The Role of Planted Forests
in Forest Landscape Restoration

By

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Abstract

Deforestation and forest degradation have resulted in many impoverished landscapes worldwide that are characterised by a paucity of livelihood opportunities, drastically reduced biological diversity and diminished ecosystem functionality and productivity. Consequently, the restoration of forest functionality is important from both a socio-economic and environmental perspective inasmuch as it can enhance the contribution of natural resources to rural poverty reduction, increase the productive capacity and commercial viability of existing land-use systems, minimize long-term, environmental and economic risk, improve ecosystem services, ensure greater habitat connectivity and enhance biodiversity conservation.

Although the conventional response of establishing planted forests as a counterweight to deforestation is seldom capable of restoring the multiple values that flow from natural forests or of adequately addressing all the needs of key interest groups, this paper argues that there is still a critical role for planted forests in restoring forest functionality at a landscape level. However in order to achieve this potential, and to move beyond the controversy that currently surrounds plantation forestry, it will be necessary for governments, the private sector and civil society to move beyond the "absolutist" rhetoric of entrenched positions.

The true economic, societal and ecological utility of planted forests can only be determined when the broader context of the land use configuration within which they are located is properly considered. By focusing on the flow of forest goods and services at a landscape, or ecosystem, level rather than the nature of one particular land-use intervention at one particular site, disparate interest groups have a better starting point to negotiate how trade-offs between various land-uses can be best balanced to achieve an optimal outcome.

Introduction

Why should the planting of trees fuel such an acrimonious debate? The arguments surrounding planted forests in general and industrial plantations in particular are well known and regularly rehearsed. To some they offer the opportunity to relieve pressure on natural forests in the face of growing demand and reportedly dwindling supplies. To

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others they represent the further imposition of corporate power over land and natural resources at the expense of local communities, a manifestation of short-term financial greed over long-term sustainable development (WRM, 1998).

Whereas twenty-five years ago the failure of any particular plantation scheme would have been attributed to a species-site mismatch, a more common explanation nowadays, at least from opponents of plantations, is that industrial-scale planted forests are bound to fail as they are an inherently inequitable technology that exacerbate rather than ameliorate the social and environmental impacts of forest loss. Notably, the NGOs that signed on to the Montevideo Declaration stated that "tree plantations have little in common with forests".

While it is likely that the debate over the true societal value of plantations will not be resolved in the near future it is also certain that plantations as a landscape feature, and source of industrial roundwood, are here to stay. Although accounting for only 5% of global forest cover, forest plantations now supply about 35% of the world industrial wood products (FAO, 2003). The question is whether the role of planted forests is one limited to wood fibre production or is it one that can make a more comprehensive societal and ecological contribution without compromising an economic rationale?

To answer this question one needs to go beyond the debate of whether plantations are an inherently positive or negative technology and start to assess their value in terms of enhanced or impoverished forest functionality within the context of the broader landscape. This paper will explore the role of planted forests in Forest Landscape Restoration, an inclusive approach to reversing forest loss and degradation that is being promoted by IUCN - The World Conservation Union, WWF (World Wide Fund for Nature), the Forestry Commission of Great Britain and other partners.

Why focus on forest landscape restoration?

When it comes to forests, the principal debate in recent years has tended to revolve around two key issues: how much, and what sort of, forest land needs to be set aside in order to attain an adequate network of protected forest areas; and what constitutes best management practice in timber production forests. While addressing such challenges is certainly of the utmost priority, recent analysis by Howard and Stead (2001) indicates that forest protection and timber production probably only account for 30% to 35% of the world's forest estate (10% of the world's 3 billion hectares of forests are now legally protected while the 1.6 billion m^3 of timber harvested each year is sourced from 600–800 million hectares of forest).

Much less attention is paid to the land-use configuration within which these protection and production forests exist and concomitantly how landscape level changes can enhance or inhibit the vital role that forests plays in securing and maintaining peoples' livelihoods and conserving biological diversity. In reality, forest goods and services can no more be considered solely in terms of formally traded commodities, such as industrial roundwood, than nature conservation can be limited to 10% of the world's forests.

Over the past 50 years many forest landscapes have changed beyond recognition in both qualitative and quantitative terms. Bryant et al. (1997) estimate that only 40% of the world's remaining forest cover (or 22% of original forest cover) is still found in relatively large, contiguous tracts. Seventy percent of such uninterrupted forest cover is limited to three countries, Russia, Canada and Brazil, while the forest estate in at least seventy six countries is now found solely in fragmented blocks, the majority of which is likely to have undergone some degree of structural degradation and floristic simplification.

The scale of the loss in forest quality is equally alarming. Using 1993 FAO Forest Resource Assessment for tropical countries Emrich et al. (2000) estimated that one third of the total tropical forest area, or 532 million hectares, could be classified as either degraded primary or secondary tropical forest. Brown and Lugo (1990) have produced similar figures (600 million hectares) for secondary forest alone.

Aside from fragmentation there is approximately another 350 million hectares of former tropical forest land that are now so degraded through excessive logging, grazing, repeated fire and other land-use that forest re-establishment is, at best, severely delayed or, at worse, completely inhibited (ITTO, 2000). Typical of this is the situation in the countries of the lower Mekong, for while Vietnam, Lao PDR, Cambodia and Thailand have 46 million hectares of protected, managed, degraded and secondary forest they also possess another 23 million hectares of bare land that was formerly forested but is of such poor quality that it has little value for agricultural production (Gilmour et al., 2000).

The fact is that tree cover no longer dominates many forest landscapes. In some areas, the current land-use configuration has led to a dramatic and detrimental decline in the availability of forest goods and services. In such degraded landscapes, agricultural production tends to suffer, local shortages of timber and fuelwood prevail, household income falls, and biological diversity declines. Often, the effects of landscape degradation are felt further downstream – siltation loads increase and water quality declines.

Forest landscape restoration can help reverse some of the more severe impacts of forest loss and degradation by providing: more secure access for local people to a range of forest products, including fuelwood and non-timber forest products; improved hydrological regulation and nutrient cycling; more diverse and better connected habitats, thus supporting more biological diversity; and options to increase the resilience and adaptability of existing agricultural systems.

Although restoration should be a key element in any national forest strategy, this does not mean simply getting as much forest cover back as possible. A more comprehensive approach to restoration should emphasise the importance of both the quality and quantity of tree cover and should require that ecological integrity is enhanced at the same time as tangible benefits accrue to local people.

Restoring forest landscapes

Forest landscape restoration is defined as '*a process that aims to regain ecological integrity and enhance human well-being in deforested or degraded forest landscapes'*. It

is being promoted by IUCN – The World Conservation Union, the World Wide Fund for Nature (WWF International), the Forestry Commission of Great Britain, CIFOR[3], ITTO[4] and various other governments and partners to meet the challenge of restoring goods and services in modified and degraded forest landscapes. It focuses on restoring forest functionality: that is, the goods, services, ecological processes and future options that forests can provide at the broader landscape level as opposed to solely promoting increased tree cover at a particular location.

Forest landscape restoration does not aim to return forest landscapes to their original, 'pristine' state. Rather, it is a forward-looking approach that seeks to put in place forest-based assets that are good for both people and nature. Since forest landscape restoration addresses the supply of forest goods and services at a landscape level it is not limited to – nor does it exclude – any particular site-based technical interventions. Any individual application of the forest landscape restoration approach will be a flexible package of site-based techniques – from pure ecological restoration through blocks of plantations to planted, on-farm trees – whose combined contribution will deliver significant landscape-level impacts.

One of the key challenges for forest landscape restoration is to identify the type and level of restoration that will be compatible with social and bio-physical realities. Thus, it is important to be clear on both the immediate and long-term objectives of restoration when identifying the potential suite of technical approaches and policy interventions. For example, Whisenant (1999) points out that while healthy ecosystems have built-in repair mechanisms, those that are badly degraded may have lost their capacity for self-repair. In such situations restoration activities are better focused on the recovery and maintenance of primary processes (hydrology, nutrient cycling, energy flows), rather than on attempting to replicate the original forest structure or 'near-natural' species mix.

Restoration objectives must be based on the interests of key stakeholders, the nature of the physical landscape and the resources available. They will also be determined by factors such as the existing institutional and land tenure arrangements, the prevailing land-use policy framework and, in some countries, a willingness to address perennial land-use governance issues such as decentralised decision-making and the equitable resolution of local peoples' access and use rights. While long-term objectives may seek to increase the resilience, diversity and productivity of land-use practices and conserve biodiversity, realities on the ground may require short-term interventions that yield immediate benefits.

Is there a role for planted forests in forest landscape restoration?

There is undoubtedly a major role for planted forests in forest landscape restoration. However, in order to better understand the nature of that role is it is useful to consider three important caveats.

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The first caveat is that while afforestation and reforestation are part of the response, conventional plantation silviculture is unlikely ever to provide the whole solution. Although it has long been recognized that approaches to industrial-scale plantations can be modified to enhance the range of goods and services they deliver without significantly compromising their primary function of economically viable roundwood production, it is questionable whether plantations can be managed at the stand level for truly multi-purpose objectives. Indeed the implied lack of prioritization in a plantation management regime that attempts to pursue multi-purpose objectives is arguably every forest manager's worse nightmare, resulting in "damned if you do and damned if you don't" outcomes.

None of the above is any reason for excluding planted forests from forest landscape restoration but it does mean that we have to tailor our expectations of what planted forests can deliver and recognize that space needs to be created so that other complementary restoration strategies can be deployed. The multiple function and dominant use paradigms should not be treated as mutually exclusive forest management options, but rather as individual points on a scale-dependent hierarchy, i.e. "dominant-use" is a perfectly legitimate approach to site level activities while the achievement of "multiple-functionality" should be the sine qua non of how landscapes are configured. The implication of this approach to forest land-use is that a landscape entirely dominated by plantations, even if they are well-managed, will not be capable of delivering the optimal levels of all forest goods and services. Conversely, a landscape configured so that it accommodates planted forests, ecological corridors and stepping stones, regenerating native woodland refuges and agroforestry systems (or other agricultural systems that make use of on-farm trees) lays the foundation for multiple functionality.

The second caveat is that a more consistent interpretation of what constitutes a planted forest is required. While the FAO definitions of both "forest" and "forest plantation" (FAO 2001) are sufficiently all encompassing to cover most types of planted forest, the way that many governments interpret these definitions tends to equate planted forests with recently established, large-scale plantations. Thus small-scale farmstead and environmental planted forests, that under some circumstances offer a wider range of forest goods and services than their larger, industrial-scale counterparts, tend to get discounted both from national reporting and in qualifying for government incentives. One particularly relevant example of this at this time is the on-going discussions between the parties to the United Nations Framework Convention on Climate Change as to the nature of "afforestation and reforestation" activities that will qualify under the Clean Development Mechanism (Orlando et al., 2002). The typology of planted forests, illustrated in Figure 1, is one option to taking a more inclusive approach to defining planted forests (CIFOR, 2002).

Figure 1:   A proposed typology of planted forest (CIFOR, 2002)

Typology	Description
Industrial plantation • Timber • Boimass • Food • Other	Intensively managed forest stands established to provide material for sale locally or outside the immediate region, by planting or/and seeding in the process of afforestation and reforestation. Individual stands or compartments are usually with even age class and regular spacing, and: – of introduced species (all planted stands), and/or – of one or two indigenous species, and – either large scale or contributing to one or more large-scale industrial enterprises in the landscape
Home and farm plantation • Fuelwood • Timber • Fodder • Orchard • Forest garden • Other	Managed forest, established for subsistence or local sale by planting and/or seeding in the process of afforestation and reforestation, with even age class and regular spacing. Small scale and selling, if at all, in a dispersed market.
Environmental plantation • Windbreak • Erosion control • Game and wildlife • Site reclamation • Amenityr	Managed forest stand, established primarily to provide environmental stabilization or amenity value by planting and/or seeding in the process of afforestation and reforestation, typically with even age class and regular spacing
Managed secondary forest with planting	Managed secondary forest where forest composition and productivity is maintained through additional planting and/or seeding.

The third and final caveat is that there is no "one-size fits all" model which defines the specific role that planted forests can play in forest landscape restoration. The package of restoration options will be defined not only by situation specific biotic factors such as residual soil fertility and remnant species diversity, abundance and distribution but critically by institutional and land tenure arrangements and the inherent equity of the prevailing land-use policy framework. If home and farm plantations are identified as a key element in forest restoration then stakeholders will need to feel empowered to act and to be sure the resources they put in place will not be taken away from them. Alternatively if large-scale industrial plantations are being employed then it is critical that community support has been secured in advance. For example, Marghescu (2001) notes that early attempts to reforest the Khao Kho district in central Thailand met with violent opposition from landless families who often resorted to arson in order to prevent plantation establishment. The stand-off was resolved by incorporating local people into the project, reallocating about 500 hectares from reforestation to agriculture and redefining the species mix and planting configuration to suit both local needs and technical challenges.

The contribution of planted forests to forest landscape restoration

Occasionally planted forests will have only a marginal role to play in forest landscape restoration. For example, the Sukuma people who live in Shinyanga Region, Tanzania, undertook in 1985 to restore their traditional ngitili woodland enclosures through exclusion of cattle and reliance on natural regeneration. In a matter of 15 years the area of

ngitili had increased to over 250,000 hectares, dramatically transforming the Shinyanga landscape and the lives of the people who live there (Barrow et al. 2002). However, in the majority of cases, planted forests will be a necessary component for restoring landscape-level forest functionality. Given that there are many ways in which planted forest can contribute to forest landscape restoration the following section will concentrate on a limited number of specific examples to demonstrate the breadth of economic, social and environmental benefits that it is possible to accrue. An overview of how planted forests can positively promote or negatively inhibit progress towards forest landscape restoration is presented in Table 2.

Economic Benefits

A forest that supplies 5% of a large industrialized nation's softwood requirements may seem to offer little scope to contribute to the broad goals of forest landscape restoration. Yet the Forestry Commission of Great Britain has managed to enhance landscape level social and environmental attributes in the north of England while sustainably delivering 1400 tonnes of roundwood per day. In 1970, Kielder Forest was composed of 50,000 hectares of even-aged Sitka Spruce plantations. Although successful in terms of timber production there was increasing disquiet over the lack of public access and the environmental and wildlife habitat value of this publicly owned scheme. The Forestry Commission undertook to restructure the forest while maintaining its productive capacity. The proportion of native broadleaf species was increased to 8% of the total area (up from 1% in 1980), ostensibly for aesthetic and habitat purposes and restocking practices in 20% of harvested compartments were altered to enhance biodiversity conservation. Much greater efforts were made to include people in the restructuring and management or Kielder so that although the workforce has fallen from 2000 to 260 employees over 50 years the number of visitors has risen to half a million per year, bringing in their wake opportunities to revitalize the local economy through tourism and ancillary services.

Economic contributions from planted forests to forest landscape restoration are not limited to industrial scale activities such as those at Kielder Forest. In Chiapas in southern Mexico, poor farmers have established a global enterprise selling high quality carbon offsets to polluting businesses in the developed world. Rapid in-migration has caused the rural population of Chiapas to grow by 4% per year since 1980, placing dwindling forest resources under ever more pressure. Since 1996 over 700 farmers have joined the Scolel Te initiative, planting native pines, cedars and fruit trees on their own farmland, in configurations of their own choosing. Two thirds of the income generated goes straight to the farmers providing them with investment capital worth US$ 800 per hectare to help restore productive forest and agroforestry systems on current by degraded sites (R. Tipper, pers comm.). These homestead and farm plantations will provide farmers with a steady supply of saleable timber, fruit, medical plants and modest quantities of fuelwood and in doing so take pressure off existing forests and their biodiversity.

Social Benefits

As noted at the Santiago meeting on "The Role of Planted Forests in Sustainable Forest Management" the boundary between planted and natural forests is often indistinct and this prevents a highly prescriptive definition of planted forests being used. Unfortunately this sensible guidance is often overlooked and foresters and conservationists alike tend to assume that the principal goods or services will primarily be derived from the woody component. However, in some circumstances the main reason for establishing a particular configuration of planted forest is not the fruit or fibre of the trees themselves but the associated non-timber forest products (NTFPs).

In northern Vietnam, an IUCN project has been working with poor rural communities on the incorporation of non-timber forest products with demonstrable market value into agroforestry systems (Duong et al, in preparation). The aim of the project is to help foster farming system diversification that has both tangible livelihoods and ecological benefits. Cost-benefit analysis demonstrates that the incorporation of NTFP species into agroforestry systems (e.g. eucalyptus species are used in combination with on-farm rattan production) generates new and more profitable economic opportunities for farmers compared to the traditional crop cycle of Peanut – Green bean – Potato. As illustrated in Table 1, profits from NTFP species were consistently higher while labour inputs were reduced by 30% to 66%.

Table 1: Profitability of NTFP on-farm cultivation compared to traditional cropping cycle (Duong et al., in prep)

	Vetiver Grass	***Adenosma caeruleum & Potatoe***	**Forest Banana**	**Forest Ginger**	***Dioscorea persimitis***
1. Labour Inputs	37%	70%	73%	64%	71%
2. *Non-labour inputs*	38%	92%	76%	84%	84%
3. *Output total*	111%	101%	103%	165%	163%
4. Profit	**277%**	**122%**	**164%**	**350%**	**343%**

If one accepts the inclusion of "managed secondary forest with planting" as a form of planted forest then there should be no reason why planting activities have to be confined solely to tree species. Enrichment planting of NTFPs in managed secondary forests offers the prospect of some of the most biological by diverse and socially valuable planted forests and includes examples such as the Krui agroforests of southwest Sumatra (ASB, 2001).

Planted forests are capable of delivering major social benefits when they are used as a vehicle to enhance local peoples' access and use rights over natural resources. During the 1980s and early 1990s, the Nepal Australia Community Forestry Project worked with farming communities to establish some 20,000 hectares of plantations in the districts of Sindhu Palchok and Kabhre Palanchok. Jackson et al. (1998) attribute the significant increase in forest cover to the careful management and conservation of the new plantations by the local communities themselves. As in Chiapas, the communities were

involved from the outset, not just in establishing nurseries and planting the trees, but in determining which species they planted, and where they planted them. Community forest activities contributed to more balanced land-use with shrublands and grasslands being converted to more productive forest lands. In Nepal there are now some 12,000 forest user groups who control around 850,000 hectares of forest. Over a million households now have much stronger rights to control and manage their own forest resources.

Environmental Benefits

Perhaps the most obvious environmental contribution that planted forests can make to a landscape is when they closely replicate the structure and floristic composition of the original forest cover. Such intense ecological restoration at a large scale is an extremely rare luxury, often being prohibitively expensive, ecologically impractical, socially constrained. In some cases, even if the previously listed limitations could be addressed, strictly defined ecological restoration will never be achieved because there is no reference ecosystem left from which to work. Nevertheless, as has been demonstrated in north Queensland planted forests can make a major contribution to ecological restoration (Tucker, 2000; Goosem and Tucker, 1995).

Faced with the challenge of creating new habitat in, and restoring some semblance of landscape connectivity through, private farm land the Queensland Parks and Wildlife Service have worked with landowners to restore critical biological corridors and "stepping stones". In addition to planting an intricate mix of local tree species that is capable not only of site capture but also of attracting and sustaining local wildlife, important physical niches such as decaying large logs, nesting hollows, rock piles and dens have been created. One problem that faces these corridors that stretch across several kilometres of open countryside yet are no more than 100 meters wide is how to deal with edge effect and create suitable conditions for deep forest obligates. This problem has been innovatively dealt with through planting commercial tree crops such as *Araucaria cunninghamii* adjacent to the restored corridor. The lessons generated in Queensland have broader application, not only for forest landscape restoration in farmland but also as a conservation intervention in industrial plantations.

While the strict ecological restoration approach described above is one way to employ planted forests in the delivery of environmental benefits, Sayer et al. (2001) point out that even conventional mono-culture plantations can, if properly designed and managed, make significant contributions to landscape level biodiversity conservation and ecological integrity. They emphasize the importance of working at scale both from the point of view of economic efficiency and biodiversity benefits, which in practice means planning at the level of the concession not the site. Parrotta et al. (1997a) emphasize the catalytic role that plantations can play in the restoration and rehabilitation of degraded tropical lands by providing the necessary conditions for the establishment of native flora. In Porto Trombetas, Brazil where a mixed plantation was established over an abandoned bauxite mine site at least 75 tree palm and shrub species were naturally introduced over the first 10 year period (Parrotta et al. 1997b). Similar experience exists in the Bamburi quarry in Kenya where over a twenty five year period native flora and fauna have been both

naturally and deliberately introduced into a *Casuarina equisetifolia* plantation established on top of an abandoned limestone quarry. The most recent species survey recorded 19 IUCN red list species on the restored site.

In addition to contributing to the conservation of biological diversity, both at the site and landscape level, extensive reforestation with plantation species can help ameliorate long-term environmental degradation in badly eroded landscapes, restoring not only ecological functionality but also site productivity. On the east coast of New Zealand's north island years of overstocking left a legacy of severe past use erosion encompassing some 850,000 hectares. As an indication of the magnitude of the problem sediment rates in some of region's lakes were recorded as high as 14 mm per year (2.1 mm per year is expected from "natural" erosion). The accompanying decline in soil productivity had meant that east coast had already fallen far behind some of New Zealand's other livestock producing regions in socio-economic terms by 1960.

In order to counter this environmental and economic decline the government responded by expanding a programme to purchase and plant unforested headwaters. The first phase of large-scale planting resulted in 36,000 hectares being established and ended in 1987. Then between 1989 and 1993 alone another 50,000 hectares of *Pinus radiata* was planted delivering a net increase in jobs within the region. Indigenous forest reserves are protected and fenced as part of the initiative and on the restoration sites scope is given to managers to vary planting density in accordance with the magnitude of the erosion problem being addressed. Understandably, forest plantations have not been able to ameliorate some of the most severely eroding gullies but they arrested the development of moderate and incipient gullies. Currently 1,300 full time equivalent jobs have been created and although there have been some job losses within the farming sector, it is predicted that by the time of commercial harvesting there will be a net increase of 3,800 jobs due to the initiative. It is also expected that in some areas household incomes will rise as much as 18% due to increased land productivity (Rhodes, 2001).

Table 2: Determinants of whether planted forests contribute to, or undermine, forest landscape restoration.

	Positive	Negative
Environmental	• When the ecological functioning and productivity of degraded or biologically impoverished sites is improved. • When conservation interventions are directed at the entire planted forest concession not isolated sites. • When the spatial design of planted forests emphasizes corridors and connectivity – especially between existing remnant habitats. • When the species mix includes keystone food plants that accelerate wildlife colonization (especially ecological specialists).	• When planted forests replace, simplify or isolate of key species habitats / ecosystems. • When no provision is made to mitigate negative environmental off-site impacts such as run-off. • When the planted species are, or create the conditions for the spread of, alien invasives. • When planted forests or associated management systems significantly alter major ecological processes, e.g. natural fire regimes.

	Positive	Negative
	• When planted forests help maintain local genetic diversity.	• When planted forests increase opportunities for ecological generalists at the expense of ecological specialists.
Social	• When communities have role in shaping the composition, location and configuration of planted forests. • When peoples' rights to the forests and trees they plant are guaranteed and protected under law. • When peoples' rights to places of cultural or spiritual significance guaranteed.	• When traditional access or use rights are disrupted or denied. • When planted forests are established on disputed lands. • When planted forest schemes reinforce rent-seeking behaviour by outsiders or local elites • When planted forests further disenfranchise marginalized sections of society.
Economic	• When planted forests can contribute to the enhanced productivity of other land-use systems. • When planted forests yield ancillary income generating activities for local communities. • When planted forest incentives can promote delivery of multiple forest goods and services	• When planted forests incentives distort local and national markets. • When planted forest incentives skew landscape level trade-offs towards the supply of a very limited range of forest goods and services.

Conclusions

The case study material present in this paper illustrates that there is a major role for planted forests in forest landscape restoration. Nevertheless, that should not be taken to infer that planted forests in general and industrial-scale plantations in particular automatically constitute a positive contribution to the ecological integrity of modified or degraded landscapes or the livelihoods of people who dwell there.

A number of key issues remain to be addressed, not least what governance arrangements can be put in place to plan and implement large-scale planting programmes. As scale increases so does the number of interest groups and therefore the complexity of negotiations and trade-offs. What forest landscape restoration has to offer is that it helps create the space for interest groups to define the configuration of land-use systems they wish to see shape their landscape. It holds out the option for interest groups to agree how best to balance the trade-offs among social, economic and environmental objectives of land-use, recognizing that losing the option to benefit from one particular forest good or service from one site does not mean that one has to forego an optimal outcome at the landscape level. This means that the true economic, societal and ecological utility of planted forests can only be determined on a case by case basis when set against the broader context of the landscape level forest functionality. That said, whatever the nature of governance system that is put in place to help achieve this outcome, it is imperative that those people who depend most on forest resources for their livelihoods have their needs and interests fairly and equitably addressed.

Finally, there is no blueprint for forest landscape restoration. It should not be equated with, nor become, a static land-use planning process. That means restoring forest functionality to a landscape has to be built on learning and adaptive management, as

illustrated in the case of Kielder forest. In practical terms this calls for a new maturity on all sides of the planted forest debate. Governments and the private sector need to be less reticent about admitting to past mistakes and more open about the lessons that they learned from trial and error. Professional foresters and conservationists need to learn to opine less and listen more, including (or particularly) to those without formal technical training. Civil society organizations need to learn to be more open to process and less attached to rigid benchmarks. And all stakeholders need to be constantly reminded that, like a journey, restoring landscape level functionality cannot be achieved by talking about how to get there but only by taking small steps in what we think is the right direction.

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Changing Needs – Changing Forests
The UK Experience

By

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Abstract

Introduction

The United Kingdom is a densely-populated country with a long history of forest loss, mostly through conversion to agriculture, and a more recent history of forest expansion.

Forest Loss and Expansion

The UK was once heavily wooded, but the natural forests that established after the last ice age had already been reduced to some 15% of our land area 1000 years ago and to just 5% at the beginning of the 20th century. The UK took drastic action. A state agency – the Forestry Commission – was set up with ambitious programmes to restore the forest cover. From the outset, the programmes were a partnership between the public and private sectors. By 2000, over 1.5 million hectares of new forests had been created – the biggest change in land use in the UK in modern times. Woodland cover is now 12%.

Changing Priorities

The policy objectives for forestry have changed just as dramatically. The early priorities were national security – to create a strategic reserve of timber – and rural employment, though even in the 1930s the Government understood the value of the new forests for outdoor recreation and health. During the late 1980s, concerns to protect remaining areas of open, ecologically valuable land created a backlash against large-scale afforestation programmes in the uplands of Britain. The Government made changes to the regulation of forestry, the incentives for forest creation and management, and introduced new forestry standards. Following the Rio Earth Summit in 1992, forestry policy became based on principles of sustainable forest management, with the publication by the Government of a UK Programme and a UK Standard for sustainable forestry.

More recently, social issues have moved up the agenda alongside economic and environmental programmes. New partnerships have been developed to create community forests and encourage participation in management of the state forests. Forest planning has become sophisticated and is supported by a multidisciplinary research effort to allow managers to optimise and find the appropriate balance for the benefits that forests can provide.

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Conclusion

In just 80 years, a new planted forest resource has been created in the UK. The use of the forests has changed as dramatically as the landscapes. The new forests were created to meet a narrow set of objectives. Today different objectives are required of the same forests. We recognise the value of the planted forests – and the wood from them – as a sustainable, natural, and renewable resource, able to provide multiple and diverse services as well as products. Experience in the UK has shown that planted forests can be adapted to meet rapidly changing policy priorities and public needs and perceptions. The paper describes this experience.

Changing Needs – Changing Forests: The UK Experience

Introduction

The United Kingdom is a densely-populated, industrialised country with a long history of forest loss, and a much shorter, and more recent, history of forest expansion. This paper sets out the background to the creation of new planted forests in the United Kingdom; explains why these planted forests are of value; draws together some of the lessons learnt in order to maximise the benefits; and provides some concluding remarks on how planted forests can contribute to sustainable development.

Background – Changing Needs

Forest Loss

The United Kingdom was once heavily wooded, but forest loss over many centuries in favour of human settlements, agriculture and industry, had already eroded this to about 15% some 1000 years ago, and to just 5% forest cover by 1900. Although they were of natural origin, direct or indirect human influence had altered all of these remaining forests. Further felling to aid the war effort in 1914-1918 had exposed the UK to the risk of relying on imports of an essential primary industrial resource and convinced the Government of the day to undertake a serious forest expansion programme.

Forest Expansion

A state forestry department – the Forestry Commission – was set up in 1919 with the principal objective of creating a strategic reserve of timber as a matter of national security. From the outset, the Commission set ambitious targets for forest planting by private landowners and on the state forest land, and provided advice and financial encouragement to private owners to rehabilitate their depleted forests. The Forestry Commission took the lead in developing the techniques of plantation forestry, backed by a strong forestry research programme. Much of the available land had not been forested for centuries and the technical problems of establishing tree cover were formidable.

A powerful machine was created through a combination of scientific research, integrated with operational planning, training, and a committed work force, strongly supported by the Government, and pursuing a largely single purpose objective – to expand the forest area. New techniques were developed and it soon became possible to create fast-growing

planted forests on land that had previously been considered as unsuitable and unplantable. The foresters and forest workers of the day were pioneers and the new planted forests that they created were successful in achieving the national policy objectives of the time. Plantation forestry was seen as the way forward and the means of rebuilding the nation's forest resources.

From the very start, the forestry programme was a partnership. The Forestry Commission developed the technology for the new forests. Private landowners collaborated by making land available and by restoring their own forests. Later on, wood processors made major new investments, knowing that secure supplies of raw material would be available. More recently, partnerships have been extended to a wider set of stakeholders as forestry has become more diverse.

Forest Area Doubled

The programme had considerable success. In just 80 years, over 1.5 million hectares of new planted forests had been created – the biggest single change in land use in the United Kingdom in modern times. By the year 2000, the UK's woodland area had been more than doubled, from 5% of land cover to 12%. About one-third of all woodland in the UK is managed by state forest services and the rest by private individuals, forestry businesses and other public sector bodies, communities and charities (Forestry Statistics, 2002).

Policy Priorities

A strongly utilitarian approach was followed with timber production as a priority. Even so, as early as the 1920s, the Forestry Commission was promoting forests as a place for healthy outdoor recreation. The first of a series of National Forest Parks was created in the 1930s – well before legislation for National Parks was introduced in 1947. At the same time, however, the new planting – while strongly supported by the Government – was not without controversy. For example, the planting of conifer forests in the Lake District in England was seen as an intrusion into a highly valued scenic landscape. It was bitterly opposed and sparked the formation of the Council for the Protection of Rural England in 1927. This was one of the foundations for the organised environmental movement in the United Kingdom. The reaction was very much concerned with the visual aesthetic and this is still a strong influence in the way that the countryside is perceived.

From the 1950s to 1970s there was gradual recognition of wider forestry values, particularly recreation and wildlife conservation. During the 1980s, this interest grew and there was a backlash, particularly against the planting of non-native conifer plantations in the uplands. The marginal agricultural land was increasingly being recognised for its nature conservation and cultural values as a semi-natural habitat that is found in few other places in the world. Forestry planting became a focus of bitter conflict.

Controls and Incentives

Throughout most of the 20th century, the Forestry Commission had been able to control tree felling through statutory regulation. Planting and management of woodlands were

encouraged through tax incentives and grants to private owners, and through state ownership of up to 40% of the forest resources. Other than for tree felling, the regulations were largely based on voluntary principles (a typically British approach) rather than forestry legislation. This approach provided flexibility, allowing policies and practice to be adapted as the need arose. During the 1970s and 80s, the very favourable tax incentives which had been offered to the private sector to create new forests were seen to be encouraging planting schemes that were increasingly disputed and unpopular. Tax relief appeared to be fuelling an engine that seemed, to those concerned about the scale of land use change and its impact on the countryside and with the conversion of unimproved land, to be out of control.

In 1988, the tax regime was changed in favour of direct grants to private owners for forest creation and management. The new grants were tailored to promote a much wider range of forest planting. There was greater emphasis on planting native species, on small-scale woods, on community woodlands offering public access, on enhancing biodiversity in the new forests, and on managing existing woodland for public benefits. The new grants were conditional on compliance with best practice. Statutory environmental impact assessment of large-scale afforestation proposals came into force in 1989. The Forestry Commission introduced a system of consultation with local government, agriculture departments, environmental agencies, non-governmental organisations, and local people, in order to reconcile conflicts.

UK Standards and Indicators of Sustainable Forestry

The UK strongly supported the Statement of Forest Principles agreed at the Rio Earth Summit in 1992, and has since played an active role in international forestry processes. Following commitments made at the Earth Summit and at the Ministerial Conference on the Protection of Forests in Europe in Helsinki in 1993, the UK reviewed its guidance to forest managers and, after public multi-stakeholder consultations, published the UK Forestry Standard in 1998. This set out the Government's framework and standards for the sustainable forest management of all woodlands and forests in the UK. The Standard was supported by both the domestic industry and environmental organisations. It is built on a series of guidelines on issues such as landscape design, nature conservation, water management, recreation, archaeology and soil conservation. These are themselves supported by a range of more detailed guidance and information to forest managers and owners on sustainable forest practice.

The Standard is monitored through Indicators of Sustainable Forestry, published in 2002 (Forestry Commission, 2002), and through a wide range of survey data and research findings that provide information about the current state and trends of our woodlands. This work informs the reports we make internationally. The UK Indicators, based on criteria and indicators developed internationally at a European level, show woodlands' contribution to sustainable development.

The UK Government also facilitated the development of a standard for forest certification – the UK Woodland Assurance Standard (UKWAS). UKWAS was developed in response

to the growing demand from retailers for timber products from sustainably managed forests. In 2000, the entire UK public forest estate managed by the Forestry Commission and the Northern Ireland Forest Service was certified against the Standard. Wood products from state forests are now eligible to carry the Forest Stewardship Council (FSC) logo of sustainable forest management. About 40% of woodlands in the UK have now been certified and 60% of timber production from UK forests is now potentially available to the market as certified.

20 Years of Change

The 1980s and 1990s saw huge changes to forestry policies, the regulation of new forestry planting, the incentives to encourage forest creation and sustainable forest management, and forestry standards. These changes led to significant changes in forest management and practice, particularly in efforts to convert single purpose timber plantations into more diverse ecosystems capable of delivering a wide range of services. By the end of the 1990s, forestry's role as an agent for sustainable development had become well established.

Following political devolution in the UK in 1999, responsibility for forestry was devolved to a new Parliament in Scotland and a National Assembly in Wales (forestry had much earlier been devolved to Northern Ireland). The new administrations have published forestry strategies setting out the policies and programmes for forestry in each country of the United Kingdom (England, 1998; Scotland, 2000; Wales, 2001; Northern Ireland, 2002).

In 2001, the forestry industries in the UK, from nurseries to wood processors and importers, agreed to work together to produce a sustainability strategy for the forestry sector. Through the Forest Industries Development Council (the umbrella body for the industry in the UK), the industry engaged environmental and social stakeholder organisations in this process and published a draft strategy, including targets for progress on all significant aims and impacts, at the World Summit on Sustainable Development in Johannesburg in September 2002.

In February 2003, the UK Government published *Sustainable Forestry in the UK: The UK's National Forest Programme,* drawing together the forestry strategies for England, Scotland, Wales and Northern Ireland and the UK Forestry Standard. The Programme provides the framework for policy and practice on sustainable forest management in the UK.

Why the Planted Forests are Valuable – The Benefits

UK Forest Resources

Unlike many other parts of the world where forests have been planted, the UK has no remaining natural forests and less than one-quarter of woodland is semi-natural (native woodland which is not obviously planted). The remainder – some 75% of the UK forest resources – are planted. The focus of this paper is on the forests that were planted in the 20th century. In a densely populated, industrialised country, with only a small forest area,

these planted forests have to satisfy a multiplicity of purposes. Many are now highly valued by a wide range of interests. They have become more diverse as they have matured. They are no longer seen simply as places to produce timber and, in many areas, this is no longer their primary function.

In many parts of the UK, particularly in the heavily-populated south of England, the planted forests are widely used for outdoor recreation. There are often few other available alternatives. In a recent survey of countryside use, some 350 million visits a year were made to forests – larger even than visits to the coast (UK Day Visits Survey 1998). As far as much of the public is concerned, the planted forests are spaces for consumption of services rather than places of primary production. We now recognise the importance of our planted forests – and the wood coming from them – as a sustainable, natural and renewable resource, able to provide multiple and diverse services as well as products.

Wood production from the maturing planted forests is currently around 10 million cubic metres a year and continuing to rise (Forestry Statistics, 2002). This is set to increase to 17 million cubic metres a year by 2020. Even so, we produce only about 15% of our wood needs domestically. The UK is a major importer of wood and wood products, with imports of around £8 billion each year. As a consequence, the UK's impact on the way forests are managed in other countries – our 'forestry footprint' – is significant. Prices in the UK are set by imports in a free world market and recent trends have been markedly down. The profitability of forestry in the UK is now so low as to raise issues about the value of planted forests for solely commercial purposes. This situation is unlikely to improve for UK growers as future increases in demand for wood are predicted to be met by increasing supplies from forest plantations around the world (FAO, 2001). Cost effective management is more important than ever.

Environmental and Social Benefits

Over the last 20 years, there has been a broadening in the objectives for which we manage our forests. The uniformity of the new plantations was much criticised in the past. Lacking age or species diversity, they were often considered to be intrusive in the landscape, unattractive to visit, and poor habitats for wildlife. The new forests have become more mature and positive actions have been taken through forest management planning to diversify the tree species and age structure. The planted forests are now seen as important in their own right. Research indicates that the public is not as ambivalent about the new forests as we had thought. Once the trees are grown and the woods have developed structural diversity, the public makes little distinction between planted and semi-natural woods – but is quite sophisticated and values woodlands for a diversity of reasons.

There has been a steady and increasing demand for outdoor recreation in forests. With the growth of car ownership, leisure time and personal incomes, the forests have become more valuable as recreational resources. The main demand has been for access for walking, but is becoming more diverse. Today a wide range of traditional and new outdoor activities take advantage of the forests, for example orienteering, car rallying,

cross-country cycling, fishing, wildlife observation, riding and trekking. Recent surveys show some 300-400 million visits a year to forests in Great Britain (Forestry Statistics 2001). They have potential to link to local businesses and add economic value, particularly in rural areas.

Over time, the new forests have also become a part of the land use pattern and not seen as a new intrusion. While many of the planted forests will never reflect the full diversity of natural forests, they are increasingly recognised for their biodiversity potential. Some are now recognised as priority habitats under the UK Biodiversity Action Plan (1994). The potential for further enhancing biodiversity in the planted forests extends beyond simple environmental protection to active management for biodiversity, for example, through increasing open space, improving regeneration, maintaining dead wood, managing remnants of ancient woodland within them, and increasing species diversity.

We are also coming to realise that forests have real benefits for mental health and physical well-being (through accessibility for relaxation and gentle exercise) especially around towns. There are now several examples of health professionals promoting the use of forests to their patients.

Tree planting of all kinds, including planted forests of non-native species, contributes to carbon sequestration. Under the Kyoto Protocol, new woodland planted since 1990 contributes to the UK's carbon dioxide emissions targets. While the amounts are modest, they are nevertheless positive and welcome. We also recognise that protection of existing carbon stores represented by forests is a rather more substantial contribution to the carbon economy and to our obligations under the UN Framework Convention on Climate Change.

There has been growing public appreciation of woods and forests as desirable in themselves. Ownership of woods and forests by individuals and organisations such as charitable trusts and wildlife organisations, for non-commercial purposes, has been increasing in recent years. Along with changes in forest practice and ownership has gone an enormous increase in public involvement in forestry.

Planted Forests – a Versatile Resource

In response to the changing policies for management of the forests, changes to the regulatory environment, changing public perceptions, and changing needs of society, the planted forests have demonstrated that they can be a very versatile resource. They are valued for providing a wide range of economic, social and environmental benefits, and a balance amongst these benefits is critical for sustainable forestry. These benefits may include marketable outputs such as timber and commercial recreation, which can generate employment and income to help sustain rural communities, as well as a range of non-market benefits, such as open-access, non-priced recreation, landscape enhancement, and other environmental and educational benefits.

However, this needs to be focused. While multi-benefit forestry is the right approach for the UK, this does not mean that all forests should produce the same outputs. Clear

objectives of management need to be set. From an economic perspective, under-valuation of the social and environmental benefits impedes the efficient allocation of resources to achieve sustainable forest management. The range of benefits generated by the forestry sector has also increased awareness of the role of forestry in supporting the wider rural economy as part of an integrates approach to rural development.

Valuing the Benefits

The Forestry Commission is currently funding research to estimate values for a range of non-market social and environmental benefits of forestry. The following non-market benefits are being examined: biodiversity, landscape, recreation, carbon sequestration, water quantity and quality, air pollution absorption, and archaeology. Early results show that the values are substantial (University of Newcastle, 2003). We are therefore able to make a strong case for forestry based on economic studies into the value of their environmental services, and also through social research that connects with the consensus of consumerist society. Further analysis of non-market benefits in the future could play an important role in appraising and evaluating forest policies, programmes and projects.

The high value of the social and environmental services (mostly not traded in the market place) and the low profitability of forestry explain in part the relatively large public sector ownership of forest resources in the UK and the recognition of the special roles that public forests can play. The history of forestry in the UK shows that a wide range of arguments, based on providing public benefits, have been used to underpin the case for continued public investment to increase the forest area and to maintain the flow of economic, environmental and social goods and services from the forests.

In providing these public benefits, we face the same dilemma as in many other parts of the world. Timber revenues are no longer sufficient to meet the diversity of demands made on the forests. There is a cost to good landscapes, clean air and water, diverse habitats, unfettered public access and participative management. Costs within the sector are rising as income falls. The case for public support for forestry seems unassailable – but the same is also true for schools, hospitals, roads and a dozen other calls on the public purse. In the same way that we are in competition when we sell our timber, so are we in competition when we seek for public funding. The case has to be made based on good evidence, skillful argument and political acumen. This is a new set of skills needed for the 21st century.

Lessons Learned – Maximising the Benefits

The United Kingdom experience – and the lessons we have learned, particularly in the last 10 years – suggest a number of ways in which the benefits from planted forests can be maximised. Some key issues for the UK have been:

- setting standards for sustainable forestry;
- high quality research;
- forest planning to implement sustainable practices;

- partnerships with stakeholders in the forestry sector and the wider public; and

- a continued process of responding to new demands by adjusting policies and practice.

These are dealt with below:

Standards for Sustainable Forests and Wood Products

Over the last 5 years, the UK has focused attention on achieving well-managed forests through the development and monitoring of sustainable forest standards and management. As noted in the previous section, the UK Government published a UK Forestry Standard in 1998. The Standard brings together in one document the criteria and standards for sustainable management for forests in the UK. It is based on international principles and practical forest management issues related to major components of the forest ecosystem and human resources.

A practical approach was taken deliberately in order to build on guidance that was already familiar to UK forest managers. The Standard provides a description of the legal and environmental context in which forest management decisions need to be taken and describes the practices appropriate to a variety of operations and management systems. It is linked to a range of supporting publications which provide more detailed advice. The forestry practices set out in the Standard are delivered through a range of regulatory and incentive mechanisms, including grant aid for forestry planting and management, statutory regulation of tree felling and environmental impact assessment.

The success in obtaining recognition of the UK Forestry Standard by all the main stakeholder interests encouraged their representatives to work together towards the production of a voluntary standard for forest certification. Partners worked on an independent standard and, after huge effort in various pan-sectoral working groups, were able to publish the UK Woodland Assurance Standard (UKWAS) in 1999. Foresters had to acknowledge that they did not know everything about forest management and that others had a legitimate view. Environmental groups had to temper their ideals with practicality.

Recent research into the impact of certification has shown that certification has improved forest management and operational practices in the UK. Woodland managers have benefited from an external review of their management proposals and subsequent operational decisions, in particular in areas such as biodiversity management, restoration of ancient woodland and reduction in the use of chemicals. There has been justifiable complaint that bureaucracy has increased, and work is underway to match requirements for documentation to the scale and sensitivity of the site and the impact of the proposed management activities. From a regulatory point of view, certification can provide Government with assurances that agreed standards are being met in the forest.

While some retail markets and overseas markets demand certified supply, demand from the buying public remains weak. A challenge for wood promotion programmes espousing sustainable forest management is to increase the profile of legal and sustainably produced

timber in purchasing decisions such as housing. The UK Government has taken a leading role by adopting a policy of purchasing wood products that derive from legal and sustainably managed sources. There is concern in the industry that unless evidence of sustainable production can be communicated easily and at low cost to producers, wood will be disadvantaged against other materials (such as concrete and plastic) which are not subject to a similar scrutiny of environmental and social impact.

At the outset, there was scepticism in the UK about the possibility of producing a practical forestry standard, and even more about independent forest certification. A key lesson learned has been that the effort required to agree the UK Forestry Standard, and subsequently the UK Woodland Assurance Standard, has been rewarded by much clearer mutual understanding of policy and strategy among all stakeholders and has led to changes in sustainable management practices. This required perseverance and an inclusive approach.

Research

From the outset of the post-war expansion in forestry, the UK Government played a leading role in supporting forestry research. The shift in emphasis over the last 20 years from commercial production of wood to the provision of environmental and social services has required increasingly innovative management and, in turn, investment in research and knowledge transfer. While research programmes in silvicultural management and wood production have been maintained, there has been a shift of emphasis on the role that forests play in sustaining our quality of life.

The Forestry Commission's research agency (Forest Research) has had an important role in providing the core of long-term research. It is the source of much of the scientific advice on which the Forestry Commission – as a Department of Government – depends. The Forestry Commission has published a Research Strategy (Forestry Commission 2001) which sets out the strategic programme of research. Implementation of the Strategy is intended to secure the research and development capability, based on scientific and technical excellence, that is needed to support the efficient and sustainable practice of forestry in the UK.

As noted previously, the early research focussed on increasing yields and reducing the costs of timber production. Today, sustainability is the key driver. The emphasis on forestry research has been changed – and will continue to change. For innovation in attitude and practice to succeed in improving sustainability of UK woodlands, forest researchers in all areas must maintain and improve contacts with managers, owners and regulators. As a result of a recent review, we are taking steps to improve the arrangements for commissioning research through greater engagement with stakeholders. An increase in emphasis in our research programmes is now being put on effective knowledge transfer by demonstration and on-site advice.

Table 1:   Research Priorities

Following a number of strategic reviews of forestry research, the following research priorities were identified in the Research Strategy:	
• Evaluation and improvement of standards.	• Understanding the role of forestry in rural development.
• Finding routes to social inclusion and participation.	• How to design and manage woodlands for recreation.
• Understanding the values that society places on woodland.	• Valuation of social and environmental benefits.
• Understanding the impact of trees on soil and water resources.	• Understanding the impacts of environment change.
• Maintenance of biodiversity in managed forests.	• Protection against exotic pests.
• Utilisation of contaminated land for forestry.	• Reduction in pesticide use and development of novel methods of pest and weed control.
• Market development for wood products.	• Assessment and improvement of timber quality.
• Developing alternative silvicultural systems.	• Landscape ecology.
• Restoration of native woodland.	• Development of new and improved wood products.

The development of forestry in the UK has been an exercise in innovation led by good quality applied research. Throughout this period, the research and development programmes have been continuously adapted to reflect changing policy priorities. A key to success is the translation of the results of research into new policies and practices.

Forest Planning

In the 1970s, forest design planning – initially focused on the visual landscape – became a part of standard training for forest managers. Today, landscape design planning for state forests has been replaced by a much broader and sophisticated forest planning process, incorporating all aspects of forest management: economic, environmental and social. The aim is to create attractive and productive forests, which blend with the landscape, are rich in wildlife and are efficient to manage. How this balance is achieved and what is appropriate in individual circumstances depends on local conditions and priorities.

Within the UK, forest planning is the process which has been developed to ensure that plans for change to the structure of existing woods, or the creation of new ones, will meet the UK's requirements for sustainable forest management. The process takes into account the physical, biological, human and cultural resources described in the UK Forestry Standard. This planning process within the state forestry service has been strengthened in recent years. New planning procedures, supported by geographical information systems, help to integrate management, resource values and development. There is an integrated approach linking regional strategic plans, landscape scale forest design plans and activity based operational plans. A guide to good practice for Forest Design Planning in the UK has been published (Forestry Commission 1998).

The early development of forest plans was partly in response to public concerns about the appearance of new planting in the 1970s. Managers quickly began to incorporate social and environmental aspects in the plans and used them to explain their management intentions to local people, local government and to special interest groups. Not surprisingly, local people were not only interested, but had valuable knowledge and experience to contribute. Panels of local people were set up to advise the managers of the state forests on developing the plans.

Today, the forest plans are the strategic heart of business planning in the state forests managed by the Forestry Commission, driving both forest management programmes and financial planning. Subject to regular review, extensive consultation processes are in place with a wide range of stakeholders. Formal participatory techniques are used, with computerised mapping and visualisation, surveys and meetings to gather outside opinion. Many of the forest districts depend on partnership programmes for a large part of their income. For example in the Lake District in England, a popular tourist destination and a National Park, almost 40% of the district's income comes from partners in recreation and environment projects. The forest plans are a means of engaging with partners and building their needs into sustainable forest management. Larger private sector forest owners have been encouraged (through grants, advice and research) to develop their own forestry planning systems.

Good forest design planning allows forest managers to maximise the benefits from planted forests. The planning process is all the more critical because the consequences of actions may be a long way in the future. Plans need to allow for flexibility. Actions taken today will affect the options open to future generations. Forest planning can provide the framework for managing change.

Partnerships

The development of forestry in the UK has been founded on partnerships of interest. From the early days, the Forestry Commission worked closely with private landowners to achieve the ambitious programmes of forest expansion. The need to include a wider range of stakeholders in the development of policy and the management of forests in the UK has resulted in new partnerships being created to deliver sustainable forest management.

From the very start the Commission understood that there was little point to the new forests without a processing industry to take their products. The new forestry was to be taken forward through the closest collaboration between the Forestry Commission, private landowners and wood processors. An important milestone in the 1980s, when volume production from the new planted forests really started to take off, was an initiative to encourage major capital investment in sawmilling, paper and board production. Over £1 billion was invested in new capacity in the space of 7-8 years. This could not have happened had the Forestry Commission not been able to guarantee secure supplies of timber (delivered at open market prices) to the new processing plants. The UK's ownership structure, with relatively concentrated ownership of planted forests, has

been an important commercial advantage, partly offsetting the small overall size of the forestry sector.

The professional forestry sector in the UK is quite small and, over time, a culture of consensus has been developed, where progress is made through dialogue between stakeholders. In the early years we defined stakeholders very narrowly – today we are much more inclusive, but the underlying tradition of informal dialogue remains and still stands us in good stead. It enables good ideas to come forward from across the whole forestry sector, and bad ideas to be recognised at an early stage. It also allows us to draw on accumulated wisdom and a broad spectrum of experience.

A very recent example is the setting up of a UK Forest Partnership for Action. This Partnership was developed as a result of meetings held in the run up to the World Summit on Sustainable Development (WSSD) in 2002. Our Prime Minister invited a group, co-ordinated by the Forestry Commission, to represent the forestry sector in the UK. Members of the Partnership include the forest and wood processing industries, Government departments, devolved government administrations and environmental organisations. The Partnership's aim is to promote sustainable development in the forestry sector, both at home and internationally. The Partnership is the main platform at UK level for taking forward our WSSD commitments on forestry. The partners have agreed priority areas for action on forest certification, illegal logging, timber procurement, and forest restoration and protection.

Another recent example is an international partnership on Forest Landscape Restoration between the UK Government (through the Forestry Commission), IUCN (the World Conservation Union), and WWF (the conservation organisation). Forest landscape restoration is an important component of implementation of the work programmes of the UN Forum on Forests, the UN Convention on Biological Diversity, and the Plan of Implementation on forests of the World Summit on Sustainable Development. The partnership aims to establish a network of organisations, governments and people working on forest landscape restoration around the world, with partners coming together to learn from each other and to identify, undertake and support restoration activities. The UK will be providing support, drawing on the 80 years' of experience of forest restoration and the lessons learned.

Partnerships at all levels – from international, to national, regional and local levels – have been developed across the forestry sector in the UK in recent years. The UK Government actively supported the development of sectoral partnerships between Government, businesses and non-governmental organisations in the run up to the World Summit and beyond. This recognises that Governments cannot deliver alone all of the actions needed to deliver sustainable development. Partnerships between the public, private and corporate sectors, and more recently, with the voluntary sector have been a key to the success of many forestry programmes in the UK. Programmes have usually been successful where partnerships have been strong, and inclusive.

Adjusting Policies

One of the key lessons of UK experience is not to get too hung up on definitions of 'forestry'. The Forestry Commission has expertise in managing extensive areas of land and forest. Provided that we are working within the framework of sustainable management then we should be aiming to maximise the benefits – in whatever form is most appropriate – from each of our forests. There is therefore no question that recreation and environment are the most important benefits in public forests close to large centres of population. Or, conversely, that timber production will continue to be the key to the future of many forests in remote rural areas with few alternative sources of employment.

But we need to recognise that priorities can change as perceptions, knowledge and understanding change. For example, it is only quite recently that we have started to employ social science researchers. One of the insights that this has given us is into the links between individual and community identity and sense of place. This has led us to work closely with community development agencies in projects to improve local environments and build local pride and self-esteem. In some cases this has also had direct benefits to local enterprise and forest production.

The key lesson we have learnt is the need to be responsive and flexible. Through being responsive we find that our forests are valued and are relevant to modern society – and that we too are valued and relevant.

Organisational Change and Culture

Throughout all of this change the Forestry Commission has remained the pre-eminent forestry body in the UK. It has not done so without change to its organisational structure but even more importantly to its culture. There is more to be done but in essence the Forestry Commission has:

- become outward looking, embracing international fora and external interests within the UK, and making links between the high level statements on SFM and our people on the ground who have to achieve the practical expression;

- moved away from being a hierarchical organisation suited to rapid expansion of a forest estate focussing on creation of strategic timber supplies, to an organisation where decisions are taken closer to the forest unit involving inputs of a wide range of stakeholders;

- made links with other policy areas recognising that the definition of a well functioning forest goes beyond the physical borders of the forest unit into its contribution to a well functioning physical, biological and sound landscape.

This has been achieved by focussing on our people (recruitment, training and development) to achieve the right organisation to support the changing needs of our changing forests.

Concluding Remarks – Planted Forests and Sustainable Development

In the UK, a major new forest resource, based on planted forests, has been created in just 80 years. The development of the new resource has been controversial and not without conflict. Many lessons have been learned along the way. But as the forests have matured, they have become highly valued. In a relatively small country with a large population, the forests are under pressure. Today, we recognise that they can provide a wide variety of services – with products that we need and use in our everyday lives – but also environmental and aesthetic services such as biodiversity, recreation and carbon sequestration.

In UK conditions, we have to take a wide view, and not one based solely on wood production. Even so, the UK imports around 85% of our wood needs, so putting pressure on other countries' forest resources. The world needs wood, and planted forests – properly and responsibly managed to internationally agreed standards – are a very efficient way of producing that wood. Put simply, producing wood from planted forests can take the pressure off more sensitive natural forests that we might want to protect.

We value the forests – and the wood from them – as a sustainable, natural and renewable resource, able to provide multiple and diverse services as well as products. Today, sustainability is the key driver of change. Balancing the demands on the forests for economic, environmental and social services is complex and requires co-operation at all levels, and scientific underpinning.

The forest sector, in UK conditions, suffers from low profitability. The case for state support forestry cannot be made on the basis of timber supply alone. But the UK is short of forests, and well managed forests contribute to social, economic and environmental improvements. In the UK, the multifunctional forests of the future will not be the same as the planted forests we established largely for timber production. They will be richer in biodiversity, designed for people, and part of functioning landscapes. But they will also produce timber as an environmentally sound source of construction material, fibre, and renewable energy.

Recent economic studies of the value of the social and environmental benefits shows that they are very substantial indeed. There is strong justification for public support. But there are very many other demands on the public purse. What the forestry sector has to offer – uniquely – is the delivery of a sustainable supply of products and services from the planted forests. The public and the Government increasingly demand assurances that the forests are managed sustainably. The certification of all the state forests in the UK – which are predominantly planted forests – provides an important "seal of approval". There has been a sea change in the way the sector is now viewed in the UK.

Our experience in the UK, and this applies to many other countries, is that we are able to "put something back" for future generations. Unlike most other sectors of activity, we can say with confidence that we will be passing on to future generations a resource – a planted forest resource – that will be of greater value than the one we inherited.

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