

Asia and the Pacific

The Asia and the Pacific region (Figure 8), consisting of 47 countries and areas, is home to more than half of the world's population and has some of the most densely populated countries in the world. It has 18.6 percent of the world's forest area in a wide array of ecosystems including tropical and temperate forests, coastal mangroves, mountains and deserts (Figure 9). Rapid socio-economic changes in the region are having profound impacts on all sectors, including forestry. While wood products demand is increasing, so is the demand for environmental services of forests.

DRIVERS OF CHANGE

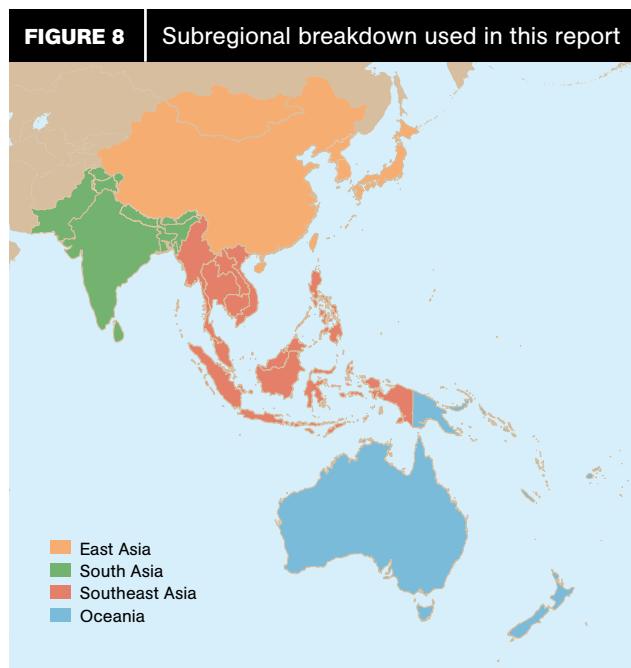
Demographics

The population of Asia and the Pacific is projected to reach 4.2 billion by 2020, an increase of 600 million from 2006 (Figure 10). The annual population growth rate in Japan is close to zero and declining, but in several countries – particularly low-income countries – the growth rate exceeds 2 percent.

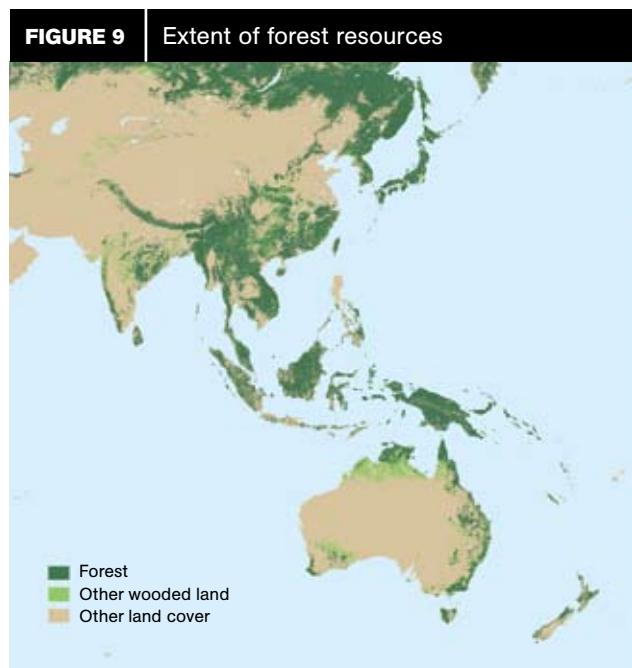
Population density in the region varies enormously, from fewer than 2 people per square kilometre in Mongolia to more than 1 000 people per square kilometre in Bangladesh and to more than 6 300 people per square kilometre in completely urban Singapore.

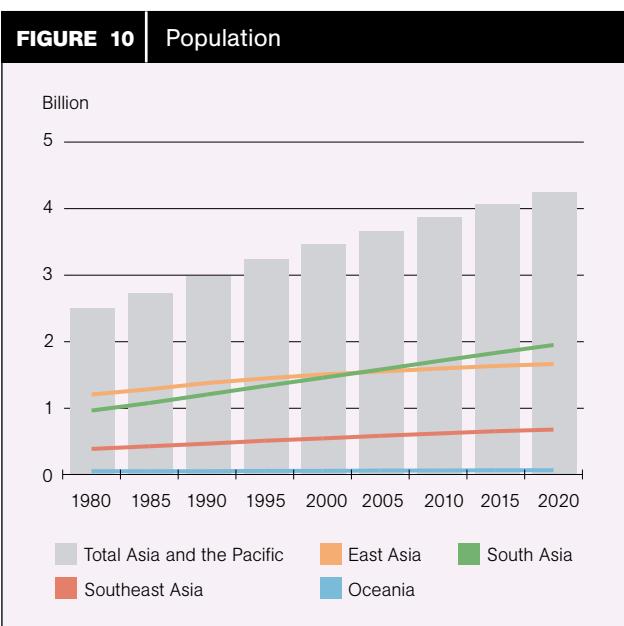
The urban population in Asia and the Pacific is expected to rise from 38 percent in 2005 to 47 percent in 2020. It is increasing especially rapidly in China – by 2020, China's urban population is expected to have grown by 230 million and its rural population to have decreased by 122 million relative to 2005 figures. South Asia, where 65 percent of the population is rural, is expected to remain the least urbanized subregion.

Another important demographic change is the ageing of the population. In Australia, Japan, Malaysia, New Zealand and Thailand, more than 15 percent of the population is over 65 years old; in Japan, more than one-quarter of the population is over 60 years old. The reduction in the proportion of working-age adults in these countries, as well as in China (where a strict population policy is implemented), will have important implications for productivity and the demand for goods and services.



NOTE: See Annex Table 1 for list of countries and areas by subregion.





SOURCE: UN, 2008a.

Economy

Asia and the Pacific has the fastest economic growth of all regions. China and India, which account for two-thirds of the region's population, have registered annual GDP growth rates of 8–11 percent during the past decade. While some slowdown is possible, most countries are expected to have growth rates well above the global average (Figure 11).

However, despite notable poverty reduction since the 1990s, the region still has 640 million people living on less than US\$1 per day (UNESCAP, 2007). With poverty more pervasive in forested areas, many people depend in large part on forests for their livelihood.

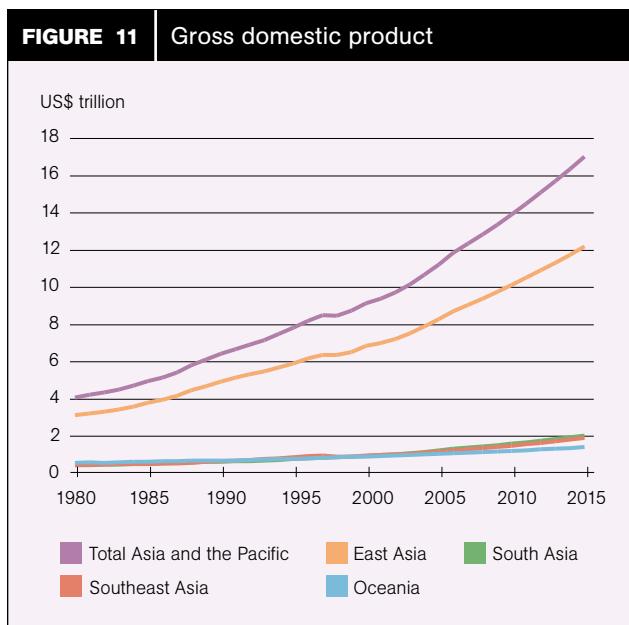
In most developing countries in the region, the manufacturing and services sectors are growing rapidly, with a corresponding decline in the share of agriculture in income and employment (UN, 2006a; FAO, 2007b). These changes in the structure of the economy will have different effects on forests and forestry depending on their pace:

- Several countries in the region will remain largely dependent on agriculture. High population growth and continued dependence on land will raise the

pressure on forests, especially in densely populated countries. Efforts to improve agriculture in response to recently escalating food prices could increase the impact on forests.

- In countries where industrialization is reducing the pace of agricultural expansion, other factors such as mining, infrastructure development and urbanization, as well as plantation crops, are becoming important causes of forest clearance.
- Some countries have become, or are becoming, knowledge economies, largely focused on technology and services. With high incomes, most of the primary commodities are imported and dependence on forests is reduced. Forests are then used primarily for the provision of environmental services.

Globalization has played an important role in the region's rapid economic growth and will become more pronounced in the coming years, with continued impact on the forest sector, including increased transnational investments. Relative political stability, large markets, high investments in human resources, regional and subregional trade and economic cooperation agreements, improved



SOURCES: Based on UN, 2008b; World Bank, 2007a.

transportation infrastructure and rapid development of information and communication technologies have all promoted globalization.

Policies and institutions

Important changes under way in the policy and institutional arena in Asia and the Pacific include:

- changes in policies and legislation enabling greater involvement of diverse stakeholders in forestry, especially through privatization and community participation, including the restoration of rights to indigenous communities (Box 6);
- improvement in tenure conditions providing more incentive for landowners to grow trees;
- increased corporate investments in forestry, often through partnerships;
- greater involvement of civil-society organizations in policy formulation, forest management, research, extension and awareness generation;
- weakening of the authority of public forestry agencies, largely because of the emergence of other players.

Governance problems encumber the forest sector in some countries, often those with the most forests. Combating corruption and illegal logging has been a focus of recent national and international efforts (Box 7). Conflicts disrupt forest management in several countries, and these could escalate as pressures on natural resources increase, especially if effective institutional arrangements are not in place to resolve them.

Science and technology

The region has been at the forefront of the development and adoption of green revolution technologies, which have slowed or even reversed the horizontal expansion of

BOX 7	Forest law enforcement and governance in Asia
<p>In Asia, multilateral arrangements on forest law enforcement and governance (FLEG) target explicit improvements in reducing corruption and illegal activities in, and associated with, forests and forestry. The East Asian FLEG process emerged from a series of multistakeholder consultations in 2001. A ministerial FLEG meeting held in Bali, Indonesia, in 2001 affirmed commitments to eliminate illegal logging and associated illegal trade and corruption. It also developed a comprehensive list of actions – encompassing political, legislative, judicial, institutional and administrative actions as well as associated research, advocacy, information disclosure and sharing of knowledge and expertise – to be undertaken nationally and internationally. However, while the FLEG process has helped to draw attention to forest governance, it is difficult to ascertain its impacts on the ground.</p>	

agriculture. Technological advances have enhanced the region's competitiveness in the manufacturing and services sectors. Investments in biotechnology, nanotechnology, information and communications and alternative energy technologies will all have important impacts on forestry. However, differences in the adoption of technologies will persist among countries, sectors and subsectors.

OVERALL SCENARIO

The Asia and the Pacific region is extremely diverse. Countries, or even areas within countries, are likely to follow one of three main development paths.

In the rapidly emerging industrial economies, continued industrialization will result in an expanded middle class. A consequent increase in the demand for food, fuel, fibre and environmental services will exert tremendous pressure on the natural-resource-rich countries in and outside the region. Agricultural expansion will slow; non-agricultural land uses such as mining and urban expansion may continue to place pressure on forests.

In the agrarian societies, agriculture will remain the mainstay of livelihoods and may even expand in the context of high population growth rates. Increasing global and regional demand for food, fuel and fibre, especially from rapidly industrializing countries, could be either an opportunity or a challenge depending on the state of governance and institutional development.

In the high-income, postindustrial societies, growth will be based on technologically advanced manufacturing

BOX 6	Restoration of rights to indigenous communities
<p>Of the estimated 210 million to 260 million indigenous people in Asia and the Pacific, about 60 million are forest-dependent. Many countries have policies and laws to remedy their marginalization (e.g. Australia, India, Malaysia, New Zealand, Papua New Guinea and the Philippines). For example, the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act enacted by India in 2006 recognizes the rights of traditional forest-dwelling communities, including title over land that they have been cultivating (up to a maximum of 4 ha per family) and the right to collect and use non-wood forest products.</p> <p>SOURCE: Asia Forest Network, 2008.</p>	

and the provision of high-quality services. Populations will be relatively stable (and in some cases declining) and technically skilled. Improving the quality of the environment will be a major concern, and high income will provide the necessary means to do so.

OUTLOOK

Forest area

Asia and the Pacific had 734 million hectares of forest in 2005, about 3 million hectares more than in 2000 (Table 5). However, this increase was largely a result of the high afforestation rate in China, masking significant loss of natural forests in a number of countries; in the region as a whole, 3.7 million hectares were lost annually between 2000 and 2005.

Considering the two dominant development paths – rapid economic growth through industrialization and agriculture remaining the mainstay of livelihoods – forest loss is likely to continue in most countries in the next two decades at more or less the current rates. Some countries have reversed their trends of forest loss, but the countries with the most deforestation are unlikely to be able to do so. Expansion of large-scale commercial crops will be the most important driver of deforestation in the region (Figure 12), especially as oil-palm cultivation expands to meet the growing demand for biodiesel and foodgrain prices rise. In addition, in the more populous countries, especially those in South Asia, forest degradation will be a major problem, stemming from unsustainable collection of wood and non-wood forest products and from grazing.

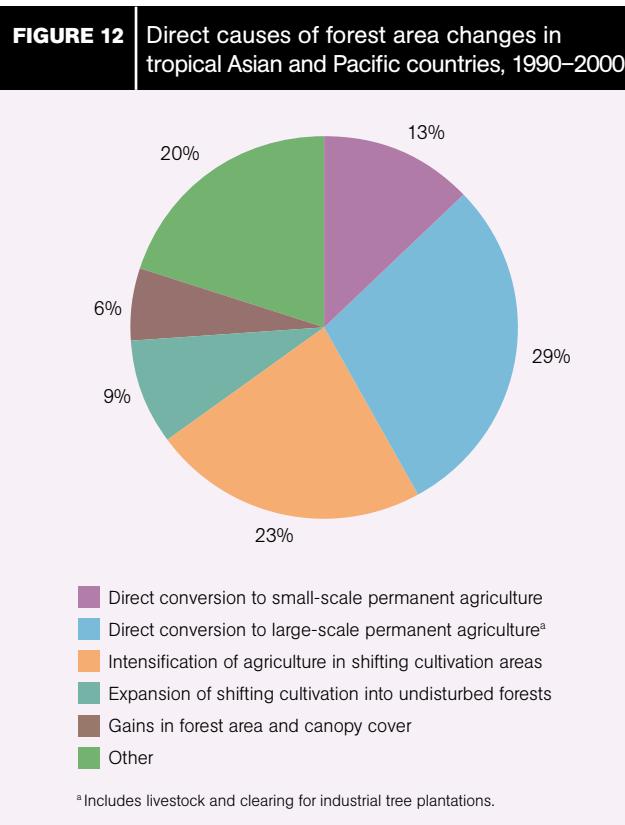
Forest management

In natural forests managed for wood production, the region has made major efforts to implement sustainable forest management through such measures as reduced-impact logging and the use of certification to target niche markets, with many success stories (see FAO, 2005a). ITTO (2006) reported 14.4 million hectares of natural tropical production forests in the permanent forest estate of its ten

member countries in the region as sustainably managed, mostly in India, Indonesia and Malaysia.

With increasing wood production from planted forests, the area of natural forests managed for wood supply has declined, partly because of the complexity and higher costs of natural forest management. Some countries have imposed outright logging bans, setting natural forests aside for their environmental values. However, where institutional arrangements are weak, unsustainable and often illegal logging is likely to continue, depressing the economic viability of sustainable forest management.

Asia and the Pacific has 136 million hectares of planted forests, nearly half of the global total (Table 6). However, their productivity is far short of their potential.



SOURCE: FAO, 2001.

TABLE 5

Forest area: extent and change

Subregion	Area (1 000 ha)			Annual change (1 000 ha)		Annual change rate (%)	
	1990	2000	2005	1990–2000	2000–2005	1990–2000	2000–2005
East Asia	208 155	225 663	244 862	1 751	3 840	0.81	1.65
Oceania	212 514	208 034	206 254	-448	-356	-0.21	-0.17
South Asia	77 551	79 678	79 239	213	-88	0.27	-0.11
Southeast Asia	245 605	217 702	203 887	-2 790	-2 763	-1.20	-1.30
Total Asia and the Pacific	743 825	731 077	734 243	-1 275	633	-0.17	0.09
World	4 077 291	3 988 610	3 952 025	-8 868	-7 317	-0.22	-0.18

NOTE: Data presented are subject to rounding.

SOURCE: FAO, 2006a.

TABLE 6
Planted forest area change

Year	Extent of planted forests			Global total (million ha)	Annual change in Asia and the Pacific
	Productive		Protective		
	Total				
1990	67	36	103	209	-
2000	78	41	119	247	1.4
2005	90	46	136	271	2.8

SOURCE: FAO, 2006b.

TABLE 7
Production and consumption of wood products

Year	Industrial roundwood (million m ³)		Sawnwood (million m ³)		Wood-based panels (million m ³)		Paper and paperboard (million tonnes)	
	Production	Consumption	Production	Consumption	Production	Consumption	Production	Consumption
2005	273	316	71	84	81	79	121	128
2020	439	498	83	97	160	161	227	234
2030	500	563	97	113	231	236	324	329

SOURCE: FAO, 2008c.

Most of the planted forests are in Australia, China, India, Indonesia, New Zealand, the Philippines, Thailand and Viet Nam. Investments in planted forests, especially by the private sector, have increased in the past two decades. As more of the natural forests are excluded from production, planted forests are becoming the mainstay of wood production in the region. There has also been substantial investment in planting for protective purposes; almost one-third of the planted forests in the region have been established for environmental protection, mostly in China and India (FAO, 2006b).

However, the scope for expansion of planted forests for production is limited, especially with current wood prices. Water availability is already a major constraint and will be more problematic in the future. The costs of productive land are steep, inflated by high agricultural prices and demand for biofuel feedstocks. Although marginal land is extensively available, it requires high investments. Thus, future wood supply will depend on improving the productivity of existing planted forests and on encouraging farm forestry as an important source of wood, including for large-scale industrial processing (Box 8).

Wood products: production, consumption and trade

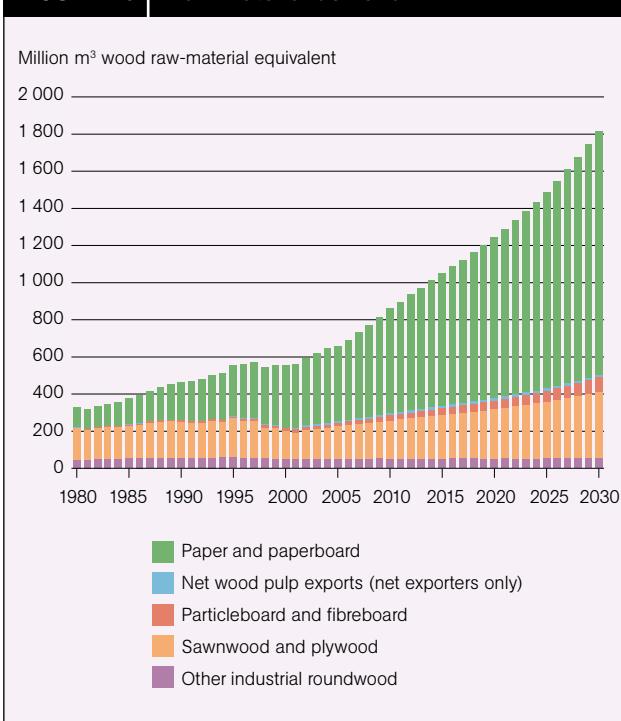
Regionally, large increases in industrial roundwood consumption and production are projected to 2020 (Table 7). China, India and other emerging economies will account for much of the growth in consumption. Trends in industrial roundwood imports are in contrasting directions. Net imports to the advanced industrialized economies (especially Japan) have

BOX 8	Farm forestry
<p>Trees are an integral part of homestead farming systems in many Asian countries, particularly Bangladesh, Indonesia, the Philippines, Sri Lanka and certain parts of India. Past investments in social or community forestry have helped to make farms important sources of wood supply. Several industries have established partnership arrangements with farmers to source wood supplies from farms. Farm forestry is expected to continue to expand as a result of:</p> <ul style="list-style-type: none"> • improving security of land tenure; • declining profitability of agriculture, which encourages farmers to invest in forest crops (which are less labour-intensive than agriculture); • increasing demand for wood products and consequent increases in their prices, making farm forestry more profitable. 	

declined, while those to the emerging economies (China and India) have greatly increased as a result of surging domestic demand and declines in domestic supply caused by logging bans.

Growth in demand for wood products (Figure 13) will largely be a continuation of recent trends and will be similar to the global outlook (see Part 2), with substantial expansion expected in the consumption of wood-based panels and paper and paperboard, and more modest growth in sawnwood consumption. Sawnwood and plywood will continue to account for most of the consumption of solid wood products, although some substitution of

FIGURE 13 | Raw material demand



SOURCE: FAO, 2008c.

reconstituted panels for sawnwood and plywood is expected. Consumption of paper and paperboard is expected to grow markedly, and recovered paper and wood produced in planted forests of fast-growing species will provide most of the fibre used in their production.

Rapid economic growth has boosted the region's share in the global trade in wood products, especially in the past two decades. Rising prosperity generally implies higher disposable income, increasing the demand for products and consequently imports (Figure 14). China accounts for a large part of the growth in trade; its total wood products imports rose from US\$5.4 billion in 1990 to US\$20.6 billion in 2006. India's wood products imports have also increased notably, from about US\$587 million in 1990 to US\$2.4 billion in 2006. China's recovered paper imports (mainly from the United States of America) grew from 5 million tonnes in 2000 to 16.7 million tonnes in 2006.

The region is also becoming an important exporter of wood products, with an increasing share of high-value products. Most remarkable is the emergence of China as the leading global exporter of furniture, overtaking some of the traditional furniture producers in Europe. Since 2005, Viet Nam has also emerged as a main exporter of wooden furniture.

The trends in demand and trade have several interesting implications for the future of forests in the region:

- The boom in demand creates opportunities for forested countries, but also challenges for sustainable forest management and control of illegal logging,

especially in countries with weak institutions and poor governance.

- Growth in trade may have impacts on forest management outside the region.
- Some of the demand may be met through improvements in efficiency.

Woodfuel

Almost three-quarters of the wood produced in Asia and the Pacific is burned as fuel. In South and Southeast Asia, woodfuel's share in total wood production is 93 and 72 percent, respectively. In contrast, woodfuel accounts for less than 1 percent of the wood produced in Japan.

Woodfuel consumption in the region declined between 1980 and 2006 from about 894 million to 794 million cubic metres. South Asia was the only subregion that registered an increase.

As incomes and urbanization increase, woodfuel will be substituted with electricity, kerosene and gas. This is already evident in most of Asia and the Pacific, although there are some differences in the predicted trends among subregions (Figure 15). For example, South Asian woodfuel consumption is expected to grow and then start to decline from around 2015. However, rising fossil fuel prices could lead to a different scenario, and the predicted fuel switching may not take place. In some cases, there could be a shift back to woodfuel, with consequences of increased collection and forest degradation.

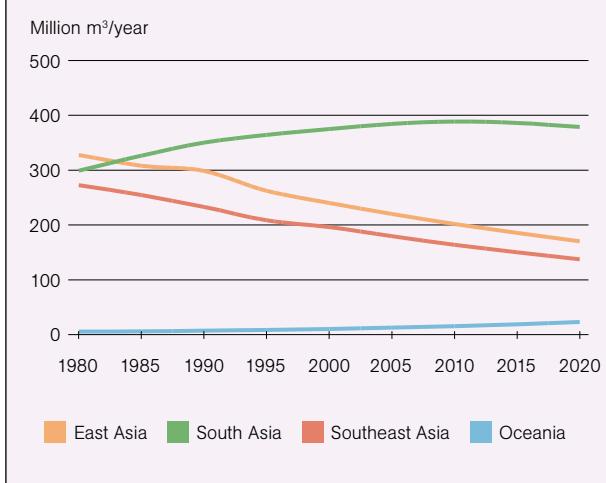
Recent oil price increases have already led to substantial public and private investments in biofuel production. Oil-yielding species such as *Jatropha curcas* are being planted on degraded land for biodiesel production. As biodiesel is mainly used only in transportation, this

FIGURE 14 | Wood products imports



SOURCE: FAO, 2008a.

FIGURE 15 | Woodfuel consumption trends by region



SOURCE: FAO, 2003b.

development may not alleviate the traditional woodfuel problem.

If cellulosic biofuel production becomes commercially viable, the demand for wood as a source of energy will increase significantly.

Non-wood forest products

Non-wood forest products from the region are diverse – food, medicines, fibres, gums, resins, cosmetics and handicrafts. Most are used for subsistence, collected and consumed locally or traded in limited quantities. More than 150 NWFPs from Asia and the Pacific are traded internationally, although apart from bamboo and rattan the quantities are usually small. Increasing interest in “natural products”, owing to their perceived health and environmental benefits, is drawing attention to the multitude of NWFPs commonly used by local communities.

The consumption of many subsistence NWFPs is likely to fall in the long term because of:

- declining supply from the wild, largely because of reduction in forest cover and poor management;
- development of synthetic materials and their substitution for NWFPs as a result of increasing incomes and consumer access;
- the decreasing attractiveness of NWFP collection relative to more remunerative and less arduous occupations available when incomes rise.

Several NWFPs – especially medicinal plants – have been commercialized and are traded nationally and globally. Increasing demand has led to their intensive collection and to depletion of wild stock. Products from open-access public forests are particularly vulnerable. In many cases, collection and trade are informal, offering minimal financial benefits to collectors.

Declining supply from the wild has led to substantial investment in the domestication of some NWFP resources. Bamboo, rattan and several medicinal plants are grown on a large scale and, thus, have largely ceased to be forest products. Cultivation of medicinal plants on farms and in home gardens, often with technical and financial support from pharmaceutical companies, is becoming popular. As with most cultivated crops, periodic demand–supply imbalances create challenges for organized cultivation of NWFPs.

Contribution of forestry to income and employment

In absolute terms, the value added generated by the forestry sector rose from about US\$100 billion in 2000 to about US\$120 billion in 2006 (Figure 16). Most of this increase is attributed to the pulp and paper and wood-processing sectors, while wood production has remained stagnant. This pattern reflects the growing dependence of the region on wood imports and the changing structure of industry, with greater emphasis on more value-adding manufacturing. However, the share of forestry in GDP and employment continues to decline (Figure 17), largely because of the much faster growth of other sectors of the economy.

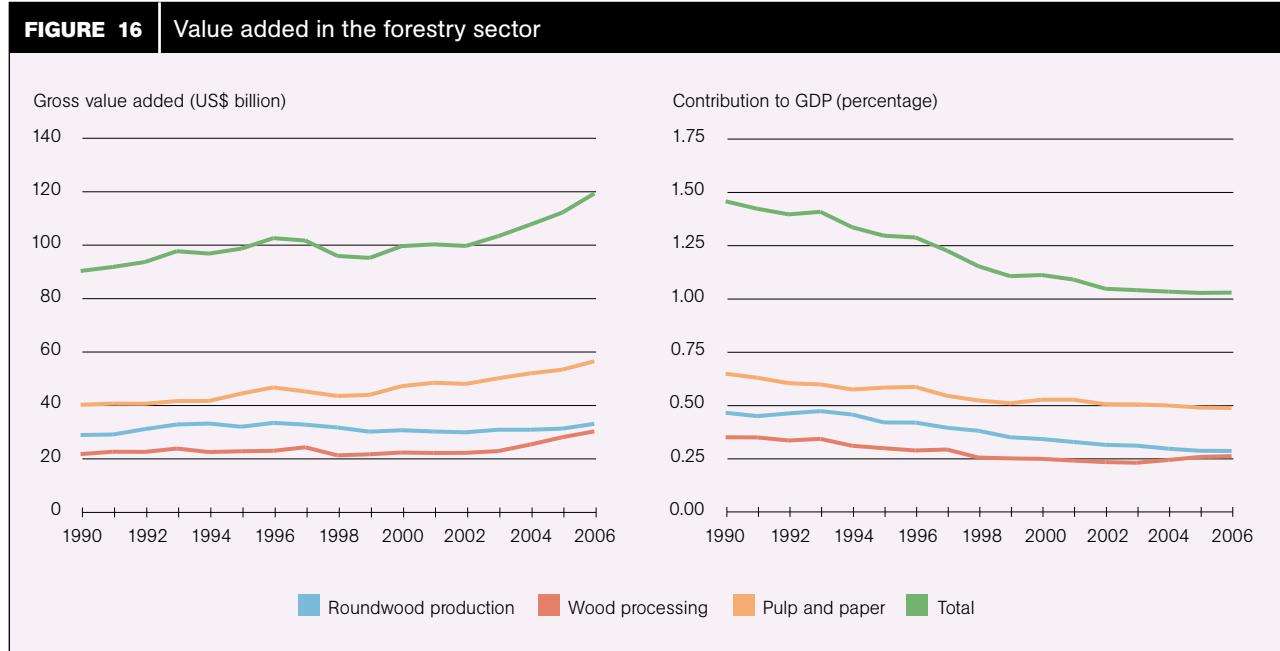
Environmental services of forests

The current situation and outlook for the provision of environmental services from forests are extremely varied in the region. National policies and strategies are focusing increasingly on environmental services of forests, and several countries have imposed logging bans in response to catastrophic events such as flooding and landslides. The provision of environmental services relies more on regulatory than market approaches.

The region has a long history of protected area management, but the control of illegal encroachment is often a challenge. Shrinking habitats are increasing human–wildlife conflicts, and trafficking in animals and animal parts is soaring. Declines have been reported for flagship species such as tiger and rhinoceros. In view of the continued degradation of protected areas, increasing emphasis is being given to participatory management, enabling local communities to benefit from protected areas, for example through ecotourism.

The region has extensive and highly fragile dry lands. Increasing socio-economic pressures have led to cultivation of marginal lands and overgrazing, which in tandem with climate variations are accelerating desertification. Many countries (e.g. China, India, Mongolia and Pakistan) implement tree planting and integrated land-use systems to combat degradation and desertification, including windbreaks and shelterbelts to protect agricultural land.

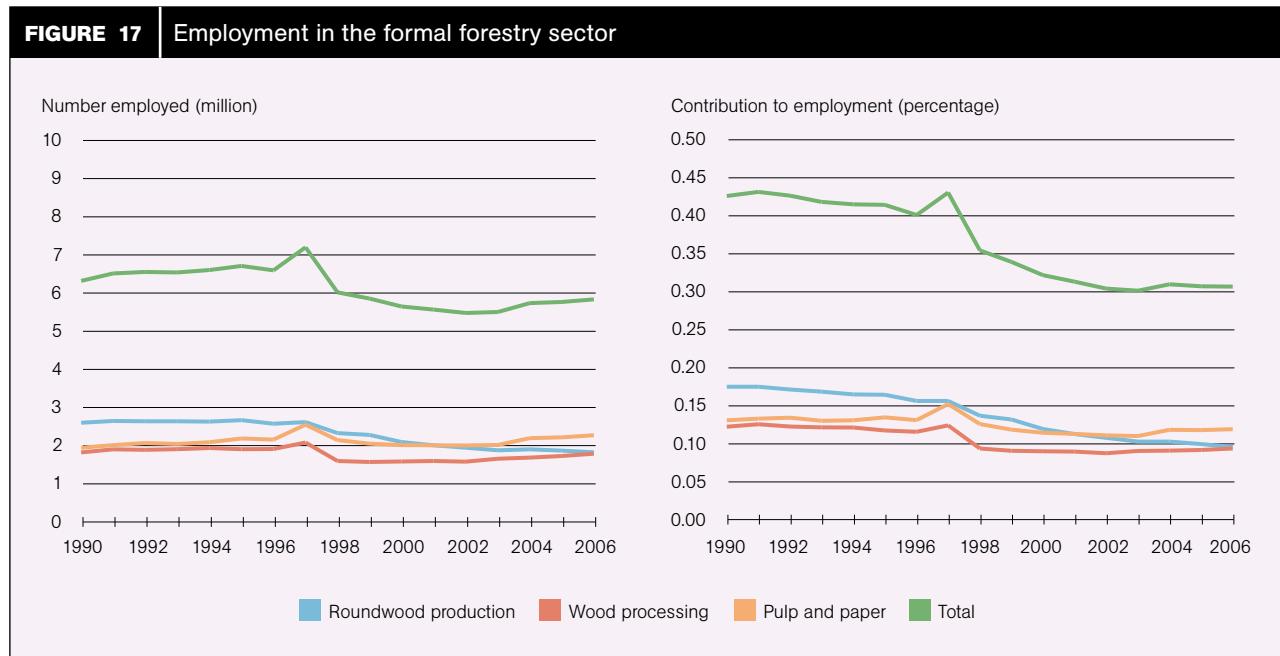
FIGURE 16 | Value added in the forestry sector



NOTE: The changes in value added are the changes in real value (i.e. adjusted for inflation).

SOURCE: FAO, 2008b.

FIGURE 17 | Employment in the formal forestry sector



SOURCE: FAO, 2008b.

Reducing the region's high rate of deforestation and forest degradation holds potential for mitigating climate change; much hope is pinned on the future of REDD initiatives under discussion in the context of the United Nations Framework Convention on Climate Change (UNFCCC).

Water scarcity is critical in some countries (especially Australia, China, India, Mongolia and Pakistan), affecting key sectors including agriculture and industry. The continued growth of most economies will depend on a sustained supply of freshwater. Public funding

for watershed management has received considerable attention, but market approaches are also being adopted, although most are still in the pilot stage of implementation (Dillaha *et al.*, 2007).

Tourism in general, and ecotourism in particular, is one of the fastest-growing sectors in Asia and the Pacific, especially in view of the rapid growth in incomes. Most countries have developed national policies and strategies to promote ecotourism for its potential to revitalize local economies and protect and manage rural landscapes,

BOX 9	Ecotourism development in Asia and the Pacific
	<p>The tourism industry is an important source of revenue for many countries in Asia and the Pacific, with revenues expected to top US\$4.6 trillion by 2010 and tourist arrivals growing at around 6 percent annually. China, the Lao People's Democratic Republic and Viet Nam are among the ten countries with the fastest-growing tourism sectors in the world. Ecotourism is becoming more popular as local and international travellers demand nature-based experiences that conserve the environment and generate revenue for local communities. In some countries, such as China and Indonesia, ecotourism is now an official conservation strategy. The region has more than 20 national and regional ecotourism associations.</p> <p>SOURCES: PATA, 2008; TIES, 2007; UNWTO, 2008.</p>

including forests (Box 9). The main challenges arising from the growing demand for ecotourism are preventing environmental degradation and enhancing the income accruing to local communities, thus providing them with incentives to protect and manage natural assets.

Provision of most of the necessary environmental services depends on arresting deforestation and forest degradation. Considering the three broad development paths, the overall outlook for environmental services is as follows:

- In the postindustrial societies – with well-developed institutions, declining pressure on land and a strong will to maintain environmental quality – environmental protection has already received, and will continue to receive, substantial attention.
- The situation in the emerging industrial economies will be more varied. Although a growing environmentally conscious segment of the population will spearhead environmental protection initiatives, continued pressures of industrialization and the needs of marginalized people will strain the environment, particularly in countries with high population densities.
- In low-income forest-rich countries – which will need to cater to the demand for wood products, energy and industrial raw material from the rapidly growing economies, and to the demand for land from the expanding agricultural population – environmental protection is unlikely to receive much attention. These societies are less likely to be willing or able to pay for improving or maintaining environmental services.

SUMMARY

Considering the great diversity of the region, a varied scenario is expected to unfold. While forest area will stabilize and increase in most of the developed countries and some of the emerging economies, most of the low- and middle-income forest-rich countries will witness continuing decline owing to expansion of agriculture (including the production of biofuel feedstock). Both traditional woodfuel and emerging bioenergy options will pose enormous land-use challenges. The rapid industrialization of the emerging economies will create great demand for primary commodities, which is likely to result in forest conversion in the remaining countries.

Demand for wood products will continue to rise in line with the growth in population and income. While the region is at the forefront of plantation forestry, its dependence on wood from other regions will continue in the foreseeable future. Overall, the region – especially some of the most populous countries – faces severe land and water constraints that may limit the scope for self-sufficiency in wood products.

The demand for forest environmental services will increase as incomes rise. Conservation involving local communities will receive greater emphasis. It remains to be seen how the post-2012 climate change arrangements evolve and whether initiatives such as REDD will actually provide sufficient incentives to refrain from forest clearance and other unsustainable uses.