

ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY II

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CAMBODIA FORESTRY OUTLOOK STUDY

by

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**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC**

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INFORMATION NOTE ON THE ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY

The Asia-Pacific Forestry Sector Outlook Study (APFSOS) is a wide-ranging initiative to gather information on, and examine, the evolution of key forestry issues as well as to review important trends in forests and forestry. The main purpose of the study is to provide a better understanding of the changing relationships between society and forests and thus to facilitate timely policy reviews and reforms in national forest sectors. The specific objectives are to:

1. Identify emerging socio-economic changes impacting on forest and forestry
2. Analyze probable scenarios for forestry developments to 2020
3. Identify priorities and strategies to address emerging opportunities and challenges

The first APFSOS was completed in 1998, with an outlook horizon to 2010. During its twenty-first session, held in Dehradun, India, in April 2006, the Asia-Pacific Forestry Commission (APFC) resolved to update the outlook extending the horizon to 2020. The study commenced in October 2006 and is expected to be completed by September 2009.

The study has been coordinated by the Food and Agriculture Organization of the United Nations (FAO), through its regional office in Bangkok and its headquarters in Rome, and implemented in close partnership with APFC member countries with support from a number of international and regional agencies. The Asian Development Bank (ADB), the International Tropical Timber Organization (ITTO), and the United Kingdom's Department for International Development (DFID) provided substantial financial support to implement the study. Partnerships with the Asia-Pacific Association of Forest Research Institutes (APAFRI) and the Secretariat of the Pacific Community (SPC) supported the organizing and implementing of national focal points' workshops and other activities, which have been crucial to the success of this initiative. The contributions of many other individuals and institutions are gratefully acknowledged in the main APFSOS report.

Working papers have been contributed or commissioned on a wide range of topics. These fall under the following categories: country profiles, sub-regional studies and thematic studies. Working papers have been prepared by individual authors or groups of authors and represent their personal views and perspectives; therefore, opinions expressed do not necessarily reflect the views of their employers, the governments of the APFC member countries or of FAO. Material from these working papers has been extracted and combined with information from a wide range of additional sources to produce the main regional outlook report.

Working papers are moderately edited for style and clarity and are formatted to provide a measure of uniformity, but otherwise remain the work of the authors. Copies of these working papers, as well as more information on the Asia-Pacific Forestry Sector Study, can be obtained from:

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EXECUTIVE SUMMARY

Forests cover approximately 59% of Cambodia's total land area, corresponding to approximately 10.7 million hectares (FA, 2006). The net annual rate of deforestation was estimated as 0.5 per cent during the period 2002-2005/06 representing a significant decrease compared to earlier estimates. The Cambodian Millennium Development Goal (CMDG) aims to maintain forest cover at 60% by 2015. Currently, insecure title over forested land and unclear rights to use *de facto* open access forest resources mitigate efforts to maintain the forest cover, to secure livelihoods or to contribute to rural economic growth in Cambodia. This situation reflects a lack of coherence in rural land management policies, weak capacities of sub-national sector line agency departments, poor service delivery mechanisms and the limited involvement of rural land and resource users in formalized natural resource management procedures. The key challenges in the sector are the needs to ensure sustainable management and equitable use of forests, to improve rural livelihoods, and to promote a balanced socio-economic development in Cambodia. Past forest management systems have not contributed sufficiently to these broad policy objectives.

The Forest Administration (FA) is the key government agency in the forestry sector in Cambodia. There are also a large number of other actors including forest-dependent rural communities, Development Partners (DPs), investors and international and national Non Governmental Organizations. In 1998 the Royal Government of Cambodia (RGC) initiated the forestry reform process by establishing a national committee on forest policy reform with support from DPs. In 2002, the secretariat of the committee formulated a national forest policy statement. Subsequently, a new Forest Law was promulgated in 2002, and a new Forestry Administration was established in 2003 (replacing the former Department of Forestry & Wildlife). A temporary Joint Coordinating Committee, representing the RGC and DPs, and chaired by the Minister of Ministry of Agriculture, Forestry and Fisheries (MAFF), commissioned an Independent Forest Sector Review in 2003. The review resulted in a comprehensive report containing some of the background information necessary to develop a National Forest Programme (NFP) (available at <http://www.cambodia-forest-sector.net/index.htm>).

In November 2004, the RGC established a Technical Working Group on Forestry and Environment (TWG-F & E) to provide a mechanism for government-DP coordination to support and strengthen development activities within the sectors (details available at www.twgfe.org). A four-year *Forestry and Environment Action Plan 2007-2010* and one-year *Framework Work Plans and Indicative Budgets* for 2007 and 2008 have specified 26 prioritized activities within six prioritized programmes of the NFP. The finalization of the NFP is the critical next step in the FA's efforts to promote sustainable and equitable forest management in Cambodia during the period 2009-2020 and beyond. Preliminary results indicate that DPs in the forestry and environment sectors are increasingly aligned with government institutions, and government-led reforms.

The Vision of the RGC is to ensure "...ecologically, socially and economically viable conservation and management of forest resources as a major pillar of public welfare directly contributing to environmental protection, poverty reduction and socio-economic development" (RGC 2002a p. 1). The RGC Policy is to ensure that forest resources are used in an efficient manner in order to support sustainable and equitable socio-economic development, protect forests from degradation, and support the decentralization, effectiveness and accountability of forest governance while research and development (one of the main tasks for sustainable forest management) are ongoing.

At the current stage the FA/RGC, with the supports of DPs has been focusing efforts on forest demarcation, community forestry, forestry law enforcement and governance, climate change and innovative financing, and capacity development and research.

From now on until 2020 two main factors are suggested to be the most important players in Cambodia: strong/weak commitment of forest and forest-related policy implementation and active/inactive local community participation. With the existing trends of threats on forest development and efforts of forest management, the scenario suggests that strong commitment of forest policy implementation and active local community participation should be the most likely mechanisms to achieve the target of 60% forest cover. However, many of the lower government agencies have been very passive and depended very much on "being told to do" rather than "trying to do". At this stage of democracy in Cambodia, local communities are encouraged to use their rights in managing natural resources but they still have minimal voice and usually have lost their demands to powerful and rich people while defending their rights from natural resource management. Therefore, in order to reach 60% forest cover, bringing local community participation into highly active participation is essential.

1. INTRODUCTION

Forest management in Cambodia has been a challenging task for the Cambodian government from the 1950s to the present. According to the remaining available records, forest management systems have been evolved from solely timber benefit management to timber, non-timber forest products (NTFPs), and environmentally friendly management. Past management, moreover, was focused mainly on national economics. However, for the last ten years or so forest management has encompassed timber production, the environment, tourism-recreation, and benefit sharing among national and local economies. For the latter, the RGC has been confronted with a challenging task due to fast emerging demands for timber and NTFPs while human and financial resources are changing their needs.

However, with the strong leadership of the Prime Minister, the FA and MAFF's very important roles, a number of laws, regulations, and declarations related to sustainable forest management and conservation have been ratified and entered into force. Commitment of the third mandate of the RGC in cracking down on forest illegal activities have been recognized among civil society and ASEAN country members. One of the outstanding achievements, for example, is the significant reduction of the rate of forest degradation. The RGC, moreover, has committed itself to work harder to maintain the country forest cover up to 60% in 2015. To catch up with this forest cover figure, the RGC needs to work with regional countries, particularly neighboring ones.

The RGC of the third legislature of the national assembly has set policies that are related to sustainable management including land administration reform and natural "forest" resource management. The reform in natural resource management (NRM) has focused on strengthening sustainably environmental protection and natural forest resources that are based on three important pillars: Sustainable Forest Management Policy, Natural Resource and Biodiversity protection, and Community Forestry development promotion. Incorporated with the United Nations Millennium Development Goals, the RGC set out its own Cambodian Millennium Development Goal (CMDG) for 2015. The Cambodian CMDG includes maintenance of: forest cover, Protection Forests and Protected Areas, increased fishing lots, and increase in issuing land titles. Specific Sector Policies include: Forestry Policy, Sustainability of Operation and Maintenance of Irrigation System Policy, Strategic Development Plan for Water Sector, Natural Water Resource Policy, Strategic Framework for Decentralization and De-concentration Reform, and Land Policy.

Among other countries, Cambodia has been actively working with ASEAN country members, FAO, UNFF, and ITTO to fight against further degradation of forest and the loss of biodiversity. With neighboring countries, Ministerial and Prime Ministerial agreements on curbing illegal activities in timber and endangered wildlife species trades and trans-boundary issues were signed with Lao PDR, Thailand, and Vietnam.

Background

For the second phase of the Outlook Study to 2020, members of the Asia-Pacific Forestry Commission agreed to conduct forestry outlook studies, facilitated by the United Nations Food and Agriculture Organization (FAO). The study is objectively looking to better understand how the future of forests and forestry is unfolding in Cambodia and in the Asia-Pacific region in the coming decades.

With the assistance of financial and technical support from FAO, a desk study was conducted. The study was mainly based on available documents especially existing papers from the Forestry Administration (FA) and from websites. Based on these documents, it is posited: "what would the Cambodia forest cover likely be in 2020?" Will forest be managed for the

purpose of timber production, biodiversity conservation, or forestland conversion for other economic, national and local development?

Objectives

The general objective is to foresee Cambodian forest status in 2020. Based on the current challenges of forest management efforts and current trends the paper discusses relevant impacts, strengths, weaknesses, threats, and opportunities regarding natural forest resources from the present to the year 2020. The specific objectives are to:

- Review existing forest related papers,
- Seek opinions of development and conservation stakeholders or partners in foreseeing future forests by 2020,
- Present reviewed findings, and based on which policy should be made.
- The review results could be aligned or complemented with any other relevant national forest policies such as the National Forest Programme.

2. CURRENT FOREST SITUATION

Forest resources

Cambodia's forest cover resources

In 1965 forests covered an estimated 73% of the country's territory. To monitor the loss of forestland, the Forestry Administration conducted a series of forest cover assessments in 1993, 1997, 2000 (partial), 2002 and 2006. Results revealed that Cambodia's forest cover had declined to an estimated 59.09% of the total land area in 2006. The loss of forest cover is consistent with land use and land cover change patterns associated with demographic growth and economic development in most countries.

Critically, insecure title over land and unclear land use rights continue to hamper the efforts of Cambodia's rural poor to secure their livelihoods. Agricultural expansion, illegal logging, a construction boom and increasing demands for land associated with growth in Foreign Direct Investment from S.E. Asia continue to result in the loss of forests, and the increased vulnerability of communities who depend on forest resources. There is clearly a need to ensure sustainable management and equitable use of forests, to improve rural livelihoods, and to promote balanced socio-economic development in Cambodia.

Forest Cover Resource Assessment 2006

The FA has conducted national forest cover change assessment for 2006 using Landsat ETM+ satellite imagery data; this resulted in forest cover statistics for 2006 and a forest cover map (Table 1 and Figure 1).

Table 1. Forest cover statistic 2006

No.	FOREST TYPES	AREA	
		Ha	%
1	Evergreen forest	3,668,902	20.20
2	Semi evergreen forest	1,362,638	7.50
3	Deciduous forest	4,692,098	25.84
4	Others forest	1,007,143	5.55
Total forest land		10,730,781	59.09
5	Non forest	7,429,893	40.91
TOTAL AREA		18,160,674	100.00

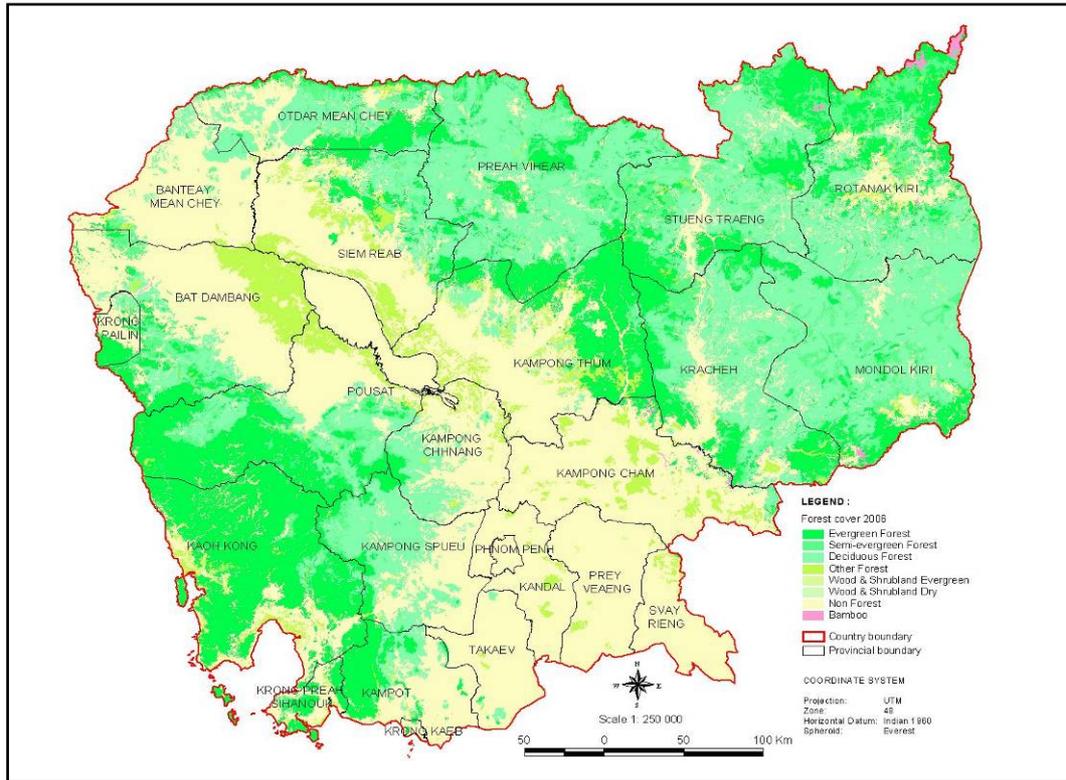


Figure 1. Forest cover map 2006

Forest cover change from 2002-2006

Forest cover between 2002 and 2006 declined from 61% to 59%. This means that forest area lost 2% of the total land area. The 2% decline in forest cover represents an estimated loss of 373,510 hectares of forest (Table 2).

Table 2. Forest cover change 2002-2006

No.	FOREST TYPES	FOREST COVER AREA				CHANGE 2002-2006	
		2002		2006		Ha	%
		Ha	%	Ha	%		
1	Evergreen forest	3,720,493	20.49	3,668,902	20.20	-51,591	-0.28
2	Semi evergreen forest	1,455,183	8.01	1,362,638	7.50	-92,545	-0.51
3	Deciduous forest	4,833,887	26.62	4,692,098	25.84	-141,789	-0.78
4	Others forest	1,094,728	6.03	1,007,143	5.55	-87,585	-0.48
Total forest land		11,104,291	61.15	10,730,781	59.09	-373,510	-2.06
5	Non forest	7,056,383	38.85	7,429,893	40.91	373,510	2.06
TOTAL AREA		18,160,674	100	18,160,674	100		

The most significant loss of forests occurred in the north-west of the country notably Banteay Meanchey, Battambang, Siemreap, Oddar Meanchey and Pailin Provinces (Figure 2). The net annual rate of deforestation from 2002-2006 is estimated as 0.5% of the total land area.

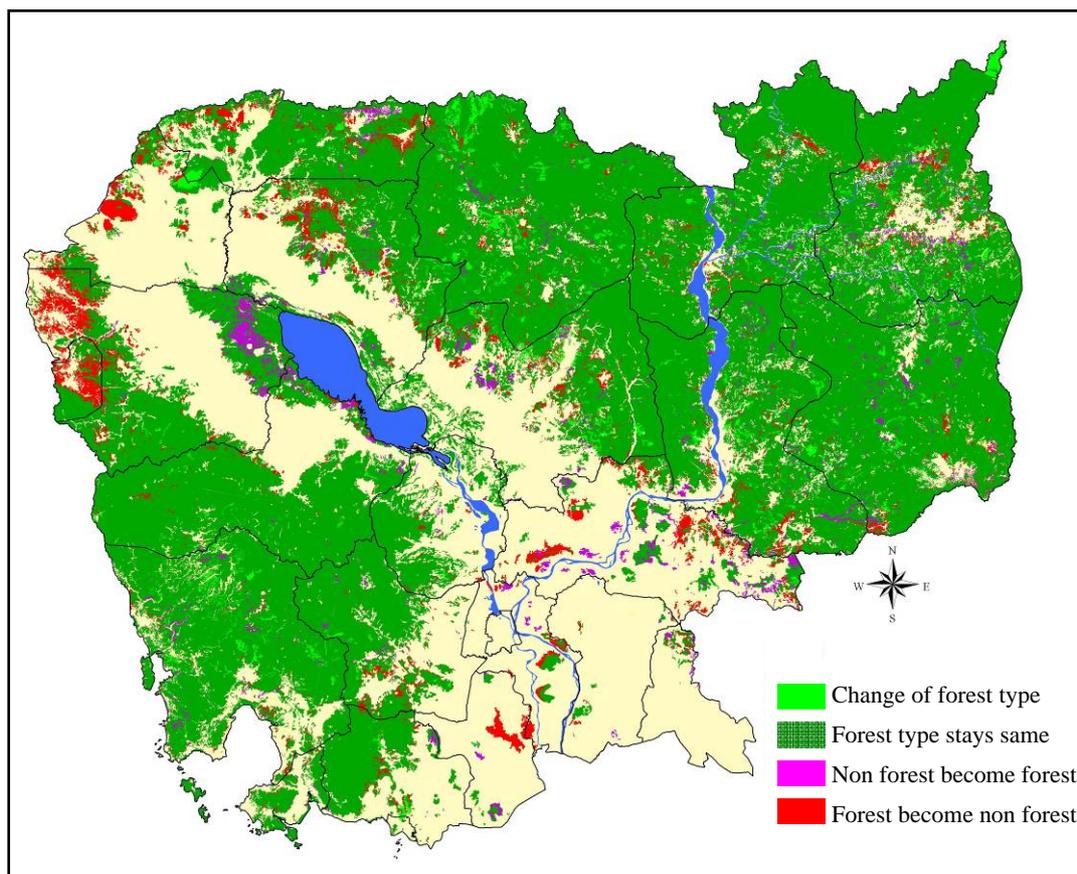


Figure 2. Forest cover map change 2002-2006

Forest cover change from 1965 to 2006

Forest cover area in 1965 was 73.04% of the total land area and this area declined to 59.82% in 1993 and 58.60% in 1997. In 2002, forest area was 61.15% and decreased to 59.09% in 2006 (Table 3 and Figure 3).

Therefore, change in Cambodian forest cover from 1965 to 2006 was 13.95% or 0.34% of the total land area regarding the annual average loss of forest cover.

Table 3. Cambodian forest cover estimates 1965-2006

No.	Assessment by year	Land				Total Area (ha)
		Forest land		Non forest land		
		Ha	%	Ha	%	
1	1965	13,227,100	73.04	4,883,400	26.96	18,110,500
2	1992/93	10,859,695	59.82	7,293,290	40.18	18,152,985
3	1996/97	10,638,209	58.60	7,514,776	41.40	18,152,985
4	2002	11,104,293	61.15	7,056,383	38.85	18,160,677
5	2005/06	10,730,781	59.09	7,429,893	40.91	18,160,674

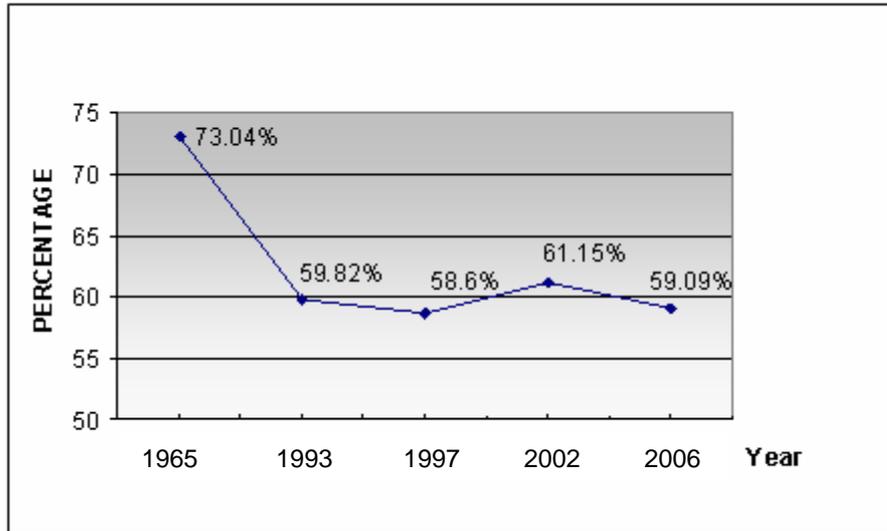


Figure 3. Forest cover change 1965-2006

Permanent forest estate

According to the Forestry Law Article 10, all natural production forest types are state property managed by the FA and MAFF. However, the Forestry Law clearly states that private forest plantations are encouraged. For economic management purposes, the natural forests in Cambodia are classified as follows (Article 10):

The Permanent Forest Estates consist of:

- 1- Permanent Forest Reserves; and
- 2- Private Forests

The Permanent Forest Reserves consist of three categories:

- 1- Production Forests shall be maintained in a manner to allow for the sustainable production of Forest Products and By-products, and protection functions are considered as a secondary priority. Production Forests consist of the following:
 - Forest concessions;
 - Production Forests not under concession;
 - Forests rehabilitated;
 - Reserve forestland for reforestation or tree plantation;
 - Reserved forestland for forest regeneration;
 - Degraded forestland; and
 - Community forests under agreement.
- 2- Protection Forests shall be maintained primarily for the protection of the forest ecosystems and natural resources therein. Protection Forests consist of the following:
 - Reserve Forests for special ecosystems;
 - Research forests;
 - Forests for regulating water sources;
 - Forests for watershed protection;
 - Recreation forests;
 - Botanical gardens; and
 - Religious forests.

Local communities have customary user rights to collect forest products and by-products within the Protection Forest with minor impact on the forests.

- 3- Conversion Forestland for other development purposes is idle land, comprised mainly of secondary vegetation, not yet designated for use by any sector that shall be classified as Permanent Forest Reserves until the government decides to use and develop the land for another purpose.

Private Forest shall be maintained by the owners with the interest rights to manage, develop, and harvest, use, sell and distribute the products by themselves.

Production forest

Production Forest (PF) is forest areas having the primary function for sustainable production of timber and NTFPs. It includes forest concession, forest permitted for harvesting, degraded forest, forest to be rehabilitated, reserved area for forest regeneration or forest plantation, reforested areas and forest areas under agreement between the FA and the local community.

Protection forest

Forest areas having the primary function for protecting the forest ecosystems encompass water resource governance; conservation of biodiversity, land, water, watershed and catchments areas; wildlife habitats, fisheries; prevention of plot encroachment, erosion, seawater intrusion; soil fertility and value for cultural heritage. Protection Forests under the Forestry Law do not include Protected Areas under the jurisdiction of the Ministry of Environment pursuant to the environmental protection and natural resource management law.

Conversion forest for other development purposes

Idle forestland covered mainly by secondary vegetation that is not yet designated for any use, and shall be classified temporarily as permanent forest reserve.

Private forests

Forest plantations or trees, whether planted or re-grown on private lands under registration and legal title and pursuant to authorized legislation and procedures.

Forest management status

Background

As in other tropical countries, Cambodia is rich in biodiversity resources, and thus the economic welfare of rural people, particularly forest dwellers depends almost entirely on agriculture, and forest and NTFPs. Since the Department of Forestry and Wildlife (DFW) was established in 1979, forests have been systematically managed. Over the years, ecologically sound forest conservation and management practices have been developed to ensure forest renewal and sustain yields.

Past efforts of forest management

Formerly, forest management using the forest concession system was introduced but was not successful with regard to efficient economic harvesting and forest sustainability. Since late 2001, the forest concessionaires were required to suspend harvesting activities and started

preparing strategy forest management plans (SFMPs) and environmental social impact assessment (ESIAs).

The RGC has committed its efforts to manage forest sustainably through guidelines, regulations, and laws. Achievements to date are:

- The Forest Concession Management Sub-Decree was adopted
- Codes of Practice for sustainable forest management (SFM) were adopted and applied in operations
- Forest concession performances were completely reviewed 1999/00
- Terminated agreements from 15 companies with forest area greater than 3 million ha to be converted to protection forests.
- 14 valid companies need new SFMPs and ESIAs and new investment agreements.
- Royal Decree on conservation area for the Sarus Crane (12.650 ha)
- Sub-Decree to set aside the Central Cardamom as a watershed, wildlife and biodiversity conservation area (401.313 ha)
- Sub-Decree on Preah Vihear Wildlife and Genetic Resource Conservation Area (190.027 ha)
- Sub-Decree on MondulKiri Wildlife and Genetic Resource Conservation Area (429.438 ha)
- 25% of the total country area under conservation and protection systems (> 4.5 million ha.)
- The new Forestry Law was adopted and promulgated in August 2002
- Reassessment of the remaining forest resource and new forest maps via GIS/FRM
- Established a new structure for the FA, and regulations for effective and comprehensive enforcement of the new forestry law
- The National Policy statement on the Forestry Sector was declared by the prime minister in July 2002. The objectives are:
 - The conservation and the sustainable management of the country's forest resources shall provide a maximum contribution to the sustainable socio-economic development of the Kingdom of Cambodia.
 - The remaining forest resources of the country shall be considered as Permanent Forest Estate and managed by exclusively promoting conservation and sustainable forest management initiatives that directly contribute to the rehabilitation and conservation of a maximum stock of forested land and forest resources.
 - A wide range of coordinated multi-stakeholder processes shall be implemented to enable the harmonization of the different perceptions, interests and objectives of the various forest interest groups at all levels.
 - To continue to support forestation of arable land and to protect those trees for the development of forest resources.

Current forest management status

The pursuit of forest management requires proper implementation for sustainability as the forest systems are developed. The challenges of forest management vary from place to place; there is no single, universal formula for sustainable forest management. However, the Royal Government of Cambodia considers the implementation of environmentally, sociologically and financially sustainable management of forest resources as important; if properly managed, they can contribute significantly to poverty reduction and socio-economic development. Tasks are as follows:

- Development and maintenance of forest inventory data

- Forest resource development action plan formulation
- Development and technical implementation of production forest management
 - o Development of SFM around a landscape approach
 - o Enable SFM through post-concession forest management
 - o Development of silvicultural capacity and alternative sustainable forest management models
 - o Identification and management of annual bidding coupes
 - o Identification and management of areas for rehabilitation
- Strengthen monitoring and reporting on sustainable forest management

Development and maintenance of forest inventory data

Forest inventory methods are developed to apply proper data collection in the field for reliable analysis and valid utilization:

- Formulate forest inventory project proposals for all forest types
- Develop guidelines on forest inventory to assess forest resource quality and quantity (including inventory of medicinal plants, sprouts, seedlings, saplings, NTFPs, carbon stocks, environmental services, endangered species etc).
- Identify capacity and experience in forest resource inventory (all species and diameters of plants)
- Input and analysis in national forest resource inventory for compilation and database management.



Forest resource development action plan formulation

Ensure integration of the local FA forest resource development action plan is consistent with the forestry law, government policies and the national forest programme. However, a plan formulation team is needed to:

- Follow up on action plan formulation by the local FA
- Collect all action plan data of the local FA to review and synthesize all forest related information

- Formulate the forest resource development action plan
- The action plan must detail activities in accordance with the forestry sector vision for 5 year planning of sub-programmes and the national forest programme and emphasize goals, activities, expected outcomes, indicators, means of verification, and a clear time frame.

Development and technical implementation of production forest management

Development of SFM around a landscape approach: A national review of production forest management systems will be initiated and, subsequently, replaced with new systems that are transparent, with a high degree of public accountability, and which are developed in a landscape context. The review and amendments will focus on ensuring:

- Forest planning is developed around a landscape approach as a basis for ensuring public accountability through representation mechanisms for provinces, districts and communes among concerned ministries. This approach will act as the line of connection between (a) the planning of the landscape and (b) the approval and monitoring of the landscape plan and its implementation
- The current structure of the FA is split into separate planning and regulatory functions in reflection of (a) and (b) above
- Public accountability mechanisms are developed and implemented effectively.

Enable SFM through post-concession forest management: To enable expansion of SFM in production forest, it is a priority to review and clarify the future of all remaining forest concessions. The FA will, in collaboration with all relevant stakeholders, develop a transparent review-system and clarify the future of remaining concessions. Thus, the FA may implement a wide range of alternative SFM systems in line with the NFP vision and mission, i.e. certified commercial forestry, community forestry, REDD, protected forests and conservation areas. The review will develop strategies and systems to make sure that:

- Production and protection forests inside concessions are defined based on a landscape approach to mitigate negative effects from non-sustainable activities on ecosystem services
- Forests of high biodiversity value inside concession areas are defined for conservation
- Any concessions that restart operations will fully comply with ecological, economic and social responsibilities through obligatory third-party certification
- Forests within cancelled or inactive concessions are protected until the national review process is concluded and implemented.

Development of silvicultural capacity and alternative SFM models: A first step will be to develop a silvicultural understanding and capacity among the foresters in charge of forest management on the ground, making them able to select and adapt well-known silvicultural techniques.

A wide range of alternative SFM systems will be developed which integrate benefit sharing with local communities, environmental protection, environmental services, watershed protection and carbon sequestration. New SFM systems will be piloted, monitored and linked to national efforts to implement certification in Cambodia. Good practices will be identified and scaled up based on forest resource development action plans.

Identification and management of annual bidding coupes: Effective, transparent management and monitoring of annual bidding coupes will be reviewed, developed and implemented to ensure compliance with ecological, economic and social standards. A

mechanism for a transparent and consultative process will also be developed to identify areas for annual bidding coupes.

Identification and management of areas for rehabilitation: The method for identification of degraded forest areas designated for forest rehabilitation, through enrichment planting and silvicultural tending will be developed and implemented. Effective planning preparation for planting activities, increasing forest resources, silviculture application, and maintaining planted trees is required to ensure compliance with ecological, economic, and social conditions and for carbon sequestration.

Strengthen monitoring, assessment and reporting on SFM

Promote establishment of monitoring, assessment and reporting (MAR) through setting up and maintenance of a database to analyze national forest data (economic, social, environmental, and inventory data).

This would include:

- Input information/data into the MAR-SFM format at both national and forest management unit levels
- Annual reporting on MAR-SFM
- Develop a forest management database for effectiveness of MAR at national and FMU levels
- Collaborate with relevant institutions that can assist the FA with monitoring and assessment of social, political and economic aspects of SFM at national and FMU levels and incorporate systems into MAR-SFM reporting systems.

The MAR-SFM format is a crucial tool for developing the forest action plan. Furthermore, the data/information of MAR-SFM can be included for national economic development plan formulation.

In order to speed up forest plantation to reach 60% forest cover of national territory, the RGC has addressed new policy that is covered in various legal documents such as the Forestry Law and Policy Statement of the RGC for the Forestry Sector to encourage private sector investment. Recently, to show its commitment to convincing the private sector to invest in forest rehabilitation, the RGC promulgated Sub-Decree 26 on "Roles for Granting User Rights to Cultivate Tree Plantation within State Forest Land" dated 25 March 2008. Since 2003, with the contribution of the private sector, the area of human-induced forest has steadily increased to about 17 924 hectares.

From now on, in order to maximize the outputs of forest plantation, the FA has developed the following measures:

- Improve the enabling environment and national policy for multi-purpose plantation.
- Identify suitable tree species and tending principles for multi-purpose tree plantations.
- Develop nurseries to ensure seedling quality for multi-purpose tree plantation.
- Site identification for multi-purpose tree plantation and integrate these areas into decentralized forest management plans.
- Establish demonstration plots for multi-purpose tree plantation in cantonments and local communities.
- Develop extension service and awareness raising in forest plantation for local communities.

- Cooperate with local communities, the private sector and development partners to develop a model of agreements for forest plantation management and benefit sharing within relevant stakeholders. Such modality is justified in the Sub-decree on “Granting user rights to cultivate tree plantations within state forest lands”.

Local forest product development and market promotion

The forest policy statement (RCG 2002) promotes private sector forest product development to meet the needs of local markets in line with the RGC’s overall strategies to support pro-poor and private sector development. Forest product utilization, including NTFPs, is a fundamental part of the majority of rural people’s livelihoods and it is expected to become more important as part of ongoing national reforms to expand decentralized forestry systems. Local forest product development and marketing, however, is still limited and there is a need to create an enabling environment to add value to forest products, create local jobs, and contribute to socio-economic development.

Promote research and development

Improve collaboration among government, private sector and local communities to develop and implement joint research and development programmes aimed at improving local processing systems of selected products to meet quality standards for local and export markets.

This includes improving the public service’s capacity to provide new and modern technology to, in particular, local communities without the necessary knowledge to produce high-tech products. While one of the aims of the RGC is to introduce new technology at all levels it is important that products created by local communities consider their cultural heritage whenever this is feasible as well as production of goods that reflects market demand. The FA is encouraging creativity and competition amongst villages and is helping them to identify suitable markets for their products.

Good experience identified, knowledge sharing among producers promoted, and opportunities for training explored.

Strengthening of quality wood processing and marketing

The FA leads the development of a quality assurance framework in order to ensure that product development results in quality products that are marketable and competitive locally as well as internationally. This requires collaboration with the private sector, research institutions and government agencies as well as capacity building at the community level. In order to promote competition local people are encouraged to sell products either as private individuals or through local co-operatives or enterprises.

The national working groups support local enterprises by helping them to identify both existing and emerging markets, as well as promoting efficient and effective production, i.e. it is important that production is sustained for locally available resources. They also assist in identifying business and technology partners, and support branding of products.

Timber processing and wood technology development

The 2006 Sub-decree on “Timber and Non-timber Forest Products Allowed for Export and Import” stipulates that logs or rough sawn timber are prohibited from export in order to enhance incentives for local timber industry to produce high quality value-added and competitive products. The majority of forest products, however, have been exported in the form of semi-finished products without significant value-adding. Compared to neighboring

countries Cambodia still has considerable natural forests, which could contribute to the country's economy if the forest industry was properly developed to also play a bigger role in rural livelihoods.

Sustainable wood processing depends on a continued flow of raw material from sustainably managed forest resources. Transparent chain of custody of timber product transportation from logging sites to factory log-yards and to retail shops is extremely important.

Analyses of potential supply of legally produced timber under SFM

The government carefully analyses the potential sustainable supply of timber and identifies systems to ensure that the capacity of the timber processing industry is in balance with its sources of supply. While ensuring appropriate SFM systems are established through NFP activities, the government carefully creates an enabling environment for larger timber processing to a level where it is in balance with sustainable supply.

Promote research and development

The government will develop appropriate systems to strengthen research and development of efficient timber processing techniques, test new technology in collaboration with private partners and develop systems to ensure that wood processing meets international standards. It is important that much of this technology is developed to meet current and future demands and that its benefits are also advanced at the community level. This process will be undertaken in partnership with local as well as foreign investors and NGOs.

Forest certification

To ensure that future wood processing is based on legally harvested timber, the government will require that larger wood processing industries are integrated in national efforts to implement timber legality assurance systems and chain of custody certification systems. This will also ensure that processed timber from Cambodia can be sustainably exported. Funding opportunities for the introduction of chain of custody certification will be explored, and recognized certifiers identified. Overall implementation of chain of custody certification for forest product processing industries will be carefully guided.

Opportunities for forest certification in Cambodia

Cambodia is one of several countries that have expressed interest in developing a national forest certification system. A lot of requirements for certification are already included in the Cambodian Forest Legislation. Cambodia is interested in certification because of the possible benefits it can bring in relation to wood exports, especially for the European and North American markets. Timber certification is therefore critical for Cambodia to improve the access to high-value international timber markets.

Community forestry

Community Forestry (CF) has been established throughout the country since 1991. To date there are 377 community forests with 347,740 ha established. Besides, there are 13 potential areas with 20,203 ha to be established. Table 4 shows the CF area throughout the country.

Table 4. Total Community Forestry Areas

No	Provinces	No of CF	Area (ha)
1	Banteay Meanchey	09	4,970
2	Battambang	17	5,415
3	Kampong Cham	10	3,480
4	Kampong Chhnang	33	10,908
5	Kampong Speu	22	12,915
6	Kampong Thom	67	66,065
7	Kampot	18	8,221
8	Koh Kong	02	3,638
9	Kratie	13	24,866
10	Mondulkiri	09	12,401
11	Preah Vihear	21	44,950
12	Pursat	52	6,260
13	Rattanakiri	28	37,815
14	Siem Reap	37	18,122
15	Steung Treng	06	14,838
16	Svay Rien	02	510
17	Takeo	13	10,605
18	Oddor Meanchey	12	60,477
19	Keb	02	426
20	Pailin	04	858
Existing Community Forestry		377	347,740
Potential Areas for C. Forestry		13	20,203
Total Community Forestry		390	367,943

Source: Community Forestry Office's Report, June 2009.

CF has been increasingly considered by the government, NGOs, private sector agencies, and research scientists. The relevant sectors believed that CF should be pursued to manage the remaining forests. With the existing Sub-Decree on CF, remaining forests are hoped to improve and maybe increase in the short future. Because of their wood and NTFP needs, local people will make sure that their CF resources are continuously available for them and future generations.

Soil and water security (environmental) services

Forests have played a very significant role in environmental services. These services are:

Soil erosion prevention: Unlike many other countries in Asia and the Pacific, the Code of Practice for Forest Harvest of Cambodia was officially issued in 1999. One of the main objectives of the code is to prevent soils from heavy erosion during and after logging activities. The code clearly and specifically states that logging is not allowed along the waterways at least 50 m on either side. Soil erosion could also happen during road building activities which is addressed by the code. At this stage although large-scale forest concession timber harvesting has been suspended, the Code is implemented for the existing Annual Bidding Coupes.

However, soil erosion continues due to upland slash and burn agriculture. Due to population increase, especially in rural areas, slash and burn activities have increased causing soil erosion particularly in the areas around Tonle Sap Lake.

Flood control: One of the main roles of forests is water absorption and water retention after rains, especially after heavy rain in a short period of time.

Scenic value: Forests provide very good scenic views. Many forested National Parks such as Kirirom, Bokor, and Ream, are visited by tourists. Mondulkiri Protection Forest has been attracting increased numbers of tourists since intensified management and protection in the early 2000s. The area is and will be managed using the South African country model of eco-tourism. Mondulkiri could be a pilot site for other Protection Forest areas including Preah Vihear and Central Cardamom Mountain.

Recreation sites: Green zones are very important for cities. However, many cities grow bigger with few or without green zones. Therefore, forests areas either inside or outside cities play significant roles as recreation sites. Citizens very much enjoy having time outside their city and spend considerably in recreation time and at sites. The RGC has allocated three outstanding sites for recreation purposes: Phnom Tamao Zoological Garden, Ang Tra Peang Thmar Crane Reserve, and Seima Biological Conservation Area. Phnom Tamao (approximately 500 ha), located about 50 km from Phnom Penh city, plays significant role as a recreation site. Up to half million tourists, most of them are Cambodian, visit it each year (Phnom Tamao Zoological Park and Wildlife Rescue Center). The area was completely degraded in 1996. Nevertheless, trees have regrown to 10 m height and some local animal species, including wild pig (*Sus scrofa*) and barking deer (*Muntiacus muntjak*) have recovered.



Watershed management

Watershed management was officially started in 1999 endorsed and signed by the King of the Kingdom of Cambodia. Watershed management is under the care of the FA and MAFF, while water management is under the Ministry of Water Resource and Meteorology (MOWRAM). The FA has been working with many main water management agencies like the Cambodia National Mekong River Committee (CNMRC) and MOWRAM to classify watersheds in different levels of management importance. To some extent watersheds have been well managed. Most of the water catchments are assigned as either Protected Areas or Protection Forest areas that are automatically protected.

Some concerns are mining activities on the upper water catchments. Mining usually occurs in the forest areas of upper water catchments but so far few measures have been taken to monitor

it. The mining companies or family-scale mining usually have no treatment of mining waste. Instead, they dump their waste into rivers that may cause health problems to people in downstream areas. Coordination among ministries is a problem in this context. For example, the Ministry of Industry, Mines, and Energy (MIME) allowed a mining company to assess the feasibility of mining in forest areas but the company started digging and clearing forests without informing the FA or FA staff at the local level. Some companies, moreover, have started mining while their permits only allow research.

Forest plantation

Forest plantation has been supported by the national budget. The number of forest plantation areas has been increasing although with some fluctuation (Table 5). There are two types of forest plantation: annual plantation and Arbor Day plantation. The annual plantation usually covers degraded lands or former forestlands that were deforested years ago. Arbor Day plantation encourages the public, government institutions, and the private sector to participate in forest maintenance and reforestation. Arbor Day is usually chaired by the Head of the State or the King. It is promoted by television and radio broadcasts throughout the country.

Table 5. Forest plantation, 1985-2009

N	Year	FA	Army	NGOs	Arbor Day	Private	Total
01	1985	289	0	0	0	0	289
02	1986	435	0	0	0	0	435
03	1987	601	0	0	0	0	601
04	1988	576	0	0	0	0	576
05	1989	837	0	0	30	0	876
06	1990	502	0	0	2	0	504
07	1991	176	0	50	0	0	226
08	1992	839	0	50	20	0	909
09	1993	662	0	50	20	0	732
10	1994	533	0	102	218	0	853
11	1995	514	0	57	106	0	677
12	1996	513	0	0	98	0	611
13	1997	387	0	0	98	0	485
14	1998	0	0	0	2	0	2
15	1999	486	0	0	16	0	502
16	2000	865	0	0	119	0	984
17	2001	810	0	0	59	0	869
18	2002	976	295	0	32	0	1,303
19	2003	1,525	340	0	48	100	2,013
20	2004	250	752	0	64	350	1,416
21	2005	1,250	527	0	83	10,000	11,860
22	2006	700	300	0	96	3,670	4,766
23	2007	1,000	200	0	75.50	7,944	9,220
24	2008	900	200	0	50.65	7,436	8,587
25	2009	1,00	0	0	69	17,924	18,993
Total		16,626	2,614	309	1,306.15	47,424	68,279.15

Source: Department of Forest Plantation and Private Forest.



Wildlife protection and management

Wildlife protection and management started significantly in the early 1990s. In 1993 a Royal Decree declared 23 Protected Areas (PA). The PAs were allocated according to biodiversity significance. All PAs combined cover up to 18% of forested country areas. Further, regarding key species of flora and fauna, more production forest areas were allocated as Protection Forests. To date Protected Forest has increased to over 1 million ha, so total conservation areas cover over 25% of the country.

The Law of Forestry states that all kinds of wildlife species in Cambodia are state property and components of forest resources, including all species of mammals, birds, reptiles, amphibians, insects, other invertebrates, and their eggs or offspring. Such wildlife is under the management, research and conservation of the FA. Additionally, the Ministerial Declaration (Prakas) on Classifications and List of Wildlife species in Cambodia issued on January 2007 contains three categories: Endangered species, rare species and common species. The Department of Wildlife and Biodiversity (DWB) is responsible for developing biodiversity conservation and management plans, including ecological monitoring, surveying, and research.

For in-situ conservation, the FA (former DFW) worked with IUCN to allocate 23 Protected Area sites. In 1990-1993, although working in the field was impossible, DFW-IUCN identified (mainly on maps) important conservation areas and sites. Identification was also based on previous forest reserve maps and IUCN Protected Area standards. DFW-IUCN's main purpose was to allocate conservation areas for long-term use. The Ministry of Environment was not established until 1993. Therefore, DFW/MAFF was solely responsible for all forest management and conservation. The 23 PAs were identified and submitted to MAFF by DFW-IUCN for further consideration. At the same time, the 23 PAs were ratified and signed by the King, and the Secretary of State of Environment (former MoE) was established in 1993. Following the Royal Decree, a number of subdecrees were issued, as listed below.

- Royal Decree on Establishing Ang Trapeang Thmor Sarus Crane Conservation Area 2000
- Sub-Decree on Establishing Mondulkiri Protected Forest for Genetic Conservation of Plants and Animals 2002
- Sub-Decree on Establishing Preah Vihear Protected Forest for Genetic Conservation of Plants and Animals 2002
- Sub-Decree on Establishing Central Cardamom Protected Forest for Genetic Conservation of Plants and Animals 2002
- Directory of Important Bird Areas in Cambodia – key sites for conservation - 2003
- Sub-Decree on Establishing Protected Forest for South West Elephant Corridor 2004

- Sub-Decree on Establishing Boeung Prek Lapouv Management and Conservation Area for Sarus Crane and other birds 2007
- Sub-Decree on Establishing Seima Protected Forest for Biodiversity Conservation 2009
- Sub-Decree on Establishing Protected Forest for Recreation and Hunting Game 2009
- Ministerial Declaration (Prakas) on Establishment Bengal Florican Biodiversity of Ecological Management in Kampong Thom and Siem Reap provinces 2010
- Sub-Decree on Establishing Kampong Trach Management and Conservation Area for Sarus Crane and other birds (under processing)
- Sub-Decree on Establishing Siem Pang Protected Forest for Genetic Conservation of Plants and Animals (under processing)

In-situ conservation

In-situ conservation has been addressed by the RGC with technical and financial cooperation from NGOs. Community development is taken into consideration while implementing in-situ conservation. Local villagers have cooperated in the project. Targeted species include: Tiger (*Panthera tigris*), Elephant (*Elephas maximus*), Eld's deer (*Cervus eldii*), Wild Water Buffalo (*Bubalus arnee*), and Hog deer (*Axis porcinus*) and globally endangered bird species including Giant Ibis (*Pseudibis gigantea*), White-shouldered Ibis (*Pseudibis davisoni*), 3 species of vulture (*Gyps spp*), Bengal Florican (*Eupodotis bengalensis*), and Sarus Crane (*Grus Antigone*),. Although some challenges need to be overcome, populations have been increased.

International partners include: the Wildlife Conservation Society, World Wild Fund for Nature, Conservation International, Fauna and Flora International, Wildlife Alliance, and BirdLife International.

Ex-situ conservation

Very recently this year, Samdech Hun Sen, the Premier of the RGC chaired the inauguration of the “Wildlife Rescue Center” located within the Phnom Tamao Zoological Garden. The Rescue Center serves to immediately take care of confiscated wildlife illegally traded in the country.

Other ex-situ wildlife management centres include:

- Phnom Tamao Zoological Park and Wildlife Rescue Center (government)
- Prey Angkor Zoo (private)
- Angkor Center for Conservation Biology (private)
- Wildlife Development Center, in Kampot province (private)
- Koh Kong Safari World (private)



Capacity building for sustainable forest management

Capacity building is a continuous need for all agencies. FA staff are trained in internal and external institutions. The FA provides short term training and long-term academic courses on SFM.

Internal training employs senior staff to teach junior staff with additional technical and financial support from JICA, GTZ, and DANIDA. Subjects address forest silviculture, tree plantation, law enforcement, and basic use of new equipment such as GIS and GPS. Details on qualified staff and training are found in Tables 6 and 7 respectively.

Table 6. Forestry Administration human resources, 2006

Academic level	Number of individuals
PhD/Doctorate	3
Master of Science	79
Engineer (most in forestry science)	470
Association in forestry	320
Skilled workers	168
No degree	627
Total	1667

Table 7. Number of officials trained and SFM topics during 2002-2006

Topic	Number of individuals trained
Forestry Law	300
Community Forestry	334
Nursery	60
Silviculture	358
Forest plantation management	63
Wildlife Management	161
Forest Management	220
Forest Management Planning Formulation-I (FMPF-I)	19
FMPF-II	20
FMPF for Division FA	370
Nursery Management	23
Nursery Establishment	21
Agricultural chemistry	28
Other	16

Forests and forest products

Wood and wood products demand (timber, NTFPs, fuel wood)

NTFPs have not been systematically studied till recently. Hansen and Top (2006) provide very detailed calculation of NTFPs and their benefits to rural Cambodian people. Their study found that at different provincial villages local poor households gain between USD167 and USD424/household/year from NTFPs; and 30-42% of their incomes come from forests annually. NTFPs play a significant role in wood energy as well.

Wood industry production and utilization

Increased augmentation for sawmills in Phnom Penh occurred in the 1990s and early 2000s. Peak timber (round and sawn) harvesting occurred in 1993-1997. Round log production reached 846,113 m³ in 1994 (FA, 2002). Export wood industry products, however, dropped to zero in 2002 after suspension of all forest concessions.

Nevertheless, domestic consumption of wood has carried on due to the need for local constructions such as houses, pagodas, and public buildings like schools and hospitals. Those used by families and public buildings are allowed by the Forestry Law.

Forest trade

International forest trade concerns timber and wildlife products whereas domestic forest trade concerns timber, wildlife, and NTFPs. Trade in timber has fluctuated from time to time. Timber was increasingly available in the markets during the 1980s and the 1990s but the trade decelerated early in the 2000s. Immediately after the Khmer Rouge regime, the Cambodian economy depended very much on natural forest products mainly timber, to be exchanged for foreign currency. Up until the 1990s Cambodia timber was traded with Vietnam, Laos and the Soviet Union. After the Soviet Union collapsed and the Cambodian market system changed (from State-Plan to free competition markets), Cambodian timber entered many other countries such as Thailand, Malaysia, China, Japan.

In early 2002, the Cambodian Government decided to suspend all forest concession. Since then, export activities have plunged. All forest concessionaires have been requested to submit proper Strategic Forest Management Plans (SFMPs) for their legitimate forest concession areas. But no forest concessionaire has reached a sustainable timber harvest standard to date.

Besides timber harvest for foreign currency exchange, NTFPs are also collected as well as wildlife and wildlife derivative products and sold to neighbouring country markets. Rattan and bamboo are the most outstanding NTFPs harvested for domestic use and export. Records show that most NTFPs have been collected traditionally by local communities and traded within the country (Table 8) (FA, 2006).

Table 8. Forest product trade during 2000-2006

Forest product types	Year	2000	2001	2002	2003	2004	2005	2006
	Unit							
Round log	m ³	187,488	126,697	644	0	4,248	9,552	2,526
- Domestic coupe*	m ³	0	0	0	0	0	0	1,338
- Concession coupe**	m ³	179,330	121,497	0	0	3,065	0	0
- Bidding***	m ³	8,158	5,200	644	0	1,183	9,552	1,188
Acacia & Eucalyptus	Double stere	0	514	3,449	0	820	0	1,880
Sawn/Process timber	m ³	19,789	16,174	10,016	3,269	3,971	3,675	1,020
Veneer	m ³	25,749	9,501	1,360	0	0	2,872	-
Plywood	m ³	17,980	26,039	3,762	0	0	0	-
Firewood	Stere	56	0	7,000	12,753	0	1,350	1,166
Charcoal	ton	350	0	0	10	0	50	-
Poles	pole	6,210	1,875	52,213	22,961	23,552	0	20,255
Rattan	ton	0	79	23	10	147	4.5	40
Liquid resin	ton	157	208	304	364	683	185	1,494
Solid resin	ton	0	10	0	0	0	0	0
Gardenia angkorensis (Edxøa)	ton	0	0	0	15	4.5	0	0
Small bamboo	ton	89	32	0	0	0	0	0
Bamboo	ton	719	208	3,075	2,562	1,634	558	3,280
Yellow vine (powder)	ton	0	22	0	0	1,504	0	0

Source: Cambodia: forest Statistics, FA, 2007.

* Domestic coupe has been introduced to harvest timber for local and national uses. The domestic coupe activities were not undertaken until 2006 due to regulation preparation and bidding process.

** Some logs remained in the concession depots after felling. Therefore, they were allowed to be processed after the concession era.

***The bidding process focused on selling seized illegal wood. Wood accumulated as result of confiscation was sold through bidding/auction.

Table 9. Forest revenues during 2000-2006

Year Description	in 1000Riel or USD	2000	2001	2002	2003	2004	2005	2006
	Fine	in 1000Riel	195,228	197,597	273,052	207,586	535,717	815,979
	in USD	4,005	16,392	1,065	0	0	0	0
Auction	in 1000Riel	5,273	2,495	350	159,173	393,729	1,049,349	944,744
	in USD	449,449	175,744	67,619	0	0	0	0
Reforestation fee	in 1000Riel	0	0	0	0	0	0	0
	in USD	313,040	370,755	89,675	11,250	8,802	29,879	12,736
Royalty from forest concession	in 1000Riel	0	0	0	0	0	0	0
	in USD	8,689,657	5,921,531	87,205	0	0	0	0
Royalty from other forests	in 1000Riel	82,690	143,861	351,112	730,360	272,485	339,785	786,843
	in USD	0	645	1,609	362,630	460,716	761,146	528,916
Other	in 1000Riel	0	13,600	0	36,767	13,624	190,984	0
	in USD	1,615,356	1,192,375	137,926	32,836	25,823	57,271	15,743
Total	in 1000Riel	283,191	357,554	624,514	11,338,86	1,215,555	2,396,097	2,486,132
	in USD	11071508	7677443	385100	406717	495341	848296	557395
National Budget	in 1000Riel	979836	3832991	3489932	1983760	1969467	4114936	6531675
	in USD	96165	0	0	0	0	0	50688

Source: Cambodia: Forest Statistics, FA, 2007.

Note: exchange rate: 1USD1 has been fluctuated around 4000 Riel during 2000-2006

Carbon sequestration

Carbon credits are in great demand for countries around the world. Developed countries, which emit most CO₂, are requested to pay for countries that absorb CO₂. Cambodia is one of those countries with forests able to absorb CO₂. In May 2008, the Council Minister of the RGC declared Oddar Meanchey province with highly degraded forests as the first Reduced Emissions in Deforestation and Degradation (REDD) implementation site. The FA has been working with DANIDA and some NGOs to introduce the REDD approach in the south west Cardamom areas, too.

The Climate Change Office has conducted training and awareness raising on the Clean Development Mechanism (CDM) nationally and sub-nationally/provincially. Projects related to CDM have focused on PA clusters of coastal areas of the south west.

Forest contribution to poverty reduction and socio-economic development

Population growth

Forest resources, in particular and natural resources in general, are affected by the increase of human population and human activities. The Cambodian population was about 9 million in the 1960s and early 1970s while forest cover was around 73% of the total country area. However, the FA (FA, 2004) demonstrated that forest cover was about 60% in 2004 while the Cambodian population was around 13 million people. This means that forest cover has been and is disproportionate to human population: bigger human populations reduce forest cover. According to the National Institute of Statistics (NIS, 2007), the Cambodian population could increase to about 19 million people by 2020. Hence, forest cover will be further reduced due to the need for land for settlement and agriculture if proper action is not taken.

It is noted that compared to neighboring countries, Cambodian forests are still in good condition and could be one of the main sources of national and local economic revenue if they are managed for not only for short-term purposes but for the long-term as well.

Income and poverty

Cambodia is one of the poorest developing countries in Southeast Asia. Around 35% of Cambodians are living under poverty lines (NIS, 2007). Most, around 85%, are rural people depending on agriculture and forest production (CMDG, 2003). The study of Hansen and Top shows that forest resources contribute from 30% to 42% of total household income for such rural people (Hansen and Top, 2006). People of the country remote areas are always dependent on forest products for their everyday consumption. One can say that forests are markets for them.

Besides agricultural products, timber and NTFPs have been the main sources of local people's economic incomes. Of the same remote local Cambodians, those living near or adjacent to productive forest areas have better lives than those who live far from forest areas. The villagers who live near the forest areas can acquire wild vegetables, meat, and medicinal plants. Sometimes wild forest products can be exchanged for agricultural products and cooking ingredients.

The rights of indigenous people

The rights of indigenous people to forest uses have been granted since before and after the French protectorate era in Indochina in general and in Cambodia in particular (Lao Bun Hak, 1972). During the 1980s and the 1990s forests were managed under the lower level of law called Anukret (Sub-Decree) No. 35. The Sub-Decree stated that all forest uses for local people's consumption are allowed without demanding a permit. Local subsistence could be wood for house construction, firewood, and poles for making fences. Moreover, indigenous people have used forest areas surrounding their home as pasture for their domestic cattle grazing. Usually during the six month off-farm period their domestic cattle are released into forests for grazing and browsing.

The latest Forestry Law, which was ratified by the National Assembly and Senate, also clarifies traditional uses of forest products (RGCb, 2002). Shifting cultivation, at the family-scale and usually manual tree cutting and clearing, is considered by the law to be traditional use. However, due to rising birth rates and in-migration, shifting cultivation could cause serious problems of forest clearance.

At this stage, processes of developing law on the use rights of indigenous people to their ancestors' lands have been undertaken among relevant ministries led by the Ministry of Land

Management, Urbanization Planning and Construction (MLUPC). The law should be ratified soon. There are at least three types of traditional ancestors' land use: first is land area used for agriculture and NTFP collection, second is land area used for cemeteries, and the third is sacred forests.

Rural poverty reduction

Forests could play a vital role in rural poverty prevention but not further reduction of poverty. Forests are the main reserve for rural people when their agricultural production faces problems. Studies have shown that forests could be a safety net when drought or floods affect rural people (Hansen and Top, 2006). Several species of wild yams can be used instead of rice by hundreds, if not thousands, of rural people when confronted with scarcity of rice. Bushmeat is the main source of protein for local people when their domestic animals face disease.

However, forests are the main sources of income and can contribute to poverty reduction and even improving rural livelihoods if proper management is achieved. Thinking of renewable resources, forests play a pivotal role in rural development and local economic improvement. From sustainable forest management and NTFPs such as resin, rattan, and bamboo collection local people can continue to benefit from their nearby natural forests. Demands for NTFPs like rattan, bamboo, and other lianas for furniture in cities and hotels provide more income-generation opportunities for local people who collect these raw products.

3. CHALLENGES IN FOREST MANAGEMENT

Population growth

Cambodia's population has grown continuously. From around 3 million in 1980 to 14 million today. Of these 14 million people, 2-3 million live in cities while the rest are in rural areas and depend mainly on natural resources, especially forest and NTFPs for their day-to-day lives. The population growth rate, that is about 2.5, has been almost stable for the last two to three decades. The high population growth rate may cause more deforestation due to needs for lands for settlement and agriculture.

The increasing gap between the rich and the poor is also one of the driving forces in deforestation. The rich gain more lands in the productive agricultural zones, whereas the poor force themselves to clear forestlands for settlement and agriculture. The two parties affect each other, and loopholes in laws and regulations (for instance: the rights of traditional use of natural resources for family consumption) contribute to forest clearance.

Demand for agricultural land

Being a highly agriculture-dependent country with accelerating population growth, Cambodia will need more forestland to be cleared. One of the most reliable strategies to solve agricultural land needs is to improve agricultural yield and to increase the number of rice plantations each year, i.e. intensive agriculture should be applied.

Forests positively contribute to agriculture in particular, and to human life in general, in terms of fertility maintenance, flood prevention, temperature and rain regulation, and watershed protection.

Road development

Road access facilitates introduction of technology to places where it had never been available before. However new roads can open new opportunities for negative impacts on forests if proper forest conservation is not addressed.

Demand for wood: domestic and regional scales

In addition to domestic demands for wood, regional wood markets are increasingly growing. Neighbouring Thailand and Vietnam are the two main clients. With limited human and financial resources, and huge areas of remote forest, Cambodian forests face a very difficult situation in their protection and development. Cambodian timber was increasingly exported to Malaysia, Thailand, and Vietnam during the 1990s and early 2000s until the RGC suspended all round and sawn timber exports in early 2002.

Under the National Forest Programme (NFP) wood supply and demand at provincial and national levels has been studied by the Forest Industry, Trade and Development Office of the FA. The objective of the study was to gain knowledge of forest supply capacity and increasing demand based on harvesting policies for SFM.

Human resources

Insufficient staff for forest management has led to unsatisfactory management. Unskilled staff cause even more difficulties for proper forest management in the country. Qualified human resources are needed in order to cope with emerging issues and updated forest management demands. Because forest management has shifted from solely timber purposes to timber and environmental purposes at the same time, upgraded human resources are vital. Many policy studies on forestry management and conservation in the country since the late 1990s and early 2000s were led and conducted by Technical Advisors but most of them have left the country. Moreover, most of the remaining documents are available only in non-native languages (English or French). However, government staff have gradually taken up policy developments for forestry management and conservation, especially since late 2000.

Long-term management skills for SFM are needed for staff of both the FA and private sector. Therefore, human resource development is urgent for emerging forest management and conservation issues.

Financial support

Forestry management has been the main challenge for the forestry development sector of Cambodia. However lack of funding has been a continuous problem. For instance, the Tree Seed Conservation Project, Tiger Conservation Programme, and Tree Plantation Development were stopped due to lack of national budget for further continuation.

Since the FA reform, the FA and the RGC have planned to demarcate forest boundaries, which is a priority, but lack of financial assistance has delayed the job. Nevertheless, with available national budget and financial aid from DANIDA, DFID, NZAid, FAO, etc. the FA has started forest demarcation in priority areas of the country.

4. FORESTRY OUTLOOK AND VISION

The RGC has set the goal to have 60% national forest cover in 2015. In order to support this goal, the National Forest Programme (NFP) has been set up with six programmes and its supporting sub-programmes:

1. Forest Demarcation, Classification and Registration Programme

- 1.2 Forest Demarcation and Registration
- 1.3 National Forest Classification

2. Forest Resource Management and Conservation Programme

- 2.1 Forest Management Plan (FMP)
- 2.2 Development of management systems for production forests outside community forests (CF)
- 2.3 Development of biodiversity management for protected forests
- 2.4 Conservation of genetic resources from forests and establishment of seed sources for planting programmes
- 2.5 Development of multi-purpose tree plantations
- 2.6 Local forest product development and market promotion
- 2.7 Timber processing and wood technology development
- 2.8 Forest Certification

3. Forest Law Enforcement and Governance Programme

- 3.1 Legal and Administrative Reform (including good governance and updating forest regulations and orders)
- 3.2 Law Enforcement and Forest Crime Monitoring and Reporting (including forestland crimes)
- 3.3 Rapid Response on Forest Crime Information

4. Community Forestry Programme

- 4.1 Community Forestry Identification and Formalisation
- 4.2 Community, Institutional and Livelihoods Development
- 4.3 Community Forestry Development Support

5. Capacity and Research Development Programme

- 5.1 Institutional and Human Resource Development
- 5.2 Extension and Public Awareness
- 5.3 Research Capacity Building Development

6. Sustainable Forest Financing Programme

- 6.1 Government financing
- 6.2 Income from National Forestry
- 6.3 Private Sector Income Generation including Community Forestry
- 6.4 Financing via Donors
- 6.5 Innovative financing sources

Setting for the future

For guiding tools in relation to national economic and natural resource management, the RGC has committed to a number of overall development and conservation strategies. These include the Cambodian Millennium Development Goal (CMDG), National Strategy Development Plan, the Rectangular Strategy for Growth, Employment, Equity and Efficiency, Governance Action Plan, Strategic Framework for Development Cooperation, the National Poverty Reduction Strategy, and Environment Protection Action Plan.

In addition, the RGC has formulated some general reforms, among others the Legal and Judicial Reform, Public Administration Reform, Forestry Reform, Fisheries Reform, Land Reform and Mine Clearance, and Armed Force Demobilization.

The Forestry Organizational Reform and Forest Policy Reform could be an opportunity to improve socio-economic conditions of local provincial and national livelihoods through improved partnerships and coordination management. Lately, the Technical Working Group on Forestry and Environment (TWG F & E) was established in order to ensure sustainable development and coordination of natural resources. Further on, the National Forest Program, which is under the leadership of The TWG F & E chairperson has an Action Plan 2007-2010 developed in December 2006 and is going to be implemented in the coming four years.

The main responsibilities of the FA from now on are and will be to improve sustainable forest management in a time of increasing demands for natural resources as well as fighting against forestland encroachment and illegal tree cutting.

The Community Forestry (CF) management approach to forest management has been increasingly considered by the government, NGOs, private sector agencies, and research scientists. The relevant sectors believe that CF should be pursued to manage the remaining forests. With the existing Sub-Decree on CF, remaining forests are expected to improve and maybe increase in the short future. Because of their wood and NTFP needs, local people will be assured that their CF resources will be continuously available for them and their future generations.

Annual Bidding Coupe (ABC) for local wood demand: seeing the needs of domestic markets for wood and NTFPs, the FA/RGC ensures that forests should have capacity to meet these needs. The ABC method could be the answer. As mentioned earlier in this paper, due to the shortage of staffing within the FA, it is not realistic for the FA to patrol huge forest areas. Therefore, ABC companies could assist in this respect.

The way forward for Cambodian forestry

With emerging social, financial, and environmental issues, forest management and development are not an easy task. What will the forests of Cambodia look like in 2020? What should be done now in order to have better forest management and development in 2020 in Cambodia?

In order to support the goal of 60% forest cover in 2015, the NFP has established six programmes, i.e.

1. Forest Demarcation, Classification and Registration Programme
2. Forest Resource Management and Conservation Programme
3. Forest Law Enforcement and Governance Programme
4. Community Forestry Programme
5. Capacity and Research Development Programme
6. Sustainable Forest Financing Programme

Forest demarcation

Despite ongoing efforts to curb deforestation in Cambodia, it continues largely unabated. A coordinated effort to demarcate the permanent forest estate will help to achieve sustainable use of public forest resources. Demarcation is vital to the long term planning of forest resources. It will enable efficient land use planning, land allocation, afforestation, as well as protection and development of forests in Cambodia. Demarcation of PFE will also lay the foundations for the sound management and sustainable use of natural resources, the

regeneration of depleted forest areas, and the significant reduction of conflicts based on forest land boundaries and regulations.

The RGC is committed to demarcating the forest estate across the country using the provisions of Sub-decree 53 on Procedures for Establishment, Classification and Registration of the Permanent Forest Estate, and the Forestry Law 2002 (RGC 2002e; RGC 2005a). During 2007-08, the FA piloted forest demarcation processes in four provinces. These aimed to develop national guidelines defining the criteria, procedures and technical means to identify and demarcate forested lands to be declared as part of the PFE. By September 2008, the FA had demarcated around 600 km of the PFE (FA 2008), and is now in the process of developing sound and effective methodologies for delineating and marking forest boundaries in order to respond to the needs of local people for socio-economic development and environmental protection, through a consultative process with multiple stakeholders.

Sustainable forest management

Accurate information about the PFE including boundaries, area and forest composition is indispensable for SFM in general, and more particularly for management activities such as concession allocation, determination of annual allowable cuts and growth modeling. At least seven forest management models are currently being explored in Cambodia. These include the vestiges of the forestry concession model; annual bidding coupes; protection forests and protected areas for biodiversity conservation, wildlife management and ecotourism; community forestry; commercial community forestry; partnership forestry; and contracted forest managers for new plantations established using the provisions of the Economic Land Concessions Sub Decree. The longer-term priority of the RGC is to continue to meet domestic demand for wood and NTFPs, to promote greater private sector investment in forest plantations, and to reduce the loss of government revenues due to non-compliance with forest management plans.

Community forestry

The FA has developed a coherent community forestry programme in Cambodia during the past five years comprising a clear policy, Sub Decree, Guidelines, functional mapping/GIS Unit, training materials and a National Community Forestry Coordination Committee. The development of Community Forestry training services and the de-concentration of GIS skills and mapping services to 15 FA Cantonments during the period 2008-2010 will enable the FA to meet this growing demand. Comprehensive works of CF are summarized below:

- Decentralised Forest Management (Community Forestry, Community-based Production Forestry, Partnership Forestry, Community Conservation Forestry),
- CF identification and formalisation,
- Community, institutional and livelihood development,
- CF development support services.

Forest Law Enforcement and Governance

The FA in cooperation with relevant government agencies and development partners is preparing the Forest Law Enforcement and Governance (FLEG) Program that is one of the six programs of the national forest program including three sub-programs for legal and administrative reform, law enforcement and forest crime monitoring and reporting, and rapid response on forest crime information which are significant instruments to decrease deforestation and forest degradation in Cambodia.

The main activities in the legal and administrative reform are:

- Establish a working group on regulations
- Establish a working group on intelligence and inspection of forest crime
- Establish a committee to review and evaluate FA officials' work
- Improve institutional structures at the FA
- Improve the ability of the FA in conflict management and resolution
- Improve communication in the FA
- Improve good forest governance
- Develop monitoring and evaluation (M&E).

Means of implementation in law enforcement and forest crime monitoring and reporting are:

- Set up appropriate means and facilities
- Develop effective monitoring and reporting mechanism on forest crime
- Develop an effective judicial communication system
- Improve cross-border collaboration
- Effective collaboration with other law enforcement agencies
- Effective implementation of systems to combat illegal land encroachment and land grabbing
- Establish a law enforcement working group.

The key activities in rapid response to forest crime information are:

- Develop a working group on forest crime information response at the central FA
- Develop a working group on forest crime information response at the local FA
- Effective collaboration with journalists and other informants.

Forestry climate change and innovative financing

Supporting the inclusion of GHG emission reduction from forest conservation and avoided deforestation in post-Kyoto regimes is essential for forest management in an emerging climate change era. Reduced Emissions from Deforestation and Degradation (REDD) are not eligible in the Clean Development Mechanism during the first commitment period (2008-2012). In future, additional initiatives to support potentially both CDM-Afforestation and Reforestation pilots and payments for other ecosystem services will be explored.

Capacity development and research

The FA will continue its collaboration with several research institutions including the Forest & Wildlife Research Centre and Cambodian Development Resource Institute in producing policy-relevant studies and policy briefs. Furthermore the FA's commitment is to institutional reforms including the introduction of a Performance Incentives Management Programme to strengthen the delivery of national and sub-national forestry services; the decentralization and de-concentration of core functions; strengthening forestry extension services for all Cambodian citizens; broadening on-the-job and specialized training for FA personnel. Action for capacity building and development & research should be focused on:

- Human Resources Development,
- Institutional Development,
- Forestry Extension and Public Awareness,
- Data analysis and interpretation,
- Research Capacity Development,
- Coordination among players.

5. CONCLUSION

Changes in forest cover, through forest management history, have been driven by demands of timber and NTFPs, agricultural and settlement lands, and economic development. In addition to the practical demands, forest management polices have played a pivotal role in forest management and development.

For the coming years and with the current suspended forest concession, focus will be on short and long term large-scale forest conversion (especially for economic industrial purposes), policy establishment and its implementation, and levels of rural community impact (positive and/or negative) on the existing forest cover in Cambodia (see *scenario analysis of country forest cover 2020*).

6. SCENARIO DESCRIPTION

Empirically and historically throughout the forest management records in Cambodia, especially in the last 20-30 years, two main factors have affected forest management: forest policy implementation and stakeholder participation. Forest policy implementation has almost always been under pressure of political regimes.

Weak commitment of forest related policy implementation is attributable to state regulation implementation bodies being too busy with other duties or having insufficient willingness to implement them. However, while demands of laws and regulations are in place, other burdens such as lack of human resources, means of implementation and financial support have emerged.

Local communities have quite often perceived that forest and natural resources that they consume daily belong to the state. They only have family consumption rights and there is no clear ownership of the natural resources for them. Therefore, to some extent their participation in the management of natural resources is loose or reluctant.

Scenarios to 2020 are discussed below.:

1: Forest Management Failure (country forest cover will be less than the target figure of 60%).

In this scenario when commune and relevant stakeholders are inactive in participation in forest management and commitment to existing forest laws and regulations is weak, the targeted 60% forest cover will not be reached. As a result, high deforestation will occur. It is difficult, however, to estimate how much forest cover loss will be due to the scale of deforestation, economic development, and human population growth. In addition, land use planning and forest resource management will become even more difficult. Most Cambodian people historically have obeyed state laws and regulations. But, and it is a big but, rich and powerful people and people in charge of implementing these laws and regulations usually abuse them for their own benefits.

2: Inequality of benefit sharing and top down approach (forest cover could reach the target of 60% or higher, but timber production will not be guaranteed).

In this scenario it is assumed that forestry laws and regulations will be highly and strongly implemented by the state with inactive participation of local communities. The assumptions of this scenario are problems in forest policy implementation (mistrust among stakeholders), forest management could be effective in the short-term, but weak forest policy implementation on the ground, and forestlands could be easily converted to other land use

types (agriculture, economic concessions, etc.). Furthermore, illegal activities/logging due to lack of government officials and financial support to deal with illegal activities, and local family-scale forest encroachment could occur.

In previous political regimes problems of forest policy implementation mistrust happened repeatedly between the government and local communities. Local communities perceived the forest policy implementation of the state was government rent-seeking rather than sustainable forest economic development. Participation in forest management and protection occurred only through force. Therefore, forest management could be effective in a short period of time but is unsustainable.

3: Fragile Land Tenure and Forestland Grabbing (country forest cover will be less than the target of 60%)

Historically, where policy implementation has been low conflicts of land tenure and forestland encroachment are high. This continues in remote forest areas where access makes it difficult for officials to monitor and control forest clearance.

Local communities, despite some democratic decentralization, have been too weak to stop illegal forest activities within their areas. They have major difficulties in dealing with their own people, powerful or rich groups who seize opportunities to clear forests in remote areas (Fox J. M. et al., 2008). Because of weak policy implementation, in this scenario, continuous conflicts in forestland ownership (state vs. private sector or community) may persist beyond 2020. As the result, forest development will not be possible because forest development needs long-term investment.

4: Achieve maintenance of 60% country forest cover (country forest cover will achieve the target of 60%).

This scenario assumes that both forest related policy implementation and community participation are at the highest stage. It is argued that local communities will actively participate in natural resource management while resources benefit them. In return, the communities will actively participate in SFM. Also, their livelihoods will improve as long as forest and NTFPs are available. By and large, local poverty alleviation will be achieved.

The stronger the government policy implementation, the better trust can be built, and the more actively local participation can be made. Therefore, both factors will work together and, as a result:

- Permanent Forest Estate will be respected and forest plantations can be increased,
- Annual Bidding Coupes will be well supported,
- Rural poverty alleviation will be achieved,
- Community Forestry sites will be well managed, and
- Sustainable forest management will be practiced.

Scenario 4 suggests that if both strong forest policy implementation and local forest communal and relevant stakeholder collaboration can be accomplished, SFM and development will ensue.

With the current trends in political forest management and the reality of a young democratic country, scenario 2 is the most likely. Regarding decentralization, there are not only issues of the central government's power retention and top-down tradition, but also issues of the ability and capacity of local or lower levels of government agencies to run natural resource management. Many of the lower government agencies have been very passive and depended

very much on "being told to do" rather than "trying to do". At this stage of democracy in Cambodia, local communities are encouraged to use their rights in managing natural resources but they still lack voice considerably and usually lose out to elites while defending their rights in natural resource management. To achieve the target of 60% forest cover, encouraging local community participation at higher levels is essential.

7. SCENARIO ANALYSIS OF COUNTRY FOREST COVER 2020

<p>Strong Commitment of Forest Related Policy Implementation</p> <p>↑</p>	<p>2. Inequality of benefit sharing & Top down Management approach (FC ≤ 60% or FC ≥ 60% of CFC?)</p> <ul style="list-style-type: none"> . Problems of forest policy implementation mistrust . Forest management could be effective in short-term . Groundless forest policy implementation . Forestlands could be easily converted to other land use types (agriculture, economic concession, etc.) 	<p>4. Achieve maintenance of 60% of CFC</p> <ul style="list-style-type: none"> . Rural poverty alleviation . Sustainable forest management . Permanent Forest Estate is respected and forest plantation can be increased . Annual Bidding Coupe will be supported . CF (CCF) will be well managed . Forest Governance will be included
<p>Weak Commitment to Forest Related Policy Implementation</p>	<p>1. Forest Management Failure (< 60% of CFC)</p> <ul style="list-style-type: none"> . High Deforestation . Land use planning and forest resource management will not be possible 	<p>3. Fragile Land Tenure & Forestland Grabbing</p> <ul style="list-style-type: none"> . Continuous conflicts in forestland ownership . Forest development will not be possible (because forest development needs long term investment)
<p>Inactive Forest Community Participation → Active Forest Community Participation</p>		

Note: CFC – country forest cover, CF – community forestry, CCF – commercial community forestry, FC - Forest Cover

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