Ukraine

Forestry Sector Note

Status and Opportunities for Development

March 2006

PREFACE

This note was prepared by a combined team of World Bank staff and Ukrainian and international consultants, working in close collaboration with the State Forestry Committee of Ukraine. The team is grateful for contributions and support provided by the Swiss Development Corporation and PROFOR[1]. The findings and opinion presented are based on an assessment of the available information and consultations with a broad range of forestry sector stakeholders, including officials of the Ministry of Agricultural Policy; the Ministry of Industrial Policy; the Ministry of Environmental Protection; the State Forestry Committee, Oblast level forestry departments, State forest enterprises, private sector investors in primary and secondary wood processing industries, NGOs, and the academic community.

The objective of the note is to draw attention to a tentative agenda of key issues, and to inform discussion among forestry sector stakeholders regarding the needs, opportunities and options available to maintain and manage Ukraine's forests for the benefit of all.

[1] PROFOR is a multi-donor partnership formed to pursue a shared goal of enhancing forests' contribution to poverty reduction, sustainable development and protection of environmental services, through improved knowledge and approaches for sustainable forest management. PROFOR is funded by the Department for International Development (DFID) of the United Kingdom, the Finnish Department for International Development Cooperation, the Japanese International Forestry Cooperation Office, Swiss Development Cooperation (SDC). The German Government is an in-kind contributor.

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Currency

US$ 1 = 5.070 Ukrainian Hryvnia (UAH) (Interbank rate May 21st 2005)

ACRONYMS

AAU	Assigned Amount Unit
AFE	AgroForest Enterprisesn
ERU	Emission Reduction Unit
FAO	Food and Agriculture Organisation of the United Nations
FMP	Forest Management Plan
FRMP	Forest Roads Master Plan
FSC	Forest Stewardship Council
FSMP I II	Forest Sector Master Plan Volumes I and II
GDP	Gross Domestic Product
GHG	Green house gases
GIS	Geographic Information System
GNP	Gross National Product
HCV	High Conservation Habitat
JI	Joint Implementation (Under Kyoto Protocol)
MCPFE	Ministerial Conference for the Protection of Forests in Europe
MDF	Medium density fibreboard
MoAP	The Ministry of Agrarian Policy
MoD	Ministry of Defence
MoEP	Ministry of Environmental Protection
MP	Member of Parliament (of Ukraine)
NFPS	National Forest Policy and Strategy
NGO	Non governmental organisation
NTFP	Non Timber Forest Product
OSB	Orientated Strand Board
RFD	Regional Forest Department
SFC	The State Forestry Committee
SFE	State Forest Enterprise
SFM	Sustainable forest management
tCO_2e	Tonnes of Carbon Dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
VAT	Value Added Tax

EXECUTIVE SUMMARY

A. Status and Values of Ukrainian Forests

1. About 10.8 million hectares of Ukrainian territory, or about 18% of the country, is included in the forest fund[2]. The country has four major geographical zones, each with their own forest type characteristics and forest management needs. In the Carpathian region, where poverty levels as well as the value and volume of the native timber species are highest, about 37% of the land is forested. By contrast, the southern steppe is not naturally forested, but forest shelter belts and agricultural forests help maintain agricultural soil moisture and productivity and safeguard against erosion. Irrespective of regional differences, the forestry sector plays an important role in rural areas where unemployment is high, through provision of jobs and maintenance of rural communities, while also providing essential environmental services. Direct employment in the forestry sector, including wood industries, is about 350,000. Total employment (direct plus indirect) is of the order of 500,000. The annual growth of Ukraine's forests is estimated at 50-55 million cubic meters (million m^3)[3], but the actual annual harvest is only 15 million m^3. Hence there is significant potential for increasing the harvest of timber within sustainable levels, and expanding Ukrainian forest based industries, employment and exports.

B. Potential for Sustainable Development of the Forestry Sector

2. The forestry sector could more than double its contribution to the national economy while also better ensuring sustainable provision of public good functions, such as watershed management, control of erosion and flooding, conservation of landscape and biodiversity, and the opportunity for recreation and tourism. This could be achieved through: increasing the level of sustainable harvesting of timber and forest products; encouraging private investment in forest based industries including wood harvesting, processing and tourism; ensuring that all public good functions are incorporated in production forest management; and that forest protected areas are effectively financed and managed to conserve conservation of indigenous biodiversity. In addition, Ukraine may be able to capture additional international financing for afforestation in the context of Kyoto Protocol related green investment schemes and Joint Implementation Projects.

3. Increasing the harvest of timber and forest products could be achieved, in line with modern sustainable forest management practice. The Forest Sector Master Plan[4] assessed the potential for increasing the harvest from Ukrainian forests, and concluded that production could be increased

[2] The Forest Fund comprises all forested areas of Ukraine but also includes some unforested areas which have been granted and used for the needs of forestry. 9.49 million ha are actually forested i.e. 15.7% of Ukraine's territory and 16.4% of Ukraine's land area (excluding water bodies). Source: 'Brief handbook of Ukrainian forest fund', Irpin 2003.

[3] According to the inventory of SFC's forests, the average growth of Ukraine's forests is 3.8m^3/ha/yr. In Ukraine growth statistics are calculated by measuring the standing volume on two separate occasions and subtracting the first volume from the second. This ignores natural mortality and harvested volumes. If these two factors were incorporated in the calculation, the estimated average growth would be around 5 m^3/ha/year or nearly 54 million m^3/year in total (Popkov M. - Present state of the forest sector of Ukraine and contribution of the project in solution of the problems facing the forest sector - Ukraine Forest Sector Master Plan, Mid Term Seminar 2002).

[4] Ukraine Forest Sector Master Plan II (2004)., Ramboll Natura AB, Sweden

from the existing 15 up to at least 20 million m^3 per year[5] by either: (i) allowing for sustainable silvicultural felling operations in forests with environmental and protection functions, or (ii) lowering the final harvest ages for production forests in line with European practices. A combination of both of these options could result in a sustainable harvest in excess of 20 million m^3. Ukraine currently harvests less than 30% of the estimated gross annual growth of its forests (15 million m^3 versus 50-55 million m^3). The average percentage harvest of annual growth rates in the twenty five European countries is 63%. Increasing Ukraine's harvest to European average levels could result in an annual harvest of about 34 million m^3 per annum (i.e., an increase of around 127%). Additionally, there is potential for further developing the sustainable harvesting, processing and marketing of a range of non timber forest products (e.g., wild berries, mushrooms, nuts, game meat, etc.), to take advantage of growing lucrative markets in Western Europe. There is also the potential to process large quantities of small round wood (much of which is currently wasted), or market it locally as an alternative to fossil fuels.

4. Increasing the economic and social benefits derived from wood industries. There is significant scope to increase the value of forest products produced in Ukraine for both local and foreign markets, while also decreasing imports of processed forest products. Ukraine is a net exporter of wood products but a net importer of pulp, paper and particleboard. While this positive trade balance is widening, currently Ukraine's main exports of forest products are sawn timber and round wood (i.e., unprocessed or marginally processed raw material that could be significantly increased in value by further processing in-country). In 2004 the annual value of Ukraine's exports of wood products was about US$ 507 million, with round wood accounting for about 27%. Imports of wood products to Ukraine (worth about US$ 262 million in 2004), could be manufactured locally - with increased private investment in wood industries. Pulp and paper accounted for about 66% of imports in 2004, and particle boards for about 28%. There is expected to be a growth in the production and consumption of wood products in Eastern Europe. With lower domestic prices than in neighbouring Poland and Hungary, Ukraine is well positioned to compete with other wood industries in the region and take advantage of market growth in the east, while also increasing penetration of higher value markets in Western Europe and elsewhere.

5. Maintaining and enhancing environmental benefits. In the past, the primary economic value of forestry was seen as the value of timber produced and the effects of employment created – often in rural areas with low employment opportunities. During the 1990s, there has been a growing worldwide recognition of the multiple values and services that forests can provide, and emphasis on the development of policies and management practices that safeguard public good functions, while also optimizing the commercial assets of forests. The potential for forestry to increase its contribution to the national economy through timber production, wood industries and export of forest products is significant. However, evidence derived from total economic valuation of similar forest resources in other European countries suggests that the non pecuniary values of Ukraine's forests (e.g., water regulation and water quality, soil conservation and erosion control, biodiversity conservation and carbon storage, etc.) together with landscape maintenance, recreation and leisure, are likely to be worth at least double the value of the forest harvest. Ukraine could maintain and enhance provision of public good and commercial forest products and services through recognizing and incorporating the multiple use functions of forests in the forest management planning process.

[5] See footnote 3

6. Increasing revenues from forest based tourism. Economic growth and development of cheaper transportation networks is leading to a dramatic increase in demand for forest-based recreation throughout Europe. While tourism and recreational infrastructure is relatively underdeveloped in many of Ukraine's forested areas, Ukraine has a wide diversity of forest landscapes that could provide for the development of local and international tourism (thereby capturing additional foreign exchange), and boosting rural economies.

7. Capturing carbon trade financing. It may be possible for Ukraine to access international carbon financing - in the context of green investment or Joint Implementation schemes associated with the Kyoto Protocol - to support reforestation of large areas of degraded agricultural lands, thereby further enhancing the scale and productivity of the national forest estate, and mitigating environmental degradation.

C. Institutional Responsibility and the Costs of Forest Management

8. Ukrainian forests are almost completely state owned and managed (>99%). About 69% of forests are under the authority of the State Forestry Committee (SFC), which is responsible to the Ministry of Environmental Protection, and about 18% fall under the authority of the Ministry of Agrarian Policy (MoAP). The SFC has 24 Regional Forest Departments at Oblast level, and one Forestry Committee for Crimea. The Regional Forest Departments are state funded and supervise about 420 different forest enterprises employing approximately 90,000 staff. The day-to-day management of MoAP forests has been decentralized to the Oblast level, and in the 16 Oblasts that have relatively more forest resources, AgroForest Enterprises employing more than 22,000 people undertake forest operations. The remaining 9 Oblasts manage the forest through their forestry departments at the main Agricultural and Food Department of the State Oblast Administrations. Forests that are under the authority of the MoAP includes blocks of forests in the agricultural landscape that are of critical importance for maintaining agricultural soil moisture levels and preventing wind erosion in adjacent arable lands. Partly because of the ease of access, combined with an insufficient number of forest department staff, some MoAP forests are particularly subject to illegal harvest and are, consequently, relatively poorly maintained.

9. The current cost of managing the State Forestry Committee forests, and the opportunity to increase revenue capture by the state: In 2004, 12.4 million m^3 of timber were harvested from forests managed by the SFC. The revenue derived from the sale of these forest products was US$ 260.1 million (excluding VAT). Management costs were US$ 208.5 million, of which about US$ 24.9 million was made available by direct state budgetary support. In the same year, SFC paid the state US$ 87.7 million in taxes and stumpage fees (US$ 76.7 million in taxes and US$ 11 million in stumpage fees), i.e., a net return to the state of US$ 62.8 million. The state captures additional returns from taxes associated with value adding industries (sawmilling, paper, plywood, board, and furniture manufacture). Returns to the state could be significantly increased by: (a) increasing harvesting within sustainable levels, (b) improving cost effectiveness of forest management and harvesting (thereby reducing the need for state subsidy), and (c) increased private sector development of value adding industries.

10. Agricultural forests: AgroForest Enterprises are funded from the sale of forest products and state subsidy (approximately 16%). The state budget support for agricultural forests is

approximately US$ 1.33 per ha in comparison with US$ 2.75 per ha for SFC forests. The cost of managing agricultural forests in 2004 was about US$ 17.9 million. The State contributed only about US$ 2.9 million toward these costs and the remainder was generated by the Agroforest Enterprises from the sale of forest products. The return to the state derived from stumpage fees was approximately US$ 0.85 million. 66% of agricultural forests are categorized as Group I, where commercial cutting is restricted. Agricultural forests are primarily used to satisfy the needs of rural areas in forestry products[6]. The reported production in agricultural forests is about 0.7 m^3/ha/year (excluding shelterbelts), whereas the average for the country is 1.4 m^3/ha/year. Even allowing that agricultural forests occupy some of the less productive sites and the average age of the trees is less than in SFC forests, the level of production could be considerably higher with improved management.

11. Priorities for successful development of a forestry sector: A recent World Bank review of experience of the reform and development of forestry institutions in transition countries[7] emphasises that there is very little empirical evidence to suggest that organizational structures, by themselves, are the key element to a successful forestry sector reform process. To the contrary, evidence strongly suggests that the functional form of a forest organization simply does not matter. Very different models can succeed, and very different models can fail. What matters more is that forest organizations operate in a way which is geared toward service delivery, whether those services are provided for the public good (e.g., biodiversity conservation, recreational purposes, watershed management, insect and fire control, etc.) or for private benefits to the forest industry, to private forest owners in need of forest management advice, or to people who need forest products such as timber, firewood and non-timber forest products. For an institutional reform process to succeed, it must be strongly supported both at the political level, and at the organizational level. Top priorities for successful development of a forestry sector include:

a. ***Agreeing on the overall objectives*** of managing the forest resources (e.g., the relative priority of production versus other services to the exclusion of production) combined with the introduction of modern, sustainable and – where appropriate - independently certifiable forest management, which can often allow for improved production of wood and other forest products, and also better safeguard environmental, social and recreational services, etc.,
b. ***Clarifying responsibilities*** of the different institutions, and the functionaries working in them and avoiding overlapping and duplicating roles (text box 1 provides a check list of functions of forest organizations),
c. Putting in place, and maintaining, transparent systems for budgeting and accountability, and
d. Developing clear ***benchmarks to monitor results***.

[6] There is however no Government policy for agricultural forests yet.

[7] Forest Institutions in Transition, World Bank Europe and Central Asia Region (ECSSD) February 9, 2005

Text Box 1 Functions of Forest Organizations

When policy makers mandate that forest organizations are to deliver on certain tasks, and when multi-functional forest management is an explicit objective of policy, forest organizations (broadly defined) can be expected to have clear functions specific to:

Policy and Legislation
1. Policy setting
2. Legislation and regulation
3. Enforcement of the legal framework

Forest management services
1. Forest management planning
2. Fire and pest management
3. Forest inventory
4. Forest roads construction and maintenance
5. Forest regeneration
6. Management for recreational uses
7. Management for conservation
8. Management for the provision of environmental services such as watershed protection

Other services
1. Sale of timber and timber products
2. Sale of non-timber products
3. Marketing services (both timber and non-timber forest products)
4. Socio-economic services to local communities, derived from state-owned forests (fuelwood, non-timber forest products, grazing resources, etc.)
5. Forest extension services to private owners/users

In considering these functions, it is also important to note that they can be provided by multiple organizations both within the public sector (forest departments, commissions, state enterprises) as well as outside of it, by the private sector and by civil society organizations. It should be added that, in most countries, harvesting, transport, and processing services (which in transition economies had previously been provided by the public sector) are provided by the private sector, though often with mixed results.

Current institutional responsibilities for forest management functions in Ukraine are summarized in Table 1. Many institutions are involved and there is a potential for overlapping or duplication of functions and responsibilities. Additionally, some important functions are poorly resourced both in terms of human resources and infrastructure. Current statutory processes, such as procedures for approval annual harvesting plans, further disempower forest managers. There is, therefore, potential to increase the efficiency of state forest management.

e. Table 2 outlines some of the financial, environmental and social benchmarks that could be used to monitor the performance of forestry institutions. While the balance of objectives of forest management are likely to vary from region to region, in order to access and safeguard the potential benefits that can be provided by its forest estate, Ukraine should confirm the overall objectives of forest management, and then c***larify institutional responsibilities***, agree on clear ***benchmarks to monitor results and progress in achieving objectives,*** and establish ***transparent systems for output based budgeting and accountability.***

Table 1 Current institutional responsibilities for forest management functions in Ukraine

Functions of Forest Organizations	Institutional responsibility in Ukraine
Policy and Legislation	
1. Policy setting	• Verhovna Rada (Parliament)
2. Legislation and regulation	• Verhovna Rada (laws) • Cabinet of Ministers (programs and normative legislation and guidelines) • State Forestry Committee (drafting, laws, state programs, and normative legislation • Oblast Administration (local implementation)
3. Enforcement of the legal framework	• Forestry Inspectorate of the Ministry of Environment (inspection function) • Service of Forest Protection of the State Forestry Committee (inspection and production process supervision functions) • Ministry of Interior (within their authority) • Prosecutors Office (within their authority) • Customs (within their authority)
Forest management services	
1. Forest management planning	State Forestry Design Institute (Irpin) and its affiliates in L'viv and Kharkiv
2. Fire and pest management	• State Forest Enterprises • State Forestry Committee (Lviv and Ukraine Forest Protection Agencies • State Forestry Committee Aerial fire suppression)
3. Forest inventory	State Forestry Design Institute
4. Forest roads construction and maintenance	State forest enterprises
5. Forest regeneration	State forest enterprises
6. Management for recreational uses	• State forest enterprises • Local Authorities and their specialized enterprises
7. Management for conservation	• Ministry of Environmental Protection – State Service for Protected Areas • State Forestry Committee • Local Administrations (Oblast and Rayons) • State forest enterprises
8. Management for environmental services, such as watershed protection	• State forest enterprises • State Committee for Water Resources
Other services	
1. Sale of timber and timber products	• State forest enterprises • Oblast specialized forest enterprises (Les-Services)
2. Sale of non-timber products	State Forest and Private Enterprises (Not regulated)
3. Marketing services (both timber and non-timber forest products)	Oblast Specialized Forest Enterprises (Les-Services)
4. Socio-economic services to local communities, derived from state-owned forests (fuel-wood, non-timber forest products, grazing resources, etc.)	State forest enterprises under Regulations developed by State Forestry Committee and approved by the Cabinet of Ministers
5. Forest extension services to private owners/users	Not applicable

Table 2 Financial, Environmental, and Social Benchmarks for Forest Organizational Performance

Financial Benchmarks	Indicator
Profit:	by area, employee, % turnover, asset value
Operational Cost:	harvesting, establishment, haulage,direct / indirect breakdown
Income:	by forested ha, timber / non timber ratio
Cost of Management:	as proportion of income
Value of forest industry:	as proportion of national GDP

Environmental Benchmarks	Indicator
Protected areas:	ha, % of total area
Forest health:	% area affected by disease, fire
Certification:	% covered
Sustained yield:	% Annual Allowable Cut felled

Social Benchmarks	Indicator
Employment:	quantity, quality, direct/indirect, staff morale
Stakeholders:	involvement in planning, public satisfaction
Training:	% budget on staff training, awareness programs for children
Visitors:	numbers/forest type, numbers/total population
Budget:	% spent on social issues

Source: Coillte 2002

D. Current Management Practice – key issues and opportunities for improvement

12. Overly conservative harvesting levels and inappropriate classification of forest use areas is impacting negatively on good forest management, and wasting a valuable sustainable resource. Ukraine harvests less than 30% of the estimated gross annual growth of its forests. In addition, about 33% of the current annual harvest from State Forestry Committee forests is removed for so called 'sanitary' reasons (i.e., old, dead or diseased trees that need to be removed to avoid loss or further damage to the forest). The high proportion of sanitary harvest results from a combination of factors: (i) an inappropriately large area of the forest estate is currently classified as protection forest where commercial harvesting is restricted (almost 50% of the forest is protected to some extent), (ii) the potential sustainable harvest is underestimated (growth estimates are calculated by measuring the standing volume on two separate occasions and subtracting the first volume from the second, thereby excluding mortality and harvested volume from the calculation), and (iii) the final or regeneration felling ages set by the technical norms are too high, whereby growth rates have slowed and senescence has begun before the tree is harvested. In addition, since the sanitary

harvest cannot be adequately planned it can result in localized over harvesting, and there is also the temptation to remove larger groups of better value trees to boost flagging revenues. This is negative or reactive rather than proactive silviculture.

13. Forest production levels could be significantly increased following review and revision of the classification of forest types and management objectives so as to: (a) better define the strategic distribution and coverage of a network of forest protected areas that could be managed more effectively for conservation objectives, and also (b) better manage other categories of forests for economic, environmental and social objectives. Experience from elsewhere in Europe has shown that it is possible to incorporate management for environmental objectives in production forest management, thereby maintaining valuable habitats, biodiversity and environmental benefits, while also improving the overall economic value of the resource. It would be possible to significantly increase the sustainable harvest of wood from Ukraine's forests by adjusting the technical norms to allow for: (i) increasing harvesting levels in accordance with actual forest growth rates; (ii) rationalizing the areas of forests where final or regeneration felling is currently prohibited; (iii) aligning rotation and felling ages with European best practice norms; (iv) reducing the level of 'sanitary cutting' with a corresponding increase in final, regeneration and thinning volumes; and (v) providing access to productive stands that are currently inaccessible for harvesting by improving the forest road network. These improvements would entail a revision of the current technical norms for forest management planning, and could be introduced at the same time as introduction and certification of sustainable forest management, which will become an increasingly important requirement to ensure access to higher value export markets. The revision of technical norms for felling and forest management planning could be addressed in the context of developing a national standard for sustainable forest management, based on an objective evaluation of the economic, environmental and social values of forests, and building on experiences from elsewhere in Europe.

14. Investing in thinning would yield dividends in the future in terms of timber quality and sustainability of supply. Insufficient thinning (i.e. selective felling of poorer quality smaller trees to provide space for the remaining good quality trees to grow quickly to optimal size), particularly over the last fifteen years, together with excessive final felling ages, is leading to overstocked forest stands of poor quality stems that are more prone to disease and catastrophic events such as wind blow and fire. The backlog of thinning needs is caused by financial constraints coupled with a collapse in markets for small round wood (the product of early thinnings, which can be used to make paper, particle or hard board, or fuel wood). If allowed to continue, insufficient investment in thinning will impact on the productive capacity of the forest estate and sustainability of future supplies of higher quality timber. Conversely investment in addressing the backlog of thinning needs and ensuring that optimal levels of thinning are maintained would yield dividends in terms of future timber quality and sustainability of supply.

15. Improving the forest road network would reduce negative environmental impacts while increasing economic returns from forest management. The density of forest roads in Ukraine (national average 12.6 meters per hectare, and 7.7 m/ha for the Carpathian region) is less than optimal for environmentally responsible harvesting and sustainable forest management, and is significantly lower than in comparable conditions in other countries with similar conditions (Austria 36 m/ha and France 26 m/ha). Furthermore, the existing network is in poor condition and up to 70% is in need of rehabilitation. Deficiencies in the forest road network results in increased costs of harvesting, longer skidding distances (often along water courses in steep

terrain), thereby leading to erosion, environmental degradation, over-harvesting near to the existing road and rail access, and under-harvesting in inaccessible areas of production forest where sustainable harvest is required. Based on assessment of local costs for road construction and maintenance, and on conservative estimates of timber harvest yields, initial analysis indicates that investment in new forest roads in areas of production forests in the Carpathian region could have an economic internal rate of return of about 19%. Experience in other countries in the region shows that rehabilitation of existing forest roads is likely to have an even higher economic return.

16. Controlling illegal harvesting could capture additional revenues and safeguard forest services: According to official figures, in 2003/2004 the number of reported cases of illegal harvesting of wood was 12,000/15,000 with a volume of 30,000 m^3/40,000 m^3. However, local experts suggest that the volume of illegally harvested wood may be as high as 1.2 million m^3/year. At average domestic prices, this level of illegal off take would equate with an annual loss of **US$ 27.4 million**, although the real cost is likely to be many times greater as illegal loggers generally over harvest in areas close to roads and remove only the better quality stems with no regard for the environmental damage caused. In Transcarpathia, illegal logging for domestic fuel wood has been linked to poverty. Before an action plan is prepared to address the problem there is a need to better understand the extent, nature and impact of illegal logging on forests and the environment.

17. Potential new forests, and the Kyoto Protocol: About 2 million ha of degraded and abandoned arable land under the jurisdiction of village councils has been identified as more suitable for reforestation than agriculture[8]. This includes areas that were cleared of their natural forest cover and have been cultivated for many decades, but where agricultural productivity has declined and, in some cases, the land is subject to erosion with associated negative impacts on water courses, and infrastructure. Consequently, investment in reforestation is desirable both as a means of stemming the physical and economic impacts of land degradation, and also enhancing the economic productivity and environmental services of the land. It may be possible for part of the cost of reforestation (about US$ 1,000/ha for establishment and tending for the first six years) to be covered under Joint Implementation or Green Investment Schemes associated with the Kyoto Protocol. Such reforestation could, therefore, enhance the scale and productivity of the national forest estate, while capturing significant international financing from the carbon market.

E Forest Based Industries – Opportunities to Encourage Private Investment and Development

18. Opportunities for developing wood processing and furniture industries. The State Program for the Development of the Wood Processing and Furniture Industry (2004-2011) was submitted to the Cabinet of Ministers at the end of 2004 by the Ministry of Industrial Policy. This program includes proposals for: (a) the modernization of furniture and wood processing, (b) the establishment of new particleboard and Medium Density Fibreboard capacity, and (c) a research and development program. Private sector investment in wood industries may, however, be discouraged in some areas by inequalities in wood pricing, whereby the price paid by State forest

[8] From: (i) The Law of Ukraine 'On the State Program of the National Econet for the Period of 2000-2015'; (ii) the Decree of the Cabinet of Ministers 'On Urgent Measures on Creation of Protection Forest Stands on Abandoned Lands and in the River Basins' and (iii) The National Program for Ecological Recovery of the Dnieper River Basin and Improvement of the Potable Water Quality

enterprises (which currently consume approximately 15% of the total wood harvest) is substantially lower than the more competitive prices paid by private enterprises. This inequality limits free market competition, tempts black market pricing, and reduces fiscal potential. Additional disincentives to private investment in wood industries include: (i) difficulty in arranging for long term contracts to ensure sustainability of supply of raw materials; (ii) lack of clarity regarding the procedures to be followed to obtain approvals; (iii) difficulty of access to data on forest resources needed for planning purposes; (iv) frequent revisions of agreed contractual terms and conditions, sometimes related to the replacement of Oblast administration decision makers; and (v) non-reimbursement of VAT on exports and lack of clarity in the taxation system.

19. Despite these difficulties, foreign investment in the wood processing and furniture industry in 2004 totalled US$ 102 million. However, to process and add value to most of Ukraine's sustainable harvest of forest resources, increase exports and decrease imports of processed forest products, a significantly larger scale of private investment would be needed. In an endeavour to overcome current obstacles, some foreign companies are seeking to invest significant sums in processing equipment and infrastructure in return for: (a) long-term (e.g. 25 year) resource concessions to ensure guarantee of supply of resources, as well as (b) state subsidy to cover the cost of managing the would-be concession to maintain public good and environmental benefits. Such an approach to overcoming the disincentives listed above is unusual in the European context. Priority actions that could improve the enabling environment for beneficial private investment in forest industries could be identified in the context of developing national and regional forest policy and strategic action plans, and would include options for improving security and continuity of supply of raw materials, and improving the access to quality information on the resource base and on investment procedures, thereby allowing for identification of costs and benefits needed for business planning. National and regional forestry sector strategies could also better define the role of government as a service provider to safeguard public good functions, while facilitating private sector investment in commercial aspects of sustainable forest management.

20. Opportunities to capture additional economic returns from Ukraine's forests, through sustainable harvest of non timber forest products, the development of tourism, and wood energy.

- *Non-timber forest products*: The marketing and processing of forest and wild food has generally not received the same attention by food manufacturers, national associations of food and beverage producers or national food promotion agencies that other sections of the food industry has. This may be because these products are currently sold in local markets through decentralized trade networks that involve large numbers of forest collectors, middlemen, and small shop owners. Perhaps, in the short term, the greatest potential to increase production, co-ordinate processing and add value to non timber forest products will be associated with improved marketing of mushrooms, nuts and game meat. While Eastern Europe supplies circa 70% by volume of these products, the revenue share of the producing countries is less than 5%, reflecting the low added value and the export of unprocessed raw materials. Improving the capture of revenue would require coordinated private investment in market development, processing and supply, and distribution chain management.
- *Tourism*: Ukraine's potential to capture some of the expanding market for forest based tourism is significant. Determinants of up-take of the recreational benefits of forests include visitor accessibility, quality of facilities and visitor awareness of the resource. To date tourism in Ukraine has focused on traditional markets, largely in the coastal region. Ukraine remains relatively unknown in Europe. There is potential, especially in the

Carpathian region, to provide a range of eco-tourism products, such as trekking, camping, cycling, heritage trails, etc, which could be developed at local level and support rural income diversification. The quality of landscape and the forest resources is high, the regional market for forest related tourism is growing, and technical barriers, such as infrastructure and marketing, can be overcome. Notwithstanding the potential for increasing the capture of revenues from international tourism, there is also scope to enhance the recreational value of forests for all of society through improvements in access, basic facilities and awareness of opportunities.

- *Wood energy*: The results of pilot projects in Ukraine (e.g., enterprises of plywood 'ODEK Ukraine' in city Orzhev, Rovno region; and Malinsk district forestry secondary technical school, Zhitomir region) indicate that small wood (i.e., derived from thinning or the portions of harvested trees that are too small to be processed into timber) can be used to provide heating and hot water at a price that can be competitive with other forms of energy. Additionally, over the period 2002-2004, a number of State Forest Enterprises and wood processors have established wood fuelled boilers for heating and firing of drying kilns. The use of wood energy could allow for a reduction of dependency on fossil fuels, and their replacement with an indigenous, carbon neutral and sustainable alternative. In the absence of significant investment in alternative processing markets for small wood, estimates suggest that Ukraine's forests could supply more than several million tonnes of biomass per annum. The main barrier to switching from fossil to wood fuels for larger scale water and heating supplies is the relatively high initial cost of equipment for utilizing wood energy, and the associated need for long term guarantee of supply of sufficient fuel wood. With the development of sustainable harvesting and mechanisms to guarantee long term supply of forest resources including small wood, investment in wood energy systems may be economically competitive and could be eligible for support under green investment schemes or Joint Implementation associated with the Kyoto Protocol.

F. Forestry Sector Stakeholder Opinion

21. Lack of awareness and understanding on the part of important stakeholders threatens sustainable management and conservation of Ukraine's forests: Media, environmental NGOs, the general public, and some government officials are often poorly informed and perceive forestry as the negative exploitation of natural resources leading to environmental degradation. There is a lack of understanding of the potential critical role that forestry can play in maintaining the environmental functions and services provided by forests, including conserving biodiversity, in the production landscape. This perception may, in part, have contributed to the prevailing overly conservative classification of forest types and uses, together with the constraints that this has placed on good forest management practice, and the maintenance and growth of forest based industries.

22. Partly as a consequence of the negative perception and understanding of the role of forestry, the number of forest areas being removed from production forestry and set aside as protected areas has been increasing rapidly in recent years. As the coverage of these 'paper parks' increases, the resources available for effective protected area management are being spread ever more thinly over a larger area, and the opportunity for mainstreaming conservation in the wider production landscape is being neglected. Experience from Europe has shown that foresters and environmentalists can work together to more effectively protect and maintain critical habitats,

while enhancing the biodiversity and environmental benefits of production forests and protected areas.

G. Ukrainian Vision for the Future and Strategy for Development

23. Current forestry sector policy and strategy: The 'Forests of Ukraine Program' was prepared by the State Forestry Committee and passed by the Cabinet of Ministers in 2002. The program's 'objectives' include increasing the productivity of the sector, providing for environmental and social services, and increasing the area of land under forests by 500,000 ha. The program was prepared, fundamentally, as a proposal for national government budget allocations to the State Forestry Committee and the Ministry of Agricultural Policy ($45 million over a 14 year period, with a further US$ 2.02 billion to be derived from finances generated by the state forest enterprises from sales of state forest resources). Hence the program has not benefited from input from forest sector stakeholders, such as the private sector, local communities, academia, NGOs and the environmental community. Forest sector officials and stakeholders consulted during the preparation of this Sector Note frequently indicated that it would be highly beneficial to bring all key stakeholders together to discuss and agree on a national forest policy and strategy, which could then provide the overall guidance for development of the sector. There is a need to build consensus at a national level on a vision together with a statement of forestry sector priorities. This vision and statement could provide guidance for the subsequent participatory development of a national forest policy and strategy[9].

H. Potential Role for the World Bank and Partners

24. Capturing the multiple values of Ukraine's forests will require reclassification of forest use areas so as to allow for effective and sustainable management of the economic, environmental and social values of the forest estate. It will also require investment in developing public sector institutions and improving infrastructure, including forest roads, as well as increased private sector investment in competitive wood industries.

25. Sweden has supported the Ukrainian forest sector over the past decade and has assisted with the preparation of the Forest Sector Masterplan and provided technical assistance and training in: silviculture; inventory; public communication and information; education and research; and forest policy and strategy. Switzerland has supported sustainable, multi-functional forest management in Transcarpathia including environmental management, participation, livelihoods, productivity and disaster prevention.

26. The World Bank is currently working with governments and other forest sector stakeholders in many countries in the region and around the world to assist them to facilitate and finance forest sector reform and development. Together with partners already involved in supporting the Ukrainian forest sector, the World Bank could be available to provide similar support for Ukraine. A summary of some of the main findings of this note and generic recommendations is included as Table 3.

[9] Based on experience in other countries in the region, development of a national forest policy and strategy is likely to require the participation of representatives of several hundred forestry sector stakeholder groups, over a period of 12-24 months.

Table 3 Summary of Current Situation and Generic Recommendations

Current Situation	Generic Recommendation	Responsible Party
Forest Policy and Legislation		
National and Regional Level Forest Policy: Lack of consensus and national level guidance on forest sector development, e.g., the overall objectives of forest management (the balance between public good and commercial functions); the legal and institutional framework needed to achieve these objectives (including roles and responsibilities); ownership and tenure; the management of agricultural forests; the development of forest industries, and the control of illegal activities, etc.	***Develop the overall vision and goals for the sector*** at the national, regional and local levels; allowing for the development of policies and approaches that support national objectives while emphasising local priorities, and facilitating development of forest based industries and better safeguarding public good functions, including environmental services and biodiversity.	*Subject to approval by Parliament*: Cabinet of Ministers, Ministries of Environmental Protection, Agrarian Policy, Industrial Policy, SFC, Local Authorities, private sector stakeholders, environmental NGOs, etc
Revision of the Forestry Act*:* The Forest Code has inconsistencies with legislation and requires harmonisation to facilitate the legal development of the sector, and conform with EU directives	***Develop the forest code*** – with the involvement of key stakeholders and make amendments to facilitate sustainable forest management and implementation of new forest policy	*Subject to approval by Parliament*: Ministry of Environmental Protection, SFC, and other sector stakeholders
Subsidiary Legislation: Some existing regulations, such as the approval of annual harvesting plans, are overly bureaucratic and inflexible.	***Develop and revise regulations and technical norms*** to allow for implementation of new forest legislation in accordance with the principles of sustainable forest management	*Cabinet of Ministers* or *Ministry of Environmental Protection*, or *SFC* or *Local Authorities* (depending on which regulation)
Institutional arrangements		
Development of Forest Institutions*:* Many forest sector institutions are poorly resourced in terms of human resources and infrastructure, and there is some lack of clarity regarding institutional functions, responsibilities and services.	***Clarify functions and responsibilities of forest institutions*** to remove areas of overlap, and introduce transparent, output-based budgeting, based on provision of services against agreed benchmarks. Development of forest institutions should be incremental rather than radical, building on existing institutions in a realistic timeframe.	Subject to approval of the *Cabinet of Ministers*
Management Practices		
Protected areas and forest biodiversity conservation*:* the number of protected areas is increasing, while the resources available for their effective management is decreasing in real terms.	***Confirm and address priorities for forest biodiversity conservation*** through establishing and managing an effective network of priority forest protected areas, as well as appropriate management of high conservation value forests in the production landscape.	*Ministry of Environmental Protection* and *SFC*, guided by national sector policy (if any), the scientific and environmental community

Current Situation	Generic Recommendation	Responsible Party
Forest Functional Classification*:* Overly conservative harvesting levels and inappropriate classification of forest use areas is impacting negatively on good forest management, and wasting a valuable sustainable resource	***Review and revise the classification of forest categories and management objectives*** to allow for increase production levels in line with modern sustainable forest management practice.	Subject to approval of the *Cabinet of Ministers,* proposed by *SFC* and cleared by the *Ministry of Environmental Protection*
Forest Management Planning and Forest Inventory*:* Forest mapping and stand data are maintained in a centralised database, and are not geo-referenced or compatible with GIS software. Field surveys use only ocular estimates for middle and younger aged stands. The inventory method underestimates growth and yield	***Improve forest information systems,*** including the capacity to store, retrieve and analyse spatial and statistical data in GIS compatible centralised or regional databases, accessible to relevant stakeholders through a web based interface. Revise field survey techniques in accordance with modern practice. Undertake a statistically sound national level inventory.	*SFC* and the *Ukraine State Forest Design Institute*
Pre-Commercial Thinning: Young forests are often overstocked and insufficient thinning is leading to reduced forest value and productivity, as well as susceptibility to catastrophic events such as disease, wind and fire. Investing in thinning would yield future dividends in terms of timber size and quality and sustainability of supply	***Invest in pre-commercial thinning*** – in the context of national pre-commercial thinning and cleaning program based on application of agreed criteria to ensure that investments target stands that will generate maximum benefits including: (a) improvements in stand quality, (b) reduction of fire hazard, (c) biodiversity benefits, (d) subsequent commercial thinning opportunities, and (e) provision of local employment.	*SFC* and *State Forest Enterprises*
Forest Road Network*:* Low density and poor maintenance of forest roads and railways in production forests is leading to over-harvesting in accessible areas and other negative environmental impacts associated with excessive skidding distances, as well as high harvesting costs	***Improve the forest road and rail network*** – through developing and implementing a forest roads master plan, targeting investments in road and rail rehabilitation and new forest road construction to reduce negative environmental impacts, increase economic returns from forest management, create more local employment, and provide access for better forest management.	*SFC* and *Local Authorities*
Illegal Harvesting: Local experts estimate that the illegal harvest may be as much as 1.2 million m^3 /year, which would have a value of more than US$ 27 million/year. The full extent of illegal logging, the causes, and type of illegal logging are not known.	***Characterise and control illegal logging*****,** this will entail: (i) clarifying the extent of illegal logging by volume, value and region, (ii) identifying the drivers of various types of illegal logging, and (iii) defining practical measures to reduce causes, while improving monitoring and enforcement.	*SFC* and *State Forestry Committees*
Potential New Forests: Large areas of agricultural lands are under productive and subject to degradation resulting in declining agricultural production and erosion in some areas.	***Invest in afforestation*** to stem the process of land degradation and enhance economic productivity and environmental services. Explore options for financing afforestation with funding derived from Kyoto Protocol compliant sequestration and Green Investments	*SFC* and *Local Authorities* (State Land Committee is developing streamlined procedures)

Current Situation	Generic Recommendation	Responsible Party
Forest industries		
Forest industries are poorly developed with a significant proportion of exports being unprocessed or semi-processed wood, and imports of products that could be manufactured in Ukraine	***Create a secure business environment*** with more transparent and consistent procedures and approvals. This would entail providing access to inventory data, securing access to supply of raw materials through transparent, competitive and fair timber sales; and possible compensation for undertaking public good functions of forest management	*Local Authorities SFC* and *the Ministry of Industrial Policy*
Additional Economic Returns from the Forest		
Non-timber forest Products*:* Currently non-timber products such as nuts, berries, mushrooms and game meat are locally marketed through ad hoc processes.	***Adjust regulatory arrangements*** to improve the transparent sustainable production, harvesting, in-country processing and high-value marketing of NTFPs, and capture of revenues associated with the harvest and sale of these valuable forest resources.	*Local Authorities* and *SFC*
Tourism: The quality of the quality of the landscape and forest is high and there is potential to develop a range of eco-tourism products such as nature trails, trekking, camping, cycling, heritage trails etc.	***Support development of forest based tourism*****,** by assessing opportunities and bottlenecks to private investment and marketing.	*Local Authorities*
Wood Energy*:* Results of initial pilot projects have shown that use of small wood and waste wood can be used to provide heating and hot water at a competitive price. Using small roundwood from thinnings as source of energy for heating would have the double benefit of (a) replacing the combustion of non-renewable energy resources and (b) providing an indigenous carbon neutral and sustainable source of energy.	***Support the introduction of wood energy usage*** by undertaking cost benefit analysis of applications and technologies that could be used in public buildings (e.g., schools, hospitals, offices etc.) where the use of wood energy could be adopted.	*Local Authorities*

Current Situation	Generic Recommendation	Responsible Party
Community Forestry		
Forests surrounding communities are frequently managed less intensively than SFC forests and are often subject to uncontrolled removals, with only limited benefits going to the poorest in the adjacent community. There is little local participation in forest management and benefit sharing which further reduces the communities' incentives to look after their local resources.	***Introduce local involvement in the management of forests surrounding communities*** on a trial basis, through identifying areas where community forest management is feasible, confirming stakeholder interest, clarifying management roles, training community forest managers and extension workers and developing and implementing community forestry work programmes. Once trials have been shown to be successful and if there is sufficient stakeholder support this approach should be replicated nationwide.	*Local authorities and SFC*
Stakeholder Opinion		
Public Awareness*:* Media, environmental NGOs the general public and some officials are often poorly informed, and perceive forestry as negative exploitation of natural resources leading to environmental degradation. There is a lack understanding of the role of forestry in maintaining the environmental functions and services of forests. Experience from Europe has shown that environmentalists and foresters can work together to more effectively protect and manage critical habitats, while enhancing the biodiversity and environmental benefits of production forests.	***Improve public awareness of the role of forestry****.* This may entail: (a) training selected staff, (b) developing a public awareness program, (c) media events to educate and inform media and the public on the sustainable management of forest resources and their multiple benefits, and (e) placing of positive and informative articles on forest management and its contribution to the environment, and the local and national economy.	*SFC, Ministry of Environmental Protection* and *Local Authorities*

COUNTRY SETTING

1. Ukraine is one of the largest countries in Europe. The territory of Ukraine is 603,700 km^2 with a population of 47.28 million (as of January 1, 2005). There are three main geographical zones in the plains: (i) a mixed forests zone (Ukrainian Polissya) with an area of 101,900 km^2, (ii) a forest-steppe zone of 194,700 km^2, and (iii) a steppe zone of 242,800 km^2. The mountain areas comprise the Carpathian mountains (56,600 km^2) on the west, and the Crimean mountains (7,500 km^2) in the south. The climate of Ukraine is moderately continental, except for a narrow strip of the southern coast of Crimea, which has a subtropical climate, and the mountain areas which are characterized by vertical zoning of climatic elements. Fertile soils and favorable climatic conditions have allowed extensive commercial use of land for growing crops and timber. In 2001 agricultural land use was 72% (almost 78% of which are arable lands).

2. Since independence in 1991, Ukraine has undergone an intense process of socio-economic reforms. In 2000, an increase in real volume of GNP (6 %) was achieved for the first time in 10 years. The gross domestic product (GDP) in 2004 was US$ 64.7 billion or US$ 1,353 per capita, which accounts for 12.1% and 13% growth relative to 2003 respectively . This made Ukraine the fastest growing country in the CIS (Commonwealth of Independent States) in 2004. Gross fixed capital investments grew by 10% in 2004, exports of goods and services were circa US$ 39.72 billion and imports US$ 34.85 billion resulting in a positive trade balance of US$ 4.87 billion, compared to US$ 1.29 billion in 2003.

A. STATUS AND VALUES OF UKRAINIAN FORESTS

3. The forestry sector plays an important role, particularly in rural areas where unemployment is high, in terms of provision of jobs and maintenance of rural communities, while also providing essential environmental services.

A.1 The Forest resource

Overall forest area, volumes and species

4. About 10.8 million hectares of Ukrainian territory, or about 18% of the country, is included in the forest fund[10] (see Table 4). The area of forest is comparable to Poland (8.9 million ha) and Italy (10 million ha). Forests are unevenly distributed across Ukraine's geographical zones (Map 1) shows the area and standing timber volume by region. In the Carpathian region, where poverty levels as well as the value and volume of the native timber species are highest, about 37% of the land is forested. The Crimea and Steppe regions have relatively low volumes per hectare. Stocking in the forests managed by the State Forestry Committee (SFC – see section C.2.1) is higher than the national average.

[10] The Forest Fund comprises all forested areas of Ukraine as well as unforested areas which have been granted and used for the needs of forestry. 9.49 million ha are forested i.e. 15.7% of Ukraine's territory and 16.4% of Ukraine's land area (excluding water bodies). Source: 'Brief handbook of Ukrainian forest fund', Irpin 2003.

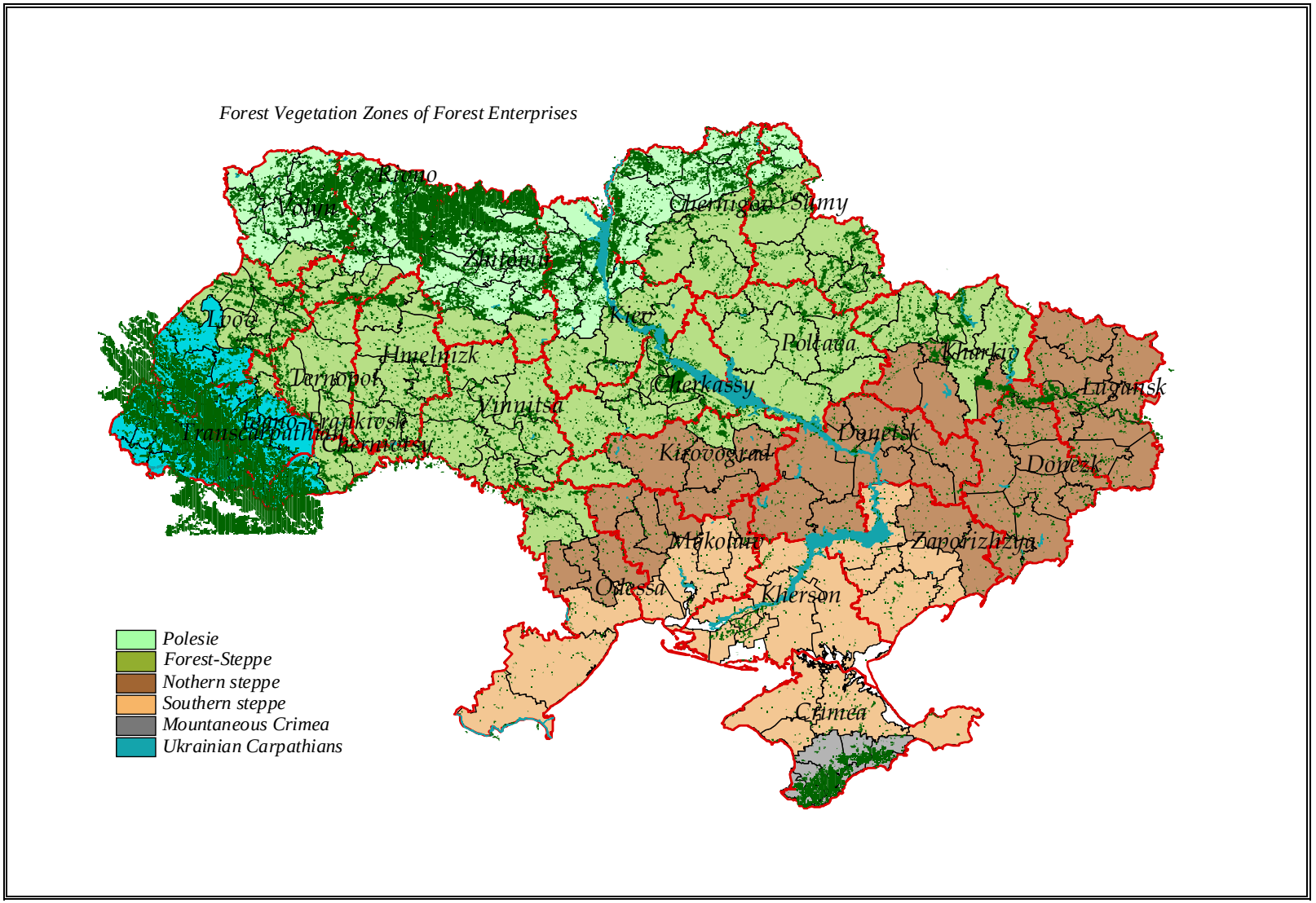
Table 4 Forest Areas and Standing Volume

Region	Forest Area		Standing Volume		Av Vol
	(millions of ha)	% of total	(millions of m^3)	% of total	(m3/ha)
Polissya	4.092	38	645	37	158
Forest Steppe	3.015	28	527	30	175
Carpathians	1.578	15	391	23	248
Crimea	0.331	3	33	2	99
Steppe	1.694	16	127	7	75
Total / Average Ukraine	**10.782**	**100**	**1,730**	**100**	**160**
SFC Forests					
Conifers	2.862	27	668	39	233
Hard Broadleaves (Oak, Beech etc.)	2.478	23	498	29	201
Soft Broadleaves (Poplar, Aspen etc.)	0.859	8	112	6	130
Total / Average SFC	**6.199**	**57**	**1,278**	**74**	**206**

Source: Foellmi H (FORZA project), 2005 and SFC 2005.

5. In Polissya, pine stands account for 57% of the forest land, birch 20%, oak 11%, alder 10%, other species 2%. In the Forest Steppe, oak stands occupy 52% of the forest area, pine 25%, beech and alder 4% each, hornbeam and ash 3% each, other species 9%. In the Carpathians, spruce stands account for 39% of the forest land, beech 36%, oak 11%, larch 8% and other species 6%. In Crimea, oak stands are 56% of the forest area, pine 18%, beech 14%, hornbeam 6%, and other species 7%. In the Northern Steppe, oak forests account for 43% of the forest area, pine 32%, acacia 10%, ash 6%, poplar 2%, elm 1% and other species 6%. In the Southern Steppe, pine stands account for 55% of the forest area, acacia 21%, oak 7%, willow 5%, ash 3%, elm 2% and other species 7%.

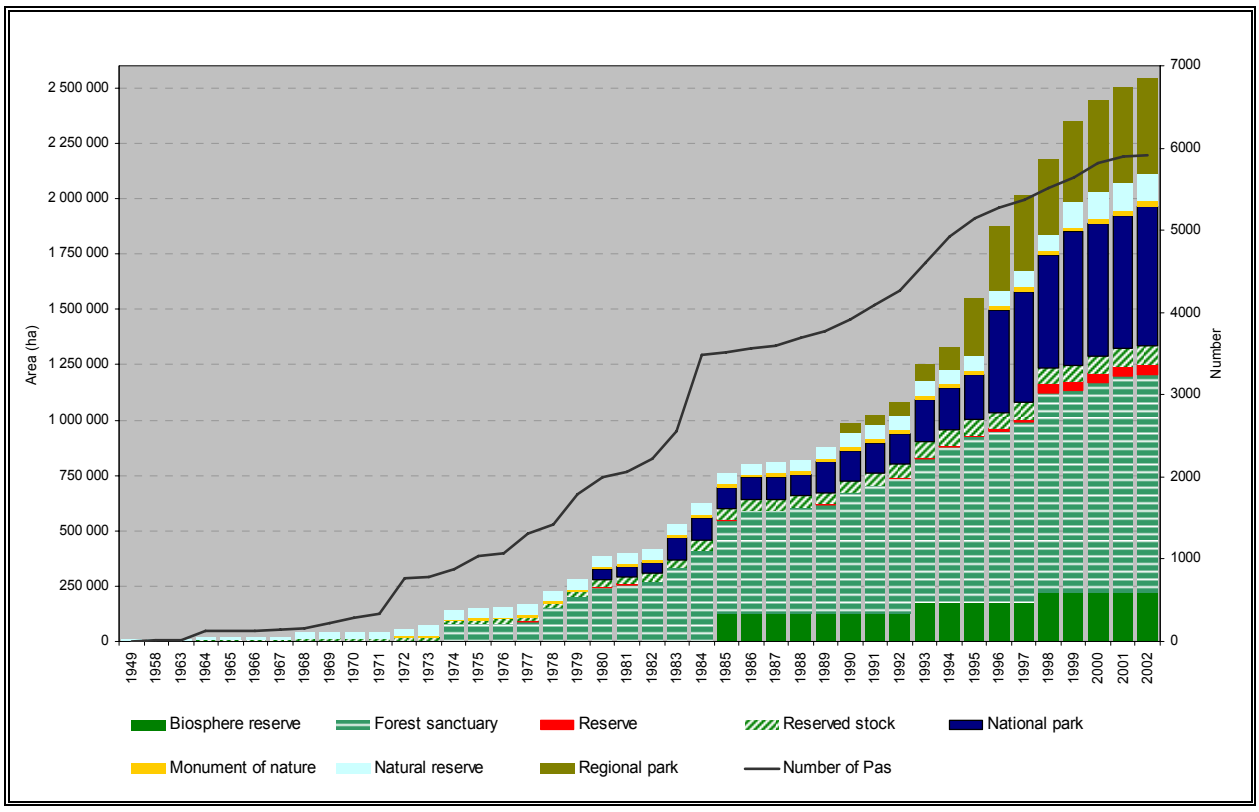
Map 1 Distribution of forests across Ukrainian's regions



Protected Areas

6. There has been a steady increase in the number of designated Protected Areas[11] (Figure 1). As of April 16, 2003 the total area of all Protected Areas in Ukraine was 2,718,300 ha for 7,087 Protected Areas. More than 60% of the total area of Ukraine's Protected Areas is under forest cover.

Figure 1 Area and number of Protected Areas over time by Protected Area category



Area affected by the Chernobyl nuclear power plant catastrophe

7. The Chernobyl Nuclear Power Plant catastrophe in 1986 affected about 3.5 million ha of forest of which 157,000 ha have a high level of caesium 137 (>15 Curies [Ci]/Km²) and are not exploited. A further 1.4 million ha (39% of the affected area) is polluted with a lower level of caesium (>1 Ci/Km²) and are subject to management restrictions. Seven certified laboratories have been established to monitor forest products. Research has shown that the most contaminated products are mushrooms, berries, medicinal plants and game meat. Media releases are issued to inform the public where and when it is safe to harvest non-timber forest products.

A.2 Employment in the forestry sector

8. Total direct employment in the sector is estimated as being about 350,000, of which 260,000 are employed by the private sector. Using the results from input-output and cost benefit analysis in other countries[12], it is possible to estimate the total employment contribution (direct, indirect

[11] The different types of Protected Areas are included in Annex 1
[12] Public and Corporate Economic Consultants (2000). English Forestry Contribution to Rural Economies, report commissioned by Forestry Commission (United Kingdom).

and induced). This would conservatively estimate the total employment as being in excess of 500,000.

A.3 Forest resource growth, age, production and value

Growth

9. Table 5 indicates that the average growth of Ukraine's forests is 3.8m³/ha/yr. In Ukraine growth statistics are calculated by measuring the standing volume on two separate occasions and subtracting the first volume from the second. This ignores natural mortality and harvested volumes. If these two factors were incorporated in the calculation, the estimated average growth would be around 5m³/ha/year or nearly 54 million m³/year in total (Popkov, 2002[13]). The average for the European Union is 4.6 m³/ha/year for forest areas and 3.9 m³/ha/year for forest and other wooded areas[14].

Table 5 Average Standing Volume and Increment by Species Group

Species Groups	All Ukraine	
	Vol (m^3/ha)	Increment (m^3/ha/yr)
Conifers	226	4.7
Hard Broadleaves	163	2.9
Soft Broadleaves	135	3.5
Total	**186**	**3.8**

Source: SFC Forest Inventory (1996)

Age distribution

10. A large proportion of Ukraine's forests are relatively young (Table 6). In forests managed on a sustained yield basis, the area would be the same in all five age classes for hard broadleaves and the same for the first three classes for conifers and soft broadleaves (with only a small area over 90 years). A skewed age distribution has implications for a sustainable level of supply of quality roundwood into the future and will result in peaks and troughs in supply and periods of over and under supply for industry. Part of the reason for this age profile are (i) former afforestation patterns and (ii) the technical norms which only allow final harvest or regeneration fellings when crops are mature or over mature.

Table 6 Age Class Distribution – SFC Forests

Species Group	Area by Age Class (thousands of ha)					
	1-30	31-60	61-90	91-120	121+	Total
Conifers	585	1 395	656	156	70	2 862
Hard Broadleaf	340	952	771	256	159	2 478
Soft Broadleaf	347	439	71	2	0	859
Total	1 272	2 786	1 498	414	229	6 199

Source: The Scientific and Information Centre of Forest Management, 2005

Thomson, K.J., Psaltopoulos, D. (1996). Methodological Issues in Forestry Input-Output Modelling, in Rural Economic Modelling: An Input-Output Approach, Midmore, P., Harrison-Mayfield, L., Eds., *Rural Economic Modelling: An Input-Output Approach,* Wallingford: CAB International

[13] Popkov M. Present state of the forest sector of Ukraine and contribution of the project in solution of the problems facing the forest sector. Ukraine Forest Sector Master Plan, Mid Term Seminar 2002.

[14] Draft Commission Staff Working Document in support of the Communication from the Commission to the Council and the European Parliament on the implementation of the European Union Forestry Strategy (April 2004)

Wood production

11. Before independence, Ukraine harvested 15 million m^3 per year and met most of its demand for 36-38 million m^3 of round wood equivalent[15] through imports from Russia and Belarus. Table 7 shows that forest production is steadily increasing and is now at pre-independence levels. Due to the skewed age class distribution and technical norms for felling ages (which only allow final harvest or regeneration fellings when crops are mature or over mature), the proportion of harvested volume from older age classes has declined in recent years resulting in a higher proportion of smaller sized logs.

Table 7 Wood Production by Year and Forest Manager

Forest Manager	Annual Roundwood Production by Year (thousands of m^3)					Average ($m^3 \times 10^3$)	%age of the total (%)
	2000	2001	2002	2003	2004		
State Forestry Committee	9 595	10 256	10 857	11 560	12 387	10 931	82
Ministry of Agrarian Policy	1 366	1 379	932	1 040	1 189	1 181	9
Ministry of Defence	270	288	272	358	389	315	2
Ministry of Emergency Situations	No data	No data	31	36	30	33	0.2
Ministry of Transport	No data	No data	8	9	7	8	0.1
Ministry of Nature Protection	No data	No data	63	69	55	62	0.5
Other (3.2%) * included	326	377	763	983	1 157	721	5
Total	11 558	12 300	12 926	14 055	15 215	13 252	100

Source: The Scientific and Information Centre of Forest Management 2005 - Note: As not all the latest data (except for SFC forests) were available some figures are extrapolations.

Illegal harvest

12. According to SFC's official figures, in 2003/2004 the number of reported cases of illegal harvesting of wood was 12,000/15,000 with a corresponding volume of 30,000 m^3/40,000 m^3 but the full extent, nature and impact of illegal logging on forests and the environment remain unknown. Local experts suggest that the volume of illegally harvested wood may be as high as 1.2 million m^3/year. At average domestic prices this would represent an annual loss of US$ 27.4 million. The real cost is likely to be many times greater as illegal loggers over harvest in areas close to the road and remove only the better quality stems with no regard for the environmental damage caused. In Transcarpathia, illegal logging has been linked to poverty. The official firewood sales only account for 45% of the volume that is required by the households that depend on firewood[16]: the shortfall is likely to be covered by illegally harvested wood, originating mainly from agricultural forests.

Non timber forest products

13. Non timber forest products (NTFPs) are harvested where there are local communities and reasonable access. Most of the harvest is for local subsistence use and this is permitted without regulation or fee. Some production is sold in the local markets and this is unregulated. Commercial harvesting of NTFPs such as mushrooms is allowed by permit. Many NTFP (particularly mushroom and berries) processors collapsed since independence. Statistics on quantity or value are limited. Exports of mushrooms are increasing and totalled US$ 403,000 in 2004. The recorded

[15] UNECE (2003) Geneva Timber and Forest Discussion Paper 32. Forest and Forest Products Country Profile - Ukraine *Dr. Igor Buksha, Dr. Volodymir Pasternak, and Mr. Volodymir Romanovsky*

[16] 28,000 households x $8m^3$/year =224,000 m^3

production for 2004 is presented in Table 8. These figures are likely to underestimate the actual values.

Table 8 Non Timber Forest Products in 2004

Product	Units	Quantity
Coniferous sap	tonnes	2 065
Green brush	tonnes	48
Christmas trees	number	23 696
Fruits	tonnes	29
Nuts	tonnes	13
Mushrooms	tonnes	21
Berries	tonnes	2 514
Herbs	tonnes	55
Wood sap	tonnes	2 198
Hay	tonnes	4 890

Source: The Scientific and Information Centre of Forest Management

Hunting and Game Management

14. The area available for hunting is 50.2 million ha. Hunting rights are state owned (despite large areas of agricultural land being transferred to communal and private ownership) and are managed by the organisations shown in Table 9.

Table 9 Hunting Areas by Managing Organisation

	Managing Organisation	Area (ha)	% of the total
1	State Forestry Committee (SCF)	6 645 000	13
2	Ukraininan Society of Hunters and Fishermen	37 425 000	75
3	Military Hunting society	1 079 400	2.2
4	Athletic society "Dinamo"	241 400	0.5
5	Ministry of Emergency Situations	202 000	0.4
6	Other organisations	4 607 200	9
	Total Allocated	50 200 000	100

Source: Ramboll 2000, Forest Sector Masterplan Volume I[17]

15. Table 10 shows that the harvest of some species (elk, red deer, roe deer and wild boar) is decreasing, possibly indicating that the populations are in decline. The number of these animals shot fell significantly between 1993 and 1999. France by contrast, which has a similar sized hunting area, has an annual cull of more than 450,000 cloven hoofed animals (with a similar mixture and proportion of species). According to the Forest Sector Master Plan, Volume I (FSMP I), possible reasons for this decline include: poor hunting land management (for game purposes) and a lack of high nutrient food; the prevalence of poaching (estimated to be around 14 and 15 times the legal cull for wild boar and roe deer respectively); and an increase in predator populations. The FSMP I recommends that a new system for managing hunting be established and that there is potential to develop the international hunting business.

[17] This is the most up to data currently available.

Table 10 Number of Cloven Hoofed Animals Legally Harvested by Year

Species	Thousands of Head by Year						
	1993	1994	1995	1996	1997	1998	1999
Elk	12.2	10.8	9.1	7.8	6.4	5.8	5.3
Red deer	19.2	18.9	18.3	17.4	16.5	15.3	13.8
Sika deer	3.1	3.0	3.1	3.3	3.0	3.0	3.0
Roe Deer	162.0	159.0	157.0	145.0	136.0	129.1	120.9
Fallow deer	1.4	1.2	1.3	1.3	1.1	1.0	1.0
Moufflon	0.9	0.8	0.7	0.9	1.2	0.4	0.3
Wild boar	53.7	49.8	47.1	43.0	40.5	38.1	37.1
Aurochs	0.6	0.7	0.7	0.6	0.6	0.5	0.5
Total	253.1	244.2	237.3	219.3	205.3	193.2	181.9

Source: Ramboll 2000, Forest Sector Master Plan Vol I (FSMP I).

16. In addition to game bird shooting, small game taken include squirrel, muskrat, beaver, raccoon dog, American mink, marten, and polecat which are traditionally hunted for their fur, however the fur trade has largely collapsed. There are about 370 bears in the Carpathians with an annual hunting quota of five. The population of wolves was estimated at 2,300 in 1998 of which 967 were shot. The SFC pays a bounty of US$ 20 per wolf shot. In 1999, the administration of hunting cost US$ 4 million, of which US$ 0.47 million came from the state budget. The income from hunting amounted to US$ 1.75 million. The shortfall was made up from the budget and hunting membership fees. Income from international hunting tourism grew from US$ 100,000 in 1990 to US$ 700,000 in 1999.

A.4 Forest industry

17. Difficulties experienced by the forest sector following 1990, caused by changes in ownership, disintegration of the economy, increased costs for energy and transport etc. peaked in 1996-97. During that period many forest enterprises went bankrupt, ceased production or reduced production capacity. The demise of the large wood processing companies saw the emergence of many smaller enterprises. The period 1998-99 marked the beginning of a turnaround due to foreign investment in wood processing facilities and capacity.

Enterprises

18. In 2001, the forest industry comprised 3,653 enterprises. Ownership includes: (a) collectives (89.8%, including joint-stock companies 66.5%), (b) state (3.1%), (c) private (1.6%), and (e) international or other (5.5%)[18]. There are between 500-550 large and medium size private companies specializing in wood products (sawn wood, fibreboard, particle board, veneer, plywood, parquet, carpentry, furniture, pulp and paper[19]). There are approximately 7,500 small private enterprises and a large number of entrepreneurs. Results of tax inspections show that the number of non-registered sawmills in the Polissya and Carpathian regions is several hundred. These small-scale producers often process illegally harvested wood and rely on middlemen to sell their products.

[18] UNECE (2003) Geneva Timber and Forest Discussion Paper 32. Forest and Forest Products Country Profile - Ukraine *Dr. Igor Buksha, Dr. Volodymir Pasternak, and Mr. Volodymir Romanovsky*

[19] The Forest Industry data presented in this section are taken from official statistical reports and collected data of the industrial department from the Ministry of Industrial Policy, the SFC Report and from the Association 'Ukrpapir' as well as from analytical publications of the period 2002-2004.

Production

19. In the last 6 years wood processing and furniture enterprises increased production by 20-25%. Production (volume and price) during the first quarter of 2005 was more than 20% up on 2004. From 2002 to 2004, some 2 to 2.2 million m^3 of sawn wood (excluding parquet blanks or friezes) was produced. In 2004 parquet production - the majority solid parquet of hard-wood species - was circa 1.4 million m^2 compared to 5.5 million m^2 in 1990. Furniture production is a large consumer of particleboard and sawn wood. In 2003-2004 furniture sales grew by more than 25%. There are eight particleboard plants (four of which are owned by foreign multi-nationals) which produced 998,000 m^3 of particleboard (a six fold increase from 1998 levels) and 23.8 million m^2 of hardboard in 2004. Coated particleboard (skin board) has recently been added to the product line and it is planned to substantially increase production. In 2004, some 141,000 m^3 of plywood was produced (in 2003 123,900 m^3). The prospects for the development of demand for wood products are good.

Balance of Trade

20. Ukraine is a net exporter of wood products and a net importer of pulp, paper and particleboard (Table 11). The positive trade balance is widening and increased more than three fold over the 5-year period. The annual value of Ukraine's exports of wood products was about US$ 507 million in 2004, with round wood accounting for about 27%. Imports of wood products to Ukraine (worth about US$ 262 million in 2004), could be manufactured locally - with increased private investment in wood industries. Pulp and paper accounted for about 66% of imports in 2004, and particle boards for about 28%. In 2000, roundwood exports made up more than 30% of the export value but fell to 27% by 2004, indicating only a marginal decrease in the export of unprocessed logs. Furniture exports were valued at US$ 105 million in 2004. Official furniture imports were valued at US$ 85 million although the true figure could be up double this figure due to undeclared imports and smuggling.

Table 11 Value Exports and Imports of Wood Products in 2000 and 2004

Product	Value of Exports and Imports by Year (US$ x 10^3)					
	2000			2004		
	Export	Import	Balance	Export	Import	Balance
Round Wood	71 479	4 057	67 422	135 655	8 200	127 455
Sawn Lumber	117 192	5 313	111 879	258 526	3 163	255 363
Veneer	11 458	693	10 765	54 123	6 080	48 043
Particle Boards	5 016	21 787	-16 771	28 858	72 187	-43 329
Pulp / Paper	29 037	124 443	-95 406	29 626	172 039	-142 413
Total	234 182	156 293	77 889	506 788	261 669	245 119

Source: The Scientific and Information Centre of Forest Management 2005

B. POTENTIAL FOR SUSTAINABLE DEVELOPMENT OF THE FORESTRY SECTOR

21. The forestry sector could potentially double its contribution to the national economy over the next decade, while also better ensuring sustainable provision of public good functions, such as watershed management, control of erosion and flooding, conservation of landscape and biodiversity, and the opportunity for future watershed maintenance and erosion control, biodiversity conservation and other environmental services, recreation and tourism. This could be achieved through increasing the level of harvesting of timber and forest products within

sustainable levels, encouraging private investment in forest based industries including wood processing and tourism, ensuring that all public good functions are incorporated in production forest management, and that forest protected areas are effectively financed and managed to conserve conservation of indigenous biodiversity. In addition, Ukraine may be able to capture additional international financing for afforestation in the context of Kyoto Protocol related green investment schemes and Joint Implementation Projects.

B.1 Increasing the harvest of timber and forest products could be achieved, in line with modern sustainable forest management practice.

22. The Forest Sector Master Plan[20] assessed the potential for increasing the harvest from Ukrainian forests, and concluded that production could be increased from the existing 15 up to at least 20 million m^3 per year by either: (i) allowing for sustainable silvicultural felling operations in forests with environmental and protection functions, or (ii) lowering the final harvest ages for production forests in line with European practices. A combination of both of these options could result in a sustainable harvest in excess of 20 million m^3. Ukraine currently harvests less than 30% of the estimated gross annual growth of its forests (15 million m^3 versus 50-55 million m^3). The average percentage harvest of annual growth rates in the twenty five European countries is 63%. Increasing Ukraine's harvest to European average levels could result in an annual harvest of about 34 million m^3 per annum (i.e., an increase of around 127%).

23. A sustainable and increasing level of roundwood supply will be key to the development of the sector and in providing opportunities for adding value along the wood chain. In terms of European raw material supply over the next decade, it is expected that: (i) in the Nordic countries demand will exceed supply requiring significant wood imports. It is expected that this supply will be met largely by imports from Russia and the Baltic countries; (ii) in European Russia there will be significant under utilised harvest potential with utilisation hampered by undeveloped infrastructure especially in the northern area; and (iii) Eastern Europe will significantly under utilise forest resources but has expansion potential if more intensive forest management practices are applied. The largest resource based expansion potential will be in European Russia and Eastern Europe. This augurs well for Ukraine in a number of respects. Firstly as supply / demand tightens in Europe, processors will look east for sustainable sources of raw material. Secondly, to maintain competitiveness in a global market, processors will look for a combination of sustainable supply and low cost economy both of which Ukraine can offer.

24. Additionally, there is potential to process and market large quantities of small round wood (much of which is currently unutilised as an alternative to fossil fuels and for further developing the sustainable harvesting, processing and marketing of a range of non timber forest products (e.g., wild berries, mushrooms, nuts, game meat, etc.), to take advantage of growing lucrative markets in Western Europe. FAO has estimated the European market for edible non timber forest products at approximately US$ 3.7 billion and growing[21].

B.2 Increasing the economic and social benefits derived from wood industries.

25. There is significant scope to increase the value of forest products produced in Ukraine for both local and foreign markets, while also decreasing imports of processed forest products. The

[20] See footnote 3

[21] Additionally, the speciality / premium food market in Europe represents some €33.5 billion and is growing at an average of 11% per annum. The sector now accounts for nearly 5% of the total food and drinks market. The number of natural food users is estimated to increase from 209 million in 2002 to 309 million by the end of 2007.

growth in the production and consumption of wood products in Europe will be modest overall throughout the next five to ten years[22]. However, there are expected to be differences both between products and countries. The production and sales of conventional products such as orientated strand board (OSB) and medium density fibreboard (MDF) are expected to continue to experience strong growth. New innovative wood products will grow even more rapidly. Eastern Europe is expected to experience significantly higher growth in the production and consumption of all wood products – sawnwood, wood panels and paper. This growth will be driven by factors such as rising GDP and increase in housing starts etc. whereas in the rest of Europe demand drivers (population, GDP, construction, furniture, product life cycle) are expected to provide only modest to weak growth[23] [24]. With significantly lower domestic prices than in neighbouring Poland and Hungary, Ukraine is well positioned to compete with other wood industries in the region and take advantage of market growth in the east, while also increasing penetration of higher value markets in Western Europe and elsewhere. However for the strategic development of the sector, it will be important to add value to exports.

26. Currently Ukraine's main exports of forest products are sawn timber and round wood (i.e., unprocessed or marginally processed raw material that could be significantly increased in value by further processing in-country). The continued export of unprocessed logs is clearly a lost opportunity. While export prices are in some cases higher than domestic prices, the export results in better quality logs leaving the country thereby reducing the potential to add value. Despite the relative abundance of forest resources in the Carpathians, forestry does not provide the level of employment that it could. One reason is the relatively low degree of value-adding processing. Proximity to export markets ensures a strong demand for round wood and rough sawn timber. Value-adding processing - that would enable higher prices to be paid for quality material and would provide additional employment - will require additional private investment in technology and secondary processing. There is potential for import substitution in particleboard and wood panels. The raw material (small roundwood) is potentially available and the increased demand for wood residues (sawdust, chips and bark) would further support expansion in sawmilling. Imports of wood products to Ukraine (worth about US$ 260 million in 2004), could be manufactured locally - with increased private investment in wood industries (expansion of existing capacity and / or investment in new capacity).

B.3 Maintaining and enhancing environmental benefits.

27. In the past, the primary economic value of forestry was seen as the value of timber produced and the effects of employment created – often in rural areas with low employment opportunities. During the 1990s, there has been a growing worldwide recognition of the multiple values and services that forests can provide, and emphasis on the development of policies and management practices that safeguard public good functions, while also optimizing the commercial assets of forests. The potential for forestry to increase its contribution to the national economy through timber production, wood industries and export of forest products is significant. However, evidence derived from total economic valuation of similar forest resources in other European countries suggests that the non pecuniary values of Ukraine's forests (e.g., water regulation and water quality, soil conservation and erosion control, biodiversity conservation and carbon storage,

[22] Market, Industry & Forest Resource Analysis as part of the Roadmap to 2010 Process Prepared by Jaakko Pöyry Consulting London, February 2004

[23] O Carroll Dr. C (2004) Future supply/demand of forest products in Europe. Innovawood conference Future Issues for Forest Industries in Europe, Dublin, Ireland April 2004.

[24] UNECE Timber Bulletin Vol LVIII (2005) Forest Products Annual Market Review 2004-2005

etc.) together with landscape maintenance, recreation and leisure, are likely to be worth at least double the value of the forest harvest.

28. The increase in protected areas has not been matched by a comparable increase in the resources allocated to manage them and ensure that they fulfil their important role in the delivery of environmental and public purpose benefits. Overall actual financing of Protected Areas managed by the State Forestry Committee (which manages 39% of the total area of Protected Areas) in 2004 was US$ 1,495,000 and the SFC was able to generate US$ 790,000 from: visitor's fees; services provided by the park such as horse riding, souvenirs, equipment rental, etc.; and selling of wood from sanitary cutting. However, the SFC estimates the overall financing needs for its Protected Areas at US$ 3,186,000 for 2005.

29. Experience from elsewhere in Europe has shown that it is possible to incorporate environmental values into normal forest management and thereby effectively protect and manage valuable habitats, while enhancing the biodiversity and environmental benefits of production forests. Ukraine could maintain and enhance provision of public good and commercial forest products and services through recognizing and incorporating the multiple use functions of forests in forest management practices i.e. by (i) mainstreaming conservation and biodiversity into normal forest management and forest management planning, (ii) adapting the forest classification system to focus on the identification and protection of high conservation value habitats, (iii) increasing the area under natural regeneration and (iv) amending the rotation ages in all forests to allow for greater flexibility in the felling and regeneration of mature and over mature stands.

B.4 Increasing revenues from forest based tourism.

30. Economic growth and development of cheaper transportation networks is leading to a dramatic increase in demand for forest-based recreation throughout Europe. While tourism and recreational infrastructure is relatively underdeveloped in many of Ukraine's forested areas, Ukraine has a wide diversity of forest landscapes that could provide for the development of local and international tourism (thereby capturing additional foreign exchange), and boosting rural economies.

B.5 Capturing carbon trade financing.

31. It may be possible for Ukraine to access international carbon financing - in the context of green investment or Joint Implementation (JI) schemes associated with the Kyoto Protocol - to support afforestation of large areas of degraded agricultural lands, thereby further enhancing the scale and productivity of the national forest estate, and mitigating environmental degradation. The Kyoto Protocol commits industrialized signatory countries to reduce their carbon emissions by an average of 5.2% compared with 1990 emissions in the period 2008-2012 (first commitment period). To meet their commitments under the Kyoto Protocol industrialized countries are expected to purchase up to 1.6 billion tonnes of CO_2 equivalent (tCO_2e) from projects that reduce greenhouse gas (GHG) emissions or enhance carbon sequestration. A further 1 to 2 billion tCO_2e are expected to be traded on the international market between industrialized countries and economies in transition. With prices ranging between US$ 3 and US$ 12 per tCO_2e, this represents a potential significant source of short term hard currency revenue.

32. Ukraine's parliament ratified the Kyoto Protocol on 4 February 2004. Under any plausible scenario of economic growth and energy efficiency, Ukraine will emit less GHGs than it would be permissible under the Kyoto Protocol (i.e. so called Assigned Amount Units or AAUs). Estimated excess emission rights over 2008-2012 may amount to 1.5 - 1.8 billion tCO_2e. These AAUs can be sold on the international emissions trading market to those OECD countries that will not be able to

meet their emission reduction targets domestically. Assuming a negotiated price of US$ 12 per tCO_2e, Ukraine could sell up to US$ 21.6 billion of AAUs over the first commitment period. However, in order to participate in International Emissions Trading, Ukraine must, by 1 January 2007, meet specific eligibility conditions related to calculating its AAUs, managing transactions and reporting. In addition, several potential OECD buyers indicated that they would consider buying AAUs only if the selling countries invested proceeds in projects and programs that further reduced emissions or increase carbon sequestration, a so-called 'greening' of AAUs. AAUs transactions could therefore provide financing for various types of projects, including afforestation. A World Bank study for Greening of AAUs in Bulgaria identifies forestry as a priority sector with high emission reduction potential.

33. Under the Kyoto Protocol, Ukraine may also participate in project based carbon finance transactions (JI projects), i.e. where a buyer in an industrialized country purchases Emission Reductions Units (ERUs) generated by a project (compared with the level of emissions in the absence of the project) to meet their emission targets under the Kyoto Protocol. A project proponent in Ukraine would obtain an annual payment for each tonne of carbon emission avoided or removed from atmosphere. The prices would be determined by the market, and range between US$ 3 and US$ 12 per tCO_2e. JI projects may involve sequestration of carbon from atmosphere through afforestation / reforestation.

34. Ukraine is currently preparing a pilot Joint Implementation sequestration project with the World Bank's BioCarbon Fund to reconstruct, maintain and manage natural pine and birch forest on approximately 15,000 hectares of abandoned agricultural lands in the vicinity of Chernobyl. While detailed preparation work has yet to confirm project feasibility, costs and sequestration rates, and the price that could be paid per tonne of carbon sequestered will be subject to negotiation, it is likely that the overall cost of the project will be about US$ 11 million over ten years, and that carbon trade could offset these costs by about US$ 2-4 million. This pilot project will build the knowledge and capacity that could assist Ukraine to pursue significantly larger carbon trade transactions in support of carbon sequestration (afforestation, reforestation and erosion control). If successful, Ukraine may be able to access some hundreds of millions of dollars to support implementation of the 'Forests of Ukraine Program', which aims to expand the forest estate by 500,000 ha.

C. INSTITUTIONAL RESPONSIBILITY AND THE COSTS OF FOREST MANAGEMENT

C.1 Forest Ownership

35. Forest ownership has changed little since the Soviet era; more than 99% of the forest is state owned. A small amount of privatisation occurred between the passing of the Land Code in 1992 and the enactment of the 1994 Forest Code which stated that all forests shall be the exclusive property of the state. The Land, Civil and Commercial Codes mention private and communal forest ownership but no legal framework exists to transfer ownership. Forests are ascribed to organisations or institutions for 'permanent use' allowing them to manage the forest but ownership remains with the state. In addition to the SFC, there are more than 50 agencies (or non-specialised users) that have control of some area of forest. Currently the SFC manages 69% of forests (Table 12). The official statistics, based on the 1996 inventory state that the SFC manages 66% of forests.

Table 12 Area of Forest by Managing Institution

Institution	1996		2002	
	Area (million ha)	(%)	Area (million ha)	(%)
State Forestry Committee	7.115	66	7.425	69
Ministry of Agrarian Policy	2.848	26	1.900	18
Ministry of Defence	0.236	2	0.236	2
Ministry of Emergency Situations	0.178	2	0.178	2
Ministry of Transport	0.109	1	0.109	1
Ministry of Nature Protection	0.085	1	0.085	1
Other (including communities)	0.229	2	0.866	8
TOTAL	10.800	100.000	10.799	100

Source: SFC for the 1996 data. The data for 2002 were updated for SFC, MoAP and Communities – no new data are available for the other Institutions.

36. The 2002 Land Code removed 412,000 ha of shelterbelt forests from the forest fund and classified them as non-farming agricultural land, and allocated responsibility for management to the village councils. Currently there is no structure that oversees or controls the management of these shelterbelt forests.

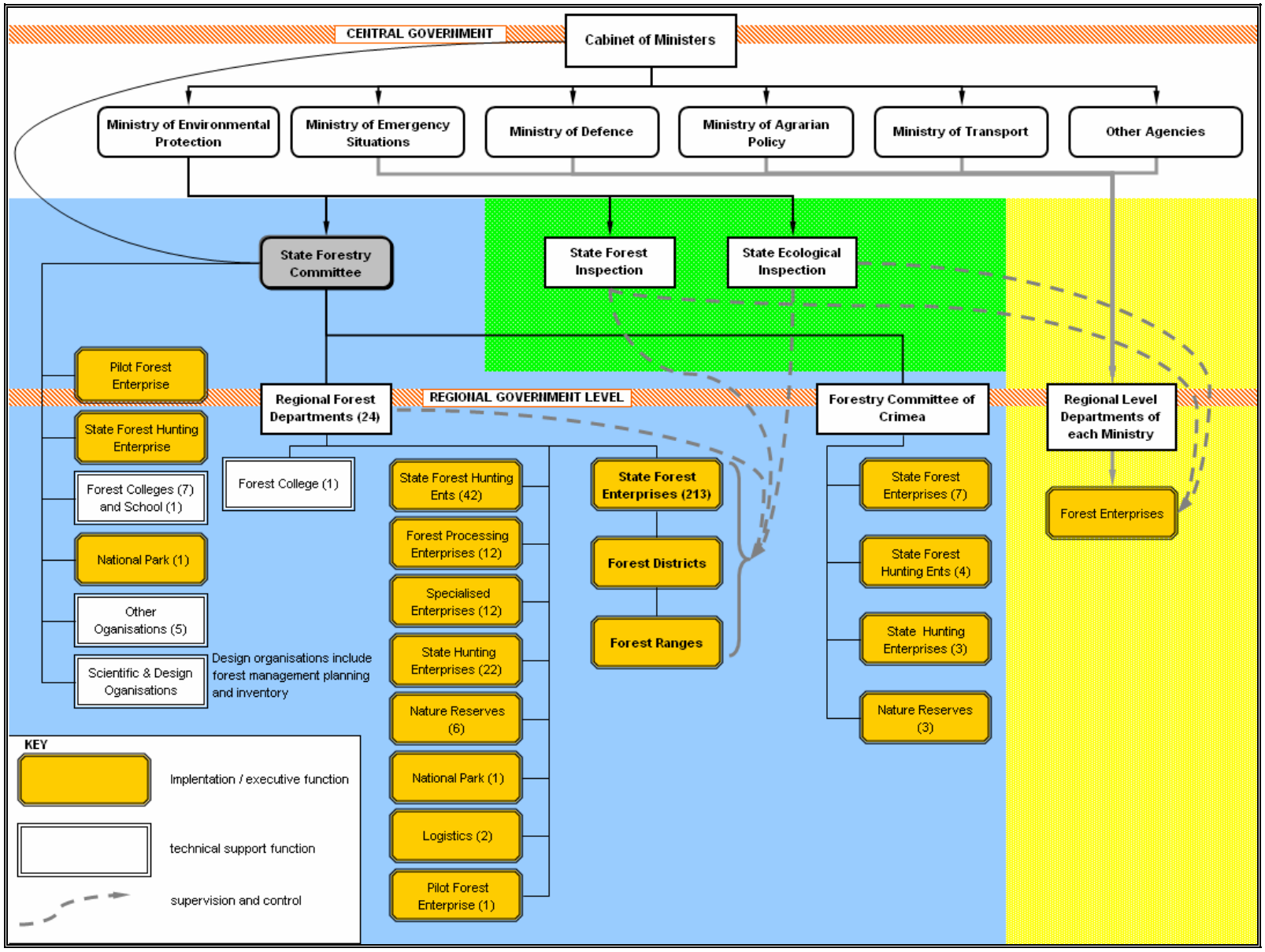
C.2 Forest Institutions

37. The overall structure of forest sector institutions is presented in Figure 2. The blue background indicates functions under the SFC which is subordinate to the Ministry of Environmental Protection (MoEP), the green background indicate inspection responsibility and the yellow background indicates those forests under the authority of other Ministries or government agencies.

C.2.1 The State Forestry Committee

38. The SFC administers 420 forest enterprises employing some 90,000 staff. It has headquarters in Kyiv and Regional Forest Departments (RFDs) in 24 Oblasts and one Forestry Committee for the Autonomous Republic of Crimea. The RFDs are state funded and coordinate, control and supervise the forestry enterprises in their areas. Included in the 420 forestry enterprises are, among others: (i) State Forest Enterprises (SFEs), (ii) State Forest Hunting Enterprises which undertake management of forest as well as game resources, (iii) State Hunting Enterprises which only manage game, (iv) Forest Processing Enterprises and (v) Protected Areas. Two SFEs report directly to the SFC: Teterev and Sevastopol with the former having the status of a pilot enterprise to test new approaches to forest management. Technical support services include the forest inventory management planning division (Ukrderzhliproekt) which undertakes forest management planning for the entire sector and is completely funded from the state budget); research institutes; forest seed inspection; forest aviation; and eight forest schools and colleges.

Figure 2 Organisation Charts of the Forest Institutions of Ukraine



39. The SFC's Hunting Bureau acts as the hunting authority and prepares and proposes legislation, hunting seasons, level of off take, hunting licences etc. The SFC forest management planning division prepares game management plans for a ten to fifteen year period and, based on a census and availability of food, calculates sustainable level of culls.

40. The SFEs are responsible for implementing fire protection measures. There are about 3,000 forest fires annually resulting in the loss of 3,000 ha of forest. Losses during high fire years are greater (1994, ~10,040 ha and in 1996 ~12,670 ha[25]). Up to 4,000 people are fined annually for violations of the fire safety rules. Protection measures implemented by the SFEs include the annual construction of 300 km of firebreaks and 36,000 km of exposing mineral soil to contain fires. In addition, some 9,000 km of roads are blocked for public access. Before and during the fire-danger period the forest guards conduct a media campaign to explain the danger of forest fires. Although there is continued investment in forest fire fighting equipment much of the equipment needs replacing.

41. Three harvesting options exist in SFC forests: (i) harvesting by SFE workers (about 80%), (ii) harvesting by contractors hired by the SFC (about 5-10%) and (iii) selling of standing trees (only in Carpathian region). The SFEs lack capacity for harvesting and their equipment is often inferior to the contractors. The harvesting equipment used is mainly tracked or wheeled skidders on flat and sloping terrain, and a few cable systems on steeper slopes. The equipment is old and poorly maintained. There is an urgent need for investment in new and more environmentally friendly and efficient harvesting equipment and practices. Under the current operating and financial conditions, the SFEs and logging contractors are unable to replace their equipment. The law on Moratorium of Clear Felling banned the use of tracked skidders in the Carpathian region from January 1, 2005, to be replaced by low impact wheeled skidders or cable systems. If implemented, enforcement of the ban will have a negative impact on production with knock on effects on the local economy and employment.

Photo 1 Loading Logs from a Sanitary Cutting

[25] UNECE Geneva Timber and Forest Discussion paper 32. Forest and Forest Products Country Profile Ukraine 2003.

42. Even though the institutional structures for management of forests under the auspices of the SFC may not be ideal, the existing institutions have been able to maintain Ukraine's forests through the challenging period of transition. While many stakeholders are calling for an immediate institutional reform and privatisation of certain activities, experience shows that agreement on management objectives, adequate financing and transparency of financing flows are more important than the organizational structure of forest institutions. Provided that governance is sufficient and the delivery of market and non-market benefits is proceeding, then the focus of reform should be on improving efficiency, enhanced delivery of environmental services and support for sustainable forest management.

Timber Pricing and Sales Methods

43. The State Forest Enterprises (SFEs) and other managers are charged a 'stumpage'[26] fee on harvested timber according to a system developed during the Soviet era. Stumpage varies from US$ 0.44 /m^3 for firewood to US$ 13.25 /m^3 for high quality broadleaves. Roundwood sales prices vary from US$ 6.35 to US$ 233 /m^3 (Annex 2). Until May 2004, the stumpage fee was paid only for final felling. From May 2004, it is also paid for clear sanitary felling. 100% of the stumpage fee is paid to the central government budget. The SFEs are independent entities and have the right to sell roundwood and forest products both domestically and abroad. Sales are co-ordinated at the regional (Oblast) level and centrally with the SFC. This co-ordination involves approval of contracts. Many SFEs own their own processing plants. There is a tendency to export high quality roundwood, process lower quality logs themselves and export semi-processed products (e.g. rough sawn timber) and only sell on the open market the logs they cannot use themselves. A growing shortage of oak saw logs in the domestic market is a side effect of this. Unless the sale of logs from the forest to the SFE's sawmill is open and transparent, it is likely that below market value 'transfer pricing' will occur. Under this scenario, forest production would subsidise the sawmilling operation. The main timber sales method is direct negotiation. Many contracts involve 100% advance payments to improve SFE cash flow. Competitive sales are at an early stage (auctions were introduced in Transcarpathia Oblast for example only in 2003). The market prices for domestic sales are 10 – 25% lower than in neighbouring counties (Poland and Hungary).

SFC Funding

44. The SFC is primarily self-funding through the sale of logs, NTFPs, game and processed forest products. Table 13 shows a derived income and expenditure statement for 2004. In 2004, 12.4 million m^3 of timber were harvested from forests managed by the SFC. The revenue derived from the sale of these forest products was US$ 260.1 million (excluding VAT). Management costs were US$ 208.5 million, of which about US$ 24.9 million was made available by direct state budgetary support. In the same year, SFC paid the state US$ 87.7 in taxes and stumpage fees (US$ 76.7 million in taxes and US$ 11 million in stumpage fees), i.e., a net return to the state of US$ 62.8 million. The state captures additional returns from taxes associated with value adding industries (sawmilling, paper, plywood, board, and furniture manufacture). Returns to the state could be significantly increased by: (a) increasing harvesting within sustainable levels, (b) improving cost effectiveness of forest management and harvesting (thereby reducing the need for state subsidy), and (c) increased private sector development of value adding industries.

[26] Stumpage is usually taken to mean the value of standing timber calculated by subtracting the price paid (e.g. delivered to a sawmill) less the costs of harvesting and haulage including a reasonable profit margin for the contractors. In Ukraine however, the stumpage is not a calculated price but an arbitrarily set fee charged for accessing harvesting areas.

Table 13 SFC Income and Expenditure Statement for 2004

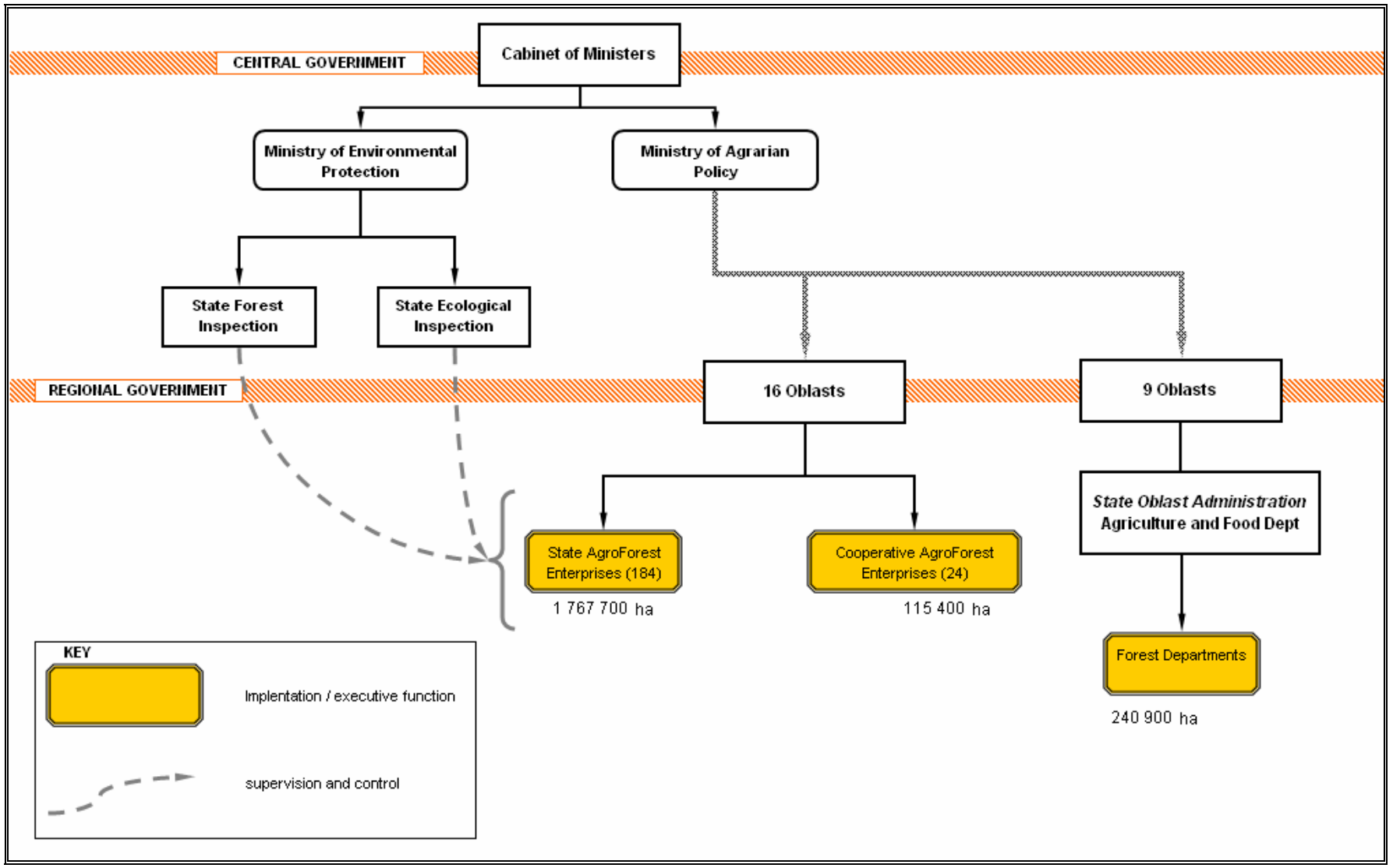
Item	(millions of US$)	
	Income	Expenditure
Income		
Budget Support	24.9	
Sales of forest products (excluding VAT)	260.1	
Sub-total	285.0	
Expenditure		
Stumpage		11.0
Forestry budget expenditure		
forestry management		21.8
creation of protection stands and shelterbelts		1.6
nature reserve management		1.5
Sub-total		24.9
Other Forestry expenditure		183.6
Other costs		67.2
Sub-total		286.7
Tax payments to state budget		18.6
Tax paymentst to local budget		15.0
Tax payments to other funds		43.0
Sub-total		76.7

Source: Derived from data provided by The Scientific and Information Centre of Forest Management 2005, using the dollar exchange rate of UAH 5.30: US$ 1.00 (exchange rate for 2004).

C.2.2 Ministry of Agrarian Policy (MoAP)

45. The MoAP is responsible for overseeing the management of 18% of Ukraine's forests. The day-to-day management of these forests has been decentralised to the Oblast level, with only one person responsible for agricultural forests in the central MoAP. In 16 Oblasts that have relatively more forest resources, AgroForest Enterprises undertake the forest operations, employing more than 22,000 people. The remaining 9 Oblasts manage the forest through their forestry departments at the main Agricultural and Food Department of the State Oblast Administrations. The structure is shown in Figure 3. In a number of southern areas there is a shortage of expertise to provide satisfactory protection and control of forests and forest protection belts. Forests that are under the authority of the MoAP include blocks of forests in the agricultural landscape that are of critical importance for maintaining agricultural soil moisture levels and preventing wind erosion in adjacent arable lands. Partly because of the ease of access, combined with an insufficient number of forest department staff, some MoAP forests are particularly subject to illegal harvest and are, consequently, relatively poorly maintained.

Figure 3 Organisation Chart of the Management of Agricultural Forests



Wood production

46. 66% of agricultural forests are categorized as 'Group I' (see section D.1 page 20), where commercial cutting is restricted. Agricultural forests are primarily used to satisfy the needs of rural areas in forestry products[27]. Over the last five years production from agricultural forests has ranged from 1 to 1.4 million m^3/year. If agricultural forests account for 1.9 million ha (this excludes 412,000 ha of agricultural shelterbelts), production is only 0.7 m^3/ha/year (country average is 1.4 m^3/ha/year). Even allowing that agricultural forests occupy some of the less productive sites and the average age of the trees is less than in SFC forests, the level of production could be considerably higher with improved management.

Funding of Forest Management under the Ministry of Agrarian Policy

47. AgroForest Enterprises (AFEs) are funded from the sale of forest products and state subsidy (15-17%). The state budget support for agricultural forests is approximately US$ 1.33 per ha in comparison with US$ 2.75 per ha for SFC forests. The current annual cost of managing agricultural forests (2004 figures) is about US$ 17.9 million. The State contributed only about US$ 2.9 million toward these costs and the remainder was generated by the Agroforest Enterprises from the sale of forest products.

48. A recent World Bank review of experience of the reform and development of forestry institutions in transition countries[28] emphasises that there is very little empirical evidence to suggest that organizational structures, by themselves, are the key element to a successful forestry sector reform process. To the contrary, evidence suggests that the structural form of a forest organization simply does not matter. Very different models can succeed, and very different models can fail. What matters more is that forest organizations operate in a way which is geared toward service delivery, whether those services are provided for the public good (e.g., biodiversity conservation, recreational purposes, watershed management, insect and fire control, etc.) or for benefits to the forest industry, to private forest owners in need of forest management advice, or to people who need forest products such as timber, firewood and other non-timber forest products. For an institutional reform process to succeed, it must be strongly supported both at the political level, and at the organizational level. Top priorities for successful development of a forestry sector include:

(a) ***Agreeing on the overall objectives*** of managing the forest resources (e.g., the relative priority of production versus set aside for other services to the exclusion of production) combined with the introduction of modern, sustainable and – where appropriate - independently certifiable forest management, which can often allow for improved production of wood and other forest products, and also better safeguard environmental, social and recreational services, etc.,

(b) ***Clarifying responsibilities*** of the different institutions, and the different functionaries working in them (Text Box 2 provides a check list of functions might be included),

(d) Putting in place, and maintaining, ***transparent systems for budgeting and accountability***

(e) Developing clear ***benchmarks to monitor results*** in comparison with other similar organisations from other countries (Table 15 outlines financial, environmental and social benchmarks that could be used to monitor the performance of forestry institutions)

[27] There is however no Government policy for agricultural forests yet.

[28] Forest Institutions in Transition, World Bank Europe and Central Asia Region (ECSSD) February 9, 2005

49. Current institutional responsibilities for forest management functions in Ukraine are summarized in Table 14. There are clearly many institutions within the forest sector, many with overlapping functions and responsibilities. Some are also poorly resourced both in terms of human resources and infrastructure. This when combined with the statutory processes involved in managing the sector results in unclear responsibilities, duality of function and burdensome procedures for approval of important management documents such as the annual harvesting plan. There is therefore potential to increase the efficiency of state forest management. Table 15 outlines some of the financial, environmental and social benchmarks that could be used to monitor the performance of forestry institutions. While the balance of objectives of forest management are likely to vary from region to region, in order to access and safeguard the potential benefits that can be provided by its forest estate, Ukraine will need to first decide on the overall objectives of forest management, and then c***larify institutional responsibilities***, establish ***transparent systems for budgeting and accountability,*** and then agree clear ***benchmarks to monitor results and progress in achieving objectives.***

Text Box 2 Functions of Forest Organizations

When policy makers mandate that forest organizations are to deliver on certain tasks, and when multi-functional forest management is an explicit objective of policy, forest organizations (broadly defined) can be expected to have clear functions specific to:

Policy and Legislation
1. Policy setting
2. Legislation and regulation
3. Enforcement of the legal framework

Forest management services
1. Forest management planning
2. Fire and pest management
3. Forest inventory
4. Forest roads construction and maintenance
5. Forest regeneration
6. Management for recreational uses
7. Management for conservation
8. Management for the provision of environmental services such as watershed protection

Other services
1. Sale of timber and timber products
2. Sale of non-timber products
3. Marketing services (both timber and non-timber forest products)
4. Socio-economic services to local communities, derived from state-owned forests (fuelwood, non-timber forest products, grazing resources, etc.)
5. Forest extension services to private owners/users

In considering these functions, it is also important to note that they can be provided by multiple organizations both within the public sector (forest departments, commissions, state enterprises) as well as outside of it, by the private sector and by civil society organizations. It should be added that, in most countries, harvesting, transport, and processing services (which in transition economies had previously been provided by the public sector) are provided by the private sector, though often with mixed results.

Table 14 Current institutional responsibilities for forest management functions in Ukraine

Functions of Forest Organizations	Institutional responsibility in Ukraine
Policy and Legislation	
1. Policy setting	• Verhovna Rada (Parliament)
2. Legislation and regulation	• Verhovna Rada (laws) • Cabinet of Ministers (programs and normative legislation and guidelines) • State Forestry Committee (drafting, laws, state programs, and normative legislation • Oblast Administration (local implementation)
3. Enforcement of the legal framework	• Forestry Inspectorate of the Ministry of Environment (inspection function) • Service of Forest Protection of the State Forestry Committee (inspection and production process supervision functions) • Ministry of Interior (within their authority) • Prosecutors Office (within their authority) • Customs (within their authority)
Forest management services	
1. Forest management planning	State Forestry Design Institute (Irpin) and its affiliates in L'viv and Kharkiv
2. Fire and pest management	• State Forest Enterprises • State Forestry Committee (Lviv and Ukraine Forest Protection Agencies • State Forestry Committee Aerial fire suppression)
3. Forest inventory	State Forestry Design Institute
4. Forest roads construction and maintenance	State forest enterprises
5. Forest regeneration	State forest enterprises
6. Management for recreational uses	• State forest enterprises • Local Authorities and their specialized enterprises
7. Management for conservation	• Ministry of Environmental Protection – State Service for Protected Areas • State Forestry Committee • Local Administrations (Oblast and Rayons) • State forest enterprises
8. Management for environmental services, such as watershed protection	• State forest enterprises • State Committee for Water Resources
Other services	
1. Sale of timber and timber products	• State forest enterprises • Oblast specialized forest enterprises (Les-Services)
2. Sale of non-timber products	State Forest and Private Enterprises (Not regulated)
3. Marketing services (both timber and non-timber forest products)	Oblast Specialized Forest Enterprises (Les-Services)
4. Socio-economic services to local communities, derived from state-owned forests (fuel-wood, non-timber forest products, grazing resources, etc.)	State forest enterprises under Regulations developed by State Forestry Committee and approved by the Cabinet of Ministers
5. Forest extension services to private owners/users	Not applicable

Table 15 Financial, Environmental, and Social Benchmarks for Forest Organizational Performance

Financial Benchmarks	Indicator
Profit:	by area, employee, % turnover, asset value
Operational Cost:	harvesting, establishment, haulage,direct / indirect breakdown
Income:	by forested ha, timber / non timber ratio
Cost of Management:	as proportion of income
Value of forest industry:	as proportion of national GDP

Environmental Benchmarks	Indicator
Protected areas:	ha, % of total area
Forest health:	% area affected by disease, fire
Certification:	% covered
Sustained yield:	% Annual Allowable Cut felled

Social Benchmarks	Indicator
Employment:	quantity, quality, direct/indirect, staff morale
Stakeholders:	involvement in planning, public satisfaction
Training:	% budget on staff training, awareness programs for children
Visitors:	numbers/forest type, numbers/total population
Budget:	% spent on social issues

Source: Coillte 2002

D. CURRENT MANAGEMENT PRACTICES – KEY ISSUES AND OPPORTUNITIES FOR IMPROVEMENT

D.1 Overly conservative harvesting levels and inappropriate classification of forest use areas is impacting negatively on good forest management

48. Ukraine harvests less than 30% of the estimated annual growth of its forests. The main silvicultural systems are clear-cutting and 'gradual' cutting. The proportion of harvest by felling type (Figure 4) shows that the level of thinnings and stand treatment operations (cleaning and pre commercial thinning) is decreasing, whilst the volume of selective sanitary cut (i.e., old, dead or diseased trees that need to be removed to avoid loss or further damage to the forest) and 'other' is increasing. The category 'other' is mainly made of clear sanitary cut. Hence, it is estimated that in total about 33% of the current annual harvest from SFC forests is removed for sanitary reasons[29].

[29] Source: SFC felling reports.

As described in this section (see below), the high proportion of sanitary harvest results from a combination of factors: (i) an inappropriately large area of the forest estate is currently classified as protection forest where commercial harvesting is restricted (almost 50% of the forest is protected to some extent[30]), (ii) the potential sustainable harvest is underestimated (growth estimates are calculated by measuring the standing volume on two separate occasions and subtracting the first volume from the second, thereby excluding mortality and harvested volume from the calculation), and (iii) the final or regeneration felling ages set by the technical norms are too high, whereby growth rates have slowed and senescence has begun before the tree is harvested. In addition, since the sanitary harvest cannot be adequately planned it can result in localized over harvesting, and there is also the temptation to remove larger groups of better value trees to boost flagging revenues. This is negative or reactive rather than proactive silviculture.

Forests classification and technical norms

49. Forests are currently classified as:

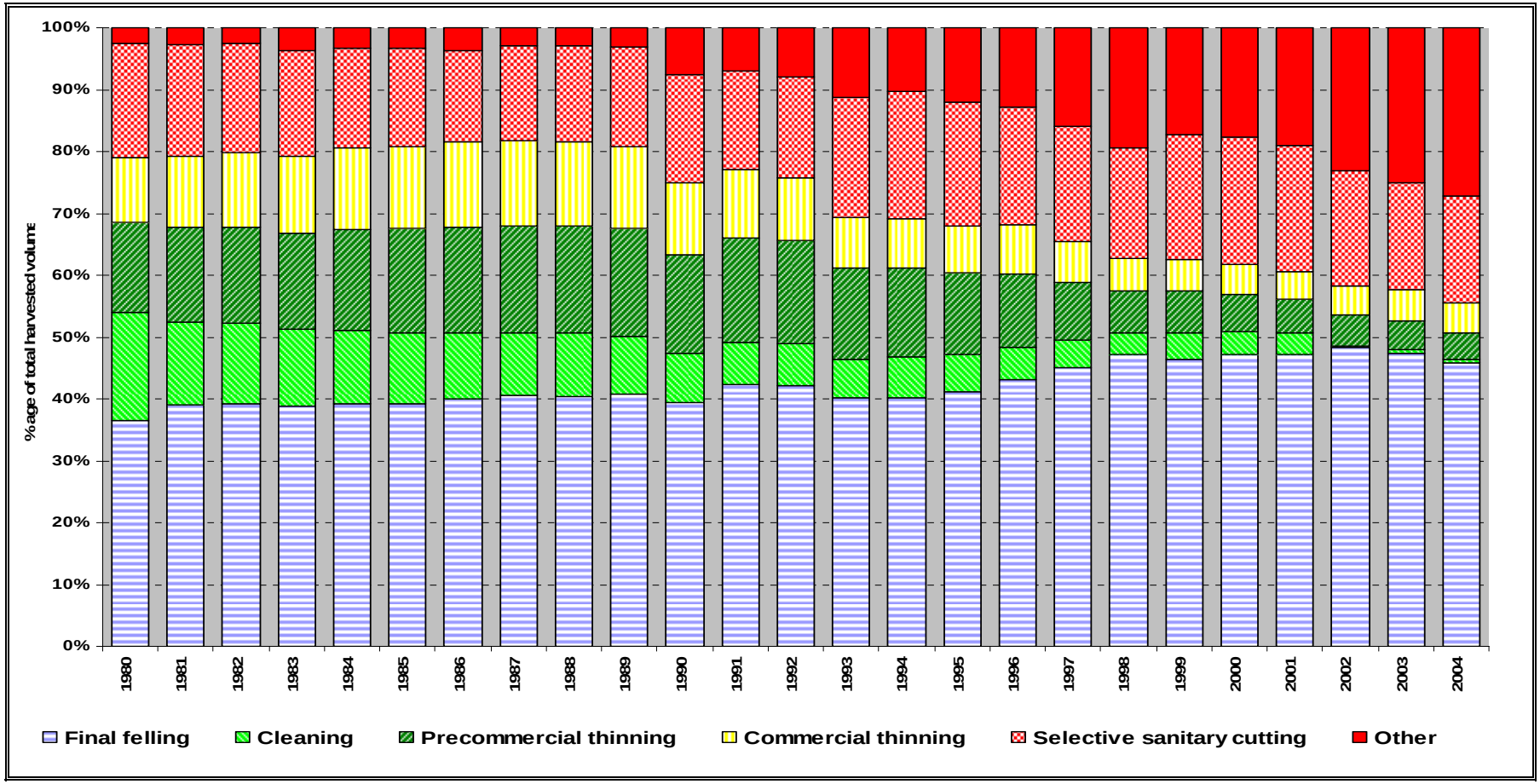
- Group I forests (56%) classified as having primarily environmental and protection functions and with a number of management restrictions. Group I forest functions include (i) water protection (3.6%), (ii) protection – mainly erosion (30.4%), (iii) sanitary/hygienic – mainly green zones and settlements (18.7%) and (iv) special purpose forests – reserves, parks etc (3.1%); and
- Group II forests (44%) which are production forests (35%) and specially protected areas (9%).

50. Technical norms only allow final harvest or regeneration fellings when crops are mature or over mature. If the trees are left too long, growth begins to decline making them more susceptible to disease and catastrophic events such as wind blow. An example of this in Ukraine is large areas of planted spruce in Ivano-Frankivsk Oblast are starting to die back well before the age of felling as defined in the technical norms (probably because the spruce was planted outside its natural range). Forest managers must wait until the trees start to die before they can be harvested in a piecemeal fashion as 'sanitary' fellings. In addition, Group I forests have a number of management restrictions. They are further subdivided into a number of categories, often where final fellings are not permitted, thereby resulting in the need for sanitary cuts, or there are other restrictions, such as increased felling ages, reduced area of cuts, etc. Adjustment of the technical norms in line with European practice would improve yield and timber quality and provide for continuous supply of material to market.

[30] Ukraine Forest Sector Master Plan II (2004)., Ramboll Natura AB, Sweden

Photo 2 Area of Sanitary Cutting in Ivano Frankivsk Oblast

Figure 4 Proportions of the Total Harvest by Type of Felling



Forest management planning

51. Forest management plans (FMPs) are prepared on a ten-year cycle by Ukrderzhliproekt, the State Forestry Design Institute, (under a state monopoly). All forests managed by SFC, the reserves managed by MoEP, and forests of the Ministries of Defence and Emergency Situations (including Chernobyl) have up to date FMPs. About 50% of MoAP forests are inventoried but the FMPs are still to be completed. The inventory of MoAP forests should be completed by 2007. The FMPs for the SFEs is funded by the state budget. In 2004, the cost to the State was US$ 1.9 million. Ukrderzhliproekt undertakes inventory and planning on a contract basis for other forest users. The average charge for preparing FMPs (excluding satellite imagery or aerial photography) is US$ 3/ha. The process of preparing and approval of FMPs takes from 1 to 1½ years.

52. Since 1991 all collected data is stored in a central database (data input for all SFC forests was completed in 2002). Forest mapping and stand boundaries, based on satellite imagery or aerial photography, are stored in a central geographic database which is not geo-referenced and/or compatible with modern GIS software. This severely limits the use of the data for planning, analysis and interrogation purposes and for integration with other information systems. Field measurements taken are limited to ocular estimates in younger and middle-aged stands. Only in the older stands are statistically valid samples taken. The inventory information is analysed, mapped and forms the basis for the FMPs and annual harvesting and commercial thinning plans. Generally the final harvesting plans are valid for the 10 years but the sanitary cuts need to be planned over a shorter period (normally 3 years).

53. Management and annual harvesting plans undergo a complex yearly approval procedure. Following approval at Oblast level, plans are submitted to central Government where they are circulated through the SFC, the Ministry of Finance, and MoEP and finally the Cabinet of Ministers then approves each annual cutting plan. Ukrderzhliproekt carries out annual monitoring of the harvesting operations in SFC forests. Elsewhere in Europe such high level approval is normally reserved for either national programmes or in some instances regional forestry plans or programmes. A simplification of procedures with approval by the MoEP for a multi-year programme would facilitate planning and industry development.

54. A new continuous inventory system has been introduced that, when fully functional, will provide annual updates to the management plan. There is concern that the FMP and inventory information is not providing an adequate picture on the extent and quality of the timber resource and forest biodiversity. The methodology used generally underestimates the overall yield, due to the lack of statistically accurate data and has a low priority for biodiversity data and or indicators. Experience from neighbouring countries such as Poland and the Czech Republic - where new inventories were carried out - shows an increase in volume estimates of up to 20%. Ukraine needs a statistically sound national level inventory for strategic planning and to meet international reporting obligations especially, the Conference on Biological Diversity, the Framework Convention on Climate Change, and the Convention on Desertification and the MCFPE (e.g. Lisbon 1998 and commitment to indicators for sustainable forest management). Without accurate and comprehensive information on the forest resource, including habitat and environmental data, decisions on future use and management may be flawed.

D.2 Forest production levels could be significantly increased following review and revision of the classification of forest types and management objectives.

55. Forest production levels could be significantly increased following review and revision of the classification of forest types and management objectives so as to: (a) better define the strategic distribution and coverage of a network of forest protected areas that could be managed more

effectively for conservation objectives, and also (b) better manage other categories of forests for economic, environmental and social objectives. Experience from elsewhere in Europe has shown that it is possible to incorporate management for environmental objectives into production forest management, thereby maintaining valuable habitats, biodiversity and environmental benefits, while also improving the overall economic value of the resource. It would be possible to significantly increase the sustainable harvest wood from Ukraine's forests by adjusting the technical norms to allow for: (i) increasing harvesting levels in accordance with actual forest growth rates; (ii) rationalizing the areas of forests where final or regeneration felling is currently prohibited; (iii) aligning rotation and felling ages with European best practice norms; (iv) reducing the level of 'sanitary cutting' with a corresponding increase in final, regeneration and thinning volumes; and (v) providing access to productive stands that are currently inaccessible for harvesting by improving the forest road network.

56. These improvements would entail a revision of the current technical norms for forest management planning, and could be introduced at the same time as introduction and certification of sustainable forest management, which will become an increasingly important requirement to ensure access to higher value export markets. The majority of stakeholders are unfamiliar with forest certification. There is limited domestic demand for certified forest products and only exporters are aware of certification issues. Four SFEs (20,000 ha) achieved Forest Stewardship Council (FSC) certification with the support of an Italian importer. However, support has been subsequently withdrawn and the certified status is likely to lapse. In 2005, some 150,000 ha in Polissya and possibly up to 480,000 ha in Transcarpathia may be certified. The process of developing a national certification standard has commenced with support from a World Bank/World Wide Fund for Nature Alliance project and the Swiss funded FORZA project in Transcarpathia although some issues still remain e.g. reliance on artificial regeneration and low attention paid to biodiversity in FMP process. Regions with potential for certification are (i) Polissya (3.7 million ha), (ii) the Carpathians (2.0 million ha) and (iii) Forest Steppe (0.65 million ha). This accounts for 60% of the forest area.

57. The revision of technical norms for felling and forest management planning could be addressed in the context of developing a national standard for sustainable forest management , based on an objective evaluation of the economic, environmental and social values of forests, and building on experiences from elsewhere in Europe.

D.3 Investing in thinning would yield dividends in the future in terms of timber quality and sustainability of supply.

58. Thinning volumes fell during the 1990s and remain at a low level. Insufficient early thinning (i.e. selective felling of poorer quality, smaller trees in to provide space for the remaining good quality trees to grow quickly to optimal size), particularly over the last fifteen years, together with excessive final felling ages, is leading to overstocked forest stands of poorer quality stems that are more prone to disease and catastrophic events such as wind blow and fire (coniferous species account for 46% of the area). The backlog of thinning is caused by financial constraints coupled with a collapse in markets for small round wood (the product of early thinning, which can be used to make paper, particle or hard board, or as fuel wood). If allowed to continue, insufficient investment in thinning will impact on the productive capacity of the forest estate and sustainability of future supplies of higher quality timber. Conversely investment in addressing the backlog of thinning needs and ensuring that optimal levels of thinning are maintained would yield dividends in the future in terms of timber quality and sustainability of supply. Immediate benefits would include: (a) improvement in stand quality, (b) reduction in fire hazard, (c) facilitation of subsequent commercial thinning and (d) provision of local employment.

D.4 Improving the forest road network would reduce negative environmental impacts while increasing economic returns from forest management

59. The density of forest roads in Ukraine (national average 12.6 meters per hectare, and 7.7 m/ha for the Carpathian region) is less than optimal for environmentally responsible harvesting and sustainable forest management, and is significantly lower than in comparable conditions in other countries (Austria 36 m/ha and France 26 m/ha). Furthermore, the existing network is in poor condition and up to 70% is in need of rehabilitation. The road network is unevenly distributed and frequently sited in the wrong places (i.e. in river valleys where the roads are often flooded and environmental impact is greatest on fish and water quality). Deficiencies in the forest road network results in increased costs of harvesting, longer skidding distances (often along water courses in steep terrain), thereby leading to erosion, environmental degradation, over-harvesting near to the existing road and rail access, and under-harvesting in inaccessible areas of production forest where sustainable harvest is possible. Based on assessment of local costs for road construction and maintenance, and on conservative estimates of timber harvest yields, initial analysis indicates that investment in new forest roads in areas of production forests in the Carpathian region could have an economic internal rate of return of about 19%. Based on experience in other countries in the region, rehabilitation of existing forest roads is likely to have an even higher economic return.

Table 16 Road and Rail network in SFC forests

Type	Distance (Km)		
	Forestry Use	General Use	Total
Dirt Roads	81 700	4 200	85 900
Hard Surface Roads	600	1 600	2 200
Narrow Guage Railways	300	500	800
Total	82 600	6 300	88 900

Source: Ukrderzhliproekt 2005

Photo 3 Forest Road with Improper Drainage

Photo 4 Typical Forest Road in the Carpathians

60. Any expansion in harvesting without comparable investment in forest roads will lead to increased environmental damage. The optimal road density depends on (a) protected status, (b) harvesting technology used and (c) costs of road construction and maintenance. In protected areas a lower than average density is desirable.

D.5 Potential new forests, and the Kyoto Protocol

61. About 2 million ha of degraded and abandoned arable land under the jurisdiction of village councils has been identified as more suitable for reforestation than agriculture[31]. These include areas that were cleared of their natural forest cover and have been cultivated for many decades, but where agricultural productivity has declined and, in some cases, land is subject to erosion with associated negative impacts on water courses, and infrastructure. Consequently, investment in reforestation is desirable both as a means of stemming the physical and economic impacts of land degradation, and also enhancing the economic productivity and environmental services of the land. It may be possible for part of the cost of reforestation (about US$ 1000/ha for establishment and tending for the first six years) to be covered under Joint Implementation or Green Investment Schemes associated with the Kyoto Protocol. Such reforestation could, therefore, enhance the scale and productivity of the national forest estate, while capturing significant international financing from the carbon market. In order to explore opportunities to capture carbon finance, forest sector managers could build on the experience being developed under the pilot sequestration BioCarbon Fund project, and should actively engage in the national dialog leading to possible negotiations of a first package of green investments.

E. FOREST BASED INDUSTRIES – OPPORTUNITIES TO ENCOURAGE PRIVATE INVESTMENT AND DEVELOPMENT

E.1 Opportunities for the development of wood processing and furniture industries.

62. The State Program for the Development of the Wood Processing and Furniture Industry (2004-2011) was submitted to the Cabinet of Ministers at the end of 2004 by the Ministry of Industrial Policy. This program includes proposals for: (a) the modernization of furniture and wood processing, (b) the establishment of new particleboard and Medium Density Fibreboard capacity, and (c) a research and development program. However, disincentives to private investment in wood industries include: (i) difficulty in arranging for long term contracts to ensure sustainability of supply of raw materials; (ii) a lack of clarity regarding the procedures to be followed to obtain approvals; (iii) difficulty of access to data on forest resources needed for planning purposes; (iv) frequent revisions of agreed contractual terms and conditions, sometimes related to the replacement of Oblast administration decision makers; and (v) non-reimbursement of VAT on exports and lack of clarity in the taxation system. Despite these difficulties, foreign investment in the wood processing and furniture industry in 2004 totalled US$ 102 million.

63. However, to process and add value to most of Ukraine's annual sustainable harvest of forest resources, increase exports and decrease imports of processed forest products, a significantly larger scale of private investment would be needed. If sawmilling is to develop and maintain competitiveness, additional investments will be required in processing and drying capacity and in adding value through finished products. In addition, in view of the growing shortage of suitable hard broadleaves, parquet producers may have to invest in new technologies to switch to multi-layer parquet, parquet blocks or mosaic parquet. The furniture industry lacks competitiveness due to poor quality products and obsolete equipment. Investment in new technology for the production of windows and doors – for which demand has increased and is expected to continue

[31] See: (i) the Law of Ukraine 'On the State Program of the National Econet for the Period of 2000-2015', (ii) the Decree of the Cabinet of Ministers 'On Urgent Measures on Creation of Protection Forest Stands on Abandoned Lands and in the River Basins', and (iii) the National Program for Ecological Recovery of the Dnieper River Basin and Improvement of the Potable Water Quality

to increase in response increases in construction and home improvements - is also required. The pulp and paper sector urgently needs investment to increase capacity and upgrade existing facilities (capital investments necessary are estimated at between US$ 600-800 million).

Photo 5 Log Yard of Kronos Osmoloda Particle Board Mill in Broshniv-Osada

64. In an endeavour to overcome the current obstacles, some foreign companies are seeking to invest significant sums in processing equipment and infrastructure, but in return for: (a) long-term (e.g. 25 year) resource concessions to ensure guarantee of supply of resources, as well as (b) state subsidy to cover the cost of managing the would-be concession to maintain public good and environmental benefits. Priority actions that could improve the enabling environment for beneficial private investment in forest industries could be identified in the context of developing a National Forest Policy and Strategy, and would include options for improving security and continuity of supply of raw materials, and improving access to quality information on the resource base, investment procedures and costs needed to develop a business plan.

E.2 Opportunities to capture additional economic returns from Ukraine's forests, through sustainable harvest of non timber forest products, the development of tourism, and wood energy.

E.2.1 Non-timber forest products:

65. Throughout Europe, the marketing and processing of forest and wild food has generally not received the same attention by food manufacturers, national associations of food and beverage producers or national food promotion agencies that other sections of the food industry has. This may be because these products are currently sold in local markets through decentralized trade networks that involve large numbers of forest collectors, middlemen, and small shop owners. Perhaps, in the short term, the greatest potential to increase production, co-ordinate processing and add value to non timber forest products will be associated with improved marketing of mushrooms, nuts and game meat. While Eastern Europe supplies circa 70% by volume of these products, the revenue share of the producing countries is less than 5%, reflecting the low added value and the export of unprocessed raw materials. Improving the capture of revenue would require co-ordinated private investment in market development, processing and supply, and distribution chain management.

E.2.2 Tourism

66. Ukraine's potential to capture some of the expanding market for forest based tourism is significant. Determinants of up-take of the recreational benefits of forests include visitor accessibility, quality of facilities and visitor awareness of the resource. To date tourism in Ukraine has focused on traditional markets, largely in the coastal region. Ukraine remains relatively unknown in Europe. There is potential, especially in the Carpathian region, to provide a range of eco-tourism products, such as trekking[32], camping, cycling, heritage trails, etc, which could be developed at local level and support rural income diversification. The quality of landscape and the forest resources is high, the regional market for forest related tourism is growing, and technical barriers, such as infrastructure and marketing, can be overcome. Notwithstanding the potential for increasing the capture of revenues from international tourism, there is also scope to enhance the recreational value of forests for all of society through improvements in access, basic facilities and awareness of opportunities.

E.2.3 Wood energy

67. ***Wood energy***: The results of pilot projects in Ukraine (e.g., enterprises of plywood 'ODEK Ukraine' in city Orzhev, Rovno region; and Malinsk district forestry secondary technical school, Zhitomir region) indicate that small wood (i.e., derived from thinning or the portions of harvested trees that are too small to be processed into timber) can be used to provide heating and hot water at a price that can be competitive with other forms of energy. Additionally, over the period 2002-2004 a number of State Forest Enterprises and wood processors have established wood fuelled boilers for heating and firing of drying kilns. The use of wood energy could allow for reduction of dependency on fossil fuels, and their replacement with an indigenous, carbon neutral and sustainable alternative. In the absence of significant investment in alternative processing markets for small wood, estimates suggest that Ukraine's forests could supply more than several million tonnes of biomass fuel per annum. The main barrier to switching from fossil to wood fuels for larger scale water and heating supplies is the relatively high initial cost of equipment for utilizing wood energy[33], and the associated need for long term guarantee of supply of sufficient fuel wood. With the development of sustainable harvesting and mechanisms to guarantee long term supply of forest resources including small wood, investment in wood energy systems may be economically competitive and could be eligible for support under green investment schemes or Joint Implementation associated with the Kyoto Protocol.

F. FORESTRY SECTOR STAKEHOLDER OPINION

68. The centralized approach to forest management and the low degree of communal forest ownership do not encourage public involvement in decision making and contributes to the low level of awareness. The public receives patchy information about some of the issues. Official information tends to be only positive and is received with scepticism. The private press covers issues as they emerge such as flooding, fuel wood shortages, biodiversity, environmental impacts of harvesting, illegal harvesting etc. but is generally critical of the forest administration authorities,

[32] One initiative in Transcarpathia which gives hope for the future is a continuous hiking trail that eventually links up with the trail systems of the neighbouring Oblasts and with Poland, Hungary, Slovakia and Romania. The Transcarpathia Hiking Trail concept has been worked out with the support of the FORZA Project. First segment of the trail is under construction in the Rakhiv Pilot Area and should be inaugurated soon.

[33] Costs to supply and install wood chip burners are estimated at: US$ 59,000 for 100KW, €86,000 for 200kW, US$ 96,000 for 300kW. Pellet burners cost 20-30% more. A 300kW boiler will use circa 750-1,000 tonnes of timber.

putting the blame for many problems squarely on 'poor' forest management. Often such one-sided criticism is unjustified and shows the need for general awareness raising.

69. Lack of awareness and understanding on the part of important stakeholders threatens sustainable management and conservation of Ukraine's forests. Media, environmental NGOs, the general public, and some government officials are often poorly informed and perceive forestry as negative exploitation of natural resources leading to environmental degradation. There is a lack of understanding of the potential critical role that forestry can play in maintaining the environmental functions and services provided by forests, including conserving biodiversity, in the production landscape. This perception may, in part, have contributed to the prevailing overly conservative classification of forest types and uses, together with the constraints that this has placed on good forest management practice, and the maintenance and growth of forest based industries.

70. Partly as a consequence of the negative perception and understanding of the role of forestry, the number of forest areas being removed from production forestry and set aside as protected areas has been increasing rapidly in recent years. As the coverage of these 'paper parks' increases, the resources available for effective protected area management are being spread more thinly over a larger area, and the opportunity for mainstreaming conservation in the wider production landscape is being neglected. Experience from elsewhere in Europe has shown that foresters and environmentalists can work together to more effectively protect and manage critical habitats, while enhancing the biodiversity and environmental benefits of production forests.

G. UKRAINIAN VISION FOR THE FUTURE AND STRATEGY FOR DEVELOPMENT

G.1 Forest Policy – European Context

71. Forest policies are increasingly influenced by a number of broader societal and policy issues outside the forest sector, such as the protection of natural and cultural heritages, climate change mitigation and the use of renewable energies. The last five years have been marked by changes in forest policy, legal frameworks and institutional settings in the forest sectors of the European Union countries[34]. Many countries are linking their national policies to the Ministerial Conference for the Protection of Forests in Europe, with national legal frameworks being modified and updated accordingly. Concurrently, pressure to control illegal logging and introduce market-based instruments that promote sustainable forest management, such as forest certification, have arisen from concern about the rate of loss and degradation of tropical and boreal forests. Growing emphasis is placed on nature conservation and the promotion of biological diversity of forest ecosystems.

[34] The study 'Forest policies and institutions in Europe 1998-2000' by the UN Economic Commission for Europe (UN/ECE) provides a detailed overview of changes in forest policy on the basis of national reports from 24 European countries.

Photo 6 Forest Rail Haulage in the Carpathians

G.2 Forest Policy- Ukraine

72. Following independence, the major initiative was to retain forests in state ownership and to separate and privatise wood processing. This led to the break up of the large integrated wood processing complexes in the Carpathians. The newly privatised wood industries found it difficult to compete and many became bankrupt. Nationwide, forests and harvesting operations were transferred to SFEs. In many instances the SFEs did not have the necessary equipment for harvesting so the use of harvesting contractors became common. At the same time, the majority of the former collectively managed Kolkhoz (agriculture) forests and shelterbelts were taken over by the MoAP and municipal governments. In 2002 the government introduced the 'Forest of Ukraine' programme[35] which defines overall forest management goals and identifies specific targets for forest area and timber volumes (Table 17). The goals stated in the programme include:

- To increase forest area, productivity and quality and enhance nature protection;
- To improve utilisation and efficiency of forest operations;
- To increase the area of protection forest;
- To improve and harmonise legislation with principles of sustainable forest management;
- To increase state control of forest protection (e.g. control of fire, pests and disease);
- To develop forest science and education; and
- To improve working conditions for forestry employees.

73. The program was prepared, fundamentally, as a proposal for national government budget allocations to the State Forestry Committee and the Ministry of Agricultural Policy (US$ 45 million over a 14 year period, with a further US$ 2.02 billion to be derived from finances generated by the state forest enterprises from sales of state forest resources). The programme was prepared along traditional lines and in compliance with procedures of the Cabinet of Ministers. These procedures did not engage all stakeholders and did not allow opportunities for public participation. Hence the

[35] The State Program 'Forests of Ukraine 2002 - 2015' was approved by the Cabinet of Ministers (CoM) on 29 April 2002, Resolution Number 581

program has not benefited from input from forest sector stakeholders, such as the private sector, local communities, academia, NGOs and the environmental community.

Table 17 Targets of the Forests of Ukraine Programme

Indicator	Units	Year			
		2002	2005	2010	2015
Total area of designated forest lands and other lands covered with forest vegetation	Million ha	10.8	10.9	11.1	11.3
Land covered with forest vegetation	Million ha	9.4	9.4	9.5	9.7
Total standing volume	Billion m^3	1.74	1.86	1.97	2.03
Average standing volume*	m^3 per 1 ha	186	200	205	210
Average change of standing volume	m^3 per 1 ha	3.8	3.8	3.9	4
Forest cover of total land area	%	15.6	15.6	15.8	16.1

Source: Cabinet of Ministers Resolution 581

The Need for a National Forest Policy and Strategy (NFPS)

74. A national forest policy and strategy (NFPS) should provide the vision, goals and guidance of how a nation's forest resources are to be used and managed. It should be dynamic and respond to changing circumstances and evolve over time. As forestry involves activities that extend beyond the forest, many groups throughout society are, to some degree, affected by the way forests are managed. NFPS development should allow and respect the legitimate range of interests of all concerned, (e.g. government, academia, civil society, private sector, NGOs, local communities etc.) and bring about their effective participation in the formulation process. Without stakeholder buy-in, the policy will be socially irrelevant and politically ineffective.

75. Ukraine's forest sector is facing a number of issues that require guidance and consensus at a national level in the context of a NFPS:

- Delivery of public purpose functions;
- Sustainable level of harvesting;
- Forest ownership and tenure;
- Development of new forest legislation and regulations;
- Control of illegal activities;
- Development of forest industry;
- Management of reclassified shelterbelt forests and former Kolkhoz forests;
- Development of forest institutions; and
- Protected areas management.

76. The need for an NFPS is widely acknowledged. In its absence, vested interests will continue to lobby on single issues without considering the overall sector. Forest sector officials and stakeholders consulted by the Bank frequently indicated that it would be highly beneficial to bring all key stakeholders together to discuss and agree on a national forest policy and strategy, which could then provide the overall guidance for development of the sector. There is a need to build consensus at a national level on a vision together with a statement of forestry sector priorities. This vision and statement could provide guidance for the subsequent participatory development of a national forest policy and strategy[36].

[36] Based on experience in other countries in the region, development of a national forest policy and strategy is likely to require the participation of representatives of several hundred forestry sector stakeholder groups, over a period of 12-24 months.

G.3 Forest Legislation

77. A new Forest Code was signed by the President on 13 March 2006. As the time of approval of the new Code coincided with the publication of this note, a review of the new Code has not been possible. However it is essential that: a) subsidiary legislation is prepared to ensure that law can be implemented, b) that new code is harmonised with other laws and EU directives, and c) that the Code is amended once the new forest policy and strategy has been prepared so that the Code facilitates the implementation of the new Policy.

Annex 3 provides a list of international treaties and conventions that Ukraine is signatory to.

H. POTENTIAL ROLE FOR THE WORLD BANK AND PARTNERS

78. Capturing the multiple values of Ukraine's forests will require reclassification of forest use areas so as to allow for effective and sustainable management of the economic, environmental and social values of the forest estate. It will also require investment in developing public sector institutions and improving infrastructure, including forest roads, as well as increased private sector investment in competitive wood industries.

79. Sweden has supported the Ukrainian forest sector over the past decade and has assisted with the preparation of the Forest Sector Masterplan and provided technical assistance and training in: silviculture; inventory; public communication and information; education and research; and forest policy and strategy. Switzerland has supported sustainable, multi-functional forest management in Transcarpathia including environmental management, participation, livelihoods, productivity and disaster prevention.

80. The World Bank is currently working with governments and other forest sector stakeholders in many countries in the region and around the world to assist them to facilitate and finance forest sector reform and development. Together with other partners already involved in supporting the Ukrainian forest sector, the World Bank could be available to provide similar support for Ukraine. Table 18 presents a summary of some of the findings of this sector note and some generic recommendations for development of the sector.

Table 18 Summary of Current Situation and Generic Recommendations

Current Situation	Generic Recommendation	Responsible Party
Forest Policy and Legislation		
National and Regional Level Forest Policy: Lack of consensus and national level guidance on forest sector development, e.g., the overall objectives of forest management (the balance between public good and commercial functions); the legal and institutional framework needed to achieve these objectives (including roles and responsibilities); ownership and tenure; the management of agricultural forests; the development of forest industries, and the control of illegal activities, etc.	***Develop the overall vision and goals for the sector*** at the national, regional and local levels; allowing for the development of policies and approaches that support national objectives while emphasising local priorities, and facilitating development of forest based industries and better safeguarding public good functions, including environmental services and biodiversity.	*Subject to approval by Parliament*: Cabinet of Ministers, Ministries of Environmental Protection, Agrarian Policy, Industrial Policy, SFC, Local Authorities, private sector stakeholders, environmental NGOs, etc
Revision of the Forestry Act*:* The Forest Code has inconsistencies with legislation and requires harmonisation to facilitate the legal development of the sector, and conform with EU directives	***Develop the forest code*** – with the involvement of key stakeholders and make amendments to facilitate sustainable forest management and implementation of new forest policy	*Subject to approval by Parliament*: Ministry of Environmental Protection, SFC, and other sector stakeholders
Subsidiary Legislation: Some existing regulations, such as the approval of annual harvesting plans, are overly bureaucratic and inflexible.	***Develop and revise regulations and technical norms*** to allow for implementation of new forest legislation in accordance with the principles of sustainable forest management	*Cabinet of Ministers* or *Ministry of Environmental Protection*, or *SFC* or *Local Authorities* (depending on which regulation)
Institutional arrangements		
Development of Forest Institutions*:* Many forest sector institutions are poorly resourced in terms of human resources and infrastructure, and there is some lack of clarity regarding institutional functions, responsibilities and services.	***Clarify functions and responsibilities of forest institutions*** to remove areas of overlap, and introduce transparent, output-based budgeting, based on provision of services against agreed benchmarks. Development of forest institutions should be incremental rather than radical, building on existing institutions in a realistic timeframe.	Subject to approval of the *Cabinet of Ministers*
Management Practices		
Protected areas and forest biodiversity conservation*:* the number of protected areas is increasing, while the resources available for their effective management is decreasing in real terms.	***Confirm and address priorities for forest biodiversity conservation*** through establishing and managing an effective network of priority forest protected areas, as well as appropriate management of high conservation value forests in the production landscape.	*Ministry of Environmental Protection* and *SFC*, guided by national sector policy (if any), the scientific and environmental community

Current Situation	Generic Recommendation	Responsible Party
Forest Functional Classification*:* Overly conservative harvesting levels and inappropriate classification of forest use areas is impacting negatively on good forest management, and wasting a valuable sustainable resource	***Review and revise the classification of forest categories and management objectives*** to allow for increase production levels in line with modern sustainable forest management practice.	Subject to approval of the *Cabinet of Ministers,* proposed by *SFC* and cleared by the *Ministry of Environmental Protection*
Forest Management Planning and Forest Inventory*:* Forest mapping and stand data are maintained in a centralised database, and are not geo-referenced or compatible with GIS software. Field surveys use only ocular estimates for middle and younger aged stands. The inventory method underestimates growth and yield	***Improve forest information systems,*** including the capacity to store, retrieve and analyse spatial and statistical data in GIS compatible centralised or regional databases, accessible to relevant stakeholders through a web based interface. Revise field survey techniques in accordance with modern practice. Undertake a statistically sound national level inventory.	*SFC* and the *Ukraine State Forest Design Institute*
Pre-Commercial Thinning: Young forests are often overstocked and insufficient thinning is leading to reduced forest value and productivity, as well as susceptibility to catastrophic events such as disease, wind and fire. Investing in thinning would yield future dividends in terms of timber quality and sustainability of supply	***Invest in pre-commercial thinning*** – in the context of national pre-commercial thinning and cleaning program based on application of agreed criteria to ensure that investments target stands that will generate maximum benefits including: (a) improvements in stand quality, (b) reduction of fire hazard, (c) biodiversity benefits, (d) subsequent commercial thinning opportunities, and (e) provision of local employment.	*SFC* and *State Forest Enterprises*
Forest Road Network*:* Low density and poor maintenance of forest roads and railways in production forests is leading to over-harvesting in accessible areas and other negative environmental impacts associated with excessive skidding distances, as well as high harvesting costs	***Improve the forest road and rail network*** – through developing and implementing a forest roads master plan, targeting investments in road and rail rehabilitation and new forest road construction to reduce negative environmental impacts, increase economic returns from forest management, create more local employment, and provide access for better forest management.	*SFC* and *Local Authorities*
Illegal Harvesting: Local experts estimate that the illegal harvest may be as much as 1.2 million m^3 /year, which would have a value of more than US$ 27 million/year. The full extent of illegal logging, the causes, and type of illegal logging are not known.	***Characterise and control illegal logging*****,** this will entail: (i) clarifying the extent of illegal logging by volume, value and region, (ii) identifying the drivers of various types of illegal logging, and (iii) defining practical measures to reduce causes, while improving monitoring and enforcement.	*SFC* and *State Forest Enterprises*
Potential New Forests: Large areas of agricultural lands are under productive and subject to degradation resulting in declining agricultural production and erosion in some areas.	***Invest in afforestation*** to stem the process of land degradation and enhance economic productivity and environmental services. Explore options for financing afforestation with funding derived from Kyoto Protocol compliant sequestration and Green Investments	*SFC* and *Local Authorities* (State Land Committee is developing streamlined procedures)

Current Situation	Generic Recommendation	Responsible Party
Forest industries		
Forest industries**:** are poorly developed with a significant proportion of exports being unprocessed or semi-processed wood, and imports of products that could be manufactured in Ukraine	***Create a secure business environment*** with more transparent and consistent procedures and approvals. This would entail providing access to inventory data, securing access to supply of raw materials through transparent, competitive and fair timber sales; and possible compensation for undertaking public good functions of forest management	*Local Authorities SFC* and *the Ministry of Industrial Policy*
Additional Economic Returns from the Forest		
Non-timber forest Products*:* Currently non-timber products such as nuts, berries, mushrooms and game meat are locally marketed through ad hoc processes.	***Adjust regulatory arrangements*** to improve the transparent sustainable production, harvesting, in-country processing and high-value marketing of NTFPs, and capture of revenues associated with the harvest and sale of these valuable forest resources.	*Local Authorities* and *SFC*
Tourism: The quality of the quality of the landscape and forest is high and there is potential to develop a range of eco-tourism products such as nature trails, trekking, camping, cycling, heritage trails etc.	***Support development of forest based tourism*****,** by assessing opportunities and bottlenecks to private investment and marketing.	*Local Authorities*
Wood Energy*:* Results of initial pilot projects have shown that use of small wood and waste wood can be used to provide heating and hot water at a competitive price. Using small roundwood from thinnings as source of energy for heating would have the double benefit of (a) replacing the combustion of non-renewable energy resources and (b) providing an indigenous carbon neutral and sustainable source of energy.	***Support the introduction of wood energy usage*** by undertaking cost benefit analysis of applications and technologies that could be used in public buildings (e.g., schools, hospitals, offices etc.) where the use of wood energy could be adopted.	*Local Authorities*

Current Situation	Generic Recommendation	Responsible Party
Community Forestry		
Forests surrounding communities are frequently managed less intensively than SFC forests and are often subject to uncontrolled removals, with only limited benefits going to the poorest in the adjacent community. There is little local participation in forest management and benefit sharing which further reduces the communities' incentives to look after their local resources.	**Introduce local involvement in the management of forests surrounding communities** on a trial basis, through identifying areas where community forest management is feasible, confirming stakeholder interest, clarifying management roles, training community forest managers and extension workers and developing and implementing community forestry work programmes. Once trials have been shown to be successful and if there is sufficient stakeholder support this approach should be replicated nationwide.	Local authorities and SFC,
Stakeholder Opinion		
Public Awareness*:* Media, environmental NGOs the general public and some officials are often poorly informed, and perceive forestry as negative exploitation of natural resources leading to environmental degradation. There is a lack understanding of the role of forestry in maintaining the environmental functions and services of forests. Experience from Europe has shown that environmentalists and foresters can work together to more effectively protect and manage critical habitats, while enhancing the biodiversity and environmental benefits of production forests.	***Improve public awareness of the role of forestry****.* This may entail: (a) training selected staff, (b) developing a public awareness program, (c) media events to educate and inform media and the public on the sustainable management of forest resources and their multiple benefits, and (e) placing of positive and informative articles on forest management and its contribution to the environment, and the local and national economy.	*SFC, Ministry of Environmental Protection* and *Local Authorities*

ANNEX 1 PROTECTED AREA TYPES AND MANAGEMENT

Type of Protected Area	Management Objectives	Establishment and Management Opportunities and Constraints
National Park **(introduced in 1992)**	• Conservation, restoration and efficient use of natural and historical/cultural complexes and elements of the ecosystem, which have conservation, recreational, historic and cultural, scientific, educational and aesthetic value; • Organization of tourism and various types of recreation activities in natural environment while keeping strict protection regime for selected complexes and elements of the ecosystem; • Scientific research and development of recommendations on environmental protection and use of natural resources; • Environmental awareness and education activities.	• Established by Presidential Decree after a complex approval procedure (multiple clearances from local stakeholders); • Funded from the national budget through managing agency (i.e. Ministry of Environmental Protection, SFC, etc.) and National Environmental Fund; • Establishment requires withdrawal of land from land-users or land owners only for the strictly protected zone. Other zones may remain with original land-owners/users; • Recreation and traditional economic activity allowed.
Biosphere Reserve	• Preserve in natural condition the most typical natural complexes of the biosphere; • Environment monitoring; • Research of the environment and its changes as a result of anthropogenic factors.	• Established by Presidential Decree; • Funded from the national budget through managing agency (i.e. Ministry of Environmental Protection, SFC, etc.) and National Environmental Fund; • Recreation and traditional economic activity allowed • Historically biosphere reserves did not allow economic activity. Zoning and protection regimes are now being revised.
Nature Reserve	• Conservation of natural complexes with all their components in natural condition which are typical or unique for a given landscape; • Scientific research and development of nature conservation recommendations; • Environmental awareness; • Training of environmentalists and conservation specialists; • Scientific supervision of sanctuaries, monuments of nature and reserved stoves in the region.	• Established by Presidential Decree; • National level of funding through managing agency and National Environmental Fund • Strict protection; • No public access; • Focus on scientific research .
Regional Landscape Parks **(introduced in 1992)**	• Conservation of valuable natural and historical/cultural complexes and elements • Tourism and recreation while keeping strict protection regime for selected complexes and elements of the ecosystem • Environmental awareness.	• Established by decision of Oblast council • Establishment requires withdrawal of land from land-users or land owners only for the strictly protected zone. Other zones may remain with original land-owners/users • Funded by Oblast budget
Sanctuary	• Preservation and restoration of natural complexes or their specific components.	• Establishment does not require withdrawal of land from land- owners/users • Management does not require PA administration and staff. Managed by landowner/user

Type of Protected Area	Management Objectives	Establishment and Management Opportunities and Constraints
		• Territories are not demarcated • No designated warden service
Monument of Nature	• Preservation in the natural state of unique natural elements of landscape	• Establishment does not require withdrawal of land from land- owners/users • Management does not require PA administration and staff. Managed by landowner or land-user • Territories are not demarcated • No designated warden service
Reserved Stock	• Preservation in the natural state of unique natural landscape(s)	• Establishment does not require withdrawal of land from land-users or land owners • Strict protection regimes similar to Nature Reserve • Management does not require PA administration and staff. Managed by landowner/user • Territories are not demarcated • No designated warden service

ANNEX 2 STUMPAGE FEES

Table 19 Stumpage Fees in Comparison to Average Domestic and Export Prices

Round wood assortment	Domestic market price (UAH/m^3)	Export prices (UAH/m^3)	Stumpage rate (UAH/m^3)	Stumpage as %age of domestic price (%)	Stumpage as %age of export price (%)
Coniferous saw logs, d=20-26 cm					
1 grade	215.8	259.2	21.8	10	4
2 grade	193.2		21.8	11	
3 grade	169.8		21.8	13	
Coniferous saw logs. d= or> 26					
1 grade	259.1		25.6	10	
2 grade	217.3		25.6	12	
3 grade	186.2		25.6	14	
Hard-leafed saw logs. d=26-36					
1 grade	664.6		67.2	10	
2 grade	489.8		67.2	14	
3 grade	327.9		67.2	21	
Hard-leafed saw logs. d= or >36					
1 grade	823.5	1 180.6	67.2	8	1
2 grade	613.2	744.0	67.2	11	2
3 grade	407.9	419.4	67.2	17	4
Coniferous timber	127.5	202.6	21.8	17	9
Hard-leafed timber.	152.5	136.3	43.1	28	21
Coniferous pulp wood	91.2	180.5	16.4	18	10
Hard-leafed pulp wood	101.1	148.9	21.5	21	14
Coniferous technical raw material	71.1	121.0	4.1	6	5
Hard-leafed technical raw material	84.4	135.3	5.4	6	5
Fire wood	32.2	75.6	2.2	7	9

Source: The Scientific and Information Centre of Forest Management 2005

ANNEX 3 INTERNATIONAL NATURE CONSERVATION CONVENTIONS AND AGREEMENTS RATIFIED BY UKRAINE BY CORRESPONDING NATIONAL LAWS

- Convention on Biological Diversity (Rio de Janeiro, 1992) ratified on November 29, 1994.
- UN Framework Convention on Climate Changes (Rio de Janeiro, 1992) ratified on October 29, 1996.
- Convention on Protection of Wild Flora and Fauna and their Natural Habitat in Europe (Bern, 1979) ratified on October 29, 1006.
- Convention on Water and Swamp Areas as Habitat for Waterfowl (Ramsar, 1971) ratified on October 29, 1996.
- Convention on Preservation of Migrating Wild Life (Bonn, 1979) ratified on March 19, 1999);
- Convention on International Trade of Endangered Wild Flora and Fauna Species (Washingtonne, 1973) ratified on May 14, 1999;
- Agreement on Preservation of Bats in Europe (Bristol, 1995) ratified on May 14, 1999;
- Kartachena Protocol on Biological Safety within the Convention on the Biodiversity (Montreal, 2000) ratified on September 12, 2002;
- Kyoto Protocol to the UN Framework Convention on Climate Changes ratified on February 4, 2—4;
- Framework Convention on Protection and Sustainable Development of Carpathians ratified on April 2004.