme that involves a clearer definition of ownership or control is necessary. In this situation Project Campfire, which recommends the formation of a land and asset management association, could be implemented. Every member of the community would be a member of the association. The association would then lay down rules for the management of each resource, charging individuals for the right to use the resource and sharing the proceeds equally between all members of the association. Thus a royalty would be placed on resource allocation and the tendency to overexploitation would be diminished.

3)

The necessary conditions for the extinction of a common-property resource is briefly covered in Fisher and more rigorously derived by Berck.

Looking at the demand side of the strategy, research into improved stove designs over the years has only achieved very modest savings in fuelwood consumption.

Most of the fuelwood consumed in the communal areas of Zimbabwe is used for cooking and approximately 50 per cent of the households (Baseline Survey) now use a metal grate. However, significant amounts of wood are used in beer brewing, brick-making and in bread ovens. Hancock and Hancock (1985) state in their recent study of domestic fuel use in Masvingo Province, that minor modifications to the cooking grate can greatly improve its efficiency. The authors determined that under laboratory conditions, the unimproved grate had an efficiency of 9,1 per cent while an improved grate achieved an efficiency of 21,7 per cent. Reducing these figures by 20 per cent to compensate for field conditions, Hancock and Hancock calculated that if 40 per cent of the households in Masvingo Province adopted the improved stoves the annual saving of wood in the Province would be in the region of 300 000m³.

Thus, investigations into improved stove technology and over-coming the problems of field acceptance of new or improved cooking devices should obviously continue but fuel-saving projects should be an integral feature of an overall social Forestry Programme:

"Fuel-saving efforts must be closely linked with those of reforestation. It is imperative that the two are connected in people's minds."

(Hancock & Hancock)

Forestry for Rural Development

The major objective of the current rural afforestation project is not simply to establish nurseries and plantations but to develop a national afforestation programme. Designing an effective forestry extension service, training staff, and implementing research are some of the major components that should be investigated and developed in such a programme. In fact the very term "Rural Afforestation" simply implies tree planting whereas a programme of this nature should be very much more comprehensive. It should encompass such issues as soil conservation and soil improvement, agroforestry, fruit tree production and management of indigenous woodland. Afforestation should not be restricted to growing trees for fuel and poles, but for a multitude of end products that would support rural industries. Trees also have an essential role in the national food security programmes. The programme therefore could be more appropriately termed "Forestry for Rural Development" (FRD) which encompasses the complex and challenging role of rural afforestation and forestry extension.

The complexity of issues which social forestry presents is well illustrated in the relatively small (75km²) communal land of Denhere, situated in Masvingo Province, which has been recorded as the most severely deforested communal land in the country. Denhere₂ also carries one of the highest population densities, 52 people per km² in 1983, yet the people of Denhere do not "really have any problems meeting their woodland resource needs",

(Hancock) and Hancock, 1985). The answer to this apparent anomaly lies in the fact that the communal land is bounded on almost all sides by well wooded commercial farms and resettlement areas. It is in these areas where Denhere's inhabitants collect their woodland resource needs and no part of Denhere is further than five kilometres from the nearest supply point.

Over 88% of Denhere is cultivated and therefore very little land could be made available for growing fuelwood. It is also extremely unlikely that Denhere's inhabitants would plant trees for fuelwood when there is an abundant supply closeby. A eucalyptus nursery in Zimbabwe's worst deforested communal land is not going to be a success.

The problem of a sustained fuelwood supply for Denhere will have to be tackled and met through developments such as the management of indigenous woodland and the establishment of plantations in the neighbouring commercial and resettlement areas.

The development of an FRD programme within the communal land should focus its attention on such issues as soil conservation, soil improvement, fruit production and the provision of tree fodder, and therefore a nursery producing fruit trees, shade trees, hedging and agroforestry trees is more likely to succeed.

This overall approach to Denhere's wood resource needs and environmental issues, demonstrates the need for research to provide the appropriate technology and for skilled extension staff to cope with anything from managing indigenous woodland to advising on fruit tree growing.

To establish a truly effective forestry extension system 'forestry' must be fully integrated within the existing rural development network, and this can be achieved principally in two ways.

First, everyone involved in rural development work, be they extension workers, agronomists, or teachers, should have a basic input of 'forestry' during their training. Second, to backup and provide the necessary inputs throughout a rural development programme, forestry extension specialists should be integrated at all levels into the national extension system.

It is only when these two objectives are being met that forestry extension has a chance to succeed and in the long run, rural development in general will benefit enormously through the provision of this service. In a rural development context, trees should be viewed as another crop.

The most logical, cost-effective and practical place for developing a forestry extension system in Zimbabwe is within Agritex. The infrastructure and necessary support facilities are already in place and it would be a relatively simple operation of integrating the forestry extension specialists into the existing network.

It is imperative that the project launches a research component to investigate the problems associated with social forestry in Zimbabwe. In addition an FRD programme should consider developing research, especially agro-forestry research, in association with the Ministry of Agriculture.

The Rural Afforestation Project began and still exists on a narrow technical base of essentially three eucalyptus species. In the higher rainfall areas and on the better soils, there appears to be few problems but the main thrust of the project's activities are in the drier, semi-arid areas with correspondingly poorer and exhausted soils. Observations and, of late, measurements undertaken by the Monitoring and Evaluation Unit in these areas have suggested that the eucalyptus trees are not performing as expected and growth on many sites could be very low.

A nursery component is an essential feature of any social forestry programme to provide plants for farmers, schools and councils and to stimulate tree planting in general in the rural areas. However, such components are expensive to operate and inevitably involve heavy subsidies and only touch a small fraction of the rural community. More efficient and more effective ways of increasing tree planting must be investigated. Many farmers are requesting seed, plastic pots and advice on how to grow their own seedlings. Last season 89 schools in Masvingo Province produced 85 000 seedlings and this was achieved at a tenth of the cost compared with seedling production in the Project's nurseries.

A recent field tour in Manicaland by the M & E Unit revealed that schools who had received assistance from the project in the form of fencing, pots and seed (Support Fund) were quite capable of producing 10 000 seedlings each. Encouraging farmers, schools, councils, village clubs, etc., to grow their own seedlings should be the main thrust of a national FRD Programme and will involve a combined approach of promotional measures, incentives and education. This will not signal the end of the Project's nurseries, but it will mean that their roles will change from units of production and selling, to centres where demonstrations and field days are held, advice and information are freely available and where the local community can obtain such inputs as seed and plastic pots.

Conclusion

The incorporation of fuel supply in the farming system is new to traditional agricultural extension officers but is an important task for peasant farm households. The importance of woody vegetation to soil conservation, water supplies, rainfall and thus, food supply, are widely recognised. It is essential for Zimbabwe to take positive and effective steps to ensure sustainability of agriculture, particularly in marginal areas. It is therefore imperative that trees and social forestry developments are no longer isolated and treated as a separate rural development issue but are fully integrated into all aspects of agricultural development.

Zimbabwe needs to establish rural nurseries, but more importantly it needs a multidisciplinary team to investigate and establish the basis for a national Forestry programme. This would involve foresters, agriculturalists, and other rural development specialists meeting and discussing the major issues of forestry extension development, social forestry research and staff training and development.

Plantations in Zimbabwe

The current Rural Afforestation Project has a small programme of rural and urban exotic plantations to supply fuelwood and poles. These plantations have proved to be expensive to establish and inevitably their end products will be relatively expensive too. The role of the rural plantations has always been in doubt.

Operations have been suspended and utilisation of remaining resources to develop an "extension" programme in the communal areas adjacent to the plantation sites is now being considered.

The role of the urban plantations must be questioned too. A study of Gweru's fuelwood supply (Forestry Commission) illustrates some of the problems associated with urban fuel-wood supply.

The study determined that the annual consumption of fuelwood in Gweru is in the region of 90 000m³ (solid) and that most of this wood is cut from surrounding indigenous woodland. The Project over the past five years has established 100ha of plantations which, if harvested annually in 20ha blocks, will provide less than 3 per cent of the current fuelwood demand of Gweru. Therefore, leaving aside economics, population growths, and the marketability of eucalyptus fuelwood, the current plantations will have a very small impact indeed.

To supply Gweru with its present demand means that approximately 3 000 hectares of indigenous woodland are cleared every year. A glance at a satellite imagery "map" of Gweru's surrounding countryside will reveal the amount of environmental destruction yet the current programme makes no attempt to address this problem.

A more cost-effective way of tackling the fuelwood demand would be to encourage communal farmers, small scale farmers and councils to establish plantations and manage the remaining indigenous woodland. This approach would be far more environmentally acceptable and would involve developing the extension service around Gweru.

Urban plantations can still play a part if establishment costs can be reduced and growth rates increased, but urban fuelwood supplies must be tackled in future on a much broader front with a much more aggressive policy for supplying alternative energy sources.

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It was further proposed that a Rural Wood Energy and Pole Division within the Forestry Commission be established to plan and manage all but the extension aspects of the project.

In accord with the objective of developing the communal lands of Zimbabwe, the Government recognised the need for such a project and the above proposals, with a few minor modifications, were accepted and provided the planning framework for the four year pilot rural afforestation Project which, with World Bank assistance, officially began in June, 1983. The Project, which is implemented by the Forestry Commission, has been designed as a modest first stage, characterised by selectivity in choice of target areas and populations within a relatively small scale of operations, and flexibility to experiment, learn and change course. Therefore, the main objectives of the current project are to:

"test a number of approaches to rural afforestation and evaluate the people's responses to these, carry out socio-economic studies, campaign to increase public awareness of the fuelwood problem, closely monitor and evaluate all field activities and emphasise improvement of the institutional framework in Government to implement rural afforestation. In this manner, Project activities should provide a sound basis for undertaking a future broader afforestation programme."

(Staff Appraisal Report, 1983)

The Forestry Commission is responsible for recruiting field staff, implementing a nursery programme and establishing rural and urban fuelwood plantations. The second half of the Project is the development of Forestry extension, which in collaboration with the Forestry Commission was largely the responsibility of Agritex (the national agricultural extension agency). Forestry extension has not been effective because the Forestry Commission,

being essentially a commercial concern, has very little to offer on forestry extension. Furthermore, Agritex has been unable to fulfil its role in developing forestry extension because of a lack of resources. Thus, forestry extension in Zimbabwe is still inadequate although the key to successful rural afforestation is a strong forestry extension service. This message was a major finding of the Baseline Survey and of a subsequent survey undertaken by the Monitoring and Evaluation Unit in the Rural Afforestation Project.

A Strategy for Future Development

The Final Declaration of the Seventh World Forestry Congress (Buenos Aires, 1972) centred its attention on the responsibilities of governments. It said:

"Recognising that in many countries, declared forest policies are not in accord with new knowledge, new preoccupations and new aspirations, the Congress considers it is now urgent to redefine forest policies in view of these new circumstances."

Westoby notes that few countries have responded to this call to define or review their forest policies, and also argues that a commitment to rural development on the part of the foresters will be of no avail unless there is a first commitment on the part of governments. Westoby states too that a policy should serve as a guide, not only to the forest services, but to all agencies and departments, national, regional or local, having a measure of responsibility for implementing the policy.

The scope of the national forest policy should not be unnecessarily restrictive, and where appropriate, the policy should accord special emphasis to the role of forests, woodlands and trees in:

- i) providing support services to agriculture,
- ii) contributing to appropriate agroforestry systems,
- iii) specifically promoting the welfare of the rural poor,
- iv) contributing to the fuel and energy needs of both rural and urban people, and
- v) rehabilitating marginal lands.

The forest policy should be arrived at through a widespread and democratic process of consultation and therefore much of the value of preparing a policy statement is in the dialogue that is demanded by the preparation of it.

Thus, a prerequisite for a social forestry programme is a sound national forest policy backed by political support and a firm commitment on the part of the government to provide adequate resources on a sustained basis to meet the broad objectives set out in the policy statement.

Fuelwood Strategy

In developing a fuelwood strategy the overall objective has to be twofold, first to increase supply and second to reduce consumption.

a) Wood Supply

On the question of supply, broadly speaking there are three major options, first to establish urban energy plantations, second to get farmers to plant trees, and third, to manage and utilise existing resources. Invariably, past programmes have attempted to implement the first and second options and ignored the third.

Government sponsored urban energy plantations (1) have proved costly to establish and, coupled with the fact that growth rates have not met expectations in many areas, fuelwood prices have had to be heavily subsidised. Even then, it is only the more affluent urban dweller who can afford and has access to this type of fuelwood, and in order to supply a total city's needs, thousands of hectares of land must be freely available.

Fuelwood plantations may still have a role to supply urban energy needs, but governments should consider alternative and more cost-effective ways of producing the wood by offloading the responsibility of growing the trees to farmers and councils around urban centres. This approach leads to the second option of encouraging farmers to grow trees.

Problems of "rural" tree planting have already been described, but since the ultimate answer to deforestation problems lies with farmers, the major component of a supply strategy must be the mobilisation of this target group to plant trees. There should be three major thrusts to this component. First, the development of a forestry extension service; second, the implementation of an appropriate research effort; and third, increased land allocation.

1) See Appendix I

Looking at forestry extension, the planting of trees on farms is not fundamentally a forestry issue, it is a farm system and social issue and therefore there is a need for an extension approach which treats trees as one of many potential productive activities that must be incorporated into the farm system. It is difficult to conceive of this working through a separately operated extension service focusing only on trees, and in doing so raises important institutional and organisational issues. In Malawi, where a social forestry programme has been implemented over the past five years, it has been agreed and accepted that, for the future development of forestry extension, forestry subject matter specialists will be fully integrated into the agricultural extension system.

The integration and development of forestry extension within the agricultural service is now gaining wider acceptance and support. Forestry extension staff will not generally be in contact with farmers but operate with and through agricultural extension staff. This intermediary role therefore calls for quality rather than quantity of forestry staff and emphasises the need for suitably qualified foresters in the disciplines of agriculture, soil conservation, land management, farm systems and extension methodology. Thus, the design of appropriate courses and where these should be located are issues of prime importance to be tackled in the development of social forestry programme.

One of the major problems in social forestry is the rather limited availability of appropriate technology and therefore the implementation of a research component, the second thrust, is of vital importance.

Malawi, recognising the need for more packages or appropriate technology, has recently established an agroforestry research unit within the Department of Agricultural Research. This development has also included the post of research/extension co-ordinator in agroforestry extension which should ensure a smooth functioning of the research/extension link.

Thus, to launch a programme whereby farmers are to be encouraged to grow trees, necessitates the design and implementation of both an extension service and a research programme. The third element of this approach is the sensitive issue of land allocation. Where the land is all privately owned, the farmer must be convinced of the financial returns to tree planting. If he is able to obtain wood supplies more cheaply from other sources it would be irrational to allocate land, labour and capital to raising trees. Poor control of state tree resources and subsidised wood, are strong disincentives. Where the land is communally owned it becomes necessary to consider the management and allocation of the trees planted after the community has been persuaded to allocate land. If the heaviest user obtains maximum benefit with no costs, the exercise will be futile.

2)

2) Readers are referred to Project Campfire (Communal Area Management Programme for Indigenous Resources) as one method of managing forests, grazing areas and other communally-owned resources.

The third option of the fuelwood supply strategy is the management and utilisation of existing resources, and up to recently only a few forestry programmes have investigated the potential of both indigenous woodlands and existing exotic plantations. In Zimbabwe, initial attention should perhaps focus upon the considerable amounts of wood residues generated by the commercial forestry operations. One entrepreneur is already considering the conversion of wattle stems, originally grown for bark tannin, to charcoal for sale in the major urban markets of Zimbabwe.

The remaining indigenous woodlands and forests in Zimbabwe can generally be placed in one of four groups. Firstly, there are the relatively large tracks of protected forest reserve controlled by the Forestry Commission, second, the indigenous woodlands found in the commercial farming areas, third, the woodlands of the communal areas and fourth, the indigenous woodlands controlled by the Department of National Parks and Wildlife. Woodland in all four groups, through correct management on a sustained yield basis, could play a significant role in both an urban and rural fuelwood supply programme as well as fulfilling an equally important conservation function.

Exploration of the possibilities of controlled utilisation of indigenous woodlands raises the issue of fuelwood pricing, especially when a commodity such as indigenous wood has been collected free of charge for generations.

Where resources are a common property there is a tendency towards overexploitation. In an optimal regime for renewable resources, price equals marginal extraction cost plus royalty; in an unrestricted common-property regime price equals average cost. 3) If overexploitation is to be avoided a management scheme that involves a clearer definition of ownership or control is necessary. In this situation Project Campfire, which recommends the formation of a land and asset management association, could be implemented. Every member of the community would be a member of the association. The association would then lay down rules for the management of each resource, charging individuals for the right to use the resource and sharing the proceeds equally between all members of the association. Thus a royalty would be placed on resource allocation and the tendency to overexploitation would be diminished.

3)

The necessary conditions for the extinction of a common-property resource is briefly covered in Fisher and more rigorously derived by Berck.

Looking at the demand side of the strategy, research into improved stove designs over the years has only achieved very modest savings in fuelwood consumption.

Most of the fuelwood consumed in the communal areas of Zimbabwe is used for cooking and approximately 50 per cent of the households (Baseline Survey) now use a metal grate. However, significant amounts of wood are used in beer brewing, brick-making and in bread ovens. Hancock and Hancock (1985) state in their recent study of domestic fuel use in Masvingo Province, that minor modifications to the cooking grate can greatly improve its efficiency. The authors determined that under laboratory conditions, the unimproved grate had an efficiency of 9,1 per cent while an improved grate achieved an efficiency of 21,7 per cent. Reducing these figures by 20 per cent to compensate for field conditions, Hancock and Hancock calculated that if 40 per cent of the households in Masvingo Province adopted the improved stoves the annual saving of wood in the Province would be in the region of 300 000m³.

Thus, investigations into improved stove technology and over-coming the problems of field acceptance of new or improved cooking devices should obviously continue but fuel-saving projects should be an integral feature of an overall social Forestry Programme:

"Fuel-saving efforts must be closely linked with those of reforestation. It is imperative that the two are connected in people's minds."

(Hancock & Hancock)

Forestry for Rural Development

The major objective of the current rural afforestation project is not simply to establish nurseries and plantations but to develop a national afforestation programme. Designing an effective forestry extension service, training staff, and implementing research are some of the major components that should be investigated and developed in such a programme. In fact the very term "Rural Afforestation" simply implies tree planting whereas a programme of this nature should be very much more comprehensive. It should encompass such issues as soil conservation and soil improvement, agroforestry, fruit tree production and management of indigenous woodland. Afforestation should not be restricted to growing trees for fuel and poles, but for a multitude of end products that would support rural industries. Trees also have an essential role in the national food security programmes. The programme therefore could be more appropriately termed "Forestry for Rural Development" (FRD) which encompasses the complex and challenging role of rural afforestation and forestry extension.

The complexity of issues which social forestry presents is well illustrated in the relatively small (75km²) communal land of Denhere, situated in Masvingo Province, which has been recorded as the most severely deforested communal land in the country. Denhere₂ also carries one of the highest population densities, 52 people per km² in 1983, yet the people of Denhere do not "really have any problems meeting their woodland resource needs",

(Hancock) and Hancock, 1985). The answer to this apparent anomaly lies in the fact that the communal land is bounded on almost all sides by well wooded commercial farms and resettlement areas. It is in these areas where Denhere's inhabitants collect their woodland resource needs and no part of Denhere is further than five kilometres from the nearest supply point.

Over 88% of Denhere is cultivated and therefore very little land could be made available for growing fuelwood. It is also extremely unlikely that Denhere's inhabitants would plant trees for fuelwood when there is an abundant supply closeby. A eucalyptus nursery in Zimbabwe's worst deforested communal land is not going to be a success.

The problem of a sustained fuelwood supply for Denhere will have to be tackled and met through developments such as the management of indigenous woodland and the establishment of plantations in the neighbouring commercial and resettlement areas.

The development of an FRD programme within the communal land should focus its attention on such issues as soil conservation, soil improvement, fruit production and the provision of tree fodder, and therefore a nursery producing fruit trees, shade trees, hedging and agroforestry trees is more likely to succeed.

This overall approach to Denhere's wood resource needs and environmental issues, demonstrates the need for research to provide the appropriate technology and for skilled extension staff to cope with anything from managing indigenous woodland to advising on fruit tree growing.

To establish a truly effective forestry extension system 'forestry' must be fully integrated within the existing rural development network, and this can be achieved principally in two ways.

First, everyone involved in rural development work, be they extension workers, agronomists, or teachers, should have a basic input of 'forestry' during their training. Second, to backup and provide the necessary inputs throughout a rural development programme, forestry extension specialists should be integrated at all levels into the national extension system.

It is only when these two objectives are being met that forestry extension has a chance to succeed and in the long run, rural development in general will benefit enormously through the provision of this service. In a rural development context, trees should be viewed as another crop.

The most logical, cost-effective and practical place for developing a forestry extension system in Zimbabwe is within Agritex. The infrastructure and necessary support facilities are already in place and it would be a relatively simple operation of integrating the forestry extension specialists into the existing network.

It is imperative that the project launches a research component to investigate the problems associated with social forestry in Zimbabwe. In addition an FRD programme should consider developing research, especially agro-forestry research, in association with the Ministry of Agriculture.

The Rural Afforestation Project began and still exists on a narrow technical base of essentially three eucalyptus species. In the higher rainfall areas and on the better soils, there appears to be few problems but the main thrust of the project's activities are in the drier, semi-arid areas with correspondingly poorer and exhausted soils. Observations and, of late, measurements undertaken by the Monitoring and Evaluation Unit in these areas have suggested that the eucalyptus trees are not performing as expected and growth on many sites could be very low.

A nursery component is an essential feature of any social forestry programme to provide plants for farmers, schools and councils and to stimulate tree planting in general in the rural areas. However, such components are expensive to operate and inevitably involve heavy subsidies and only touch a small fraction of the rural community. More efficient and more effective ways of increasing tree planting must be investigated. Many farmers are requesting seed, plastic pots and advice on how to grow their own seedlings. Last season 89 schools in Masvingo Province produced 85 000 seedlings and this was achieved at a tenth of the cost compared with seedling production in the Project's nurseries.

A recent field tour in Manicaland by the M. & E Unit revealed that schools who had received assistance from the project in the form of fencing, pots and seed (Support Fund) were quite capable of producing 10 000 seedlings each. Encouraging farmers, schools, councils, village clubs, etc., to grow their own seedlings should be the main thrust of a national FRD Programme and will involve a combined approach of promotional measures, incentives and education. This will not signal the end of the Project's nurseries, but it will mean that their roles will change from units of production and selling, to centres where demonstrations and field days are held, advice and information are freely available and where the local community can obtain such inputs as seed and plastic pots.

Conclusion

The incorporation of fuel supply in the farming system is new to traditional agricultural extension officers but is an important task for peasant farm households. The importance of woody vegetation to soil conservation, water supplies, rainfall and thus, food supply, are widely recognised. It is essential for Zimbabwe to take positive and effective steps to ensure sustainability of agriculture, particularly in marginal areas. It is therefore imperative that trees and social forestry developments are no longer isolated and treated as a separate rural development issue but are fully integrated into all aspects of agricultural development.

Zimbabwe needs to establish rural nurseries, but more importantly it needs a multidisciplinary team to investigate and establish the basis for a national Forestry programme. This would involve foresters, agriculturalists, and other rural development specialists meeting and discussing the major issues of forestry extension development, social forestry research and staff training and development.

Plantations in Zimbabwe

The current Rural Afforestation Project has a small programme of rural and urban exotic plantations to supply fuelwood and poles. These plantations have proved to be expensive to establish and inevitably their end products will be relatively expensive too. The role of the rural plantations has always been in doubt.

Operations have been suspended and utilisation of remaining resources to develop an "extension" programme in the communal areas adjacent to the plantation sites is now being considered.

The role of the urban plantations must be questioned too. A study of Gweru's fuelwood supply (Forestry Commission) illustrates some of the problems associated with urban fuel-wood supply.

The study determined that the annual consumption of fuelwood in Gweru is in the region of 90 000m³ (solid) and that most of this wood is cut from surrounding indigenous woodland. The Project over the past five years has established 100ha of plantations which, if harvested annually in 20ha blocks, will provide less than 3 per cent of the current fuelwood demand of Gweru. Therefore, leaving aside economics, population growths, and the marketability of eucalyptus fuelwood, the current plantations will have a very small impact indeed.

To supply Gweru with its present demand means that approximately 3 000 hectares of indigenous woodland are cleared every year. A glance at a satellite imagery "map" of Gweru's surrounding countryside will reveal the amount of environmental destruction yet the current programme makes no attempt to address this problem.

A more cost-effective way of tackling the fuelwood demand would be to encourage communal farmers, small scale farmers and councils to establish plantations and manage the remaining indigenous woodland. This approach would be far more environmentally acceptable and would involve developing the extension service around Gweru.

Urban plantations can still play a part if establishment costs can be reduced and growth rates increased, but urban fuelwood supplies must be tackled in future on a much broader front with a much more aggressive policy for supplying alternative energy sources.

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