# FOREST SCIENCE AND FOREST POLICY: KNOWLEDGE, INSTITUTIONS AND POLICY PROCESSES

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**Note:**
This report follows ESCOR's requirement for a brief account of the applications of the main findings to policy and practice related to the original objectives. In such a short report only indicative references can be given. The UK Department for International Development (DFID) supports policies, programmes and projects to promote international development. DFID provided funds for this study as part of that objective, but the views and opinions expressed are those of the authors alone.


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## INTRODUCTION

This study provides evidence which suggests that current configurations of science and policy – their co-production – around forests and biodiversity remain antithetical to the interests of the poor. This is despite some important changes in scientific perspectives on people forest relations, and policy moves to 'decentralisation' and 'participation'. This conclusion derives from research into the social shaping of science and policy in three contrasting countries in West African and the Caribbean (Guinea, Ghana and Trinidad and Tobago), and into the relations of the science /policy field with wider society in the context of their increasingly globalised scientific and governance regimes.

## BACKGROUND AND OBJECTIVES

Research in several disciplines has transformed understanding of forest ecology and its social dynamics in West Africa and the Caribbean. Challenging long established views of forest as stable, climax vegetation:

- Analyses of climate and vegetation history suggest major fluctuations in forest cover and quality over recent centuries and milennia (Maley 2001; Tardy 2001).
- Work in ecology underscores this, and the importance of disturbance events and path dependency to forest dynamics (Hawthorne 1996, Sprugel 1991).
- Studies in social anthropology and history show the long term shaping – in some circumstances enrichment - of vegetation through local practices, and the relationship between landscape, memory and resource claims (Fairhead and Leach 1996, 1998; Amanor 1994).

Such findings converge to suggest what we call a 'dynamic landscape perspective' in forestry. The imperative for this research derived from the apparent gulf between these transformed perspectives on forests (reframing how policy might consider and work with forest users) and existing policy and development practice in Africa and the Caribbean.

We hypothesised that this was not just a question of poor or time-lagged dissemination of research, but because institutions and power relations have formed around older, more orthodox science. We thus problematised linear notions of the way research feeds into policy.

In this context, the research objectives were to:

- make explicit the relationships between positions in forestry knowledge/science, positions in policy debates, and the operation of forestry institutions;

- show what factors influence the uptake, resistance to or selective transformation of emergent scientific perspectives and agendas in local, national and international arenas;

And hence, to:

- suggest approaches to establishing more effective relationships between science, knowledge and policy processes.

## RESEARCH STRATEGY AND METHODS

The research developed and applied an analytical approach drawing from traditions in the anthropology of knowledge, policy and development (e.g. Shore and Wright 1997, Grillo and Stirrat 1997) and the anthropology and sociology of science (e.g. Martin 1997, Barnes *et al* 1996).[1] It applied this to four key forest problematics: decentralisation of forest governance; biodiversity; climate and watershed protection, and sustainable forest-based industries (timber production).

The research took a multi-sited ethnographic approach, extending from localities and their resource users, government/project fieldworkers, NGOs and district government officials, through national research, policy and administrative settings, up to international organisations. Rather than focus on particular institutions and organisations, our research explored their interactions and networks around these forest problematics. Doing so through a science/policy lens complements more conventional perspectives on governance, revealing a different dimension to the ways institutions operate and relate to each other, and opportunities for change.

Our approach explored the processes by which scientific/research and policy agendas come to frame each other ('co-production'), and in doing so, incorporate and shape particular sets of societal and institutional values and economic order (Jasanoff and Wynne 1994; Shackley and Wynne 1995). We contextualise how narrow science/policy processes interplay with wider society, attentive to ways wider publics come to understand and engage with the science and policy field, whether through media, education, or direct interaction.

Our analytical strategy to science and policy needed to be attentive both to the agency of particular researchers and policy-makers, and to the effects of bureaucratic, economic and political structures. We thus developed a 'structuration and practice' perspective. This treats science and policy as constellations of component practices and procedures. In policy it allows each practice – each workshop, committee, meeting, report, legislative decision, funding flow - to have its own biography and set of local meanings, each of which shapes the character of 'policy'. In science it allows practices to have their own specificity (sampling procedure, reviewing species lists, characterizing ecological zones, listing the forces leading to degradation etc.), without conforming to any totalizing narrative of scientific method and scientific advance. Yet we also explore how specific practices come to coalesce within institutional and interpersonal networks and 'discourse coalitions' (Hajer 1995), whether through agentive intent or circumstance, such as to structure subsequent meanings and agendas (see also Knorr-Cetina 1999). In this way we identify how contemporary policy initiatives interplay with the history of scientific and administrative practices, and how this shapes their form and meaning both for those in policy and wider publics.

This strategy helps to reveal how certain perspectives come to be included within science/policy, while others remain marginal, and thus to discern how the processes shaping science/policy embody particular values and interests.

The research examined the processes through which the mutual construction of science and policy have proceeded in three contrasting countries, drawing on comparison to see different configurations. Trinidad and Tobago in the Caribbean, and the Republic of Guinea and Ghana in West Africa, made an apt comparison for several reasons. In common, they:

[1] Many disciplines and sub-disciplines have recently engaged in the study of policy processes. Recent reviews include Keeley and Scoones (1999) and Sutton (1999).

- shared key dimensions of colonial research and policy history;
- have biodiversity, decentralisation, watershed management and sustainable timber production as dominant contemporary policy concerns.

But they differ in their:

- levels of foreign aid dependence for supporting national research and development (high in Guinea and Ghana, much lower in Trinidad, with a long history of scepticism of foreign expertise);
- levels of local livelihood dependence on forests (high in Guinea and Ghana, lower in highly industrialised and urbanised Trinidad);
- importance accorded to timber production in the national economy and forest service orientation (high in Ghana, less in Trinidad, even less in Guinea);
- bureaucratic and scientific traditions and political and administrative structures, and the interaction of these with the internationalised science-policy field.

In each country research combined (a) semi-structured interviews; (b) field site visits (in interaction/discussion with goverment/project staff and forest users) and participant-observation in meetings, and (c) analysis of policy, research and project documents, and of educational and media materials (table 1). Broader discussions of forest research and policy were combined with case studies of research and policy initiatives and debates, selected to cover the four focal themes and be of high contemporary relevance (table 2).

Table 1: Research activities in Guinea, Ghana and Trinidad

| **Country and time period** | **Researchers involved** | **Activities** |
|---|---|---|
| Guinea<br><br>January – March 1999 | Melissa Leach, James Fairhead, Rresearch Officer Dominique Millimouno | • Interviews in Conakry (7 university researchers, 10 ministerial staff, 9 donors, 3 national NGOs)<br>• Interviews and group discussions in Kissidougou, Kankan and Macenta prefectures (5 university researchers, 22 administrators and project staff, 22 field-level workers/teachers, 24 forest users)<br>• Interactive field visits to Parc National du Haut Niger, Ziama forest reserve, village forest projects in Kissidougou<br>• Collection and translation of 10 rural radio interviews, analysis of university, school and adult educational materials on environment |
| Ghana<br><br>1999-2000 | Kojo Amanor, Research Officer MaxwellKude Dideretuah | • Interviews in Accra (3 university lecturers, 22 university students, 5 donors, 11 Ministerial staff, 5 NGOs)<br>• Interviews in Kumasi (5 university/ CNIR researchers, 2 Forestry staff, 1 NGO)<br>• interviews in Tamale ( 2 university lecturers, Coordinator Savanna Resources Management Project, 2 NGOs, farmers)<br>• Interviews, field visits and group discussions in Upper East, Brong Ahafo and Eastern region (1 university lecturer, 7 university students, 9 administrators, 1 radio presenter, 7 NGOs, 4 Forest Officers, teacher at Sunyani Forestry School, farmers, fire volunteers and Taungya groups. |
| Trinidad<br>May – July 1999 | Melissa Leach, James Fairhead, Thackwray Driver, ROs Keisha Charles, Leigh Morton | • Interviews in Port of Spain (16 university researchers, 18 ministerial staff, 3 donors, 3 national NGOs)<br>• Interviews and group discussions in Mayaro, and Matura districts and Western Northern Range (6 administrators and project staff, 12 field-level workers, 24 forest users and groups)<br>• Interactive field visits and group discussions in Victoria-Mayaro forest reserve; proposed Matura National Park, Community-based turtle conservation project; proposed Tamana community forestry site; Northern Range<br>• Analysis of environmental/forest coverage in 3 national newspapers; analysis of university, school and adult educational materials on environment<br>• |

Table 2: Case studies and their relationship to focal forestry problematics

| **Country** | **Case study** | **Forestry problematic(s)** |
|---|---|---|
| Guinea | Establishment of decentralised forest co-management in Forest Guinea | Decentralisation; sustainable timber production |
| | Establishment of new National Parks in Upper Guinea | Biodiversity, climate/watershed protection |
| | Enacting the biodiversity convention in Forest Guinea | Biodiversity |
| Ghana | Fire management in Upper East, Brong Ahafo and Eastern Region | Climate/watershed protection; decentralisation |
| | Tree planting in Upper East and Eastern Regions | Sustainable timber production; biodiversity |
| | Conservation through sacred groves in Northern region and Brong Ahafo | Biodiversity; decentralisation |
| Trinidad | Watershed management, land tenure and forests on the Northern Range | Climate/watershed protection |
| | Natural forest management in the south-east | Sustainable timber production |
| | Attempts to create a national parks policy, and park planning in Matura district | Biodiversity; decentralisation |

International research aimed to (a) track national science-policy processes identified in the three countries up into the international processes which influence them, and (b) explore configurations of scientific and policy debate as conducted amongst international (United Nations) organisations and others operating internationally (e.g. NGOs, donors and research organisations). The strategy was first, to gauge the positions, recent activities and interconnections of a range of influential organisations, including the Convention on Biodiversity (CBD); the Inter-governmental Panel on Forests/Inter-governmental Forum on Forests (IPF/IFF) process; the Forestry Department of the Food and Agriculture Organisation (FAO); WorldWide Fund for Nature (WWF); International Union for the Conservation of Nature (IUCN); United Nations Environment Porgramme/World Conservation Monitoring Centre (UNEP/WCMC); Consrevation International (CI); The World Bank, Department for International Development (DFID), International Centre for Research in Agroforestry (ICRAF); CIRAD, and the European Union ( EU). Subsequently, international research focused on a number of key science/policy debates of high contemporary relevance both internationally and to our three countries, and which covered aspects of the four focal forestry problematics. Those selected were:

- Priority-setting for biodiversity conservation
- Establishment of the Ecosystem Approach to biodiversity conservation
- Decentralisation and co-management approaches in forestry
- Criteria and Indicators for sustainable forest management/timber certification
- Fire management, ecology and global climate
- Agroforestry and alternatives to shifting cultivation

Methods combined documentary analysis (published, ‘grey’ and website materials), follow-up detailed interviews with staff of key organisations, and participant-observation in a number of international meetings. Visits were made to the FAO and DFID Caribbean offices in Barbados (July 1999, 4 interviews); FAO in Rome (May 2000, group discussion and 8

interviews); to CIRAD in France (July 2000, carrying out 7 interviews), and to DFID in London (2 interviews). A week was spent in Ghana (6-11 December 1999) participant-observing the West African forest biodiversity priority-setting workshop convened by Conservation International, and carrying out interviews with c. 20 international scientists and policy-makers.

## FINDINGS AND THEIR APPLICATIONS TO POLICY AND PRACTICE

Despite the inclusive, participatory tenor of policy debates in the four arenas, and the activities of many individuals and institutions to this end, the case studies show how, in numerous manifestations, current configurations of science and policy – their co-production - around forests and biodiversity appear to be antithetical to the interests of the poor.

To explain and illustrate this concisely we summarise case studies in a set of boxes, and then outline a range of key, cross-cutting themes, which also draw out comparative findings across the three countries.

### *Case Studies*

#### SCIENCE, POLICY AND NATIONAL PARKS IN TRINIDAD

Since the 1960s there have been various moves to create a system of national parks in Trinidad, including several well-funded initiatives involving international support from the FAO, OAS and most recently a World Bank supported project. Despite many plans, legislation and implementation is blocked. Reasons are to be found in (a) the production of science/policy by an elite (b) the nature of participation, and (c) the way tensions between national bureaucracies interplay with international,

The system, in its varied permutations, continues to be focused on the preservation not use of lands that are in part privately owned, farmed, forested, hunted, squatted or otherwise illegally used. The rationale, location and extent of the proposed parks has repeatedly been elaborated at a nexus between conservation activists (NGOs), the wildlife section of the Forest Department, conservation biologists at the university of the West Indies, and government and private sector interests in promoting ecotourism. They are supported by international scientists and funders who are keen to establish protected areas to blend international conservation goals with national development.

There is a tension between 'participation' as practised within this science-policy nexus (principally involving several community based conservation organisations promoting a win-win ecotourism agenda and village tour-guiding), and 'participation' by others in the policy process through wider political systems. Land users whose rights and interests would be curtailed express critique via the press, the law, administrative politics and party politics. To date, resolution has been in favour of land users who, although marginalized from the participation managed by the 'project', have succeeded in blocking the national parks legislation politically.

Their success in this is assisted by opposition from (a) other bureaucracies (principally Forestry) which would lose control of resources, should an autonomous national parks authority be established – as donors repeatedly advocate, (b) legislators and politicians concerned by the costs and wisdom of taking large loans, and who are sceptical of the internationally-influenced science shaping the proposals.

**PRACTISING 'BIODIVERSITY' IN GUINEA**

Biodiversity has become important to research and policy in Guinea; to daily work in the National Environment Department, the Forest and Wildlife Department, and the many donor funded programmes. Scientists and projects are reproducing and reworking the biodiversity concept as they grapple to find ways to operationalise it.

Several kinds of practices are now configured together (and funded) under a biodiversity label, including (a) the production of lists of plant and animal species which university scientists and projects carry out with donor support; (b) the exploration of ecosystem dynamics through 'cutting edge' sampling and computer modeling techniques, (c) the harnessing of traditional plant medicines by environmental NGOs and networks of healers to promote conservation; and issues also linked with discussion and action concerning bio-piracy, multi-national corporations and 'indigenous property rights', and (d) promoting the use of semi-wild plants such as oil palms, which link conservation with land user's economic interests.

Modern concern for biodiversity echoes older colonial environmental concerns. Contemporary science and policy draws on historically sedimented practices (science and policy traditions) shaped by the particular history of administrative succession: from colony, to independent African socialist state, to one party military dictatorship, to contemporary liberal democracy. The policy practices of each epoque have been shaped in relation to its predecessor.

For example, Guinea's radical pan-Africanist socialist state sought to promote African herbal medicine. An economic necessity, this was also a political act which gained meaning in opposition to the alien colonial health regime which had earlier demeaned indigenous health practices. Yet whilst framed in opposition to colonial medical practice, research practices (and claims to scientific authority) also drew on colonially shaped scientific practice. Research sought to identify active plant chemicals, but not the social practices of medicine in which herbs were embedded. The policy thus trod a difficult line between Africanization on the one hand (defined in opposition to colonial practice), and 'demystification' defined according to colonial traditions of 'scientific' practice. In doing so, it helped shape new meanings for those involved about what it is to be African and Guinean; what is natural and what is supernatural, what is cultural and what is 'mystification'.

With attention on biodiversity, numerous programmers now compile knowledge of plant medicines, encouraging environmental and health NGOs and 'traditional healers' to pool information and discuss strategies for biodiversity conservation. This suits a generation of development donors concerned to link biodiversity conservation with participation and to carry out development by working through 'traditional' forms of organization and authority. But whereas under Sekou Toure this interest derived from a focus on human health, the interest of international discourse focuses on vegetation health, and whereas it was earlier locked into a nationalist discourse, international interest in biodiversity conservation is locked into an internationalist one.

Other contemporary biodiversity practices similarly present biodiversity as a 'nature' which people might act on or exploit, but from which their lives are ontologically distinct. Species lists drawn up for reserves iconise their superior diversity, but remain uncompared with inhabited landscapes. Semi-domesticated plants are recast as 'semi-wild' ones, detached from the social processes of their establishment. These practices reproduce and reinforce ideas of nature as separate from people, whether in the form of commodities, of spaces (parks, reserves), or of desocialized medicinal plants. This contrasts with local framings which present a more socialised historical perspective on ecology and landscape. Despite avowed attempts to 'include people' in biodiversity conservation – to move from colonial exclusionary approaches to modern 'conservation with development' and 'participation', the framing and institutional/funding imperatives linked to international biodiversity debates have pushed those working within their ambit further towards practices which reproduce western, colonial distinctions between nature and culture, and which are antithetical to understanding relationships between people and vegetation in the region. Where perspectives of villagers have been incorporated, this has been only partially, with 'good' and 'bad' practices in African social life being adjudicated by scientific enquiry based on alien values.

**SACRED GROVES IN GHANA**

Sacred groves are small areas of 'nature' which are maintained as sacred areas by chiefs or priests and the communities under their authority. They are considered sacred because they are the sites of memorable historical events, the burial grounds of politically important ancestors or habitats of ancestral spirits, the headwaters of important river systems and the abode of important nature spirits, and the habitat of animals that are accorded special sacred significance in their interactions with humans (e.g. Colobus and Mona monkeys at Buabeng-Fiema, bats and their caves at Buoyem).

Research into sacred groves in Ghana has been supported by UNESCO, World Resources International, and the UNDP Global Environmental Facility. The World Bank is also considering financing support of sacred groves as part of the biodiversity component of the Savanna Resources Management Project. Sacred Groves have also been studied by the Environmental Protection Association since the mid 1970s.

The major environmental interests in sacred groves are associated with preserving biodiversity and fascinations with the more exotic dimensions of indigenous knowledge and community participation. A major part of scientific research associated with sacred groves is concerned with collecting myths on the groves and carrying out inventories of their species composition. Development actions concerned with sacred groves consist in helping communities to create new management structures - including the formulation and implementation of bye-laws, helping communities to develop inventory surveys, and other technical methods of maintaining the boundaries of the grove and the creation of firebreaks, and the development of ecotourism. Several groves have, however, independently developed their own potential as ecotourist sites, such as Buabeng Fiema.

Underlying the discourses around sacred groves are exclusionary principles - sacred groves are upheld for their effective traditional management organisations that excluded farmers and other producers from the area. Environmentalists attempt to strengthen these exclusionary principles further. While sacred grove conservation appeals to contemporary concerns with indigenous knowledge and community participation, the very consciousness which is being upheld mirrors colonial conceptions of the separation between nature and culture and the exclusive principles of forest reserve management. The focus of these conservation activities are also the chiefs who in the colonial periods were the allies of the colonial authority in developing rural administration, creating forest reserves, implementing local bye-laws on soil and water conservation, raising communal labour for public works, etc. The groves come to symbolise the protection of a static world of natural equilibrium and traditional political equilibrium from change and modernity.

However, not all groves exclude farmers - at Buabeng Fiema, before the Wildlife Department became involved in the management of the grove, farms existed within the grove, there were no boundaries between humans and the rest of the environment and people and monkeys cohabited. These types of instances are often perplexing for environmental researchers.

The NGO Ghana Association for Conservation of Nature (GACON) has been instrumental in setting up three sacred grove conservation community projects at Jachie in the Ashanti Region and Buoyem and Tanoso in the Brong Ahafo Region. GACON has close relations with the Forestry Department and many of its founding members now hold prominent positions in the Forestry Service or in forestry research organisations. Voluntary Service Oversees (VSO) and Peace Corps volunteers have also played roles in developing the ecotourism potential of these sacred groves, particularly in the Brong Ahafo region. The techniques they have introduced for management of the sacred groves mirrors those used by foresters in forestry reserves. This consists of developing "green fire-belts" of Cassia siamea around the perimeters of the grove. Into these green firebelts are planted fruit trees for the fauna around the grove and non timber forest products (mainly fuelwood) for the communities. Fire is seen as a major threat to the biodiversity of these sacred groves, a threat emanating from inappropriate farming practices.

However, in some transitional and savanna zone sacred groves fire may be a common event. At Tanoboase, a custodians of the sacred grove, an elderly man, insisted that he remembers fire to have been a common event in the grove since his childhood. The characteristic forest species of the sacred grove are those which have evolved with fire. Thus attempts to remove fire from the sacred grove, will lead to a transformation of the species that have characterised this area for many centuries. Moreover, in this grove there is no clear cut distinction between the vegetation inside and outside the grove. The dry forest cover continues into the surrounding farming country and in the surrounding landscape other conservation activities of farmers can be located, such as the preservation of large numbers of Daniella oliveri trees. These are, however, excluded from consideration as examples of a potentially liberating relationship between people and the environment, since they do not fit into the environmentalist conception of a pristine, arcadian nature. Thus the concepts of indigenous, tradition, and an exclusive sacred nature contrive to exclude the majority of people from globally acceptable conservation activities.

**DECENTRALISED FOREST CO-MANAGEMENT IN FOREST GUINEA**

Since the early 1990s Guinea's National Forest Directorate has attempted to develop more collaborative relationships with local populations. The Forestry Code and new addenda permits the establishment of village and private forests. This heralds a major policy change: since early colonial times the state has claimed felling and revenue rights for timber trees even in peri-village forests. It now appears to hand over these rights to a village association or 'Groupement forestier', with revenues going to a village infrastructure projects. Groupement applications require a forest map, inventory, management plan agreed with the sub-prefectoral representative of the forest service, a management committee, village development plan and signatures from prefectoral representatives of 4-5 sectoral ministries. Numerous projects and donors have supported the creation of groupements forestiers, many working through local NGOs comprised of ex-project staff.

A range of narratives represent the origins, operation and advantages of the groupement forestier approach. Each narrative is linked with different institutions, and reveals their positions and interests in the political economy of rural administration and resource control. First, for two local NGOs which have emerged along with the groupement policy, the approach is central to their identity and institutional survival. Members represent its origins in their own pioneering participatory work in forest conservation as project staff, or in mutually supportive relationships with key expatriate project leaders who lobbied for the necessary legal changes. In this 'innovation' narrative, the NGOs appear uniquely capable of replicating the approach, supporting their financial dependence on contracts to prepare groupement applications. Second, a further NGO located origins within problematic relationships between villagers and local chainsaw operators whose 'theft' of timber limited villagers' incentives for sustainable forestry, and the main advantage in enabling villagers to get a better deal form loggers. This has been the key activity of the project they had once worked for. Third, many expatriate forestry advisors present groupements forestiers as a means to protect villagers and their forests from a predatory state forest service, intent on enhancing both official and personal timber receipts linked to state control. In this struggle donors also see themselves as part of a worldwide movement towards community forestry and participation. Lastly, national and prefectoral forest service staff locate the approach as an extension of state activity, part of efforts to improve the effectiveness, efficiency and sustainability of forest management. Through groupement forestiers, the inventories and the state monitoring of village forestry management plans, there is a sense of management of village forests where there was 'no management' before.

Notably, no coherent 'official' perspective sees groupements forestiers as a logical outcome of villagers' past and present management of their dynamic forest landscapes. Evidence of the anthropogenic histories of many peri-village forests, and of villager's landscape and forest-enriching practices, are not seen to undermine the need for complex project and state procedures in creating, monitoring and educating villagers to manage groupements.

Yet villagers' (who are not concerned at the adequacy of their own forest management) are anxious over motives and future control of village forests – fearing that this a step in resource alienation to the state. This adds to concerns over the costs of increased monitoring and management plans. Anxiety is felt especially by poorer, immigrant and female villagers who do not consider themselves as represented by the village management committee and are unsure of receiving any benefit from timber felling.

Each of these diverse perspectives on groupements forestiers presents some actors and organisations involved in the approach rather negatively, and others positively. Nevertheless, each group can find a narrative in which the approach is advantageous to them. It is this that partly explains how the groupement forestier approach has emerged – as a coalition of interests. However, in another sense, the diverse perspectives reveal that the approach is not actually a common project. 'Groupements forestiers' go on meaning different things to different people, despite the manuals, procedures and laws which appear to produce it as a unitary phenomenon. In particular, while certain people applaud (or regret) groupements forestiers as a devolution of state resources, others experience it as a loss in autonomy, and an extension of external control.

**FIRE MANAGEMENT IN GHANA**

Local level research was conducted in two areas, the savanna zone of the Upper East Region and in the transitional zone. The institutional management framework for fire was examined through various hierarchical levels of national administration, through policy research interfaces and through linkages between national institutions and international organisations involved in fire administration.

In the Upper East Region the dominant policy on fire is to attempt to exclude its use in farming and bush clearing, and several district assemblies have introduced bye-laws banning use of fire and introducing sanctions for the violation of the bye-laws. These are reinforced by chiefs who are empowered to develop their own bye-laws and punish violators. However, in many areas a move away from burning had occurred before contemporary concerns with fire, and arose out of changing farm practices. The introduction of bullock plough technology resulted in less burning on compound farms dominated by grass, as grass was ploughed into the soil rather than hoed. With increasing population density and less land to graze cattle many farmers became concerned with preserving certain species of grass for dry season browse and refrained from burning them to conserve them and encourage their spread to more fire tolerant grasses. There are frequently lively debates on the merits and demerits of bush burning and on the introduction of composting. These are often concerned with specific environmental conditions in relation to soil, flora characteristics, and patterns of rainfall. Under clayey soils, burning may be the best option as when there are a large number of trees which do not integrate well with crops.

In contrast with lively local debates, global and national policy research frameworks on fire do not encourage debate but are rather concerned with repressing the use of fire. This leads to discourse coalitions that attempt to criminalize fire or promote it as culturally unacceptable. At the local level this serves to close down debates about fire and agricultural technology. Community organisations such as the Fire Volunteer Squads, the District Assemblies, chiefs and NGOs use these discourse coalitions to gain political domination over the debates over fire and to take credit for the movement away from fire, which originated in the adaptive strategies of farmers, outside of policy discourse on fire. In gaining domination over local discourses, they downgrade the knowledge of farmers, presenting them as ignorant, but then develop simplistic environmental messages, that do little to supply farmers with relevant information or support for natural resource management.

In the transition zone, the major policy concern is to control the use of fire rather than exclude it, since viable techniques for farming forests without resort to felling and burning have not been developed. Fire Volunteer Squads are responsible for regulating the use of fire. They are trained in fire management by the Fire Services. Before burning farm plots farmers have to get a Fire Volunteer to supervise the process and pay for this “service”. Fire Volunteers stress the knowledge they have acquired in making fires and farmers dispute the “scientific” (exclusive) base of this knowledge. However, the most effective strategy they have found of deflecting the scientific control of fire is to make sure that they or one member of their family joins the fire volunteers. They can then continue to burn their own farms now claiming to have acquired the “scientific” art of fire control or they can claim that their fire volunteer relative supervised the firing of their own farm. Thus Fire Volunteers are recording increasing numbers of membership, indicating the success of the campaign, and business continues as usual.

In both cases, interventions of forestry policy serve to erode dialogue within the community, erode any formation of a platform promoting citizen participation in development policy formation. The dominant environmental line is able to articulate its authority within national institutions but fails to account for the complex relations between people and their environment and the political processes within the locality.

**WATERSHED MANAGEMENT, LAND TENURE AND FORESTS IN THE NORTHERN RANGE, TRINIDAD**

Trinidad's Northern Range mountain, towering over the urban population centres, appears as an "environmental disaster". Farming and fires ooze smoke and flood waters down to urbanised valleys below. The hillsides are a chaos of grasses, low scrub and the occasional palm, of hillside farming and urban squatter housing, except for patches of regimented pine plantations. The western end has been destroyed, the eastern end under imminent threat. Squatters clearing hillsides for housing or 'slash and burn' agriculture are blamed.

The urbanised plains and foothills were farmed or savanna in populous Amerindian times. After Amerindian extermination, Spanish and then British colonists encouraged settlement by planters with their slaves. Slave emancipation, left planters with a labour problem. They lobbied limit allocation of state land. Many freed slaves pursued illegal squatting. Planters and elite imaged squatters as environmental vandals to restrict this. Environmental reasoning and the 'squatter' category thus interlocked with debates over land and labour.

19th century planters grew cocoa in forests. A 1930s depression in the cocoa industry prompted planters to let hillsides to peasants (laid off labourers). As highlands became fields, not cocoa forests, environmental concern heightened. The Imperial College of Tropical Agriculture (ICTA) for research and training agricultural administrators for British colonies was established on the foothills of the Northern Range which became a laboratory for the study of tropical landscapes, shifting cultivation and soil erosion. Studies of land capability and land use merged into land use planning, and solutions were proposed to prohibit cultivation above the 300 or 500 foot contour, buy back land, and relocate (militant) farmers to more suited areas. Little was achieved. After Independence, a series of Projects, funded on the back of Trinidad's oil boom, attempted reforestation. Yet (a) only monoculture Caribbean Pine survive the harsh conditions, (b) targets were not met (only 10%), (c) only state-owned land was planted whereas the 'problem' land was privately owned, and (d) many planted areas were burnt, by ill fortune, evicted squatters, or disgruntled forest workers. A problematic forestry response was matched by a problematic agricultural one, linked into ineffective demonstration terracing, fruit plantations etc.

Land capability studies inform watershed protection initiatives, yet contradictory methods have been adopted by different government agencies in accordance with their own capabilities and plans and links with international discourses. The basic methodology is the same as that followed in colonial times. GIS techniques have injected new energy into the approach.

Policies to get occupants to comply with planning invoke contrasting reasoning about private property. Post independence, it was argued that private-property ownership caused of environmental problems; creating indifference to the "good of the land", encouraging speculation, rapid land transfer, mortgages and indebtedness, fragmentation, and inaction. Government involvement was the solution, dovetailing with broader moral and political visions of the time. Leasehold was better than freehold as government had leverage over land use. Cabinet considered re-purchasing critical lands. In contrast, arguments that sustainability is improved when land is clearly owned by users emerged in Trinidad's 'Structural Adjustment' era, with privatisation, and squatter regularisation a solution. Science and social science are embedded broader moral and political worlds.

Images of the squatter vandal are reproduced. The forestry division, conservation lobby and the media they influence blame increased squatting for increased degradation. Squatters 'rape land', 'booze', take and grow drugs, deceive, are foreign. The moral public deduce a person's land status from their housing or farming. In contrast, however, is acceptance of squatting among may Trinidadians who have limited property documentation. The 'regularisation' of squatters, through ceding tenure or resettlement, is an important national debate, pursued by the Ministry of Housing but opposed by the Forest Division/conservationists.

Thus since the mid 19th century, environmental policy discourse has reproduced the social categories (squatters) through the different political and economic eras, and the different sciences/reasoning concerning solutions – embedded in their contrasting economic and political visions – but which have all been about rational government control. Land capability studies have developed in their technical sophistication, but build on practices linking assessment with state land control, allocation, acquisition dating back to the 1930s and before.

Endurance in the framing of social and ecological problems, and in distinctions between state, private and illegally-held land, has closed off other lines of inquiry: lines which might have led to rather different policy recommendations. It reproduces ideas of a degraded landscape linked to farm and fire based savannisation; a highly visible 'reminder' of the apparent severity of the country's environmental destruction, symbolic of what may be assumed to be happening elsewhere. Yet it deters inquiry into the ecological history of the Northern Range, which such evidence as there is suggests will challenge assumptions about (a) recent savannisation and forest and vegetation dynamics, and (b) the effects of farming practices, and (c) their differentiation according to the multiplicity of social, economic and tenurial patterns which the term squatter obscures.

**TREE PLANTING IN GHANA**

This case study argues that agroforestry and woodlot planting programmes are based on technologies that do not meet the needs of farmers, but the time scales of research programmes and policy cycles. The trees disseminated in these programmes are usually fast growing exotics which are robust, easy to establish and cheap to reproduce. The value of these trees often lies in the environmental messages which accompany them and the establishment of woodlots and other agroforestry system are often seen as reflecting the receptivity of communities to global environmental messages. For communities the planting of these trees represent the passport to recognition of other developmental entitlements, such as the provision of financial and social infrastructure support which often take labels such as "poverty alleviation", "livelihood support" and "income-generation" activities. However, these trees can eventually become nuisances which come to dominate the landscape.

In the Chiana district of Upper East Region three different tree planting cultures can be discerned. The first is an indigenous tree preservation tradition which focuses on Shea and Parkia trees. In recent years farmers may be preserving higher densities of these two trees as a result of their growing economic value in regional, urban and international markets. These activities are frequently discounted in environmental discourses because they are preserved rather than planted or because they represent preservation of low rates of biodiversity. They may stress medicinal plants which are becoming scarce because of the destruction of biodiversity. Nevertheless the narrow range of exotics promoted by the environmental lobby, in this second tradition, hardly increases the biodiversity of the landscape. A third tradition exists of forest plants which returning migrants to the forest zone have experimented with cultivating in wetter locations in the savannas, including oil palms, avocado pears and even cocoa. This tradition shows a local interest in experimenting with tree planting, independent of the global environmental lobby. Farmers accept tree seedlings from agricultural and forestry services, to gain access to support from these services and from other state services and to show some deference to development experts and workers. However, they often find difficulty in finding locations for these tree species outside the farm environments in which they preserve the trees they really value, which they have integrated with their farming practice through many years of experimentation and adaptation. Ideally they seek some marginal area beside a major road in which they can grow a woodlot, placing a signpost around it which identifies their community organisations as part of environmental policy development networks. While farmers often accept these seedlings they also make requests for Shea and Parkia seedlings. But the forestry policy research world finds these species difficult to incorporate into their tree planting programmes since they take a long time to reach maturity and observe in experimentation, and are not the easiest plants to grow from seed.

A second study examines the *taungya* system in forest reserves in the Eastern region. Farmers are given plots of forest reserves to rehabilitate by planting trees, in return for which they are able to cultivate crops among the trees for their own use. The trees planted were not chosen by the Forestry Service in relation to their ability to integrate with crops; rather, trees that do not integrate well with crops were often deliberately chosen since this would force the farmer to leave the forest land more quickly. The taungya system has also led to much competition and conflicts between different groups within communities for control over the allocation of land. The first groups to be involved in taungya were often land hungry migrants. As land became increasingly scarce the value of taungya land became more obvious. Complaints were lodged that taungya land should be given to locals rather than migrants. Networks became organised around gaining control over taungya and eventually a number of taungya "contractors" emerged who built up linkages with members of the Forestry Department and gained access to land which they then sold to farmers. Farmers who had purchased land did not see why they should plant trees and felt this should be the responsibility of the "taungya contractors" who they often identified with the Forestry Department. The taungya system failed because it failed to develop a common ground in which farmers and foresters could bring together their knowledge of the forests and farming practice, and because various political networks could manipulate poorly defined concepts of community to create patron client networks in which members of the Forestry Department and of civil society colluded to gain rents from forest lands and membership of community groups.

In both instances various levers are used to impose tree planting activities on communities. Farmers who are not interested in participating on these terms are excluded from environmental discourse, and those who defer in an attempt to gain access to resources and influence are empowered to act as community representatives in activities to which they do not have any sense of engaged commitment.

**SUSTAINABLE FORESTRY IN TRINIDAD**

In international policy, Trinidad has acquired a reputation for sustainable natural forest management. Definitions, criteria and indicators of sustainability are premised on ecological and social predictability; that forests and people will respond to rational management in rational, predictable and known ways. These premises are incorporated within the Periodic Block System; a 'blueprint' system for selective logging in particular blocks every 25-30 years in the Mora excelsa forests of the south and east.

Yet uncertainties have continually beset the system over the last 80 years, both ecological (e.g. failure of expected regeneration, fire events) and socio-economic (e.g. changes in timber markets and felling practices; conflicts between loggers). While some mora stands are of high quality after two felling cycles, others are highly degraded, swept by fire. Corrective silviculture to 'stabilise' and shape the forest have been costly, placing greater stain on budgets (capital investment loans) and poor, small-scale artisanal loggers (for whom improvement felling is less profitable). Moreover, the changing social configuration of the logging sector, in which artisans increasingly lose out to larger, well connected enterprises threatens the viability of corrective measures. Socio-political instabilities and possible unrecognised non-equilibrial dynamics of the forest may thus interact to undermine sustainability.

National-level Forest department officials nevertheless represent the system as stable, sustainable and productive. First, it iconises a form of scientific professionalism in forestry which has long been central to the department's image and claims to institutional ground, and is increasingly so as multiplying conservation-focused institutions compete for national and international funds and attention. Second, the system is a means to justify the continued use of state forest reserves for timber production against critical NGOs and others who would prefer them devoted to biodiversity protection. Third, the relationship with artisanal loggers can be cast as a form of 'community forestry' – useful to the department's image with NGOs and international donors – without implying loss of state resource control, and simultaneously preventing timber sales to large concessionaries.

Sustaining this image has depended on several processes less openly acknowledged by national foresters. The dependence of the artisanal community means they absorb much of the work resulting from 'unforeseen' 'externalities' of the system. The system has also received – and may owe its economic viability to – heavy state subsidisation from the oil and gas-rich revenue base. That forestry has not had to be financially autonomous has enabled its science and practice to continue in particular ways, such as intensive PBS management over a relatively small area, and has allowed Trinidad to maintain a culture of scientific forestry as opposed to economic forestry..

In contrast both foresters working in the conservancy ('field level bureaucrats'), and artisanal loggers, acknowledge the ecological and social unpredictabilities of the system. They make flexible adaptations to felling practices and agreements that continually subvert the system's 'rules', yet are necessary for it to work. These practices of adaptive management remain unformalised and unacknowledged within the larger forestry bureaucracy, as the latter's required image of scientific professionalism intersects with its strongly hierarchical authority structures which tend to discourage and discount initiative-taking by local staff.

**SCIENCE AND THE PRODUCTION OF SOCIAL AND MORAL CATEGORIES IN TRINIDAD**

**Hunting**
Studies of wildlife population change have been conducted at the University of the West Indies (UWI), supervised by a Visiting Professor from the Department of Conservation Biology at the University of Wisconsin, and linked with the Wildlife Section and the World Bank funded Environmental Management Authority (EMA). The study used traps and the returns from the Mandatory Data Sheets which licensed hunters are required to return annually to the Wildlife Section to estimate mammal off-take. It found mammal numbers to have declined, and hunting to be the cause. The South East Hunters' Association, a non-governmental organisation questions the research and conclusions. Members identify habitat loss, oil pollution and poaching as key. They also question the university researchers' methodology, having tampered with the traps, and knowing that hunters fill in their mandatory forms 'strategically'. Reporting too many kills would indicate over-hunting; too few, the effects of over hunting. Hunters are developing their observations – how small a circle in which an animal runs when hunted, as a gauge of its territory and hence population levels – into a more rigorous methodology - a method developed through and with hunting. These different analyses (re)produce competing social categories. The first sees hunters as irresponsible; as little but dressed up poachers, supporting moves to further regulate hunting, and expand national parks. The hunter's science images hunters as noble, responsible and law-abiding. The Association's leaders take pains to distinguish their members from illegal poachers, farmers and marijuana growers, whom proper hunters would be able to control should they be given access to wildlife sanctuaries and national parks. Indeed they argue that it is in precisely the areas from which these 'real' hunters are excluded – Trinidad's current wildlife sanctuaries – that drug growers and poachers have free rein, and where mammal populations have thus suffered most. National parks would make things worse. Hunters' 'citizen science' gives conceptual space for hunters to be conservation partners with the state, in helping to control the wayward.

**Farming**
Similar controversies emerge over whether farming should be permitted in national parks. One approach to National Parks envisages acquiring private lands. Another envisages larger parks, allowing (but regulating) land use. The former has dominated legislation. Park plans image farming as destructive – symbolised in having reduced the range of the rare Pawi bird. But farmers suggest more compatibility of their land use with conservation. Short term, profit seeking chemical farming they suggest gives them a bad name. Their self-image is as organic farmers, intercropping, planting fruit and other trees, cocoa, and valuing useful wild plants, with a disdain for fire. Their techniques 'attract Pawi' and other animals. Farmers' self image as responsible contrasts strongly with that of the Parks. Their perspectives were never seriously investigated by those with authority and legitimacy to conduct and publish 'scientific, policy-relevant' research. So when land acquisition was written in to parks policy, these farmer perspectives were written off. Yet their citizen sciences may hold clues as to how land use might be integrated with conservation.

## *Cross-cutting themes*

The case studies and their broader contextualisation suggest several cross cutting themes:

1. **The (re)production and (re)shaping of social categories within science/policy processes**. Science/policy arguments invoke and draw on categorical labels such as squatter, charcoal-maker, farmer-fire setter, poacher, drug grower, associated with particular types of problematic environmental behaviour. Equally they reproduce positive social categories whether 'traditional' (e.g. traditional hunter, organised community, indigenous person) or 'modern' (e.g. environmentally literate citizen, fading into social categories of civilised, global). Such caricatures contribute to simplified narratives which frame elaboration of policy. In turn, the social relations of science/policy in all countries are shaping and sharpening social fault-lines which have a far wider bearing on processes of governance and social change.

2. **Environmental communication through media and education** is prominent in all countries, closely integrated with science/policy institutions and processes, sharing common programmes, donors, funding flows, etc. The institutional practices and narrative styles in media, education and the popular culture they inform amplify and reinforce policy framings, narratives and social categorisations. They create a mutually supportive field of messages. This is as true in West Africa where media and education are directed to reforming the perpetrators of rural environmental problems, as in Trinidad it more

creates environmental literacy among urban based and other populations less dependent on forest livelihoods.

3. **Practices of 'participation' and public consultation** frequently either exclude those who are stigmatised, or frame the terms of discussion to limit the expression of their perspectives. This is the case both for press-advertised public consultation meetings in Trinidad (e.g. in national biodiversity strategy), and for community based meetings (e.g. for community forestry and fire planning in West Africa and National Park planning in Guinea and Trinidad).

4. **Public contestation of policies and science** nevertheless proceeds outside 'participatory' procedures, taking a variety of forms. This ranges from 'citizen science', attempting to contest policy agendas through engaging critique of science and methods and drawing on alternative methods still within the domain of science (e.g. hunters in Trinidad), to democratic political, and legal action to derail policies (e.g. around national parks in Trinidad), to uses of the media to express and publicise dissent (e.g. in Trinidad). Where there is no available platform or coalition for expression, contestation ranges from calculated acceptance of and acquiescence to elements of science/policy in exchange for other benefits (e.g. in Guinea and Ghana), to everyday forms of resistance where knowledge and values are excluded or incommensurable with those in science/policy (e.g. in Guinea and Ghana), perhaps even contributing to political sympathy with armed insurgency in Guinea. Higher levels of education and integration of scientific institutions with broader society in Trinidad underlie these differences. Yet in Trinidad, as in Guinea certain social groups are excluded from citizen-scientific engagement.

5. **Field-level workers** – forest and wildlife extension officers, teachers, 'peasant' journalists etc. – frequently face contradictions between the science-policy agendas they are trained and mandated to promote, and the perspectives of local resource users; contradictions which may appear in some aspects of their jobs but not in others. Equally they broker narratives of stability with more uncertain social and ecological dynamics. In some cases they have attempted to develop innovative actions in response (e.g. practising adaptive management in Trinidad's sustainable forestry; adjusting school teaching to reflect local fire ecology realities in Guinea; managing tree-planting in Ghana). But such adaptations rescue the viability of – reinforce – managerial approaches based on ideas of stability and predictability.

6. **Discourses of innovation** characterise many project activities, making these increasingly indistinguishable from 'research'. In all countries, and whether in community forestry, wildlife of fire management, national parks projects or watershed development, projects are cast as experimental, as pilot, and even as 'laboratories', with project staff being as much 'scientists' and research managers as administrators. Research questions are framed by project goals. Casting project activity as experimental has depoliticising effects; masking the political nature of project interventions (e.g. fire projects reinforcing the power of chiefs in Ghana) by casting them as scientific, experimental and temporary. It is largely confined to projects with their artificial, limited and hence non-threatening character towards broader political structures, distancing projects from the state. It also constructs forest users themselves as continual experimental subjects, deferring their potential critique into the next phase of trial, and deferring the production of knowledge so that it cannot be so firmly contested.

7. **Science-policy processes have their own economies**. The sources of funding from particular combinations of timber, national budgets and donor financing, and the procedures of expenditure (e.g. centralisation vs. contractualisation; allocations to research, meetings, management etc.; rent-seeking opportunities) shape the practices of

particular institutions and the wider science-policy field of which they are a part. On the one hand, central state subsidisation has shaped 'scientific forestry' in Trinidad, the Forestry Division's mandate to control forest as a national asset, and research linked to this. On the other hand, competition for funds from more international sources shapes other practices (e.g. in Trinidad's Wildlife section, starved of state funds). Discourses of innovation, for example, are enhanced by the entrepreneurial economy in which contractualised NGOs, donor-funded projects and researchers compete for funds.

8. **The international research and policy world articulates with national research traditions.** In Guinea, for example, international concerns with biodiversity conservation have revitalised and funded older traditions of ethno-botanical research into plant medicines, as well as older agricultural research interests in farmer's domestication and use of semi-domesticated wild oil palms. In Trinidad, international biodiversity concerns have stimulated interest in integrating research traditions around natural history, species-focused studies in the department of life science and botanical work in the national herbarium, in a nascent biodiversity umbrella institution. In these processes, older research practices are revitalised, but transformed in meaning, hitched to meanings cast within a globalised, universal, rather than a national or local frame.

9. **International-national engagement takes place within particular national institutions and political constituencies**. For example, in Trinidad international institutions taking decentralised, community based approaches build coalitions with the Wildlife Section with its tradition in research into local wildlife management. Those intersecting with sustainable natural forest management build coalitions with the Forest department, with its research tradition in the monitoring of Permanent Sample Plots etc. In forest reserve management in Guinea, one donor, a bank seeking capital returns, has supported timber reserve management and conservation, and another, a development donor, has supported participatory resource management in the buffer zone. Shared scientific problematics are linked with particular funding flows and so on. In this way, science-policy conducted at the nexus of international and national institutions plays into national (and international) schisms and 'turf battles'. The amplification of these schisms, and the amplification of polarities in research agendas and styles, can feed each other.

10. **Forest related science and policy are increasingly globalised** with international deliberation, conventions and regimes co-established and co-evolving with scientific committees, comprised largely of government researchers. In as much as these regimes are political, science is political. At the same time, the multiplication of international NGO involvement, large international research programmes and NGO-donor coalitions add to the intensity and mass of international networks debating forest issues, frequently in highly self-referential ways. Whether in the arenas of biodiversity, sustainable forest management, fire ecology or forest decentralisation/co-management, many international organisations and staff are at pains to incorporate perspectives of 'the poor', 'the indigenous' and 'the marginalised', and the perspectives of poorer governments. Many natural and social scientists emphasise local specificities, ecological and social dynamics. Yet this sits alongside and in some contradiction with procedures in international deliberation, where biases embedded in attendance, agenda-setting, definitions and consensus building processes tend towards conformity to an international order of social and moral valuation of forest. They also sit alongside a strongly 'managerial' emphasis on strengthened management systems to ensure forest sustainability, and on international harmonisation of these, which make heroic and a-political assumptions about capacities to manage and abilities to regulate. Furthermore articulation with national processes (above) and the way dynamics of national policy process are shaped by economic and cultural orders (above) means that the international order contributes to processes which

undermine its stated values even in promoting them – in ways that are beyond the influence of any individual or organisation.

The research shows the importance of understanding science-policy at the intersection of these various processes. Opportunities for policy change have opened through a combination of international pressure, and particular moments and imperatives in national political and bureaucratic processes, into which lobbying by particular people and organisations has played. Different researchers, administrators, politicians or field-level bureaucrats have had different interests in particular initiatives, representing their nature and genesis very differently. Science/policy change in many cases has come about through the coalescence of such disparate interests, and of practices in diverse arenas (media, financing, university research etc.) and associated with different institutions, in a particular initiative, forming a discourse coalition. An ethnographic focus on cases where these openings are particularly visible, has illuminated sharply how science/policy processes have nevertheless been excluding the experience and perspectives of many poor people.

***Comparative issues***

Comparatively, the research has revealed the marginalisation of (poorer) land-user perspectives in all three countries. This reflects important systematicities in the way science-policy processes operate despite – and in some respects overriding – the important differences between the three settings.

Different levels of foreign aid dependence for supporting national research and development made less difference to the national autonomy and local relevance of emerging research agendas than expected. Research structures in each country are being transformed to become more 'relevant', yet in each case, relevance is defined largely by international problem-framings, despite different levels of dependency for research funding on international organisations. Different levels of livelihood dependence on forests have affected the scale and manner of marginalisation, but not the fact of it. In Trinidad, the relatively small number of people directly dependent on forests for their livelihoods – and the dominance of community-based conservation agendas by outward and urban-looking ecotourism issues - has assisted their marginalisation from research and policy debates. In Guinea and Ghana, the large numbers of small farmers using forest resources have been a key subject of research, but within frames of debate which marginalise their own perspectives and interactions with ecology.

Differences in bureaucratic, political and administrative structures and traditions have had some influence. In Trinidad, a long-established multi-party democracy with a fine balance of power between two dominant, ethnically-based parties, electoral politics has had more influence on the policy process than in the more recent democracies of Guinea and Ghana. One might have expected Guinean and Ghanaian policy processes to reflect differences between francophone and anglophone bureaucratic traditions: perhaps the top-down, directive styles of administration as a legacy of French colonial direct rule, in contrast with greater bureaucratic responsiveness to existing institutions as a legacy of British indirect rule. Yet cases suggest that these 'formal' differences are to a large extent overridden by the *de facto* realities of policy process which become visible through a practice-based framework, and by the extent to which each country is embroiled within common regional and international scientific and science/policy networks. Displacing attention from administration to science/policy has helped to reveal these important commonalities across the anglophone-francophone divide.

An axis of comparison which was less anticipated but emerged as important concerns forms of public engagement with and dissent from science/policy. In Trinidad, vibrant local and national NGOs, citizens' organisations and national media are used as forums for public mobilisation, debate and for citizen science around environmental issues, amongst a highly literate population. Public dissent and its threat have, at times, put a brake on policy development. In Guinea and Ghana different educational, cultural and political histories have shaped less overt forms of public engagement which have had less impact on policy processes. But here, intra-population differences cross-cut distinctions between countries. Poorer land users in Trinidad (such as squatters) tend not to organise or mobilise, and to remain as marginalised as those in West Africa. .

***Policy implications***

How can science/policy better incorporate the perspectives of poorer forest/land users, in particular their socially and ecologically dynamic relationships with forest?

Given the focus on research-policy relationships, the practical implications of this study concern less getting a particular angle on people-forest relations into policy, than reshaping the social relations of science-policy processes themselves. This is not easy because new types of research and policy making have a tendency to be denatured, or marginalised within existing processes linking international and local levels. This underlines the importance of expanding the field of inquiry around science and policy to explore their broader social, cultural, media and economic relations, and to generate practical implications which also refer to this wider social field. Just as the findings (cross-cutting themes) show the interdependence of numerous processes in shaping science-policy, so these practical implications (linked here to their respective theme by number) would be mutually supportive in transforming science/policy.

A first set of practical implications concerns **strengthening citizen participation in science/policy processes**.

- Given the way policy problematics and their interaction with science come to embody social values (*theme 1*), issues of participation and inclusion of diverse perspectives need to be considered in relation to science as well as policy. This suggests the need for participatory research strategies in which poorer forest users help to set agendas and questions. Direct forms of citizen participation and consultation in science and in policy making processes around specific forest issues could valuably be expanded through the growing repertoire of deliberative and inclusionary procedures (DIPs), including citizen's juries, consensus conferences, multi-criteria mapping exercises and others. These help to expose the values and assumptions behind particular social categories deployed in environmental policy making, and to promote negotiation between diverse perspectives. The proposed multi-stakeholder Forest Forum in Ghana, for example, could valuably be used to debate not just policy positions but also the scientific/knowledge positions and social values linked to them.

- Given the tendency for practices of participation to reproduce social exclusions (*theme 3*), however, even new procedures such as DIPs and other face-to-face encounters are unlikely to produce open dialogue and mutual understanding unless there is particular attention to (a) inclusion of the social groups which dominant environmental problem framings delegitimise; (b) the 'hosting' of DIPs by disempowered groups (recognising that the institutional initiative of any DIP is likely to bias the terms of discussion), and (c) opening up the process to a greater diversity of problem-framings. In this, there is a need

to take consultation a stage further back, into the very concepts and ideas informing policy, and the conduct of the science on which these are based.

More broadly, findings suggest the importance of **building citizens' platforms for expression of interests, demands and perspectives on policy on their own terms**.

- If participation cannot (and should not) be 'contained' within programmes or projects (*theme 4*) then it is necessary – for environmental as well as for broader good governance reasons - to promote aspects of political and legal culture which enable critique. This also extends to broadening participation in scientific culture: building citizen scientific confidence and skills, and making space for citizen science to inform broader debates, and shape or dictate their terms.

- 'Learning process' approaches in which projects/policy actually become research (*theme 6*) are important. However, learning should not be restricted to technical project remits, but expanded to incorporate reflection – by both project staff and citizens - on the broader political and policy field of which such projects are a part.

- Media and education (*theme 2*) are potentially important tools for overcoming amplification and reinforcement of current policy framings and social categorisations. Media strategies could be directed to making explicit the evidence, values, and uncertainties underlying particular scientific and policy positions, enhancing and empowering public capacity to critique and engage in science policy debate. This might include citizen interrogations of experts in radio and print media; different groups presenting their situations and experiences, and promoting exposition of multiple perspectives on landscape, history and forest dynamics in national media and education, helping to break down stigmatisation. It could possibly also include (at least in urban areas) interactive internet sites which expose diverse perspectives on a particular issue and give space for public comment (as in the Scidev.net approach currently being considered by DFID).

- Those who face contradictions between policy models and social/ecological realities (field-level workers, journalists, teachers and others; *theme 5*) need to be supported in exposing and exploring these, rather than pasting them over. In this way, field-level staff could become valuable brokers and conduits for transmitting citizen perspectives and ecological unpredictabilities 'upwards' in policy bureaucracies. This carries practical implications for hierarchies, work conditions and incentives, lines and styles of communication and decision-making to make them more responsive to field-level voice and creativity.

- Given that science/policy processes have their own economies, which shape policy and knowledge (*theme 7*), resource flows should support rather than detract from the building of citizen platforms. Forms of financing should support downwards accountability of programmes and policy arrangements to local users. In community-based forestry activities, for example, restructuring power in setting and carrying through research-policy agendas will require greater devolution of financial control to community groups.

- To balance the dependence and shaping of national research and local research by international agendas and values (*theme 8*), support for independent and critical research within national institutions is needed. This could focus on enhancing the capacity of social and natural science to respond to and engage with land users' agendas. It could also build up the constituencies interested in more dynamic, adaptive approaches to forest ecology and landscapes, perhaps involving coalitions of ecological and social scientists, citizens and policy/NGO groups. In each country researchers with such interests exist but

their work is both isolated and little-practised, undermining its perceived academic and policy importance. Forms of support to strengthen these perspectives could extend from funding of studentships, lectureships and research centres in West African and Caribbean universities to focused regional and trans-regional research networks, workshops etc.

To complement and assist these approaches, **building better-informed and more reflexive national and international processes** is important.

- That national institutions have historically-embedded scientific and political practices which link in specific (and polarising) ways with international organisations (*theme 9*) could become matters for critical reflection amongst their staff. Government departments, NGOs and media/educational institutions alike need to become better aware of the origins and partiality of the environmental messages they promote, and the lines of scientific debate which challenge them. Promoting awareness amongst researchers and policy-makers at all levels of linkages and influences between local, national and international science/policy networks, could enable them to (re)assess their positions and strategies in an informed way, rather than simply attempt to fit opportunistically into emergent niches. Equally, rather than attempt to harmonise the strategies of government departments, parastatal and non governmental institutions in forest matters – as many national environmental and biodiversity planning efforts do - a more effective approach would accept diversity as inevitable. Such an approach would make explicit the practices, values and political-economies of different institutions, and seek to generate complementarity and co-operation amidst diversity, promoting strategic alliances around particular science-policy agendas, and forms of negotiation where conflicts and trade-offs become apparent.

- To address the somewhat biased and self-referential nature of international science-policy debates over forest issues (*theme 10*), new procedures are needed in these which allow perspectives from local settings to feed upwards into and shape terms of debate. This may run counter to perspectives seeking to harmonise local and global analytics (for instance around Criteria and Indicators for sustainable forest management, and around the Convention on Biodiversity) and the forms of managerialism they strive for and promote. It could encompass attention to new structures for deliberation; wider inclusiveness of scientific input (beyond current dominance by government science, and gatekeeping of NGO contributions by international conservation organisations); mechanisms and practices of local and national attendance, representation and articulation of voice, and to opening up processes of deliberation to a greater diversity of perspectives on landscape values and dynamics.

## RESEARCH DISSEMINATION

Dissemination has involved a continuous process of sharing and reflection on research questions and findings by key scientists and policy-makers in each country as the research progressed. Several mechanisms facilitated this:

1. **Reference Groups**:
Establishing and maintaining close communication with an informal 'reference group' in each country. The original plan to constitute and convene regular meetings of a reference group proved inappropriate both because key potential members were also research subjects, having particular perspectives, and (in Guinea) because of logistical difficulties in bringing together people from widely scattered locations. Hence instead, initial preparatory workshops/meetings were held in each country (in Trinidad, at the University of the West Indies and Forest department; in Guinea, at CERE and the Forest Department; in Ghana at the Forestry Department and Forestry Research Institute, Kumasi) to discuss research agendas with a range of researchers and policy –makers. These were followed up with repeated contact and reflective discussions on research progress with 3-4 representatives of government, university and the donor community in each country.

2. **Working Papers**:
Preparing and circulating (to researchers and policy-makers) timely working papers, focusing particularly on the case study issues. 12 working papers were produced in the course of the research (see Appendix 1).

3. **Workshops**:
A workshop to disseminate and discuss preliminary findings was held in each country at the end of its respective national research phase, hosted by the principal collaborating institution:

> 25 March 1999 '*History and environment: a roundtable'*, Centre d'Etude et de Recherche en Environnement, Universite de Conakry, Republic of Guinea
>
> 21 July 1999, '*Science, policy and society: controversies in Trinidadian forestry and conservation*', Sustainable Economic Development Unit, University of the West Indies, St. Augustine Campus, Trinidad
>
> May 2001, '*Science and Environmental Policy in Ghana'*. Forestry Research Institute of Ghana, Kumasi.

An international workshop to debate the research findings in their broader context, '*Changing Perspectives on Forests: Ecology, People and Science/Policy Processes in West Africa and the Caribbean*', was held at the Institute of Development Studies on 26-27 March 2001, involving 40 researchers from different disciplines and policy-makers. The programme and list of participants is appended (appendix 2).

4. **Written outputs:**
Further outputs targeted at policy audiences include an IDS Project/Policy briefing (in preparation) which will be direct-mailed to 500 individuals internationally. Summary articles will also be prepared for policy/practitioner journals such as the Rural Development Forestry Network.

The principal outputs for communication with researchers in multiple disciplines (and a large intended student audience) are three books:

- *Science Society? Globalising governance and the politics of forest control* (by James Fairhead and Melissa Leach), focusing on Guinea and Trinidad case material.
- on science-policy processes in Ghana (Kojo Sebastian Amanor)
- a co-edited comparative volume on Changing Perspectives on Forests, based on selected papers from the International Workshop and a distillation of the working papers produced in this research

All manuscripts are at an advanced stage of preparation.

Papers based on the research have also been – and will continue to be – published and presented at conferences, university seminars and invited lectures, assisting dissemination to a wider community of researchers both in the Ghana, the UK and internationally (see appendix 1).

Research findings have already been incorporated into training materials for postgraduates (e.g. MPhil Environment and Development course, IDS; doctoral students at SOAS) and developing country professionals (e.g. IAC training course, Wageningen). Further such materials will be produced and applied.

## REFERENCES


Amanor, K.S., 1994, *The New Frontier: farmer responses to land degradation*. London: UNRISD and Zed Books.

Barnes, B., D. Bloor and J. Henry, 1996, *Scientific Knowledge: a sociological analysis*. London: Athlone Press.

Blanc-Pamard, C., 1979, 'Un jeu écologique différentiel: les communautés rurales du contact forêt-savane au fond du "V Baoulé', *Travaux et Documents de l'ORSTOM*, 107. Paris: ORSTOM.

Fairhead, J. and M. Leach, 1996, Misreading the African Landscape: Society and ecology in a forest-savanna mosaic. Cambridge: Cambridge University Press.

Fairhead, J. and M. Leach, 1998, Reframing Deforestation: Global analyses and local realities – studies in West Africa. London: Routledge.

Grillo, R. and R. Stirrat, 1997, *Discourses of Development: Anthropological perspectives*. Oxford: Berg Publishers.

Hajer, M., 1995, *The politics of environmental discourse: ecological modernization and the policy process,* Oxford: Oxford University Press.

Hawthorne, W.D., 1996, 'Holes and the sums of parts in Ghanaian forest: regeneration, scale and sustainable use', *Proceedings of the Royal Society of Edinburgh*, 104B: 75-176.

Jasanoff, S. and B. Wynne, 1997, 'Science and decision-making' in S. Rayner and E. Malone (eds) *Human Choice and Climate Change: an international assessment*, Vol 1 The Societal Framework of Climate Change. Batelle Press.

Knorr-Cetina, K., 1999, Epistemic Cultures: How the sciences make knowledge. Cambridge, Mass.: Harvard University Press.

Maley, J., 'The catastrophic destruction of African forests around 2500 years ago still exerts a major influence on present vegetation form and distribution', Paper for the Workshop 'Changing perspectives on forests: ecology, people and science/policy processes in West Africa and the Caribbean', 26-27 March 2001 at The Institute of Development Studies, University of Sussex.

Martin, E., 1997, 'Anthropology and the cultural study of science: from Citadels to String Figures', in J. Ferguson and A. Gupta (eds) *Anthropological Locations*, 131-146. Berkeley: University of California Press.

Shackley, S. and B. Wynne, 1995, 'Global climate change: the mutual construction of an emergent science-policy domain', *Science and Public Policy* 22

Shore, C. and S. Wright (eds), 1997, *Anthropology of Policy: Critical perspective son governance and power*. London: Routledge.

Sprugel, D.G., 1991, 'Disturbance, Equilibrium, and Environmental Variability: What is 'natural' vegetation in a changing environment?' *Biological Conservation* 58, 1-18.

Sutton, R., 1999, 'The policy process'. *ODI Working Paper* 118. London: Overseas Development Institute.

Tardy, C., 1998, Paleoincendies naturels, feux anthropiques et environnements forestiers de Guyane Française du Tardiglaciaire a l'holocene recent: approches chronologique et anthracologique. These, Universite de Montpellier II.

# APPENDIX 1: HIGHLIGHTS SUMMARY

## ARE NEW APPROACHES TO FOREST GOVERNANCE REALLY HELPING THE POOR? TRACKING SCIENCE-POLICY PROCESSES

**Policy debates around forests and livelihoods, biodiversity, sustainable timber production and watershed protection now emphasise social inclusion and participation. Yet comparative research in West Africa and the Caribbean demonstrates how current configurations of science and policy continue to exclude the knowledge and experiences of land users - especially the poorest - remaining antithetical to their interests, and compromising broader policy effectiveness.**

Recent research has exposed many new perspectives on forest issues. Climate history, 'new' ecology and social anthropology, for instance, challenge established views of forest as stable, climax vegetation simply undergoing degradation.Yet these transformed perspectives are hardly represented in current policy and practice. While one might trace this gulf to poor research dissemination to policy-makers, this research used anthropological approaches to explore ways that forest policy and science are 'co-produced' such that certain questions, agendas, and sets of practices persistently dominate, while others are excluded. Case studies in Trinidad, Guinea and Ghana tracked the interaction of science and policy from local forest users, government and project fieldworkers, NGOs and district officials, through national research, policy and administrative settings, up to international organisations.

The research revealed the marginalisation of (poorer) land-user perspectives in all countries, despite their differences, reflecting how:

- Science-policy processes concerning environment produce and shape social categories Negative or positive labels (e.g. squatter, fire setter, indigenous person) contribute to simplified policy narratives, and sharpen social fault-lines.

- Environmental communication in media and education is closely integrated with science/policy institutions. The mutually supportive field of messages produced amplifies and reinforces policy framings, narratives and social categorisations.

- Practices of 'participation' and public consultation frequently exclude stigmatised groups and their views. But public contestation of policies and science proceeds through other channels, for example through 'citizen science', political and legal action, or everyday forms of resistance.

- Field-level workers adapt to contradictions between mandated, simplified science-policy agendas and complex, 'non-equilibrial' land-user perspectives, but such creativity is rarely transmitted upwards to re-shape agendas.

- Project activities are frequently cast as 'research' - 'pilot', 'experimental' or 'laboratories' – but within research agendas restricted by project goals, and in ways that mask the political nature of interventions.

- Forest science and policy are increasingly globalised with international deliberation, conventions and regimes co-established and co-evolving with scientific committees. In these, emphasis on local specificities and participation sits uneasily with biases towards internationally-harmonised forest values and management systems.

- As international concerns and organisations link with national research and policy, older national research practices are often transformed in meaning to conform with global agendas.

If science/policy is to incorporate the perspectives of poorer forest/land users more effectively, there is therefore a need to:

- Strengthen citizen participation and consultation through deliberative and inclusionary procedures which are explicitly opened to a variety of problem-framings and less powerful, stigmatised social groups.

- Build citizens' platforms for expression of interests, demands and perspectives on science and policy on their own terms, whether through support to citizen-scientific confidence and skills, to media strategies which expose scientific uncertainties, diverse perspectives and values, or to independent, critical research within national institutions.

- Build better-informed and more reflexive national and international processes, which make the values underlying science and policy explicit, and allow perspectives from local settings to feed upwards into and shape terms of debate and subjects of research.

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**Sources**
Fairhead, J. and M. Leach (forthcoming) *Science Society? Globalising governance and the politics of forest control*
Case study Working Papers will also be available at the Environment Group site on the IDS website http://www.ids.ac.uk/ids/env/

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Melissa Leach, March 31 2001

# APPENDIX 2

## Project working papers, conference papers and published articles

***Working papers*:**

Science policy and forestry in Ghana (Kojo Amanor). Pre-fieldwork country paper

The forestry sector in Trinidad and Tobago (Thackwray Driver). Pre-fieldwork country paper

Science, policy and national parks in Trinidad and Tobago (Keisha Charles, Melissa Leach and James Fairhead)

Sustainable forestry in Trinidad? Natural forest management in the south east (James Fairhead and Melissa Leach)

Science, policy and society: controversies in Trinidadian forestry and conservation (Melissa Leach and James Fairhead)

Decentralisation and 'Groupements Forestiers' in Guinea (James Fairhead and Melissa Leach)

Practising 'biodiversity' in Guinea (James Fairhead and Melissa Leach)

Discourse coalitions and the politics of fire in Ghana (Kojo Sebastian Amanor)

The symbolism of tree planting and hegemonic environmentalism in Ghana (Kojo Sebastian Amanor)

Sacred Groves in Ghana (Kojo Sebastian Amanor)

Watershed management, land tenure and forests on the Northern Range, Trinidad (Thackwray Driver)

'From the forest to the sea': reflections on Conservation International's priority-setting workshop for West Africa (Melissa Leach)

***Seminar and conference papers and published articles:***

New shapes to shift: war, parks and the hunting persona in modern West Africa (Melissa Leach). Audrey Richards Lecture, Oxford, March 1999, and published in the *Journal of the Royal Anthropological Institute* 6(4): 577-595.

Manners of contestation: reflections on the social relations of scientific practice in West Africa and the Caribbean (Melissa Leach). Paper presented at the ESRC/CSEC Workshop on 'Environmental Knowledge: Uncertainty, Authority and Responsibility – Indigenous Knowledge', Lancaster University, 22-23 November 1999

Plural perspectives and institutional dynamics: challenges for community forestry (Melissa Leach). Paper presented at the IAC Executive Seminar 'Decision-making in natural resources management with a focus on adaptive management' Wageningen, 22-24 September 1999, to be published in IUCN proceedings and journal IJARGE.

What's the policy? Meanings, motives and the political economy of an emergent forest policy in Guinea, West Africa (James Fairhead), presented at the University of British Columbia, January 2000

Practising 'biodiversity' in Guinea, West Africa: nature, nation and an international convention (James Fairhead), presented at the University of British Columbia, January 2000

'We are not charcoal makers' – why ethnography? (James Fairhead), presented to Social Anthropology seminar, School of Oriental and African Studies, January 2000

Practising 'patrimony' and 'biodiversity': the articulation of diverse local, national and international perspectives in Guinea, West Africa (James Fairhead), presented at the University of Paris I, March 21 2000

The science of bush fire management in Ghana (Kojo Amanor). Presented at the Institute of African Studies, University of Ghana, Legon.

Radio Fusion: media, mirage and marginality in Guinea (Melissa Leach), presented to Social Anthropology seminar, University of Sussex, February 13 2001

# APPENDIX 3

## CHANGING PERSPECTIVES ON FORESTS: ECOLOGY, PEOPLE AND SCIENCE/POLICY PROCESSES IN WEST AFRICA AND THE CARIBBEAN

**Workshop at the Institute of Development Studies, University of Sussex, UK**
**26-27 March 2001**

**Programme**

**Day 1: Emerging perspectives on forests**

10.00 *Registration and coffee*

**10.30 Introduction to the workshop**
Melissa Leach

**11-12.30 Climate and the shaping of forests over the last 3,000 years**
Chair: James Fairhead

The catastrophic destruction of African forests around 2,500 years ago still exerts a major influence on present vegetation form and distribution

Jean Maley

Studies on climatic changes and human disturbances during the last thousand years in Guiana and the Caribbean. New perspectives for local sustainable management?
Christophe Tardy

Discussant: Richard Grove

12.30 – 1.30 *Lunch*

1.30 – 3.00 **Forest ecology: Climatic and anthropogenic footprints**
Chair: Melissa Leach

New perspectives on tropical rain forest ecology in West Africa: typology, gradients and disturbance
Renaat Van Rompaey

Forest loss and species extinctions in West Africa
Thomas Brooks and John Pilgrim

Discussant: Katherine Homewood

3.00 – 3.15 *Tea*

3.15 – 4.45 **Society, history and the shaping of forest landscapes**
Chair: Kojo Amanor

History, memory and the social shaping of forest in West Africa and the Caribbean
James Fairhead

Is 'Tumi' in the sacred grove really gone? Local interpretations of the

changes in the landscape of the forest-savanna transition in Ghana.
Paul Sarfoh-Mensah

Pathways to the social shaping of forest landscapes: archaeology, sacred groves and the dynamics of socio-political complexity in coastal Ghana
Gerard Chouin

4.45 – 6.00 **Discussion -** New perspectives on forest dynamics? Convergences, dissonances and implications

6.00 – 6.45 *Drinks reception*

8.00 *Workshop dinner (The Strand Restaurant, Brighton)*

**Day 2: Forest science/policy processes**

9.15 **Perspectives on the relationship between science, policy and forest governance**
Melissa Leach

9.45 – 11.15 **Science-policy processes in the Caribbean: cases from Trinidad**
Chair: Sally Jeanrenaud

Sustainable forestry in Trinidad? Natural forest management in the south-east
James Fairhead

Watershed management, land tenure and forests in the Northern Range, Trinidad
Thackwray Driver

Science, policy and national parks in Trinidad
Melissa Leach

Discussant: Kate Brown

11.15 – 11.30 *Coffee*

11.30 – 1 **Science-policy processes in West Africa: cases**
Chair: Reg Cline-Cole

Discourse coalitions and the politics of fire control in Ghana
Kojo Amanor

New perspectives on forest dynamics and the myth of 'communities': reconsidering co-management of tropical rainforests in Cameroon
Karen Biesbrouck

Changing perspectives on forests, people and development: reflections on the case of the Korup forest
Ruth Malleson

Practising biodiversity in Guinea: nature, nation and an international convention
Melissa Leach

Discussant: Philip Burnham

1 – 2 *Lunch*

2 – 3.30 **Panel discussion: International dimensions to forest science and policy: opportunities and threats**

Chair: James Fairhead

Mohamed Bakarr
Sally Jeanrenaud
David Kaimowitz
Andy Roby (to be confirmed)

3.30 – 4 *Tea*

4 – 5.00 Forest science/policy: Reducing poverty, promoting inclusion? Discerning better practice

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**Workshop at the Institute of Development Studies, University of Sussex, UK**
**26-27 March 2001**

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