

**ASIA-PACIFIC FORESTRY:
OUTLOOK AND REALITIES FIVE YEARS SINCE APFSOS**

ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY II

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FOREWORD

The initial Asia-Pacific Forestry Sector Outlook Study (APFSOS) drew together the myriad forestry dimensions to provide a coherent description and analysis of the situation and prospects for forestry in the region. The study resulted in 50 working papers on a variety of forestry themes. The formal aspects of the study culminated in a comprehensive main report, published in November 1998. APFSOS provided an important roadmap for forestry sector development in the Asia-Pacific region to 2010, which is still being used to guide policy makers in the region today. Much of the first APFSOS is now becoming outdated and, since 1998, several changes have taken place within and outside the forestry sector. FAO is now committed to conducting a second APFSOS: “Asia-Pacific Forestry Towards 2020”. The work will focus on existing and emerging issues of importance to forestry in the region. Paths of future developments will also be constructed on the basis of a range of scenarios. This paper provides a retrospective of changes since 1998 in comparison with forecasts made in 1998 and also summarises major developments that were not envisaged at the time. On this basis, areas to be included under the second APFSOS are suggested and lessons are drawn to guide the outlook process.

EXECUTIVE SUMMARY

The face of Asia-Pacific forestry has changed considerably since the first Asia-Pacific Forestry Sector Outlook Study in 1998 (APFSOS). The Asian economic crisis of 1997-98 and the subsequent restructuring and slow down¹ significantly affected forest products trade and markets. A five fold increase in the rate of road construction in the region² has improved access to modern facilities and markets whilst opening isolated areas to associated opportunities and risks. In relation, rural populations in the region have been falling and, with greater urbanisation and increasing wealth, use of woodfuel is also falling. Following the economic crisis, poverty rates in East Asia and the Pacific increased but since 1999 indications are that poverty has declined significantly. South Asian countries were less affected by the crisis and GDP growth has helped reduce poverty rates.

Against this background, natural forest cover in the region fell by an estimated 35 million hectares between 1990 and 2000. In absolute terms, reductions were greatest in Southeast Asia and, above all, in Indonesia and Myanmar. Total forest cover, including planted forests, fell by 10.5 million hectares to 24.5% of regional land area and, in connection, protected forest area in insular Southeast Asia fell by 40% between 1997 and 2000 and in continental Southeast Asia by 6%. In Australasia, forests in protected areas increased by 32%.

Progress with sustainable forest management (SFM) in the region appears to have been slow despite enunciation of supporting policy in many countries. The rate of increase in the area of forest under certification has, nonetheless, exceeded forecasts and 1.7 million hectares are currently under FSC certification alone. A host of factors associated with underdeveloped economies, weak governance, industrial over-capacity and shortages of alternative rural livelihoods have, however, continued to encourage unsustainable forest management and unplanned conversion. In connection, indicators of governance effectiveness have shown worsening trends in the majority of Asia-Pacific countries. In many cases institutional support for SFM may, therefore, be lacking for some time to come.

Hopes that devolution and decentralisation of government would support improved forest management have been tempered by findings that, where local users are excluded from the policy process, governmental control increases whilst centrally borne costs fall. Similarly, community-based forest management (CBFM) has continued to face difficulties due to the reluctance of authorities to transfer forest related rights or an adequate share of benefits. As such, CBFM has usually only thrived under project support with the exception of a small number of countries where systems have become institutionalised. Moves to support livelihoods through improved non-wood forest products management have been similarly hindered and have also suffered where domestication and commercialisation have resulted in loss of local benefits.

With respect to wood production from plantations, the region's expanding plantation area and increasing maturity will heighten the importance of plantation wood as markets for wood-pulp and paper grow and those for less processed products contract. With the bulk of the region's plantations located in China, India, Japan, Indonesia, New Zealand, Australia and Thailand and supplies from natural forests falling, regional forest products markets will become more

¹ Between 1993 and 1997 average annual GDP growth in the Asia-Pacific stood at around 3.7%; between 1998 and 2002 the rate was 2.4%.

² 1993-1996 compared to 1996-1999.

centred on these countries. In other countries, plantations and trees outside forests are likely to play a greater role in supplying local demands. In this respect, it may be that trees outside forests emerge as the chosen form of multiple-use/multiple benefit sustainable forest management, fulfilling environmental, economic and social goals with little outside intervention. In comparison with more widespread sustainable management of natural forest, this will be at some cost to biodiversity and resolute efforts are therefore warranted to protect 'protected areas'.

Overall consumption of the major forest product groups in the region has, in contrast to predictions and despite GDP and population growth, stagnated. Large reductions in consumption of primary products between 1997 and 1998 compounded the situation and, in contrast to predictions, the Asia-Pacific share of global consumption of major forest products³ fell. Consumption of wood-based panels, however, increased marginally and wood pulp and paper and paperboard consumption had risen well above pre-crisis levels by 2002. These changes were accompanied by falling forest product prices whereby aggregate regional export prices for industrial roundwood, sawnwood, wood-based panels and wood pulp fell by 15-30% between 1997 and 1998. Paper and paperboard prices, however, fell less dramatically and maintained a more even trajectory.

Overall, consumption and production of the less processed products, industrial roundwood and sawnwood, were considerably overestimated by previous forecasts. In China, however, industrial roundwood consumption was underestimated and production overestimated as a result of rapid economic growth and harvesting restrictions. Wood-based panel consumption was considerably underestimated for North Asia, reflecting increasing demand in China. In the advanced industrialised economies, Southeast Asia and the Pacific Islands, however, consumption was overestimated. Regional wood pulp consumption was underestimated and consumption of paper and paperboard was marginally overestimated for the industrialised economies and underestimated for the rest of the region. With respect to trade, recorded imports and exports were generally above forecast levels although for sawnwood, increases in exportation following the Asian economic crisis were not foreseen.

Given weak policy implementation in the region and increasing globalisation it is clear that the primary focus of the second Asia-Pacific Forestry Sector Outlook Study should be forest products production and markets and the drivers that influence them. With respect to outputs, the contribution of forestry to economic growth and poverty alleviation and the status and outlook in relation to environmental protection are of key interest given their close interdependence and central position in forestry and development.

³ Industrial Roundwood, Sawnwood, Wood-based panels, Wood pulp and Paper and paperboard.

1 OVERVIEW

1.1 INTERNATIONAL AND REGIONAL DEVELOPMENTS

Momentous changes have taken place in the world and the Asia-Pacific region since publication of the first Asia-Pacific Forestry Sector Outlook Study in 1998. The breaking Asian economic crisis on the eve of publication resulted in substantial and lasting adjustments in the forestry sector, events having signalled the initiation of significant structural changes rather than a simple setback in an otherwise linear trend. The remarkable rise of China as a global economic power and consumer of a wide range of goods has also had a marked influence the regional forestry sector and India's impact also looks set to increase substantially. On a wider scale, globalisation, both economic and cultural, has accelerated and with the passing of the second millennium, heightened awareness of the need for improved international equity has been articulated through the UN Millennium Development Goals. At the same time, security issues and the threat they pose to greater liberalisation of international relations have come to the fore. The September 11th attacks in 2001 underscored global ideological differences and an increase in international dialogue and greater focus on transparency and accountability in international dealings have since been witnessed.

From another angle, the first mass anti-globalisation protest in 1999 demonstrated significant dissatisfaction with the direction of global change. More recently, resistance to US and EU agriculture related trade barriers, which appreciably influence rural development in the region, have slowed WTO negotiations and elevated natural resource issues to the highest political levels. Seemingly unstoppable clearance and degradation of natural forests has also questioned the effectiveness of efforts to promote sustainable forest management whilst concomitant harvest reductions have turned attention towards plantation-grown wood and other sources of fibre. In much of the Asia-Pacific region, transformations in economies, from subsistence based to export led to consumer driven, have placed rapidly changing and often conflicting demands on forests as different groups and arguments vie for ascendancy. The magnitude and rapidity of these changes and increases in the range over which they are experienced has heightened the need for up-to-date regional-level information; information that not only promotes market efficiency and draws attention to the status of economic externalities but underpins the democratic process.

1.2 SHIFTS IN PRIORITIES AND OBJECTIVES

Priorities and objectives in Asia-Pacific forestry have remained essentially unchanged since 1998 although new approaches promising greater returns in the face of altered economic and political circumstances have been developed. In many of the region's developing countries, changes in land-use and policy rearrangements have meant that extra-sectoral effects are increasingly mediating change in the forestry sector (FAO, 2003a). Development of infrastructure and transport links has resulted in further loss of natural forest whilst access to facilities and markets has brought new opportunities, and risks, to rural dwellers. Concurrent efforts to protect ecologically representative forest areas have met with limited success as the attractiveness of land and timber resources has outweighed incentives to retain potential long-term benefits. Under funding and weak monitoring and control have also played a part in this trend and, internationally, efforts have turned towards strengthening forest law enforcement and governance to promote equitable and efficient use of forest resources.

The enunciation of the UN Millennium Development Goals, particularly in relation to eradicating extreme poverty and hunger and improving trading and financial systems, has been of great importance in shaping both national and international forestry related policy. Greater participation of stakeholders, especially at the local level has been an associated and growing theme and many forestry sector workers are predicting that the future of forest management lies in more inclusive approaches. Devolution of land and forest related rights to local levels has been central to these efforts in many countries although results have often fallen short of expectations.

In much of the region, recent experience suggests that priorities may turn towards greater distinction between protection and production roles of forest. Experience has shown that the transition from traditional forest-based livelihood systems to sustainable forest management is far less frequent than to alternative systems in which the role of forest is more limited. At the same time, rural-urban migration rates are increasing and falling agricultural and forest commodity prices have reduced the attractiveness of rural livelihoods. Wider changes from subsistence to market orientation, of which these transitions are a part, are, however, increasingly seen as the primary route to poverty alleviation, revenue generation and environmental protection. Thus, there is growing recognition that long-term forestry benefits may be best realised through rapid socio-economic development, poverty alleviation and improved governance - itself supporting the contribution made by the forestry sector (Persson, 2003). This point of view contends that, in the short- to medium-term, a proportion of forests will be converted to alternative uses that, paradoxically, may be unsustainable. It is, however, generally recognised that more affluent societies can better afford non-commodity forest values than those where weak governance, shortages of alternative livelihood options or developing economies place excessive demands on natural capital (e.g. Lanly, 2003). Adopting this scenario, whilst not negating current efforts, demands greater focus on two distinct long-term priorities: generating benefits from forestry that contribute to mainstream development and preserving that which cannot be recovered, i.e. biodiversity and associated ecosystem function. Integrated multiple-use forestry, satisfying social, economic and environmental goals, is more likely to emerge in the guise of trees outside forest, a system which has already developed in many regional countries with little outside intervention. Cutting across these transitions, a third priority of strengthening forest law enforcement and governance, is central to support efficient functioning of markets and protection of vulnerable resources. These combined themes characterize possibly the most important developing trends in Asia-Pacific forestry.

In South Asia, the situation differs somewhat and development has followed an alternative pattern. Lower rates of economic growth balanced by greater focus on maintaining existing cultural and environmental practices have, in much of the country, taken precedence over more forthright pursuit of industrialisation and urbanisation. In rural India, avoidance and mitigation of poverty, rather than widespread integration into mainstream economies, are being given greater attention with forestry acting to provide safety nets through provision of a wide range of traditional goods and services. In Bhutan, the integral role of forests in socio-economic activity has been promoted in a model of development fuelled by hydropower that captures rather than alters cultural traditions. Similarly, in Nepal, the isolation of many areas has demanded that existing systems be improved rather than new ones implemented and in Sri Lanka development of home gardens is providing one of the most promising avenues for forest related livelihood improvement.

In the industrialised Asia-Pacific economies where comparative advantage associated with industry and institutions is central, many of the more important changes are closely associated with macro-level developments and wider cross-sectoral issues. For example, the greatest concerns to the New Zealand forest industry at present are the strength of the New Zealand Dollar and high shipping rates and their effect on the competitiveness of forest products exports. In Japan, with its pivotal role in Asia-Pacific forest products markets, the ageing population and continued economic sluggishness are having lasting effects on regional trade patterns as imports continue to decline. These circumstances have meant that forestry sector objectives are more related to finding new markets that better serve requirements under altered economic conditions.

The next section outlines economic and demographic changes in the Asia-Pacific region since 1998 as well as changes in the natural environment and developments in policy and governance, both within and outside the forestry sector. Section 3 focuses on forest resources, products and trade in relation to APFSOS forecasts and Section 4 looks at status and trends in forest management related issues in comparison with the situation in 1998. Section 5 summarises lessons learned and puts forward a number of thematic areas as a basis upon which the second Asia-Pacific Forestry Sector Outlook Study can be formed.

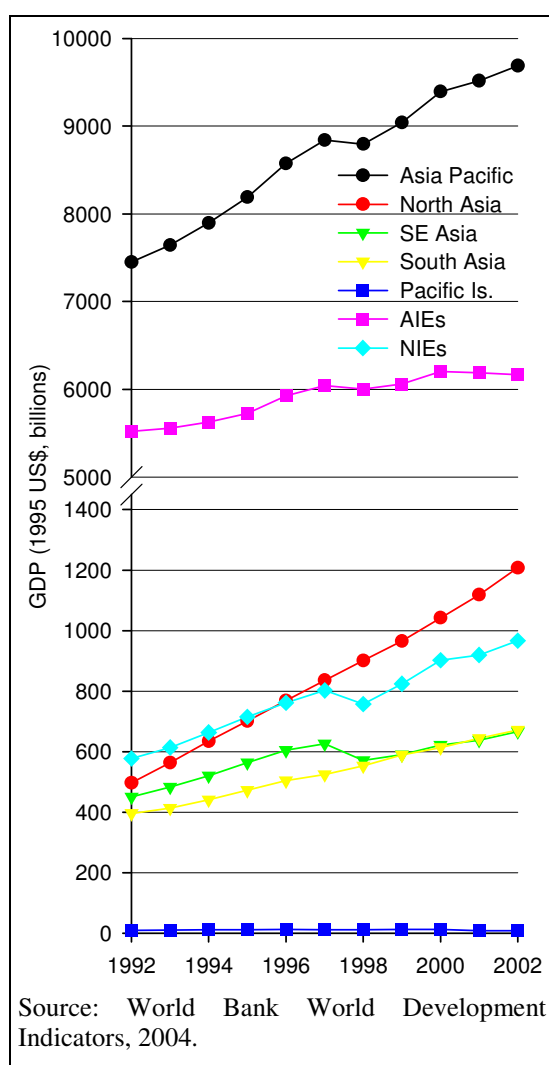
2 CHANGES IN FACTORS AFFECTING FORESTRY

2.1 ECONOMIC CHANGES

2.1.1 Income

Asia-Pacific economies have been rocked by several major events since 1998, the bursting of the 'high-tech bubble' and the September 11th events in 2001, the SARS epidemic in 2003 and preceding these, the Asian economic crisis beginning in mid-1997. Indonesia, Thailand, the Republic of Korea, Malaysia and the Philippines were the most severely affected and, between 1997 and 1998, Asia-Pacific GDP fell by 0.53%. Two years after the crash, the World Bank reported that, in affected economies, recovery had begun (World Bank, 1999). Since then, although other events have taken precedence, the Asia-Pacific share of global GDP, which reached 31% in 1997, stood at only 24% in 2002.

Figure 2-1 Asia-Pacific GDP 1992-2002



As shown in Figure 2-1 North and South Asia were little affected by the crash and although not directly involved, Japan, having its own long-term economic difficulties, suffered most in absolute terms. Subsequently, Japan's dominance in the region weakened further, with GDP share falling from 63% to 58% between 1997 and 2002.

The 2001 economic downturn affected the AIEs⁴ and NIEs⁵ most severely. The Pacific Islands also suffered economic difficulties with GDP falling by 32% between 2000 and 2001 as a result of political instability, poor weather and low commodity prices (Table 2-1). There was, however, some recovery in economic growth in 2002 (ADB, 2003). In South Asia, growth in per capita income has been low in recent years due to the relatively closed nature of constituent economies. In India, however, recent increases in economic growth may signal a long-term change in the economic outlook (ADB, 2003).

Despite recent difficulties, ADB (2003) stated that 'the Asia-Pacific region will remain a bright spot on the world economic map'. For example, China, the region's largest producer and importer of the five major forest product groups⁶, has, in perhaps the most important economic development over the last two years, emerged as a

⁴ Advanced Industrialised Economies: Australia, Japan, New Zealand.

⁵ Newly Industrialised Economies: Republic of Korea, Singapore.

⁶ Industrial Roundwood, Sawntwood, Wood-based Panels, Wood Pulp and Paper and Paperboard.

major growth engine in interregional trade. For economies in East Asia, China has become the largest export market whilst for those in Southeast Asia it has become an important export destination (ADB, 2003). Reflecting China's influence, growth since 1998 has been strongest in North Asia with Newly Industrialised Economies, and the Republic of Korea in particular, also recording rapid expansion (Table 2-1).

Table 2-1 Asia-Pacific GDP and APFSOS GDP forecasts by sub-region

	GDP (billions, 1995 US\$)			Average annual change (%)		GDP forecast as % of actual 2000 figure ¹	
	1994	1998	2002	1994-1998	1998-2002	Business as usual	Downturn scenario
AIEs	5,626	6,002	6,167	1.6	0.7	100.7	99.8
NIEs	663	757	967	3.4	6.3	97.0	94.0
North Asia	635	901	1,208	9.2	7.6	101.4	97.5
Southeast Asia	520	571	666	2.4	3.9	101.6	100.3
South Asia	441	553	672	5.8	5.0	100.0	99.1
Pacific Islands	11	11	8	0.5	-8.3	102.2	101.9
Asia-Pacific	7,896	8,795	9,688	2.7	2.4	100.4	99.1
World	29,855	35,090	40,810	5.5	5.2		
Asia-Pacific share (%)	26.4	25.1	23.7				

Source: World Bank World Development Indicators, 2004.

1 – Figures derived by comparing actual GDP for individual Asia-Pacific countries in 2000 with projections.

With respect to APFSOS forecasts, figures in the right-hand columns of Table 2-1 show that GDP estimates calculated for 2000 from the 1994 baseline were close to actual figures for the Asia-Pacific sub-regions. The fact that estimates for the business as usual scenario were closer than those used for the downturn scenario reflects higher than expected growth prior to the crisis. These figures, however, belie the complexity of the restructuring that has taken place in Asia-Pacific economies and forest products markets during the last five years (Section 3.2).

2.1.2 Poverty⁷

With respect to poverty, in East Asia and the Pacific⁸, strong economic growth over the past few years has lowered poverty rates faster than anywhere else in the world. Poverty declined rapidly in the 1990s, especially in China, although growth in China's poorer and more rural western provinces was much slower than in the east. The divergence reflects slow growth in rural incomes resulting from reduced off-farm employment and, until recent reversals, declining agricultural product prices. Elsewhere in East Asia and the Pacific, poverty increased after the 1997–98 economic crisis, especially in some Pacific Island countries where poverty is still on the rise⁹. In Indonesia, where political and social unrest followed the crisis, the government responded by strengthening safety nets but poverty nonetheless increased to almost one-and-a-half times its pre-crisis level. Since early 1999 indications are, however, that poverty has declined significantly with falling rice prices and recovery in wages.

⁷ This section is summarised from the World Bank reports given at: <http://www.developmentgoals.org>.

⁸ Cambodia, China, East Timor, Fiji, Indonesia, Kiribati, R. Korea, Lao PDR, Malaysia, Marshall Islands, Fed. States of Micronesia, Mongolia, Myanmar, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Tonga, Thailand, Vanuatu and Viet Nam.

⁹ http://www.unescap.org/pdd/publications/bulletin03-04/bulletin03-04_ch3.pdf.

Deindustrialisation and lack of foreign direct investment are, however, clouding prospects for rapid future gains against poverty.

In South Asia¹⁰, rapid GDP growth, averaging 5.5% per year, has helped reduce poverty substantially since 1990 with India lowering its poverty rate by 5-10% and most other countries, except Pakistan, registering a significant reduction over the period. Child mortality has also fallen significantly, especially in Bangladesh and enrolment in education has increased. At the same time, child malnutrition and gender balance in education pose challenges and while sustained growth will be necessary for poverty reduction, institutional improvements will be essential to achieve other millennium development goals.

2.2 DEMOGRAPHIC CHANGES

As levels of socio-economic development in the region have increased and less industrialised countries have moved away from subsistence-based economic systems, rates of rural to urban migration have accelerated. Table 2-2 shows that population growth rates in all Asia-Pacific sub regions have been falling for a number of years. In the AIEs, NIEs and North Asia, despite continuing population growth, rural populations have been shrinking at an accelerating rate as urbanisation and rural to urban migration continue. In the remaining regions although rural populations are still growing, they have been doing so at lower rates since 1998. In absolute terms, rural populations in China and Indonesia are decreasing whereas in India, Bangladesh and Pakistan they are still increasing, these five countries accounting for 87% of the region's rural population.

Overall, figures in Table 2-2 demonstrate that, notwithstanding recent reversals in agricultural commodity prices, rural livelihoods are becoming less attractive and although there are calls for greater rural development support, actions taken are unlikely to reverse these trends. The long-term effects of rural depopulation on forestry are dependent on a number of factors and although regrowth and expansion of forests may occur as people leave the land, low rural incomes and inappropriate land-tenure systems and policy environments may motivate depletion of remaining resources.

Table 2-2 Total and rural populations in Asia-Pacific sub regions

	Population 2002 (000s)	Average annual change (%)		Rural population 2002 (000s) ¹	Average annual change (%)	
		1994-1998	1998-2002		1994-1998	1998-2002
AIEs	150,595	0.4	0.3	28,810 (19%)	-0.6	-0.8
NIEs	58,577	1.3	0.8	8,112 (14%)	-2.6	-2.8
North Asia	1,305,943	1.0	0.8	808,878 (62%)	-0.2	-0.7
Southeast Asia	525,366	1.6	1.5	321,820 (61%)	0.4	0.2
South Asia	1,373,093	1.8	1.7	986,650 (72%)	1.5	1.4
Pacific Islands	7,438	2.3	2.2	5,634 (76%)	1.9	1.8
Asia-Pacific	3,421,012	1.4	1.2	2,159,905 (63%)	0.6	0.4

Source: World Bank World Development Indicators, 2004.

1 – Figures in brackets show rural proportion of total population.

¹⁰ Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka.

In the aftermath of the Asian-economic crisis reports of reversals in rural-urban migration patterns were made although little quantitative information on the size of movements or their effects on forestry is available. In Indonesia, however, there was considerable movement as macro-economic reforms led to abolishment of subsidies on staples and fuel and urban job losses forced people to return to the provinces. Furthermore, movement to rural areas was encouraged by 70% reductions in transport costs and provision of rural credit schemes. In Malaysia, a different course of action was taken and migrant workers were redeployed from construction, manufacturing and services to rubber and palm plantations (Bernhard von der Heyde, pers. comm.; Asian Migrant Yearbook, 1998). The significance of shifts at the regional level are difficult to comment on given this diversity of effects. It seems doubtful, however, that these shifts would have been permanent and urban workers are likely to have returned as soon as conditions allowed.

With respect to age structure, a significant trend likely to affect forest products trade in the region is Japan's aging population. Between 1992 and 2002 the population aged 65 and over increased by 3.6% per year, whilst the working population, aged between 15 and 64, decreased at -0.1% per year¹¹. This, in association with low economic growth, is likely to have continuing effects on forest product imports for housing and furniture, etc., due to the aggregate reduction in purchasing power of the population and reduced investment (Joseph Roos, USDA Forest Service, pers. comm.). Differentials in population structure similar to those in Japan are also evident in China, the Republic of Korea and Singapore, amongst others.

2.3 CHANGES IN GOVERNANCE

2.3.1 Governance indicators

With increasing focus on the role of governance in attaining forestry related objectives, as discussed in Section 2.3.3, changes in World Bank Aggregate Governance Indicators¹² between 1998 and 2002 were assessed to provide an indication of the extent to which forestry is likely to be supported by wider national developments¹³. Comparisons between 1998 and 2002 showed that in over half of the Asia-Pacific countries for which information is available, governance worsened with respect to all indicators except government effectiveness and rule of law (see Table 3-1). In particular, political stability and control of corruption worsened in the majority of countries. There is, however, a great range of movement amongst countries. In Lao PDR, for example, five of the six indicators indicate worsening governance with political instability and corruption coming to the fore. In contrast, governance in Samoa and the Maldives is improving with respect to all indicators, particularly regulatory quality and rule of law. Otherwise, in individual countries, indicators have shifted in sometimes seemingly contradictory ways. For example, in Indonesia, voice and accountability has increased by a large margin whilst regulatory quality has fallen by a similarly large amount.

These results suggest that forestry will, in many countries in the region, suffer with shortcomings associated with weak governance for several years to come. There are, however, some difficulties with perceptions based indicators that should be taken into

¹¹ World Bank, World Development Indicators, 2004.

¹² Kaufmann, Kraay, Mastruzzi (2003).

¹³ The six governance indicators cover: (i) Voice and Accountability, (ii) Political Stability, (iii) Government Effectiveness, (iv) Regulatory Quality, (v) Rule of Law and (vi) Control of Corruption.

consideration. For example it may be that the greater openness and voice allows greater criticism of a feature of governance that may in fact be improving (Kaufmann et al., 2003). Furthermore, comparison of 1998-2000 changes in the World Bank's Control of Corruption indicator with Transparency International's Corruption Perceptions Index¹⁴ showed changes in the same direction in only eight of the fourteen cases in which comparisons were possible.

2.3.2 Devolution and decentralisation

Continuing moves towards devolution and decentralisation of governance in the region have had a range of effects on forest management, not least because of the diverse range of approaches employed (Enters et al. 2000). Effects have often been complex and, as a result, prediction of the long-term consequences for forestry is hazardous. On the one hand, moving decisions closer to field level has opened possibilities for improved forest management and livelihood improvements. Division of duties between central and provincial/local bodies has also offered the potential of greater balance between local and national needs. On the other hand, where devolution has been implemented against a background of capacity limitation at lower government levels and/or poor regulatory quality, the efficiency of policy implementation has been reduced and earlier advances have even been reversed. In many cases, however, it has only been responsibilities that have been devolved by government whilst rights conceded to local levels have often covered only resources serving subsistence needs. In these cases, meaningful interpretation of the effects of devolution is precluded and instead, rigidities warrant further attention. In forestry, devolution has commonly been linked to community-based forest management, but as CBFM is only one form of devolution¹⁵ these aspects are dealt with in Section 4.2.

Relevant in explaining the current position with respect to devolution and decentralisation is the fact that, in many countries, the motivation for change has often been related to wider global tendencies rather than having developed internally or through the demands of local people. Governments have therefore been met at different states of evolution and readiness. In Lao PDR for example, capacity outside the central level is seriously limited and training and education are urgently needed to enable local management of relatively complex systems (Bouahong Phanthanousy, pers. comm.; Pravongviengkham, 2000). In other cases, problems are more entrenched whereby local groups remain of secondary importance to authorities more interested in maintaining control over resources than sharing benefits.

Devolution in Indonesia, together with the Asian economic crisis and the ensuing democratisation and decentralisation process, had considerable impacts on forestry. The forestry sector was largely unprepared for the rapidity of decentralisation and direct links between the provinces and the Ministry of Forestry were broken. This resulted in some confusion over responsibilities for licence issue and harvesting rights, etc. and in some senses led to an effective decentralisation of corruption. Powerful interests were also reportedly relocating to the provinces to maintain benefits previously reaped at the central level. Direct effects on forestry during the adjustments included accelerated logging, increased supply of timber from illegal sources and a reduction in forest policing. The Indonesian Government responded with legislative changes to better protect forest but these were rendered ineffective by the decrease in implementation capacity that accompanied decentralisation. Since decentralisation, relations and engagement with the private sector have deteriorated due to

¹⁴ Lambsdorff (2003).

¹⁵ See Contreras (2004).

distrust stemming from previous dealings and support for investment has therefore decreased. As a result, the opportunity for benefits through private sector involvement are being lost when improved regulation and application of pressure to maintain investments could bring about more satisfactory outcomes (Jörg Albrecht, Yanti Kusumanto, William Sunderlin, Ani Nawir, Luca Tacconi, pers. comm.).

In contrast to the comparative loss of control experienced in Indonesia, the devolution process in China has taken place in a slower and more ordered fashion and the recent strengthening of the shift in responsibility to household level has had direct effects on forest as well as on forest products trade and markets (Brian Belcher, pers. comm.). Initial moves towards devolution of forest control to households in the 1980's led to poverty related increases in deforestation and although preventative regulations were issued the system remained far from perfect (Ting, 2004). The 1998 amended Forestry Law of the People's Republic of China has recently improved the situation by legalising and extending the period of user rights for family plots in collective forests and by emphasising the environmental roles of forest (Hyde, 2003). High taxes and fees and the threat of future removal of rights and benefits have, however, detracted from the overall positive thrust of policy changes. Implementation has also proved a stumbling block and rapid and inexperienced administration of policy has created knock-on effects in cases where conflicts have arisen with existing systems (Liu and Edmunds, 2003). The net effects of this and other policy reforms over the past few decades have, however, been positive with farm incomes and forest protection having improved.

In Viet Nam and Lao PDR, devolution has been closely associated with land allocation. In Viet Nam, the process began with the Land Law in 1993, which allowed allocation of land, including forestland, to individuals, households and other organisations. Recently, however, allocation to groups of households and communities has become more common (Nguyen, 2004). In Lao PDR, decentralisation began in 1998 and allocation of land to villages, but not to individuals or households, began thereafter. Neither system permits villagers access to revenue generated from timber sales although subsistence requirements are granted. In both countries, the land allocation process has been a source of difficulty through the disruption caused to traditional and often sustainable patterns of land and forest use, particularly in upland areas (Thanh, 2003; Van Gansberghe, 2003). Overall, the separate processes are limited by administrative and field level capacity and these matters will take time to resolve. Village forest management, in which villagers receive benefits from timber sales, is, however, taking place under project support in Lao PDR and villagers have profited considerable (Katila, 2000). Efforts have, however, faltered in the past due to the reluctance of central authorities to continue sharing benefits from state-owned resources with village groups.

A case has recently been made that where local users are excluded from forming, implementing and evaluating devolution policies, the policies have served to increase governmental control over the management of resources whilst reducing costs (Edmunds and Wollenberg, 2003). It has also been found that local elites may reap a disproportionate proportion of benefits whilst the poorest in the community are left relatively unaffected (Contreras, 2004). The range of experiences of devolution and decentralisation, related here and experienced elsewhere in the region, clearly indicates that, although such policies are components in shifts towards greater democracy, they are not democracy itself and an internal evolution of ideas and attitudes is necessary before new models of governance begin to serve their designated purpose. Contreras (2004) has suggested that for devolution to yield benefits to local people, strong civil society is essential and that, in the past, local action has been precipitated by economic and environmental adversity. It may, therefore be that for real

change to take place, conditions must warrant adjustment of existing systems although a receptive rather than repressive approach from authorities is also prerequisite.

2.3.3 Forest Law Enforcement and Governance

In a number of Asia-Pacific countries the socio-economic and environmental contributions derived from forestry remain negligible due to uncontrolled logging and diversion of benefits to unaccountable and unresponsive interests. Exclusion of royalties, taxes and social and environmental costs has also meant that markets for products from sustainably managed sources have often been undercut and wider efforts to improve forest management have therefore been undermined. International support to forestry, having charted a course in recent decades through industrial, environmental, social and poverty related approaches, has consequently turned towards the overarching issues of governance and law enforcement (Persson, 2003). There has also been increased willingness to acknowledge difficulties at the national level and illegal logging issues were addressed for the first time at the 19th session of the Asia-Pacific Forestry Commission in 2000. Backing for forest law enforcement and governance has come from a number of governments in the region and the growing recognition of, and reaction to, illegal logging and corruption in recent years implies that forest law enforcement and governance will become a major focus in Asia-Pacific forestry in coming years.

Over the past few years, several regional and international processes have been launched in a concerted effort to tackle illegal logging, particularly in its relation to resulting losses of natural habitats and biodiversity. In 1998 the G-8 backed Action Program on Forests was initiated to support efforts to control illegal logging through international and regional processes. Representatives of Cambodia, China, Indonesia, Lao PDR, the Philippines, Thailand and Viet Nam attended the subsequent Forest Law Enforcement and Governance (FLEG) ministerial conference in Bali, Indonesia in 2001. The resulting Bali Declaration recognised, amongst other things, the environmental, social and economic importance of forest law enforcement and governance and the necessity of involving both importing and exporting countries in corrective efforts. Demarcation of forest areas, enforcement of property rights and improved stakeholder involvement were among the main areas identified to remedy flaws in existing systems (IISD, 2001). Similarly, the European Union Forest Law Enforcement Governance and Trade Process (FLEGT) has brought together major wood producing and importing countries in a scheme utilising 'legality licenses'. Illegal logging issues are now also a priority in the EU-Japan action plan¹⁶ (ITTO, 2003).

Complementing these intergovernmental processes, the Asia Forest Partnership¹⁷, launched at the World Summit on Sustainable Development in 2002, is a regionally based, multi-stakeholder initiative involving civil society and governmental and intergovernmental organisations. The partnership aims to strengthen existing programs by acting as a catalyst for existing initiatives and through increasing synergies and reducing duplication between programs and activities.

¹⁶ http://europa.eu.int/comm/external_relations/flegt/intro/.

¹⁷ <http://www.asiaforests.org/>.

A considerable proportion of FLEG related efforts have been directed towards the situation in Indonesia as detailed on a recently established illegal logging web site¹⁸. Currently 50-60 million cubic metres of timber are being harvested annually despite an annual allowable cut of just 5.5 million cubic metres (Luca Tacconi, pers. comm.). It has also been reported that at least 5 million cubic metres per year were being exported illegally under the log export ban. The Indonesian group Telapak has alleged Malaysian and Singaporean involvement in the illegal trade of timber¹⁹ and several other national and international NGOs have played leading roles in bringing matters to light. International moves to improve the situation have included the signing of an announcement of cooperation on illegal logging and timber trade by Indonesia, China and Japan²⁰. A similar agreement between Indonesia and the UK was signed in 2002. Similarly, a memorandum of understanding between Malaysia and Indonesia aimed at controlling illegal logging, led to dramatic falls in Malaysia's imports of industrial roundwood from Indonesia in 2002 (ITTO, 2003). A log tracking system, involving bar-coding, has also recently been piloted in Kalimantan to enable timber source identification. For producer countries to maintain exports, recognised forest management standards will have to be met, which will require time and effort for relevant training and implementation. Given sufficient political and industrial backing, however, this scheme should expand to other areas and countries, such as Cambodia, Lao PDR and Myanmar²¹. For the time being, continuing export of illegal timber to countries not directly involved in such initiatives poses a threat. For instance, China, the largest importer of industrial roundwood in the region, reported imports of Indonesian industrial roundwood for 2001 of 1.1 million cubic metres, or 6% of total imports. Indonesia, on their part, reported exports to China of over 1.8 million cubic metres or 45% of total exports²². Diverting such flows will take considerable effort by many parties and although China has signed a memorandum of understanding with Indonesia to stop illegal imports, new sources of timber will have to be found to supply soaring domestic demands.

In Cambodia, strengthening implementation of forestry policy and improving forest law enforcement and governance have been priority issues since 1998 (Savet and Sokhun, 2003). In January 1999, the Government of Cambodia issued a declaration concerning 'Measures on the Management of Forest and the Elimination of Illegal Forest Activities' which cancelled permits to establish sawmills in order to eliminate processing of illegally extracted wood. In December 2001, problems with concession management brought to light by the UK based NGO Global Witness, resulted in a 'Declaration on Suspension of Forest Concession Logging Activities' and in 2000 a sub-decree on forest management control was adopted to improve participation of local people in forest concession management. These measures have, however, provided little incentive for those involved in illegal activities to adopt new practices and illegal activities remain rife^{23, 24, 25}. The agenda is, however, advancing with

¹⁸ <http://www.illegal-logging.info/index.php>.

¹⁹ Malaysia Accused Of Selling Indonesian Hardwood Illegally. Associated Press February 4, 2004 (http://www.enn.com/news/2004-02-05/s_12801.asp).

²⁰ <http://www.mofa.go.jp/region/asia-paci/indonesia/pv0306/joint.html>

²¹ Bar-Coding Trees Isn't As Silly As It May Sound: <http://www.illegal-logging.info/news.php?newsId=127>.

²² FAO FAOSTAT database

²³ Illegal Logging Rife in Cambodia. Washington Post, Sunday, 16/02/04.

²⁴ Illegal Logging in Cambodia Levels Protected National Park. Radio Free Asia, 21/06/04. (<http://origin.rfaweb.org/front/article.html?service=eng&encoding=10&id=139075>)

²⁵ Cambodian Government Authorises Clear-Cutting in National Park. Global Witness, 09/07/04. (http://www.globalwitness.org/press_releases/display2.php?id=245)

recent milestones having included publication of an independent forest sector review and adoption of a new Forestry Law.

These examples from Indonesia and Cambodia suggest that both inter-governmental and civil society efforts to curb illegal logging and timber trade will meet with limited success without political will within involved countries and, in some cases, this may take time to develop. However, devolution of forest related rights and responsibilities has provided another avenue to prevent misappropriation of forest products. For example, accounts of communities stopping illegal logging and other forest related violations have been made at nearly all community forest management sites in the Philippines (Pulhin, 2004). In Nepal, the protection and management of degraded forests by community forestry user groups has similarly led to the regeneration and increasing value of forest resources, which has led to renewed interest from authorities and outside interests (Shrestha and Khanal, 2004). Similarly in Viet Nam, forest allocated to communities in areas of high population density has often been cleared for agricultural production, although at lower rates than forest managed by state forest enterprises (Nguyen, 2004). In Indonesia, communities who see logging as a customary right have also been motivated by profit to harvest trees and use land for agricultural production (Munggoro, 2004). In such cases, forest protection may impose an excessive burden on local communities and law enforcement may be an inappropriate approach. Overall, therefore, the problems of illegal logging may be difficult to confront using a regulatory approach and alternative livelihoods and routes to development that either encourage SFM without imposing costs on local people or remove pressure from forest resources should be sought.

2.4 INFRASTRUCTURE DEVELOPMENTS

2.4.1 Roads

APFSOS commented on the general expectation that with increasing road construction in the region, the area of undisturbed natural forest would fall as new areas became accessible. Table 2-3 shows that the rate of increase in road density in the region rose by over five times between 1993-1996 and 1996-1999 to just under 5% per annum. The most rapid rates of increase were in South Asia, with India's 12% annual increase accounting for the greater part. In North Asia, disregarding a large fall in road density between 1995 and 1996, the reason for which is unclear, increases between 1993 and 1996 were between 4 and 5%. In contrast, road construction rates in the NIEs have slowed and in the AIEs, road networks have fallen in density reflecting reductions in Australia.

In developing countries, the effects of increased rates of road construction are likely to further accelerate deforestation and forest degradation given the difficulties commonly encountered with controlling demand where accessibility is not a constraint. Improved transport and communication links should, however, offer benefits associated with modern facilities and market access to previously isolated communities.

Table 2-3 *Changes in road density in Asia-Pacific sub-regions*

	Road density 1999 (km/km ²)	Average annual change (%)	
		1993-1996	1996-1999
AIEs	0.25	1.1	-1.4
NIEs	0.92	9.8	2.1
North Asia	0.13	-3.1	4.2
Southeast Asia	0.19	-1.2	0.9
South Asia	0.94	3.2	10.4
Pacific Islands	0.05	1.0	0.0
Asia-Pacific	0.29	0.9	4.8

Of substantial importance to development in Southeast Asia, the 1500 km long ‘East-West Economic Corridor’ will link the Indian and Pacific Oceans through Myanmar, Thailand, Lao PDR and Viet Nam²⁶. It is expected that the corridor will bring about major economic and social change to the subregion and will eventually become an important link between South Asia, mainland Southeast Asia and East Asia. Completion of the corridor is expected towards the end of 2005 although the Second Mekong International Bridge between Thailand and Lao PDR, across which the link will pass, will not be finished until early 2007. To encourage investment and economic growth, parallel efforts are being made to facilitate cross-border transportation of goods and people and improvements to air and sea ports are also underway. Opportunities for plantation establishment and forest based ecotourism as well as more general tourism development are being investigated in Lao PDR and Myanmar whilst in Viet Nam, investments are also being made in the Lao Bao economic zone to provide job opportunities in a less developed area^{27, 28}.

2.4.2 Dams

The publication of the report of the World Commission on Dams²⁹ (WCD) at the end of 2000 represented a step forward in an area characterised by controversy and division. The report assesses reasons for the success or failure of dams in meeting development objectives and provides a rationale for a shift in options assessment and in the planning and project cycles for development of water and energy resources.

Dams have long been associated with loss of forests and species of fauna and flora and the WCD report suggests that it is not possible to mitigate many of the impacts. Therefore, increased attention is being given to avoidance or minimisation of ecological impacts through setting aside river segments or basins and selection of alternative projects, sites or designs. Governments in the region are also experimenting with offsetting ecosystems and biodiversity losses through investment in conservation, regeneration and protection of sites of equivalent ecological value.

In Lao PDR, issues surrounding the Nam Theun II dam provide some insight into the difficulties associated with the environmental impacts of dam construction despite mitigation initiatives. The proposed dam has attracted significant attention from many groups over a

²⁶ <http://www.adb.org/Documents/News/2004/nr2004016.asp>.

²⁷ <http://www.visit-mekong.com/ewec/index.htm>.

²⁸ <http://vietnamnews.vnagency.com.vn/2004-06/08/Stories/03.htm>.

²⁹ World Commission on Dams: <http://www.dams.org/>.

number of years, especially with respect to the involvement of the World Bank, potential providers of a \$100 million partial risk guarantee (ADB, 2001; World Rainforest Movement, 2003). Much of the controversy involves the adjacent Nakai Nam Theun National Biodiversity Conservation Area, which has been threatened by logging activities associated with clearance of the dam inundation area (World Rainforest Movement, 2001). A number of timber processing facilities were set up in the area and, following clearance of the reservoir area, large-scale logging continued in the dam catchment area (World Bank, 2000). This not only had potential effects on the life span of the dam, given erosion and siltation risks, but also ran contrary to the initiative whereby the project would contribute \$1 million per annum towards management of the catchment area (ADB, 2001). Considerable efforts were required on the parts of both the Government and the World Bank to bring the situation under control (World Bank, 2002). Although controversy has not disappeared, the case demonstrates practical difficulties in executing well planned initiatives where Government capacity to enforce legislation is limited.

In Malaysia, the Bakun Dam project received attention in connection with planned inundation of around 500 km² of Sarawak's diminishing primary rainforest. The project, which has been suspended on several occasions since inception in the 1960's, was revived in 2001 despite doubts over markets for electricity and social problems related to earlier village resettlement³⁰ and in September 2004, the government decided that the complete the dam by 2007. Given that clearance of the inundation area began in the 1980s, well before dam construction, environmental concerns are now outdated. Whether the dam will eventually be completed is therefore of diminished consequence and, as in other cases in the region, forest clearance in the inundation area appears to have been driven primarily by timber demand rather than planned flooding.

The Three Gorges Dam on the Yangtze River in China will result in inundation of around 108,000 hectares of farm and forestland as well as numerous urban areas. The connection with forestry is, however, primarily through erosion control measures including afforestation and logging bans in a catchment deforested in recent decades. According to China Daily³¹, erosion control measures implemented since the late 1990s have included creation of a tree belt and conversion of farmland into forest. As a result, forest cover in the reservoir area is said to have expanded by 2.2 million hectares. Reports from other sources, however, suggest that, despite incentives, farmers have been unwilling to convert farmland to forest due to food shortage concerns resulting partly from relocation to poorer agricultural lands higher up in the watershed (Steil and Yuefang, 2002). The effectiveness of the logging ban, instituted after serious flooding in 1998, has also been questioned and reports were that logging by private companies and dependent government officials had continued³².

2.5 AGRICULTURE

The impact of agriculture on regional forestry has increased in recent years as a result of several factors related to population growth and increasing demand for agricultural products and foreign exchange. Production of agricultural tree crops and especially oil palm has, in particular, been of interest due to forest conversion and also associated forest fire and increase

³⁰ <http://forests.org/articles/reader.asp?linkid=33900>.

³¹ http://www.chinadaily.com.cn/en/doc/2003-06/09/content_168451.htm.

³² Edict banning logging proves no match for greed, poverty. South China Morning Post, October 15/2001 - (<http://www.threegorgesprobe.org/tgp/index.cfm?DSP=content&ContentID=2742>).

in fibre supply as detailed in sections 2.6 and 4.4. Shifting cultivation, has, in some areas, also contributed to forest loss although in many localities where shifting cultivation is practiced, any vegetation that could be termed forest has long since been lost (Van Gansberghe, 2004; Christoph Feldkoetter, pers. comm.).

The continued expansion of agricultural tree crops and oil palm in particular has been of greater interest to forestry. Indonesia and Malaysia dominate palm oil production in the region and in 2002 accounted for 42 and 53% of the regional total respectively³³. Although recent establishment rates have been higher in Indonesia, each country established around 1.2 million hectares of oil palm between 1994 and 2002 to give total areas of 2.8 million hectares in Indonesia and 3.4 million hectares in Malaysia. Between 1994 and 2002 the area of rubber plantation also increased in Indonesia from 2.1 to 2.6 million hectares whilst in Malaysia the higher profitability of palm oil production and demands for rubber wood led to a reduction in area from 1.5 to 1.2 million hectares. The sustainability of the palm oil industry remains in question given that second rotations are showing reduced productivity. However, information suggests that oil palm production remains profitable and that consumption will increase steadily in coming years. Further conversion of land to palm oil production may therefore be expected although impacts on forest will depend largely on whether degraded lands are deemed suitable for production (Rowell and Moore, 2000). Slower expansion of rubber plantations can also be expected, particularly in Thailand, India and Indonesia.

With respect to trade in agricultural commodities, trade liberalization by high-income countries may have considerable effects on agriculture and forestry in the future. For example, possible gains for developing countries in East Asia are estimated at well over \$10 billion and around \$30 billion with dynamic productivity gains taken into account (World Bank, 2003). The gains are not primarily associated with EU and US agricultural subsidies which concentrate on products that, with the exception of rice, are of little importance to East Asia. Rather, tariffs on low quality goods (including palm oil), health and safety regulations and complexities associated with rules of origin are of greater importance.

The effect of increasing returns on agricultural intensification/extensification, forest cover and investment in the sector are complex. Angelsen and Kaimowitz (2001) concluded that increased profitability of agricultural production may result in diametrically opposing outcomes. On the one hand, with greater investment and intensification, forest removal may decrease as equivalent production is gained from a smaller land area. On the other hand, increased access to higher paying markets may encourage extensification, as agriculture becomes more profitable (Angelsen and Kaimowitz, 2001). Forecasting the effects of trade liberalisation and commodity prices on forestry is therefore likely to be fraught with difficulty. In the long-term, however, it is probably that increasing prosperity resulting, in part, from higher agricultural commodity prices will eventually lead to better management of forests as outlined in Section 1.2.

³³ FAO FAOSTAT database.

2.6 FOREST FIRE

The most significant development in relation to forest fire in recent years in the Asia-Pacific region has been the enunciation of the ASEAN Transboundary Haze Agreement, which followed in the wake of extensive forest fires in Indonesia. In 1997/98 11.7 million hectares of land and forest mainly in Kalimantan and Sumatra were burned as dry weather exacerbated fires started predominantly to clear land for oil palm plantations and agricultural cultivation (Tacconi, 2003, Rowell and Moore, 2000). The smoke and haze from the fires drifted across international boundaries causing a widespread health hazard and closing airports in Singapore and neighbouring countries. Taking into account both fire and haze related damages, the economic cost of the fires was estimated in excess of US\$4.5 billion (EEPSEA/WWF, 2003). In reaction, Indonesian legislation forbidding all forest and land fires was implemented³⁴ and a National Fire Management Plan was completed and given legal status in 1999 (Wardojo and Masripatin, 2002). The Transboundary Haze Agreement, although not yet ratified by Indonesia itself³⁵, was signed by the ten ASEAN members in 2002³⁶ and entered into force in November 2003. The Agreement contains provisions on monitoring, assessment and prevention, technical cooperation and scientific research, coordination mechanisms and simplified international procedures for disaster relief³⁷.

The impact of the agreement on forests and biodiversity may be less than suggested by extent of the initial devastation as much of the affected area was degraded forest or land cleared in plantations (Tacconi, 2003). Legislation and better fire management should, however, help prevent unplanned forest loss as large proportions of the affected areas in East Kalimantan were in fact within forest concessions (2.35 million hectares) and protected areas (0.44 m ha, Hoffman et al. 1999). The extent to which this transpires will depend much on the challenging socio-economic and institutional conditions prevailing in Indonesia and reports in 2004 indicated that fires were again widespread in Sumatra and Kalimantan³⁸.

The increasing frequency of El Niño events over recent decades and the dry periods with which they are associated in Southeast Asia may, if trends continue, have important effects on Asia-Pacific forestry in coming years. Rowell and Moore (2000), amongst others, have suggested that the changing weather patterns and increased levels of anthropic fire ignition may result in increasing cycles of forest devastation as burned areas become progressively dryer and recovery intervals contract.

Since 1997/98, when fires swept across large areas of Australia, China, Indonesia, Malaysia and Papua New Guinea, responses to this threat have been limited. International efforts have included the establishment of the Global Fire Monitoring Centre³⁹ and implementation of a range of regional strategies and in-country forest fire projects (Goldammer, 2004). However, the sources of problems have, in many cases, remained untackled. For example, forest managers or local inhabitants do usually not hold responsibility for fire control and land tenure arrangements may promote short term strategies and excessive use of fire as a

³⁴ Government regulation 4/2001.

³⁵ <http://www.haze-online.or.id>.

³⁶ Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam.

³⁷ <http://www.aseansec.org/15129.htm>.

³⁸ Haze from 1,100 forest fires burning in Indonesia prompts health concerns. Jakarta Post 04/09/04. (<http://forests.org/articles/reader.asp?linkid=34681>).

³⁹ <http://www.fire.uni-freiburg.de/>.

management tool. Weak governance and ineffectual legal and regulatory systems may also hinder law enforcement with respect to fire (Rowell and Moore, 2000). Furthermore, increasing prices and greater focus on palm oil in export strategies suggest that the economic incentives for much of the burning that has taken place in recent years will remain.

Other fire related developments in the region include the following (Mike Jurvelius, pers. comm.):

- Wildland Fire Networks for Southeast (2002) and Northeast Asia (2004) have been established under the auspices of the United Nations International Strategy for Disaster Reduction (ISDR, Goldammer, 2004).
- National forest fire management responsibilities have been transferred from forest departments to Fire and Rescue Services (e.g. Philippines) although the latter often lack experience and proper equipment.
- Emphasis on participatory fire management has increased (e.g. Rowell and Moore, 2000; Moore et al. 2002; FAO, 2003f).
- Zero burning policies are being pushed with little regard for the 10-20 million families practicing shifting cultivation in the region, thus criminalizing this section of society.

2.7 FORESTRY POLICY

Key forestry policy developments identified in APFSOS were associated with post-UNCED changes and included (i) trends towards people-centred development, (ii) greater environmental responsibility in forestry development and (iii) challenges to reconcile global priorities with national and local concerns, industry demands with community needs and preservation with diversified management and use of forests. Since 2000, similar shifts have been encouraged by the Millennium Development Goals and recent international support for forestry in developing countries has often focussed on targets related to poverty reduction and improving trading and financial systems.

Again at the international level, there has been some disappointment over the failure to reach agreement on an international forest convention through the IPF/IFF/UNFF⁴⁰ process. Proposals for Action and a Multi-Year Programme of Work were adopted as an alternative and by 2005 the UNFF will 'consider recommending the parameters of a mandate for developing a legal framework on all types of forests'⁴¹. There may still be hope for an international agreement although the current situation presided over by many governments continues to contrast markedly with that aimed at by proponents of a forestry convention. Within countries, sustainable forest management has, nonetheless, remained the main thrust in forestry policy although actions have often fallen short of written objectives. In many cases, the thrust behind proliferation of policy has come from outside rather than having developed domestically. As a result, direct incentives to implement improvements in management have been lacking and foresight has often been unable to prevail in the face of other opportunities and exigencies in the short term. Problems also exist due to the frequently reactive rather than proactive nature of forestry policy. As a result, sources of problem are often not adequately identified and therefore remain untackled.

⁴⁰ IPF - Intergovernmental Panel on Forests; IFF - Intergovernmental Forum on Forests; UNFF - United Nations Forum on Forests.

⁴¹ <http://www.un.org/esa/forests/index.html>.

As policy developments in many South and South-east Asian countries have been summarised elsewhere (FAO, 2003b; Brown and Durst, 2003), policy changes in only four of the most important producers and consumers in Asia-Pacific wood products trade and markets are reviewed here: China, Indonesia, Australia and India. In Japan, also a major player in Asia-Pacific forestry, regional influence in coming years is likely to be dependent on levels of economic growth and demographic trends which, to a large extent, determine import levels. Decisions to bring increased natural forest areas into production will also play a part although, at present, harvesting costs remain too high to compete with imports (Joseph Roos, pers. comm.). More generally, policy recently formulated in the region has focussed on promotion of sustainable forest management and although implementation has often been poor there has been a clear shift in thinking as recognition of the potential contribution of forestry to sustainable development increases. Focus has also been given to environmental protection and maintaining or increasing production whilst governance, restructuring and participation have also come to the fore.

2.7.1 China

In China a number of policy changes have taken place as awareness of the importance of forests has grown within the State Forest Administration, universities and other government institutions. Five major shifts are currently underway (Shengxian, 2002):

- from emphasis on timber production to ecological protection;
- from timber production in natural forest to production in plantations;
- from conversion of forest land to farm land to reversion of farm land to forest land;
- from allowing free environmental benefits from forest to charging fees; and
- from forestry sector management of forestry to management by the whole society.

In pursuit of these objectives and following the catastrophic flooding of the Yangtze River in 1998 and water shortages in the Yellow River catchment in 1997, two major national programmes are being implemented: the Natural Forest Protection Program and Sloping Land Conversion Program. A number of other afforestation and greening programmes aimed at desertification control, wildlife conservation and development of shelterbelts and plantations are also being implemented as summarised by Brown and Durst (2003).

The Natural Forest Protection Program (NFPP) was instituted in 1998 on the basis of the new Forest Law and is scheduled to continue until 2010. The program aims to phase out logging operations of state-forest enterprises in defined areas and, in replacement, to institute a stewardship role. Three main components are included: (i) a logging ban in the natural forests of the upper reaches of the Yangtze and the upper and middle reaches of the Yellow River and logging reductions in state-owned forests in Northeast China, Inner Mongolia, Xinjiang, Hainan and other provinces (ii) reforestation and silvicultural treatment in designated forestlands; and (iii) provision of alternative employment and pensions for state forestry workers affected by the logging bans (CCICED, 2002). There are also plans to plant 8.6 million hectares of forest, increasing China's forest cover from 17.5% to over 21% (Weyerhaeuser and Wilkes, 2003).

In the Yangtze and Yellow River catchments, the logging ban includes some 30.4 million hectares of natural forest and a suspension of activities in a further 30.8 million hectares of planted forest and planned forestland. Planned reductions in timber harvest volumes from

natural forests from 32 million m³ in 1997 to 12 million m³ in 2003 have had considerable effects at the regional level (Yuexian, 2001). China's imports have soared in the face of increasing demand and as a result, increased forest degradation has been recorded in neighbouring countries (Sun et al. 2004). Although increases in China's timber production have recently been reported⁴², future focus is likely to be directed towards supplies in Malaysia, Indonesia, Myanmar, Lao PDR, Papua New Guinea and other countries outside the region such as Russia.

The Sloping Land Conversion Program (SLCP) is, in contrast to the NFPP, essentially a public payment scheme for environmental services from private farmlands and subsidises conversion of farmland to forest or grassland (CCICED, 2002). The program's main objective is to reduce erosion and aims at conversion of all cropland on slopes of greater than 25 degrees. There are reportedly 6 million hectares of agricultural land that fulfil this criteria in China with over 70% located in the west. In 2001, the program covered 20 provinces and, in similarity with the NFPP, key regions included the upper reaches of the Yangtze and the middle and upper reaches of the Yellow River. Incentives to achieve objectives include provision of funds grain and saplings to participating farmers. In addition to the conversion of agricultural lands, the policy also calls for simultaneous greening of degraded lands and barren hills with forests and grassland.

Although there have been significant environmental impacts of both the NFPP and the SLCP in terms of reduced exploitation of natural forest and planting of huge areas of degraded lands, there have been a range of adverse socio-economic effects especially with respect to the NFPP. These include increases in poverty, diminished incomes and tenure insecurity, which, in the case of both programs, have been exacerbated by a lack of monitoring and subsequent fine-tuning (CCICED, 2002).

2.7.2 Indonesia

Following the economic and political changes in 1997/98 and failure of timber orientated forest utilisation as a sustainable production strategy, forestry policy has been directed towards conservation of remaining forest and rehabilitation of approximately 23.9 million hectares of degraded forest land (Wardojo and Masripatin, 2002). Five focal areas have been adopted by the Ministry of Forestry for the period 2001-2004: (i) combating illegal logging, (ii) forest fire prevention and suppression, (iii) restructuring forest-based industry, (iv) forest plantation development and reforestation and (v) decentralisation of the forestry sector (Wardojo and Masripatin, 2002; Chrystanto and Justianto, 2003).

To achieve these objectives a range of measures are being employed, which, amongst others, include: a partial moratorium on logging and gradual reduction of annual harvests; assertion of criteria and indicators for sustainable management of natural production forests and plantation establishment financed through the reforestation fund and other sources. Community development is included as a cross-cutting theme and as such permits have been given for community-based forest management and forest based businesses for individuals or cooperatives. The main source of national funding for the five focal areas is the reforestation fund, which is reliant on forestry sector revenues. Concerns are, however, that financing will be insufficient given the estimated 60% reduction in contributions as timber production is cut-

⁴² <http://www.globalwood.org/market1/aaw0601d.htm>.

back. The wider economic impacts of reductions in timber production are also a concern for the timber industry and regional wood-based forest products markets will also be affected. As such there is a clear need to locate other sources of national and international funding for the focal areas although the current investment climate may prevent significant private sector contributions (Romain Pirard, pers. comm.).

From a different standpoint, the efficiency with which the Indonesian government can achieve forest related aims is now largely dependent on the provinces given the rapid government restructuring that took place in 1998 as detailed in section 2.3.2. Government willingness to publicly acknowledge problems in forestry has, however, been a positive development in recent years and cooperation with other countries is also strengthening reforms.

2.7.3 Australia

In Australia, the most important policy development since 1997 has been the signing of Regional Forest Agreements (RFAs), which bring into effect 20-year plans for the conservation and sustainable management of Australia's native forests⁴³. Ten RFA's have been signed in four States: Western Australia, Victoria, Tasmania and New South Wales. The agreements are aimed at providing greater certainty for forest-based industries, forest-dependent communities and improved conservation measures. The agreements have led to a National Conservation Reserve System and a considerable increase in conservation reserve area but have been less successful in providing resource security for industry (Ian Ferguson, pers. comm.). Although following many of the principles of SFM, Australian forestry policy in recent years has attracted criticism for being dominated by public opinion strongly biased against tree felling for commercial purposes. Such views have been embodied in policy and law but are perceived as detrimental to the forest industry, forest owners and to the forestry as a whole (Neil Byron, pers. comm.). Recent pledges for support to the forest industry in lieu of reducing cutting in old growth forests have, however, been made⁴⁴.

Since 1997, the Plantations 2020 Programme has also been supported by the government with the aim of trebling the area of plantations in Australia to 3 million hectares by 2020 to complement timber production from native forests managed under the RFA's⁴⁵. The programme concentrates on promotion through policy support, regulatory adjustment and information dissemination rather than subsidy as has been the case in the past. Total investments of around US\$2.2 billion of mainly private capital are anticipated and benefits include increased farm incomes and rural employment and environmental benefits related to water balances and carbon sequestration. With appropriate follow-on investment in processing infrastructure, it is also expected that Australia's wood and wood products trade deficit could be transformed into a surplus. Over half a million hectares of new plantations were established between 1997 and 2002, the majority of which were eucalyptus, and around US\$1.4 billion has been invested in plantation-related processing infrastructure in the sawmilling, paper manufacturing and wood-based panel industries.

⁴³ <http://www.affa.gov.au/index.cfm>.

⁴⁴ http://www.nzforestry.co.nz/nzf_news.asp?articleid=2195.

⁴⁵ <http://www.plantations2020.com.au/>.

2.7.4 India

Since the National Forestry Policy of 1998, programmes in India have been predominantly directed towards increasing forest cover. The National Forestry Action Programme of 1999 has the central aim of raising forest cover to 25% by 2007 and 33% by 2012 (Pande and Pandey, 2004). Five programs aim to: (i) protect existing forest resources, (ii) improve forest productivity, (iii) reduce total demand, (iv) strengthen the policy and institutional frameworks, and (v) expand forest area⁴⁶. In keeping with these objectives, the National Afforestation Programme was launched in 2002 as part of the tenth five year plan. The programme is an amalgamation of all afforestation schemes under the Ministry of Environment and Forests and is financed by the National Afforestation and Eco-Development Board. Joint forest management (JFM) is integrated within all planned projects and a participatory approach is emphasised. In connection, a JFM cell was set up within MoEF in 1998 in response to calls for increased capacity to consistently monitor the impact of the JFM programme across the country. Guidelines issued by the cell have, amongst other things, requested legal backup for JFM committees, extension of JFM to better quality forest areas and increased participation of women in JFM decision making⁴⁷.

The Coimbatore Charter on Environment and Forests of 2001 outlined strategies for reaching Forest Policy goals and included measures dealing with wildlife, fire control and forestry in drought prone areas as well as budget increases for afforestation (IIFM, 2003). The government has also been considering launching the 'Greening India Programme' to contribute to the reforestation task. The programme will involve mass planting campaigns supported by central and satellite nurseries producing high quality planting material. The proposal aims to cover 43 million hectares of degraded land within 10 years through rehabilitation of 15 million hectares of degraded forest and establishment of 28 million hectares of agroforests (GoI, 2001; Pande and Pandey, 2004).

In addition to these centrally sponsored schemes, a number of states have also been liberalising policy to allow trees to be grown, felled and transported with less bureaucratic and administrative involvement in order to increase tree cover and forest products supply (Pande and Pandey, 2004). The impacts of these developments on regional forestry are likely to be moderated by the current wood supply deficit in India and increasing demands resulting from rapid economic growth.

⁴⁶ <http://envfor.nic.in/nfap/index.html>.

⁴⁷ <http://envfor.nic.in/nfap/jfap/jfmp.html>.

3 STATUS, TRENDS AND APFSOS PREDICTIONS – RESOURCES, PRODUCTS AND TRADE

3.1 FOREST RESOURCES

Within the region, the general picture in recent years has been one of continuing loss and degradation of natural forest and mixed success with respect to plantation establishment. Shifts towards forest protection and away from production have also been widespread and moves to rehabilitate degraded forest have begun in many countries. With respect to forecasts, APFSOS predicted that between 1994 and 2010, plantation area in the region would increase from 40 to 64 million hectares (3.0% per annum). Figures from the FAO Forest Resources Assessment (FRA) indicate that between 1990 and 2000 plantation area increased by 2.8% per annum to 54 million hectares although problems with assessment suggest that figures should be used as a guide only (see Section 4.3). Between 1994 and 2010, natural forest area in the region was expected to decline from 490 to 465 million hectares (-0.33% per annum). As a result of altered definitions, figures from FRA are incompatible with previous records⁴⁸ and as a result an increase in natural forest cover to 644 million hectares in 2000 is indicated. By subtracting new plantings between 1990 and 2000⁴⁹ from total forest cover in 2000, however, change in natural forest cover of -0.36% per annum, or an average of 3.5 million hectares per year, is indicated. These figures indicate a rate slightly above that predicted in APFSOS⁵⁰.

Table 3-1 shows statistics relating to regional forest cover change between 1990 and 2000. The overall low rate of change in total forest cover masks significant discrepancies between sub-regions and differing situations with respect to natural and planted forest. In Southeast Asia, forest cover declined at 1.0% per annum between 1990 and 2000 but when plantings since 1990 are taken into account, a decrease in natural forest cover of around -1.4% per annum is indicated. In South Asia the figure is much higher at -2.4% and in North Asia the 1.0% annual rate of increase in total forest area is associated with a 0.1% decrease in natural forest cover. In some cases, however, reported net deforestation rates may be overestimated due to forest regeneration and plantation establishment remaining unaccounted for due to the time lag in reporting and general focus on natural forest (Peter Holmgren, pers. comm.).

Between 1990 and 2000 the total annual reduction of forest cover in Asia was greatest in Indonesia and Myanmar with evidence from Indonesia indicating an annual loss of 1.8 million hectares per year (Indonesia FLB 2001, cited in FAO, 2001). Although the breakdown in government systems since 1998 has made it difficult to understand the situation on the ground, information from the Ministry of Forestry suggests that between 1997 and 2000 deforestation averaged as much as 3.8 million hectares per year. Furthermore, current extraction rates may be as high as ten times the estimated annual allowable cut, suggesting extensive forest degradation (Luca Tacconi, pers. comm.).

⁴⁸ The difference with previous figures results from a definition change between the 1990 and 2000 forest resource assessments. For the latter a minimum cover of 10 rather than 20% was used to define 'forest' in developed countries, bringing the definition into line with that for developing countries.

⁴⁹ Annual planting rate of 3.4 million ha/yr given by FRA for the Asia-Pacific region.

⁵⁰ This method of calculation assumes that plantation areas have not decreased.

In Malaysia, although the economy is still dependent on natural forests, implementation of sustainable management is progressing slowly and current actions may be insufficient to tackle the scale of the tasks involved. Plantations are not taking off and the furniture industry has become heavily dependent on rubberwood and although substitutes such as palm wood are likely to be sought in the future, it is likely that imports will increase (S. Appanah, pers. comm.).

Table 3-1 *Changes in Asia-Pacific forest cover, 1990-2000*

	Total forest area (000 ha)		Annual change (%)	Annual planting rate (000 ha)	
	1990	2000			
North Asia	DPR Korea	8,210	8,210	0.0	-
	Japan	24,047	24,081	0.0	-
	Mongolia	11,245	10,645	-0.5	-
	PR China	145,417	163,480	1.2	1,153.8
	The Republic of Korea	6,299	6,248	-0.1	-
	Brunei	452	442	-0.2	0.2
Southeast Asia	Cambodia	9,896	9,335	-0.6	2.5
	Indonesia	118,110	104,986	-1.2	270.7
	Malaysia	21,661	19,292	-1.2	34.9
	Myanmar	39,588	34,419	-1.4	36.5
	Lao PDR	13,088	12,561	-0.4	6.3
	Philippines	6,676	5,789	-1.4	30.0
	Singapore	2	2	0.0	-
	Viet Nam	9,303	9,819	0.5	80.3
Thailand	15,886	14,762	-0.7	225.0	
South Asia	Bangladesh	1,169	1,334	1.3	22.1
	Bhutan	3,016	3,016	0.0	0.8
	India	63,732	64,113	0.1	1,508.8
	Maldives	1	1	0.0	-
	Nepal	4,683	3,900	-1.8	5.3
	Pakistan	2,755	2,361	-1.5	30.0
	Sri Lanka	2,288	1,940	-1.6	4.3
Pacific islands	Australia	157,359	154,539	-0.2	-
	Cook Islands	22	22	0.0	0.1
	Fiji	832	815	-0.2	9.2
	Kiribati	28	28	0.0	-
	New Caledonia	372	372	0.0	0.2
	New Zealand	7,556	7,946	0.5	-
	Papua New Guinea	31,730	30,601	-0.4	4.0
	Samoa	130	105	-2.1	0.5
	Solomon Islands	2,580	2,536	-0.2	1.0
	Tonga	4	4	0.0	0.03
Vanuatu	441	447	0.1	0.2	
Asia-Pacific	708,578	698,151	-0.1	3,427	
North Asia	164,872	182,335	1.0	1,154	
SE Asia	234,660	211,405	-1.0	686	
South Asia	77,644	76,665	-0.1	1,571	
Pacific Islands	36,139	34,930	-0.3	15	
AIEs	188,962	186,566	-0.1	0	
NIEs	6,301	6,250	-0.1	0	

Source: FAO (2001).

In Lao PDR and Cambodia, rates of loss of natural forest cover are high and forest degradation remains a serious problem. Plantation programmes have also been slow to take off owing to high perceived investment risk although there has been some recent investment in rubber plantation establishment. In Viet Nam, although authorities are making efforts to reduce natural forest utilisation, there is still some decrease in natural forest cover despite an increase in total cover indicated in national statistics. In similarity with many other countries in the region, plantation establishment is balancing a good proportion of the reduction in natural forest cover (Persson, 2003).

In North Asia, an annual increase in forest area of 1.8 million hectares in the 1990s was largely the result of plantation programmes in China and there is probably no longer a reduction in total forest area although natural forests may still be shrinking (FAO, 2001; Persson, 2003). In the Democratic People's Republic of Korea over 2 million hectares of forest have been converted to agriculture over the past 10 years whilst plantation establishment rates have been low. In the Republic of Korea, by contrast, 4 million hectares have been planted over the past four decades (Don Koo Lee, pers. comm.). Pest problems in North Asia have, in the meantime, lead to loss of large numbers of trees and have also had effects on trade as outlined in Box 3-1.

In South Asia, forest cover has been falling at roughly twice the average rate for Asia although in Bhutan and Maldives forest cover has been stable during the past decade. In Bangladesh and India, cover has increased but in Nepal, Pakistan and Sri Lanka forest has been lost with the highest rates of decline in Nepal and the least in Pakistan. In Bangladesh, increases have been due to plantation programmes and natural forest cover has decreased significantly. The sub-region in general has a large proportion of forest area accounted for by plantations and annual planting rates as a proportion of existing forest cover in Bangladesh, Pakistan and India are, along with Thailand and Fiji, the highest in the Asia-Pacific region.

Forest cover change in Australia and New Zealand between 1990 to 2000 have been relatively small with Australia reporting deforestation of 282,000 hectares per year and New Zealand registering an average annual increase of 39,00 hectares. Australia is, in particular, susceptible to losses from fire although attention in recent years has also been drawn to clearance of old growth forest, particularly in Tasmania⁵¹.

In Papua New Guinea forest cover remains high, even though losses have continued with most readily accessible production forest areas already having been logged out or committed for exploitation. At present, however, there is some opportunity for bringing remaining natural forest under sustainable management as changes to the concession system are made. A similar situation exists in the Solomon Islands where most of the exploitable natural forests are soon likely to have been logged. Inaccessible upland areas are, however, likely to remain forested. Both Papua New Guinea and Solomon Islands have made efforts to establish plantations, but many in Papua New Guinea are reported to be neglected or abandoned.

Fiji has experienced continuing loss of natural forests in recent years, particularly in the lowlands with around 40% of the remaining natural forest having been logged and an additional 30% in reserves. The remaining 30% is being cut at around 8 000 hectares per year. Fiji does, however, have a substantial plantation area and high levels of plantation establishment. In Vanuatu, harvesting licences have been reduced to a level well within

⁵¹ <http://www.acfonline.org.au/asp/pages/home.asp>.

sustainable forest management and there is the potential for a substantial increase in forest plantations. In Samoa, the National Forest Policy calls for the sustainable utilization and management of the remaining merchantable indigenous forests. Most of the previous plantations were damaged by cyclones, and the current rate of planting is very low and it therefore appears that Samoa will increasingly depend on timber imports.

Box 3-1 *Pests and Forest Resources – North Asia*

Since 1998 outbreaks of Asian Longhorned Beetle (*Anoplophora glabripennis*) in China and Siberian caterpillar (*Dendrolimus sibiricus*) in Mongolia and DPR Korea have threatened national forest reserves and international trade as changing climatic and forest environments increase the severity of infestations.

Damage by Asian Longhorned Beetles in the Three North region in China has worsened due to climatic stresses on trees and increasing reliance on monocultural plantations (FAO, 2003c). In all, more than 200 million infected trees have been felled and burnt. A new forest network was established in 1986, which supported planting of alternative, more tolerant, species but lack of adaptation to local climate and diseases have resulted in lower economic returns. Farmers have therefore continued to plant poplar, which has promoted the risk of further infestations and spread to other areas. Furthermore, in November 2001, the Three North Shelterbelt Program began with plans to establish over 9.5 million hectares of forest by 2010. Associated risks will therefore require significant management attention. Adding to difficulties, the beetle was also discovered in the USA in 2001, probably having been transferred from China in hardwood packaging. This has affected exports from China and initiated transfer of technology from the USA to control outbreaks.

In Mongolia and The Democratic People's Republic of Korea the Siberian Caterpillar, which is widespread on the Asian continent, has been attacking conifers with increasing frequency, possibly in relation to climatic change in the region (FAO, 2003d; FAO, 2003e). In Mongolia, it is estimated that more than one million hectares of larch, and to a lesser extent pines, in more than 10 provinces are affected. For fir and five needle pines, mortality is close to 100 percent in many stands but in larch mortality rates are lower. According to forecasts for the next decade, Mongolia may lose around 3.6 million hectares of its already limited forest area if action is not taken (Ghent and Onken, 2003). The Mongolian Parliament and Government are paying increasing attention to forest pest protection and prevention activities and the Government Action Programme has identified these areas as main nature conservation issues (FAO, 2003e). In DPR Korea, the problem is currently on a smaller scale with 13400 hectares estimated to be infested and mortality rates significantly lower (FAO, 2003d).

3.2 *WOOD-BASED FOREST PRODUCTS TRADE AND MARKETS*⁵²

In APFSOS, the estimate made at the 1998 World Economic Forum in Davos that 5 years would be required for full economic recovery following the Asian economic crisis was adopted as a timeline for recovery of industrial forest products demand. Thereafter it was expected that demand would increase significantly with population growth and a return to strong economic performance. However, in contrast to the economic recovery in the region (Section 2.1), industrial roundwood consumption in 2002 was still 7% below 1997 levels and sawnwood 31% below. Conversely, consumption of wood-based panels had increased by

⁵² All data used in this paper are derived from FAO databases and summaries for each of the major product groups are given in Section the Annex,- Section 2-2-1. Quantitative predictions, where quoted, correspond to the APFSOS downturn scenario except where stated.

21%, wood pulp by 22% and paper and paperboard consumption by 1%. APFSOS also predicted that Japan would remain the main driving force in determining patterns of forest supply, demand and trade within the region. However, in 1998, China became the number one importer by value and by 2002 China's share of regional imports had risen to 44% by value compared to Japan's 26%.

Gross volumes of production, consumption and trade were expected to continue to increase despite the economic crisis. Production of industrial roundwood and sawnwood were, however, below 1997 levels in 2002 whereas for other more highly processed products there were net increases. With respect to trade, exports by 2002 were up for all products except panels. Imported quantities had increased for all product groups except sawnwood and panels. Specific predictions made in APFSOS concerning wood-based forest products are compared with the recorded situation in Box 3-2.

Box 3-2 *Production, consumption and trade of wood-based forest products in comparison with APFSOS forecasts*

The summary outlook for wood-based products made in APFSOS included the observations listed below. As a result of recent changes, the reality has often diverged from that predicted although as the outlook was to 2010 some of the changes predicted may still occur.

- In general, demand in the region for all forest products will increase significantly due to population growth and an anticipated return to strong economic performance.
 - Between 1998 and 2002, regional consumption of the five major forest products¹ rose at 1.5% per annum compared to 1.4% between 1994 and 1997 although with a fall of over 10% between 1997 and 1998.
- Asia-Pacific share of global industrial roundwood production will increase from 19 to 22% between 1994 and 2010.
 - By 2002 the Asia-Pacific share of global industrial roundwood production had fallen to 16%.
- Asia-Pacific will increase its dependence on imports for all industrial wood products;
 - After falling to 16% in 1998, Asia-Pacific imports, as a percentage of consumption, increased to 21% in 2002.
- By 2010, Asia-Pacific consumption of wood-based panels and paper and paperboard will exceed consumption in both North America and Europe; Asia-Pacific consumption of sawnwood will be second only to that in North America;
 - By 2002, Asia-Pacific consumption of wood-based panels as a percentage of that in both North American and Europe remained well below 1997 levels. Asia-Pacific consumption of Paper and Paperboard had risen close to that of North America and exceeded European consumption. Asia-Pacific sawnwood consumption had, by 2002, fallen well below that in both North America and Europe.
- Asia-Pacific will become a net importer of wood-based panels, changing from its current position as a net exporter;
 - By a small margin, the Asia-Pacific was still a net exporter of wood-based panels in 2002;
- Regional paper and paperboard production will likely increase to 126 million metric tonnes in 2010 from 75 million metric tonnes in 1994;
 - By 2002 paper and paperboard production had risen in line with projections to 99 million metric tonnes.
- Consumption of practically all commodities is led by the needs of North Asia, particularly demand in Japan and China; these countries will be the dominant influence in trade;
 - By 2002 Japan and China continued to dominate trade in the region although at a level unchanged from 1997, with just over 70% of the regions imports. China's imports were increasing rapidly, however, and Japan's decreasing.
- The very large latent market for paper and its products could emerge to create huge new demands for paper, particularly if economic growth accelerates in key countries such as India.
 - Between 1994 and 2002, Asia-Pacific consumption of paper and paperboard increased by 33% whilst in India, the increase was 45%.

1- Industrial Roundwood, Sawnwood, Wood-based panels, Wood pulp and Paper and paperboard

With respect to prices, forecasts assumed that the 1997/98 economic downturn would result in falling prices for forest products throughout the region. This was indeed the case for industrial roundwood for which export prices fell by 17% in the between 1997 and 1998 with little recovery evident by 2003 (ITTO, 2003). Since 1993, however, a long-term decline in prices has been in progress at an average annual rate of ~8% in real terms. Similarly, sawnwood prices have been falling since 1995 with a fall of 19% between 1997 and 1998 and continued reductions to 2002. Wood-based panel export prices have also been falling since

1995 and, during the economic crisis, fell by 29% but have since recovered slightly. Wood pulp export prices hit their lowest point since 1993 in 2002 and fell by 16% during the crisis although trends have been highly erratic for the past 15 years or so. Paper and paperboard prices fell by only 8% during the crisis and have since remained relatively constant. With respect to the total value of Asia-Pacific forest products trade in real terms, the 2002 import value of the five main wood products groups was 37% below the 1995 high of \$38.8 billion whereas exports were 26% below.

3.2.1 Woodfuel

Since 1998, the leading development in the Asia-Pacific and global woodfuel⁵³ situation has been the culmination of a prolonged shift from a paradigm centred on environmental and social crisis to one more closely reflecting the revealed situation. Widespread fuelwood scarcity and ensuing deforestation as envisaged by, amongst others, Eckholm (1975) and de Montalembert and Clément (1983) failed to materialise and the assumptions underlying these forecasts have since proved unsound. The connection between fuelwood use and deforestation is, for example, no longer believed to be strong and the significance of supply from trees outside of forests was underestimated. Additionally, human responses to scarcity played a more significant role than expected despite the fact that outside intervention often met with limited success (see Arnold et al. 2003). The importance of fuelwood and attendant issues at international and regional levels has therefore been downgraded and the expectation is that isolated problems will now be dealt with ad hoc or through integrated development efforts. There are, however, still large numbers of woodfuel users in the region and supportive policy therefore remains important. With respect to charcoal, the situation differs and increased attention may be warranted in connection with the higher risk of deforestation although, historically, charcoal consumption in the Asia-Pacific region has been low and in 2002 only reached an estimated 4.5% of woodfuel consumption.

In connection with these changes and in response to increased focus on national carbon emissions, FAO have revised fuelwood and charcoal consumption estimates for all countries (Broadhead et al. 2001). The resulting figures have indicated that woodfuel use in most of the region is falling. The revised estimates show that growth in fuelwood consumption⁵⁴ is continuing in South Asia and the Pacific Islands although in nearly all countries in the region consumption is either falling in absolute terms or growing at reduced rates. Estimates presented in APFSOS suggested that fuelwood demand in the region would increase by 27% between 1994 and 2010 to 1,295 million cubic metres⁵⁵. The recent models, however, suggest that consumption will fall by a total of 11% over this period from 841 to 748 million cubic metres⁵⁶ (Figure 3-1). Of the major fuelwood using countries, consumption is estimated to be falling most rapidly in China and Indonesia with annual rates of reduction of around 2%. In

⁵³ 'Woodfuel' applies to the sum of wood used as fuel ('fuelwood') and wood for making charcoal.

⁵⁴ Consumption of fuelwood, as opposed to wood for charcoal, has constituted over 95% of the region's overall woodfuel consumption during past years. This proportion is expected to fall marginally with increased charcoal use and falling fuelwood consumption but as the latter is dominant it is discussed here instead of the aggregated quantity 'woodfuel' for which figures are shown in Section the Annex,- Section 2-2-1.

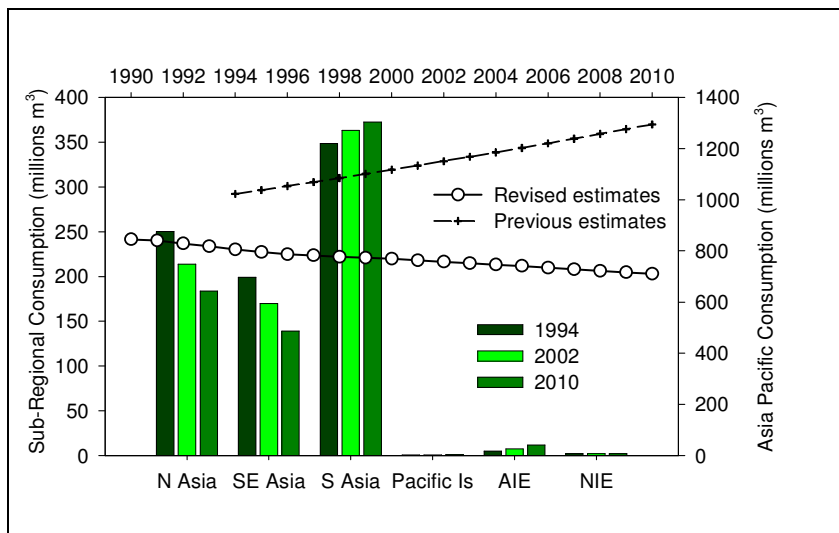
⁵⁵ Calculated using earlier FAO records which, where data was not received from countries, were approximated by scaling long-standing per capita consumption figures by population. Between 1970 and 1998 global reporting rates were only ~20% for fuelwood and ~6% for charcoal. Most records were therefore estimated by FAO.

⁵⁶ The new models use driving variables including income, forest cover and the urban proportion of the population (Broadhead *et al.* 2001).

India, which accounted for an estimated 38% of the region's fuelwood use in 2002, annual growth in consumption is expected to fall in line with the rest of South Asia to lower and lower rates as economic expansion outpaces population growth. With respect to charcoal, although consumption levels are low in all Asia-Pacific countries, the situation differs from that for fuelwood and growth in consumption is estimated at between 0.5% and 0.6% per annum.

Recent developments and analyses have modified the situation and outlook relative to that presented in APFSOS. Allowing markets to function efficiently and improving property rights are, however, still of major importance for the large numbers of woodfuel users in the region. Potential future initiatives outlined by Arnold et al. (2003) include locally managed woodlands, improving access to woodfuel resources and protecting the landless poor, promoting individual land tenure and generating income from woodfuel trade and markets. The main long-term thrust, however, should be to remove people from the grip of fuelwood dependence and its negative impacts on labour availability and health (Arnold et al. 2003).

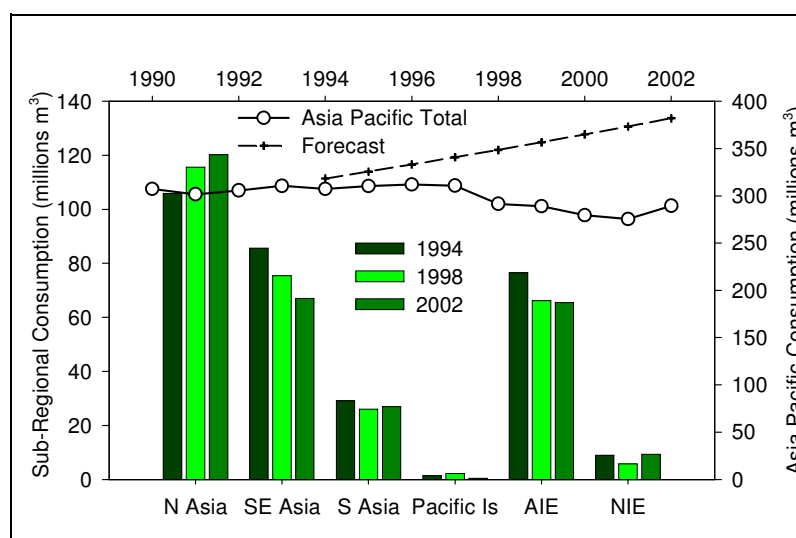
Figure 3-1 *Fuelwood consumption in Asia-Pacific sub-regions*



3.2.2 Industrial Roundwood^{57/58}

Between 1994 and 2002, industrial roundwood consumption outside the region increased by 1.3% per annum whilst Asia-Pacific consumption fell, in net terms, by 6% to 289 million cubic metres in 2002. The forecast consumption of 382 million cubic metres was therefore a considerable overestimate as shown in Figure 3-2. Discrepancies for both consumption and production, which showed similar trends, are likely to have resulted partly from increases in illegal logging during the 1990s and related under-reporting.

Figure 3-2 Industrial roundwood consumption in Asia-Pacific sub-regions



Between 1998 and 2002, reported figures show that consumption fell most sharply in Southeast Asia where illegal logging and institutional restructuring in Indonesia are likely to have had considerable effects on data reporting (Figure 3-2). In the rest of the region, consumption in Japan continued to decline at a long-term rate of around 6% per annum whereas in India a gradual increase was recorded between 1997 and 2002.

In contrast to the overall situation, China's consumption of industrial roundwood increased much more rapidly than expected and by 2002, domestic consumption, at 118 million cubic metres, accounted for 41% of the regional share, compared to a predicted increase to 33% in 2010. Conversely, annual industrial roundwood production fell from 99 to 93 million cubic metres between 1994 and 2002, following the partial logging ban in 1998. Forecasts of an increase to 152 million cubic metres by 2010⁵⁹ are therefore unlikely. Balancing the relative changes in production and consumption, China's imports soared from 6.4 to 25.9 million cubic metres between 1994 and 2002 with the bulk coming from the Russian Far East.

⁵⁷ Roundwood used in the production of other goods, comprising (i) sawlogs and veneer logs (ii) pulpwood and (iii) other industrial roundwood, excluding wood fuel. Measured in cubic metres, excluding bark.

⁵⁸ As production and consumption of IRW and sawnwood have not rebounded since the 1998 crash, the years 1993-1997 and 1997-2001 have been used to demonstrate trends in the appendices. This may be misleading with trade and some other products which have made a recovery since 1998 and in these cases, important developments are identified.

⁵⁹ Under the standard APFSOS forecasting scenario.

At the regional level, despite reductions in trade during the economic crisis, 2002 imports exceeded pre-crisis levels by ~26% with China and other countries in the region countering the effects of Japan's long-term slide in imports. With respect to regional exports, the total in 2002 equalled that prior to the crisis notwithstanding interim fluctuation. New Zealand, however, increased exports rapidly throughout the period and surpassed Malaysia as the region's largest exporter. Aggregate export prices for the Asia-Pacific fell between 1994 and 2002 at an average annual rate of 5% although in 2002 there were slight increases. In 2003, Asian log prices were generally held down by falling consumption in Japan with prices being led by Chinese buyers (ITTO, 2003).

Box 3-3 *Discrepancies in industrial roundwood trade data*

Tables in the Annex,- Section 2-2-1 show results from a comparison of bilateral trade data received by FAO and reported in the FAOSTAT database. For the analysis, all industrial roundwood import and export records received from Asia-Pacific countries in 2001 were extracted where there were also records from the partner country.

Few of the countries included in the analysis reported consistently biased import or export figures. New Zealand comparatively underestimated imports in all cases, with figures reported by partners over eight times higher (predominantly due to differences with Australia). Indonesia over-reported industrial roundwood imports in six out of seven cases with quantities derived from trading partners equalling 80% of imports reported by Indonesia (predominantly due to differences with USA).

With respect to exports, only data from China showed large discrepancies. In over three quarters of cases examined, data from other countries showed higher levels of imports from China than were reported as exports by China itself. This mainly resulted from discrepancies with Japan.

With respect to possible illegal trade, Indonesia's figures did show significant export discrepancies with individual countries. For example, China and Malaysia reported imports of non-coniferous non-tropical timber from Indonesia of 547,000 and 415,000 cubic metres in 2001; corresponding exports were reported by Indonesia of just 3,879 and 299 cubic metres. Non-coniferous tropical roundwood imported by China and Malaysia from Indonesia were, however, reported at 585 and 230 thousand cubic metres, well below Indonesia's reported exports of 1.8 million and 714 thousand cubic metres. On balance, therefore, Indonesia over-reported exports to these two countries by 748 thousand cubic metres. A similar analysis of 2002 data by ITTO (2003) suggested that illegal flows were reflected in trade statistics although this analysis suggests that misclassification may be to blame. However, it is still possible that illegal flows may pass through a second country, recorded as exporter, as has reportedly been taking place between Kalimantan and Malaysia.

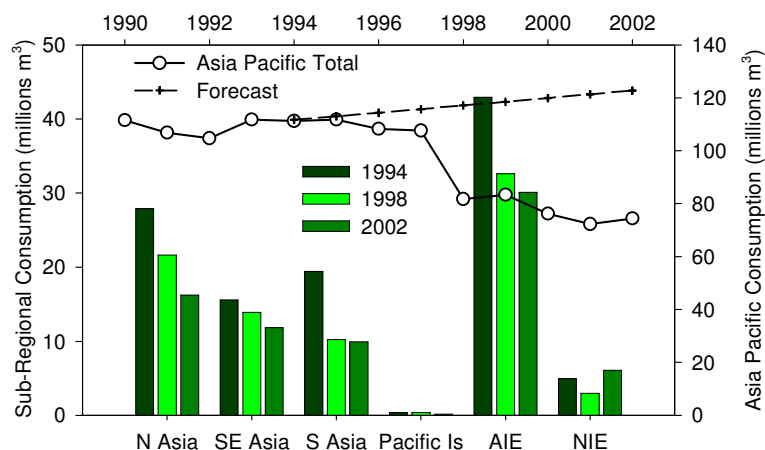
3.2.3 Sawnwood⁶⁰

Sawnwood consumption in the Asia-Pacific region fell by just under a third between 1997 and 2002 whilst for the rest of the world the net reduction was only ~4%. In both cases, major reductions took place between 1997 and 1998, after which consumption climbed slowly in the rest of the world but fell within the region to 74 million cubic metres in 2002. Reductions in

⁶⁰ Wood produced either from domestic roundwood by sawing, with the exception of wooden flooring, which is measured in cubic metres solid volume.

consumption were most severe in Japan, India and China although in China and many of the region's smaller consumer countries, a return to growth was evident by 2002.

Figure 3-3 Sawnwood consumption in Asia-Pacific sub-regions



In contrast to the actual trend in consumption, APFSOS predicted an increase to 123 million cubic metres by 2002 (Figure 3-3). Actual and projected sawnwood production showed similarly diverging trends. The discrepancies are likely to have resulted from increased illegal logging as well as underestimation of the rate of decline in supply of large logs.

Regional sawnwood production fell between 1997 and 2001 and then returned to growth. In China, which accounted for around a quarter of Asia-Pacific production in the mid-nineties, production fell until 2000 but had climbed to 9.4 million cubic metres or 15% of the regional total by 2002. Production in Japan continued a long-term decline at an annual rate of around 6% and in India sawnwood production remained stagnant. Of the larger producers, net increases were only recorded in New Zealand between 1998 and 2002.

Regional sawnwood trade increased rapidly after 1998 although imports, at 21 million cubic metres in 2002, were still below pre-crash levels and close to the forecast figure. China and Japan, the dominant importers in the region, experienced differing trends after the crisis, with China's share increasing to 30% of the regional total and Japan's falling to 48% despite some recovery after 1998. Asia-Pacific exports of sawnwood, after six years of decline, increased rapidly between 1998 and 2002 to around 10 million cubic metres, reflecting trends in Indonesia, Thailand, Australia and New Zealand. China's sawnwood exports, on the other hand, halved between 1997 and 2002. Forecasts that exports would fall between 1994 and 2002 were, despite falling production, forestalled by increased requirements for foreign exchange following the economic crisis.

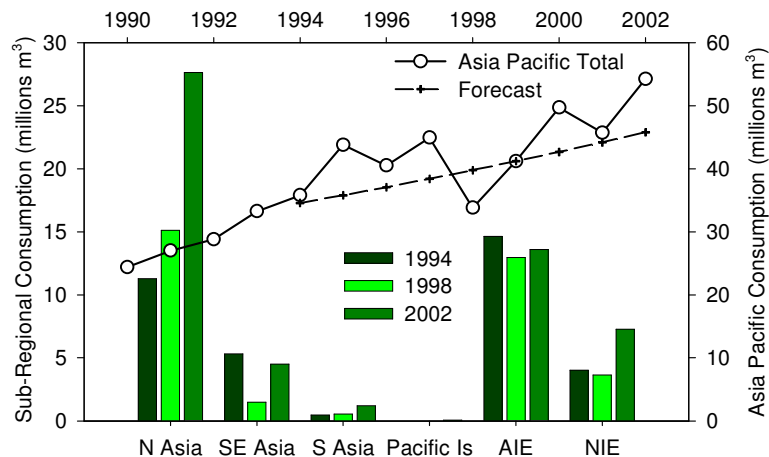
3.2.4 Wood-based Panels⁶¹

Despite falling sharply in 1998, Asia-Pacific production and consumption of wood-based panels were both well above pre-crisis levels by 2002 and had also risen ahead of forecasts (Figure 3-4). Predictions that by 2010 Japan would be matched by China as the region's

⁶¹ These include veneer, plywood and several types of board manufactured from wood particles or fibre. They are reported in cubic metres solid volume.

largest consumer of panels⁶² were surpassed in 1995 and by 2002 China's panel consumption was two and a half times that of Japan. Panel consumption in the Republic of Korea also grew rapidly after 1998 whereas in Japan, consumption in 2002 was well below 1997 levels. With respect to production, regional output increased rapidly between 1998 and 2002 as a result of considerable increases in China and smaller advances in the Republic of Korea, Australia and New Zealand. In contrast, production in Indonesia and Japan fell and Malaysia's contribution increased only marginally.

Figure 3-4 Wood panel consumption in Asia-Pacific sub-regions

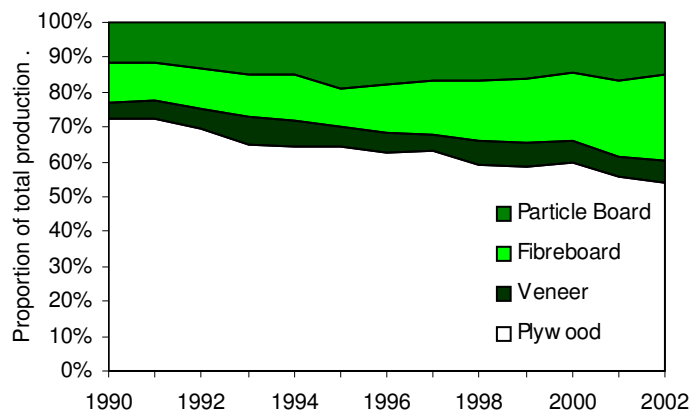


Asia-Pacific dominance in global wood-based panel trade has continued to wane in recent years. Imports were more severely affected by the crisis but by 2002 both imports and exports remained below pre-crisis levels but well above 1994 levels. Japan and China, the region's largest importers showed gradually rising and falling trends respectively. Malaysia and Indonesia continue to dominate regional panel exports although Indonesia's share is falling rapidly and Malaysia's has stagnated.

Aggregate panel export prices, which by 1998 had fallen by 36% from a mid-nineties high, reflecting plywood price falls and increased production of cheaper fibreboard and MDF, had recovered slightly by 2002. With respect to different panel types, plywood production, as a proportion of total wood-based panel production, continued to fall between 1998 and 2002 whilst fibreboard⁶³ production rose (Figure 3-5). Forecasts that particle board production would increase have not materialised and fibreboard, rather than particle board, has absorbed the share relinquished by plywood.

⁶² Under the standard APFSOS forecasting scenario.

⁶³ Sum of hardboard, MDF and insulating board.

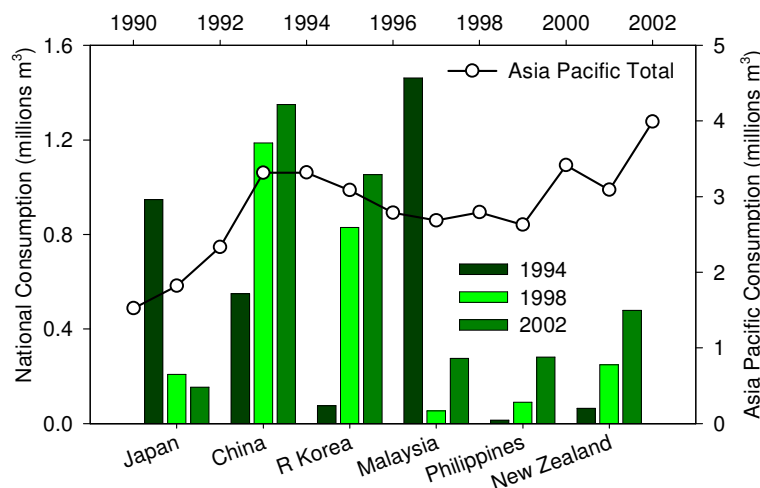
Figure 3-5 Asia-Pacific Wood panel production composition

Veneer

As a result of increases in the main veneer consuming countries in the region, and despite continuing reductions in Japan, regional veneer consumption increased significantly between 1998 and 2002 (Figure 3-6). Production has increased at similar rates although still lags marginally behind consumption. Regional trade has decreased since 1997 as a result of falls in exports from Malaysia and imports to China.

Figure 3-6 Veneer consumption in Asia-Pacific countries

(Countries shown accounted for 90% of regional consumption in 2002)



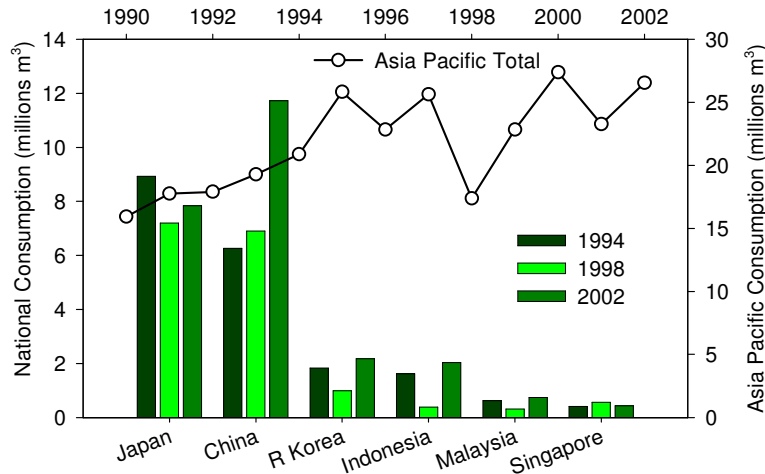
Plywood

Despite some fluctuation, Asia-Pacific plywood consumption in 2002 had risen beyond pre-crisis levels (Figure 3-7). China's increasing consumption and Japan's stable trend have dominated the regional picture although increases in some of the smaller consuming countries have also had an upward effect. Production has followed a similar although less erratic course with China's output increasing rapidly, Japan's and Indonesia's falling and Malaysia's

stable. Regional imports and exports, although climbing slowly, have remained well below pre-crash levels. Plywood prices fell rapidly between 1997 and 1998 since when only small net increases have been registered (ITTO, 2003).

Figure 3-7 Plywood consumption in Asia-Pacific countries

(countries shown accounted for 94% of regional consumption in 2002)

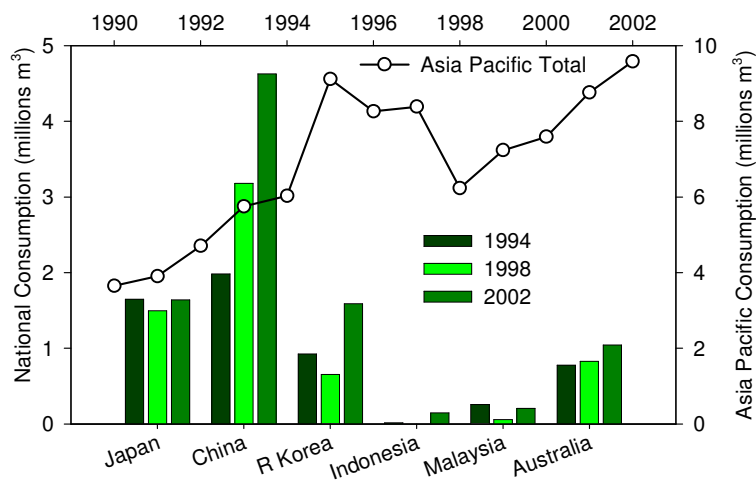


Particle Board

Driven mainly by China, and the Republic of Korea, Asia-Pacific consumption of particle board has increased rapidly since 1998 (Figure 3-8). Production has followed a similar pattern whilst imports, driven by China and the Republic of Korea also increased rapidly after 1998. Exports, which increased continually until 2000 subsequently fell as a result of reductions from Indonesia and Malaysia.

Figure 3-8 Particle Board consumption in Asia-Pacific countries

(countries shown accounted for 97% of regional consumption in 2002)

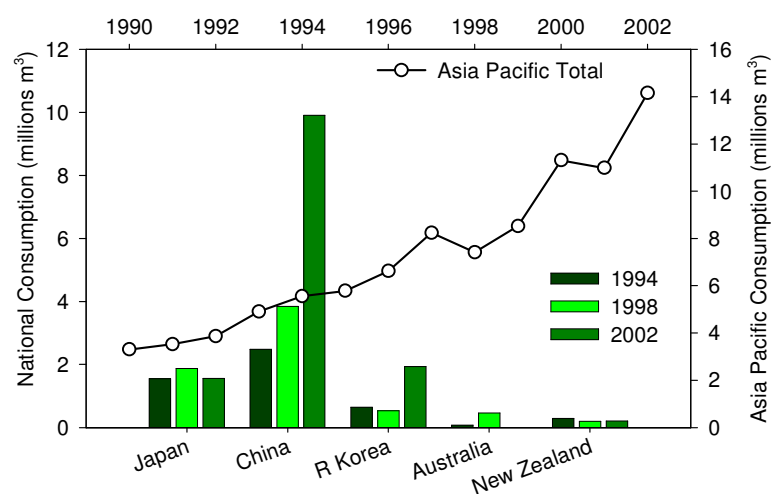


Fibreboard⁶⁴

Dominated by growth in China, fibreboard production and consumption in the Asia-Pacific region have climbed rapidly since 1998 (Figure 3-9). Consumption growth in the Republic of Korea has also been rapid whereas in Japan, New Zealand and Australia, consumption has been stable or falling. Trade in fibreboard has continued to increase steadily over recent years with imports driven by China and Korea and exports by Malaysia, New Zealand and Australia. Fibreboard prices have fallen at rapid but decreasing rates since 1994.

Figure 3-9 Fibreboard consumption in Asia-Pacific countries

(countries shown accounted for 94% of regional consumption in 2002)



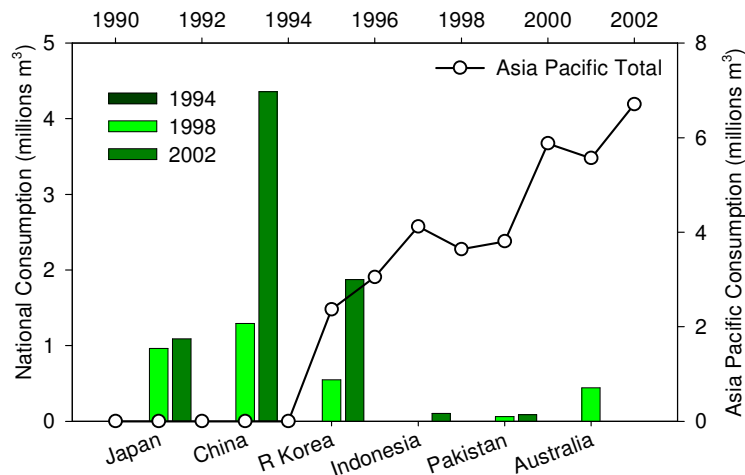
Medium Density Fibreboard

Regional production and consumption of MDF, both driven by China and the Republic of Korea, continued to climb steeply after 1998 (Figure 3-10). Production in Australia and New Zealand also continued to increase rapidly whereas Japan's production, and consumption, showed only marginal growth. Imports have climbed steeply since 1998, driven by China, the Republic of Korea and, to a lesser extent Japan. Exports, which were less affected by the economic crisis, have shown marginally slower growth driven by Malaysia, Australia, New Zealand and Thailand. MDF prices have fallen at decreasing rates since 1995.

⁶⁴ Fibreboard is sum of hardboard, Medium Density Fibreboard (MDF) and insulating board.

Figure 3-10 Medium Density Fibreboard consumption in Asia-Pacific countries

(countries shown accounted for 96% of regional consumption in 2002)

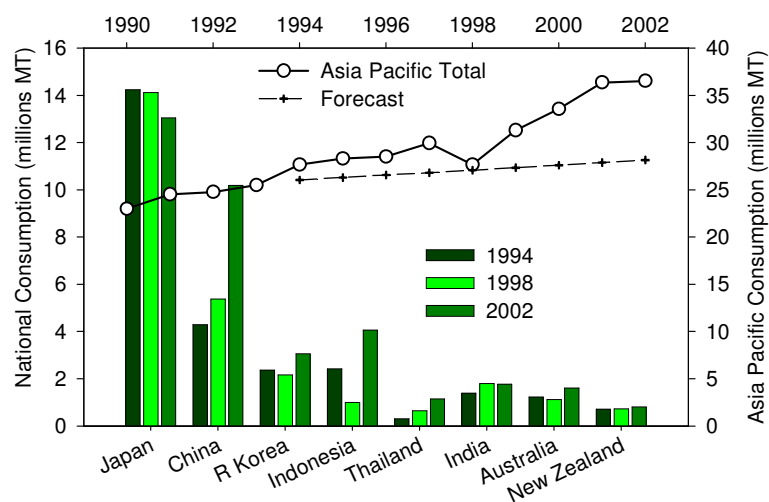


3.2.5 Wood Pulp

Following falls in 1997, annual growth in regional wood pulp consumption between 1998 and 2002 considerably exceeded the forecast rate⁶⁵ (Figure 3-11). Over the same period the region's share of global woodpulp consumption rose from 17 to 22%. Of the main consumers, only in Japan and New Zealand was consumption in 2002 below 1997 levels and although falling, Japan's share remained dominant. Since 1998, the most significant increases in production have been in China and Indonesia, although in all major producing countries except Japan and the Republic of Korea, production has been increasing.

Figure 3-11 Wood pulp consumption in Asia-Pacific countries

(countries shown accounted for 98% of regional consumption in 2002)



⁶⁵ Business as usual scenario.

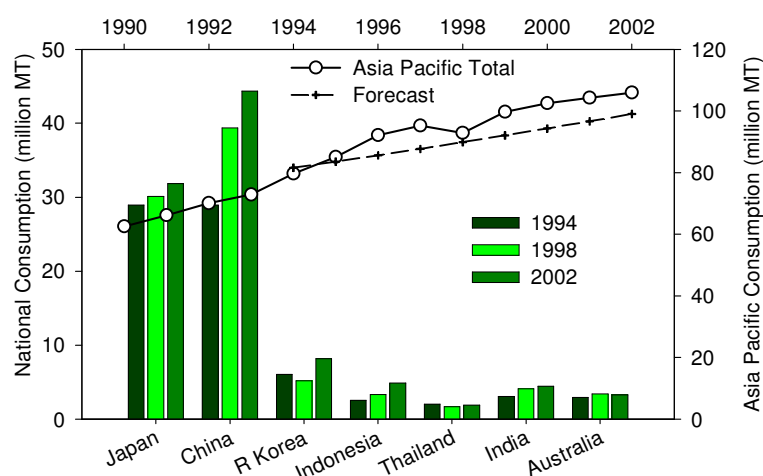
Imports in the region continued to increase steeply after 1999 with China and the Republic of Korea's shares rising, Japan's falling and other major importers showing relatively even trends. The bulk of imports were from Canada and Indonesia and also, in China's case, Chile. Although at considerably lower levels, exports also increased despite large reductions registered in 1999 by Indonesia and New Zealand, the region's largest exporters. Asia-Pacific wood pulp export prices in 2002, hit their lowest point since 1993 although the trend has been cyclical for many years.

3.2.6 Paper and Paperboard

Global consumption of paper and paperboard increased at an average annual rate of 2% between 1998 and 2002. In comparison, growth rates in the Asia-Pacific region were well over 3% and by 2002, regional consumption stood at 106 million metric tonnes, compared with a forecast of 99 million (Figure 3-12). All major consumers increased consumption until 2002 with the highest rates of growth in China and the Republic of Korea. In similarity with consumption, paper and paperboard production forecasts fell slightly short of the reported figure of 99 million tonnes. Of the larger producers, output grew fastest between 1998 and 2002 in China and the Republic of Korea although there were also increases in India and Japan.

Figure 3-12 Paper and Paperboard consumption in Asia-Pacific countries

(countries shown accounted for 93% of regional consumption in 2002)



Imports were predicted to fall and exports to remain level between 1994 and 1997, however, trade prior to the economic crisis increased much faster than expected and, by 2002, imports and exports were 30 and 55% above 1994 levels respectively. However, between 1999 and 2002, imports stagnated and exports fell. China's imports, accounting for 55% of the Asia-Pacific share in 2002 remained relatively level between 1999 and 2002, whilst imports by other major consumers continued to show highly varied trends. Of the four main exporters, only China increased exports between 1999 and 2001 whereas exports from Indonesia and the Republic of Korea declined steeply and Japan's nose-dived in 2002. In contrast, exports from Australia and New Zealand showed strong growth between 1997 and 2002.

3.3 WOOD-BASED FOREST PRODUCTS TRADE AND MARKETS: APFSOS FORECASTS AND THE REVEALED SITUATION

Overall, the forecasts considerably overestimated consumption and production of industrial roundwood and sawnwood in the region. In contrast to this overall trend, and as a result of rapid economic growth, China's industrial roundwood consumption was underestimated. Wood-based panel consumption was overestimated in most of the region, but again there were considerable underestimates for China. Overall, consumption forecasts for less processed panel types such as veneer and plywood tended towards overestimation whereas for more processed types, such as MDF and fibre board, consumption was underestimated.

Although forecasts were closer than for other product groups, consumption of paper and paperboard was underestimated for most of the region with the exception of advanced and newly industrialised economies where less paper and paperboard was consumed than expected. Wood pulp consumption was underestimated across the region.

With respect to trade in forest products, imports and exports were above forecasts in the majority of cases although for sawnwood, increased levels of exports following the Asian economic crisis were not foreseen.

These patterns suggest that economic restructuring and changes in the resource base have favoured more processed products and that there has been greater than expected focus on trade. Reported industrial roundwood and sawnwood figures are, however, likely to have been below actual volumes given increases in illegal logging and trade during the 1990s and early 2000s. This would mean that forecast overestimates mentioned above may be smaller than indicated. Nonetheless, findings suggest that the models used for forecasting did not capture variation related to economic transitions in the region and the related forestry sector developments favouring more processed products e.g. the receding forest frontier, increased capital intensity, specialisation, better skilled labour and mechanisation favouring lighter more uniform products, etc. (Hyde, 2004). The models also failed to capture trends related to unforeseen events such as the Asian economic crisis, the rapid growth of China, continued slow growth in Japan, political upheaval in Indonesia, etc. These occurrences are likely to be impossible to predict accurately although scenarios may be used in future efforts to estimate the effects of looming possibilities.

4 STATUS, TRENDS AND APFSOS PREDICTIONS – FOREST MANAGEMENT

4.1 PROGRESS WITH SUSTAINABLE FOREST MANAGEMENT

A major obstacle in charting progress with sustainable forest management (SFM) resides in the complexity of assessing movement towards a continuum of objectives spanning the full range of forest types and encompassing economic, environmental and social functions. Related to this complexity is the continuing lack of consensus as to an encompassing definition of SFM and how it should be achieved, as was noted in APFSOS. This uncertainty combined with tacit disagreement over related costs and benefits, has, in several countries, led to obfuscation whilst unsustainable forest management practices and ‘forest mining’ continue. Although widespread in the region, clearly unsustainable forest management is particularly evident where weak governance and political instability erode impetus to manage forests for longer-term benefits.

To assess progress towards the multiple objectives of sustainable forest management, Criteria and Indicators for SFM have been developed and several certification schemes are available to endorse the sustainability of field-level management. Criteria for sustainable tropical forest management developed by ITTO were endorsed by member countries in 1992 whilst a number of other countries in the region are members of the Montreal Process on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests⁶⁶. In 1999 a process to develop criteria and indicators for dry forest management was also launched and guidelines are currently being drafted (Brown and Durst, 2003). Progress with respect to targets related to these indicators will form the basis of the 2005 FAO Forest Resource Assessment and should thus to some extent resolve the problem of whether sustainable forest management is in fact being achieved.

With respect to forest management certification, the scheme run by the Forest Stewardship Council is of global prominence despite poor representation in the Asia-Pacific region. In 1998 an alternative scheme was established by the Malaysian Timber Certification Council (MTCC), partly in reaction to concerns that links between trade and environment policies could be used to justify protectionism by importing countries (Ministry of Primary Industries, Malaysia, 2003). Similarly, Lembaga Ecolabelling Indonesia has developed a certification programmes and although nationally based schemes may better suit local conditions, it remains to be seen whether they can secure the confidence of industry and consumers. In Myanmar and New Zealand, schemes are also being developed and in Australia, the Australian Forestry Standard was approved in 2002 and implementation is currently underway⁶⁷. The ISO 14001 system has also made some impact in the forestry sector although disaggregated figures for forest products related companies are not readily available.⁶⁸ The system, however, differs from forest management certification in that an organization’s environmental management system is certified and the applicant defines environmental performance requirements.

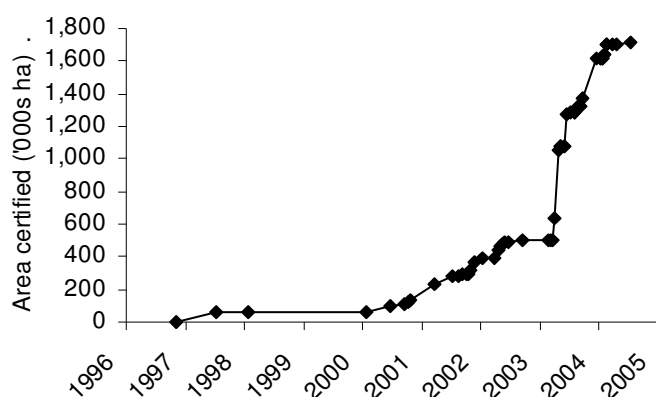
⁶⁶ China, Japan, Australia, Republic of Korea and New Zealand.

⁶⁷ <http://www.forestrystandard.org.au/>.

⁶⁸ International Organisation for Standardization (<http://www.iso.ch/iso/en/iso9000-14000/index.html>).

Forest management certification, although not fully identified with SFM, provides a ready means of assessment of progress in implementation. FSC certification has shown rapid growth since 2000 (Figure 4-1), although the area covered remains a very low proportion of the region's total forest area. Nevertheless, the 64,000 hectares under FSC certification in 2000 was well above the maximum of 10,000 hectares under improved forest management predicted in APFSOS. The 2004 figure of 1.7 million hectares represents average annual growth since 2000 of around 120%. Future expansion at this rate is likely to secure an increasing proportion of the 267 million hectares or 38% of the regions forest area that FRA 2000 indicated was under some sort of forest management plan.

Figure 4-1 Cumulative area under FSC certification in the Asia-Pacific region



Few countries in the region have so far become involved in FSC certification and plantations dominate, accounting for 76% of the forest area certified (Table 4-1). The reason the distribution of certification does not reflect the relative abundance of different forest types results from the greater difficulty and questioned profitability of certifying natural forest. The existing lack of more sophisticated management in natural forests and entrenched systems of exploitation and trade also frequently pose barriers to acquiring certification.

Table 4-1 Area and number of FSC certified areas in the Asia-Pacific region

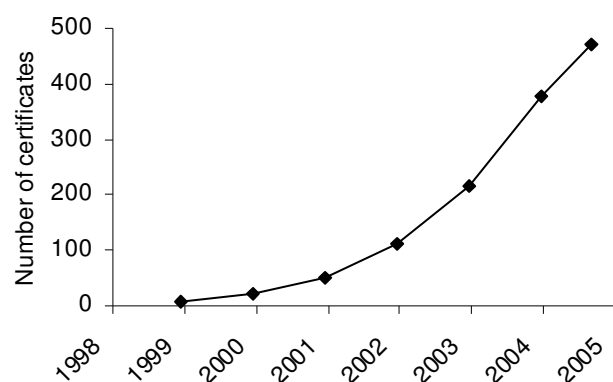
	Forest area (ha) and number of areas			Total area
	Natural forest	Semi-natural, mixed plantation & natural forest	Plantation forest	
Australia	-	-	657,694 (3)	657,694 (3)
China	-	940 (1)	5,237 (1)	6,177 (2)
Indonesia	90,240 (1)	-	-	90,240 (1)
Japan	5,703 (2)	157,722 (7)	14,070 (9)	177,495 (18)
Malaysia	64,808 (2)	-	12,434 (1)	77,242 (3)
Philippines	-	14,800 (1)	-	14,800 (1)
Sri Lanka	-	-	16,251 (4)	16,251 (4)
Thailand	-	-	921 (1)	921 (1)
New Zealand	36,867 (2)	-	592,205 (16)	629,072 (18)
Solomon Islands	-	39,402 (1)	-	39,402 (1)
Total	197,618 (7)	212,864 (10)	1,298,812 (35)	1,709,294 (52)

Source: Forest Stewardship Council, 09/09/04 (<http://www.fsc-info.org/english/dbmaine.htm>).

Reflecting demand for timber from certified sources, chain of custody certificates provide an additional indication of the possibility of future expansion of certification and sustainable forest management. Chain of custody certificates, which allow certified wood products to be traced to the consumer, have been issued at a rapidly increasing rate since 1998 and are held by a wide range of countries in the region (Figure 4-2, Table 4-2). In relation to trade in products from sustainably managed sources, the goal of ITTO member countries to achieve exports solely from sustainably managed sources by 2000 was not achieved. Given current progress with SFM in the Asia-Pacific region, meeting such a target will probably take many more years even if political will is gained.

To accelerate uptake of forest management certification, a 'stepwise' approach is being adopted and it is hoped that Japan and China as well as other countries in the region will, with support from NGOs and international organisations, increasingly seek certification to facilitate supply of products to Europe and North America (Jim Sandom, Nigel Sizer pers. comm.).

Figure 4-2 *Cumulative number of chain of custody certificates in the Asia-Pacific region.*



As a component of SFM, efforts to promote Reduced Impact Logging have provided a further avenue for advancement. Measures to improve the efficiency of harvesting operations and minimise forest damage are not only of environmental importance but can also reduce costs and improve the efficiency of harvesting operations (Applegate, Putz and Snook, 2004). Reduced Impact Logging has been endorsed by the Asia-Pacific Forestry Commission and ITTO have financed a number of projects in Malaysia and Indonesia and are also setting up a regional logging school to train foresters in relevant techniques.

Codes of Practice for forest harvesting (CoP) have also been supported by the Asia-Pacific Forestry Commission to address SFM in natural forests. Following development of a regional level code of practice in 1999, many countries in the region have established or are in the process of establishing corresponding national level codes (Brown and Durst, 2003). SFM has also been implemented in a number of countries through direct payment and also through the model forests programme, designed to demonstrate SFM in action (Brown and Durst, 2003). Survey and review of cases where SFM is actually practiced have also provided a pragmatic addition to more general efforts to promote SFM although qualifying sites remain few and far between (ITTO in progress).

The future pace of certification will undoubtedly hasten and although there has been doubt cast over the willingness of consumers to pay associated premiums, national and regional moves to prevent the import of uncertified timber may act in lieu. Such moves could, however, force existing suppliers of timber from unsustainably managed sources to focus on buyers indifferent to management standards. In this respect it has been suggested that even donors are losing interest in sustainable forest management (Anon, 2003) and that, with the decline in production from natural forests, many regional governments also believe forestry to be of ebbing importance (Brown and Durst, 2003).

Table 4-2 *Chain of Custody certificates held in Asia-Pacific countries in 2004*

	Total certificates
Australia	4
China	70
Hong Kong	3
India	3
Indonesia	26
Japan	183
Korea	1
Malaysia	39
New Zealand	52
Philippines	2
Singapore	4
Sri Lanka	7
Taiwan	4
Thailand	12
Viet Nam	60
Total	470
Global share	14%

Source: Forest Stewardship Council, 09/09/04.

Such uncertainty and slow implementation in the region make the near-term future of SFM for natural forests look bleak especially with current rates of natural forest clearance. Whether SFM makes bigger impacts in the future may be more dependent on the rate at which economic development proceeds rather than the effectiveness of direct forestry related efforts. A host of factors including, greater wealth, increased institutional capacity, better regulatory environments, more secure tenure and concomitant reduction of pressure on forests for subsistence and fiscal requirements are likely to provide a more fertile environment for proliferation of sustainable forest management.

4.2 *COMMUNITY-BASED FOREST MANAGEMENT*

Progress with community-based forest management (CBFM) has remained debatable in recent years and, with opinions differing widely with respect to the current state of play, a true assessment of broad scale progress is difficult. On the one hand, reports indicate that many people in the region benefit from CBFM, which is becoming more sophisticated and increasingly institutionalised, whilst the position of communities within national systems is strengthening (e.g. Kaimowitz, 2003; Colchester et al. 2003). Community forests have also provided a resource with which villagers are familiar and which can therefore form a bridge to improved livelihoods where other options may require greater and more culturally unsettling interventions. On the other hand, the proportion of national and regional forest resources

managed by communities remains small in most countries and, in all but a few cases, it is only degraded or poor-quality forests that are released for community management. In many countries it is also the case that community-based forestry is not happening at all and in those cases where it is, it is often largely only under project support, as in India and the Philippines (Saigal, 2004; Pulhin, 2004). Furthermore, benefits derived by local people have varied widely and evidence shows that resource degradation, inequity and financial invariability can and do occur under CBFM (e.g. Shackleton et al. 2002; Kaimowitz, 2003, Quintos-Natividad et al. 2003). Measures to improve the situation may be as simple as ensuring communities receive adequate benefits and often tie in with general development efforts such as improving links with markets. However, although it is possible for communities to benefit from attribution of forest rights, the rate of change in the future, given the need for outside intervention and the reluctance of governments, will depend largely on the determination of the donor community although current devolution and land allocation efforts may also assist (Section 2.3.2).

In India, Nepal and the Philippines community-based forest management initiatives have a longer history than in other parts of the region (Brown and Durst, 2003). In India, Joint Forest Management has been implemented through 84,632 Village Forest Committees in more than 17.3 million hectares of degraded forests, or 25% of the total area of forest and other wooded land (Saigal, 2004; FAO, 2001). As a result, large areas of forest have been regenerated, civil society has been strengthened and incomes have often increased. The sustainability of JFM is in question, however, as funding in most states is through externally assisted projects whilst non-assisted groups have often become demoralised. JFM also lacks a firm legal basis in all but a few states and real devolution may only occur when local communities are aware of and able to assert their rights. This is likely to be a gradual process that could either be accelerated or stalled by authorities where community empowerment has yet to reach a critical mass (Saigal, 2004).

In Nepal, over 1.6 million hectares of forest, or 28% of forest and other wooded land, have been placed under the management of more than 13,000 Forest User Groups. Community forestry has, however, been threatened since 1998 when central authorities began moves to regain control of forest resources through measures including increased taxation and amending the Forest Act to extend the control of district forest offices. Actions taken in the Supreme Court by the Federation of Community Forest Users' Nepal (FECOFUN), the largest civil society organisation in Nepal, have, however, been successful in reducing proposed levels of taxation. Nonetheless, the Forest Department have been able to enforce proposals through direct administrative control despite the legal uncertainty of policy reformulations (Shrestha and Khanal, 2004). The current situation could therefore go either way although the power balance in Nepal appears reasonable in comparison with other countries.

In the Philippines, about 5.7 million hectares of forest and non-forested forestlands are covered by CBFM with an increase to 9 million planned by 2008 (Pulhin, 2004). Physical accomplishments in forest rehabilitation and protection have not, however, necessarily improved the welfare of communities and in most CBFM sites viable livelihoods have been difficult to find given the marginal land, weak links to markets and limited state support. Inconsistency in application of policies regarding resource use rights has also led to uncertainty and insecurity in communities and increased empowerment has been hindered by continuing state control and domination by elites. Results are, however, mixed and, in some provinces, outcomes with respect both to forest management and socio-economic development have been positive.

The key to sustainability in many areas in the Philippines is now concerned more with ensuring adequate benefits to communities rather than controlling resource loss.

Recent changes potentially supporting CBFM in other countries have included global trends towards devolution of government to local levels. It has been found, however, that the effects of devolution are not always beneficial and where local users are excluded from forming, implementing and evaluating devolution policies, governmental control over resources has increased (Edmunds and Wollenberg, 2003; Section 2.3.2). The difficulty in securing rights for local people has been somewhat addressed by the formation of CBFM networks over recent decades. The potential of these networks to promote community forestry, which have received significant focus over the past twenty years, has, however, been brought into question given that links to the communities themselves have often been poor (Colchester et al. 2003). There is thus a realisation that future efforts need to link existing networks with emerging and future local networks so that change may be driven by local rather than international voices.

Other changes suggesting future expansion of CBFM include the fact that many forest areas in the region are already or will soon be degraded and, given the trend of Governments only releasing forest to communities when this has occurred, community forestry may find a more agreeable environment for proliferation. For example, following withdrawal of concession holders from logged forest in Indonesia, policy allowing communities to replant some of the concession areas has been developed, however, the situation is expected to take some time to develop (Yanti Kusumanto, pers. comm.). The challenge in these cases will be to ensure that communities receive adequate benefits for their efforts and are not exploited to improve forest condition. In India, however, it has been suggested that the success of JFM is inversely related to the value of the resource, which determines the level of participation that local communities are allowed (Ravi Prabhu, pers. comm.). Whether CBFM proves therefore sustainable or whether governments squeeze communities out will depend on aspects of development over which outside agencies may have little control.

4.3 THE ROLE OF PLANTATIONS

4.3.1 Asia-Pacific plantation resources

In the Asia-Pacific region, 91% of the plantation area of 113 million hectares is contained within five countries: China (45.1 million ha), India (32.6 million ha), Japan (10.7 million ha), Indonesia (9.9 million ha) and Thailand (4.9 million ha) (FAO, 2001). In general, the majority of Asia's industrial plantations are less than 15 years old owing to the recent increases in planting (Brown and Durst, 2003). In Indonesia and Thailand, large proportions of the plantation area are accounted for by rubber trees (35 and 43% respectively) and teak (15 and 17% respectively) with smaller areas of Acacia and Eucalyptus. Of the five main countries, only India has significant proportions of Acacia and Eucalyptus (6.4 and 8 million ha respectively) with the remainder made up of broadleaves other than rubber and teak, which together account for only 10% of the total area. In China, two-thirds of plantations are coniferous and more than 80% are industrial species although of the total plantation area a significant proportion are agroforests. In contrast to South Asia where plantations focus on social and environmental needs, significant efforts have been devoted to management of high-yielding plantations in China (FAO, 2001).

In New Zealand, 90% of the 1.8 million hectares of plantation forest is made up of *Pinus radiata*, the remainder being mostly *Pseudotsuga menziesii* and *Eucalyptus*. Around 60 % of production is exported and, with large areas of plantation approaching maturity, annual wood availability is forecast to increase from 18 million cubic metres in 2000 to more than 30 million cubic metres by 2010 (FAO, 2001). Despite more recent shifts to blue gum, Australia's plantation estate of 1.7 million hectares is similarly composed primarily of *Pinus radiata* with other softwoods making up over 70% of the total area and *Eucalyptus* the bulk of the remainder. In 2000, Australia's annual wood harvest totalled around 21 million cubic metres, divided evenly between coniferous and non-coniferous wood. Australia's plantation estate has also been expanding rapidly although at a decreasing rate since 2000 and exports are expected to increase significantly as plantations mature (Australian Department of Agriculture Fisheries and Forestry, 2004). The Plantations 2020 Programme, launched in 1997, is currently being supported by the government with the aim of increasing the area of plantations in Australia to 3 million hectares by 2020 (see Section 2.7.3).

The Pacific Islands constitute a small proportion of the regions plantation resource with most of the area concentrated in Fiji, Papua New Guinea and the Solomon Islands. In many areas, the plantation sector has been beset by problems including fire, pests and disease, cyclones, restrictive customary land tenure systems and poor establishment. In Fiji, however, plantations have been aggressively developed in past years and a substantial industry producing and exporting wood products has developed (FAO 2001).

China has been implementing six major forestry programmes since 2001. The majority are aimed at protection, erosion control, preventing desertification, land rehabilitation and wildlife conservation (see Section 2.7.1). In contrast, the 'High-yield timber plantation development program' aims to supply 130 million cubic metres per annum to resolve projected wood supply shortages and in 2002, 7 million hectares of plantations were reportedly established (Brown and Durst, 2003). For comparison, China's consumption of industrial roundwood in 2002 was around 118 million cubic metres with 22% of this imported.

India's current National Afforestation Programme, launched in 2002, aims to increase forest/tree cover to 33% by 2010 from the 2000 level of 22%. Much of the planted area, however, will be for non-industrial purposes or will go towards filling the current domestic timber deficit (see Section 2.7.4). In Viet Nam, the Five Million Hectare Reforestation Program is aiming to re-establish or rehabilitate 5 million hectares of forest by 2010 to increase forest cover and enhance ecological stability while expanding income opportunities for the rural population. Around one million hectares of fast-growing plantations are planned, with most of the remaining area being degraded natural forest targeted for rehabilitation (Brown and Durst, 2003).

4.3.2 Change in plantation area – APFSOS predictions

APFSOS estimated the area of plantations in the region, excluding AIEs, at between 60-65 million hectares with 40 million for industrial purposes and the remainder fulfilling environmental roles. Predictions were that by 2010 industrial plantation area would increase from 40 to 64 million hectares, the majority in South and Southeast and North Asia. The annual planting rate was estimated at 1.5 million hectares, with much of the increase in China, India and Indonesia. Table 4-3 shows that by 2000, plantation area in the region had

increased to 54 million hectares and 41 million hectares excluding AIEs. This minor increase is likely to have been the result of discrepancies between data sets and known difficulties in obtaining accurate plantation statistics rather than a reflection of the actual increase. With respect to total plantation area (Table 4-3), which includes non-industrial plantations and draws on sources of information additional to official estimates, the annual planting rate was 3.4 million hectares. The bulk of the increase was concentrated in China (1.2 million/yr), India (1.5 million ha/yr) and Indonesia (271 thousand ha/yr).

Table 4-3 *Asia-Pacific plantation area and annual planting rate by sub-region*

	Plantation area (000 ha)	Annual planting rate (000 ha)	Total plantation area (000 ha)	% of Asia-Pacific Total
AIEs	13,267	0	13,267	11.7
NIEs ¹	0	0	0	0.0
North Asia	39,876	1154	45,083	39.8
SE Asia	266	686	19,972	17.6
South Asia	405	1571	34,652	30.6
Pacific Islands	96	15	257	0.2
Asia-Pacific	53,910	3427	113,231	100.0

1 – No direct reports of plantation area were given in FAO 2001 for the NIEs (Republic of Korea and Singapore) although 21% (1.3 million ha) of the Republic of Korea's total forest was reported to be plantation.

Source: FAO (2001).

4.3.3 Future Supply and Demand

There has been considerable discussion over past years of a forthcoming glut of plantation wood on world markets. Leslie (2003) estimates that by 2010, the global industrial wood supply and demand balance will move towards or into surplus, bringing low and perhaps falling prices and cut-throat competition. Within the region most of the plantation wood is expected to come from maturing sources in Australia and New Zealand but also from recently established fast-growing plantations in North and South Asia and Indonesia. The bulk of the oversupply is expected to be in softwoods. As an example, Australia's export of woodchips and particles in 2001, at 10.5 million cubic metres, equalled 26% of the region's consumption. Asia-Pacific woodchip export prices have decreased at 7.5% per year since 1995 and paper and paperboard export prices at 3.0% per year over the same period. Therefore, unless new markets are found for greater volumes of wood coming on line, the situation certainly suggests that new supply will not be welcomed.

Running contrary to this opinion, questions have been raised over whether plantation supply will keep pace with declining natural forest production and growing consumption (Waggener, 2001). The results of this analysis suggested that timber supply would be insufficient to replace reductions in output from natural forest. Consumption, however, was based on FAO projections that have since proved well in excess of recorded figures (Section 3.2.2). Increased rates of road building (Section 2.4.1), logging in protected areas and the slow progress of SFM in the region may also mean that harvests from natural forest, and overall production, will be further sustained.

FAO projections of industrial roundwood supply from forest plantations⁶⁹ indicate that around 56% of the region's actual industrial roundwood production of 252 million cubic metres came from plantations in 2000. The projected production of industrial roundwood from plantations in 2010 of 285 million cubic metres will come close to 2002 industrial roundwood consumption of 289 million cubic metres; a figure which is currently falling (Brown, 2000). Furthermore, at 56%, the proportion of industrial roundwood supplied from plantations is already well above predictions that suggested an increase from 32 to 46% between 2000 and 2020 (ABARE-Jaakko Pöyry, 1999).

Given falling regional consumption of industrial roundwood and sawnwood since 1997, only modest increases in wood-based panel consumption and an average reduction in industrial roundwood export prices of close to 5% per annum since 1993, the future market situation could become highly competitive. Wood pulp consumption has, however, been increasing at 4% per annum between 1997 and 2002, albeit with falling prices (Sections 3.2.5), whilst paper and paperboard consumption increased at 2.3% per annum during the same period (Section 3.2.6).

The situation is thus likely to create challenges for producer countries. Possible courses of action include developing new markets, reversing trends of substitution of wood products for synthetics and ensuring that consumer needs are met. In Australia, the suggestion has been made that the vast majority of plantation wood could substitute for native forest sawn timber and wood chips, as happened in New Zealand after the logging ban on state owned forest in 2000 (Clark, 2002). In New Zealand, harvests and exports have been cut back due to poor export markets and the strength of the NZ dollar (New Zealand Ministry of Agriculture and Forestry, 2004). In both countries, however, investments in plantations have slowed in recent years and harvests could be postponed to avert potential over-supply.

With China's economy having had straight growth of 9.7% per annum between 1991 and 2002, a leading question amongst producers, given the situation described above, is whether domestic sources in China can supply future needs given the high levels of growth, the huge size of the market and the wood supply deficits caused by the logging restrictions in natural forests. China, however, already has huge plantation stocks and establishment programmes and although questions over plantation quality remain, the future will depend partly on investment in new capacity for manufactured board production to absorb plantation timber and provide a substitute for imports (Adams, 2002).

Despite potential oversupply, subsidies for plantation establishment are continuing and forest policies are almost everywhere in favour of the reverse situation (Enters and Durst, 2004). In the Philippines, loans and tax exemptions are offered to promote the establishment of industrial forest plantations and seedlings are commonly provided free of charge, as, for example, in Sri Lanka (Brown and Durst, 2004). The high rate of plantation establishment in the region certainly does not suggest that notice is being taken of the potential oversupply. If new markets are not found, the effect of plantation subsidies may prove simply to have been to provide rural employment given that profits may be wiped out by falling prices. For this reason, Adams (2002) suggested 'Growing the markets before growing the wood'.

⁶⁹ Under the high planting rate scenario, which coincides most closely with recent developments: new planting at the 1994 rate for 10 years, with this rate reduced by 20 percentage points at 10 yearly intervals (plus replanting of all existing areas after harvesting).

There are, however, considerable local shortages in the region. In India, the private sector is desperate to secure rights to establish plantations on degraded state forestland but Government reluctance to release land and ceiling limits on landholding size are currently preventing significant expansion (S.N. Rao, pers. comm.; Pande and Pandey, 2004). Similarly in Thailand and Lao PDR, plantation sources of wood are in short supply due to lack of investment, poor management and poor policy environments. In Malaysia, the government is looking to establish large-scale forest plantations in degraded forestlands in response to concerns over raw material supply (Shamsudin Ibrahim, Woon Weng Chuen, pers. comm.). Similarly in Indonesia, seventeen of twenty-six provinces have a timber deficit (Jim Roshetko, pers. comm.).

There should also remain some reservation over predictions of massive future supply given that significant uncertainty exists over plantation resources due to lack of accounting for mortality or lack of information regarding age profiles and management (FAO, 1998). Furthermore, a comparison of FAO data sets over a number of years demonstrated that the lack of data poses a serious constraint to policy formulation and management in the sector and that until the forest plantation database is improved, analysis on future scenarios may not provide a true assessment of forest plantation potential (Del Lungo, 2001).

4.4 TREES OUTSIDE FORESTS

With the exception of agricultural tree crops, quantitative assessments of trees outside forests remain scarce due to the difficulty in measuring such a widely and unevenly distributed resource. The FAO Forest Resource Assessment is, however, planning low intensity assessment of all forest resources, including trees outside forests, in the Philippines, Viet Nam and Bangladesh during the next few years but, with the exception of agricultural tree crops, imprecise data will be the norm in the region for the foreseeable future.

The potential supply of wood and fibre from trees outside forests in the region is, however, huge, having been estimated at 875 million cubic metres per year compared to Asia-Pacific roundwood production of 1.1 billion cubic metres in 2002 (FAO, 1998). Between 1994 and 2010, the area of agricultural tree crops⁷⁰ was predicted to increase at 5.9% per annum from 15 to 60 million hectares. At the same time, the area of other wooded land⁷¹ was projected to fall slightly, through reversion to forest, plantation establishment and conversion to agriculture, whilst permanent crop areas likely to contain trees, either scattered or as crops, were expected to increase. An increase in the abundance of trees outside forests, besides agricultural tree crops, was therefore expected.

With respect to available statistics⁷², between 1998 and 2002, the area of coconuts, rubber and oil palm in the region rose from 21.2 to 22.8 million hectares (Table 4-4). The annual rate of change fell from 2.8% between 1994 and 1998 to 1.8% between 1998 and 2002; considerably lower than the predicted 5.9% annual increase. Regarding the different crops, the area of oil palm and rubber trees in region increased by 1.9 and 0.23 million hectares respectively between 1998 and 2002 whilst the area of coconut trees decreased by 548 thousand hectares. Of these crops, the vast majority are distributed between a small number of countries in the region as Table 4-4 shows.

⁷⁰ Fruit orchards, oil palm, rubber and coconut.

⁷¹ Shrubs/trees and forest fallow.

⁷² FAOSTAT database.

Despite the lower than expected rate of increase in the area of agricultural tree crops, potential wood and fibre supplies from trees outside forest are considerable. In Southeast Asia, rubberwood supply has been estimated at around 6.5 million cubic meters per annum, equivalent to just under 10% of Southeast Asia's industrial roundwood consumption in 2002 (Balsiger et al. 2000). In Malaysia and Thailand the furniture industries are particularly dependent on rubberwood and supplies are also becoming increasingly used for wood-based panel manufacture. In 2003 the Malaysian government correspondingly announced plans for significant investment in establishment of 'Malaysian Oak' (*Hevea brasiliensis*) plantations (ITTO, 2003). Coconut timber supply is estimated at 5 million cubic metres per year in Asia although production is currently used predominantly for local needs (Durst, Killmann and Brown, 2004). The expected annual supply of oil palm stems over the next decade is close to 50 million cubic metres with more than double that quantity of palm fronds, empty fruit bunches and palm kernel shells. At present the only large scale commercial operations using oil palm residues are MDF plants although this is expected to change as technologies are developed.

Table 4-4 Area of Coconut, Oil palm and Rubber in Asia-Pacific countries in 2002

	Area (000s hectares)			
	Coconut	Oil palm	Rubber	Total
Malaysia	184	3375	1183	4742
Indonesia	2635	2790	2635	8059
Thailand	327	263	1593	2183
Philippines	3140	16	80	3236
India	1820	0	401	2221
Others	1098	135	1125	2358
Total	9203	6579	7017	22800

Source: FAO FAOSTAT database.

Given the potential oversupply of plantation wood and fibre (Section 4.3), the reduction in natural forest harvests and the likelihood that local shortages will continue to exist in the region, the interaction of supplies from trees outside forest with regional wood and fibre markets is likely to form an important aspect of future trade. With change occurring it is important to allow existing and potential market actors the flexibility to adapt to new conditions and, as such, focus has been turning towards removal of disincentives as a means of promotion (FAO, 2003b; Jim Roshetko, pers. comm.; Pande and Pandey, 2004). Removal of disincentives for farmers to grow and sell trees, such as transport licence charges, have stimulated supply to local markets in Java and led to reforestation of upland areas when other reforestation and greening efforts have failed (Jim Roshetko, pers. comm.). Training and initial assistance also assists farmers not accustomed to tree growing to access markets although the most important factor is outside the control of the farmers, i.e. market demand (Bruno Verbist, pers. comm.).

With respect to the significance of trees outside forest in national forestry strategies, Persson (2003) documented the reforestation of Java during the last century despite high and climbing population densities. Much of the present day forest area comprises home gardens, agricultural tree crops as well as shade trees, etc. demonstrating that people themselves can take steps to solve environmental and forestry problems if not prevented from doing so. A scenario of more people per area unit, less natural forests but more trees may thus be realised. A similar case was recorded in Kenya by Tiffen et al. (1994) and Persson also cites examples

in Bangladesh, Nepal and Kerala State in India. Furthermore, trees outside forest, in the form of home gardens, are currently seen as the most viable form of ‘sustainable forest management’ in Sri Lanka and attention has also been turning towards agroforestry as a form of sustainable forest management (Anura Sathurusinghe, pers. comm.; van Noordwijk, et al. 2003). It may therefore be that the future of forestry will become much more centred on trees outside forest given the low requirements for outside intervention, which has proved difficult to direct positively in many countries in the region. The costs to biodiversity may be considerable but acceptance of economic realities and strategic focus on protected areas could offer the potential of acceptable outcomes in both economic and environmental realms.

4.5 THE SIGNIFICANCE OF NON-WOOD FOREST PRODUCTS

With widespread transition from subsistence to market-based economic systems in much of the region, the issue of bringing NWFPs into the modern world whilst supporting poverty reduction in forest communities and preserving cultural heritage continues to pose problems. On the one hand, a vast number of products with a wide array of uses provide essential contributions to the livelihoods of many people in the region. Loss of this resource base could, in many areas, lead to increasing poverty. On the other hand, many products already available in mainstream markets are functionally equivalent to NWFPs and although markets do exist for a large number and space is available for more, inferior products are unlikely to be accepted. A central issue determining the future significance of NWFPs therefore surrounds whether a preservationist or progressive approach is taken and the probability of success offered by either.

If communities secure or are given forest management rights, traditional systems of resource management, which embrace the suite of NWFPs integrated into existing livelihoods, may be retained. Such systems could be supported by sale of NWFPs to outside markets whilst other NWFPs would be used for subsistence. The need to select certain NWFPs and discard others under such a scenario would be minimal as substitution for alternative products would be either unnecessary or unaffordable. Furthermore, the greater the number of usable NWFPs, the greater the value of the forest to the users. If, however, widespread transition to market-based systems is envisaged, domestication and intensification of marketable species would be necessary to improve the efficiency of production, allow allocation of time to more productive pursuits and generate revenue for purchase of alternatives. In addition, the work of Ruiz-Pérez et al. (2004)⁷³ suggests that relative improvements in livelihoods from NWFP production are more likely to result from specialisation in production although not necessarily cultivation.

Many conditions and caveats are associated with realising either of these scenarios. For example, the community approach would almost certainly have to include attribution of timber rights, as disjointed timber harvesting is likely to be incompatible with NWFP management. It could also be that traditional forms of forest management become a poverty trap and that demand from outside could lead to depletion of NWFPs including rare and endangered fauna and flora. On the other hand, with domestication, intensification and commercialisation, local people may lose control of production and marketing systems and taxation and formalisation may further usurp benefits, making the situation worse than to begin with.

⁷³ <http://ecologyandsociety.org/vol9/iss2/art4/main.html>.

In reality, the situation is less clear-cut and whichever course is taken, the role NWFPs play in the livelihoods of many rural people will remain critical, at least during a transitional period. Continued failure to select NWFPs that are potential revenue generators is, however, likely to result in sub-optimal outcomes given that the advance of markets is more or less assured and community-based forest management is infrequently practiced. CBFM is also unlikely to be significantly supported as a result of the high aggregated replacement value of NWFPs when demand only exists in the concerned communities. Furthermore, unsustainable exploitation of NWFPs may occur through commercialisation thus removing NWFP value from the overall value of the forest. Similar arguments have been made in APFSOS and elsewhere (e.g. Angelsen and Wunder, 2003) but advances have been slow although in different parts of the region NWFP market information systems are being developed to facilitate market development.

The NWFPs situation in India should be addressed separately given significantly different traditions and patterns of development and the fact that about 200 million rural people are wholly or partially dependent on forest resources (Anon, 2001). As summarised in APFSOS, more than 70% of India's forest-based export earnings are from NWFPs and their significance in subsistence, employment, and trade and revenue generation is considerable. In contrast to many other countries in the region, NWFP use is supported by government with, for example, 'Herbal hospitals' having been established in Chhattisgarh state in association with efforts to include forests in the livelihoods of the local populace as enunciated in the Forest Policy of 2001 (R.C. Sharma, pers. comm.).

Overall, the future significance of NWFPs lies in providing a safety net for rural people during a transition to market economic systems of which some NWFPs may become a part. The period of transition, ultimate level of development and the way in which NWFP management proceeds are likely to be interlinked and the challenge will be to avoid a situation where traditional livelihood systems disintegrate with no available substitute for NWFPs.

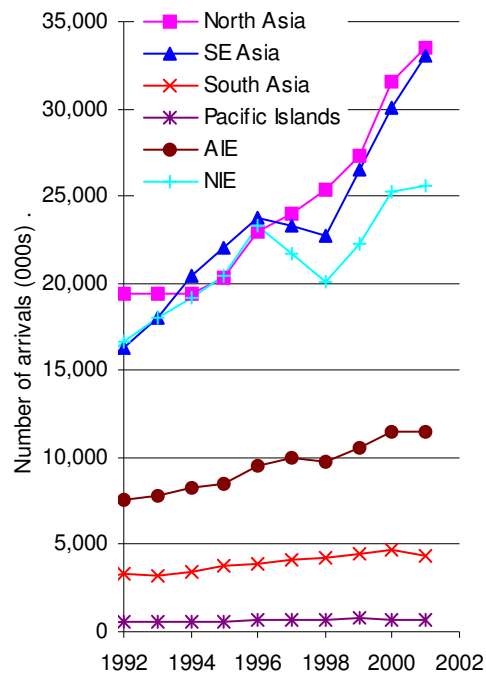
4.6 DEVELOPMENTS IN FOREST-BASED ECOTOURISM

APFSOS commented on the potential of ecotourism to capitalise on the symbiotic relationship between tourism and the environment through provision of income for environmental protection. Conclusions were, however, that only a small proportion of revenues from ecotourism would be likely to accrue to forest owners and that markets would only be able to support a few areas with exceptional tourism value. Therefore, the best prospects were expected to be in relation to increased revenue flow to areas already set aside for environmental benefit.

Figure 4-3 shows regional trends in international tourism. In the region as a whole, international arrivals increased by 9.5% per annum between 1998 and 2001, with the highest rates in North (9.7%) and Southeast Asia (13.2%). Since 2001, arrivals have dropped due to several incidents including the SARS epidemic, the Bali bombing and avian flu although tourists are now returning to the region. Domestic ecotourism is also increasing in Asia and although at present visits to pristine wilderness are not the favoured form, tastes may change as attitudes towards forest become more closely associated with aesthetic rather than functional values.

Figure 4-3 International arrivals in Asia-Pacific Sub-regions 1992-2001

(World Development Indicators, World Bank)



The fact remains, however, that environmental, economic and social benefits of ecotourism will be limited although, ironically, over utilisation is likely in some areas. In Indonesia, for example, visitor rates for more remote national parks are generally very low although parks around Jakarta and other big cities in Java are heavily over utilised (Bruno Verbist, ICRAF, pers. comm.). A different model of development embracing forestry and environmental values as an integral part of national heritage is being followed in Bhutan. In lieu of revenue generation from forest harvesting, the national strategy involves electricity generation and a tourism policy which supports a charge of \$200 per day for international arrivals. This charge is seen partly as a return on national environmental wealth which includes forest cover of around 70% (Dechen Dorji, Dept. Forest Services, Bhutan, pers. comm.; RGOB, 2002a). Under both models, however, revenues will contribute a limited amount to protected area management and forest assets are likely to have to be maintained for other reasons as suggested in APFSOS.

4.7 SET ASIDE FOR ENVIRONMENTAL BENEFIT

APFSOS suggested that the legally protected area of natural forest off-limits to timber production (i.e. IUCN categories I and II⁷⁴) in the Asia-Pacific region would remain at 100 million hectares between 1994 and 2010 although no specific predictions were made. By 1997, however, the area had risen to 150 million hectares and by 2003 stood at 154 million hectares as shown in Table 4-5⁷⁵. This increase masked a reduction in the area of category I

⁷⁴ Category Ia: Strict Nature Reserve: protected area managed mainly for science; Category Ib: Wilderness Area: protected area managed mainly for wilderness protection; Category II: National Park: protected area managed mainly for ecosystem protection and recreation.

⁷⁵ Figures for 2003 also take into account protected areas of all sizes, the minimum of 1,000 hectares, or 100 hectares for islands, having not been applied (IUCN/UNEP WCMC, 2003).

areas (strict protection) in Australia and New Zealand, East Asia and South Asia, presumably as a result of pressure from other land uses.

Table 4-5 *Protected areas in the Asia-Pacific region, 1997 and 2003*

	Protected area (millions hectares)								
	IUCN Category I			IUCN Category II			Total area protected		
	1997	2003	% change	1997	2003	% change	1997	2003	% change
Australia & NZ	28.9	26.1	-10	26.6	29.5	11	110.9	118.7	7
East Asia	58.9	54.8	-7	7.4	10.7	44	88.4	103.2	17
Pacific	0.1	0.1	0	0.0	0.6	2106	1.3	2.0	56
South Asia	0.3	0.3	-13	6.3	6.9	9	21.3	30.9	45
Southeast Asia	2.8	3.7	33	19.0	21.4	12	51.9	76.0	46
Asia-Pacific	91.0	84.9	-7	59.4	69.0	16	273.8	330.8	21

Source: IUCN/UNEP WCMC (2003).

Table 4-6 shows the area of forest protected under the six IUCN categories fell by 40% between 1997 and 2000 in Insular South East Asia and also showed a 6% reduction in Continental South and Southeast Asia. The reductions are likely to have been due to encroachment, which, with high and rapidly increasing populations in the region, was predicted in APFSOS.

Despite increases in the recorded protected area over the last decade, reports have shown that only a small proportion of the area is under secure and effective conservation management, demonstrating a disparity between high-level commitment and achievement in the field (Sayer, 2001). The World Parks Congress in 2003 also highlighted several problematic issues including the concern that many protected areas exist only on paper, especially in developing nations and that costs associated with protected areas are often borne locally while benefits accrue globally (IUCN, 2003). According to IUCN, existing global protected areas suffer an annual funding gap of around US\$25 billion and while conservation funds are promoted as available they are often inaccessible or misdirected (IUCN, 2003).

Table 4-6 *Protected forest area in selected sub-region of the Asia-Pacific, 1997 and 2000*

	Protected forest area (millions ha)		
	1997	2000	% change
Insular South East Asia¹	24.7	14.8	-40.0
Continental South and Southeast Asia²	19.2	18.1	-5.9
Far east³	145.6	157.9	8.4
Australasia⁴	12.6	16.6	31.7
Total	202.2	207.4	2.6

Source: IUCN/UNEP WCMC (2003). 1. Indonesia, Insular Malaysia, Brunei, Papua New Guinea, Philippines, Solomon Islands. 2. Bangladesh, Bhutan, Cambodia, India, Lao PDR, Myanmar, Nepal, Pakistan, Peninsular Malaysia, Sri Lanka, Thailand, Viet Nam. 3. China, Mongolia, DPR Korea, Japan, Republic of Korea. 4. Australia, New Zealand, New Caledonia, Fiji, Vanuatu.

These problems have meant that deforestation and degradation of natural forests have continued and the rights of local people have, in the majority of cases, remained overlooked (Brown and Durst, 2003). In Thailand for example, although fifteen years have passed since

imposition of a logging ban, illegal logging is taking place and forests and national parks are still under threat (Brown and Durst, 2003; Horst Weyerhaeuser, pers. comm.). There are also numerous indirect problems associated with protecting areas for environmental benefits. In China, for example, although vast areas of forest have recently been protected for environmental reasons, logging has, in some senses, been exported to old growth forest in neighbouring countries where legal cover is absent (Brown, Durst and Enters, 2001; Horst Weyerhaeuser, pers. comm.; Sun et al. 2004). Problems also remain with integrating development and conservation activities. In India, a protected area network that largely targeted fauna found competition with local people's survival needs. The more inclusive concept of People's Protected Area was therefore developed although the impact of the new concept on conservation has not been measured (R.C. Sharma, pers. comm.). In Sumatra, difficulties were also found in implementing efforts to improve conservation effectiveness through development in buffer zones. Although the idea was to enable people to move out of core areas, development projects attracted people from outlying areas into the buffer zones and further increased pressure on the protected area (Bruno Verbist, pers. comm.).

Whether the international community is able to overcome the problems faced in the majority of countries in the region and effectively deal with problems facing environmental conservation will have important effects not only on the forest environment but also on timber supply and socio-economic issues in the region.

4.8 ENVIRONMENTAL ADVOCACY

APFSOS noted the greater integration between communities, mass organisations, environmental NGOs, governments and the private sector that occurred during the 1990s. That NGOs had generally become more sophisticated and constructive and less confrontational than previously and had played key roles in major developments in the sector was also noted. In recent years, the increase in environmental advocacy, in parallel with the first mass anti-globalisation protest in 1999, signalled further modifications in the mode of engagement of groups supporting actions different from those implemented by de facto managers.

The effects of environmental advocacy may be considerable given the support of modern communication and distribution networks and the future of forestry is likely to be shaped to a greater and greater extent by advocacy groups or practitioners in the sector holding allied opinions. On the positive side, advocacy may expose injustice, overly bureaucratic decision making and short sightedness where established institutions may suffer dilemmas of conscience, be bound by institutional mandates or have vested interest in the status quo. On the other hand, advocacy may disrupt sensitive processes, scare off participants in potentially progressive developments and promote short-sighted or overly emotive goals.

As an example, the objection of numerous environmental groups to 'fast-wood' plantations⁷⁶ are argued by Cossalter and Pye-Smith (2003) to be relevant in some cases but fallacious in others. The poor identification between fast-wood plantations and the environmental and social arguments with which they are associated mean that blanket statements are potentially damaging in a large number of cases. The message that, for example, eucalyptus and pulp

⁷⁶ Short-rotation, intensive plantations consisting of single-species blocks of eucalypts, poplars, acacias and pines that generally constitute a major land use, or dominate the landscape (Cossalter and Pye-Smith, 2003).

mills are 'bad' has made significant inroads into the consciousness of many of those with an interest in forestry. The effect of such advocacy may therefore, on occasion, be to restrain economic growth and, paradoxically, to delay improvements in environmental management and social conditions that are associated with greater affluence. Environmental groups including, amongst others, the Environmental Investigation Agency, Global Witness, Greenpeace and the Indonesian group Telapak have, however, contributed considerably to bringing the issue of illegal logging in the region to the fore. The work of Global Witness in Cambodia and Myanmar for example is not only of interest to forestry but, given the frequent involvement of high ranking officials, to governance in general.

Some key issues underlying differences in opinion, principally between economists and civil society, which elucidate grey areas within arguments and may thereby speed resolution have been outlined by Kanbur (2001). Firstly, differences in spatial focus (e.g. national vs. local) may cause opposition between groups with similar aims. For example, increases in per capita GDP do not mean that everyone has become wealthier and local areas may show opposing trends. Similarly, differences in temporal focus may cause disagreements where short-term policies are detrimental in the long term or vice versa. For instance, disruption of traditional livelihoods may be objectionable in the short term but access to modern facilities, if achievable, is likely to be of benefit in the long term. Lastly, views of how markets are, or will be, structured has important repercussions on the course of action taken. If, for instance, competitive auctions are instigated to improve log sales prices but wider conditions prevent market forces from acting, e.g. buyers act in a cartel rather than in competition, benefits are unlikely to be realised. Although this framework does not solve arguments, it may prevent unnecessary polarisation of arguments if protagonists can find common ground.

The future effects of environmental advocacy are very much reliant on the level of clear thinking, open dialogue and acceptance of responsibilities amongst sector participants. Where polarisation occurs, the likelihood that the discussion will become detached from the matter in hand is high and, as a result, the overall situation may suffer.

5 FUTURE ISSUES AND APFSOS II

With rising incomes, falling poverty and decreasing rural populations in much of the Asia-Pacific region, the face of forestry is changing at a faster rate than ever before. Infrastructure developments are increasing the availability of modern goods and services whilst bringing new areas and resources within reach of markets and the opportunities and threats they bring. As governance in much of the region remains imperfect and rapid improvements are unlikely, the future course of forestry development at the macro level is likely to be driven more by supply and demand than regulatory intervention. At the local level, degradation of valuable forest resources will continue to change rural livelihoods irrevocably although in some areas allocation of indigenous rights will allow perpetuation of existing systems. Altered farming systems, incorporating NWFPs and trees outside forests are, however, likely to increasingly adorn landscapes where population densities are higher. In sparsely populated areas within reach of markets, establishment of industrial crops or tree plantations is more likely, whereas in remaining hinterlands, regrowth or rehabilitation of natural forest may take place where economic, ecological and regulatory conditions permit. Mobilisation of local populations to achieve these aims is likely to provide all-round benefits where well managed and villagers are also likely to profit through increased bargaining power.

With respect to markets, falling consumption of less processed products and rising consumption of more highly processed products in recent years has reflected changes in supply sources from natural to planted forests. Reductions in industrial roundwood consumption and prices, in spite of increasing income and population levels demonstrates falling supplies of high value species, increasing supply from plantations as well as some effect of increased illegal logging. Given the attributes of forestry as a potential source of rural income and of wood as a carbon store, investment in marketing is likely to improve the flow of benefit from the sector providing that negative impacts on natural habitats do not result. In this respect, support for forest law enforcement and governance is a key issue which should enable greater segregation of protection and production functions of forest. Parallel efforts to reduce regulatory restrictions on production of forest products should allow correction of markets and improved benefit flow to local producers. Otherwise, plantation grown wood is likely to become increasingly important in coming years and with this, forest products markets are likely to become increasingly focussed on a few leading producers in the region.

Given the developing situation, the second Asia-Pacific Forestry Sector Outlook Study will have to take into account a number of key issues. A focus on forest products trade and markets and the drivers that influence them is essential given their central position in determining outcomes in the sector and the availability of quantitative data on which to base projections. As competing land-uses and products are having ever greater effects on forestry it will also be important to take into account future scenarios in other sectors as well as planned forestry policy. Given the importance of the core areas, assessment of the reliability of forest products production and trade data will be of primary importance and several methods are available as listed in Table 5-1. Corrections to the design of projection models to better reflect forestry sector development will also be necessary and grouping countries according to income and forest cover should provide a more useful basis for forecasting than the sub-regional groupings used in APFSOS. With respect to topical areas, these would be best developed with trade and production forecasts in mind. A range of possible areas of study are listed in Table 5-1.

To simplify the outlook process and to systematise thinking amongst contributors, linking sub-themes across thematic areas and country reports and formation of related discussion groups should assist in making sense of the innumerable dimensions of Asia-Pacific forestry. With respect to information outputs from the study, a focus on future outputs of products and services from the sector will be central and scenarios will be important in taking into account different policy options. To break down outputs into areas relevant for different audiences, and taking into account the key issues in forestry, the contribution of forestry to economic growth and poverty alleviation and the status and outlook in relation to environmental protection are of most interest. The right hand columns in Table 5-1 shows the main areas of focus towards which outputs are suggested to be aimed with respect to each proposed thematic study.

Table 5-1 Potential areas for inclusion in APFSOS II

Theme and sub-issues	Topical-issues	Cross-cutting issues			
		Forest products production	Economic growth	Poverty alleviation	Environmental protection
1. Accuracy of FAO forests products production and trade data for Asia-Pacific countries 1.1 Comparison of FAO data with data from other sources 1.2 Raw materials balance 1.3 Expert knowledge	Effects of illegal logging and trade and unreported domestic consumption	Not applicable	Not applicable	Not applicable	Not applicable
2. Outlook for forest products trade and markets 2.1 Effects of changes in barriers to trade (e.g. FLEG efforts and trade liberalisation)	Economic growth in China and India				
3. Outlook for investments in the forestry sector 3.1 Changes in national investment climates 3.2 Private sector investment	Processing capacity and raw material supply				
4. Outlook for plantations 4.1 Improvements in growing stock 4.2 Genetic modification	Potential oversupply in coming years				
5. Climate change and forestry 5.1 Fires 5.2 Pests and diseases	Kyoto Protocol coming into effect on 16 Feb 2005				
6. Outlook for commodities competing with forest products	Falling industrial roundwood consumption despite increasing population and income				
7. Outlook for land-uses competing with forestry	Establishment of agricultural tree crops				
8. Outlook for wood and fibre supply	Trees outside forests, de-regulation				
9. Status and trends in forestry research	Low levels of research in recent years				
10. Outlook for NWFP trade and markets 10.1 Domestication and intensification	Impacts on poverty				
11. Outlook for FLEG and illegal logging and trade 11.1 Costs and benefits	Governance effectiveness				

Theme and sub-issues	Topical-issues	Cross-cutting issues			
		Forest products production	Economic growth	Poverty alleviation	Environmental protection
12. Changes in capacity in forestry sector	Capacity at local levels				
13. Trans-boundary issues resulting from legislative and resource differences					
14. Long-range outlook for forests in the Asia-Pacific	Under what conditions does forestry benefit from increased socio-economic development				
15. Outlook for income and employment from forestry 15.1 Forestry sector development					
16. Status and trends in number and activity of NGOs	The rise of national NGOs				
17. Perception of forestry in donor countries in relation to activities of representing institutions	Payment for international goods and services				
18. Outlook for contribution of forestry to poverty alleviation 18.1 Progress in securing tenure 18.2 Decentralisation and devolution	Contribution of forestry to poverty alleviation in comparison with available non-forest based activities.				
19. Outlook for forest dependent people	Securing rights/movement to other sectors				
20. Outlook for protection and funding of protected areas	Loss of biodiversity including wildlife, status and trends in international funding for forestry				
21. Future demands on the forestry sector	Water provision, carbon sequestration				

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ANNEXES

1 COUNTRIES INCLUDED IN APFSOS

Table 1-1 Countries included in APFSOS and World Bank income classification

	APFSOS Classification ¹	WB income classification		APFSOS classification	WB income classification
North Asia			South Asia		
China		Lower middle	Bangladesh		Low
- Hong Kong, China	NIE	High	Bhutan		Low
- Taiwan, Province of China	NIE		India		Low
Japan	AIE	High	Maldives		Lower middle
Korea, DPR		Low	Nepal		Low
Korea, Rep.	NIE	High	Pakistan		Low
Mongolia		Low	Sri Lanka		Lower middle
Southeast Asia			Pacific Islands		
Brunei		High	Australia	AIE	High
Cambodia		Low	Cook Islands		
Indonesia		Low	Fiji		Lower middle
Lao PDR		Low	Kiribati		Lower middle
Malaysia		Upper middle	New Caledonia		High
Myanmar		Low	New Zealand	AIE	High
Philippines		Lower middle	Papua New Guinea		Low
Singapore	NIE	High	Samoa		Lower middle
Thailand		Lower middle	Solomon Islands		Low
Viet Nam		Low	Tonga		Lower middle
			Vanuatu		Lower middle

1 - AIE–Advanced Industrialised Economy, NIE–Newly Industrialised Economy.

2 FOREST PRODUCTS CONSUMPTION AND TRADE

Table 2-1 *WOODFUEL (fuelwood + wood for charcoal, millions cubic metres)*

	Consumption			Change in consumption	
	1994	2002	2010	1994-2002	2002-2010
AIEs	6,272	8,886	12,863	4.4	4.7
NIEs	2,644	2,595	2,597	-0.2	0.0
North Asia	262,186	225,397	195,357	-1.9	-1.8
South Asia	360,781	376,203	386,246	0.5	0.3
Southeast Asia	208,178	179,802	150,296	-1.8	-2.2
Pacific Islands	831	987	1,107	2.2	1.4
Asia-Pacific	840,892	793,870	748,467	-0.7	-0.7
World	1,865,952	1,899,008	1,929,731	-0.8	0.2

Table 2-1-1 *Fuelwood (000s cubic metres)*

	Consumption			Change in consumption	
	1994	2002	2010	1994-2002	2002-2010
AIEs	4,984	7,586	11,584	5.4	5.4
NIEs	2,374	2,292	2,286	-0.4	0.0
North Asia	250,278	213,725	183,949	-2.0	-1.9
South Asia	348,791	363,376	372,462	0.5	0.3
Southeast Asia	198,982	169,641	139,061	-2.0	-2.5
Pacific Islands	781	925	1,035	2.1	1.4
Asia-Pacific	806,190	757,545	710,378	-0.8	-0.8
World	1,623,768	1,610,118	1,591,316	-0.8	-0.1

Table 2-1-2 *Charcoal (000s metric tonnes)*

	Consumption			Change in consumption	
	1994	2002	2010	1994-2002	2002-2010
AIEs	213	214	211	0.1	-0.2
NIEs	44	50	51	1.4	0.4
North Asia	1,965	1,926	1,882	-0.2	-0.3
South Asia	1,978	2,116	2,274	0.8	0.9
Southeast Asia	1,517	1,677	1,854	1.3	1.3
Pacific Islands	8	10	12	2.7	1.8
Asia-Pacific	5,726	5,994	6,285	0.6	0.6
World	39,960	47,667	55,838	0.6	2.0

Table 2-2 INDUSTRIAL ROUNDWOOD (000s CUBIC METRES)

	Production 2002	Imports 2002	Exports 2002	Consumption 2002	Average annual % change			
					Production		Consumption	
					1994-98	1998-02	1994-98	1998-02
AIEs	62,027	12,669	9,188	65,508	-1.6	2.7	-3.5	-0.3
NIEs	1,605	7,691	39	9,257	5.0	3.0	-10.3	12.3
North Asia	95,066	25,864	735	120,195	2.1	-3.4	2.2	1.0
South Asia	24,650	2,296	8	26,938	-4.6	0.9	-2.7	0.8
Southeast Asia	71,855	1,770	6,635	66,990	-3.7	-2.9	-3.1	-2.9
Pacific Islands	2,709	1	2,261	449	-3.2	-11.3	13.0	-32.5
Asia-Pacific	257,911	50,291	18,866	289,337	-1.2	-1.6	-1.3	-0.2
World	1,587,715	122,996	115,523	1,595,188	1.0	0.3	1.1	0.3

Table 2-2-1 Industrial Roundwood trade data comparison, 2001**Imports**

Importing country	Total imports (000's m ³) ¹	No. reporting partners ²	Total imports with data from a partner (%) ³	Partners reporting higher figure (%) ⁴	Reported by partner/ Reported by importer (%) ⁵
Australia	1	6	95	67	269
Indonesia	134	7	52	14	80
Japan	13911	30	49	60	96
Malaysia	874	12	81	58	106
New Zealand	6	4	51	100	831
Philippines	550	4	18	75	138
PR China	18459	46	22	52	116
Singapore ⁶	36	5	8	80	84
Thailand	517	12	47	42	71
Rep Korea	7118	21	86	52	89
Total	41606282	147	43	55	99

Exports

Exporting country	Total exports (000's m ³) ¹	No. reporting partners ²	Total exports with data from a partner (%) ³	Partners reporting higher figure (%) ⁴	Reported by partner/ Reported by exporter (%) ⁵
Australia	920	14	87	36	89
Indonesia	3468	22	83	50	74
Japan	3	4	59	75	111
Malaysia	5380	16	52	50	127
New Zealand	7284	8	96	63	110
PR China	697	18	3	78	271
Singapore	17	5	81	40	298
Thailand	0.2	3	166	67	101
Total	17774	91	76	55	105

1 - Reported in aggregate to FAO; 2 - Number of records from FAO bilateral trade matrices where a corresponding record exists from the partner country; 3 - Percentage of total imports/exports by volume for which data from a partner exists; 4 - Percentage of partners reporting greater imports or exports than the country in question; 5 - Sum of volumes reported by partners as a percentage of sum of volumes reported by country in question.

N.B. A figure of above 50% in column 5 and 100 in column 6 suggests systematically under-reporting by the importing or exporting country and of over reporting where the opposite applies.

Table 2-3 SAWNWOOD (000s CUBIC METRES)

	Production 2002	Imports 2002	Exports 2002	Consumption 2002	Average annual % change			
					Production		Consumption	
					1994-98	1998-02	1994-98	1998-02
AIEs	22,873	9,356	2,089	30,140	-5.7	-2.7	-6.6	-2.0
NIEs	5,219	1,072	209	6,082	-12.6	23.2	-12.1	19.7
North Asia	10,011	6,917	682	16,246	-7.1	-15.1	-6.2	-6.9
South Asia	9,872	75	8	9,939	-14.8	-0.8	-14.8	-0.7
Southeast Asia	15,144	3,334	6,636	11,842	-3.5	-1.2	-2.8	-4.0
Pacific Islands	220	11	47	185	1.8	-14.0	-0.1	-15.3
Asia-Pacific	63,339	20,764	9,670	74,433	-7.4	-3.7	-7.4	-2.3
World	390,918	115,924	118,481	388,361	1.0	0.3	1.1	0.3

Table 2-4 WOOD-BASED PANELS (000s CUBIC METRES)

	Production 2002	Imports 2002	Exports 2002	Consumption 2002	Average annual % change			
					Production		Consumption	
					1994-98	1998-02	1994-98	1998-02
AIEs	8,744	6,732	1,871	13,605	-2.9	0.6	-3.0	1.2
NIEs	3,868	3,663	248	7,283	5.3	8.5	-2.4	18.8
North Asia	24,689	5,671	2,736	27,624	10.7	24.0	7.6	16.3
South Asia	1,067	140	16	1,191	-5.6	29.7	3.7	21.4
Southeast Asia	20,873	761	12,810	8,824	-3.8	8.4	-27.3	56.1
Pacific Islands	89	14	45	58	4.1	25.4	0.9	13.6
Asia-Pacific	59,329	16,981	17,727	58,583	0.2	12.3	-1.4	14.7
World	195,359	65,937	63,953	197,343	1.0	0.3	1.1	0.3

Table 2-5 WOOD PULP (000s CUBIC METRES)

	Production 2002	Imports 2002	Exports 2002	Consumption 2002	Average annual % change			
					Production		Consumption	
					1994-98	1998-02	1994-98	1998-02
AIEs	13,486	2,864	896	15,454	0.8	0.3	-0.3	-0.8
NIEs	534	2,585	86	3,033	-5.8	6.3	-2.0	8.6
North Asia	4,131	6,176	31	10,276	-4.1	15.8	5.4	17.2
South Asia	1,637	249	25	1,860	4.5	1.5	5.2	-0.8
Southeast Asia	6,939	1,381	2,435	5,884	7.0	27.2	-8.9	28.4
Pacific Islands	0	3	0	3	-	-	-	-
Asia-Pacific	26,727	13,257	3,473	36,510	1.0	7.2	0.0	7.2
World	167,633	40,255	39,488	168,400	1.0	0.3	1.1	0.3

Table 2-6 PAPER AND PAPERBOARD (000s CUBIC METRES)

	Production 2002	Imports 2002	Exports 2002	Consumption 2002	Average annual % change			
					Production		Consumption	
					1994-98	1998-02	1994-98	1998-02
AIEs	34,208	3,452	1,792	35,868	1.3	0.7	1.2	1.2
NIEs	9,899	1,483	2,593	8,789	4.7	6.0	-3.6	10.9
North Asia	38,009	10,422	3,992	44,439	5.9	4.1	8.0	3.0
South Asia	5,222	879	106	5,994	3.2	7.4	5.3	4.0
Southeast Asia	11,772	2,426	3,458	10,740	13.5	4.6	3.6	7.0
Pacific Islands	0	118	1	117	-	-	-4.8	44.7
Asia-Pacific	99,109	18,780	11,942	105,947	4.5	3.2	3.9	3.4
World	324,649	95,000	95,425	324,224	1.0	0.3	1.1	0.3

3 AGGREGATE GOVERNANCE INDICATORS

Table 3-1 *Changes in World Bank Aggregate Governance Indicators¹ for Asia-Pacific Countries, 1998-2002.*

(Positive changes greater than 0.5 highlighted in italics, negative changes numerically greater than -0.5 highlighted in bold.)

	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control of corruption
North Asia						
China	0.13	-0.06	0.00	-0.34	0.00	-0.20
Hong Kong, China	0.31	0.05	-0.17	-0.10	-0.43	-0.14
Japan	-0.06	0.04	-0.05	0.42	-0.31	-0.12
Korea, DPR	-0.36	<i>1.21</i>	-1.66	-0.16	0.21	-0.63
Korea, Rep.	-0.05	0.27	0.36	<i>0.56</i>	0.06	0.15
Mongolia	-0.18	0.46	-0.20	-0.45	0.34	0.13
Southeast Asia						
Brunei	0.32	-0.33	<i>0.82</i>	<i>1.11</i>	-0.27	0.26
Cambodia	0.31	<i>1.12</i>	0.48	-0.21	-0.13	0.37
Indonesia	<i>0.85</i>	0.14	0.03	-0.78	0.17	-0.17
Lao	-0.47	-1.11	-0.46	-0.06	0.02	-0.55
Malaysia	-0.03	-0.05	0.16	0.01	-0.24	-0.37
Myanmar	-0.12	-0.32	0.35	-0.61	-0.56	-0.07
Philippines	-0.30	-0.58	-0.28	-0.61	-0.46	-0.18
Singapore	0.50	-0.13	-0.33	0.25	-0.49	-0.21
Thailand	0.09	0.23	0.17	0.07	-0.10	-0.03
Viet Nam	0.28	-0.13	-0.04	-0.11	0.41	-0.06
South Asia						
Bangladesh	-0.39	-0.17	-0.18	-0.97	-0.06	-0.71
Bhutan	0.39	0.26	<i>0.66</i>	-0.40	0.17	0.45
India	0.12	-0.50	0.01	-0.26	-0.14	-0.08
Maldives	0.31		0.11	<i>0.59</i>	<i>1.09</i>	<i>0.58</i>
Nepal	-0.50	-1.20	0.44	-0.17	-0.25	0.30
Pakistan	-0.48	-0.45	0.19	-0.62	0.01	0.03
Sri Lanka	0.23	<i>0.87</i>	0.49	-0.60	0.34	0.10
Pacific Islands						
Australia	-0.01	-0.03	0.01	0.36	-0.14	-0.29
Fiji						
Kiribati	-0.16	-0.20	-0.01	<i>0.51</i>	0.01	-0.08
New Zealand	-0.16		0.50	-0.16	0.34	0.10
Papua New Guinea						
Samoa	0.24	-0.15	0.01	0.09	-0.26	-0.26
Solomon Islands	-0.35	-0.16	-0.16	0.04	-0.49	-0.20
Tonga	0.07		0.37	<i>0.63</i>	<i>1.91</i>	0.24
Vanuatu	-0.74		-0.50	-0.17	0.01	-0.32

1 - Indicators range from -2.5 to 2.5 with positive values indicating better governance.

2 - Measurement is made using aggregated information on perceptions of governance from a large number of sources; indicators range from -2.5 to 2.5, with higher scores representing better governance. Because errors associated with estimates are often high in relation to the size of the change with time, larger changes are likely to be more reliable.

Source: World Bank Aggregate Corruption Indicators: (www.worldbank.org/wbi/governance/gov_data.htm)

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