What does it take to promote forest plantation development? Incentives for tree-growing in countries of the Pacific rim

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Summary of a regional study on the impact of incentives on forest plantation development, based on country case studies, with recommendations for enhancing the involvement of the private sector.

What does it take to involve the private sector effectively in forest plantation development? Governments and their respective forestry agencies are increasingly asking this question. Although the potential role of forest plantations in the sustainable supply of wood, non-wood forest products and environmental services has been recognized widely, the policy instruments that successfully encourage investments in plantations are not yet well understood.

Historically, public-sector agencies have dominated forest plantation development. This pattern has changed in many countries over the past 10 to 20 years for three main reasons. First, devolution of forest management has led to greater involvement of communities and the private sector in forest management. Second, the performance (financially and biologically) of public-sector plantations – with few exceptions – has been disappointing. Third, shrinking government budgets make it impossible for most forest departments to devote as many resources to forest plantations as they had in the past. Hence, governments are increasingly seeking the involvement of communities and the private sector in plantation development, and are using a variety of direct and indirect incentives to stimulate tree growing.

This article summarizes the main findings of a study commissioned by the Asia-Pacific Forestry Commission (APFC) to assess the impact of incentives on forest plantation development. It was based predominantly on country case studies prepared in 2002.[1] Although Asia and the Pacific leads the world in plantation area (Table 1), this is the first comprehensive study of this kind in the region. The study focused on policy instruments and mechanisms directed at achieving financial goals (i.e. returns to investors), while recognizing that forest plantations can also be established to meet society's environmental objectives. The discussion here covers Australia, China, India, Indonesia, Malaysia (Sabah), New Zealand, the Philippines and Thailand, as well as the United States. The article concludes with some recommendations for enhancing the involvement of the private sector in plantation development.

TABLE 1. **Top ten countries in forest plantation area, 2000**

Country	Forest plantation area *('000 ha)*	% of world total
China	45 083	24
India	32 578	17
Russian Federation	17 340	9
United States	16 238	9
Japan	10 682	6
Indonesia	9 871	5
Brazil	4 982	3
Thailand	4 920	3
Ukraine	4 425	2
Islamic Republic of Iran	2 284	1

Source: FAO, 2001.

INVESTING IN FOREST PLANTATIONS

Several characteristics of plantation investments strongly influence investors' decision-making relative to alternative investment options. The most obvious is the long-term nature of tree growing. A very high proportion of expenditures occurs early on, and most of the revenues come

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only at the end of a rotation. This long gestation period adds greatly to the uncertainty and risk of plantation investments. Investors often experience difficulties in withdrawing from the investment before the trees are of harvestable age. In addition, there are inevitable uncertainties about future prices of products and inputs, and especially about the prices and marketability of the final plantation harvest.

Because of progressive income tax systems (in which tax rates escalate with increased income) and the large but periodic returns from a single tree plantation, individual investors can be hit with the highest marginal taxation rate in the year of harvest unless tax relief is provided. The minimum commercially viable investment in a plantation is also likely to be large relative to an investment in agriculture on the same land.

These drawbacks give ample cause for investors to shy away from the plantation sector, despite the apparent advantages of investing in plantations such as potential profits, diversification of investment portfolios and ensuring long-term supplies for downstream industries. Thus, there remain regular calls for assistance in the form of incentives.

THE CONCEPT OF INCENTIVES

There is no single agreed definition for incentives (Meijerink, 1997), which is a source of much confusion. Many people equate incentives with subsidies, and the use of the latter value-laden term then clouds subsequent discussions. In the regional study described in this article, incentives were defined as "payments or services that increase the comparative advantage of forest plantations and thus stimulate investments in plantation establishment and management". They include a wide range of interventions from free seedlings to the provision of political and macro-economic stability (Table 2). Under this definition, incentives include any means that provides encouragement to "do business" (i.e. establish plantations). Incentives are thus much broader in concept than subsidies, which more directly reduce the costs or raise the returns of an activity.

Incentives include research and extension, which are important elements in supporting forest plantation development, and sectoral and macro-economic policies which, as argued below, create much of the general investment climate and heavily influence the economic behaviour of individuals and corporations. As this article elaborates, there has been a gradual evolution in the way that governments have provided encouragement, with increasing recognition that provision of enabling incentives or an overarching "climate of enterprise" is the most effective (and economically efficient) incentive in the long term.

JUSTIFICATION FOR PROVIDING INCENTIVES

What is the rationale for providing incentives to potential investors in forest plantation development? Why should taxpayers be interested in supporting the economic activities of others? After all, if potential investors are dissatisfied with the low returns from plantations, why not just leave them to invest in more profitable land uses or alternative ventures?

Meijerink (1997) argues that incentives should only be applied for public goods. Where plantations provide environmental services such as soil or watershed protection, prevention of land degradation or carbon sequestration, incentives are appropriate because private net returns are often lower than overall social returns.

TABLE 2. **Types of incentives**

Direct incentives	Indirect incentives		
	Variable incentives		Enabling incentives
	Sectoral	Macro-economic	
Seedlings	Input and output prices	Exchange rates	Land tenure and resource security
Specific provision of local infrastructure to support plantations	Trade restrictions (e.g. tariffs)	Interest rate policies	Socio-economic conditions
Grants		Fiscal and monetary measures (e.g. income taxes)	Accessibility and availability of basic infrastructure (ports, roads, electricity, etc.)
Tax concessions			Producer support services
Differential fees			Market development
Subsidized loans			Credit facilities
Cost-sharing arrangements			Political and macro-economic stability
			National security
			Research and extension

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Australia – a country where plantation development is often considered to be successful – has low rural population pressure and available land for growing trees (pine plantations, Queensland)

Other important justifications for providing incentives may include the goals of generating employment (particularly in less developed rural areas), jump-starting forest industries in countries with competitive advantages (e.g. better growing conditions) such as Indonesia and Chile (Williams, 2001), ensuring reliable supplies of strategic timber resources, and alleviating rural poverty.

Incentives may be particularly justified to increase the pace of plantation development where a developing industry requires a minimum supply of raw material (Scherr and Current, 1999). A rapid increase in scale is especially critical in commodity industries such as pulp and paper, where economies of scale are essential for competitive operation (Clapp, 1995).

Incentives are not needed when the private returns from plantation management exceed those from other land uses (Haltia and Keipi, 1997; Williams, 2001). In this case, incentives represent a misallocation of public-sector resources, merely enabling investors to earn higher returns.

PLANTATION DEVELOPMENT IN THE STUDY COUNTRIES

The impact of incentives on plantation development differs from country to country, even where situations seem similar. The study countries in which plantation development is often considered to be successful (e.g. Australia, New Zealand and the United States) are economically developed countries where the overall importance of agricultural production in the economy has declined, agricultural intensities and productivity are high, population pressures are low and most people reside in urban areas. As a result more land, especially in marginal agricultural areas, is available for growing trees.

In all the study countries, forested areas have been, and in some countries (e.g. Indonesia and Malaysia) still are, viewed as a considerable land reserve for agriculture and industrial development. In the past, forest conversion rates were high in all countries while populations expanded and for as long as agriculture contributed considerably to national development. At the same time, forests were viewed, explicitly or implicitly, as standing capital to be liquidated to fuel economic development. As long as natural forests were extensive, there was no apparent reason to plant trees. In fact, forests were – and in some countries still are – viewed as barriers to development, their environmental and other values going largely unrecognized.

Over recent decades, this view has slowly changed. The widening gap between demand and domestic supply (the fear of a timber famine) stimulated significant activities in the plantation sector in Australia, New Zealand and the United States as early as the 1920s. In many of the study countries the plantation area has grown considerably, and there has been a pronounced shift from public- to private-sector involvement. Does this mean that the conditions for plantation development have become more encouraging – or that governments have begun offering a more appealing mix of incentives to turn an inherently risky investment into a lucrative venture?

USE OF INCENTIVES IN ASIA AND THE PACIFIC

A variety of incentives have been used throughout the Asia and the Pacific region. Comparisons among the study countries are necessarily broad, since even schemes that are generically similar differ in detail. However, a broad evolutionary hierarchy can be perceived in the types of incentives offered at different stages of plantation development.

In all the countries covered by the study (except the United States), forest plantation development on a significant scale was initiated by the State, which sup-

TABLE 3. **Plantation development and incentives in the study countries (reported examples)**

Country	State planting	Low-cost seedlings	Land grants	Nursery subsidies	Survival incentives	Grants to growers	Concessionary loans	Tax concessions	Joint venture arrangements	Research and extension	Resource security	Focus on enabling incentives and removal of structural constraints
Australia	X						X	X	X	X	X	High
China	X	X	X			X	X			X	X	Medium
India	X	X	X	X	X	X	X		X	X		Low
Indonesia	X					X	X	X		X		Low
Malaysia	X							X		X		Medium
New Zealand	X	X	X			X	X	X	X	X	X	High
Philippines	X		X				X	X		X		Low
Thailand	X	X				X	X			X		Low
United States	X	X	X			X		X	X	X	X	High

ports the argument that an initial critical mass is necessary to ensure private-sector involvement in plantation development. Once private-sector involvement is sought more directly, the use of incentives appears to progress gradually from provision of free inputs, to grants and loans, to tax concessions, to joint venture arrangements and finally to a focus on creating an enabling environment and removing structural impediments (Table 3).

Early government efforts to engage the private sector in tree planting have tended to focus on the provision of physical incentives. In New Zealand and the United States, one of the earliest incentives was land grants, which encouraged settlement and, under certain conditions, tree planting. More recently, China has provided significant land allocations to farmers for tree growing. The provision of free-of-charge seedlings and fertilizer have also been common physical incentives. Such free inputs are appealing because they are straightforward and less intimidating – especially to small-scale investors – than more bureaucratic incentives such as grants and subsidized loans, which may require complicated forms and paperwork. However, free physical inputs often do not stimulate planting as effectively as cash grants, because most grants are financially more attractive and provide more flexibility than often-bulky physical inputs.

Cash grants and concessionary loans have proved popular at various times in most of the study countries. These instruments have engendered significant planting in China, while in Thailand the effectiveness of grants was mixed, mainly because they were not sufficiently attractive. In a number of the study countries, these more direct financial incentives have been followed by a more complex approach, namely the offering of tax concessions for plantations. Tax breaks – which have been notably successful in Australia, New Zealand and the United States – can be especially effective in helping to bridge the long gap between the initial plantation investment and later harvest revenues.

More recently, several countries that earlier focused mainly on physical incentives have shifted to an emphasis on enabling incentives, i.e. removing structural constraints and creating an attractive environment for plantation investment.

DIRECT INCENTIVES – WHAT CAN THEY ACHIEVE?

Assessing the impact of direct incentives in isolation from indirect and enabling incentives is very difficult, and the results can be misleading. In an environment characterized by strong disincentives (e.g. complex requirements for obtaining permits for cutting, transporting and processing wood, low timber prices, inconsistent policies, high fire risks, high land prices, high interest rates, uncertain marketing opportunities), direct incentives may have only marginal effects. In the worst cases, they may even lead to misallocation of funds, trigger investments in plantations that are ultimately not viable, or have long-term negative impacts on interest in growing trees.

Owing to a lack of monitoring, it is difficult to determine the extent to which direct incentives have accelerated planting relative to other factors. In some locations, extensive areas have been planted without direct support, which suggests that funds have sometimes been spent inefficiently or unnecessarily.

On the other hand, when the general investment climate is favourable and

demand for wood increases, direct incentives can definitely increase the speed with which the private sector is drawn to forest plantations. The most effective direct incentives include tax concessions and favourable capital gains treatment. Loan and grant schemes have achieved mixed results – some being more generous than others – and have favoured predominantly large-scale investors.

There are five caveats to this general assessment:

- Direct incentives are difficult and costly to administer, and with their high transaction costs it is questionable whether they are an efficient tool, particularly for attracting small-scale investors.
- Tax concessions can only work if investors actually pay taxes. This is especially significant in some countries where paying taxes is sometimes seen more as an option than a requirement.
- Direct incentives are easily abused. Free seedlings may be resold, loans may be used for unintended purposes and corruption is virtually impossible to control.
- Direct incentives are frequently flawed if they are designed according to the interests of the provider (usually the government) rather than with the needs of the recipients in mind.
- In some instances, World Trade Organization rules or national policies may preclude the use of certain types of overtly protectionist incentives.

INDIRECT INCENTIVES – OR WHAT DRIVES THE TREES INTO THE GROUND (AND WHAT DOESN'T)

The study results indicate that variable and enabling incentives generally play a much larger role in encouraging investments than direct incentives.

As commercial investments in forest plantation development aim to maximize financial returns, high timber prices have sometimes triggered investments in tree growing. Perhaps the most attractive and tempting recent stimulus for many investors in Asia and the Pacific was the global spike in wood prices in 1993 and 1994, which triggered a planting boom in many countries. Conversely, when wood prices have been low generally, or especially when prices have been kept artificially low, plantation investments have been sluggish. Under such circumstances, investor interest is seriously dampened irrespective of the provision of other incentives. Examples of this phenomenon were observed in New Zealand, where price controls were in place until 1965, and more recently in Indonesia, where policies and practices have maintained the flow of cheap timber from natural forests.

Prices also need to be reasonably predictable and to provide returns to investments comparable to those from similar land uses (e.g. oil-palm, rubber or pastoral farming). In Malaysia, current returns to investment in oil-palm are considerably higher than those for fast-growing trees, which discourages potential investments in forest plantations.

A key factor in obtaining significant levels of investment in plantations has been political, institutional and macroeconomic stability. Although it is difficult to disentangle specific factors from the overall investment environment, it is clear that investments are forthcoming when risks are perceived to be low and governments signal unambiguous support for private-sector involvement in plantation development.

Another crucial factor is tenure security. The decollectivization of land and forest tenure in China, beginning in 1978, provides an excellent example of the importance of respected and protected

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In Malaysia, current returns to investment for fast-growing trees are much lower than for oil-palm, which discourages potential investments in forest plantations (four-year-old* Azadirachta excelsa *plantation, Perlis, Malaysia)

property rights. A principal goal of the reform was to encourage farmers to manage forest resources sustainably and to plant trees. The reform has been neither smooth nor uniform, and forest tenure arrangements often vary even among townships. Consequently, not all collectives have been equally enthusiatic. However, a clear pattern is discernable: where decollectivization has gone furthest there have been significant increases in investments in tree growing (Lu *et al.*, 2002).

Just as clear tenure arrangements have underpinned the success of forest plantation development in Australia, New Zealand, the United States and parts of China, uncertain tenure has constrained investment in Indonesia, Thailand and the Philippines. In extreme cases, tenure and land-use conflicts have resulted in the destruction of plantations and equipment (Kartodihardjo and Supriono, 2000), which is certain to deter investors.

In New Zealand, the development of infrastructure (e.g. roads, railways, modern port facilities, hydro-electric power stations) by government paved the way for large-scale processing initiatives and assured potential planters that the government was serious about developing a viable plantation sector. Similar developments occurred in Australia. These measures were complemented by increased research and extension, which reduced risks, increased yields and effectively lowered the costs of plantation establishment.

In several countries, policies are in place to encourage plantation development, but little is done to translate them into action on the ground. It is critical to follow up supportive policies with strategies and actions that provide a tangible framework to encourage and enable investment. This may include examining incentive structures across all sectors of the economy to ensure a level playing field for investment in forest plantations. The role of the public sector as a forest owner and manager should regularly be reviewed to ensure that public-sector plantations do not compete unfairly with private-sector investments. Public-sector plantations are affected differently by taxes and land prices and often determine log prices and log allocation, as has been the case in Australia. In addition, the rates of return from public-sector plantations may not reflect the market cost of capital.

Removing impediments to plantation development often means reducing or eliminating subsidies in other directly competing sectors of the economy, especially in agriculture. In Thailand, for example, financial support through the Rubber Plantation Aid Fund for the replanting of rubber amounts to approximately US$1 000 per hectare, whereas the Private Reforestation Extension Project offers less than half that amount for timber plantations. If governments are truly committed to augmenting wood supplies, then such substantial differences provide the wrong signal to investors. Other factors may also sour the investment climate for plantations relative to other sectors, for example restriction of markets for plantation products in a discriminatory fashion, or constraints on foreign investments in plantations relative to other sectors.

A key point is that policies need to be consistent over time. Frequent policy changes result in increased risks and provide a climate of insecurity for investors, especially given the inherently long-term nature of plantation investment. In some countries, frequent changes of government have resulted in repeated changes in policies and the erosion of support mechanisms. For example, between 1982 and 2002 Thailand had ten governments, and the new governments rarely followed the paths of their predecessors. The situation has been similar in the Philippines.

While declining production from natural forests has provided a window of opportunity for investments in plantations, environmental concerns – and social concerns – over monoculture forest plantations have also translated into a worry for investors.

Finally, it must be asked whether incentives in any form are justified on social grounds. Forest plantations generate employment, but this benefit may be outweighed by job losses in agriculture at the local level and by the costs of significant restructuring in local economies (Tonts, Campbell and Black, 2001). Where social benefits are insignificant, the private sector, and particularly the processing industry, has an important role in motivating landowners to plant trees. In India, a legal ceiling on landholdings prohibits private companies from establishing large-scale plantations. To overcome this constraint, private companies have offered a number of incentives to smallholders, including technical assistance and buy-back guarantees (Saigal, Arora and Rizvi, 2002). Similar arrangements have been put in place in other countries (e.g. Australia, New Zealand and Thailand), which indicates that private companies may be in a better position than governments to reach small-scale growers through outgrower schemes (Desmond and Race, 2000).

There is broad agreement that high social benefits, coupled with insufficient or even negative private returns, are a rational justification for offering incentives to investors. However, in many cases the social benefits are not obvious, nor is tree-growing inherently unprofitable. Applied economic analysis is rarely used to assess whether a particular level of support is justified. This is not surprising, since broad agreement on how social benefits should be valued is even more elusive. Thus, incentives tend to be offered based on less tangible criteria, including in some cases political manœuvring and favouritism.

CONCLUSIONS AND RECOMMENDATIONS

The roles played by the private and public sectors in forest plantation development have undergone major changes in Asia and the Pacific, although the level of success in attracting private investors to plantations varies considerably. Plantation development can be divided into three stages: initiation, acceleration and maturation. Australia, New Zealand and the United States had reached the maturation stage by the 1990s, but most Asian countries are still in the initiation or early acceleration stage.

Direct incentives are most likely to be important in the initiation stage, to raise awareness and to increase the pace and scale of plantation establishment, especially to build up fibre supplies for a nascent processing sector. These should be replaced by variable incentives and complemented by research and extension during the acceleration stage. If a direct incentive becomes obsolete in the maturation stage, this is a good sign of its success (Williams, 2001).

A favourable investment climate, research, technical assistance and well-established markets often have greater influence than direct incentives such as free seedlings, subsidized credit or cost-sharing of planting expenses. In countries with a long history of providing incentives, it has become evident that incentive systems must be timely, well-targeted and flexible if they are to engage the private sector in forest plantation development successfully.

In countries that have reached the maturation stage, it has been recognized that key measures to maintain private-sector interest in plantation development are related to the reduction of barriers and the removal of structural impediments and operational constraints. Some measures such as providing adequate tenure arrangements are difficult to undertake, but crucial to success. Others such as tax reforms and removing unnecessary regulations and bureaucracy (licensing and permits) are just as important and in many cases easier to realize. While there is no single effective strategy, it is possible to outline some guiding principles that will contribute to achieving a viable forest plantation sector (see Box below).

It is generally agreed that forest plantations can help meet the increasing demand for wood and, at least sometimes, provide public goods and services. It is also generally accepted that appropriate incentives – particularly enabling incentives – can play a key role in stimulating plantation development. However, two considerations need to be taken into account. The first is that the forestry sector is not alone in asking "What does it take to promote development?". The agricultural sector has its own advocates, often backed by generous incentives of their own. Proponents of forestry need to recognize that alternative land uses may offer similar, or even greater, benefits to society. Under such circumstances it may be inappropriate to offer incentives for plantation development, since it may be more economically efficient to invest in alternative land uses.

The second consideration regards the market for wood. Although it is conventionally believed that timber shortages will ensure lucrative markets for wood

Guiding principles for plantation policy

DO

- **provide a stable and coherent forest policy that is supportive of economic activities;**
- **ensure that other (non-forestry) policies are aligned so that plantation investment can occur on a level playing field;**
- **develop strong research and extension support for plantation development;**
- **establish strong industry clusters, including supporting infrastructure, a competent labour force and appropriate practices and technologies;**
- **collect and make readily available objective, high-quality resource information to support policy-making, forecasting, planning and monitoring;**
- **encourage healthy debate and discussion on the merits of particular incentives and reasons for offering them.**

DO NOT

- **promote inequitable land-use policies that favour other sectors (e.g. agriculture) over forest plantations;**
- **persist with export or import controls that hinder the development of efficient wood processing and/or forest plantation establishment;**
- **maintain policies that allow plantation development with detrimental environmental and/or social impacts, causing conflict among private companies, communities and environmental groups;**
- **crowd out private-sector investment in plantations by maintaining great public-sector involvement, and especially do not grant public plantations vast privileges that prevent the private sector from competing;**
- **keep policies and incentives in place longer than necessary, keeping in mind that the most successful incentives are those that can be phased out;**
- **retain disincentives that directly or indirectly reduce returns to investors.**

indefinitely into the future, warnings of the opposite scenario have recently emerged, suggesting a possible timber glut in the future. If such a glut comes about, promoting too many plantations now may result in a rude awakening down the road for investors and those who encouraged them.

A final observation from the studies is that, in a historical context, incentives have largely been applied in an ad hoc manner. As understanding of the mechanisms and conditions related to economic growth and development has improved, it has become apparent that plantation incentives have often been less successful than they might have been, had various disincentives to plantation establishment also been addressed. Just as good physical site preparation is important for enhancing tree growth, so, too, preparing a favourable policy and administrative foundation is crucial for supporting successful plantation development. ◆

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