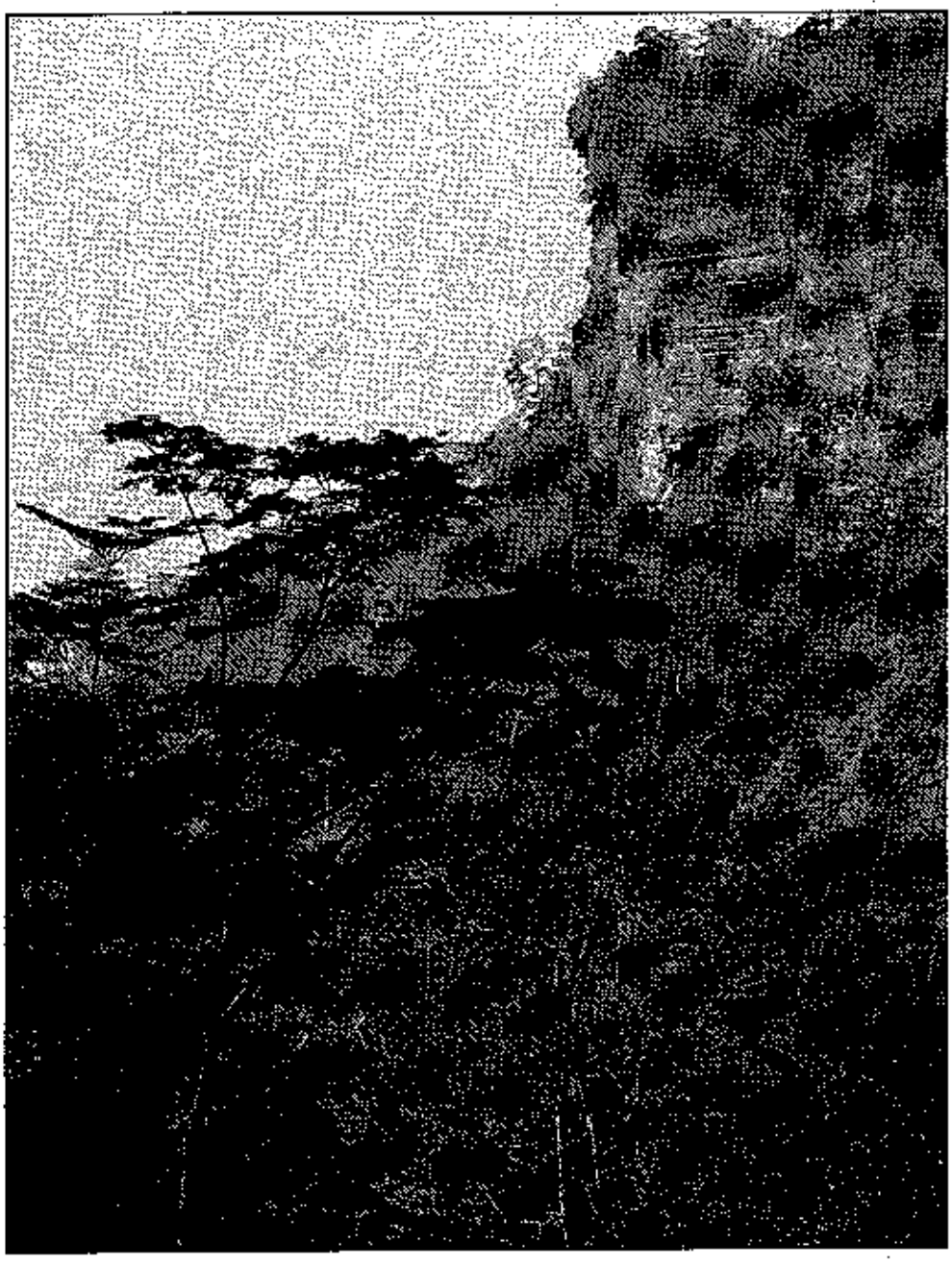
IIED Forestry and Land Use Series No:6

Incentives for Sustainable Forest Management:
A Study in Ghana



iied
International Institute for Environment and Development

A paper deriving from a joint study by:

Forestry and Land Use Programme
International Institute for Environment & Development, UK

Forestry Department, Government of Ghana

ODA
Overseas Development Administration

IIED Forestry and Land Use Series No: 6

Incentives for Sustainable Forest Management: A Study in Ghana

A paper deriving from a joint study by:

Forestry and Land Use Programme
International Institute for Environment and Development, UK

Forestry Department
Government of Ghana

JUNE 1996

Authors:

James Mayers, Caroline Howard, E. Nii Ashie Kotey,
Edward Prah, Michael Richards

Addresses:
James Mayers, Forestry and Land Use Programme, International Institute for Environment and Development, 3 Endsleigh Street, London WC1H 0DD, UK.
Caroline Howard, Forest House, 14 Barbadoes Hill, Tintern, NP6 6SX, UK.
E. Nii Ashie Kotey, University of Ghana, Faculty of Law, PO Box 70, Legon, Ghana.
Edward Prah PO Box 0464, Takoradi, Ghana.
Michael Richards, Overseas Development Institute, Rural Development Forestry Programme, Regents College, Inner Circle, Regents Park, London NW1 4NS, UK.

CONTENTS

Figures:

Tables:

EXECUTIVE SUMMARY

Incentives which can help effect the transition to sustainable forest management are being sought in many countries. This paper describes: the processes which can generate this transition; the nature and role of incentives; and a study of incentives undertaken in Ghana.

Consensus is emerging that the transition to sustainability of forests will require a cyclical process of goal-setting, planning and capacity-building, field management, monitoring, information assessment and goal-revision. Experience suggests that such a cyclical, continuously improving process requires effective communication and participation by those with interests in forests.

Incentives are needed for involvement in this process. Incentives are signals that indicate an increase in value following a particular course of action. The paper discusses common problems of "signal-failure" in forest management and consider incentives which can promote action towards sustainable forest management and deter resource use which is detrimental. Incentives for improved forest management seek to encourage the land user/manager to assume greater responsibility for the resource.

Incentives are distinct from subsidies or compensation, which are flexible instruments which can be used to correct market distortion, but which may remove responsibility from the land use/manager, and undermine local initiative and ability. Subsidies and compensation are likely to be unsustainable on any large scale. Incentives will operate effectively only where the policy and regulatory framework are complementary.

Ghana is well ahead of many countries in the pursuit of sustainable forest management. Its advantages include:

- a network of managed forest reserves;
- progressive measures adopted to regulate logging and promote conservation;
- knowledge base on its forest resource and the demands being placed on it;
- vibrant community institutions; and,
- traditional and modern local government structures providing good linkage and communication between national levels and local levels.

However, when the various positive and negative influences on forests management in Ghana were weighed up in 1993 by this study, the overall balance was on the negative side. Some key dynamics responsible for this situation were:

- demand side incentives too weak to have an impact on extraction and in conflict with supply side measures;
- an underpriced resource unable to withstand the consequent excess demand

pressures, especially outside the forest reserves;

- an under-resourced Forestry Department struggling to manage the resource without cooperation from other disaffected stakeholders and ever-dependent on the national treasury; and,

- a legal and regulatory framework with several key disincentives to better forest management.

The following challenges for making further progress stood out from the analysis in 1993:

- To *accept that full government control of forest management is unfeasible*, even if massive resources were available, and to find ways of harnessing the interest, resources and skills of others: farmers, communities, industry and other non-governmental groups in managing the forest resource.

- To create a sustainable basis for management by *recovering the full costs of management from the forest resource*, rather than from the tax payer or through donor subsidies.

- To develop the capacity within government to effectively implement a *management system based on support, monitoring and supervision* rather than complete control.

In meeting these challenges, options for incentives were identified in 1993. These incentives fall into four groups: sharing rights and responsibilities; building capacity; putting policy instruments into practice; and monitoring the results.

Goal-setting and planning: shared rights and responsibilities

- *Institutionalised mechanisms for deepening participation in the review, formulation and implementation of policies which affect forests*

- *District level negotiation and agreements on shared rights and responsibilities*

- *Community level involvement in forest management planning*

Capacity building

- *Improved management structures and employment conditions of government "forest service"*

- *Improved complementary capacity in government, private sector and communities to manage forest*

- *Coordination of downstream control structures and removal of unnecessary regulation and fees on forest industry*

Policy instruments in practice

- *Higher, species-differentiated forest fees*
- *Log export levies phased in as bans phased out*
- *Implementation of competitive concession allocation with social criteria*
- *Realistic sanctions and effective enforcement by foresters and the judicial system*
- *Consideration of market-based instruments, such as forest certification, as complements to regulatory and fiscal approaches*
- *Farmer rights to fees for timber trees on farmland*
- *Compensation to farmers for farm damage from logging, enforced on a district basis*
- *Adaptive local projects involving co-management of forests at village and concession level as learning vehicles for improving policies*

Monitoring and information

- *Monitoring and annual review of forest fees and export levies*
- *Periodic audits of forest management in concessions*
- *Usable information systems on forests, combining ecological, economic and social information*

The potential impacts of the combination of these incentives in supporting the transition to sustainable forest management are analysed. Initial calculations suggest that sufficient forest revenue could be raised to cover the institutional costs of sustainable management of Ghana's forests. The major ingredient required is courage, to raise the revenue from the forest industry, and to counter the short term macro-economic pressures which have, in the past, overridden social and environmental concerns.

Institutions and interest groups in Ghana continue to make progress in meeting the above challenges and implementing incentive options. Since 1993, many of these options have received concerted attention. Sources of further information on this progress are described.

ACKNOWLEDGEMENTS

This paper is based on a study of, "Incentives for the sustainable management of the tropical high forest of Ghana". The study was a project activity of the International Tropical Timber Organisation (ITTO) and was sponsored by the Overseas Development Administration, UK and the Danish International Development Agency. It was implemented by the Forestry and Land Use Programme of the International Institute for Environment and Development (IIED) in collaboration with the Forestry Department of the Government of Ghana, during 1992 and 1993.

The authors of this paper were members of a team led by Caroline Sargent and Kofi Nsenkyire from IIED and the Forestry Department respectively. Others who contributed greatly to the work described here are Mary Owusu Agyemang, Rose Ayibo, Julia Falconer, John Francois, Jane Gronow, Tariq Husain and Thorsten Treue.

We would also like to thank the following: A.S.K.Boachie Dapaah, Kingsley Ghartey, John Otoo, Yao Anane-Asare, Raphael Yeboah, Edward Obiaw, A.K. Oppong, I.B.M. Abradu, Atta Owusu, E.O. Gyamfi, Baah Bentu, Elijah Mensah, Graham Chaplin, John Hudson, Jonathon Moss, Tim Nolan, Valerie Sackey and Kofi Smith; and the chiefs and people of Fureso, Asuboi, Abonsuaso, Mafia, Apoli, Subriso, Offinso, Mankesim, Betinko, Mpamase, Nyamebekyere.

Since the main part of this study was completed in 1993, there have been some important developments in forest management in Ghana. We refer to some of the main developments in the text and point the reader to sources of further information on these.

Many useful comments and suggestions on previous drafts of this report have been received from Stephen Bass, Jane Carter, Ralph Cobham, Jane Gronow, Elaine Morrison, Kofi Nsenkyire and Kofi Smith. We are grateful to John Butler and Bill Howard for discussion and input on the general section on incentives; and to librarians at the Oxford Forestry Institute for their assistance. However, the views expressed here are those of the authors and may not reflect the opinion of the individuals and institutions mentioned above. The authors are also responsible for any errors or omissions.

ACRONYMS

DANIDA	Danish International Development Agency
FD	Forestry Department
FIMP	Forest Inventory and Management Project
FOB	Free On Board
FPIB	Forest Products Inspection Bureau
FRMP	Forest Resource Management Project
IIED	International Institute for Environment and Development
ITTO	International Tropical Timber Organisation
LMC	Log Measurement Certificate
MLF	Ministry of Lands and Forestry
NTFP	Non Timber Forest Product
ODA	Overseas Development Administration (of the UK)
PFE	Permanent Forest Estate
PRA	Participatory Rural Appraisal
SFM	Sustainable Forest Management
TEDB	Timber Export Development Board
THF	Tropical High Forest
UNCED	United Nations Commission on Environment and Development
WPF	World Food Programme

1. INTRODUCTION

Incentives which can help effect the transition to sustainable forest management are being sought in many countries. In this paper we briefly describe the processes which can generate this transition. Our understanding of the nature and role of incentives is then described. This is followed by a summary of a study undertaken in Ghana.

The study originates in a request from the Ghanaian government to the International Tropical Timber Organisation (ITTO) in 1991 to provide help in developing incentives for forest management. The UK Overseas Development Administration (ODA) and the Danish International Development Agency (DANIDA) agreed to support the initiative and asked the International Institute for Environment and Development (IIED) to act on their behalf during 1992 and 1993 in supporting the Ghanaian Forestry Department in this work.

2. SUSTAINABLE FOREST MANAGEMENT - AN ELUSIVE GOAL

Progress towards sustainable forestry - global agreements, national problems

Nowhere has sustainability been so strongly demanded or hotly debated as in international fora concerned with the world's tropical forests. Whilst evidence of sustainably managed forests remains scarce[1], international resolve to achieve sustainable forest management has strengthened considerably in the last few years. The International Tropical Timber Organisation (ITTO) has produced guidelines and has set Objective 2000 - the year by which all forests in member countries should be sustainably managed. UNCED's Agenda 21, the UN Forest Principles and more recently, the establishment of the Intergovernmental Panel on Forests of the Commission for Sustainable Development are all important international milestones.

At the national level however, many factors continue to conspire to make the move towards sustainable forest management a very difficult one. A common stumbling block is an outdated policy framework and/or a range of contradictory and perverse signals which direct the actions of forest users and managers to unsustainable ends.

Policies and politics in the forest

'Forest policies' in tropical regions to date have focused mostly on the relationship between government forestry agencies, reserved forests and companies engaged in

---

[1] A widely-quoted study conducted by IIED in 1988, estimated that about 0.1% of the world's productive tropical forest could be described as being 'managed for sustainable timber production at an operational level' (*ie*, not at an experimental level) (Poore *et al*, 1989). Other studies around that time (eg. ITTO/HIID, 1988; Goodland *et al*, 1990; Perl *et al*, 1991), also tended to focus mainly on a continuous yield of timber because the social, economic and political dimensions of sustainability were so difficult to pin down. This has been the subject of much attention in recent years, with bodies such as ITTO, an inter-governmental association, and the Forest Stewardship Council, an NGO alliance, developing increasing consensus on some common elements of sustainable forest management (Grayson, 1995).[1]

industrial activities. These policies were generally based on those developed for European forest management styles, with privately owned, largely uninhabited, forests. They were applied to India in the nineteenth century, and then throughout the British Empire and colonies of other European countries. As former colonies became nation-states, industrial forestry continued to be prioritised. In many countries, forest policy has become, particularly since the 1970s, increasingly refined in terms of the control specified for industrial forestry.

Most forests, however, are surrounded or populated by people who use them. These people respond to many 'external forces' or signals, many of which are stronger than the policies or policing of the government forestry agency. Industrial production or conservation policies of the forestry agency may be of little consequence in relation to *eg* agricultural pricing and subsidies, population and employment policies, infrastructure developments, the spread of the market economy and associated macro-economic and international factors. Thus, the effects of these signals on decision-making at the household and user group/community level needs to be understood.

Wheeling policy into practice: participation

Experience suggests that where policy development processes recognise the range of different interests, they tend to be more successful. There are ways to arrive at effective and practical integration of, and where necessary trade-offs between, development and conservation options for example. This type of policy process brings together a range of decision-making systems. It comprises dynamic elements monitored and modified by a wide range of interest groups.

Effective communication and participation by these interest groups can create the conditions for national policy to become a cyclical, continuously improving process. Consensus is emerging in many countries that the transition to sustainability of forests will require such a cyclical process of goal-setting, planning and capacity-building, field management, monitoring, information assessment and goal-revision - an approach which is illustrated in Figure 1.

Thus, where the policy framework is recognised as being insufficient to provide for sustainable forest management, the challenge is to bring policy and practice closer together. This will be done by changing perceptions about what policy is, opening up the process so that it is widely owned, focusing on a small number of strategic objectives and making it adaptive to change.

3. TURNING THE WHEEL: THE ROLE OF INCENTIVES

Incentives as signals

Incentives can be thought of as signals. They may be negative - disincentives - providing an alert or deterrent, or they may be positive, motivating and indicating a preferred action. In this paper we discuss common problems of "signal-failure" in forest management and consider incentives which aim to promote action towards sustainable forest resource management and deter resource use which is detrimental.

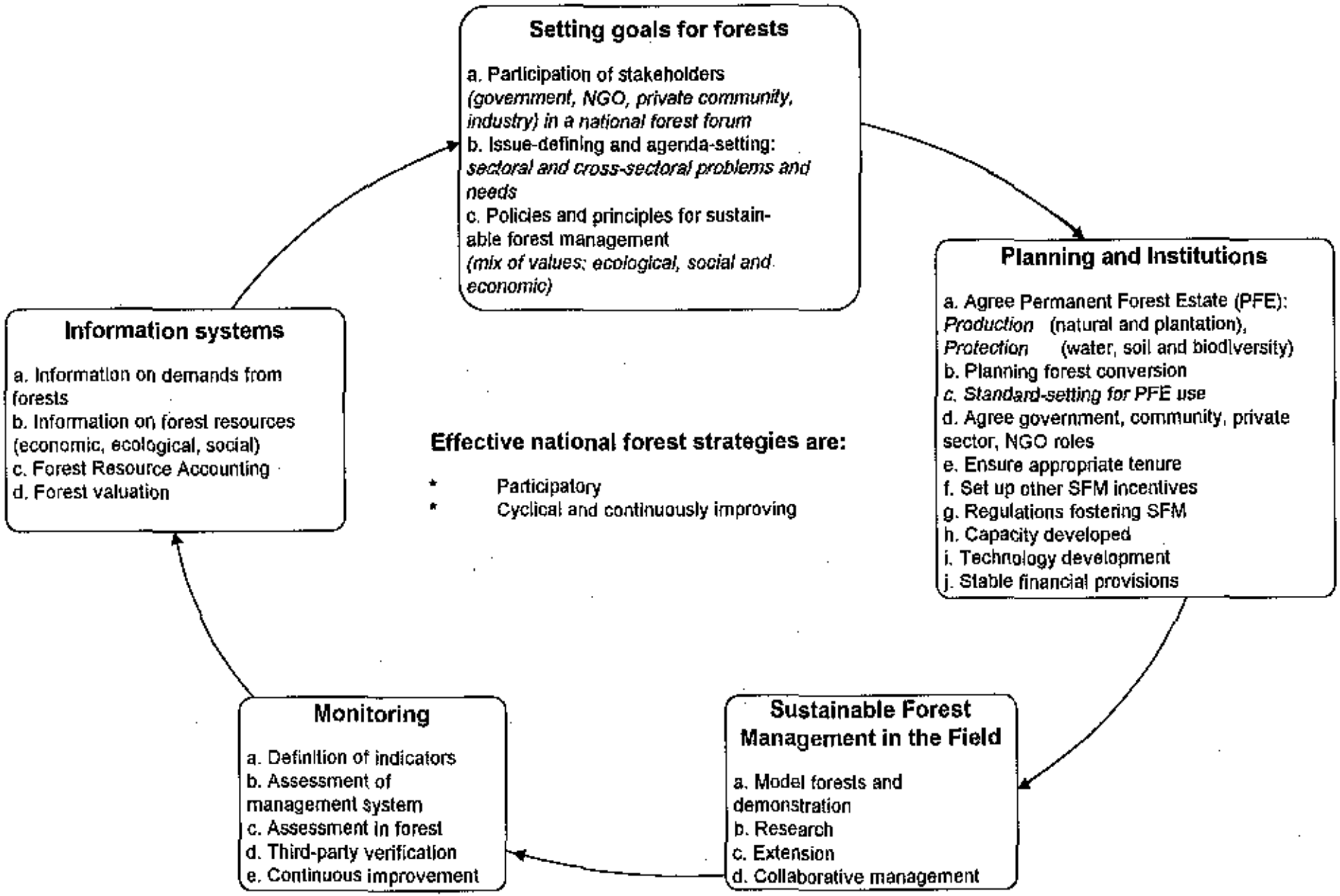


Figure 1: **Sustainable Forest Management: processes for its achievement**

Source: adapted from Upton and Bass, 1995

Incentives, in the context of improved resource management, are measures designed to encourage the resource manager to take greater responsibility for the sustainability of the resource. While subsidies or compensation tend to remove responsibility, incentives work by signalling an increase in *private* value, whilst their aim is to improve the *social* value of the resource. Incentive instruments are not necessarily of a market nature, but may be any factor that motivates or changes perceived value to the (private) actor. In this paper it is argued that incentives are most effective where they assist and empower the resource user to manage the resource in a sustainable way. Private incentives are thus considered to be instruments that increase the value of the resource to the individual, including tenure, cultural and knowledge values.

Internal and external incentives

The impact of incentives on the forest resource depends on the changes in economic value which they promote and the internalisation of costs. Incentives which internalise costs are referred to here as internal. The costs of these incentives are recovered from the forest resource and are met by those deriving the benefits from them.

A majority of incentives which have led towards improved or sustainable forest management have had both market and economic effects and have been of an internal nature. They have been found in: policy (eg. Grut *et al*, 1991); international trade and tariff measures (Barbier *et al*,1994); certain fiscal and financial instruments such as provision of loans for plantation establishment on easy terms (eg. in the Philippines - Hyman, 1983); tax rebates or direct grants for plantation establishment (eg. in Ecuador - Pereira, 1992; and in Brazil - Prado, 1986). However, many fiscal and financial instruments have had a perverse effect, and have led to increased natural resource loss and damage (eg. in Brazil - Schipulle, 1989). Forest certification is also emerging as a major market-based incentive for sustainable forest management (Upton and Bass, 1995).

Effective internal incentives also exist in the clarification of tenure and use rights (eg Sargent *et al*, 1994). Bruce and Fortmann (1989), amongst others, question the validity of the generally accepted 'security of tenure model' which assumes that without land tenure security, tree planting will be discouraged. They argue that the issues are more complicated, that trees can be the object of multiple property rights separable from land; and that these multiple "territorial niches" are often unrecognised (Fortmann and Bruce, 1993). Pretty and Scoones (1989) show that in Sudan: "Uncertainty over economic, tenurial and environmental influences in the village farming system affected tree management, land use ....and control over communal forest land".

The nature of external incentives are well captured in the quotations form the following authors. Smith (1994) writes "external incentives ...are inducements derived from a source outside the community (resource managers) which have a direct or indirect financial value and are intended to bring about a change of behaviour in the recipients. ....an incentive implies a transitional measure which is withdrawn once the desired change is established." Thomson (1992) writes "Paying for changes in recipient's behaviour and then phasing our support undermines project sustainability and local initiative. Producers reasonably conclude that if outsiders or the government paid them once they can be induced to pay again".

A clear example of the non-sustainability of such transitional financial measures is given in a review of World Food Programme (WFP) activities in Vietnam (CARE, 1994). "Whereas in previous years WFP placed the environmental objective as primary - measured by the number of surviving trees in the ground - recent thinking favours the integration of economic objectives as well. The rationale behind this shift is that small-holders, in the context of the market economy (newly emerging in Vietnam), are more likely to engage in forestry if the trees contribute something to the household economy. The motivation to maintain trees which have little market value - even if farmers are paid in kind for planting them - is low". The review concluded that "the major incentive for tree planting at the household level is perceived financial return and the availability of an accessible market outlet for the tree product. Evidence of the financial benefit of tree planting is the single most important incentive to households".

Compensation and subsidies: alternatives or complements to incentives?

Incentives should not be confused with subsidies or compensation which are often financial payments for values foregone. Subsidies can: remove responsibility for the resource from the user/manager; may undermine local initiative and responsibility; and thus remove private incentive. Strategies which seek to exclude people from the resource they depend on and to provide compensation for values foregone, rely on external inputs, do not increase the market value of the resource, and whilst compensation may provide direct financial values to former resource users, such strategies will undermine local competence and responsibility and are unlikely to prove sustainable. In Madagascar the World Bank concluded from a study "based on the use of novel household and valuation surveys that annual compensation in the order of US$100 in cash or kind would be needed to compensate local residents for management restrictions required to maintain the park's integrity (Kramer *et al*, 1994).

The time periods during which forestry conservation policies are expected to be effective are relatively long. Therefore the tools that can be recommended to governments must be many and varied to take account of evolving circumstances. Some, such as legislation governing land use, ownership or its exploitation are long term. Fiscal measures by contrast are often short term and their effectiveness will alter over time.

In developing countries social and economic change is rapid as growing populations put new pressure on rural resources; what were once high value cash crops now command low prices on world markets and need supporting policies to encourage their continued cultivation. Subsistence crops in turn have an increasing cash value in expanding urban markets. These developments alter the economic environment and can change perceptions of the relative benefits of agricultural crops and timber resources, sometimes in unpredictable ways.

Where a policy is in place to conserve or expand timber cultivation, governments may find that the only method of intervening, when the economic balance is distorted by price support to other crops, or by swings in world markets, is by payments of subsidies to those who have a direct interest in timber resources but may be tempted to switch to a more profitable cash crop. In the past, direct and indirect subsidies have tended to be used to encourage exploitation of forest. In contrast, within the European Union,

subsidies are paid to owners of agricultural land in order to encourage them to preserve it from change of use, for building or other development viewed as socially undesirable in environmental and recreational terms. It seems sensible to examine whether this practice might contribute to preventing destruction of forest resources in developing countries. The difficulty will be in ensuring that the subsidy is actually paid in a form which will effectively discourage the owners, whether communal or individual, from exploiting forests for short term cash benefit.

To ensure that any such measures are effective, it is essential to review them frequently. In Europe this is an annual process. A subsidy will successfully deter owners from exploiting forest resources if it is sufficient in the current year to offset the rent (profit) that might be made at the time by felling trees for any purpose. In some circumstances, subsidies to owners may be the only way to prevent them from making a quick profit when opportunity presents itself.

Subsidies are not popular with governments, in that they require a net disbursement of budget funds with no obvious or immediate payback in fiscal terms, and with only the intention of producing a social, and indeterminate financial, benefit in the future. In many cases it is possible that the only realistic source of such funds would be external donors, who may ultimately also be significant beneficiaries of these very conservation policies.

External subsidies and compensation can be used to reinforce resource management objectives and can be directed to protect or promote particular species groups or to introduce preferred systems of management. Such instruments may be essential in cases where complete protection of a species or site is required, since protection incurs costs and gives rise to no financial benefit. However it is argued that in the absence of a coherent policy framework and of management approaches defined in a participatory way with the land user, subsidies are likely to be deleterious to the resource, undermine local initiative, or cause (rather than reduce) market distortion. (Repetto and Gillis, 1988).

Attention has been paid to the potential for transfers of financial resources from the consumer end of the tropical wood chain into subsidies for forest management and harvesting (Plumptre *et al*, 1991). Discussion at the tenth International Tropical Timber Council meeting in Quito in 1991 indicated that producers considered subsidies derived from tax collection and transfer of resources from the consumer end of the wood chain into forest management and harvesting would be deleterious to the marketing and competitiveness of tropical timber, and would likely have little effect on the quality of production. Producers concluded that taxes at source were preferable. In effect, that the management of the timber resource was the responsibility of the producer nation.

Nevertheless, subsidies can be used to supplement incentives for key purposes. It is important that producer countries be assisted in obtaining the additional financial resources that are required to implement comprehensive national strategies for sustainable forest management. The development of an effective incentive structure, based on policy coherence and full participation of forest users and managers is considered an essential component of such strategies.

Conflicting signals - perverse incentives

Incentives (and compensation or subsidies) will operate effectively only where the policy and regulatory framework is coherent and works synergistically; and where the land user is fully involved with design and implementation of the management strategy. It is particularly important that macroeconomic, agricultural and forest policies give complementary signals to the land user/manager.

Contradictory policies lead to economic distortions and to resource loss and damage. For example, in Ghana (see section 4), the cocoa price support system encourages farmers to take more forest land for cocoa growing, whilst forest policy aims to protect existing forest and expand the forested land area. Synergistic policies could be developed to promote the establishment of timber trees to provide shade for cocoa. Such policies would clearly be beneficial to the interests of both sectors, and would provide incentives for both timber and cocoa growing..

Too often the pricing and economic policies of countries with tropical forests distort the costs of deforestation. Barbier *et al* (1994) expand:

- "The 'prices' determined for tropical timber products or the products derived from converted forest land do not incorporate the lost economic values in terms of foregone timber rentals, foregone minor forest products and other direct uses (eg tourism), disrupted forest protection and other ecological functions, and the loss of biological diversity, including any option or existence values.

- Even the direct costs of harvesting and converting tropical forests are often subsidised and/or distorted, thus further encouraging forest conversion and degradation.

- Financial (market price) signals may omit external costs to others of woodland exploitation, both currently and in the future..and/or international and global external effects: loss of recreational values, biodiversity and impact on climate. For these values only rudimentary markets exist. For biodiversity and climatic effects, international agreements are necessary to establish markets."

Re-orienting incentives towards sustainable forest management

Sustainable forest management relies strongly on the full and equitable involvement of the principal groups concerned with forest use, notably:

- Communities who are, or could be, involved with tree and forest management

- Institutions and organisations in whom forest management responsibility is formally vested

- Commercial concerns holding rights over forest resources

The empowerment and allocation of responsibility to communities and groups provides

private incentives which can motivate action towards sustainable forest management. Within institutions "motivating forces...can be summarized simplistically as fame and fortune" (Burley, 1990). Security, career structure, managerial methods and general working conditions are also likely to be important to some individuals.

The concept of shared rights and responsibilities, in which management targets and approaches are mutually defined and agreed through a participatory process, is likely to provide a more sustainable solution. Where people hold rights there is a strong willingness to assume responsibility. In the following sections of this paper, progress with collaborative approaches to forest management in Ghana is described. Also described is the recommendation for a framework of joint management in which communities and the private sector work together under the guidance of government to maximise identified economic and ecological values (IIED/FD, 1994; Sargent *et al,* 1994). The sharing of benefits provides the social incentive for investing in good ecological management. Good ecological management requires technical knowledge of the resource and this knowledge is not restricted to trained government officers. There is a richness, diversity and depth in the information held by farmers and the private sector. This information can be captured and shared through processes of joint management.

Conclusions on the nature of incentives

- Incentives are signals that indicate an increase in value following a particular course of action. Incentives for improved forest management seek to encourage the land user/manager to assume greater responsibility for the resource.

- "External" incentives are likely to undermine local responsibility. The full costs of incentives should be internalised.

- Incentives are distinct from subsidies or compensation, which are flexible instruments which can be used to correct market distortion, but which may, advertently or not, remove responsibility from the land use/manager, and undermine local initiative and ability. Subsidies and compensation are likely to be unsustainable on any large scale.

- Incentives (and compensation or subsidies) will operate effectively only where the policy and regulatory framework is coherent and works synergistically, and where the land user/manager is receiving a complementary signal from all sectors.

- Incentives should be supported with capacity building for all groups concerned with resource use and management. This will enable effective advantage to be taken of any increased motivation.

- The development of an effective incentive structure and appropriate use of subsidies/compensation, based on policy coherence and full participation of forest actors and managers, is considered an essential component of strategic planning approaches for sustainable forest management.

The study of incentives in Ghana, which the following sections summarise, had its origin

in the Ghanaian government's recognition, in 1991, that signals emanating from existing policies were in conflict. For example, the majority of existing market and fiscal signals (demand side), encouraged and promoted extraction of high value timber species. Control (supply side) measures on the other hand, including management plans, yield allocation and so forth, attempted to conserve high value species, promoting extraction of a wider range of lesser used species.

To be able to 'fuel' the type of policy process cycle described in Section 2, a systematic analysis of these inconsistencies was needed, followed by conversion of the "signal failure" into a system of incentives which promote action towards sustainable forest resource management and deter use which is detrimental.

4. GHANA'S FORESTS: CONDITION, POLICIES AND STAKEHOLDERS

Methods used in the study

The following sections summarise the results of a study undertaken by a team from IIED, representatives of local institutions and the Forestry Department during 1992 and 1993. In addition, reference is made to key initiatives and sources of further information on forest management developments in existence after the main part of this study was completed.

The main tasks that were undertaken by this study were:

- Pre-project national-level consultation workshop
- Assessment of secondary information and ongoing initiatives
- Participatory Rural Appraisals (PRA) with six communities near forest reserves in the high forest zone
- Interviews with staff/representatives of local, district and national institutions with influence on forest use and management
- Interviews with staff of eight District Forestry Offices
- Interviews and economic analysis of 17 logging companies and concessionaires, and 16 timber processing companies
- Basic assessment of forest condition and management practices in areas linked to the above groups
- Analysis and modelling of past, present and future timber extraction patterns
- Periodic meetings with a project steering committee
- District-level stakeholder negotiation workshop

- Post-project national-level consultation workshops

Detail of the PRA work and the interviews with local institutions and with district forestry offices can be found in Mayers and Kotey (1996). The other tasks, the methods used, and some lessons derived from the study's approach are described in IIED/FD (1994).

Ghana's forest resources

Ghana is well ahead of many tropical countries in the available knowledge base on its forest resource and the demands being placed on it. Whilst there remains much to be done, Ghana is also notable for the progressive measures it has adopted to regulate timber harvesting and promote conservation.

The current extent of the state-managed permanent forest estate, including three national parks, is about 18,000 km^2 (Figure 2). Outside the forest reserves, substantial conversion of the natural tropical high forest (THF) to farmland has taken place in recent decades[2]. This has been legal, intentional and arguably often necessary for economic development. Ghana has depended on these lands over the last sixty years for the country's major export earner - cocoa. Today there is very little closed canopy forest outside the forest reserves.

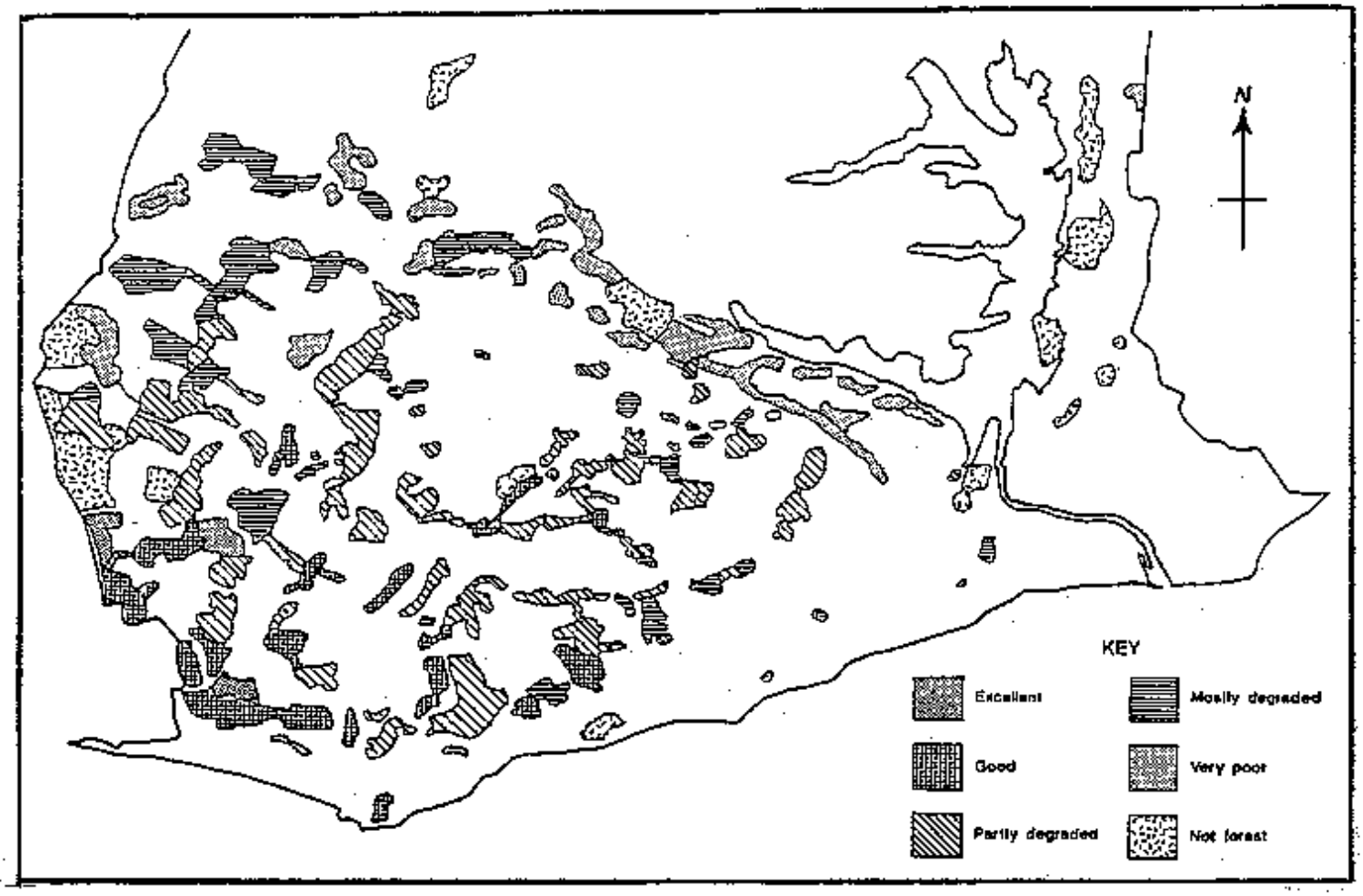
The implication of an archipelago of well protected forest islands in a sea of farmland is misleading however. The areas outside the forest reserves in the THF zone are by no means devoid of forest resources. Land in the potential 'forest zone' (Figure 1) is under a wide range of land uses in the spectrum from farm to bush-fallow to secondary forest. Furthermore, cocoa cultivation is typically accompanied by considerable shade tree cover and these trees may be timber species. Over the last twenty years, this timber outside forest reserves has consistently represented between one third and two thirds of the total annual recorded timber harvest in Ghana.

In addition, the condition of the reserves themselves varies widely. Analysis by Hawthorne and Abu Juam concluded that of the approximately 16,340km^2 of forest reserves in the THF zone, some 9,000 km^2 is in reasonable condition and the remainder is "mostly degraded" or has "no significant forest left". There is a general increase in forest disturbance from the wetter forest in the southwest of the THF zone, to the drier forest areas in the northeast, as a consequence both of greater fire and logging damage (Hawthorne and Abu Juam, 1993). However, the condition of these reserves at the time of reservation is not comprehensively analyzed by these authors.

Forest inventory data from 1985 to 1988 indicate that Ghana's forest reserves then contained a gross standing volume of 188 million m^3 of which about 90 million m^3 was in currently commercial species over 70 cm dbh. This represented a standing volume of mature commercial species of 77 m^3 per hectare of productive forest in reserve. However, the volume of the 15 to 20 species of highest commercial value represented

[2] In the light of recent questioning of 'received wisdom' on the issue, the extent and timescale of deforestation before and after reservation deserves critical review (Fairhead and Leach, forthcoming).

Figure 2 *Forest reserves in the high forest zone of Ghana*



Notes: Reserve Conditions. Each reserve has been given a single score:

1 = EXCELLENT with few signs (<2%) of human disturbance (logging/farms) or fire damage, with a good canopy and virgin or late secondary forest throughout

2 = GOOD with <10% heavily disturbed. Logging damage restricted or light and well dispersed. Fire damage none or peripheral.

3 = SLIGHTLY DEGRADED. Obviously disturbed or degraded and usually patchy, but with good forest predominant. Max. 25% with serious scars and poor regeneration; max. 50% slightly disturbed, with broken upper canopy

4 = MOSTLY DEGRADED. Obviously disturbed and patchy, but with bad forest predominant; 25-50% serious scars but max. 75% of heavily disrupted canopy. Or forest lightly burnt throughout.

5 = VERY POOR. Forest with coherent canopy <25% (more than 3/4 disturbed), or more than half the forest with serious scars and poor or no forest regeneration; or almost all heavily burnt with conspicuous *Euparorium* and other pioneers throughout.

6 = NO SIGNIFICANT FOREST LEFT: Almost all deforested with savanna, plantation or farm etc; <2% good forest; or 2-5% v.disturbed forest left; or 5-10% left in extremely poor condition e.g. as scattered trees or riverine fragments. Remnants with little chance of surviving 10 years.

Source: Hawthorne and Abu Juam (1993)

only 55% of the total 90 million m^3. Of this volume, Wawa, *Triplochiton scleroxylon*, and Dahoma, *Piptadeniastrum africanum*, account for 30% (Ghartey, 1989). There is no inventory information yet available for timber resources outside forest reserves.

Officially recorded levels of harvest have risen from under 1.0 million m^3 per year in the late 1980s to 1.8 million m^3 per year in 1994; the actual level of cut is higher, due to illegal logging. Since 1973, the annual recorded volume of timber harvested outside forest reserves has generally represented from one third to two thirds of the total timber harvest, although this has risen in recent years - in 1993 off-reserve timber was reported to represent 84% of the 1.7 million m^3 total cut[3]. The off reserve resource serves to buffer on-reserve extraction (Sargent *et al*, 1994). As off-reserve resources are increasingly depleted, pressure on reserve resources will increase. About 500 km^2 of plantation has been established by the state in the high forest zone to date; about a third of this is considered to be successful (FD, 1993).

The timber resource implications of continuation of the current policy and practice were modelled by this study. It is predicted that the harvest of the main currently commercial species from all areas will drop by 65% over the next 20 years if present practice continues. This reflects a near total collapse outside reserves and a marked depletion within reserves. In the longer run only a very few of these species will avoid commercial extinction. Some other species are being harvested at sustainable levels or could be harvested at higher levels. Changing the harvesting pattern to take pressure off over-harvested species through realising the potential increased harvest of others is a major challenge for a system of incentives.

Recent proposals to revise the forest protection regime on forest reserves (see Section 5) are likely to be ratified. These have implications for the resource and production potential of forest reserves and provide a basis (with the highly imperfect information on the off - reserve resource) for an estimate that the sustainable level of annual harvest is probably around 1.0 million m^3 per year, of which 0.3 million m^3 per year would come from reserves (FD/FIMP, 1995).

Assessment of the status of the non-timber forest product (NTFP) resource is very difficult since the range of products exploited is so great and their sources so diverse. Inventory of a limited number of NTFPs is being incorporated in the work of the Forestry Department, as is research into management options for NTFPs (FD, 1995a).

Most NTFPs used for domestic purposes come from the farm-fallow areas outside the forest reserves. The NTFPs traded in significant quantity, however, such as bushmeat, canes, chewing sticks, food wrapping leaves and medicines, largely originate from reserves. These goods are far from being 'minor forest products' - they represent the economic mainstays of some villages and many households and often provide the only income source for poor or marginalized families or those temporarily in need during the hungry season or in poor farming years (Falconer, 1992; 1993).

[3] Figures derived from Forest Products Inspection Bureau and Forestry Department annual reports.

National policy for forests

A wide range of policies have impact on the forest resources of Ghana. These policies range from those concerning agricultural pricing and extension to those concerning roads and settlement. The relative impacts of these policies are discussed further in later sections. In terms of normative forest policy, while the Forestry Department develops and implements at an operational level, initiative at the national level rests with the Ministry of Lands and Forests and the Forestry Commission. In the late 1980s, concern that the demands made on forests, and the practice of forestry itself, had long since moved out of step with the 1948 Forest Policy led the Forestry Commission to begin review of the policy (Forestry Commission, 1989). In a process with sporadic momentum, eventually bringing in issues of wildlife conservation also, this led to a new Forest and Wildlife Policy, signed by the Minister of Lands and Forestry in November 1994. The core aim of the policy is stated as:

> *"conservation and sustainable development of the nation's forest and wildlife resources for maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society".* (MLF, 1994)

Enunciation of this policy represents an important milestone in the Ghanaian government's recent efforts to strengthen the basis for good forest management. Following from this, the process of reviewing and updating the various laws in the forestry sector has began. The Ministry of Lands and Forestry aims to produce a new Forest Act to consolidate all existing forest laws in a composite law.

Whilst there was fairly widespread consultation amongst those within the forest sector in development of the new Forest and Wildlife Policy, there was limited involvement of other sectors which have an influence on forests, and the opportunity was not taken to develop a wide consensus on the national priorities for forests. One consequence of this may be continued difficulties in integrating forestry and wildlife planning with other land use decisions and policy frameworks in other "sectors" such as agriculture and mining.

Fiscal, financial and economic framework

Fiscal measures in the form of royalties, concession rents and levies act on the demand side. From the resource management point of view, they seek to reduce demand for species harvested beyond sustainable levels through lowering the market incentive (price or profitability), and to encourage increased use of species which are harvested below sustainable levels by improving their relative profitability. Log export bans are also demand side measures, and can be used in a similar way to the fiscal measures.

The only significant fees at present are log royalties collected by the Forestry Department[4], and a 3% fixed export levy collected between the Timber Export

[4]At the time of the study in 1993, the Lands Commission Secretariat was responsible for collection of royalties from timber exploitation outside reserves. This responsibility has now been transferred back to the Forestry Department.

Development Board and the Forest Products Inspection Bureau (see below). These represented an average of 96% of the total forest fees collected over the period 1989 to 1991. Log royalties have been set by the Ministry of Lands and Forestry, usually once every three to four years. Royalties have reached 2-3% of FOB[5] values of logs, but inflation quickly erodes these real values. A reflection, perhaps, of the influence of the timber industry is that this level of royalty setting has generally continued despite an agreement with the World Bank in 1988 that royalties would be increased in two stages within five years to 18% of FOB values.

It is estimated that about two-thirds of levied royalties are actually collected. However, collection rates as a proportion of all timber harvested (legally and illegally) is certainly below 50%. Many concessionaires, especially some of the largest state-controlled ones, have been successful at delaying royalty payments, thereby reducing their real value. Outstanding royalties were reported to be about US$7 million in 1992. With weak administrative capacity in the Forestry Department, there has been an increased emphasis in recent times on "downstream" royalty collection - with FPIB playing a greater role. With this reduced emphasis on collection by District Forest Offices, there is greater complexity and potentially increased scope for payment evasion, unless the timber is exported.

In 1993, total forest revenue collected by the government annually was about US$ 5.8 million, or about US$ 5 per m^3 of the official timber harvest. This compared to an estimated total annual stumpage value[6] of US$ 120 million or US$ 98 per m^3. Government rent recovery (the proportion of economic rent[7] of the forest recovered by the Government) was thus only about 5% or 6% if income tax is included.

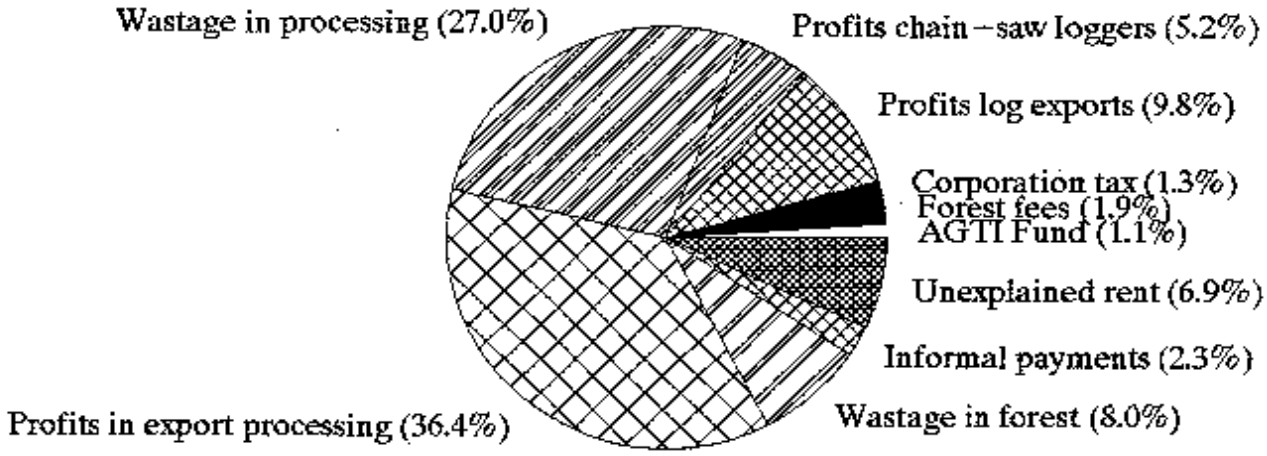
Figure 3. shows the estimated distribution of the stumpage value calculated in 1991. It was estimated that some 63% of the stumpage accrued to the processing side of forest industry, divided between profits (36%) and wastage (27%), a further 10% went to log exporters, and at least 5% to chainsaw loggers. A very small proportion of the rent was redistributed through corporate taxation and informal forest fees. Informal payments made by concessionaires to stools and/or communities were difficult to quantify but may have accounted for a further 1% to 2%. Corporation tax came to just over 1%.

[5] FOB - Free On Board, price of exports

[6] The stumpage value is defined as residual value of the timber after deducting from the FOB log export price the costs of harvesting, transport and a working profit in logging. It represents the maximum realisable profit level from exporting in raw or processed form. It is therefore the maximum price a logger would be prepared to pay for the standing tree in a theoretical competitive market situation.

[7] Economic rent is equal to the stumpage value less those forest fees which tax the value of the timber going to the private sector. In this case this excluded the 3% export levy, which was treated as payment for services, and thus deducted from the FOB value to find stumpage. It is often called 'unearned' rent because it is not earned by any productive factor - in this sense it is like a 'windfall profit'.

Figure 3. Estimated Distribution of Stumpage Value 1991



Source: Richards (1995)

Fuel on the fire: the impacts of fiscal incentives

Forest fees, especially royalties, have been too low in absolute terms to protect the resource or slow down exploitation, especially outside the reserves where control is weakest. The system has also resulted in an inadequate market differentiation between species. For example the log royalty on the increasingly rare Mahogany *Khaya sp.*, in 1993 was less than US $6 per m^3 more than that of abundant species like Dahoma *Piptadeniastrum africanum*, and Ceiba *Ceiba pentandra*. This has encouraged 'high-grading' and discouraged the use of abundant species.

Recovery of forest fees is inadequate to meet the current formal forest management costs - the project estimated that the current annual cost of the forest sector institutions is about US$ 14 million (compared to US$ 5.8 million collected). There is thus a reliance on the tax payer and donor subsidies for the costs of management and protection of the resource. Another impact of the low level of official rent recovery is the stimulus it provides to rent seeking behaviour.

The system is inefficient as a mechanism for recovering stumpage value. Loggers (who pay royalties) receive very low prices in Ghana due to the partial log export ban and other factors, and thus profitability in logging is low. The system does not target those receiving most of the stumpage value, *ie* the sawmillers and to a lesser extent the log exporters. The low proportion of stumpage value collected in forest fees has represented a 'gift' from society to industry and other users in a position to benefit from cheap logs and informal forest fees - this gift is estimated to be in excess of US $100 million annually (Richards, 1995).

Insignificant benefits from royalties, due to low levels and lack of transparency in the system, have reinforced the tenure problems to further disinterest farmers and local

communities in the forest resource. Stool chiefs[8] have shown a willingness to sell or rent the forest resource for other land uses. In addition, the system of payments to the Forestry Department for non-timber forest products, has favoured commercial and more distant collectors over local users, and done nothing to encourage sustainable management.

Wastage, both in the forest and mill, has tended to be encouraged by low royalties and cheap logs respectively. In the case of logging, low absolute royalty levels have resulted in the low cost of forest wastage, and rendered the tree-based royalty system ineffective. Wastage has been exacerbated by downstream royalty collection and the weak system of fines and sanctions. In the case of sawmilling, cheap logs due to the combination of low royalties (where concessionaires are also sawmillers), over-supply due to lack of control and the log export bans, have resulted in a subsidy which minimises the incentive to fully utilise the logs. This study found an average overall lumber recovery rate of 37%.

Fines have been too low and infrequently applied to act as an adequate deterrent against ignoring forest regulations. FPIB reported that in 1992, 86% of Wawa logs extracted were below the minimum girth limit. The 3% export levy raised by TEDB and FPIB has resulted in strong downstream regulatory and export promotion institutions; however it is arguable whether this has resulted in a commensurate benefit for the resource. Furthermore, there is a proliferation of small fees which probably do not cover their institutional collection costs, and which inhibit constructive dialogue between government and the private sector.

Analysis in this study of the situation up to 1993 showed that the problems described above have not been helped by log export bans of certain species in 1979, 1988 and 1993. The analysis showed that low domestic log prices of the high value banned species, due both to the bans and patchy supply control, had resulted in a considerable increase in the domestic consumption of these species in recent years. The bans may have also encouraged illegal log exportation (Richards, 1995).

Whilst some means of limiting external demand on the resource is essential, the bans have been ineffective as a conservation measure, and have provided a further subsidy to industry - causing wastage and over-capacity. It is likely that the major pressure for the bans comes not from environmental considerations but from the sawmilling lobby and from those with macro-economic objectives. The latter will have been disappointed by the poor level of benefit to the economy from value-added processing (see for example, Coleman, 1991) and the poor response of exports of processed timber of the banned species (General Woods, 1993). However, recent analysis has reinforced the case for log export bans as short term measures to protect the resource until proper enforcement measures are in place (see section 5).

[8] Stools are the symbols of chieftaincy. The Stool chiefs, through a combination of customary and common law, are generally the landholding authorities.

Land and Tree Tenure

Traditional landholding authorities hold allodial (absolute) title to land on behalf of the people. Members of the landholding group have usufruct rights and may permanently appropriate a portion of land by 'permanent' development. Such land, for most practical purposes, belongs to the member of the landholding group and his interests are secure, inheritable and generally alienable. Migrants acquire land by outright purchase, or more commonly by leasing under customary law.

Management and control of forest reserves is exercised by the Forestry Department on behalf of the government. At the local level, forest reservation has modified tenure systems and in general represents a disincentive for those nearest to the forest resource to take responsibility for it.

In theory timber trees are owned by the landholding stools on whose land they stand. But this ownership is ambiguous. Rights to timber trees, both inside and outside forest reserves, are vested in central government on behalf of the stools. Until 1995, this arrangement, coupled with other colonial and post-colonial policy and legislation, resulted in a situation in which farmers, native and migrant, had few rights in timber trees on their lands and farms save the right to use some for individual 'domestic' purposes. Concessions were granted by central government with little or no input by stools, village communities and local authorities. Individuals did not receive any portion of royalties and had no legal right to be informed of, or to refuse, felling of trees by timber concession holders. Furthermore they suffered damage to their trees, crops and farms when timber trees were felled, receiving little or no compensation. Tree tenure was thus a major disincentive to off-reserve timber tree planting and protection on farms and fallows[9].

Government forest management capacity

Despite a number of problems, silvicultural prescriptions, harvest controls and conservation measures applied by government institutions are becoming increasingly effective. However, the study noted in 1993 that the institutional environment presented a number of contradictions which hampered effectiveness. These included: the inconsistent application of concession allocation criteria and the sometimes inefficient deployment of available staff and resources. More fundamentally however, the low pay, poor working conditions and meagre logistical support experienced by the Forestry and Game and Wildlife Departments represented major constraints to progress.

These internal and external problems had important impacts at a number of levels in 1993: the application of felling controls in practice was patchy; implementation of stock surveys was sometimes of limited accuracy and yield allocation procedure required further refinement; off-reserve logging was essentially a salvage felling regime, with minimum

[9] During 1994, particularly heavy and illegal harvesting of timber outside forest reserves, gave impetus to the Ministry of Lands and Forestry's drive to address some of these issues. A process of broad-based consultation managed by the Forestry Department led to the introduction in 1995 of a range of important measures (see section 5).

girth limits, at best, being the only control; downstream log checks and export control functions were not adequately linked to yield allocation, felling checks and revenue collection; and the mandatory permit policy for use of non-timber forest products from forest reserves was unenforceable. In general, fines for law transgressors were inadequate and the judicial system was uncooperative, while in practice, the private sector was able to influence a number of control tasks.

Many of these problems were receiving attention by 1993. In particular, improvements had been made under the Government of Ghana/World Bank/ODA/DANIDA Forest Resource Management Project (FRMP)[10].

In overall terms however, it was concluded in 1993 that it would always prove extremely difficult for such problems to be fully overcome if key forest sector agencies remain within the core of the civil service.

Downstream regulatory frameworks

The Forest Products Inspection Bureau (FPIB) is mainly responsible for checking logs once they leave the forest, for which they issue a Log Measurement Certificate; for the development of timber grading rules; for registering different types of operations; and for export vetting. FPIB does not, however, have the mandate to impose sanctions on illegal log movement. Links with the Forestry Department, which does have this mandate, have been poor. The timber industry complains that export vetting is unnecessary and tends to resent the various registration charges and export levies charged by FPIB and associated state organisations. The Timber Export Development Board (TEDB), responsible mainly for market intelligence and promotion, has been the object of criticism from the industry which feels that it does little to justify the levy (1.6% of Free On Board value in 1993) applied to all forms of timber export. In general it could be said that while some downstream control functions are vital, others have unnecessarily hindered both exports and constructive dialogue between industry and Government.

Logging and the wood processing industry

In 1994, there were 810 extant concessions (282 in reserves, 528 outside reserves) divided amongst 413 concession holders (FIMP, 1994). Only 260 of these concession holders appear to have current property marks (for which an annual payment is required), and by implication about 37% of concessions must be either inactive or illegally operated. Many concession holders are small-scale companies employing less than 10 persons. It is estimated that 50% to 70% of the timber harvest originates from these small companies (General Woods, 1993). The resulting large number of small and/or inactive concessions has been an important constraint to sustainable management.

[10] These improvements continue, notably through; continued improvements in operational management by the Forestry Department; the revision of protected forest area management systems and the practice of "fine-grained protection" (Hawthorne and Abu-Juam, 1993; FIMP, 1994); and the introduction of management measures outside forest reserves (FD, 1994) (see section 5).

In addition to concession-holders, independent chainsaw operators and "bushmillers" have accounted for a significant proportion of trees felled outside reserves, and in some cases have been (illegally) active inside reserves. Chainsaw operators may be preferred by farmers to loggers since there is little extraction disturbance and the farmers are in a much better position to arrange compensation or some other payment because they can demand or confiscate some of the lumber.

This study concluded that, in 1993, legislation had effectively provided concessionaires with a free hand, unfettered by the complication of the rights of others. Outside the reserves, the impact of farmers not having rights over trees had been to encourage concessionaires to harvest the trees as fast as possible before the farmer cut them down. Coupled with the lack of control over exploitation, this had devastated the off-reserve resource.

The Ministry of Lands and Forestry made an analysis of these problems, and in 1992 announced plans to introduce a bidding system following a pre-qualification process for future concession allocation. By 1995 this has developed into a draft Concession Bill (to replace the Concessions Act 1962). In addition to the prequalification and tendering process, provisions include: timber rights to be held in the form of timber utilisation contracts; and harvesting rights dependent on concession plans, logging plans, an environmental impact statement and a social responsibility agreement.

Many smaller logging companies have no processing capacity. The majority of value from the timber industry is captured by the larger timber millers, particularly those exporting logs or processed products. In 1992 there 110 sawmilling entities, 9 plywood mills, 15 veneer mills in Ghana. The over-capacity of sawmilling, given the available wood supply, was noted by a study of the industry at that time (General Woods, 1993). In terms of tertiary processing there were 200 registered furniture manufacturers, almost all producing for the domestic market, and about 20 other entities producing flooring, doors and profile boards (General Woods, 1993).

In 1993 this study further concluded that the private sector has, in practice, significant influence over many forest management and control tasks, yet is not involved in formal decision-making and has little management responsibility. Loggers and secondary processors receive little reward for good forest management practice or reduction of timber wastage. (See also the above section on the impacts of fiscal instruments).

District Assemblies, Traditional Councils and Stool Chiefs

In 1988, District Assemblies replaced the old District Councils and consist of elected representatives from all the towns and villages in each of the 110 districts in Ghana. In their capacity to pass local by-laws and construct development programmes, some District Assemblies have been active in environmental and forestry matters. Many others however have seen the timber industry and, increasingly, NTFP exploitation purely as a source of revenue and support. In some districts, the District Assembly is active in preventing the continuing operations of timber companies with significant royalty arrears and the monitoring of trucks and machinery.

Traditional Councils are bodies composed around a Paramount Chief and consist of a number of Stools. The Traditional Councils and Stools, through a combination of customary and common law, are generally the landholding authorities in the high forest zone. As described earlier, government assumes the right to exercise all control of timber tree exploitation despite customary and common law 'ownership' of timber trees resting with the Stools. Successive pieces of legislation have left traditional authorities with little formal decision-making role in forest management despite their legal position as owners. As a result of the low and irregular nature of payments, Stool chiefs have shown a willingness in some areas to 'sell' or rent out areas of both reserve (illegally) and off-reserve forest for alternative land uses, especially in the Western Region.

Farmers and communities

As noted above, the tree ownership situation meant that, until recently, it was not surprising to see farmers actively destroy or prevent the growth of timber trees on their farms. Furthermore, entering into and carrying out any activity within reserves is unlawful without the prior written authority of the Forestry Department. This extends to the collection or extraction of NTFPs by communities living near forest reserves, national parks and game production reserves. These communities often resent their legal exclusion from resource use and largely disregard the rules.

However, work within this study in various locations around the high forest zone reinforced suggestions made by others (Falconer, 1991; Norton, 1991; Antwi 1992) that, policies and laws notwithstanding, communities and local institutions can achieve working cooperation in forest management, to the benefit of all parties. Results of this work are presented by Mayers and Kotey (1996).

Summary of impacts of incentives - in 1993

When the various positive and negative influences on forests management in Ghana were weighed up in 1993, the overall balance was on the negative side. Some key dynamics creating this situation were:

- demand side incentives too weak to have an impact on extraction and in conflict with supply side measures;
- an underpriced resource unable to withstand the consequent excess demand pressures, especially outside the forest reserves;
- an under-resourced Forestry Department struggling to manage the resource without cooperation from other disaffected stakeholders and ever-dependent on the national treasury; and,
- a legal and regulatory framework with several key disincentives to better forest *management.*

Table 1 summarises the main stakeholder groups, their interests, the means to secure their interests and their resource-related and people-related impacts. Figure 4 illustrates the

impacts on forest reserves and outside forests of key policy instruments in place in 1993. Figure 5 attempts to show the interrelatedness of key impacts of the forest fiscal system.

5. CONCLUSIONS ON INCENTIVES FOR SUSTAINABLE FOREST MANAGEMENT IN GHANA: AND AN UPDATE ON RECENT PROGRESS

Ghana has a head start on many countries in the pursuit of sustainable forest management. It has: a network of managed forest reserves; reasonably effective downstream controls on logging; vibrant community institutions; and traditional and modern local government structures providing the means for signals to be sent both up to national levels and down to local levels.

The following challenges for making further progress stood out from the analysis in 1993:

- To *accept that full government control of forest management is unfeasible*, even if massive resources were available, and to find ways of harnessing the interest, resources and skills of others: farmers, communities, industry and other non-governmental groups in managing the forest resource.

- To create a sustainable basis for management by *recovering the full costs of management from the forest resource*, rather than from the tax payer or through donor subsidies.

- To develop the capacity within government to effectively implement a *management system based on support, monitoring and supervision* rather than complete control.

The following section outlines some of the main options for policy and incentives which can further support the transition to sustainable forest management. Some of these options have been receiving some attention and support since 1993. Where this is the case, a brief description or reference to further information sources is made.

Goal-setting and planning: shared rights and responsibilities

The national importance of forest products and services, particularly timber and the inter-generational nature of forest values such as conservation of biodiversity and environmental stability, suggest that these should continue to have a central role in forest management. Yet the state cannot fulfil its current role as sole manager of the forest estate because its institutional capacity is insufficient. The processes by which other forest resource users can take on more responsibility for managing the resource are coming under increasing attention. These processes cannot simply be 'switched on' through education programmes and appeals to the national interest. They will require gradual development through devolution of decision-making and benefit sharing with forest users.

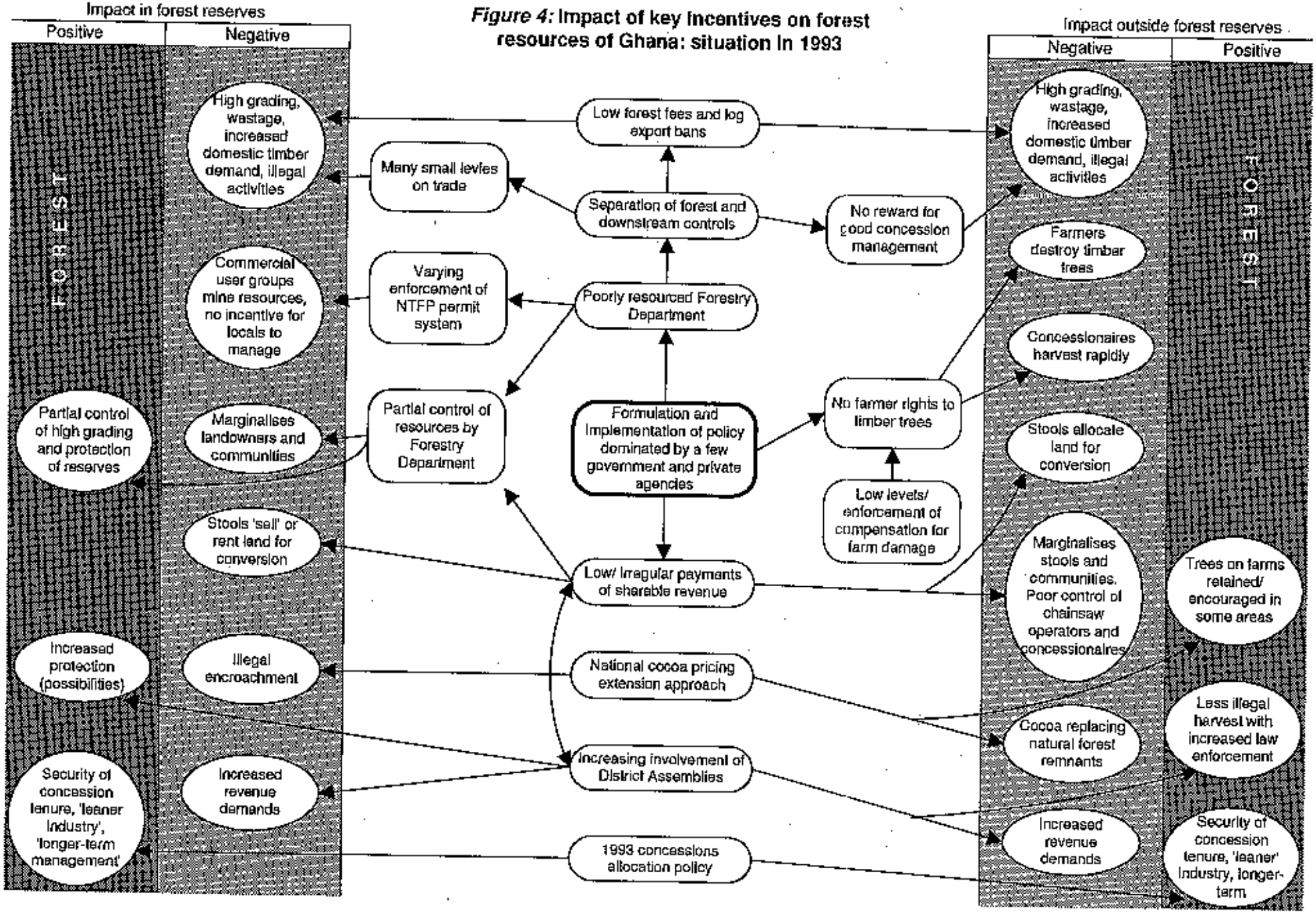
- *Institutionalised mechanisms for deepening participation in the review, formulation and implementation of policies which affect forests*. Such mechanisms should be cross-sectoral, participatory, and strategic. A periodically convened national forest forum is one such mechanism. There are various other types of forum which

Table 1: Forest Stakeholders in Ghana: their main interests and impacts
(situation in 1993)

Stakeholder Group	Main Interests in Forests	Means to Secure Interests	Main Impacts on Forests and People
Ministry of Lands and Forestry	"Conservation and sustainable development of forest resources for maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society" (MLF, 1994)	Inter-ministerial (intra-governmental) negotiation Policy statements Concession allocation Market mechanisms Laws and regulations Consultation with other stakeholders Provision or control of information Monitoring Much pressure from private forest sector	Dominate policy processes Strong policy control over Forest Department and other forest sector bodies Over-ridden or influenced by some other sectoral policies and impacts
Ministry of Agriculture (eg. of other central government stakeholder groups)	Source of land for conversion to agriculture	Statutes clashing with some forestry laws/policies Agricultural extension advice Subsidised pricing of agricultural inputs Fixed crop prices	Conversion of forest land to agriculture - particularly cocoa. Some shade trees favoured. Encroachment on forest reserves
Environment and development NGOs/lobby groups	Sustainable use Watershed protection Source of biodiversity and endangered species Climate regulation	Influential members lobby government. Access to donor support and international recognition	Some policy influence. Donor support for forest planning and control by Forest Department. Scattered environmental and community projects by NGOs
Forest Department	"Sustained supply of timber and non-timber products in perpetuity and environmental protection" (Kese, 1990)	Forest reserves as power base Allocation of yields Supervision of harvesting Policing role over people around forest reserves Poorly resourced, but significant donor support	Increasingly effective control of logging and farming encroachment in forest reserves. Weak control outside reserves Poor coordination with downstream control structures
Local government (district Assemblies)	Source of revenue through royalty shares	District bylaws Involvement in roadside checks Chainsaw controls	Some increase in law enforcement and protection Increased revenue demands
Traditional authorities	Land - power base. Source of revenue through royalty shares	Tenurial control of land Allocation of land Passive recipients of low and irregular payments of shareable revenue	Stool chiefs sell or rent land in reserves for conversion, allocate lands outside reserves for farming

Stakeholder Group	Main Interests in Forests	Means to Secure Interests	Main Impacts on Forests and People
Wood processing industry	Source of logs at low prices to convert to high value processed timber	Strong influence at policy level based on economic muscle Keep forest fees low and poorly collected	Excess sawmilling capacity and wastage in industry Low log prices promoting this
Logging concession holders (without processing capacity)	Source of logs for sale at high prices Only marketable species valued, others may be damaged	*De facto* control over large areas of forest	High grading Undersized trees felled
Chainsaw operators and bush millers	Source of logs for on-site conversion to lumber	Preferred over loggers by farmers More able to avoid royalty payments than loggers Some organised in trade associations	Active throughout high forest zone. High grading.
Commercial NTFP traders	Source of particular NTFPs for commercial use, e.g: canes, wrapping leaves, chewing sticks, bushmeat	NTFP permit and check system ineffective. No local level rights to control access	Locally-based traders may conserve resources Non-local traders likely to over-ride local customary controls and over-harvest resources
Farmers and village-level institutions	Source of agricultural land and creation of fertility Contribution to farming sytem: shade, mulch, disease control, grazing Forest products for domestic use, sale and exchange (NTFPs may be household economic mainstays)	Marginalised in policy. Do not own timber trees on farmed land Farm-level land use decisions Gain low levels of compensation for farm damage from timber extraction by concession-holders. In practice - are decision-makers about produce taken from forest reserves	Destroy timber trees on farms. Variety of tree and forest management practices on farms. Encroachment on forest reserves in particular circumstances

Figure 4: **Impact of key incentives on forest resources of Ghana: situation in 1993**



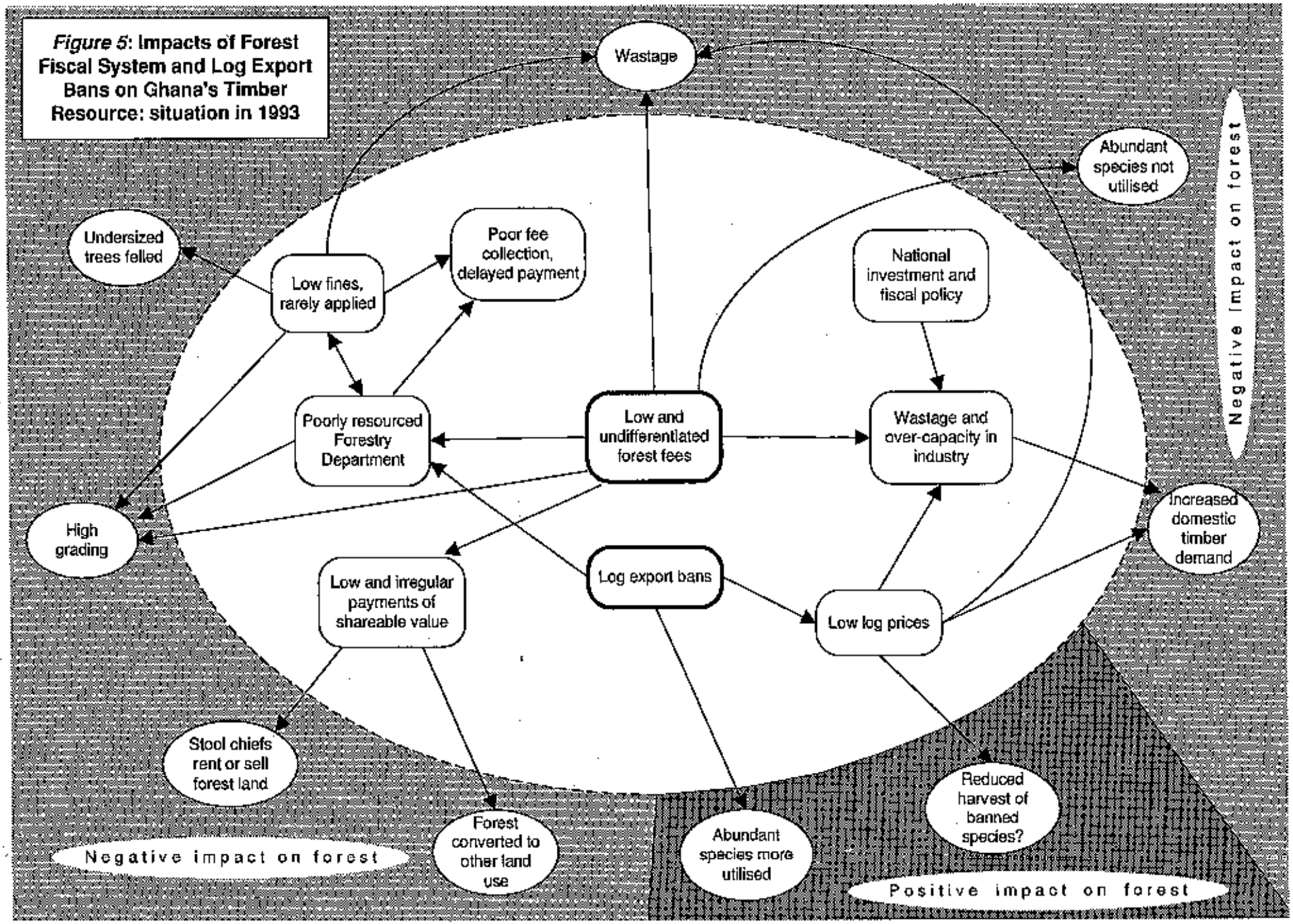


Figure 5: Impacts of Forest Fiscal System and Log Export Bans on Ghana's Timber Resource: situation in 1993
Wastage
Abundant species not utilised
Undersized trees felled
Low fines, rarely applied
Poor fee collection, delayed payment
National investment and fiscal policy
Poorly resourced Forestry Department
Low and undifferentiated forest fees
Wastage and over-capacity in industry
Negative impact on forest
High grading
Increased domestic timber demand
Log export bans
Low and irregular payments of shareable value
Low log prices
Stool chiefs rent or sell forest land
Forest converted to other land use
Abundant species more utilised
Reduced harvest of banned species?
Negative impact on forest
Positive impact on forest

might be involved, which in combination would enable negotiation and decision-making amongst institutions and stakeholders across the "horizontal" spectrum (range of sectors and interests) and the "vertical" levels (national, regional, district and community). This would create more widely-owned policy processes, and thus
policy outcomes that are integrated with other sectors, and workable in practice.

The sharing of rights and responsibilities for forest management is also being widened, recognised and formalised at the levels of operational policy development and local practice (FD, 1994; FD, 1995). Given the high value of the forest resource, the importance of the timber industry, and the increasing willingness (and imperative) for improved communication between government forestry and the private sector, possibilities exist to develop further forms of collaboration which build on nascent relationships between the private sector and other forest stakeholders. In particular, the opportunity exists for development of forms of co-management amongst concession holders, forestry officers, landowners and village communities. These could be facilitated by district forestry offices and/or non-governmental organisations.

- *District level negotiation and agreements on shared rights and responsibilities.* These should involve traditional councils, district assemblies, district forest offices, concessionaires and community representatives

At village level, the needs for recognition and development of effective forms of collaborative forest management are receiving increasing attention. The possibilities of bringing in key private sector operations into forms of co-management at concession level could also be investigated.

- *Community level involvement in forest management planning.* A key component of this should be village meetings, with the attendance of the district forest office, to discuss, formulate and approve felling plans for local concessions and other forest management plans. Key developments in this area have been made. A consultative process managed by the Forestry Department during 1994 resulted in the introduction, in mid-1995, of the 'Interim Measures to Control Illegal Timber Harvesting Outside Forest Reserves'. These measures included: stool and community consultation during concession allocation; pre-felling inspection procedures involving the Forestry Department, loggers and community representatives; involvement of community institutions in dispersal of royalties; consideration of direct payments to farmers as Timber Tending Tolls; and consideration of tree tenure changes for planted trees. Another key feature is that farmers should have the right to decide whether and when timber trees can be felled on their farms. This enhances their ability to negotiate compensation agreements (FD, 1994; FD, 1995a; FD 1995b; Smith *et al* 1995).

Capacity building

Review of government resource allocation and coordination between the forest sector institutions led this study in 1993 to support the argument for consideration of a merger of the key forestry and wildlife institutions into a single semi-autonomous organisation with a mandate and capacity to raise revenues to recover the full cost of managing the

forest for sustained yield. Of crucial importance if this were to be pursued is for the government, informed by the national forestry forum, to provide the clear policy support and direction for the new body.

- *Improved management structures and employment conditions of government "forest service".* These are required whether the government's lead forest agency is retained as the Forestry Department or combined with other forest sector bodies in a new "service". Planning is in advanced stages for a major focus on institutional reform (FD, 1995b). A key focus is on further increasing the operational effectiveness of the control of logging (FD, 1994).

A government forest service should retain the Forestry Department's central role as the government's lead executing and operational agency for the management of Ghana's forest estate. It would not however have sole responsibility for forest management. The regular functions of protection, maintenance and management of areas under concession for timber production should increasingly become the responsibility of concession holders, while management of NTFPs and some forest protection functions inside forest reserves should become the domain of local communities, subject to agreements with the forest authority, landowners and concession-holders.

- *Improved complementary capacity in government, private sector and communities to manage forest.* A variety of approaches can facilitate a redistribution of tasks between the Forestry Department and the private sector and local institutions to develop joint confidence, competence and interest to manage forests and forest resources over the long term. Plans for institutional reform emphasise development of workable systems for management of the national forest estate, facilitative roles for foresters and devolvement of some productive roles to the private sector and NGOs (FD, 1995b).

If the timber industry is to adapt positively to the range of measures aimed at sustainability in the forest, removal of several downstream impediments may be necessary. Some of the functions of FPIB and TEDB could be phased out or transferred to the industry itself. Contract vetting comes into the former category whilst market intelligence and promotion fall into the latter. Registration of forest operations could be carried out by the Ministry of Lands and Forestry. Some other functions, such as log-checking, need to be linked more closely with management in the forest and should be carried out by the forest service. In general, movement of skill centres is required rather than abandonment of functions.

- *Coordination of downstream control structures and removal of unnecessary regulation and fees on forest industry* (see below)

Policy instruments in practice

Effective differential levying of fees to protect or promote species or groups of species is only possible where there is sound resource inventory and extraction information. Generation of such information has been a major emphasis of the Forestry Department - at least in terms of the forest reserves - and a useful system of economic classification of

species related to biological rarity (star rating) has been developed (Hawthorne and Abu Juam, 1993; FD/FIMP, 1995).

- *Higher, species-differentiated forest fees.* This study recommended that royalties be increased in three stages to 20% on the valuable 'Scarlet Red Star' species (those approaching economic extinction), 15% on 'Normal Red Star' species (those currently harvested near sustainable levels) and 5% for 'Pink-Red Star' species (those which could sustain greater exploitation).

It was also recommended that up to 80% of the royalty should be collected before logs can be moved from the felling site. Log Measurement Certificates (LMCs) would be issued on payment Any log leaving the felling site without a valid LMC would be illegal. This would maximise revenue collection, simplify control of illegal extraction and provide an incentive to minimise wastage.

After allowing for revised shares to the different recipients of royalties, and the estimated annual allowable cut in ten years, it was calculated that the forest authority might expect to receive in the region of US $12 million from a total of US$ 22 million collected. This assumed some increase in real prices of the high-value species, and economic extinction of the most endangered species.

Concession rent will increase as a result of the bidding process for concession allocation, but would probably be of secondary importance in revenue generation to its main role of providing a non-subjective means of concession allocation. It was estimated that concession rent might raise about US$ 4 million (or about US$ 4 per cubic metre harvested) of which the forest authority would receive about half.

The project concluded in 1993 that the use of log export bans has proved to be a high-cost and ineffective way of securing the supposed environmental objectives, and that log export levies are to be preferred on the grounds that they can achieve the same objectives with less market distortion, are more flexible and can be an important source of revenue.

- *Log export levies phased in as bans phased out.* This study recommended that log export levies could be 45% for the Scarlet and Normal Red Star species, 30% for Wawa (heavily exploited but still common) and 25% for Pink-Red Star species.

Recent analysis has, however, reinforced the case for log export bans as short term measures to protect the resource until proper enforcement measures are in place. This follows analysis of the increasing percentage of the harvested timber of banned species which has been exported over the years 1992 to 1994, and consideration of the problems which have arisen over the dramatic increase in 1993 and 1994 of log exports to the Far East of species previously in low export demand (UK Forestry Commission, 1995). Four of these species - Kyenkyen *Antiaris toxicaria*, Ofram *Terminalia superba*, Ceiba *Ceiba pentandra* and Otie *Pycnanthus angolensis* - represented 80% of export volume in 1994[11].

[11] Timber Export Development Board export statistics

The revenue generation capacity of the above-mentioned levies was calculated in 1993 under three policy scenarios: (a) a complete log export ban - the revenue generated would be zero; (b) a partial log export ban, *ie* continuation of those species already banned - in this case some US$ 3.4 million could be generated; (c) no log export ban - it was calculated that US$ 12.7 million could be generated.

The 3% export tax in Ghana is very low in comparison with the processed timber levies of other West African producers (Ivory Coast: 5-15%; Cameroon: 7-12%; Gabon: 9.5% - in 1992). There is clearly scope for levies to be raised and differentiated to encourage secondary and tertiary processing, as well as to promote the use of lesser used species. In particular, kiln drying of lumber could be positively encouraged by applying a significantly lower levy rather than negatively encouraged through a ban on the export of air dried lumber, with accompanying market distortions. The levies proposed by the study ranged from 10% on air-dried lumber of Scarlet and Normal Red Star species down to 3% on secondary (considering veneers and plywood as primary processing) and tertiary products of all species, and 5% for all processed products of Pink-Red Star species except air-dried lumber. These levies would raise about US$ 8.2 million in the total ban scenario, US$ 7.8 million in the partial ban scenario and US$ 6.5 in the no-ban situation.

It was recommended that all other forest fees be abolished. This would create an enabling environment for the industry, especially for exporters, and would encourage more effective consultation between industry and the other stakeholder over resource sustainability issues.

The move towards a concession allocation policy based on measurable criteria is a major advance. In many respects, the fact that these criteria will be openly verifiable matters more than their exact definition. It was proposed however, that the qualification system prior to the bidding process should take more account of the social provisions proposed by the applicant (community services, employment provisions, compensation payments, health and safety). Concession allocation should also eventually be linked to the results of environmental audits of concessionaires (see below).

- *Implementation of competitive concession allocation with social criteria.* Discussion of a Bill to revise the Concession Act 1962 continued through 1995.

The current system of fines and sanctions, operating through the judicial system, has proven ineffective. Concession agreements and logging regulations in particular have been flouted. It was proposed that the forest authority be given powers to impose spot or administrative fines. In the case of timber-related offences, fines could be twice the FOB value of the tree involved.

- *Realistic sanctions and effective enforcement by foresters and the judicial system.* Background studies for new consolidated forest legislation were prepared in 1995 and are under consideration in 1996.

Use of regulatory and fiscal instruments has been the traditional approach to implementing policy for forests in Ghana, as in many other countries. However, there are increasing possibilities offered by market-based and other economic instruments. Such

instruments do not directly control or restrict activities that affect forests - they create the economic signals by which individuals choose to modify their activities. Forest certification is one such tool which might complement others in the "tool kit" for sustainable forest management. There are other possibilities, such as performance bonds for concession-holders, which might be considered.

- *Consideration of market-based instruments, such as forest certification, as complements to regulatory and fiscal approaches.* Background studies and consultative fora on forest certification and other market-based instruments are underway in 1996.

In 1993, this study noted that the legal restrictions on ownership and harvesting of trees create the very conditions they seek to prevent. Farmers who are not sure of their rights to trees will either harvest them quickly or neglect them. Farmers who see timber trees as a liability will not think twice before destroying them. The study concluded that the long-term goal should be assured full rights to timber trees for those working the land outside reserves (as opposed to the traditional landowning authorities). Recognising, however, that traditional authorities and local government will resist any suggestion that farmers might benefit at the expense of their royalty shares, interim solutions were proposed. These involved a farmer's right of refusal for timber tree felling; direct payments to farmers from concession holders and chainsaw operators at the time of felling; improved compensation for felling damage; and approval of felling plans by the District Forestry Offices before off reserve felling can take place at all. These ideas have been reflected and further developed in the "Interim Measures" introduced in 1995 (FD, 1994; see above).

- *Farmer rights to fees for timber trees on farmland.* This has been addressed in part by the "Interim measures" (FD, 1994) and needs further development.

- *Compensation to farmers for farm damage from logging, enforced on a district basis.* This has also been partially addressed by the "Interim measures" (FD, 1994)

Much progress has been made in recent times with forms of collaborative management between the Forestry Department and local communities (FD, 1995a). These include approaches for: fire prevention; forest boundary protection; preferential rights to NTFPs for villages adjacent to forest reserves; NTFP inventory by villagers; village monitoring of concessionaires and chainsaw operators; off reserve tree inventory; seed collection and tree planting on and off reserves.

Ways of bringing forest concession-holders into forms of co-management should also be investigated. Benefits for forest industry from this might include: enhanced dialogue with government foresters and village communities; reduction of malfeasance and unfair competition; enhanced protection of the reserve timber resource (better boundaries, improved fire fighting, reduced agricultural conversion); enhanced fiscal benefits and access to additional resources consequent on favourable environmental audits; and enhanced protection, growth and stocks of off reserve timber. Government forest authorities would also benefit from the reduction in onerous and often unsuccessful

policing activities; improved planning and monitoring capability; and improved capacity and equipment.

- *Adaptive local projects involving co-management of forests at village and concession level as learning vehicles for improving policies*. These should involve concession-holders, chainsaw operators and non-governmental groups in addition to foresters and community institutions.

Monitoring and information

Effective monitoring of the effects of the forest fiscal system is needed.

- *Monitoring and annual review of forest fees and export levies*

A system of five-yearly environmental audits was also proposed as the basis for continuation of concession operations. Teams to carry out the audits might be appointed by the Ministry of Environment, and until independent local firms are available, may consist of experienced foresters and environmentalists. Criteria for environmental audit should be specified to include the extent of adherence to forest management practices and prescriptions contained in the concession agreement, logging manual, reserve or forest management unit or co-management plans.

- *Periodic audits of forest management in concessions*. Social criteria should be included in audits, as well as in concession allocation policy (see above). Rewards (eg access to more concession areas, extension of concession tenure) and penalties (eg fines, withdrawal of concession tenure) should be linked to audit results. This has been reflected in discussions about national standards for sustainable forest management, and the potential for forest certification schemes. Farmer and village institutions' roles in monitoring of logging and independent chainsaw operators may also be developed. This is addressed in part by the "Interim measures" (FD, 1994)

Systems which bring together information on the supply of forest assets and products, the demands and stresses on forests, and the use or management responses, are needed.

- *Usable information systems on forests, combining ecological, economic and social information* for forest management capacity at national and sub-national levels.

Table 2 outlines the incentives described above in terms of the stakeholder groups they apply to.

Covering the cost of sustainable forest management

Forest fees as incentives have two principal objectives. The first is to create conditions in which sustainable forest management is more attractive to the manager/user than deleterious practices which destroy the resource base. The second is to ensure that sufficient revenue is raised from the forest resource to cover the full costs of sustainable management and provide a surplus to be returned to government on behalf of society. In

Table 2: Stakeholders and Incentives for Sustainable Forest Management in Ghana

Stakeholder Group	Incentives for Sustainable Forest Management
Ministry of Lands and Forestry	Open up the information and policy-making process by convening or facilitating periodic stakeholder fora (national forest forum) Higher species-differentiated forest fees Log export levies phased in as log export bans phased out, higher processed timber export levies Implement competitive concession allocation process Policy direction for restructured forestry authority
Ministry of Agriculture (eg of other central government stakeholder groups)	More recognition of indigenous agroforestry practices and development and extension of new approaches to crop-tree associations in farming
Environment and development NGOs/lobby groups	Local NGOs as brokers of collaborative forest management arrangements between foresters, communities and private sector. Recognized expanded role in forest management with external support for capacity building and research
Forest Department	Improved resourcing and institutional reform, with greater management and financial autonomy. Experiential staff training and reorientation
District Assemblies (local government)	District-level forest management agreements with communities, forest department and concession-holders
Traditional authorities	Regular transparent sustained payments of revenue shares
Wood processing industry	Investment incentives targetted at value added processing (not basic sawmilling) Higher species differentiated forest fees
Logging concession holders (without processing capacity)	Rewards (including concession allocation) and penalties related to concession management Environmental audits and forest certification linked to market benefits Higher species differentiated forest fees
Chainsaw operators and bush millers	Village level agreements between village organisations, concession-holders and foresters - to include management of local log conversion.
Commercial NTFP traders	Village-level and district- level agreements ensuring local rights to manage and benefit from NTFPs on sustained yield basis - and to control external operators
Farmers and village-level institutions	Farmer rights to fees for tree felling by concession-holders (eventual farmer ownership of timber trees). Collaborative forest management approaches involving village organisations, forestry department and private sector. Village level agreement of felling plans outside reserves.

this study the cost recovery principle was chosen in order to set forest fees. The starting point was thus to assess the recurrent costs of sustainable management.

Calculations were made of the recurrent annual costs ten years hence of the proposed forest authority and the Forestry Commission. Ten years was chosen as an estimate of the time necessary for the proposed incentives to bring the resource under sustainable management. Certain capacity building costs to bring the forest authority up to the level of operational capacity required were calculated separately with a view to seeking donor assistance (see below), although the recurrent costs of these, ie depreciation, maintenance, etc., were included in the main calculation.

This involved assessment of staffing levels (more professional and technical staff, fewer labourers); salaries and allowances; increases in civil works, transport and other equipment requirements; and the costs of the possible expansion of the collaborative management and joint forest management initiative. The total annual recurrent cost of sustainable forest management was calculated at about US$ 27 million. This therefore became the minimum revenue requirement.

The study also estimated the indicative capacity building costs which would be needed to establish the conditions for sustainable forest management. For the whole forestry sector, this averaged US$ 6.5 million each year over the 10 year period. Within this period the forest revenue system will show increasing ability to cover much of the cost, although particularly in the early years, the Ghanaian taxpayer and external funding sources will have to be tapped. To put the figure in perspective however, it represents 5-6% of the stumpage value of the commercial timber harvested in 1992.

The order of magnitude calculations of total annual revenue which could be generated in ten years time, if all the proposed incentives were implemented, can be compared to the US$ 27 million total estimated annual cost of the institutions involved. In the absence of log export bans, total annual revenue could be US$ 34 million, while a total log export ban might generate US$ 23 million. With a partial ban, quite a likely scenario, a figure in the order of US$ 26 million could be achieved.

In sum, sufficient forest revenue could be raised to cover the institutional costs of sustainable management of Ghana's forests. The major ingredient required is courage, to raise the revenue from the forest industry, and to counter the short term macro-economic pressures which have, in the past, overridden social and environmental concerns.

Impact of the Proposed Incentives on the Resource

A modelling exercise suggested that if all the proposed incentives are effectively introduced, there will be a gradual stabilisation of the harvest of industrial roundwood over a period of 20 years, with only slight changes after the tenth year.

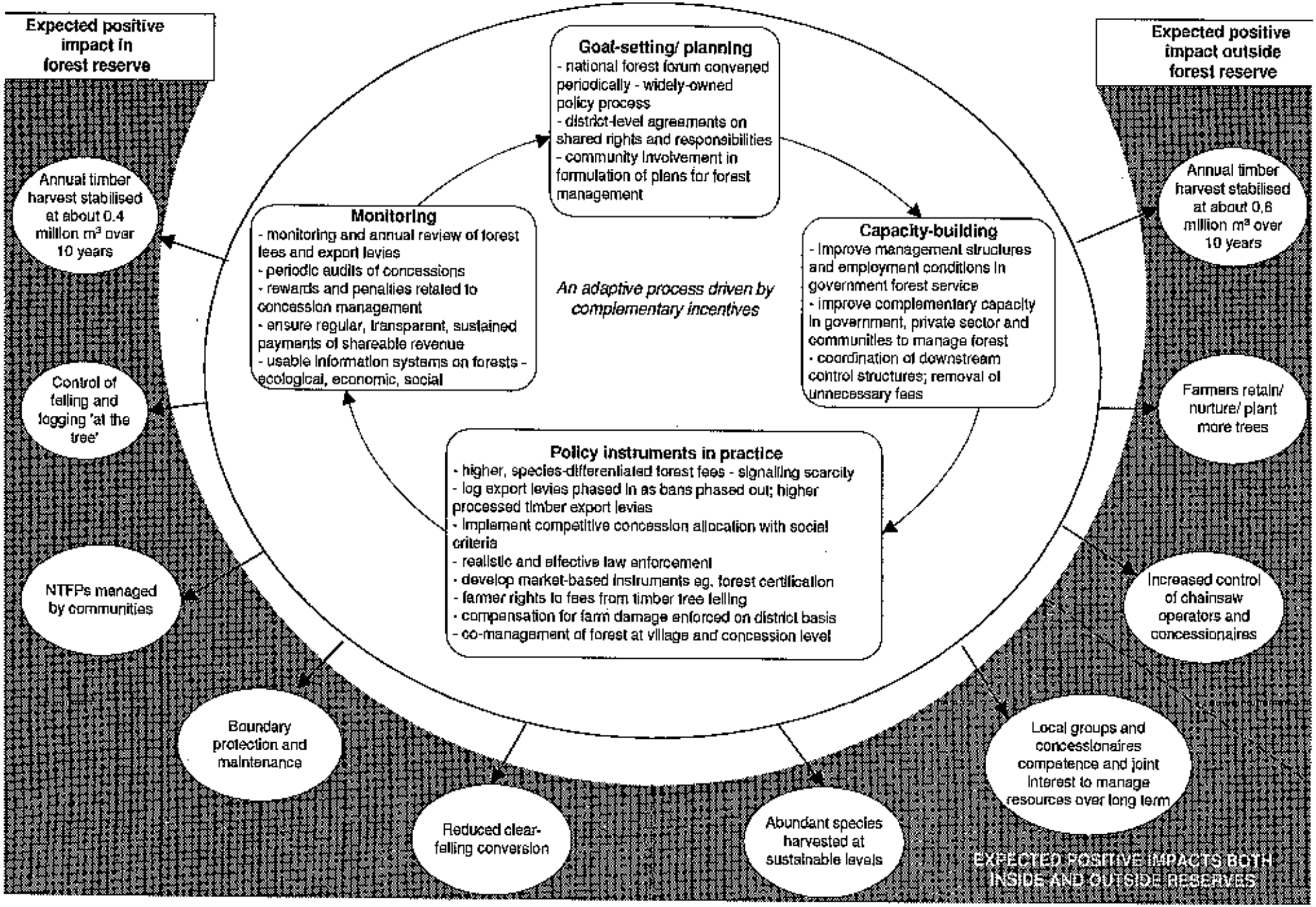
According to these estimations, total annual harvest should stabilise at around the one million cubic metres mark. A calculated future sustainable cut anticipates about 60% from outside reserve areas. Wawa would continue to be the most common species harvested, but with a reduced proportion of the total cut - about 30%, other currently commercial

species would form about 25% of the cut while those currently not in trade or poorly utilized would represent 45% . More detailed analysis by the Forestry Department, with broadly comparable results, has recently been carried out (FD/FIMP, 1995).

Impacts of the incentives outlined above on other forest resources and on other environmental, social and economic aspects of sustainability are less easily assessed, but are predicted to be positive through greatly improved forest management and the sharing of benefits and responsibilities necessary for it.

Figure 6 attempts to show the expected positive impacts of these incentives on forest within and outside reserves. The figure includes some incentives already being applied, and others under consideration. The aim of the figure is to imply the gradual phasing in of appropriate incentives through a cycle of: goal setting, capacity-building, use of policy instruments; monitoring and adapting.

Figure 6: **Incentives for Sustainable Forest Management in Ghana (under implementation or discussion since 1994)**



REFERENCES

Antwi, L.B. (1992) *Land and Tree Tenure and ParticipatoryForestry in Ghana*. MSc thesis, School of Agricultural and Forest Sciences, Bangor. Unpub.

Barbier, E; Burgess, J; Bishop, J; Aylward, B. (1994). *The economics of the tropical timber trade*. Earthscan : London

Bruce J W and Fortmann L (1989). *Agroforestry: tenure and incentives*. Land tenure center paper no. 135. Madison: University of Wisconsin.

Burley, J. (1990) Motivation for excellence in forestry research. *Forestry Chronicle* 66:6 pp 627-631

CARE, (1994). *Review of farmer perspectives and assessment of smallholder forestry systems in relation to World Food Programme project 4304 "reforestation in coastal Vietnam"*. CARE International in Vietnam, Hanoi: FAO

Coleman, H.G. (1991) *Ban on log exports as an appropriate policy mechanism for further processing of wood products*. Timber Export Development Board, Takoradi (Unpublished)

Fairhead, J & Leach, M. (forthcoming) Reframing forest history: a radical reappraisal of the roles of people and climate in West African vegetation change. In: G. Chapman and D. Driver (eds) *Timescales of Environmental Change*. Routledge, London

Falconer, J. (1991) *FRMP project working paper on the uses and trade of NTFPS and the implications for forest management and programme development*. Forest Resources Management Project, Kumasi. Unpub.

Falconer, J. (1992) *Non Timber Forest Products in Southern Ghana: A summary report*. ODA Forestry Series No.2,

Falconer, J. (1993) *The importance of non-timber forest products in the rural economies of Southern Ghana: The Main Report*. Natural Resources Institute, Chatham

FIMP (1994) *Discussion Paper No2: Concession Status and Rationalisation*. Forest Inventory and Management Project, Forestry Department Planning Branch, Kumasi

Forestry Commission (1989) Revision of Ghana's Forest Policy. *Forestry Commission Symposia Series* No.3. Accra

Forestry Department (1973-1994) Annual Reports of the Forestry Department, Ministry of Lands and Natural Resources, Accra

FD (1993) *A Strategy for the Development of Plantations in the High Forest Zone of Ghana*. Planning Branch, Kumasi. Unpub.

FD (1994) *Interim Measures to Control Illegal Timber Harvesting Outside Forest Reserves. Recommendations of the Forestry Department [Working Group] on Control of Illegal Felling Outside Forest Reserves*. September 1994, Planning Branch, Forestry Department, Kumasi. Unpub.

FD (1995a) *Made in Ghana: Collaborative Forest Management*. Prepared for XVIII Session of ITTC and XVI Session of the Permanent Committees of the ITTO, Accra, Ghana, 10-18 May 1995.

FD (1995b) *Progress Towards the Acheivement of the Year 2000 Objective: Ghana*. August 1995. Forestry Department, Accra. Unpub.

FD/FIMP (1995) *Timber Yields from the Forest Reserves of Ghana: An analysisof the implications of sustainable forest management.* Forest Inventory and Management Project, Planning Branch, Forestry Department, Kumasi

Fortmann, L and Bruce, J. (1993). Tenure and gender issues in forest policy in Bradley, P and McNamara, K (eds) *Living with Trees: policies for forestry management in Zimbabwe*. World Bank Technical Paper no. 210. Washington DC: World Bank

General Woods (1993) *Technical and Financial Audit of the Ghana Timber Industry Volumes 1-6*. Prepared for Ministry of Lands and Forestry, Ghana. General Woods and Veneers Consultants International Ltd. Quebec, Unpub.

Ghartey, K.K.F. (1989) Results of the National Forest Inventory. In: Wong, J.L.G. op cit. pp. 92-100.

Goodland, R.J.A., Asibey, E.O., Post, J.C., Dyson, M.B. (1990) Tropical Moist Forest Management: the urgency of transition to sustainability. *Environmental Conservation*, 17: 303-318

Grayson, A.J. (1995) *The World's Forests: International Initiatives since Rio*. Commonwealth Forestry Association: Oxford

Grut, M; Gray, J A; and Egli, N. (1991). *Forest pricing and concession policies: Managing the high forests of West and Central Africa*. World Bank Technical Paper no. 143. Africa Technical Department series.

Hawthorne, W.D. & Abu Juam, M. (1993) *Forest Protection in Ghana: with particular reference to vegetation and plant species*. Forest Inventory and Management Project, ODA and Forestry Department, Kumasi. Unpub. (Published in 1995 as Forest Protection in Ghana. Forest Conservation Series no. 14, IUCN, Gland)

Hymen, E. (1983). *Smallholder tree farming in the Phillippines*. UNASYLVA 35, p139

IIED/FD, (1994). *Incentives for the sustainable management of the Tropical High Forest in Ghana*. Final Report to the Government of Ghana. International Institute for Environment and Development, London and Forestry Department of Ghana, Accra.

ITTO/HIID (1988) *The Case for Multiple-Use Management of Tropical Hardwood Forests*. Harvard Institute for International Development, Cambridge, Mass.

Kese, K (1990) *Forest Management Practices in the High Forest Zone of Ghana*, Unpub.

Kramer, Sharma, Shyamsundar and Munasinghe (1994). quoted in "A World Bank Contributions to the Progress Report on Implementation of Agenda 21, Chapter 11, "Combating

Desertification" Washington DC: World Bank

Mayers, J. and Kotey, E.N.A. (1996) *Local Institutions and Adaptive Forest Management in Ghana*. IIED Forestry and Land Use Series No: 7. International Institute for Environment and Development, London

MLF (1994) *Forest and Wildlife Policy, Republic of Ghana*. 24 November 1994. Ministry of Lands and Forestry, Accra

Norton, A. (1991) *Participatory management of non-reserved forest in Ghana: Report on a consultancy mission*. Centre for Development Studies, Swansea. Unpub.

Pereira, J.L. 1992. *Analisis del sector forestal Ecuatoriano*. TFAP/FAO

Perl, M., Kiernan, D., McCaffery, Buschbacher, R., Barmanian, G. (1991) *Views from the Forest: natural forest management initiatives in Latin America*. Tropical Forest Program, World Wide Fund for Nature/U.S., Washington, D.C.

Plumptre, R A; Jayanette, L; Fraser, A I; Fawcett, T; Elliot, G K; Gane, M. (1991) *Incentives in Producer and Consumer Countries to promote sustainable development of tropical forests*. Pre-project report to ITTO. Oxford: Oxford Forestry Institute

Poore, D., Burgess, P., Palmer, J., Rietbergen, S., Synnott, T. (1989) *No Timber without Trees: sustainability in the tropical forest*. Earthscan: London

Prado, A C. 1986. Do uma avaliacao dos incentivos fiscais do FISET - florestamento/reflorestamento. *Brasil Floretal*, Fevereiro. 1986.

Pretty, J N and Scoones, I C (eds) (1989). *Rapid rural appraisal for economics: exploring incentives for tree management in Sudan*. London: IIED

Repetto, R and Gillis, M. (eds) (1988). *Public policies and the misuse of forest resources*. New York: Cambridge University Press

Richards, M. (1995) Role of demand side incentives in fine grained protection: A case study of Ghana's tropical high forest. *Forest Ecology and Management* 78: 225-241

Sargent, C; Husain, T; Kotey, N; Mayers, J; Prah, E; Richards, M; and Treue, T. (1994). Incentives for the sustainable management of the Tropical High Forest in Ghana. *Commonwealth Forestry Review*. 73:3 In press.

Schipulle, H P. (1989). Nossa Natureza: chance of reorientation of Brazilian Amazon policy. *Development and Cooperation* 5 pp 18-21

Smith, A. (1994). *Incentives in community forestry projects: a help or a hindrance?* ODI Social Forestry Network paper 17c (in press) ISSN 0968-2627

Smith, E.K., Aninakwa, B. and Ortsin, G. (1995) *Formulating and Practising New Forest Policies - Recent Experiences From Ghana*. Paper presented at a seminar on "Making Forest Policy Work", Oxford, 6 July 1995. Ministry of Lands and Forestry, Accra. Unpub.

Thomson, J T. (1994). *A framework for analyzing institutional incentives in community forestry.* Rome: FAO.

UK Forestry Commission (1995) *Policy recommendations for sustainable management of the forest resource in Ghana*. Overseas Consultancy Service, Forestry Commission, UK. Unpub.

Upton, C and Bass, S. (1995) *The Forest Certification Handbook.* London: Earthscan

Wong, J.L.G. (ed) (1989) *Ghana Forest Inventory Project Seminar Proceedings, 29-30 March 1989,* Accra. Overseas Development Administration/Ghana Forestry Department. Unpub.

IIED's Forestry and Land Use Programme

The Programme addresses needs for productivity, sustainability and equity in forestry and land use. Its research and capacity-strengthening work focuses at the national level in developing countries. It involves:

- **policy processes**: supporting participation of multiple interests in policy analysis, formulation and monitoring
- **sustainability assessment** of forest management and use
- **capacity development** of governments, NGOs and communities for sustainable forest management
- the **development and monitoring of incentives** for sustainable forest management.

Forestry and Land Use Programme
International Institute for Environment & Development
3 Endsleigh Street
London WC1H 0DD
UK
Tel: +44 171 388 2117
Fax: +44 171 388 2826
Email: iiedforestry@gn.apc.org