RAP Publication No.: 2012/06

Making forestry work for the poor

Assessment of the contribution of forestry to poverty alleviation in Asia and the Pacific

FAO FIAT PANIS
Asia Forest Network
APFNet

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC
Bangkok, 2012

ISBN 978-92-5-107230-1

The **Food and Agriculture Organization of the United Nations (FAO)** leads international efforts to defeat hunger by helping countries improve agriculture, forestry and fisheries practices and ensuring good nutrition for all. FAO is also a leading source of knowledge and information on agriculture, forestry and fisheries, and acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy. FAO's mission in forestry is to enhance human well-being through support to member countries in the sustainable management of the world's trees and forests.

The **Asia Forest Network (AFN)** is dedicated to supporting the role of communities in protection and sustainable use of Asia's natural forests. Five strategies serve as guidepost in its development approach: Regional Exchanges, Country Working Groups, Development of Field Methods, Cross-Visits, and the Documentation of Case Studies. These strategies facilitate creative synergies for enhancing the quality of local governance and collaborative agreements. They also create national and regional awareness of what communities, support organizations, local governments, and working groups are achieving in natural resource management.

The establishment of the **Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet)**, proposed by China and co-sponsored by Australia and the United State, was agreed by the 15th APEC Economic Leaders' Meeting in September 2007 in Sydney. APFNet was formally launched in 2008. As an open regional organization, APFNet aims to promote and improve sustainable forest management and rehabilitation in Asia and the Pacific, in collaboration with all international/regional forest initiatives and processes. Its programs and activities are carried out under its four pillars, i.e., capacity building, information sharing, supporting regional policy dialogues and demonstration projects.

This publication is an output from a project funded by the Asia-Pacific Network for Sustainable Forest Management and Forest Rehabilitation (APFNet). APFNet can accept no responsibility for any information provided or views expressed

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Foreword

Since the launch of the Millennium Development Goals over a decade ago, concerted efforts have been made around the world to improve the contribution of different economic sectors to poverty eradication. In the Asia-Pacific region, the forestry sector is of great importance in this respect due to the prevalence of poverty in highly forested areas. Obstacles to reducing poverty through forestry are, however, many: forests areas are often far from markets and poor people frequently lack marketing knowledge, financial capital and/or networks necessary to reap benefits from forest related activities. Unstable land and resource tenure also continue to hamper efforts to improve prospects for rural people and authorities have often been reluctant to devolve rights to the local level.

In recent years, rapid economic growth in the Asia-Pacific region has led to significant reductions in poverty. There are, however, still more than 900 million people in the region who remain in poverty—around two-thirds of the world's total. The great majority reside in rural areas and rates of poverty remain unacceptably high in the remote parts of many countries in the region. At the same time, volatile food prices and an unstable global economic environment further threaten the poor and could push more people into poverty. Efforts to ensure that the poorest are not left behind must therefore be redoubled.

With the 2015 target for achieving the Millennium Development Goals—including halving poverty—just around the corner, FAO, with support from the Asia-Pacific Network for Sustainable Forest Management and Forest Rehabilitation (APFNet), embarked upon a project entitled: "Making forestry work for the poor: Adapting forest policies to poverty alleviation strategies in Asia and the Pacific." The project aimed to assess the extent to which poverty has been reduced through forestry activities in the region and to strengthen policies and capacities to tackle poverty within the sector.

This publication represents a key output of the project and includes eleven reports respectively outlining the contribution of forestry to poverty alleviation in Bhutan, Cambodia, China, India, Indonesia, the Lao Peoples Democratic Republic, Nepal, Papua New Guinea, the Philippines, Thailand and Viet Nam. The reports were produced with support from national forestry authorities in the 11 target economies and technical assistance from the Asia Forest Network (AFN). The reports provide an analysis of key policies and plans relevant to poverty alleviation at the national level and within the forestry sector in each economy and draw attention to the need for concrete measures to support livelihood development at the local level. The reports also include case studies which tell stories of how people and communities have approached and engaged in forestry and forest management in different situations around the region.

A few Asia-Pacific economies have made great strides in forest management in recent years and investments are already paying dividends in terms of poverty reduction, income generation and livelihoods improvement at the local level. It is the hope of the partners involved in producing this publication that efforts to share the benefits of economic growth in eradicating poverty and promoting sustainable forest management will proliferate and support widespread sustainable development in the region.

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Acronyms and Abbreviations

AAC	Annual Allowable Cut
ACAP	Annapurna Conservation Area Project
AFN	Asia Forest Network
ALRO	Agricultural Land Reform Office
APFNet	Asia-Pacific Network for Sustainable Forest Management and Rehabilitation
BAPPENAS	*Bandan Perencanaan Pembangunan Nasional*; National Planning Development Agency
BPL	Below the Poverty Line
CADT /CALT	Certificate of Ancestral Domains Title; Certificate of Ancestral Land Title
CAFMSC	Conservation Area Forest Management Sub-committee
CAMC	Conservation Area Management Committee
CBE/CBET	Community-based Ecotourism
CBFM	Community-based Forest Management
CBFMA	Community-based Forest Management Agreement
CCFP	Conversion Croplands to Forests Program
CCT	Conditional Cash Transfer
CD	Community Development
CDM	Clean Development Mechanism
CDRI	Cambodia Development Research Institute
CF	Community Forest
CFFES	Compensation Fund for the Forest's Environmental Services
CFMG	Community Forestry Management Group
CFTR	Collective Forest Tenure Reform
CFUG	Community Forest User Group
CLASP	Community Livelihood Assistance and Special Project
CPR	Common Property Resources
CPRC	Chronic Poverty Research Center
CR	Cambodian Riel
CSES	Cambodia Socio-economic Survey
DENR	Department of Environment and Natural Resources
DFO	District Forest Office
DNPWC	Department of National Parks and Wildlife Conservation
DoFPS	Department of Forests and Park Services
DOF	Department of Forests; Department of Forestry
ELC	Economic Land Concession
FA	Forestry Administration
FAO	Food and Agriculture Organization
FC	Forest Cover
FCO	Forestry Cooperation Organization
FDI	Foreign Direct Investment
FEDRC	China National Forestry Economics and Development Research Center
FES	Forest Environmental Services

FLA	Forest Land Allocation
FMA	Forest Management Agreement
FMB	Forest Management Bureau
FMP	Forest Management Plan
FMU	Forest Management Unit
FRA	Forests Rights Act; Forest Resource Assessment
FS	Forest Strategy
FSC	Forest Stewardship Council
FSI	Forest Survey of India
FYP	Five Year Plan
GDP	Gross Domestic Product
GERHAN	*Gerakan Nasional Rehabilitasi Hutan dan Lahan*; National Movement for Forest and Land Rehabilitation
GNH	Gross National Happiness
GoL	Government of Lao PDR
GoN	Government of Nepal
GoPNG	Government of Papua New Guinea
GVA	Gross Value Added
Ha	Hectare
HCR	Head Count Ratio
HDI	Human Development Index
HH	Household
HKM	*Hutan Kemasyarakatan*; Government Program on Community Forestry in State Forestland
HLFFDP	Hills Leasehold Forestry and Forage Development Project
HPH	*Hak Pengusahaan Hutan*; Logging Forest Concession
HPHH	*Hak Pemungutan Hasil Hutan*; Forest Product Harvesting Permit
HTI	*Hutan Tanaman Industri*; Industrial Timber Plantation
IDR	Indonesian Rupiah
IFMA	Integrated Forest Management Agreement
ILG	Incorporated Land Group
IPRA	Indigenous Peoples Rights Act
JFM	Joint Forest Management
JFMC	Joint Forest Management Committee
KARN-WS	KhaoAng Rue Nai Wildlife Sanctuary
LAK	Lao Kip
LF	Leasehold Forestry
LFA	Local Forest Area
LFLP	Leasehold Forestry and Livestock Program
LFP	Forestry Program
LFUG	Leasehold Forest Users Group
LGU	Local Government Unit
LMA	Logging and Marketing Agreement
MARD	Ministry of Agriculture and Rural Development

MDG	Millennium Development Goal
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
5MHRP	Five Million Hectare Reforestation Programme
MoAF	Ministry of Agriculture and Forest
MoE	Ministry of Environment
MoEF	Ministry of Environment and Forests
MoF	Ministry of Forestry
MOP	Ministry of Planning
MRPP	Merang REDD Pilot Project
MTDP	Medium Term Development Plan
MTDS	Medium Term Development Strategy
MTPDP	Medium Term Philippine Development Plan
NAFRI	National Agriculture and Forestry Research Institute
NBCA	National Biodiversity Conservation Area; Conservation Forest
NFI	National Forest Inventory
NFP	National Forest Policy; National Forest Program
NFPP	Natural Forest Protection Program
NGO	Nongovernment Organization
NGP	National Greening Program
NGPES	National Growth and Poverty Eradication Strategy
NKFP	National Key Forestry Program
NPRS	National Poverty Reduction Strategy
NPSC	National Poverty-stricken County
NR	Nepalese Rupee
NRDCL	Natural Resources Development Corporation Ltd.
NRF	National Reform Federation
NSB	National Statistical Bureau
NSDP	National Strategic Development Plan
NSEDP	National Socio-economic Development Plan
NT2	Nam Theun 2
Nu	Bhutanese Ngultrum
NWFP	Non-wood Forest Product
ODA	Official Development Assistance
OP	Operational Plan
PAMB	Protected Area Management Board
PAR	Poverty Analysis Report
PD	Presidential Decree
PEI	Poverty – Environment Initiative
PES	Payment for Environmental Services
PHBM	*Pengelolaan Hutan Sumberdaya Bersama Masyarakat*; Collaborative Forest Resource Management Program (Perhutani)
PhP	Philippine Peso
PNG	Papua New Guinea
PNGDSP	Papua New Guinea Development Strategic Plan

PNGFA	Papua New Guinea Forestry Administration
PNGFIA	Papua New Guinea Forest Industries Association
PO	People's Organization
PRI	Panchayati Raj Institution
PSDHBM	*Pengelolaan Sumber Daya Hutan Berbasis Masyarakat*; District Regulation on Community-based Forest Management (Wonosobo)
PSFMS	Participatory Sustainable Forest Management System
RA	Republic Act
REDD	Reducing Emissions from Deforestation and Forest Degradation
RFD	Royal Forestry Department
RGC	Royal Government of Cambodia
RGoB	Royal Government of Bhutan
RMB	Renminbi
RNR	Renewable Natural Resources
RPJMN	*Rencana Pembangunan Jangka Menengah Nasional*; Medium-Term Development Plan
RPJPN	*Rencana Pembangunan Jangka Panjang Nasional*; Long-Term Development Plan
RUPES	Rewarding the Upland Poor for Environmental Services
SABL	Special Agriculture Business Lease
SC	Scheduled Caste
SCPAVBT	Sandification Control Program for Areas in the Vicinity of Beijing and Tianjin
SFA	State Forestry Administration
SFD	State Forest Department/Division
SFM	Sustainable Forest Management
SMFE	Small and Medium Forest Enterprise
SNPK	*Strategi Nasional Penanggulangan Kemiskinan*; National Poverty Reduction Strategy
SSFE	Small-scale Forestry Enterprise
ST	Scheduled Tribe
SUFORD	Sustainable Forestry for Rural Development
TCN	Timber Corporation of Nepal
TLA	Timber License Agreement
TP	Timber Permit
TRP	Timber Rights Purchase
US$	United States Dollar
VDC	Village Development Committee
VDF	Village Development Fund
VDP	Village Development Plan
VND	Vietnamese Dong
VSS	*Van Samrakshan Samiti*
WMPA	Watershed Management and Protection Authority

Acknowledgements

This publication of the Food and Agriculture Organization – Regional Office for Asia and the Pacific (FAO-RAP) was jointly implemented with Asia Forest Network (AFN) with financial support from the Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet).

The 11 country reports were made possible through the following individuals specifically selected for this activity: Kinley Tenzin, Mani Ram Moktan and Kinley Rabgay (Bhutan); Lao Sethaphal, Kim Sobon, Say Sinly and Pak Sngoungpisey (Cambodia); Dai Guangcui, Zhang Sheng, Wen Caiyun and Li Yang (China); K. Balachandran Thampi (India); Juni Adi and Dallay Annawi (Indonesia); Phouthone Sophathilath (Lao PDR); Bishnu Hari Pandit (Nepal); Gae Yansom Gowae (Papua New Guinea); Antonio Carandang (Philippines); Orapan Nabangchang (Thailand); and Le Thi Van Hue (Viet Nam).

The effort from the beginning was to engage the forestry departments in the focal countries and their participation in the entire process is much appreciated. The forestry department representatives who participated during the regional workshop held on 8-9 March 2011 in Chiang Mai, Thailand included Abilal Baskota (Bhutan), Hong Kimhean (Cambodia), Xing Hong (China), Magdalena Gultom (Indonesia), Khamphay Manivong (Lao PDR), Anuja Raj Sharma (Nepal), Joseph Badi (Papua New Guinea), Gwendolyn Bambalan (Philippines), Wilawan Wichiennopparat (Thailand), and Nguyen Tuong Van (Viet Nam). Likewise, acknowledgements are also given to the forestry department representatives who attended the partner event organized to share some of findings of the country reports on 9 November 2011 during the Second Asia-Pacific Forestry Week in Beijing, China. These included Kinley Tshering (Bhutan), Vathana Khun (Cambodia), Resham Dangi (Nepal), Joseph Badi (Papua New Guinea), Gwendolyn Bambalan (Philippines), Preecha Ongprasert (Thailand), and Luu Tien Dat (Viet Nam). Thanks are also given to those who attended the meetings in focal countries to disseminate the findings.

The country reports were edited by Sylvia Miclat, Ricco Santos and Dallay Annawi. Jeremy Broadhead, and Wang Hong, with Chris Brown, from FAO-RAP and Rowena Soriaga undertook reviews of the country reports. The cover design and layout were prepared by Jerome Bonto.

Thanks are also extended to the staff of the partner organizations for their whole-hearted support: Patrick Durst, Jeremy Broadhead and Kallaya Meechantra (FAO-RAP); Lu De and Wang Hong (APFNet); and Pedro Walpole, Rowena Soriaga, Sylvia Miclat and Dallay Annawi (AFN).

Policy Brief: Making forestry work for the poor

Under Millennium Development Goal 1, Asia-Pacific governments are committed to halving extreme poverty by 2015 and many have adopted poverty-related measures in national forestry policies and programs. The high incidence of poverty in forested areas and the high dependence of the poor on forest resources suggest a leading role for forestry in poverty eradication. Achievements to date have, however, fallen short of expectations. By strengthening tenure, building local capacity to manage resources, providing credit and supporting livelihood development and income generating activities, the forestry sector can tackle poverty and help to achieve MDG 1.

Despite broad acknowledgement of the importance of forests for poverty alleviation, forestry activities have not been effectively integrated into poverty reduction programmes in most countries. Even when poverty alleviation is an explicit objective of forest management, it is often afforded much lower priority than objectives such as state revenue generation and biodiversity conservation.

Historically, forestry agencies have focused on industrial logging operations, and the contribution of forests to poverty alleviation has been limited. The focus on industrial activities has in fact often created or aggravated poverty (Mayers 2006). The poor commonly lose rights and access to forests allocated for logging or plantation development and seldom share in the economic benefits.

Box 1. Forests and poverty alleviation.

Forests can help bring about poverty mitigation and avoidance by serving as sources of subsistence, seasonal gap filters and safety nets. Forests can also support poverty elimination through savings, investment, accumulation, asset building and permanent increases in income and welfare. (Sunderlin, Angelsen and Wunder 2003)

Recent initiatives to include local communities in commercial timber production have often failed because of a lack of systematic attempts to address obstacles. Often, community involvement in forest management is sought in poor-quality, low-productivity forests. Providing "little trees to little people" is, however, unlikely to alleviate poverty and often adds to the burden faced by poor communities. In several countries, withdrawal of timber rights through logging bans has also exacerbated poverty while community timber plantations have not proven economically attractive for small holders. In many countries, small and medium forest-based enterprises (SMFEs) employ millions of poor people but are seldom given high priority by governments.

To address these problems and increase the contribution of the forestry sector to MDG 1, renewed attention from forestry policy makers is necessary. Community forestry in the Asia-Pacific region benefits large numbers of stakeholders while traditional forestry activities sustain millions of forest-dependent people. But, while there are some success stories, community forestry programmes have not generally lifted large numbers of households from poverty.

While forest and forestry can be sources of income for the poor, "devolved forest management, NWFPs and outgrower schemes have to date not provided meaningful and sustained revenues to overcome poverty" (RECOFTC 2009). Policies developed over the past decade that have sought to broaden local participation in local forest management and increase benefits from forests need comprehensive revision to reflect governments' international commitments to poverty alleviation.

Legal uncertainties and policy inconsistencies often weaken the status of community forestry. Where forests have been allocated to individuals and groups, capacity building and investment in productive activities are also needed.

Box 2. To what extent is poverty alleviation integrated in national forestry agendas?

- For the first time, the Indonesian Ministry of Forestry's stategic priorities for 2004-2009 included development for communities in and around forests.
- China has adopted massive forestry-based programmes to improve environmental conditions and reduce rural-poverty, with relative success in increasing forest cover and rural household income.
- Pro-poor measures included in Nepal's Forest Policy 2000 include prioritizing those below the poverty line in the allocation of leasehold forests and hiring the poor and the landless in forest-related work.
- Under India's Joint Forest Management (JFM) programmes about 30 percent of the national forest area (-23 million hectares) is managed by local committees. Poverty alleviation through improved supply of wood and other products and income generation are the primary objectives of JFM.
- The Bhutanese government's 10th Five-Year Plan includes establishing community forestry and expanding commercial harvesting amongst its strategies.

Source: FAO 2012

The way forward

To improve the contribution of forestry to poverty alleviation, approaches must be tailored to the local context. Particularly, emphasis should be placed on the following:

- Improving familiarity with poverty in forest areas amongst forestry policy makers;
- Allocating clear and secure forest tenure and use rights over good-quality, productive forests to poor people;
- Ensuring consistency and continuity of policies;

Most tenure systems maintain state ownership over forestlands and simply specify local management and access rights or benefit sharing arrangements. Timber rights have occasionally been transferred to communities, but allocated forests are often degraded and alternative livelihood activites are required in the hiatus before benefits materialise.

Harvesting and marketing regulations for wood and non-wood forest products often need to be simplified to allow community members to benefit from their efforts. Specific measures also need to be taken to prevent benefits from being captured by more powerful families and thereby widening existing income disparities.

- Training communities in skills necessary to sustainably manage forests, and improve livelihoods– literacy, accountancy, decision making, critical thinking, etc.;
- Strengthening local level institutions, especially to democratize decision making and ensure transparency and accountability;
- Integrating forestry-based poverty alleviation activities into broader rural development programmes;
- Supporting movement up the value chain, especially through development of processing and marketing arrangements;
- Supporting community enterprises and SMFEs by simplifying regulations relating to resource access, harvesting and marketing increasing credit availability, providing marketing support and developing partnerships between forestry companies and communities.

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For more information, please go to the outloook website: http://www.fao.org/asiapacific/forestry-outlook

Overview

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Introduction

Poverty poses a major challenge for developing countries and contributing to poverty alleviation has been a crucial issue for the Asia-Pacific forestry sector over the last decade. Achievements have, however, often fallen short of expectations. The high incidence of poverty in forested areas, the high dependence of the poor on forest resources and the vast areas of forestland under state control demand an enhanced role for forestry in poverty eradication and a redoubling and re-strategizing of efforts in the forestry sector as the 2015 target for the Millennium Development Goals (MDGs), particularly MDG 1 of halving the number of people living in absolute poverty, draws closer.

This regional study implemented by the Food and Agriculture Organization's Regional Office for Asia and the Pacific, in partnership with Asia Forest Network (AFN) with the support of Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet), aims to document the extent to which different activities and factors in forestry have been effective in reducing poverty, as well as to identify the opportunities and threats to future efforts given existing initiatives and the outlook for the region's forestry sector. The study forms part of FAO's APFNet-funded project, "Making forestry work for the poor: Adapting forest policies to poverty alleviation strategies in Asia and the Pacific", which is aimed at assisting forestry agencies in contributing to national poverty alleviation goals.

This overview chapter provides background information on the study and summarises key themes drawn from the country reports and other relevant studies.

Scope and organization of the study

The study covers 11 countries in Asia and the Pacific region: Bhutan, Cambodia, China, India, Indonesia, the Lao Peoples Democratic Republic, Nepal, Papua New Guinea, the Philippines, Thailand and Viet Nam. The contribution of forests and forestry to poverty alleviation was assessed in terms of three broad areas of forestry:

(i) **Community forestry.** This broadly refers to local forest management modalities, categorised in the country reports into subsistence use of forest resources and the allocation (devolution) of forest lands and management or access rights to local people or communities.

(ii) **Commercial and industrial forestry.** Commercial forestry involves forest-related activities done at the local level that are involved in the markets, such as the collection, processing and sale of non-wood forest products (NWFPs) for commercial purposes as opposed to traditional or subsistence use; use of small wood and production of handicrafts and furniture; and outgrower schemes or contract farming. Industrial forestry, on the other hand, involves larger-scale operations for logging and the primary production of timber, growing timber (plantations) and processing (sawmill operation), and manufacture of wood products (sawnwood, panels, pulp and paper) and furniture.

(iii) **Payments for environmental services (PES) and carbon payments.** PES includes rewards, compensation or market mechanisms for the provision of environmental services, such as landscape beauty, watershed regulation, biodiversity conservation, and carbon sequestration and storage.

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The country studies were conducted from January to August 2011. National assessments of forestry policy and trends in relation to poverty, and status and trends in the contribution of forestry to poverty alleviation were carried out through literature review, supplemented by interviews with in-country experts in forestry departments and civil society organizations. Case studies based on fieldwork in selected sites served to improve understanding of poverty in and near forest areas and to determine the extent to which forestry initiatives or projects have—or have not—contributed to alleviating poverty. The case studies are intended as qualitative descriptions rather than large-scale, quantitative assessments.

A regional workshop in Chiang Mai, Thailand on 7-8 March 2011 provided an opportunity to plan the country assessments. Following the completion of the country studies, each of the authors presented his/her work to national stakeholders from the forestry departments and other government agencies, civil society organizations and other stakeholders to disseminate findings, present recommendations, bring key issues to national policy-makers' attention and explore how to feed results into government policy and development planning. Results of the studies were communicated more broadly at an event organized during the Second Asia Pacific Forestry Week (APFW) on 9 November in Beijing, China.

Organization of the country reports

Each of the country reports comprises six sections as follows:

Section 1. Overview of forest resources, poverty situation, and economic development

Section 2. The national policy context including the national poverty reduction strategy and forest-related policies

Section 3. Past and current poverty-related impacts of forestry initiatives under three broad categories: (i) community forestry, (ii) commercial and industrial forestry, and (iii) PES and carbon payments

Section 4. Case studies exploring forestry-poverty situations in and around forest areas, including the perceptions and experiences of different stakeholders

Section 5. The outlook for poverty alleviation and forestry in the coming years

Section 6. Recommendations for improving the contribution of forestry to poverty alleviation

Poverty, poverty alleviation and forests

Over the decades, the understanding of poverty has broadened to consider its complexity and multiple dimensions. Poverty is defined as "pronounced deprivation in wellbeing", which is related to lack of income, low levels of education and health, vulnerability and exposure to risks, lack of opportunity to be heard and powerlessness (World Bank 2000).

With regard to income, the international poverty standard was adjusted to US$1.25 per person per day in 2008, but many countries have set their own national poverty thresholds based on their respective estimates of the minimum income needed to meet a person's daily food and non-food needs as shown in Table 1. Poverty rates in these countries increase significantly if the US$1.25-threshold is used. Using their respective national poverty standards, China, India, Indonesia, Thailand and Viet Nam have made significant reductions in their poverty rates. China, Indonesia, Thailand and Viet Nam also posted early achievement of their MDG 1 targets. On the other hand, Bhutan, Cambodia, India, Lao PDR, Nepal, PNG, and the Philippines need to redouble efforts in the next two to three years to meet their targets by 2015.

Table 1: Status of poverty reduction in Asia-Pacific countries*

	Year	Poverty rate (%)	MDG target Poverty rate (%) (2015)	National poverty line (US$ per capita per day)	US$1.25 per day poverty**	
					Earliest	Latest
Bhutan	2004	31.7	15	0.82 (2007)	- - - -	26.2 (03)
	2007	23.2				
Cambodia	1993-94	39	19.5[1]	0.61 (2007)	48.6 (94)	28.3 (07)
	2004	34.7				
	2007	30.1				
China	1978	30.7	4.8[2]	0.42 (2000)[3] 0.98 (2011)[3]	60.2 (90)	15.9 (05)
	1990	9.6[2]				
	2009	3.6				
India	1990	37.5[4]	18.75[4]	0.26 (rural) 0.39 (urban) (2004–05)	49.4 (94)	41.6 (05)
	2004-05	27.5				
	1990	47.8[5]	23.9	0.44[6] 0.56[6]		
	2004-2005	37.2[5]				
	2009-2010	29.8[6]				
Indonesia	1990	20.6	10.03	1.0	54.3 (90)	18.7 (09)
	2008	5.9				
	2010	13.33	8–10[7]	1.50		
Lao PDR	1993	46.0	24[8]	(No official poverty line)	55.7 (92)	33.9 (08)
	2003	33.5				
	2008	27.6				
Nepal	1989	42	21	0.45[9]	68.4 (96)	55.1 (04)
	2005	31				
	2010	25.4				
	1990	33.5[10]	17	1.0		
	2005	24.1[10]				
PNG	1996	30	27	0.38	- - - -	35.8 (96)
Philippines	1991	45.3[11]	16.6	1.06 (2009)	30.7 (91)	22.6 (06)
	2000	33.0[11]				
	2006	32.9[11]				
Thailand	1990	33.69	16.84	1.719	5.5 (92)	0.4 (04)
	2000	20.98				
	2008	8.95				
Viet Nam	1993	58	7.6–8.6	0.83 (urban areas), 0.67 (rural areas) (2011–2015)	63.7 (93)	13.1 (08)
	2004	24.1				
	2010	10.6				

*Sources: *Country reports; ** UNESCAP, ADB and UNDP n.d.; 1 http://www.mop.gov.kh/Default.aspx?tabid=156; 2 http://www.un.org/chinese/millenniumgoals/china08/1_1.html; 3 http://news.xinhuanet.com/herald/2011-12/12/c_131295645.htm; 4 http://www.economywatch.com/millennium-development-goals.html; 5 New poverty estimates adopting the Tendulkar Committee poverty line. Central Statistical Organization, Ministry of Statistics and Programme Implementation. (2011). Millennium Development Goals: India Country Report 2011. Government of India. Retrieved from http://undp.org.in/sites/default/files/MDG_India_2011.pdf; 6 Planning Commission, Government of India. (2012). Press Note on Poverty Estimates, 2009-10. 7 New target set for 2014; 8 http://www.undplao.org/mdgs/factsheet/MDG%20fact%20sheet%20Eng%20final.pdf; 9 http://thepovertyline.net/?p=343; 10 http://www.undp.org.np/mdg/; 11http://www.neda.gov.ph/econreports_dbs/MDGs/4thProgress2010/Presentation%20on%204th%20MDG%20Progress%20Report%20%28Cayetano%20Paderanga%29.pdf;*

Aside from income and consumption, other dimensions of poverty have been incorporated in the national poverty reduction strategies (NPRS) and development plans of some of the focal countries. Adopting a rights-based approach, the NPRS of Indonesia characterizes poverty as a situation in which people are unable to exercise their rights, including the right to resource access and right to land. India's

rights-based approach to poverty reduction has led to the legislation of certain rights, including forest rights that give tribal communities and traditional forest dwellers ownership rights over forest lands that they have been cultivating and community rights over forest resources. The NRPS of Nepal defines poverty according to three main categories: income poverty, human poverty and social exclusion.

As a strategy for poverty alleviation, forests have been credited with the capacity to bring about poverty mitigation by keeping the poor from becoming poorer, and poverty avoidance by preventing those at or above the poverty line from dropping below the line by serving as sources of subsistence, seasonal gap fillers, saving accounts or safety nets. Forests may also support permanent poverty elimination through savings, investments, accumulation and asset creation (Sunderlin, Angelsen and Wunder 2003).

With this framework in mind, the extent to which forest-based strategies can contribute to poverty alleviation needs to consider what forests and forestry can realistically do and what they cannot do, as well as under what conditions they may exacerbate existing poverty or create poverty anew. RECOFTC (2009) suggested that "even under perfect conditions, the role of forests and forestry with respect to poverty reduction will largely remain a mitigation function rather than a significant driver of long-term socio-economic advancement as compared to other sectors". Further, considering that the benefits millions of poor people derive from forests and forestry are inadequate for them to permanently escape poverty and provide for long-term socio-economic advancement, forests and forestry are considered by the authors to be "a 'safety net' at best and a 'poverty trap' at worst" (Ibid.).

The challenge for forestry is, therefore, to prove its worth to poverty alleviation efforts and to find ways around the obstacles that have impeded progress to date. To assist these efforts, the following sections summarise the integration of poverty-related goals into forestry policies, plans and activities and of the extent to which different areas of forestry have contributed to poverty alleviation across the region.

Poverty alleviation and forestry sector policies and plans

The commitment of Asia-Pacific governments to meet the Millennium Development Goals, particularly MDG 1 of halving extreme poverty by 2015, enjoined the various sectors, including the forestry sector, to contribute to national poverty reduction goals and encouraged the adoption of poverty-related measures in national forestry policies, plans and programmes. In recent years, the objective of poverty alleviation has been incorporated in forest management plans or reaffirmed where already included. However, despite broad acknowledgements of the importance of forests for poverty alleviation and rural development, the forestry sector still lacks integration in national development plans and is not positioned at the forefront of poverty reduction strategies.

For most countries, achieving high economic growth rates remain the primary strategy for poverty alleviation by way of generating resources for pro-poor programmes and driving job creation. In some countries, the forestry sector is seen as a major source of income, particularly in relation to logging and large-scale commercial forestry. The sector's GDP share in many countries is, however, diminishingly small and declining. This in part reflects a lack of reporting of forestry sector contribution to GDP and, by association, limited contribution to poverty alleviation through government programmes and job creation. Thus, the indirect contribution of forestry to the livelihoods of millions of the poor living in and near forests is likely to be highly limited, while direct benefits are also commonly considered to be small or negative.

Medium- and long-term government development plans in Papua New Guinea are directed at the exploitation of the country's natural resources, including forests, which are recognized as making a huge contribution to the national economy and to rural development. The government has gained control over about 80% of the country's timber resources mainly for commercial timber harvesting. Papua New Guinea's forest policy, however, lacks focus on reducing poverty in rural areas, although it does seek to promote rural development and effective participation of forest owners in the forest industry in order to improve their wellbeing.

Although poverty alleviation is included in the goals of forestry policies of some countries, this objective is often marginalized in favour of other forestry sector priorities or may be incompatible or in conflict with other forest management objectives, such as revenue generation through timber production, plantation establishment, biodiversity conservation and climate change mitigation. Indonesia's forest policy and management framework continues to prioritize large-scale commercial timber production and processing for national economic growth, "with less consideration for sustainability and ecological and social values" (Leimona et al. 2009). Nevertheless, for the first time, the Ministry of Forestry included the development of communities in and around forests in its 2004-2009 strategic priorities, which reflects the recent recognition by the MoF of its responsibility in addressing poverty in and near forests (Kayoi et al. 2006).

Poverty alleviation is gaining attention in forest management agendas, but lack of coherence in addressing the livelihood needs of the poor while pursuing economic and ecological objectives has meant that poverty is often left unaddressed. In Lao PDR and Cambodia, foreign investment has been channeled into land concessions for commercial crop production in forest areas, with major implications for the poor. Lao PDR adopted commercial plantation development as the main strategy to increase national forest cover, eliminate shifting cultivation and support rural development. However, although the National Growth and Poverty Eradication Strategy (NGPES) recognizes the importance of productive forests for rural livelihoods, the government's promotion of large-scale industrial plantation development as the only means to eliminating shifting cultivation, on which millions of poor depend, threatens to displace the poor both physically and economically.

Under Lao PDR's Forestry Strategy to 2020 (FS2020), which serves as an important guide for the development of the country's forestry sector, poverty alleviation is positioned at the forefront of the sector's multiple objectives. Targets include improving the quality of forest resources by natural regeneration and tree planting for protection and livelihood support; providing a sustainable flow of forest products for domestic consumption and household income regeneration; preserving species and habitats; and conserving environmental values in relation to soil, water and climate. However, the amendment of the forestry law has reiterated centralized management of forest resources, with the removal of the declared poverty alleviation objective from the priorities and, instead, the inclusion of the following provision: "The State shall not grant any individual or organization lease or concession of natural forests to undertake logging and harvesting of NTFPs" (Yasmi, Broadhead, Enters and Genge 2010).

In Nepal, on the other hand, the potential of community forestry as a viable means for poverty reduction has been recognized and community forestry is identified in the 10th government plan as a strategy to address rural poverty (Nepal country report, this volume). In accordance with this, the poverty reduction agenda of Nepal's Forest Policy 2000 identified pro-poor actions, such as giving priority to community members below the poverty line in the allocation of leasehold forests and in providing employment in forest-related work. Another measure supportive of poverty alleviation in forest areas is the allocation of a proportion of the income of community forest users groups from forests to their poorest members. In general, Nepal's forestry policy has for several decades "maintained a strong balance between production, protection, conservation and social benefits – employment, income and poverty alleviation, and in particular, devolution to communities and the private sector" (Ibid.).

Similarly, Bhutan's 10th five-year plan recognizes that the renewable natural resources sector has the highest potential to contribute to poverty alleviation objectives, and includes the establishment of community forestry and expansion of commercial harvesting of NWFPs among its pro-poor measures (Bhutan country report, this volume).

Poverty alleviation in forestry sector programmes

Government policy initiatives aimed at reducing poverty in the rural areas can only be realized through programmes and actions that impact upon livelihoods at the local level. Poverty reduction programmes undertaken by the forestry departments in the region have shown mixed results and outcomes have often been modest.

Following the huge flooding that took place in the Yangtze River in 1998, the Chinese government carried out major forestry programmes, such as the Natural Forest Protection Programme (NFPP), Conversion of Cropland to Forest Programme (CCFP) and the Sandification Control Programme for the Vicinity of Beijing and Tianjin (SCPVT), to improve environmental conditions in major watersheds with the accompanying objective of supporting rural livelihood improvement. The commercial logging ban or reduced harvesting quotas enforced in 17 provinces through NFPP resulted in considerable economic costs among some forest-dependent communities owing to the failure of NFPP to provide new jobs (TEEB 2010). While acknowledging immediate losses of jobs and income, other studies noted the positive impacts on the total household incomes from all sources as a number of the workers engaged in alternative off-farm employment (Mullan, Kontoleon, Swansons and Zang 2008). In Yunnan Province, the re-employment opportunities provided by the government (e.g., in tourism) to displaced workers and the availability of alternative energy sources helped mitigate the negative impacts of NFPP (Leefers 2005). Under the CCFP, also known as the "Grain for Green" programme, huge investments were made in large-scale re-greening of degraded crop land in the rural areas. The CCFP, which was also designed to reduce rural poverty and increase household income, may be considered a form of payment for environmental services (PES), in which farmers were provided grain and cash subsidies in return for afforesting areas affected by soil erosion and desertification. Similar to the NFPP, while the CCFP programme made positive contributions to the incomes of millions of rural households as the subsidies received exceeded the profits from sloping cropland cultivation, there were also those who suffered income losses.

In Lao PDR, an assessment of the Sustainable Forestry and Rural Development project (SUFORD) conducted in November 2010 reported that village development grants provided following the development of forest management plans have had minimal impacts on community livelihoods in participating villages owing to the small amount of the grant given to villages and the lack of technical support (Lao PDR country report, this volume). Additionally, community income from log sales has been very limited and insufficient to fund village development projects. Other constraining factors include the small share of revenue from timber sales accruing to communities, high logging costs and overharvesting of areas designated for participatory forest management that resulted in low stocking densities, lack of remaining commercial species and low growth rates.

To contribute to the Philippine government's poverty alleviation and hunger mitigation goals, the Department of Environment and Natural Resources (DENR) initiated the Community Livelihood Assistance Special Programme (CLASP) in 2001 and the Upland Development Programme (UDP) in 2009 (Philippine country report, this volume). However, these livelihood programmes failed to ensure the sustainability of the livelihood activities or community enterprises that were supported. Not all CLASP-supported enterprises developed the capacity for viability and sustainability. Likewise, the awarding of 32,300 contracts to undertake reforestation and agroforestry during the first year of UDP implementation did not allow adequate time for monitoring and provision of technical assistance to the farmers. Besides providing farmers or people's organizations access to capital and inputs for livelihood activities or enterprises, developing their organizational and technical capacity is critical to ensuring the economic and social sustainability of their livelihood activities and enterprises.

The contribution of community forestry to poverty alleviation

Community forestry is "potentially a crucial institutional vehicle for assuring and improving the delivery of livelihood benefits from forests" (Sunderlin 2004). The roles of NWFPs, lands for crop production, fuelwood and, to a limited extent, timber in supporting the livelihoods of millions of people living in and near forests are often considered the main contribution of forests and forestry to poverty alleviation at the community level. These contributions have, however, only generally been limited to poverty mitigation (through direct consumption and sale of forests products to generate income for subsistence needs) and poverty avoidance (through acting as a safety net in times of hardship for households close to the poverty line).

Past efforts to address poverty through community forestry have focused on strengthening local people's tenure and management or access rights over forest resources. A range of community forestry modalities exist across the Asia-Pacific region varying in terms of approach, tenure and benefit-sharing arrangements, scope of rights and duration. In most cases, the government retains ownership of the forest land with only management or access rights awarded to individuals or community groups. Among the focal countries, India, Nepal and the Philippines have progressed furthest in their community forestry programmes while China and Viet Nam have adopted strategies involving allocation of forest lands to individuals and households rather than communities (Yasmi, Broadhead, Enters and Genge 2010).

Apart from a few successful cases, community forestry has neither lifted a large number of forest-dependent poor from poverty nor progressed significantly in advancing the forest tenure and rights of local communities, owing to a number of inter-related challenges and constraints summarized in the following sections.

Weak legal framework for community forestry

Community forestry in most of the countries included in this study is based on laws, decrees and activities related to government initiatives, but its legal status often remains weak in the face of more established laws related to forest industries and forest conservation. Legal uncertainties and policy inconsistencies hinder effective implementation and expansion of community forestry. Policy reforms over the past decade that sought to broaden local participation in forest management and increase local benefits from forests are mostly incomplete, reflecting governments' weak support and lack of commitment to making community forestry work. In Thailand, the lack of ratification of the Community Forestry Bill following its passage through Parliament in 2007 means that there is no formal policy on community forestry. Although there are government initiatives that provide a legal basis for participatory forestry, the absence of a law recognizing the management rights of communities heightens their level of insecurity (Fisher 2011).

Box 1: Impacts of the legal recognition of the rights of indigenous peoples or ethnic minorities

In recent decades, countries including Cambodia, Indonesia, India, and the Philippines have enacted laws to restore or recognize the rights of indigenous communities or ethnic minorities to lands and resources they have long been utilizing. While these policies fill in gaps in the legal frameworks for the recognition of the rights of indigenous peoples to forests and forest lands, implementation has been limited or poor.

In Cambodia, the government adopted the policy, Development of Indigenous Peoples and the Registration and Use of the Indigenous Peoples' Community Land in Cambodia. However, the objectives say little about the rights of indigenous peoples while being heavily oriented toward serving government interests over indigenous peoples' forests and lands. Further, despite the recognition of indigenous communities' rights to collective ownership of the land under the Cambodian Land Law of 2001, economic land concessions have been established on areas being used by rural and indigenous communities for small-scale agriculture and harvesting of NWFPs, without complying with the legal requirements on the conduct of public consultations and environmental and social impact assessments (RECOFTC, ASFN and SDC 2010). Poor implementation of the law intensifies indigenous peoples' lack of security of tenure and poses a challenge to promoting community forestry.

Under the Indigenous Peoples Rights Act of 2007 in the Philippines, the government has been issuing ancestral domain titles covering forest lands to indigenous communities. However, the government retains control over the harvesting and marketing of timber and some NWFPs even where ancestral domain plans have already been prepared. Although the ancestral domain title and plan are envisioned as instruments to empower indigenous peoples, these are not being used effectively to strengthen local access to and control over forest resources. The question of commercial or traditional scale of resource utilization needs clarification given that many indigenous peoples have adopted the practice of selling forest products, although now, in increasing quantities.

In India, the 2006 Forest Rights Act (FRA) recognizes the rights of scheduled tribes and other traditional forest-dwelling communities over forest land including management rights. Based on the initial years of FRA implementation, the opportunity for strengthening the economic and social security of these forest-dwelling groups is likely to have the most impacts where the groups have access to information about the law and are well-organised, where the bureaucracy is supportive and allows the FRA process to take its course based on the specific contexts of the communities, where civil society groups are assisting in building the capacities of communities, and where powerful castes and classes within the communities do not block the access of less powerful groups to the benefits of FRA (Kothari, Pathak and Bose 2011).

In Papua New Guinea, while 98% of the forests and 97% of the lands are recognized by law to be owned by the people, government-led processes of allocating forests for industrial timber concessions have largely divested the customary landowners of their rights to their forests.

Lack of tenure security and unclear rights

Owing to policy conflicts and legal uncertainties, tenure security is fragile in many cases and resource rights are unclear or limited. Most tenure systems maintain state ownership over forestlands while providing management or access rights or benefit-sharing arrangements. Though community forestry allows some re-distribution of forest lands and resources among local communities, including the poor, use rights are often restricted to NWFPs. Forest tenure systems afford varying degrees of security—or insecurity—to local communities. Community forestry in Cambodia has been supported mainly by national and international nongovernment organizations (NGOs). Communities' access to forest resources is limited in terms of coverage, duration and forest quality and, while economic land concessions are valid for 99 years, community forest management rights are good for only 15 years without guarantee of compensation for the communities if the state reclaims the lands for other uses. In India, JFM provides management and use rights to forest resources without clear provisions regarding long-term use of forest land. In both cases, lack of sufficient rights at the local level restricts the development of effective partnerships with local communities.

Allocation of degraded forest without adequate capacity building or investment

The primary objective of community forestry programmes initiated in the 1970s and 1980s was improving degraded forest areas, and not necessarily alleviating poverty in and around forests. As such, it was mostly degraded forests that were designated for local communities, in a trend that Banerjee referred to as providing "little trees for little people" (Warner 2007). Even with the subsequent inclusion of poverty alleviation as an objective, however, this has largely remained the pattern in many areas. The allocation of degraded forests has meant little or no immediate economic benefits for communities and necessitated much effort to achieve an economic return. Although timber rights have occasionally been transferred, timber revenue in many areas has been minimal given the small number of harvestable trees and lack of investment in forest development.

Lack of capital investment and support at the local level for community forest management, productive enterprises and value addition and marketing is in many cases preventing communities from improving their productivity and efficiency, engaging in commercial development of forest products and generating adequate and equitable economic benefits. In the Philippines, despite the national government's adoption of community-based forest management (CBFM) as the strategy for forest management and the issuance of an executive order mandating the DENR to allocate sufficient funds for CBFM implementation pending the enactment of a new forestry law, the DENR has not been channeling adequate funds for the regular budget line item for CBFM (CBFM Strategic Plan 2008-2017).

Lack of support for NWFP development and marketing and limitations of NWFPS in poverty alleviation

NWFPs are a lifeline for millions of rural poor in the Asia-Pacific region. Case studies from Bhutan, Cambodia and India undertaken as part of this study reflect the situation in many other areas. NWFPs are, however, mostly harvested and sold in raw form and subsequent benefits from value addition therefore accrue to others outside the forest-dependent communities. NWFPs are also, in general, seasonally available and are open to unsustainable extraction, particularly when commercialized without effective local regulation in relation to sustainable management. Complicated harvesting and marketing regulations can entail additional costs and further curtail benefits to communities.

These constraints underlie the characterization of NWFPs as a "safety net" at best and a "poverty trap" at worst. Indeed, these two roles indicate two sides of the same coin: "The characteristics that make them attractive to the poor also limit their potential for generating increased income" (Sunderlin, Angelsen and Wunder 2003). According to a recent review, NWFPs sustain subsistence livelihoods, serving as seasonal gap fillers and safety nets in times of hardships, but they "have not been able to make a major contribution to poverty reduction" (RECOFTC 2009). Angelsen and Wunder (2003) provided three main reasons for the limited contribution of NWFPs to poverty reduction:

1. low returns from most NWFP activities, with natural forests being economically inferior production environments;
2. remote location and poorly developed infrastructure, leading to difficulties in market access; and
3. monopsonies and exploitative market chains that prevail in the trade of some forest products, leading to manipulations and lack of transparency in the marketing process.

The safety net-poverty trap roles of NWFPs raise the questions of whether or not supporting related development can prevent escape from poverty and if the support for off-farm employment, for example, can make better sense in terms of poverty alleviation. The main challenge has been stated as "preserving the role of forests as safety nets in locations where they are more than dead-end poverty traps and where other forms of social insurance cannot take their place" (Sunderlin, Angelsen and Wunder 2003). Otherwise, there remains some potential for poverty alleviation through commercialization of NWFPs with support from community development projects as described in the next section.

Inequitable sharing of benefits from forests

At the local level, capture of benefits from forests by better-off community members is a major obstacle in poverty reduction. In Nepal, although a number of community forest user groups (CFUGs) are generating income, poverty elimination is only being seen in the few cases where the CFUGs support targeted pro-poor and locally planned activities. A number of CFUGs have invested substantial portions of their funds in infrastructure development projects that have primarily serviced non-poor households. Although the guidelines require that a proportion of income from community forests be used for the poorest CFUG members, stricter monitoring of the groups' compliance with the guidelines is necessary.

The contribution of commercial and industrial forestry to poverty alleviation

Weighing the benefits and costs of industrial forestry and large-scale commercial forestry for local communities

Industrial and large-scale commercial forestry operations can generate considerable short-term gains for economies in terms of domestic production, foreign exchange earnings and employment. These gains

are, however, "not considered at the forefront in strategies to alleviate rural poverty" (Hansen, Durst, Mahanty and Ebregt 2007). Engagement of the poor in logging, large-scale plantation development and industrial wood processing is limited due to lack of capital and technical knowhow and weak legal rights. As such, the poor generally only benefit through labouring jobs that may be both dangerous and poorly paid.

The direct and indirect links between industrial and large-scale commercial forestry and poverty alleviation may include the trickling-down of benefits resulting from improved local infrastructure and social services, local employment and expanded economic opportunities. In many sites, however, industrial forestry has a weak track record in reducing poverty, with scant proof of its impact in lifting a large number of the poor in their areas of operation out of poverty (Mayers 2006, WB 2006). Actual economic and social benefits therefore need to be weighed against the costs created for the poor, such as loss of rights and access to natural resources allocated for industrial and commercial forestry. Similarly, the opening of roads leading to remote forest communities for the needs of logging operations has both positive and negative impacts. Improved access to remote areas, although allowing local communities to reach markets and social services in urban centers, leaves formerly isolated forest areas open to unregulated exploitation and conversion. Populations may also be exposed to trafficking, and ailments and diseases against which they have limited resistance.

In some cases, national governments have made efforts to transfer a proportion of forestry revenues to local governments as a means of sharing benefits from industrial forestry and compensating communities affected by logging and plantations development. In Indonesia, the forest revenue-sharing scheme was revised to increase the flow of funding from timber royalties and other fees to local governments, including those in timber-producing districts. Actual impacts on the livelihoods and welfare of the poor are, however, highly dependent on the extent to which local governments prioritize poverty reduction programmes and pro-poor development projects and whether or not these benefits are actually reaching the poorest of the poor. In Papua New Guinea, revenues from logging make a substantial contribution to the national treasury but budgets allocated to affected communities for the delivery of social services and infrastructure development are not substantial enough to make a significant contribution to poverty reduction (Papua country report, this volume).

Similarly, in some countries legal mandates for forestry companies to contribute to community development allow a proportion of timber revenues to be channeled to local communities. Actual benefits for the poor largely depend on the scope of mandated obligations, on company commitment to these obligations and to associated corporate social responsibility (CSR) programmes, and on the effectiveness of government monitoring and accountability measures. In Papua New Guinea, logging companies are viewed as a proxy of the national government in supporting rural development, given the lack of government capacity to deliver basic services in remote areas. This critical role of logging companies often goes unfulfilled, however, due to low government enforcement capacity and the lack of effective monitoring mechanisms and accountability measures, including penalties for non-compliance. While there are responsible companies that do invest in education, health and livelihood programmes, the maintenance and sustained operation of schools, health centers and other facilities and services is not guaranteed after logging operations cease. As such, there is a responsibility of governments to assist in maintenance as part of their commitment to rural development.

Timber royalties paid to forest owners constitute a direct economic benefit from industrial logging. In Papua New Guinea, however, the share provided to landowners is typically small (3-5%) and in many cases, benefits accrue to only a few clan members (Papua New Guinea country report, this volume). Landowners commonly lack the capacity to properly manage the timber royalties or invest in long-term enterprises and, from the point of view of Forestry Administration personnel, providing support to communities to engage in productive investment is not their responsibility or area of expertise. As such, royalty payments tend to result in mere short-term benefits, lasting only while logging operations are ongoing, while the costs of logging persist into the long term.

While industrial forestry does create some local jobs, the number of opportunities is generally inadequate

to absorb the large number of people who lose access to resources as a result of logging or lose the entire forest resource base, where forests are converted. Additionally, employment in industrial timber plantation development is cyclical with labour demand centred on periods of plantation establishment and harvest. Local opposition to logging projects or plantation development and lack of skills among local communities may also persuade companies to import labour. Besides denying local communities direct benefits, this practice creates additional competition for remaining resources as people strive to maintain a living from the land. Where mechanization is used extensively, the number of jobs is often fewer and skill level requirements are higher, effectively excluding the poor. Wage rates, working conditions, job security and insurance availability may also fail to match the risks workers face and compliance with legal standards is often overlooked. Furthermore, job security can be threatened by challenges that beset the timber industry, such as depletion of forest resources, rising costs of essential machinery, opposition to forest industries and conflicts over lands and forests, which can lead to disruptions or scaling-down of operations and closure of companies, as in the case of Indonesia's ongoing forestry industry "crisis".

In recent years, the impacts of the establishment of large land concessions in forest areas and local productive lands in Lao PDR and Cambodia have been mostly negative—creating and exacerbating, rather than reducing, poverty. In Lao PDR, impacts have included partial or complete loss of access to government lands beyond private or communal lands, and loss of private lands and resettlement outside of concession areas (Hanssen 2007). Consequently, many may lose access to the entire spectrum of livelihood resources: upland rice, grazing land, NWFPs, wildlife, construction materials, and traditional medicines. Negative socio-economic impacts of investments for rubber plantations in southern Lao PDR have similarly included reduced landholdings and household income, and associated food insecurity (Leonard 2008 in Lao PDR country report, this volume).

In many areas where industrial forestry operations have ignored social and environmental considerations, forestry has aggravated poverty or created poverty anew. Logging and plantation development has led to degradation and loss of local access to forest resources and the wood and non-wood products they support as well as physical and economic displacement of local populations left with insufficient compensation, provision of jobs or support for alternative livelihoods.

Community-based or small-scale forestry enterprises: opportunities and challenges

Small and medium forestry enterprises (SMFEs), including enterprises at the community level, play a major role in the livelihoods of the poor, although unlike large-scale production and processing operations their contribution to the national economy is largely informal and hidden. In India, SMFEs comprise the bulk of the commercial forest products processing, employing millions of poor, including women and disadvantaged groups. About 80% of the forest industries in Indonesia are small and medium-sized, dominating furniture and handicraft-making industries (NRM 2000 in WB 2006). In China, activities such as under-forest cultivation, wildlife farming and domestication, forest product processing and bio-energy development are creating jobs for local farmers and are a means for many to escape poverty.

SMFEs offer more potential for poverty reduction than large forestry industries (MacQueen 2008) although compared to the latter, SMFEs are seldom the priority of forestry sector or economic development policies. Local benefits from SMFEs include employment and income generation, profit-sharing, capital accumulation, expansion of infrastructure and services, improved forest management, political and cultural empowerment and securing local communities' resource rights (Donovan et al. 2006). There are, however, also risks that constrain the potential of SMFEs to reduce poverty, including exploitative practices that are difficult to check; low social and environmental standards associated with informal operations; insecure tenure; low profitability; and unsustainable resource use and depletion (MacQueen 2006). SMFEs may also have limitations in providing secure and long-term employment.

In Viet Nam, SMFEs engaged in the processing of forest products have developed rapidly in recent

years and have contributed to national export earnings while creating jobs for thousands of workers. In some communes, many enterprises are, however, connected to illegal logging and place low priority on environmental and social responsibility concerns, such as pollution control and fair employment conditions. While the furniture industry in Papua New Guinea is creating jobs for local people, most businesses are foreign-owned and often adopt exploitative approaches.

In addition to the above-mentioned risks, the following challenges must be addressed in developing viable and sustainable forest-based enterprises, especially in areas with high wood and NWFP production potential: insecure resource ownership and access rights, weak social stability and cohesion, weak bargaining power, lack of skills and technological capacity, lack of capital, poor market connectivity, lack of awareness of administrative procedures, and remoteness and poor infrastructure (Grouwels 2009).

The range of commercial activities engaged in by SMFEs includes developing and commercializing NWFPs, engaging in small-scale timber production and processing, and smallholder tree farming as described in the following sections.

Commercialization of NWFPs

Millions of poor people in the Asia-Pacific region depend on the sale of NWFPs. NWFPs are sold mostly as raw materials and through intermediaries. In combination with support for sustained resource management, training in improved processing, value addition and marketing support for community enterprise development can directly improve rural livelihoods and reduce poverty.

A number of recent forestry-related efforts by NGOs and government agencies to reduce rural poverty have focused on the development and commercialization of NWFPs. Most NWFP enterprises, however, "struggle to advance beyond the start-up stage of business development, exhibiting low levels of output, productivity, value added and profit" (Grouwels 2009). Community organizations in many cases lack the skills to engage in commercial activities: thus, capacity building is important. Additionally, as NWFPs are prone to over-exploitation and rapid depletion when commercialized, part of the challenge is to ensure the sustainable management of the NWFPs through regulated extraction and regeneration – including domestication, if possible – to safeguard the resource base and increase long-term productivity.

Governments in several countries including Bhutan and Indonesia acknowledge that little attention has been paid to NWFPs compared to timber resources in terms of policies and investment. Recognizing the potential of NWFPs in alleviating rural poverty, they have formalized plans to develop and commercialize NWFPs as a priority for poverty reduction. Translating the plans into action involves measures such as simplifying regulations on the harvesting and NWFP marketing strategies as a part of comprehensive investment programmes to support SMFEs in producing, processing and marketing NWFPs.

Development of community-based timber production

Several community forestry programmes allow opportunities for households or community groups to engage in community-based commercial timber production. However, the degraded or logged-over conditions of forests allocated to households or communities as well as complex bureaucratic regulations surrounding timber harvesting and elite capture of timber revenues have limited the contribution of timber to the incomes of the poor. Timber rights given to forest owners and people's organizations in Viet Nam and the Philippines have been effectively canceled by logging bans. Timber revenues available to villages participating in the SUFORD project in Lao PDR, in which timber harvesting is intended as a strategy to increase household income, are generally minimal due to the low timber volumes remaining in designated forest areas and the limited proportion of revenue from timber sales allocated to villages. Although CFUGs in Nepal can harvest and sell timber from designated forests, CFUGs lack the capacity and resources to effectively engage in timber production for broader commercial purposes, and incomes from timber tend to be largely captured by better-off households.

Smallholder tree farming

Engaging in smallholder tree farms—through growing trees on private lands, out-grower or contract farming schemes or company-community partnerships—presents an opportunity for local communities to generate income from timber production and even accumulate assets to escape poverty. Smallholder tree farms and home gardens are becoming important sources of wood for processing companies in some countries including Indonesia, Philippines and Thailand. The potential of these activities and the arrangements involved in generating economic returns for the poor vary as reflected in cases related in the country reports.

In Indonesia, studies show that although agroforestry has economic and environmental advantages over agri-industrial plantations, government support tends to favor the latter. The Hutan Tanaman Rakyat (HTR) community timber plantation programme was launched by the government in 2007 to establish 5.4 million hectares of pulpwood plantations on community lands by 2016 and, in doing so, help narrow the timber supply-and-demand gap. Nevertheless, despite accompanying incentives, the scheme failed to generate participation among community groups and individual smallholders due to low economic viability for smallholders, unclear land and allocation processes and limited tenure incentives, among other reasons (Obidzinski and Dermawan 2010; Schneck 2009; Barr and Stafford 2007). Similarly, low economic returns from community-company partnerships initiated in Java in 2000 to plant trees for pulp production also accounted for the low acceptance among some communities and low renewal rates after one rotation (Maturana et. al. 2005).

In one case in Viet Nam (Viet Nam country report, this volume), contract farming with the state enterprise, Hoa Binh Forestry One-member Ltd., became the main source of income for the villagers of Mong Hoa commune. The company gave 10–20 hectares of forest land to landless villagers for them to replant along with low-interest credit for the acquisition of necessary materials. Government programmes funded development roads to reduce the cost of transporting timber products. Villagers' positive experiences during the first seven-year rotation encouraged them to renew their contracts with the company for a second cycle.

The Philippine report (this volume) includes a case study showing that tree farming in private lands can be profitable for farmers in Northern Mindanao, where the climate is favorable and where small- and large-scale processing industries are a legacy of the logging industry. In contrast, another study on the island of Leyte found that financial returns to tree farmers are generally low as a result of low yields, poor market access and lack of market knowledge (Herbohn et al. 2007).

Contract tree farming has become a major source of raw materials for pulp manufacturers in Thailand. Rules requiring farmers to possess land rights to qualify for subsidies and to have reliable sources of income to cover the period before trees reach maturity have, however, excluded poor households from participating in an initiative supported by the Forest Industry Organization to promote small-scale tree planting. Given these rules and other strict management conditions, many farmers abandoned tree farming and turned to rubber or annual crops (Thailand country report, this volume).

Certification

Certification of forest products provides access to markets, particularly international markets for forest products from well-managed private tree farms or community forests. The Bhutan country report (this volume) reported on lemon grass distillation and export as an established NWFP enterprise/industry effective in creating local employment. Processing is located in the villages in which raw materials are harvested, and certification creates an opportunity for local entrepreneurs to increase their profit while creating more labour opportunities for seasonal workers.

Community enterprises and smallholder farmers, however, usually lack awareness of the certification process and have insufficient capacity to comply with requirements or resources to cover the costs involved. To make certification work for the poor, certification costs need to be reduced and capacity-building is necessary to increase the quality and quantity of finished products. It is important to analyze

the pros and cons of accessing local, domestic and international markets in relation to the capacity of the SMFE. High-end domestic markets and international markets may pay more but they may also require greater seed capital inputs, more sustained production and higher quality of finished products.

The contribution of payments for environmental services and carbon payments

While payment or market schemes for forest environmental services are incipient in most Asia-Pacific countries, China and Viet Nam have been moving ahead in adopting 'eco-compensation' schemes and a national PES policy, respectively. PES schemes are viewed as a potential source of funds to support rural incomes and livelihoods, and to improve infrastructure and social services in communities sustaining the forests that provide the services. In most cases, it is still too early to determine to what extent PES initiatives are contributing to poverty alleviation, although some initial indication of benefits, risks and concerns can be gleaned from early project interventions.

Ecotourism

Ecotourism offers economic opportunities for local communities living near protected areas and scenic or culture-rich forest landscapes, although benefits to the poor may be limited. All too often, revenue from tourism tends to be captured by the owners of accommodation and restaurant facilities, tour services and souvenir shops, while jobs for the poor may be few. Ecotourism, therefore, faces the challenge of extending benefits to rural areas and ensuring that local communities and the poor receive fair benefits in return for their efforts to contribute to forest protection.

For ecotourism to contribute to poverty alleviation, greater participation of the poor in economic activities is necessary. This may be through community-based initiatives to manage ecotourism sites where benefits are equitably shared; employment in local businesses providing services to tourists; or through community enterprises producing goods and services for tourists. Building local capacity to engage in ecotourism management activities and ecotourism-related enterprises has been supported on many occasions by NGOs, government agencies and development organizations as a means of developing alternative livelihood opportunities for the poor living in or near protected areas.

In China, forest ecotourism is creating employment among rural farmers in several provinces. Forest parks and various forest-related tourism activities have been drawing visitors in increasing numbers in recent years and opportunities for generating local employment are expanding. In Fujian province, for example, in 2008, about 358 "forest homes" were set up by individual farmers, offering various forest-related activities to visitors and creating 3,100 jobs (China country report, this volume).

In Kerala, India (India country report, this volume), an ecotourism initiative developed under JFM has allowed the members of a Kadar tribe to benefit from the scenic landscape of the Athirapally waterfalls and its surrounding forest. The tribal group was previously displaced from their forest by the construction of a large reservoir and sidelined from jobs in timber plantations that encroached into their settlement area. For the non-farming Kadar tribe members, eco-tourism has provided alternative livelihoods and a market for the NWFPs they produce. With support for capacity building and participatory planning provided by the JFM programme, the tribe assumed much of the management of the tourism area, including the administration of funds from visitors' fees. The bulk of the funds are used for the improvement of the tourism area, infrastructure development and livelihood support. At least one member of each household works in one activity or another associated with the ecotourism project. Apart from the economic benefits for tribe members, the ecotourism initiative has contributed to reducing illegal forest activities and improving forest conservation.

In many parts of Asia, the culture has enriched the landscape through generations of land use practices that have maintained landscape stability and water quality. Nurturing cultural integrity, which contributes to this stability, while adapting to social and economic changes and engaging with other

cultures is a major challenge. Culture is much more than traditional performances and crafts sold to tourists. It involves unseen relationships and deeper systems through which communities have managed themselves and their surroundings and through which associated learning can be shared and passed on. Balancing the sociocultural and environmental sustainability of ecotourism with economic viability should form the basis upon which ecotourism activities are planned and developed.

Watershed-related services

Markets for watershed-related forest services, such as erosion control, water flow regulation and water quality maintenance, are yet to be developed in most Asia-Pacific countries. In Bhutan, Indonesia, Lao PDR, Philippines and Viet Nam pilot initiatives have been established. Associated with hydroelectric power generation or urban water supply, these PES initiatives involve transfer of payments levied on electricity consumers and downstream water users to upstream communities for their efforts in managing forests and stabilizing land use.

In the case of the Nam Theum (NT2) Hydroelectric Project in Lao PDR, payments to upstream communities were in the form of support for livelihood improvements e.g., livestock vaccinations; inputs to support crop production; contributions to savings funds; education-related support, such as funds to pay teachers or repair schools; health care-related support, such as funds to pay nurses and to buy basic medicine supplies; and construction of basic infrastructure, such as small bridges and small-scale irrigation and water supply systems. The delivery of these benefits contributed to cash income from crop production and livestock raising and improved health care and education in project villages (Lao PDR country report, this volume). To what extent, though, these benefits have been equitably distributed across and within villages in the watershed in exchange for their efforts to provide the watershed service needs to be further investigated.

Likewise, the experiences of forest owners in Hom village in Son La Province, Viet Nam reveal the need to focus on how cash transfers to communities are made such that benefits are maximized and villagers are compensated equitably for soil- and water-related conservation practices. Many forest owners in Hom village paid from the hydroelectric dam PES fund have received only a meager amount that barely compensated them for their forest conservation efforts or hardly covered the opportunity costs associated with their not having converted forests into coffee plantations. Ensuring the success of watershed-related payment schemes and increasing buyers' understanding of the benefits and potential costs of failing to protect watersheds necessitate the establishment of the links between watershed protection, the watershed-related services and the importance of the payment in maintaining the services (FAO-RAP 2011). In planning PES schemes, it must also be considered that not all downstream users are wealthy and payment systems may also unfairly impose costs on poor households.

As a form of PES, China's Grain for Green Programme (also called the Conversion Croplands to Forests Programme), provided grain and cash subsidies and free seedlings to farmers in return for converting their farmlands on steep slopes to grasslands, economic forests or ecological protection forests, and for the afforestation of barren lands. Prompted by the 1998 flooding of the Yangtze River, the programme aimed to reduce soil erosion and increase forest cover while reducing rural poverty. Farmers who participated in the programme were guaranteed tenure for 50 years and economic benefits from the established tree crops. The programme is said to be the country's largest poverty alleviation project and community forestry project. A large number of rural households are recorded to have achieved higher incomes from the subsidies than from their former farming practices (Lui and Wu 2010). Other farmers, however, suffered income shortfalls as the level of compensation did not match their previous income and full compensation was not given in some areas (Bennet 2007). Additionally, the question of how farmers will derive economic benefit from the established forests, and particularly from ecological forests, when the subsidies stop in 2016 remains a concern.

Carbon payments: opportunities and risks

Carbon payments, especially reducing emissions from deforestation and forest degradation (REDD) plus schemes, are gaining considerable attention in relation to expectations of huge flows of funding.

Depending on the extent to which local-level rights are recognized and poverty alleviation goals are incorporated into REDD plus strategies, REDD plus may have positive or negative impacts on local communities, indigenous peoples and the poor. Current demonstration and pilot REDD plus projects, place varying emphasis on poverty alleviation, community rights and participation. Potential benefits of REDD plus for local communities and indigenous peoples include the following (Poffenberger and Smith-Hanssen 2009):

1. strengthened security of forest tenure rights through legal recognition under national legislation and international agreements;
2. increased revenues and/or grant funds that could support a range of forest management and community development activities, such as sustainable agricultural programmes, microfinancing, infrastructure development and capitalization of the local economy; and
3. empowerment of local communities as equal stakeholders in multi-tiered agreements among forest-dependent communities, national governments, and international carbon markets.

There are, on the other hand, a number of risks associated with REDD plus projects whereby local people's rights are disregarded in efforts to maximize carbon-related income. Under such circumstances poverty could be exacerbated. The huge funds potentially available for standing forests or forest plantations could result in land-grabbing and expropriation of indigenous peoples' lands; reinforcement of central government and corporate control over forests and forestlands; designation of forests by governments and NGOs as protected areas and sustainably managed forests without informed participation at the local level; and loss of local community access to forest resources leading to economic dislocation, particularly if projects seek to ensure strict forest protection (Griffiths 2007).

Recommendations

For forests and the forestry sector to contribute to poverty reduction, this objective must be prioritized in national forest policies and forest management plans and programmes. Given the complex, multi-dimensional and dynamic nature of poverty, forests and forestry alone will not eradicate rural poverty. Forestry-based poverty alleviation strategies need to be integrated in broader rural development programmes to meet the basic needs and deliver social services that address the diverse conditions among the poor. This will require forestry departments to join with other organizations, agencies and stakeholders beyond the forestry sector to initiate rural development and poverty alleviation programmes with forestry included as an integral component.

Community forestry, commercial and industrial forestry, and PES (including carbon payments) offer varying levels of opportunity and potential in relation to poverty reduction. Depending on national development and forestry-related priorities, focus on different areas may be appropriate. To improve the contribution of forestry to poverty eradication, and not simply poverty mitigation, four priority actions for the three areas of forestry are identified as fundamental prerequisites necessary to expand benefits for the poor:

1. Allocation of clear and secure forest tenure and forest management rights over productive, good quality forests to poor people and local communities;

Secure tenure and clear management rights act as a guarantee to individuals, families or communities involved in forest management that they will reap benefits associated with their efforts to manage allocated forest resources. They also act as an incentive for them to invest in long-term forest management and local enterprises, and provide them leverage to negotiate with private companies aiming to operate in their allocated forest areas. Clear forest tenure and rights are also a requisite in ensuring equitable participation and allocation of benefits to local communities, including the poor, in PES and carbon payment schemes.

2. Capacity building for individuals, families and communities to develop the skills necessary to sustainably manage forests and derive economic benefits;

People and communities have different sets and levels of skills: as such, their capacity building needs vary. The skills and capacities needed may be related to sustainable forest management; enterprise development, including skills for making handicraft, furniture and other products; marketing; domestication and propagation of commercially valuable NWFPs; and organizational development, such as participatory decision making, fund management and awareness building.

3. Support for the development of economically viable and environmentally sustainable community enterprises and SMFEs;

Secure tenure and management rights and access to skills training and information are requisites in promoting the establishment of local enterprises. Related actions can also include the simplification of regulations on resource harvesting and marketing; providing credit and finance and marketing support; and support for the development of mutually beneficial partnerships between forestry companies and communities.

4. Ensuring equitable sharing of benefits from community forestry initiatives, large scale forestry activities, PES schemes and REDD+ projects

Some specific actions to promote the participation of poor households and increase benefits accruing to them include targeting the poor in selecting participants (using appropriate criteria to identify poor households), using forest revenues for projects that truly benefit the poor, waiving administrative fees for poor households, and ensuring representation of poor households, women and disadvantaged groups in village and forest management committees.

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I

Assessment of the contribution of forestry to poverty alleviation in Bhutan

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Introduction

Located in the eastern Himalayas, Bhutan is a landlocked country bordered by China in the north and India in the south. It has a relatively low population density, with a population of approximately 600,000 people in a total land area of 3,839,400 ha (LCMP 2010). It has a rugged and mountainous terrain, with steep slopes descending into narrow river valleys (Dhital 2009).

Forest resources of Bhutan

Based on the 2010 Bhutan land cover assessment, the national forest cover is about 70.5% of the country's total land area, of which 44% is broadleaf forest, 16% mixed conifer forest, 5% fir forest, 3% chirpine forest, 2% blue pine forest, and 0.8% broadleaf mixed with conifer forests. Shrubs constitute 10.4% of Bhutan's land area, while cultivated agricultural lands and meadows constitute 2.9% and 4.1%, respectively. Adding scrub cover to the forest cover will bring the total to 81% of the country's land area (LCMP 2010). Agricultural lands dropped from 7.9% in 1995 (LUPP 1995) to 2.9% cultivable land in 2010 (LCMP 2010).

Economic development

The vision for the future contained in "Bhutan 2020" re-affirms the concept of Gross National Happiness (GNH) as the central development concept for the country. This organizing concept is translated into objectives or the pillars of GNH that give strategic direction to policy making and implementation. These pillars include equitable and sustainable socio-economic development, environmental conservation, preservation and promotion of culture and good governance, and their linkages. The strategic directions from the GNH pillars require that, while the country's rich biodiversity can be regarded as a development asset, this should not compromise environmental conservation. These also emphasize that development must take into account the devolution of new powers and responsibilities to the district and sub-district levels.

Bhutan's socio-economic development planning dates back to the 1960s with the start of the preparation of five-year development plans. Since that time, poverty has always been a major concern of the government. The first five-year plan led to the opening of the road connection between Bhutan and its neighboring country, India. The country had very little infrastructure like schools, hospitals and roads.

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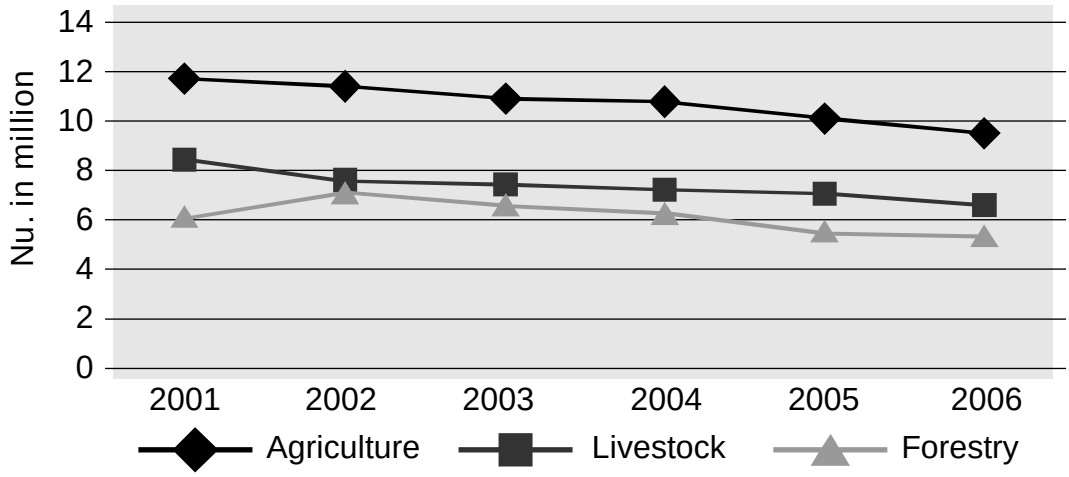
Life in an unforgiving environment was difficult and short-lived. In the subsequent five-year plans, the Royal Government of Bhutan (RGoB) placed high priorities on the socio-economic sectors such as education, health, and agriculture for the livelihood improvement of the Bhutanese people. Since then, the nation has undergone a major transformation. The Kingdom's economy is no longer entirely dependent on subsistence production. The gross domestic product (GDP) increased to Bhutanese Ngultrum (Nu) 61 million in 2011 from Nu 2.4 million in 1995. The share of the agriculture sector to GDP decreased from over 53% in 1985 to 18.2% in 2011 with the increase of secondary sectors like electricity (19%), community and social services (13%), construction (12%), transportation, storage and communication (10%), manufacturing, finance and insurance (8% each), wholesale and retail trade (5%), mining and quarrying (2%) and others, including private and tax subsidies (4%). The development of transportation and communications transformed the Kingdom into an increasingly integrated national economy. Since the 1960s, a road network of more than 3,300 km has been constructed, linking 19 of the nation's 20 districts today. The establishment of mobile services leapfrogged, setting up expensive communication infrastructure in mountainous terrains.

Today, mobile services across the country are state-of-the-art communication technology. Per capita GDP is estimated at US$ 2,109 with an average GDP growth rate of 6.7% in 2011, from slightly below 6.8% in 1985. This indicates that the average growth rate was slow, but GDP increased by 25 times from 1985 due to the contribution from tertiary and service-oriented sectors, such as hydroelectricity and water services. The contribution from electricity and water services is expected to grow further with the expansion of hydropower plants and their network in the country. Another emerging sector is tourism that contributed US$ 38.8 million in 2008 (WCD 2010).

Contribution of forestry to GDP

The Renewable Natural Resources (RNR) sector comprises agriculture, livestock, and forestry. According to data from the National Statistical Bureau 2007 (PPD 2008), the contribution of the RNR sector to the national GDP has been slightly declining from 2001 to 2006 (Figure I.1). On the average, during this period, the agriculture sector contributed 44%, the livestock sector 30%, and the forestry sector 25%. According to 2011 estimates, agriculture's share to the GDP decreased to 18.2% from 53% in 1985 (NSB 2010). Forestry and logging contributed Nu 2.6 million, just about 4% of the GDP (NSB 2010). The contribution of forestry is mainly in the form of royalties, levies, and sale of round logs, wood products, and commercially important non-wood forest products (NWFPs). The contribution of forests-based ecosystem services is currently undervalued, which otherwise could increase the RNR sector's contribution to the national GDP. However, forestry contributes a lot to forest-dependent communities in rural Bhutan as not all forestry goods and services are monetized.

Figure I1. Contribution of forestry to RNR Sector GDP at current prices



Source: PPD 2008.

Poverty in Bhutan

The first poverty index statistics showed that 31.7% of the population was below the poverty line in 2004 (PAR 2004). This was reduced to 23.2% in 2007 (PAR 2007), indicating that Bhutan is well on its way to halving the proportion of the population below the poverty line by 2015. Based on the 2007 report, the national poverty line was Nu 1,097[1] (US$ 24.6) per person per month. This figure does not take into account recent inflation and current market prices. The poverty analysis report (PAR) in 2004 noted that despite the progress made in good governance and economic development in the country, poverty persists, mostly in the rural areas (PAR 2007). Poverty reduction strategies developed over the years for improving the living standards of the poor allocated resources for developmental activities such as rural electrification, farm roads, basic health units, rural drinking water schemes, telecommunication facilities, and environmental conservation through the promotion of community and private forestry. However, the RGoB recognizes that much more needs to be done to reduce poverty in the country; thus, the RGoB and international donors emphasize support on assisting poor and vulnerable groups through special projects.

About 69% of the Bhutanese people are living on subsistence farming, livestock raising, and forestry practices. In general, farmers own very minimal landholdings and these are in many cases highly scattered and fragmented. These make it difficult for them to farm and guard their agricultural crops from destruction by wild boars, elephants, and other wild animals, a common problem throughout the country. Most of the farmers, especially those most vulnerable, depend on forest resources for their needs and cash generation. Thus, forests are an integral part of the farmers' livelihood. For the people of Bhutan, forests are an important natural renewable resource.

Poverty reduction and forestry policy in national poverty alleviation

National poverty reduction strategy

In the 10th Five Year Plan (FYP 2009-2013), poverty reduction is an overarching goal and this has major consequences for medium-term policy orientation in the forest sector. The plan emphasizes the importance of mainstreaming environmental issues into the development planning process to maximize both sustainable utilization and conservation of natural resources. It also recognizes the growing challenge of balancing development and livelihood opportunities with the need to conserve the environment. One of the five specific policy objectives of the 10th FYP is to conserve and promote sustainable commercial utilization of forest and water resources. It also noted that, more than any other sector, the RNR sector has the deepest linkage to the 10th Plan's theme and objective of poverty reduction and the best prospects to address it. Among the strategic measures included is one related to the establishment of community forests and expansion of commercial harvesting of NWFPs. This measure is clearly aimed at making progress in both devolution and poverty reduction within a broader sustainable development framework.

Among the districts (dzongkhags) in Bhutan, Samtse, Zhemgang, and Samdrup Jongkhar have the highest poverty incidence of 52-69%, followed by Mongar and Trashi Yangtse with an average poverty incidence of 44%. Lack of access roads and electricity are among the main factors impeding development in the rural areas (Kuensel 2011). Thus, accelerating rural farm road and electrification should be among the key measures for poverty alleviation in the country (Ibid.).

[1] The national poverty line, Nu 1,096.94 (US$ 24.6) per person per month, is below the international standard of US$ 1.25 per person per day. Nu 1,096.94 is broken down into Nu 867 for food needs and Nu 229.94 for non-food expenditure (Kuensel 2010).

Forest policy and its objectives

About 71% of Bhutan's forests are government-owned and are managed and protected by the Department of Forests and Park Services (DoFPS). Almost 41% of the forest area is contained within the Protected Area System with an additional 9.5% designated as biological corridors. This makes a total of 51% of the total forest area designated as national parks and reserves. As of June 2009, 0.9% of the government reserved forests (GRFs) were handed over to communities as community forests for their management and protection. The DoFPS target is to issue a total of 4% of the total forest area to local communities by 2013 (DoFPS 2009). Communities are given use rights and control of forest products and services in community forests, although the land belongs to the government. Forest products harvested include timber and wood, such as sawn beams, planks for the construction of houses and buildings, poles for scaffolding, fencing and religious flags, and fuelwood for cooking and heating (Dick and Yonten 1995); NWFPs such as food, medicinal plants, leaf litter collected for cattle bedding and fertilizers (Roder et al. 2003), mushrooms picked for vegetables and cash income (Namgyel 1996); and tree and grass fodder for feeding domestic cattle (Roder et al. 2003). The forested watersheds of Bhutan also provide vital ecosystem services like watershed regulation for hydro-electricity generation, irrigation and domestic water supplies.

According to the forest resource assessment, out of the total forest area, 14% is potentially available for commercial exploitation while 9% is available for exploitation with improved science-based technology, improved forest road networks, and forest management plans. About 5% of the national forest is currently under 16 forest management units (FMUs) that are parts of the national forest set aside for the harvesting of forest products for commercial and non-commercial uses. With the rapid development of construction industries in the country, the challenge to meet timber requirements and other forestry goods and services is a growing concern of the government. The national forests are also being lost to infrastructure development (such as road networks, urban expansion, and electricity grid networks) and agri-horticultural encroachment.

A key feature of the National Forest Policy (NFP) is the application of an integrated landscape level approach to sustainable forest management (MoAF 2009). This is done through the implementation of strategies aimed at achieving a balance between conservation and sustainable utilization that respects the cultural values of the forests. Of particular importance is the emphasis on poverty reduction that is a thread woven throughout the policy objectives and strategies. The framework for the NFP consists of a long-term goal and major policy objectives and principles. The goal of the NFP is for forest resources to be managed sustainably to provide a wide range of social, economic, and environmental goods and services, which benefit all citizens, while still maintaining 60% of the forest cover at all times. To achieve the NFP goal and to ensure that all citizens receive an equitable share of the benefits from sustainable forest management, six broad poverty reduction strategies are to be pursued within a planning framework that integrates environmental and economic or commercial outcomes, as well as poverty reduction outcomes Box I.1.

Box I.1. Strategies toward achieving the National Forestry Policy goals

The six strategies are as follows:

- Sustainable production of environmental goods and services to meet the long-term needs of society through sustainable management of forests, including government reserved forests inside and outside FMUs:
- Maintaining species diversity and ensuring long-term sustainability of biodiversity, ecosystem services, and natural habitats through a network of protected areas (including national parks, wildlife sanctuaries, conservation areas, botanical parks, nature reserves, and biological corridors), with other parts of the forest landscape also managed to deliver positive environmental outcomes;

- Active management of watersheds in the forests to achieve sustainable rural livelihoods and produce a reliable supply of high quality water for domestic use, irrigation and hydropower production;
- Meeting the demands of rural communities from community forests and deriving economic benefits from the sustainable management of their forests through the sale of forest products and services. The increase in community forestry area is partly due to the relaxation of forest resources management and ownership by the community forestry rules in 2006 providing an enabling policy framework and guidelines.
- Establishment of economically viable and efficient forest based industry, utilizing both wood and non-wood products, aimed at adding value; and,
- Organizational and institutional reforms carried out at managerial, technical, and administrative levels and capacity development to implement strategies and achieve policy objectives.

Several principles guided the framing of the National Forest Policy:

- Equity and justice in terms of access, utilization and conservation of forest resources and ecosystem services;
- Contribution of forest products and services to poverty reduction;
- People-centered forest management and decision-making, including management of national forest areas outside FMUs, community forests and private forests; and,
- Application of good science and indigenous or local knowledge to underpin all aspects of forest planning and management.

Contribution of past and current forestry to poverty alleviation

Subsistence use of forests and allocation of tenure over forest resources

The 10th FYP (2009-2013) adopted poverty reduction as its overarching goal that has major consequences for medium-term policy orientation in the forest sector. Wood products, such as timber for constructing houses and buildings both in urban and rural areas, are the primary use of forests in Bhutan. Rural communities obtain trees and timber for house construction at a subsidized rate, as well as firewood, fodder, medicines, and other products for subsistence use. Several studies, however, suggest that NWFPs have greater potential than wood to generate income for rural communities in general. Some studies show that bamboo and cane (Moktan et al. 2009), lemon grass (Yangzom et al. 2009), chirata (Pradhan et al. 2008), and cordyceps (Moktan et al. 2010) have contributed to income generation and poverty reduction at the household level.

Community forests

It is estimated that about 4% of the forest land will be designated as community forests by the end of 2013 (DoFPs 2010). This targets the establishment of 400 community forests, in addition to the 200 community forests already established as of December 2009. This will involve 9,763 rural households managing 24,997 ha of community forests (DoFPs 2010). Community forest management plans encompass both wood and NWFP management. The community forest program is one of the pillars of income generation and poverty reduction in Bhutan's rural communities in forestry. According to Dorji and Phuntsho (2007), the community forest management groups are not only able to meet their basic forest resource needs, but can also sell surplus trees and timber (after meeting household member's domestic needs) for cash income. A part of the proceeds is contributed to a community revolving fund

to meet the expenses during community forestry activities. Similarly, Chetri et al. (2009) reported that local communities generate substantial benefits from community forests through the sale of timber, firewood, and NWFPs. However, to realize the full potential of community forests, simplified procedures for the communities' sale of timber and other forest products and services are required. Others report that establishing hundreds of community forests will be a major provider of rural employment that can draw unemployed people in urban areas to the villages and make living in rural villages economically attractive (Namgyel 2010). As of now, only a few community forestry groups can generate excess timber but many derive benefits as workers paid on a daily wage basis for planting, fire line creation, and nursery activities. Wangdi and Tshering (2006) describe increased community participation in three community forests and earnings worth Nu 752,400 from labor contribution.

Private forests

With the enactment of the Forest and Nature Conservation Act 1995 and the Private Forestry Rules 2006 legalizing private forests, a number of farmers from various parts of the country applied for private forests. In the west central region, 66 and 25 households in Dagana and Tsirang, respectively, submitted their applications. Although community forestry has significantly advanced, private forestry is far from taking off. Discussions with private forest owners and survey findings reveal that the people's interest and willingness to own private forests is in direct response to forest resources security due to the rapid socio-economic and institutional changes, notably the enabling legal framework. Private forests are grown in private land, thus tenure and resource security are more assured than in community and government reserve forests. Private forests can contribute to food security in many ways. The types of trees commonly selected for planting in private forests include those for household use and those of commercial value, mainly fast-growing trees. The species desired for timber (for house building) are *Michalea champaca, Juglans regia* and *Cupressus corneyana*; for firewood (for cooking and heating), *Alnus nepalensis, Castanopsis* and *Quercus griffithii*; for tree fodder (for cattle feeding), *Ficus roxburghii, Ficus cunia, Saurauja nepalensis*; and for grass fodder, *Thysanolaena latifolia* commonly known as tiger grass. Timber and firewood in excess of household use can be sold for cash income as per the private forest rules. Integration of multi-purpose trees and grasses in the private forests is beneficial. For example, broom grass not only provides winter fodder but also raw materials for making commercial brooms. This indicates that more than community forestry, private forests have a huge potential to take on board and demonstrate forest management that is closer to the people, to guarantee forest resources security, and to reduce poverty.

Commercial and industrial forestry

Non-wood forest products

Non-wood forest products feature prominently in the 10th FYP of the RGoB as a strategy toward achieving the overarching policy goal of poverty reduction (SFD 2008). It clearly states the "establishment of community forests and expansion of commercial harvesting of NWFPs." Within the strategic framework, the policy objective for NWFP development is "strengthening agricultural marketing mechanisms to expand local markets for primary produce and enhance export of NWFPs and other low-volume, high-value products with specialization, standardization, and certification." Based on this, the forest sub-sector program outlines strategies to sustain the resource base and income from NWFPs (Box I.2).

Box I.2. Forestry sub-sector plans for NWFP development

- Formulation of the national strategy for NWFP development;
- Development of methodologies for assessing NWFPs that best suit local circumstances;
- Development of management guidelines for prioritized NWFPs and training of local government and communities in sustainable management;

- Analysis of problems and opportunities related to NWFPs harvesting, post-production technology, ecology, community use management, and marketing practices;
- Piloting of locally adapted NWFPs management regimes; and
- Review of forest and nature conservation rules to ensure that they support sustainable utilization of NWFPs.

NWFP management approaches are community-based within the framework of Community Forestry Strategy and Rules and Community-Based Natural Resource Management with specific technical guidelines. The NWFP program is coordinated and implemented under the guidance of the Social Forestry Division of the DoFPS.

To focus NWFP development activities, priority species were identified during a national stakeholders' workshop held on 16 November 2007 (SFD 2008) based on the following criteria: (i) economic (local demand and export market value, income generation, and bio-prospecting); (ii) social (job creation, poverty reduction for rural communities, and food security); (iii) environmental (positive impact on biodiversity conservation and protection); and (iv) technological (ease or difficulty in the propagation and cultivation, processing, marketing and export).

The Social Forestry Division established more than 100 community forests and 13 of these are concentrating on NWFP management. Recent studies show that NWFPs are indispensable at the household level for food, medicine, and cash income generation among rural communities. The total revenue generated from NWFPs between 2003 and 2007 amounted to Nu 146 million (about US$ 3.3 million) compared to Nu 86 million (US$ 1.9 million) from wood products, showing the importance of NWFPs in forest sector development and overall poverty reduction (PPD 2008). The revenue, however, tends to fluctuate from year to year, reflecting unreliable production. Although the policy focuses on reducing rural poverty through the commercialization of NWFPs, rural farmers lack technical capacity, capital and entrepreneurship skills to add value to NWFP products through processing and better marketing.

Also, a substantial amount of revenue through the export of NWFPs goes to the RoGB's general budget. The commercially important NWFPs exported are high-value mushrooms, lemon grass oil, *Ophiocordyceps sinensis*, and incense. The markets for Matsutake mushroom (*Tricholoma matsutake*) are Japan, Singapore, Thailand, and the United Kingdom. Bhutanese essential oils are well received in European markets with growing demands in the United Kingdom and Canada. Incense sticks are exported to Singapore, Taiwan, USA, UK, and Hongkong. Cordyceps are exported to Hongkong, Singapore, China, and USA (California). These high-value low-volume NWFPs have relatively organized markets, but not their production, as most NWFPs are harvested from the wilderness.

In the high mountains of Bhutan, cordyceps, a caterpillar fungus, is harvested annually by rural communities since harvesting was legalized in 2004. It is used as a general health tonic to improve stamina, vigor, and vitality. After the relaxation of the collection and sale of cordyceps, there is an increasing demand in international markets offering high cash returns for collectors and exporters. It was observed that, with the start of cordyceps harvest, the livelihood of high altitude herders transitioned from subsistence to cash economy. Annual production reached a record high of 673 kg in 2008 with financial value of Nu 97 million. Cordyceps collection, however, suffers from a lack of coordination during harvest, leading to over-harvesting and degradation of natural habitats.

Bamboo and rattan that grow in the forests of eastern and southern Bhutan contribute about 66% of the gross income of households in Bjoka, East Central Bhutan (Moktan et al. 2009). The local communities specialize in the manufacture of high-quality finished products designed for the export markets and showcase traditional cultural heritage. Bamboo and rattan can be sustainably cut without jeopardizing the forest integrity.

Chirata is an important medicinal plant used to combat malaria and the roots containing concentrated chiratin are used for treating common cold, flu and mosquito-borne illnesses. It is a commercially important plant for rural communities of Singkhar Lauri in southeastern Bhutan. The plants, after maturing, are uprooted, bundled, and sold to the National Institute of Traditional Medicine (NITM) and exported across the Indian border for the manufacture of pharmaceutical medicines. During 1992-93 and 1993-94, Singkhar Lauri farmers collected about 18 tonnes and 20 tonnes of chirata worth Nu 504,000 (US$ 18,000) and Nu 560,000 (US$ 20,000), respectively. According to Pradhan et al. (1998), the harvest, collection, and sale of chirata contributed the bulk (42%) of the gross household incomes of Singkhar Lauri farmers.[2] Postharvest practices such as improving processing, packaging, and marketing need to be further explored.

According to Namgay et al. (2007), incense plants contributed 14% of the total income of the Layaps, the members of the Laya village in Gasa district. Of the 14 species of incense plants found in Laya, five common species contribute 94% of the proceeds from the incense products. Most of these incense products are sold in urban centers, e.g., Thimphu. NWFPs, such as medicinal plants, mushroom and bamboo, as well as handicrafts, have a growing market worldwide as such niched products are increasingly getting scarce. There is a growing demand for ecological, nature-based products offering attractive prices, mainly from developed economies. Bhutan's rich forests provide a wide range of these NWFPs with potential benefits to both conservation and development.

Certified organic lemongrass oil is used in perfumes, soaps, and cosmetics and for pharmaceutical preparations in developed nations (FAO 1996). Bio-Bhutan, a private enterprise, exports certified organic oil to Asia, Europe, and the USA with prices ranging from US$ 20-23 per kg of oil (Yangzom et al. 2008).

Among the wild mushrooms found in the forests of Bhutan, the Matsutake mushroom is one of the commercially important ones, contributing to cash income generation for farmers during the growing season. According to Dhital (2009), between 2000 and 2005, a total of 9,339 kg of Matsutake mushrooms was collected with a total value of Nu 3.92 million (from both the market value of Nu 3.73 million and royalty of Nu 0.19 million).

Bio-energy

The main sources of energy supply for rural Bhutanese households for cooking and heating are fuel wood, wood chips, briquette and, occasionally, animal dung. Biomass energy is predominant, having the largest share (42%) of the overall energy supply matrix, followed by electricity from hydropower plants (DoE 2008). Biomass in the Bhutanese context includes wood, wood waste, peat, wood briquette, agriculture waste, and straw. Fuelwood forms the primary energy source for cooking, heating, and lighting for 69% of the rural population while fuelwood is used for room heating among the urban population, especially during winter. The rural poor are allowed to collect fuelwood from government forests for household use. Unlike the rural areas in Nepal and India, rural farmers in Bhutan do not sell firewood. Bhutan consumed about 725,000 tonnes of fuelwood in 2005, which accounted for 57.7% of the overall energy supply matrix. Bhutan has one of the highest per capita biomass energy consumption in the world (DoE 2008). This situation, however, is gradually changing with the emergence of hydropower-generated electricity and the policy of "electricity for all" by 2020 and fuelwood substitutes such as fuel for cooking and heating appliances.

Until recently, vast volumes of sawdust generated from the production of sawn logs by mills were disposed of as wastes. The commissioning of briquette machineries by a government-owned company efficiently converted sawdust as a firewood substitute for heating urban homes. The briquette machineries are located in urban centers (namely, Thimphu and Paro) with production capacity of 750 kg and 250 kg per hour, respectively. Briquettes are packed in gunny bags bearing the slogan, "Save the forest, Keep

[2] Aside from chirata, the other sources of household cash income were daily wage labor (24.7%), livestock raising (19.8%), chili (8%), star anise (4.5%) and others.

green," for marketing. The product is sold at Nu 3 per kg in summer and Nu 3.5 per kg in winter. The initiative is promoting efficient utilization of wood wastes to reduce pressure on natural forests. Poor farmers are employed as laborers on a daily wage basis.

Wood products: demand, supply, and revenue

The more accessible and productive parts of Bhutan's GRFs are managed under a system of FMUs, and all FMUs are covered by management plans. FMUs supply all commercial timber demand through harvesting, transporting, and auctioning of round logs, followed by plantations in the logged forests by the Natural Resources and Development Corporation Ltd., a government-owned forest enterprise. The FMUs also accommodate demand for timber for rural construction use.

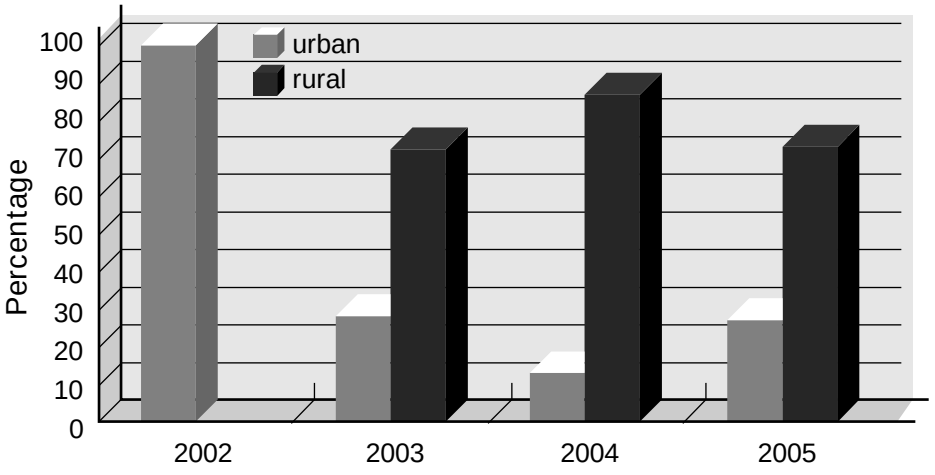
Round logs, sawn timber, and veneer, including non-wood products, account for about 20% of the exports. With the upsurge in infrastructure development in commercial towns across the country, the gap between timber supply and demand is widening. The bulk of the round logs harvested is used for the construction of houses in rural areas (Figure I.2). Demand for subsidized timber for rural house construction and other infrastructure, such as schools, hospitals and RNR offices, increased substantially from 2003 to 2005. The demand-supply gap is expected to widen in the future as urbanization increases. The DoFPS plans to reduce the gap by opening up potential areas under FMUs for commercial supply, bringing more national forests under community management and introducing forest-based enterprises. With the increasing demand, however, Bhutan may also import wood from neighboring countries in the future. Scientific studies on maximizing wood wastage in harvesting, transportation, and processing are lacking due to limited resources, research capacity, and facilities. There is ample opportunity to increase the supply and quality of wood products through reduction in costs, minimization of wastage from logging and transportation, and improvements in wood processing and use.

Table I.1. Timber production and consumption from FMUs for commercial use from 1997-2006

Production area	Demand	Supply	Deficit/surplus
	(m^3)	(m^3)	(m^3)
Wang Division	89482	89102	-380
Ringpung Division	129905	132261	2356
Zhongar Division	64321	67065	2744
Sha Division	98698	98055	-643
Zhemgang Division	66122	68172	2050
Phuentsholing Division	69763	69231	-532

Source: NRDCL 2007.

Figure I.2. Timber demand for urban and rural use



From 2003-04 until 2004-05, revenue generated from the sale of wood products to rural residents was slightly higher than revenue from wood products sold to urban residents (Table I.2). However, in 2005-06 and 2006-07, the revenue from the supply of wood products to urban users was around 60% and 92%, respectively, while revenue from the supply of wood products to rural users was about 17% and 8%, respectively. Although demand is higher in rural areas, more revenue is being generated from the sale of wood products to the urban consumers. This is because, at a subsidized rate, rural residents can buy timber at a much lower price than the amount urban residents pay for the same amount of timber. The total government revenue generated from supply of wood and wood products to rural and urban consumers from 2003-04 to 2006-07 amounted to Nu 85.93 million, which went to the government exchequer.

Table I.2. Revenue generated (Nu. in million) from supply of wood products.

User	Year			
	2003-2004	2004-2005	2005-2006	2006-2007
Rural	3.98	3.75	4.57	2.33
Urban	0.46	2.22	17.43	27
Monasteries	0.28	1.65	0.11	-
Government institutions	7.61	8.39	6.15	-
Total	12.33	16.01	28.26	29.33

Source: Department of Forests.

Government plantations

Commercial plantations in Bhutan date back to 1947 with the establishment of plantations along the sub-tropical foothills of Bhutan. Clear-felling followed by artificial planting of exotic and local species, such as teak (*Tectona grandis*), sal (*Shorea robusta*), champ (*Michelia champaca*), and other valuable species, was practiced. Since the 1960s, the plantation program expanded to other parts of the country to reforest degraded, denuded, and barren areas and to arrest forest degradation and forest cover loss, particularly in sub-tropical zones where high human population and cattle population co-exist. A total of 21,516 ha have been planted as of June 2008.

Although plantation planting has been an annual event throughout the first to the ninth FYP with the participation of government agencies and private and wood-based industries, progress has been slow. This is because of the country's dependence on the natural forests, which supply the bulk of the forest resource demand, lack of clear-cut plantation directions and strategy, lack of funding support, and other institutional gaps. Conifer and broadleaf plantations constitute about 2% of Bhutan's total forests cover. Rural people are employed on a daily wage basis as plantation laborers for planting in government land. Very little benefits are derived.

Wood-based industries plantation

Industrial and commercial forestry operations are carried out by a few wood-based industries such as the Bhutan Board Product Ltd. (BBPL), Natural Resources Development Corporation Ltd. (NRDCL) and Bhutan Chemical Carbide Ltd. (BCCL) for charcoal production. Out of the total plantations planted by various agencies, commercial plantations of short rotation-high density forests account for only 18.7%. As in government plantations, the rural poor are hired by the wood-based industry on a daily wage basis as workforce for planting, harvesting, wood processing, and marketing tasks. BBPL has two nurseries for supplying production and planting materials, NRDCL has 10 nurseries, while private individuals have 27 nurseries.

The constraints faced by industrial forestry are unclear legislation and regulation on leasehold government reserve forests, limited forest resources, and the need for accommodation of biodiversity

in plantation forestry. As regards the species and coverage, NRDCL since 2006, has established 53.85 ha of plantation of bamboo species, such as *Dendrocalamus giganteus, D. hamiltonii, D, strictus,* and *Bambusa balcooa* in the sub-tropical districts of Chukka, Mongar, Samdrup Jongkhar, Samtse, Sarpang, Wangduephodrang and Zhemgang, in addition to the ongoing regular plantation activities in the harvested cable corridor sites and degraded forest areas inside the FMUs. Bhutan is rich in bamboo resources but these remain under-utilized, due to the limited technological know-how and plantations. Many local communities manufacture bamboo crafts and their commercialization can bring positive benefits to their livelihoods. DoFPs and NRDCL jointly identified 351 ha of areas in Samtse for commercial plantations, and planting was initiated in 2007 in a phased manner for commercial species: teak, sal, champ and sissoo (*Dalbergia sisoo*). NRDCL plans to carry out commercial plantation of valuable species across the southern districts of Bhutan.

Wood-based industries

The national forest policy clearly stipulates the promotion of "an economically viable and efficient forest-based industry utilizing both wood and non-wood products aimed at adding value." However, the strategies to achieve this objective remain unclear. The move toward timber pricing and marketing reform resulted in the ban on round log export to satisfy domestic timber demand, improve wood processing, and minimize wastage. Wood-based industries can be climate-friendly by pursuing efficient harvesting, processing, and utilization of wood products and NWFPs. According to data from the Ministry of Economic Affairs (PPD 2008), there are a total of 324 operational wood-based industrial enterprises in the country, with operations varying from cottage-based to large scale: 121 furniture making shops, 21 incense making shops, nine paper factories, 77 sawmills and 13 woodcrafts shops. Rural people either own shops or get employed by the owners of these wood-based industries.

The formal forestry sector does not employ many people. For example, NRDCL, a company with seven field divisions spread out all over the country, currently provides employment to about 259 personnel in forest harvesting, forest road construction, plantations, sand and stones business, and wood-based industries (NRDCL 2011).

It is recognized that private sector development is an important driver of economic growth and can contribute significantly to employment generation and poverty reduction. The role of the government is to provide an enabling environment to encourage the private sector to grow and prosper. Until 2000, about 50% of the logs produced by the Bhutan Logging Corporation (now NRDCL) were exported. The local industry could not compete with outside buyers and thus suffered from shortage of timber. A ban on the export of logs and sawn timber was introduced in 2000 in an attempt to free up supplies for the local market and generate local employment. However, the ban was followed by an increase in the price of local timber brought about by increasing urban and rural infrastructure using wood as construction material. At present, the local wood processing industry is in an early stage of development and consists mainly of small sawmills, furniture units, joinery and woodcraft units, and particle board and plywood factories.

The efficient operation of a forest-based industry requires an open market and competition, and the presence of entrepreneurs who can take advantage of market opportunities. The harvesting, processing, and marketing of NWFPs from the rural areas are growing in importance and have the opportunity to contribute significantly to poverty reduction and food security. These are mainly cottage industries and require government support to ensure that NWFPs are harvested sustainably and that rural people who do the harvesting receive an equitable return on their efforts. The development of forest-based industries, utilizing both timber and NWFPs, can contribute significantly to income generation. In time, products sourced from private and community forests can also contribute to the overall supply. Supporting cottage-based industries in potential timber-yielding community forests are emerging initiatives of the Department of Forests and Park Services.

Payment for environmental services

Bhutan is well known for its pristine environment and conservation of its forests. With the national policy of keeping 60% of the country's land area under forest cover at all times, the Bhutanese population can benefit from the forests' environmental services. However, the identification, quantification, and valuation of various ecosystem services need to be studied, which can greatly enhance the contribution of forests to GDP.

Ecotourism

While tourism is increasingly being seen as a major opportunity for economic diversification (Norbu 2003), the country does not wish to compromise the fast economic return of tourism with erosion of cultural heritage and biodiversity. Thus, the current policy of high return and low impact tourism targets rich people and countries to limit the ill-effects of tourism on the physical and cultural environments. Endowed with a bountiful nature as well as rich and unique culture and traditions, Bhutan has a huge potential to benefit from this growing market.

According to the National Statistical Bureau (NSB 2009), the tourism industry in Bhutan began in 1974. The erstwhile government agency, Bhutan Tourism Corp., controlled tourism until its privatization in 1991. In 2008, there were 475 licensed tour operators. The potential as far as foreign exchange earnings are concerned is very high. The revenue generation from the tourism sector increased from over US$ 2 million in the late 1980s to over US$ 38 million in 2008. Culture and nature-based tourism are always the selling points for the tourism industry of Bhutan. In 2008, major festivals in the country attracted a significant number of visitors. There were 26,426 tourists who visited Bhutan for cultural exposure, holiday, and recreation purposes. Tourism businesses centralized operations, mostly by urban dwellers. In recent years, community-based tourism is being encouraged to make the benefits of tourism reach the rural communities. Such initiatives are currently piloted in a few areas. The rural poor receive minimal benefits through serving as porters and renting out their horses and mules for transporting luggage. They get paid based on the daily wage rate. The bulk of the benefits go to tour operators and tourism operation is centralized.

Bhutan's Protected Area Networks is opening up to markets for nature recreation, capitalizing on ecotourism, although the number of eco-tourists is less compared to tourists interested in Bhutanese culture. Ecotourism pursues a policy of promoting conservation as well as development for local communities in and around the protected areas.

Watershed management

With technical support from FAO, the Watershed Management Division of the DoFPS is experimenting on PES initiatives for the forests' support for the drinking water supply of the downstream communities in Mongar, conservation of the black-necked crane in Phobjikha through ecotourism, and watershed rehabilitation in Pachu-Wangchu. The initiatives focus on establishing relationships between the service providers upstream and the buyers downstream with reference to a particular environmental service of the forests, such as sustaining drinking water supply, conservation of biodiversity (specifically, the black-necked crane), and watershed protection, for the benefit of rural communities and conservation of environment. Currently, mechanisms are being worked out and implemented to compensate the communities on an equitable basis.

Reducing emission from deforestation and forest degradation (REDD)

The DoFPS is aware of the emerging financial incentive in the form of the REDD mechanism, which may accrue to rural communities. The development of policy initiatives is underway, which aims to capitalize on carbon storage by Bhutan's forests and to plough back funds for conservation, sustainable management of forests, and enhancement of carbon stocks. The strategy, however, is unclear how REDD+ can contribute to benefit rural communities and reduce poverty.

Capacity building for public forestry service

The development of human resources to carry out the Department of Forests and Parks Services functions more effectively and efficiently is a top priority in the 10th FYP. The Department of Forests at its inception had virtually no trained staff and the requirements were met by deputized Indian foresters and hiring of expatriates. To meet the dire need for competent personnel, the government sent a few Bhutanese foresters for training at the Indian Forest Research Institute (later known as Indian Council for Forestry Research and Education) starting in the 1960s. The number of forestry officials and staff by qualification as per 2003 record and updates are as follows: five professionals with PhD degrees, 15 professionals with M.Sc. degrees, and two administrators with M.Sc. degrees, and one with a B.Sc. degree, 11 post-diploma certificate holders, 18 professionals with B.Sc. degrees, 243 technical support staff with diploma, 77 technical support staff with certificates, 623 forest guard with certificates, 59 administrative staff with certificates, 47 plant and machinery operators, and 26 SPC staff (DoFPs 2003). Salary levels of forest guards, including officers, fall below the national poverty line.

Case studies

Each of the following case studies focuses on the contribution of a NWFP—namely pipla, lemon grass oil, and chirata – to the subsistence and cash incomes of rural farmers. The first case study aims to determine whether there are farmers who still engage in collecting pipla and whether pipla is still one of the main NWFPs contributing to the local economy as in the past. Farmers engaged in pipla collection were also asked to determine how much pipla contributes to the household's income. The second case study looks into the socio-economic benefits from lemongrass oil distillation activities in terms of employment and poverty alleviation for the distillers, firewood collectors and grass collectors, as well as their environmental constraints and opportunities in the management of lemon grass oil production industry. Interviews with the Dozam distillers, firewood, and grass collectors, and field visits to their distillation units were conducted to get an overview of the harvesting and distillation units and to observe practical problems and opportunities faced by distillers and harvesters. The third case study focuses on the contribution of chirata as a source of income among the farmers of remote villages (Zangthi, Dungmanba and Momring) of Shingkhar Lauri, where the resource base is depleting.

Case study 1: the contribution of Pipla to the incomes of farmers

Pipla[3], according to the baseline survey carried out by the Integrated Sustainable Development Project (ISDP) at Zhemgang, is considered a high cash income-generating crop for farmers. The forests in the Kheng region are rich in NWFPs in terms of diversity, number, and value, and produce the largest number of NWFPs, especially pipla. Incomes generated from pipla collection can be considerably high, therefore, pipla is one of the main contributors to the local economy, particularly to the incomes of the marginal farmers.

Farmers in Bardoh and Nangjor geogs (sub-districts) have long engaged in pipla fruit harvesting. Pipla used to be one of the main sources of income in 1998, but many farmers stopped collecting because the prices were lowered. Also, the farmers are now required to obtain a permit from the forest office and to follow government regulations. Some farmers are still collecting pipla, though not as much as before. In the past, farmers sold their harvests either to the National Institute of Traditional Medicine (NITM) or to middlemen, who in turn either auctioned pipla at the Food Corporation of Bhutan (FCB) auction yard in Gelephu or sold the products across the borders. However, as the demand for pipla increased, the farmers harvested unsustainably and indiscriminately. Over-exploitation eventually led to low production and to increase their collected pipla, many farmers resorted to adulteration by adding non-commercial species of piper. Because of this practice and the inconsistent trade outside the borders, there are no buyers and markets across the border at present.

[3] Pipla is a perennial crop of the Genus Piper, Family Piperaceae and grows wild in sub-tropical areas of Bhutan such as in Zhemgang Dzongkhag.

The auction yard for pipla at Gelephu was shut down for several reasons. One, most of the farmers wanted to avoid the compulsory 3% commission tax on their products, so they preferred to sell directly to Indian buyers across the border. However, the price offered by the auction yard in the 1990s was actually higher compared to the price offered by the middlemen. Other farmers preferred to sell to middlemen to avoid transportation costs. But, unlike in former times when they would go to the farmers' doorsteps, some of these traders were also discouraged by the practice of adulteration by the farmers. Thus, the low volume of pipla taken for auction made auctioning no longer economically feasible. Another, a syndicate of bidders tended to offer the farmers low prices and other bidders within and outside Bhutan were also discouraged by pipla adulteration by the farmers and middlemen.

Pipla collection and trade are now limited. Today, farmers find it difficult to harvest good quality pipla at the sources. In many areas, pipla are overgrown or are competing with shrubs and climbers, because a government regulation prohibits farmers from clearing the climbers and other competitors. Also, farmers are required to acquire permits for collecting pipla from the forest offices, adding burden to the farmers. Pipla fruit is best collected as soon as it matures, and this often coincides with the agricultural harvest. By the time agricultural harvesting is completed, it is already late for pipla collection. Many of the men are engaged in off-farm activities that are more profitable than pipla collection. Most of the children and the youth are going to school, thus, with the shortage of labor, most of the lands in the village are abandoned. Some farmers prefer to engage in agriculture than collect pipla, as there is no assurance of income from pipla collection. However, some farmers, especially livestock herders, continue to collect pipla and sell to a few middlemen.

Pipla collectors' livelihood activities

Villagers active in pipla collection and interviewed for this study also engaged in farming and livestock raising. Based on their estimated incomes, the respondents were roughly grouped into those with high-income, middle-income, and the low-income. All of them have land holdings (ranging from two to eight ha) but, in general, the farmers with the highest income in the group own the most land holdings (in terms of land area) and own more livestock than the others. Those in the middle-income group also have large land holdings, mostly grazing lands.

The farmers grow maize, paddy, vegetables, buckwheat, wheat and foxtail. Maize, the most common staple food, is double-cropped in a year. In terms of the production of food grain crops, maize yield is highest, followed by rice and buckwheat, except in Ngangkhar where rice is the major crop. On average, the high-income farmers produce the highest amount of food grain followed by the low-income farmers. Livestock are raised for village consumption. During rare occasions, some farmers earn from the rental of their horses for the transportation of officials who visit the village.

Because of their limited land holdings, the low-income farmers usually work for the better-off farmers on a crop sharing basis. Most of the lands owned by the respondents in the middle-income group are tsheri, swidden farms mostly located far from the villages and exposed to attacks by wild animals; thus some of them work for the relatively well-off farmers as well. Nevertheless, the food grain they produce is often not enough for their household needs. The common option for them is to collect and sell pipla to be able to purchase food, clothes, and other basic necessities. It is quite common for the farmers to take advance payment from middlemen within or outside their villages for their next harvests of pipla, especially during the hunger months from March to June.

Contribution of Pipla to the farmers' incomes

In general, the contribution of pipla to the farmers' household incomes depends on their economic status. For the farmers with the highest income among the respondents, proceeds from the sale of pipla harvest is secondary to the sale of livestock products, with sale of grain as their third income source. Farmers in both the middle-income category (about one-third) and the low-income category (almost one-half) say that pipla collection contributes the highest to their income. Next to pipla, middle-income farmers derive almost the same income from the sale of grain and livestock products and daily wage

labor. The respondents with the lowest incomes among the group of respondents, who also have the least landholdings and livestock, depend on pipla the most to generate cash income for their needs. The farmers in this group also depend on remittances they get from family members who have left their villages to work elsewhere.

Although pipla is a major source of income for the farmers, they also engaged in livestock raising, and only one-third of the respondents belonging to the high- and medium-income categories expressed willingness to grow and register pipla in their own land. These are the farmers who own lands, although the land holdings of the middle-income farmers are mostly tsheri and mostly located far from the villages. The low-income farmers derive the highest share of income from pipla but own limited lands.

Challenges in improving the contribution of pipla

Most farmers recognize the need to improve their capacities in collecting, processing, and marketing pipla so that they can maximize their profit and sustain their resource base. Of these three areas of limitations in pipla production, one-half of the respondents identified their current unsustainable and unorganized collection practices as the main drawback, while one-third identified marketing challenges, and the rest, limited processing skills.

Many of the farmers see the need to establish community rules on proper collection practices for more organized and sustainable harvesting of pipla. Because pipla has a high commercial value in the market, farmers tend to compete among themselves in collecting pipla berries. Ideally, pipla should be collected when the berries mature, but there are farmers who want to pick ahead of the others, even if the berries are still premature. Some farmers uproot the plant, putting to waste the small berries. The DoFPS developed guidelines for the proper harvesting of pipla, which the farmers need to collectively adopt and commit to follow.

The farmers are also concerned about marketing as the current practice is not organized and does not fetch the most favorable price for the farmers. In the early 1990s, the relatively well-off farmers at first were able to fetch higher prices than the poorer farmers because they did not involve the middlemen in selling their harvest. The farmers recalled that, in 1996, the prices improved for the poorer farmers as well with the entry of other middlemen from other places that allowed for competition in buying prices. Still, the poorer farmers tended to obtain lower cash income from pipla. Some of them bartered pipla with other products, such as rice and sheets of cloth, while others took advance payments from the middlemen; thus, they could not negotiate with the middlemen for higher prices. The market value of pipla could have been higher than the present price had the farmers not resorted to adulteration.

Many of the low-income farmers are generally forced to sell their collection to the middlemen since they cannot afford to bring their produce to the distant market outlet and, in many cases, they already tie their future harvests to middlemen as payment for their cash advances. Sometimes the low-income famers cannot compete with high-income farmers in collecting pipla since the latter exert some control over the market. In some areas, pipla grows in *tsheri* and pasturelands owned by the other farmers and are not accessible to low-income farmers. Some of the poor farmers, however, collect pipla for the well-off farmers and are paid for their labor on a daily wage basis.

Farmers process pipla berries by drying these under the sun. Direct sun-drying is done by spreading the pipla on the ground to maintain the quality. During continuous rain, pipla is oven-dried, which is a faster way to dry pipla than sun-drying. However, the smoke can cause the color of pipla to change, thereby reducing its quality. Sun drying is generally preferred to oven-drying since it is cheaper and less laborious as it does not require fuelwood. Poor farmers often store their pipla collection for a few weeks until it is sold to the middlemen. Some better-off farmers can store their collected pipla for as long as one year while waiting for favorable prices.

Recommendations

Pipla collection is the one of the main sources of income for many farmers in the central region of Bhutan. It forms a significant portion of the income of poor households with limited lands to cultivate and other assets. It plays an important role in food security when the agricultural harvests fall short in sustaining their needs. The establishment of local processing units to capture the economic value of pipla at the source, so as to benefit the farmers, is necessary. The formation of collection groups among the farmers will provide a venue for them to agree on their rights and regulations on appropriate harvesting and marketing and, with external assistance, to explore better processing and marketing strategies. There is good potential for pipla collection and trade in Bhutan. Further, government can support the farmers by reviewing and revising the policy on restrictions on the export of all medicinal plants, as marketing is adversely affected. Pipla trade should be allowed since its contribution to the household income, particularly of low-income farmers, is considerable. With more opportunities to increase their income, farmers will be more motivated to ensure the sustainability of pipla.

Case study 2: the contribution of lemon grass oil production in eastern Bhutan

History of lemon grass oil production in eastern Bhutan

The Bhutan Aromatic and Phyto-Chemicals of Tashi Commercial Corporation commercialized lemongrass oil production in eastern Bhutan in 1981. The oil was processed through steam distillation using low-cost, cottage-type distillation units made from second-hand petroleum drums. The company also demonstrated harvesting and distillation of lemongrass to farmers at various locations. In 1990, the FAO-supported project, "Production of Essential Oils by Smallholders in Remote Areas," was launched with ITA industrial-type units installed at Pakhadrang, Mongar and Lungtenzampa, Trashigang with a total capacity of 2.5 tonnes of lemongrass. The units developed by FAO developed operational difficulties and the Ministry of Agriculture intervened in 1991 modifying a stainless-steel type prototype, which improved the distilling efficiency and quality of the oil.

By 1993, the Essential Oils Development Project (EODP) of the Ministry of Trade and Industry (MTI) took part in the process of developing the cottage-type distillation units and began supporting marketing with 18 semi-portable FAO-type stainless units installed in 1995. Three years later, 118 stainless steel cottage-type distillation units were distributed to distillers meeting their demands of portability, efficiency, and durability. In 1999, distillers in four districts of eastern Bhutan owned 154 units of this type. Lemongrass oil was marketed by Tashi Commercial Cooperation to India and expanded to Europe in 1990 with Primavera Company as the first and only customer of the EODP for many years. Primavera is a German company specializing in the import and distribution of aromatherapy products. When the production of lemongrass oil increased to 17.5 metric tonnes in 1998, Primavera was unable to purchase the whole output and quit the business with Bhutan. Therefore, MTI had to search for customers. The Bhutan Export Promotion Centre reviewed potential markets for lemongrass oil in the UK, Germany, France and the Netherlands and also recommended enhancement of post-production and marketing strategies. As follow up, MTI established a quality processing unit at Mongar and started exploring new markets in Western Europe. Several consignments were delivered to end-users in France, Germany, and the UK. They desired the supply of quality lemongrass oil with minimum standards. A quality control unit was established but oil quality continued to deteriorate due to inappropriate transportation and storage problems in Calcutta, Singapore, and Sri Lanka en route to Europe.

Since 2003, John Kelly from the UK has been the sole importer of Bhutanese lemongrass oil. According to the EODP, John Kelly provides high-quality containers for transportation from Calcutta to Europe and accepts consignments with citral content below 75%, as they mix low-grade oil with high grades to maintain minimum acceptable standards.

Lemongrass and its potential to alleviate poverty

According to Yangzom et al. (2008), organic certification added value to lemongrass oil and increased the income of participating households (distillers, grass collectors and firewood collectors), enabling it to contribute directly to MDG 1 on reducing poverty and hunger, as well as MDG 7 on environmental sustainability. They reported that there was increased participation of local people in the sustainable management of lemongrass, but little or no improvement with regard to the management of fuelwood. Commercialization of the lemongrass oil industry can bring about sustainable management of lemongrass resources by local communities who are given rights to use the common resource under a community-based resource management regime. Thus, sustainable management of lemongrass is considered a success case study from eastern Bhutan where enterprise-oriented resource management brought about changes in the rural livelihood of distillers, grass, and firewood collectors through employment and cash incentives.

Lemongrass grows beneath the chirpine forest in the districts of Mongar, Lhuntse, Trashigang and Trashiyangtse in eastern Bhutan. It is estimated that 50,000 ha of chirpine forests support lemon grass with better growth and biomass where crown density of pines is low (RNR-RC 1998). RNR-RC estimates that about nine kg of lemongrass oil is produced from a hectare of lemongrass growing in the wilderness in Wengkhar, eastern Bhutan. The low production of biomass and the amount of oil is attributed to moisture and soil nutrients. RNR-RC Wengkhar undertook research studies to domesticate the lemongrass for oil extraction and soil erosion control purposes and developed technologies to improve grass harvests. At low altitudes (<1,000 masl) under reasonably good management conditions, grass growth can be maintained throughout the year allowing five harvests yielding 105 kg of oil per hectare per annum (Legha 1998).

Description of the site

Two study areas of the six eastern districts were selected for this report. First, Mongar district covers a total geographical area of 483,493 ha, of which 82% is forested, and has a total population of 40,000 (Samal 1998). Second, Trashigang district has a total geographical area of 3,721 sq km comprising of 24 sub-districts (Gyeltshen 1998). Its economy is subsistence-oriented with little or limited cash income opportunities. The firewood for lemongrass distillation and cooking and heating is sourced from natural chirpine forests. The Dozam community forest is the oldest community forest in Bhutan handed over for community management in 1997. It has a total area of 358 ha of chirpine forests whose ground story is covered with abundant growth of lemongrass. The community forest management plan was initially conceptualized for timber, but it now also covers associated resources like lemongrass.

The Dozam community forestry management group (CFMG) is composed of distillers, grass collectors, and firewood collectors. With its resource regulation by-laws, the Dozam CFMG has been managing, harvesting and distilling lemongrass oil since 1981 and supplying the product to a private enterprise, Bio-Bhutan. Bio-Bhutan buys the oil from the CFMG and exports the product to Europe. With a total community forest of 358 ha, Dozam community forest represents 0.7% of the potential area of lemongrass in eastern Bhutan. The production of 1.2 tonnes of oil from Dozam community forests accounted for 14% of average production of 8.9 tonnes in 2007 (MoE 2008). However, the CFMG still depends on the government forests for the wood supply since the group cannot meet the wood requirements from their community forest.

Livelihood activities and the contribution of lemongrass distillation to household income

The distillers among the respondents own some landholdings, with an average size of 2.4 ha. Maize and potatoes are mostly grown on dry lands and rice on irrigated paddy. Other lands are classified as *tsheri* for shifting cultivation, *pangzhing* for grass fallow and trees, and sokshing for leaf litter collection forests. Some also raise livestock, such as cattle, horses, pigs, and poultry. Their jobs at the lemongrass distillation provide additional cash income for the rural farmers, particularly those

whose incomes are at the lower end. At present, there are 41 distillation units at Dremetse and Dozam village.[4]

Distillation of lemongrass provides seasonal income for a maximum of six months from the onset of the monsoon rains in May until the decline of lemongrass growth in October. During these six months, each distillation unit on average employs up to 12 skilled and unskilled laborers, including two operators of the distillation units (one is usually the owner of the unit), six to seven grass collectors, and three firewood collectors. The wage rates paid to operators and grass and firewood collectors are the same whether or not they use organic or conventional management practices. Operators are paid Nu 50 per drum of lemongrass oil. Considering that on average five drums of lemongrass oil can be distilled over 24 hours, the total wages paid to operators amount to Nu 250 per 24 hours or Nu 125 per 12 hours (one shift). The distillation units are operated throughout the day and night. On the other hand, wage rates for grass collectors are based on the number of loads carried per day. The weight per load ranges from 25 kg for women to 45 kg for men. The number of loads collected per day varies depending on the abundance of grass in the different areas. The survey findings show that men carry on average 3.3 loads of grass per day while women carry 4.9 loads. As a result, the total weight of grass collected per day amounts to approximately 122 kg for women and 148 kg for men. Considering a male/female ratio of 1:1 among the grass collectors, it is estimated that an average of 135.5 kg of grass is collected per day. The wage rate for grass collectors is Nu 150 regardless of gender. The amount of firewood collected per day depends on the distance between firewood collection places and the location of the distillation unit. On average, one firewood collector collects and carries up to four backloads or 180 kg of firewood for an average wage rate of Nu 150.

The household income contribution of lemongrass harvest contributes 30% to the respondents' household income, next to agriculture (40%). Livestock contributes 20%, while daily wages and wood products contribute 6% and 4%, respectively. This clearly indicates that lemongrass is one of the main sources of cash income for households engaged in the business in the surveyed areas.

Employment in organic and conventional lemongrass distillation units

In a study, Yangzom et al. (2008) compared the seasonal employment and income of distillers, firewood and grass collectors working for an organically grown and certified lemongrass oil distillation unit and those working for a conventional lemongrass oil distillation unit in Dozam. Under conventional production of lemongrass oil, the farmers manage the conditions using their own harvesting practices. On the other hand, organic lemongrass oil production must strictly adhere to international guidelines on wild collection (WHO 2003; ISSC-MAP 2007). The most important requirements are: (i) resource assessment and definition of the botanical species including time of harvest; (ii) maximum harvestable quantities and annual records of harvesting volumes according to the area defined in the management plan; (iii) locally-defined good collection practices to ensure the long-term survival of the species; and (iv) a clear description of post-harvest practices, including an assurance that no chemicals were used over the last three years.[5]

Between the two types of production, the enterprise following organic procedure and guidelines reported a higher average net income for 2006-2007 amounting to Nu 32,000 (US$ 820, official exchange rate of US$ 1=Nu 39 in 2008) compared to the income of the enterprise using conventional practices for the same period of Nu 9,211 (US$ 238).

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[4] In Mongar district, apart from the 41 distillation units in Dremetse and Dozam village, there are 11 distillation units at Chaskar village and eight distillation units at Thangrong village. In Trashigang district, there is one distillation unit at Bartsham village and 13 in Udzrong village. In Lhuntse district, there are 15 distillation units at Tshengkhar village. Altogether, there are 89 lemongrass distillation units in eastern Bhutan.

[5] Other requirements are (i) a record of all substances used for cleaning, disinfection and pest control, training extended and supervision of procedures; (ii) assurance that co-mingling with conventional produce was avoided; and (iii) a transparent record of harvest volume, processing, and sales.

In 2006 and 2007, distillers, firewood collectors and grass collectors were paid the daily rate of Nu 150 from both types of production. However, those working in the organic lemongrass oil production enterprise were able to earn more because they had more person-days than those working in the conventional distillation unit (Table I.3). Comparing the total number of days of employment in 2006 and 2007, distillers involved in organic production had 129 days of employment more than their counterpart in the conventional distillation unit; firewood collectors, 378 days of employment more; and grass collectors, 135 days of employment more. The person-days for the three groups in organic distillation units were over 100% more than the person-days required by conventional distillation units.

Table I.3. Employment and income analysis of lemon grass oil production at Dozam

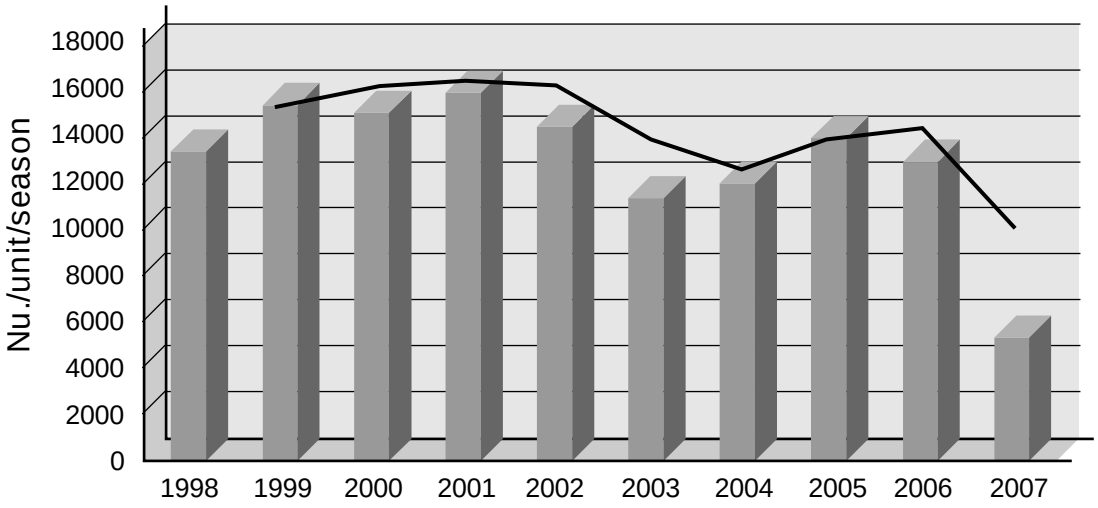
Employment and income	Organic		Conventional	
	2006	2007	2006	2007
Distillers (2 nos.)				
Days of employment	120	123	75	39
Rate of payment/day (Nu)	125	125	125	125
Gross income (Nu)	15000	15375	9375	4875
Individual income (Nu)	7500	7688	4688	2438
Firewood collectors (3 nos.)				
Days of employment	332	340	207	107
Rate of payment/day (Nu)	150	150	150	150
Gross income (Nu)	49800	51000	31050	16050
Individual income (Nu)	24900	25500	15525	8025
Grass collectors (6 nos.)				
Days of employment	125	128	78	40
Rate of payment/day (Nu)	150	150	150	150
Gross income (Nu)	18750	19200	11700	6000
Individual income (Nu)	9375	9600	5850	3000

Production and sale of lemongrass oil (1998-2007)

Production and sale of lemongrass oil peaked in 1998-99 and, since then, average production fluctuated until 2007, with an estimated annual production of 12.36 metric tonnes per year. The annual returns from sale of lemongrass oil also fluctuated since the highest sales at over Nu 8 million, with average annual returns of Nu 6.13 million per year. The decline in production is due to the unsustainable management and use of lemongrass and associated resources like firewood. The distillation process involves high firewood consumption (75 kg of firewood required to distill a kg of lemongrass oil) and water for distillation. Prommegger et al. (2004) attributed the decline of lemongrass oil production to alternative sources of income like wage labor, fluctuation in lemongrass biomass production, and shortage in fuelwood and water supply in certain pockets of lemongrass growing areas in eastern Bhutan due to environmental changes.

The distillers reported the highest net income (gross income minus cost of production) of per distillation unit per season from 1999 to 2002, peaking in 2001 at Nu 16,000 (Figure I.3). This went down to about Nu 11,000 in 2003, but rose again to Nu 14,000 in 2005. The distillers' net income was lowest in 2007 at below Nu 6,000. The net income of lemongrass harvesters, who were mostly women, per distillation unit in a season ranged from the Nu 3,800 (lowest in 2003) to Nu 5,300 (highest in 2006), with an average annual net income of Nu 4,700 per unit in a season.

Figure I.3. Net income per distillation unit of distillers in a season



It could be concluded that lemongrass distillers and harvesters reaped benefits in terms of seasonal employment and cash income during winter. Through this, the lemongrass cottage industry provides a livelihood option for the rural farmers (including a few students working as part-time workers) for them to earn cash for their needs.

Challenges in the lemongrass oil cottage industry

Although the lemongrass cottage industry is contributing significantly to the livelihoods of poor farmers in the eastern Bhutan, it is facing some challenges.

The primary concern identified by the respondents in six villages is the declining supply of the main raw materials needed for lemongrass oil production. Insufficient quantities of lemongrass, firewood, and water for the operation of distillation units was ranked as high priority in the villages of Dremetse, and Chasker, except Thangrong where water scarcity is severe. At Udzrong and Bartsham under Trashigang, water scarcity is severe; however, lemongrass and firewood shortage are not that severe.

Lemongrass can be harvested repeatedly for about 8-10 years. However, studies show that lemongrass availability in the distillation areas are declining as a result of unsustainable harvesting practices (RNR-RC East 1998; Lama 2004). The method of harvesting differs from site to site with a minimum cutting of two to three times per season depending on the altitude of the location. The distillers expressed their concern that three or more cuts per season and improper methods of harvesting were having adverse effects on the quantity of lemongrass growing in the wilderness.

To develop proper harvesting guidelines, a collaborative study was undertaken by a research center in Wengkhar, Conifer Research and Training Partnership (CORET) and the Social Forestry Division in 2005. The study recommended that cutting must be limited to two cuts per season and that during harvesting, the collectors should ideally retain 20 cm of the stalk above the ground level. The repeated cutting of lemon grass promoted the colonization of the area by weeds. According to Yangzom et al. (2008), guidelines for the sustainable management of lemongrass were established and now form part of the Dozam community forest management plan. The guidelines on lemongrass limit the annual harvest to two cuts per area and recommended the farmers to cut the grass at about 10-15 cm from the ground to maintain the reproductive capacity of the grass. Farmers related that frequent fires enhance the growth of weeds. There are four main reasons for forest fires: to promote the regeneration of fodder resources for cattle grazing in off-farm periods, to scare off wild animals, to avoid crop depredation and damages, and to induce lemongrass growth.

With regard to firewood supply, most distillers expressed that firewood has become scarce now. Firewood demand was initially obtained from collecting lops and tops and other dead, dying, or diseased chirpine

trees. These trees can be collected after paying a royalty to the DoFPS. In most cases, distillers use chirpine trees from nearby chirpine tree areas, but also occasionally use broadleaved trees sourced from FMUs to heat the distillation units. In response to the problem, the Department of Forests allowed distillers to source firewood from the FMUs through a firewood contractor. According to RNR-RC East (1998), an average of 16.5 truckloads (approximately 124 cu m) of firewood is burnt to obtain one metric ton of oil with an average fire wood consumption of 211 truck loads (1,582 cu m) per year. Yangzom et al. (2008) point out the high firewood consumption of about 75 kg per kg of lemongrass oil. Distillers, however, complained that firewood supplied by contractors is expensive and are often decomposed, which increases their costs of production. To address the constant firewood shortage, it is suggested that the distillers, in collaboration with the DoFPS, initiate the establishment of community plantations for high-intensity short rotation biomass production of indigenous or exotic fast-growing trees (for example, eucalyptus) suited the to socio-environmental conditions in the areas. Producing short-rotation firewood would not only meet firewood shortages, but also increases the distillers' net income by reducing the costs of production.

Lemongrass distillation units require a constant flow of water to cool the condensers. Some units are located near streams to have an accessible water source. Those located far from streams installed polythene pipes. Yangzom et al. (2008) proposed that the firewood and water efficiency of existing distillation units should be improved with the use of firewood substitutes through recycling of distilled grass and bio-energy plantation in collaboration with UNDP-Global Environment Facility and Bio Bhutan. The initiatives would not only reduce the cost of production but also increase the net income of distillers.

Some recommendations

Lemongrass oil production is one of the promising enterprises that can bring benefits to local communities to help reduce poverty, while at the same time conserve the environment. Most of the firewood and grass collectors are women, thus, women can gain more benefit from lemongrass oil production than the men who are mostly the distillers. To sustain the benefits from the lemongrass oil production enterprise, it is suggested that:

- Sustainable management of lemongrass harvest is practiced and strictly adhered to using the harvesting guidelines developed;
- More areas of chirpine-lemongrass ecosystem are brought under similar management under the framework of community forestry rules to multiply benefits to communities;
- Efficient distillation units and alternative biomass and non-biomass-based energy sources like fast-growing and environmentally adaptable tree species are established and electricity is tapped to reduce and eventually overcome firewood crisis and pressure on surrounding environment; and,
- Reliable sources of water for distillation units are tapped.

Case study 3: the contribution of Chirata to livelihoods of farmers

The practice of traditional medicine in Bhutan prevails until now. Local healers keep the indigenous knowledge on medicinal plants and their use. Chirata, locally referred to as *khalu* is well known for its bitter taste and medicinal value,[6] and is found in Shingkhar Lauri in eastern Bhutan. It is used widely to treat different human ailments such as fever, fungal infection, cough and colds, worm infestation, body pain, malaria, gout, and headaches. Among the species of the genus *Swertia* growing across the country, *Swertia chirayita* is the species with the highest commercial value and is in high demand in the international market. It grows mostly on former shifting cultivation areas (*tsheri*) near a number of villages. Chirata makes an important contribution to rural communities' cash income. The

[6] All parts of the plant, including leaves, flowers, roots, and stems are used. The plant is biannual and totally dies after seed dispersal during the second year.

domestic demand of traditional medicine is rapidly increasing to meet the requirements of the country's increasing population. However, the increasing number of rural households harvesting medicinal plants to generate cash income has caused serious concern about the conservation and sustainable use of medicinal plants of the country.

Chirata is one of the main sources of income of the farmers of the remote villages of Shingkhar Lauri. In 1998, 70 households in Shingkhar Lauri geog were depending on chirata as a source of income (Pradhan et al. 1998). The villagers harvested naturally-growing chirata that they sold to traders from India, although RGoB recently started to operate the auction of chirata. In recent years, the resource base is depleting. Respondents for this case study claim that 15 years ago, it was possible to produce at least 20 metric tonnes of chirata annually, but the production now is less than five metric tonnes. The factors causing the depletion of the resource base of chirata are:

- Ban on shifting cultivation (*tseri*) since 1993 to prevent the loss of forests and degradation of environment. Slash and burn agriculture is not allowed as fire under certain conditions usually escapes from the farmland into the forests. According to farmers, however, fire enhances the growth of chirata that grows in shifting cultivation land.
- Increasing number of collectors leading to over-exploitation
- Premature harvesting, thus, reducing the capacity for natural regeneration
- Lack of appropriate drying techniques and facilities
- Difficulties in transportation and marketing

Site description

Lauri geog is one of the remotest geogs in the Samdup Jongkhar Dzongkhag in the far eastern section of Bhutan. The geog is a distance of three days walk from Jomotshangkha Dzongkhag, the nearest road and market access point. The geog has 13 villages with a total of 539 households and a population of 4,303 people. The villages selected for this case study are Dungmanba, Momring, and Zangthi. The geog covers an area of about 27,800 ha, with an elevation ranging from 1,200 to 3,500 masl and heavy rainfall during the monsoon season (June-August). Shingkhar Lauri is rich in medicinal herbs like chirata, and star anise (*Illicium griffithii*). Chirata is widely grown in almost all of the villages of Lauri geog. It grows in association with other native vegetation in open and dry areas of degraded broadleaf forests, such as tseri land, fallow dry land, and grazing areas. It grows more abundantly in tseri land than in private agriculture land because the plants survive fire, and the seeds that are buried deep in the soil germinate once tseri is cleared.

In the villages of Dungmanba, Momring, and Zangthi, chirata is collected from different areas, mainly found in forests (mostly broadleaf) with less dense vegetation, in open and dry areas in rocky areas, and in steep slopes. Of the three villages, Zangthi has the highest density of chirata with 12 kg dry weight per ha (the average of the whole area is nine kg per ha).

Economic importance of Chirata

Farming practices at Shingkhar Lauri are evolving from the tsheri (shifting cultivation) system toward permanent agriculture. Because of the ban on shifting cultivation, tsheri is being converted into other uses such as wetland, orchard, and dry land cultivation. Agriculture, livestock rearing, and forestry related activities are major components of the farming system in the geog. The main agricultural crops are maize, foxtail millet, and wheat. Maize is the staple food with both local and improved varieties grown in the geog. Since wetland is limited, paddy cultivation is confined to a small scale. Local cattle dominate the cattle population with only few improved breeds.

Traditional harvesting of Chirata

Collection in each village is governed by well-defined community rules and regulations. The villagers

decide on the first collection day, based on their experience of plant maturity and the general labor availability trend in the village. Once the first day is fixed, the collection is organized by inviting one member from each household to join the collection for a period of 1-3 days. Thereafter, the limit on the number of members allowed from each household to collect is lifted. Most of the collectors used to put up a temporary shed near the chirata-growing area to have maximum collection. The groups have their own set of rules on harvesting, but these are not being followed strictly, and there is inequity in benefit sharing and conflicts in resource sharing. Through social understanding, each village or community restricts the collection of chirata within its jurisdiction to its own members. There is no violation yet on the village's respective collection area.

The main period for collecting chirata is December to January. To have the best quality, chirata should be harvested just after the flowering is over. The collectors set the day for the start of chirata collection. In harvesting, farmers usually uproot the entire plant since it is believed that the medicinal properties are concentrated in the roots. This practice puts at risk the sustainability of chirata. In the long-term, it demands measures for its conservation and sustainable use. For want of cash, the available resource is already under pressure.

Usually, the people uproot the whole plant and get what they can use until they are satisfied and no harvestable chirata is left. The collectors could harvest between 10-30 kg per day, depending on the weather condition, area, and available supply. As there is no drying facility, the harvested chirata is spread on the roof of houses or on the ground for three to seven days to dry. The method is labor-intensive and time-consuming. Drying is the main factor determining the quality of the raw product and price. The farmers tie the dried plants into bundles and carry these on their backs and bring these by mules to Jomotsangkha (Daifam).

Income from Chirata

The economic status of the farmers surveyed is generally low and they have limited sources of income. On average, a household's cash income is Nu 6,510, of which chirata contributes more than 40% (Table I.4). The other main sources of income are daily wage earning (25%), and livestock, specifically swine and poultry, for low-income families and cattle as source of dairy products for high-income families (20%). The collection and sale of star anise, another forest product collected in October-November for medicinal and kitchen use, makes a minimal contribution of only 5%, while chili contributes about 8%.

Table I.4. Farmers' sources of income

Sources of income	Income earned (in Nu.)	Percentage
Chirata	2738.6	42.1%
Daily wages	1612.0	24.8%
Livestock	1290.3	19.8%
Star anise	293.3	4.5%
Chilli	519.4	8.0%
Miscellaneous	55.5	0.8%
Total	6509.5	100%

According to many chirata collectors in Lauri geog, the market offers a higher price for mature and good quality chirata. Immature chirata fetches a low price because these will not yet have the bitter taste required by the customers. A low price is also paid for plants attacked by fungi, which can occur if the collected chirata gets wet while being transported to Jomotsangkha. The chirata management group agreed to collect mature plants and ensure this by collecting the plants only after seed dispersal, as prescribed in the group's laws.

Chirata is harvested between November and December, dried and stacked in bundles and sold in December and January. Plants are moistened for few weeks before transportation and are carried on people's backs or on horses to Jomotsangkha for marketing. A farm road is now available until Tokaphung from where vehicles can transport the products to the market. In the past, the Food Corporation of Bhutan used to

auction chirata. However, due to Indian militant activities disturbing the area, the formal marketing system ceased. Farmers individually sell their products either to Indian buyers or Bhutanese exporters. There are two main dealers located in Jomotsangkha to whom most farmers sell their chirata and star anise. A *tshering dorji* (dealer) said that dealers can buy chirata at Nu 160 per kg. A single dealer was buying all the products in 2011, and he suggested that the government should intervene to require an auction to ensure fair play. The dealers in turn sell to Bhutanese exporters. The exporters check the products, repack these in bundles, which they then send to India. The highest export price reached Nu 200 in 2000, which decreased to Nu 55 in 2004, and rose to Nu 152 in 2011.

Some recommendations

Local people have strong ethno-botanical and ethno-medical knowledge about chirata, which is currently not documented. Although they have their own set of rules for sustainability, these are not followed systematically under the user management group and therefore there is inequity in benefit sharing and conflicts in resource sharing. Government intervention on ensuring adherence to harvesting rules and marketing is required for the sustainable use of the resource and providing support in improving the markets for their products. The development of a management plan to manage, market, and protect chirata by a community self-help group is essential both for sustainability and income generation. Since chirata is harvested over a large area and small subsistence farmers and herders harvest a significant amount, studies should be done on the possibility of providing small drying facilities at the village level.

Outlook for forestry and poverty alleviation

The Royal Government of Bhutan aims to maintain at least 60% of the total land area under forest cover in perpetuity. At the same time, the RGoB aims to support the livelihoods of rural communities, which comprise 69% of the country's population and depend on agriculture and forest resources, to reach the target of reducing the proportion of the population living below the poverty line to 15% by 2015. The forestry sector in Bhutan can re-orient its policies and programs and contribute to reducing poverty by focusing the following strategies:

Non-wood forest products

The expansion of commercial harvesting of NWFPs is to be taken to a new level where it is restructured from largely subsistence production to commercial and industrial exports catering to a rapidly growing overseas market. Much of Bhutan's NWFPs need to be actively promoted in potential markets with a marketing emphasis as the cleanest and the least polluted natural environment in the world and on the organic and natural methods of production. This would not just include the exports of raw produce but also involve developing a wide array of downstream value addition processing of NWFPs products. This large-scale commercial development of the NWFP sector in Bhutan is envisaged to become an important foreign exchange earner rivaling horticulture exports and to gradually make a significant impact on the national economy. Additionally, the processes will effectively empower the rural poor by promoting self-organization and enterprise development through the development of cooperatives, community level business associations, and other necessary support mechanisms.

A key challenge in the expansion of the NWFPs sector will be to achieve a sustainable balance between commercial harvesting of NWFPs and ensuring their conservation. There is the real danger that these products could easily be over-exploited, with the possibility of destroying endemic plant populations. The lack of knowledge and awareness in local communities about sustainable harvesting methods will have to be addressed through appropriate training in crop handling, storing and drying. More research on various aspects of resource management and market opportunities for NWFPs will also need to be carried out, including studies on the prospects of broadening the range of NWFPs harvested. Adequate resource user rights and arrangements must also be provided to avoid potential resource use conflicts and to ensure that benefits accrue mainly to local communities rather than market intermediaries.

Community forestry

An essential and high priority activity for the 10th plan will be to expand the commercial harvest of timber and NWFPs under community forest management plans. There is considerable potential for harvest and sale of timber from community forests that are well-stocked. The formalization of timber harvest and market rules from community forests will facilitate timber sale and transaction for income generation by community forest management groups. There is considerable potential of the sector to significantly decrease unemployment among rural households and raise their returns on labor and investment. The revenue returns to labor from NWFPs are considerably much higher than existing agricultural wages. The most important NWFPs exported are cordyceps, bamboo, cane, chirata, pipla, mushroom, lemongrass oil, rosin and turpentine, incense sticks, and handmade papers. The rate of return on investment for harvesting certain NWFP crops, such as cordyceps and chirata, work out to as much as 500%, with further scope of enhancement through better harvesting and drying techniques.

Valuing ecosystem services

Recent studies reveal that forests are equally important for providing ecosystem services, such as regulation of water discharge for hydroelectricity, irrigation and drinking water supply, and ecotourism. The contribution of ecosystem services, however, is undervalued due to lack of appropriate policies, regulatory frameworks, scientific methods for quantification and valuation of these services that can greatly enhance the contribution of forestry to GDP and simultaneously contribute to reducing poverty of rural communities. A few initiatives are being piloted under the framework of PES. These include the scheme to plough back "payments" to watershed management upstream communities from the downstream generation of hydroelectricity in the Woochu watershed management, rehabilitation of black-necked crane habitats from ecotourism payments in Phobjikha – a high-altitude wetland management scheme – and payment for drinking water supply collected from urban households for community forest management groups in Mongar, eastern Bhutan. Such activities are at experimental stages and, if successful, may be scaled up.

Recommendations

Sustainability and the balancing with improved livelihoods are shared responsibilities of the government and the people of the country. Major areas requiring immediate attention for an overall development of NWFPs including their trade are identified, and these are: information, production, product improvement, marketing, and coordination. Improvements in these areas will be possible with research support and policy reorientation.

Research

- Documentation of NWFPs containing information on product description, uses, sources, inventory, indigenous knowledge, and other relevant information for dissemination
- Conduct of a systematic research and development program on sustainability, processing, and marketing on high-value NWFPs in collaboration with local communities
- Exchange of information through sharing of experts and exchange visits in capacity building among research institutions

Production

To ensure the sustainable supply of the NWFPs, the strategies suggested are:

- Integration of the management of wood and NWFPs in natural and plantation forests and agro-forestry systems
- Standardization of management practices for domestication and cultivation of NWFPs
- Research support for propagation techniques and qualitative assessment of NWFPs

Product improvement

- Improvement of harvesting techniques and guidelines for sustainable harvesting from wilderness and plantations
- Product diversification, improvement of processing, storage and transport methods
- Decentralization of processing near the raw material source to ensure more benefits to local communities and reduce wastage during processing and transportation
- Standardization of grades, encouragement of grading by collectors, and setting fixed minimum grades for value addition
- Encouragement of national traders or exporters from the country for product branding and marketing

Improved marketing

- Conduct of market research to understand markets and market channels
- Rationalization of the role of middlemen to safeguard against price increases
- Dissemination of market information to ensure fair prices to the collectors
- Encouragement of the formation of collectors and processors cooperatives to coordinate product development, collection, transport, and negotiate premium price

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II

Assessment of the contribution of forestry to poverty alleviation in Cambodia

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Introduction

Cambodia is one of the smallest countries in Southeast Asia, with a total area of 18,103,500 ha. It shares borders with Thailand, Laos, and Viet Nam. According to census data of the National Institute of Statistics (NIS) of the Ministry of Planning (MOP), the country's population in 2008 was approximately 13.4 million and annual growth rate was 1.5% (NIS 2008). The population is concentrated in the central plain where population density is highest at 261 people per sq km, followed by the coastal region with an average population density of 56 people sq per km. The highlands have the lowest population density at approximately 22 people per sq km.

The Atlas of Cambodia (2006) reports that over 84% of the country's population lives in rural areas with a large proportion dependent on forest resources for both consumption and income generation. On the other hand, according to the NIS survey in 2008, approximately 82% of the households live in rural areas and a large majority of these households engage in rice-based agriculture, collection of forest products, and livestock raising. The agriculture sector generates about 32% of the gross domestic product (GDP) and provides employment to about 80% of the country's labor force. Results of the Cambodia Socio-Economic Survey (CSES) in 2009 conducted by NIS show that approximately 80% of the population relies on forest-related livelihood activities (CSES 2009).

Forest resources

Cambodia's forests perform a range of important ecological, social, and economic functions needed for the development of the country. In relation to this, the National Forestry Policy Statement specifies five objectives for the forest sector, namely:

- conservation and sustainable management of forest resources to achieve maximum contribution to national socio-economic development;
- establishment of permanent forest estates managed in a sustainable way;
- maximum involvement of the private sector and participation of the local population to ensure food security, poverty reduction, and socio-economic development;
- provision of a wide range of coordinated multi-stakeholder processes to enable harmonization of different perspectives, interests, and objectives of various interest groups at all levels; and,

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- reforestation and protection of planted trees.

Within the comprehensive policies and strategies of the Royal Government of Cambodia (RGC) for economic growth, including rural poverty alleviation and livelihoods improvement, forests are emerging as a key component. Based on NIS data, many rural communities depend on forest resources for their daily livelihoods. Non-wood forest products (NWFPs) are an important safety net for the rural poor. In response, the new Forestry Law recognizes and ensures the customary user rights for local communities living within or near permanent forest reserves to collect wood and NWFPs for their household consumption.

To promote sustainable forest management (SFM) while meeting demands for forest products in the country, the formulation of forest management plans (FMPs) at national and local levels was recently initiated. These FMPs will guide the coordinated management of forest resources in both conservation and utilization, taking into account the conditions of the forest resources in each area and the forest products and services expected from those forests.

Forest cover and classification

In 1965, forest cover was estimated at 13.2 million ha or 73% of the country's total land area. Until the early 1970s, forest management emphasized the preservation of natural resources and sustainable production, which had little adverse impacts to the forest ecosystem. By 1997, forest cover declined to 58.6%. From 1998 to 2002, the government stopped all forest concessions and promoted tree-planting activities on degraded forest land and the involvement of local communities in participatory SFM. Re-planting activities between 1985 and 2002 covered a total of 11,125 ha.

To monitor the loss of forests, the Forestry Administration (FA) conducted a series of forest cover assessments in 1992-93, 1996-97, 2000 (partial), and 2002 (FA 2008). In 2002, forest cover increased to 61.15% of the country's total land area. The reduction in forest cover between the 1960s and 2002 was almost two million ha. In 2006, forest cover decreased to about 59% (10.7 million ha), with an estimated loss of 2% or 373,519 ha of forests in four years (Table II.1). Although official data shows that responses to forest cover decline were undertaken, the roots of the problem still remain, suggesting that unless the pressure for land, timber and fuelwood is curbed, forest coverage will continue to be in great danger. The loss of forests over the years was primarily due to: (i) forest clearance for shifting cultivation; (ii) illegal forestland encroachment; and (iii) conversion of forests to agricultural lands.

According to FA, the estimated annual net rate of deforestation in Cambodia during the period 2002-2006 declined to 0.5%. This is lower than the annual deforestation rate of 1.3% that the World Bank (WB) and the Food and Agriculture Organization (FAO) sources continue to cite, based on earlier analyses. There are provincial variations in the annual net rate of deforestation, the highest being in four northwest provinces.

Table II.1. Changes in forest cover (2002-2006)

No	Forest Type	2002		2006		Change 2002-2006	
		Hectare	%	Hectare	%	Hectare	%
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 Area	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		

Source: FA 2008.

Forest lands in Cambodia belong to the government, although the government recognizes prior access and use rights of local and indigenous communities and can issue long-term economic land concessions (ELC). The Forest Law of 2002 gives the FA authority to grant areas of production forest in the permanent forest estate to local communities for them to manage and derive benefits. The Forestry Administration is a government agency under the Ministry of Agriculture, Forestry and Fisheries (MAFF) with the mandate for forest resource management, according to the National Forestry Policy Statement and the Forestry Law. To improve efficiency, the government forest service went through an organizational reform in 2003 in line with the commitment of the RGC to implement "forest sector reform." Generally, forest management systems are implemented according to existing land and forestry laws, consisting of a hierarchical series of policy steps relating to the allocation of land for different purposes: indigenous titles, protection, production, and conversion.

The FA-controlled forests include the production forest and community forest areas of about 4.5 million ha, and almost one-half (2.25 million ha) can be classified as degraded forests. Of the total forest estate, 30% is presently covered under forest concessions (approximately 3.2 million ha) and the remaining 28% (approximately 3 million ha) is classified as other forests. About 4% are classified as protected forest (approximately 1.5 million ha).

According to the Community Forestry Office database (2010), there are currently more than 428 community forest (CF) sites established, covering 380,898 ha or about 26% of the total forest cover. These involve 757 villages, 247 communes, 92 districts, and 20 provinces. In 2010, the FA identified 288 potential CF sites covering 587,576 ha in 22 provinces. Thirteen CFs in Oddar Meanchey province (over 60,000 ha) are being developed as the first pilot sites for marketing carbon in Cambodia.

National economic development

Cambodia's economy grew at an average annual rate of 8.8% from 1999 to 2003. Although official development assistance continued to finance growth, foreign direct investments, especially in garment and tourism, played a key role in promoting growth. During this period, the textile sub-sector grew by 35.1% a year. The construction sub-sector became a pillar of growth, growing at an average annual rate of 20.1%. Recently, restored peace contributed to the rapid development of tourism and this sector grew at an average annual rate of 13.6%. Continued rehabilitation of the power and water sectors resulted in the electricity, gas, and water sub-sectors growth at an annual average rate of 10.2%. Although the share of the agriculture sector in total GDP declined slightly as other sectors grew, it still accounted for 32% of total GDP in 2003. Forests made a relatively small contribution to the GDP, not exceeding 4% between 1998 and 2001. This trend is likely to continue as Cambodia continues to diversify its economy away from direct dependence on natural resources.

During the economic take-off phase between 2004 and 2008, RGC accelerated the pace of the implementation of its second-generation reforms, in particular the implementation of the Public Financial Management Reform Program. It also increased investments in social sectors and infrastructure development to reduce poverty specifically in the rural areas. The efforts were focused on rehabilitating and building rural irrigation systems and provincial and rural road networks. Economic growth during the period 2004-2008 averaged 10.3% per year, with a record high growth rate of 13.3% in 2005. The overall recent economic performance was characterized by balanced contributions from agriculture, manufacturing, construction, tourism, and services. Economic performance declined to 6.7% in 2008 and 0.1% in 2009 as a result of the 2008 global financial crisis. GDP growth rose to about around 5.5% in 2010 and is expected to reach 6% in 2010 and 6.5% in 2012-2013. (KohSantepheap Daily, February 2011).

Since the first general elections held in 1993, the GDP increased to US$ 2.48 billion in 1993 to US$ 10.34 billion in 2008, and per capita GDP also increased from US$ 248 in 1994 to around US$ 738 in 2008. The accelerated economic growth during the period 2003-2008 resulted in the doubling of per capita GDP. One of the top priorities of the RGC continues to be the reduction of poverty, especially in rural areas. Through the successful implementation of the action plan spelt out in the "Vision and Financial

Sector Development Plan 2001-2010," now updated into the "Financial Sector Strategy 2006-2015" and the "Public Financial Management Reform Programme," the RGC achieved not only macroeconomic stability but also impressive growth over the last decade and raised living standards and reduced the poverty headcount across the country.

Protecting the gains made so far and staying on the path to ensure future gains in reducing poverty has now some added risks due to the global financial crisis. If the current situation persists for an extended period, people who are just over the poverty line at present can fall below the poverty line. The RGC is therefore taking urgent measures to put in place safety nets through subsidies and targeted labor-intensive work programs, like the food for work program, to protect the most vulnerable and the poor from the negative impacts of external developments on the Cambodian economy.

Poverty situation

The results of the CSES in 2007 show that the poverty headcount index in parts of the country covered by the 1993-94 survey declined from 39% in 1993-94 to 28% in 2004, and to 24.7% in 2007. In the rural areas surveyed, the poverty headcount declined from 43.1% in 1993-94, to 33.7% in 2004 and to 30.6% in 2007.

Over the three-year period from 2004 to 2007, the poverty headcount index for the whole country relative to the overall poverty line was reduced from 35% to 30%, at a rate of about 1.2% per year (Table II.2). The average growth in GDP during this period was 11% per year. The national poverty line for 2007 was Cambodian riel (CR) 2,470 or about US$ 0.61 per capita per day (at an exchange rate of CR 4,062: US$ 1 in 2007). The results showed a high concentration of the poor in rural areas. In 2007, only 0.8% of Phnom Penh City residents were considered poor. About 22 % of the population in other urban areas was classified as poor, while in the rural areas, the poverty rate was higher at over 34%. Of the total number of people who were poor, more than 92% lived in rural areas, compared to 7.5% in other urban areas and only 0.3% in Phnom Penh. The CSES results also showed a decline in the poverty headcount in the following areas from 2004 to 2007: from 4.6% to 0.8% in Phnom Penh; from 25.8% to 21.9% in other urban areas; and from 39.1% to 34.7% in rural areas.

Table II.2: Poverty estimates by region

Region	1993/1994		2004		2007	
	Index %	% of all poor	Index %	% of all poor	Index %	% of all poor
Poverty line						
Phnom Penh	11.4	3.1	4.6	1.1	0.8	0.3
Urban	36.6	10.4	24.7	7.8	21.9	7.5
Rural	43.1	86.5	39.2	91.1	34.7	92.3
Cambodia	39.0	100.0	34.7	100.0	30.1	100.0
Food poverty line						
Phnom Penh	6.2	3.3	2.6	1.1	0.1	0.1
Urban	19.6	10.8	14.2	7.8	12.7	7.3
Rural	21.9	85.9	22.2	91.1	20.8	92.7
Cambodia	20.0	100.0	19.7	100.0	18.0	100.0

Source: World Bank 1993/1994; SIDA & MOP 2004; World Bank 2007.

Poverty and forestry in national policy

National poverty reduction strategy

The 2003-2005 National Poverty Reduction Strategy (NPRS) serves as a comprehensive framework for poverty reduction. At the core of the anti-poverty strategy are measures to maintain macroeconomic

stability, shift resources to more efficient sectors, and promote integration within the global economy. Through a participatory process coordinated by the MOP, actions were suggested to improve rural livelihoods, promote job opportunities, ensure better health, nutrition and education, reduce vulnerability, improve capabilities, strengthen institutions and governance, promote gender equity, and focus on population concerns. With regard to strengthening institutions and improving governance, four critical areas are emphasized: (i) a judicial system that supports development and rights; (ii) a system of local governance that empowers people and communities; (iii) an administration that is an effective provider of public services and a trusted partner in development; and (iv) an environment where corruption does not impede development and social justice.

The 2006-2010 National Strategic Development Plan (NSDP) draws on the comprehensive Rectangular Strategy of the RGC and synthesizes various policy documents (Cambodia Millennium Development Goals or CMDG, NPRS, National Population Policy, etc.) and extensive consultations were held among many stakeholders. It provides the framework and direction for growth, employment, equity, and efficiency to reach CMDGs and well-focused and directed pro-poor and pro-rural development.

The Government's policies and strategies reflect a commitment to reduce poverty and inequality and improve the quality of life of the country's rapidly growing population, so that all Cambodians can enjoy the benefits of economic growth and participate in the development process. The government's priority poverty reduction actions, approved in December 2002, are (i) maintaining macroeconomic stability; (ii) improving rural livelihoods; (iii) expanding job opportunities; (iv) improving capacities; (v) strengthening institutions and improving governance; (vi) reducing vulnerability and strengthening social inclusion; and (vii) promoting gender equity.

The NPRS (RGC 2002) requires all sectors, including the forestry sector, to contribute to the national goal of poverty reduction. The success of the country in meeting CMDG 1 of eradicating extreme poverty and hunger is related to forest development. In the context of Cambodia where 90% of the population lives in the countryside and where approximately 57% of the land is covered by forest as of 2010 (Leng 2011), it was officially expressed that "Forests are Cambodia's most important natural resource for the county's development." Raised as a cause of major concern throughout the reviews, forest management options should be fully considered and balanced to ensure optimal forestry contributions to these major national development objectives. This will require security of rights to access and use of common property resources and an assessment of partnership options to improve rural livelihood from high-value forests. In addition, the CMDG 7 target is to maintain 60% land area as forest cover. In the revised Rectangular Strategy (2008), community forestry (CF) is prioritized as the principal vehicle for obtaining payments for carbon, through voluntary carbon markets and reduced emissions through avoided deforestation and forest degradation (REDD) mechanisms.

The Royal Government is strongly committed to achieve its prioritized goals and actions from 2009-2013 in the Fourth Legislature of the National Assembly by ensuring:

- Sustainability, peace, political stability, security and social order to promote the rule of law and protect human rights and dignity and multi-party democracy.
- Sustainable long-term economic growth at a rate of 7% per annum on a broader basis and more competitive capacity in the context of one-digit inflation.
- Poverty reduction at a rate of over 1% per annum and improvement of the main social indicators, especially education, health, and gender equity.
- Increased outreach, effectiveness, quality, and credibility of public services.

In the short-term, the RGC strongly encourages all development partners including the private sector, external development partners, nongovernment organizations (NGOs), civil society organizations, and private citizens who are able to provide financial support to communities adversely affected by the current economic crisis.

Forest policy

The RGC endeavors to implement a coordinated set of laws, programs, action plans, and institutional arrangements for forest resources that are directed toward the achievement of national goals of environmental protection, biodiversity conservation, poverty reduction, socio-economic development, and good governance. A policy brief that aims to contribute to discussions on SFM in post-concession areas toward MDG 1 on poverty reduction highlights the need for clear and secure land and user rights for long-term investments in SFM, the uncertainty of the future of concession forestry, opportunities in the form of partnership forestry, and expansion of community forestry and small-scale private plantations (CDRI 2006).

The RGC declared its intention to reorient forest policy towards increasing reforestation activities through the participation of local communities, the armed forces, and all levels of authority (RGC 2003). Furthermore, the government is strengthening its support to CF, which was mainly assisted and financed by NGOs. Many forest concessions were cancelled or suspended due to their unsatisfactory performance in terms of SFM, and some of the concession management plans are currently being reviewed and revised in compliance with the Forestry Law and new concession guidelines.

The RGC is trying to tackle the issues of deforestation and forest degradation by taking measures to improve forest management practices, to crack down on illegal forest activities, and to promote the participation of local communities in forest management activities, decision-making, and implementation processes under the supervision of the FA.

The RGC and people in Cambodia are faced with serious challenges to develop the national economy, alleviate poverty and, at the same time, ensure sustainability of the forest resources for future generations. The RGC does not have sufficient capacity to ensure the sustainable management and conservation of forest resources. Therefore all stakeholders and the Cambodian people need to take part in supporting the process. Collaboration with other countries, especially neighboring countries, is essential in sharing experiences and in coordinating on plans for economic development and measures for forest conservation. Local authorities, the private sector, local communities, research institutions, international organizations, and other relevant stakeholders will also serve as significant catalysts in the conservation of forest resources and sustainable development. Building and working with partnership is crucial to ensure the success of SFM.

The RGC adopted policies on the Development of Indigenous Peoples and the Registration and Use of the Indigenous Peoples' Community Land in Cambodia. The objectives are: (i) to ensure effective administration of State land and the conservation of State public properties, including forest land, natural resources, and the environment which are under the management of various State entities; (ii) to expand and strengthen the national economic base through promoting private sector investment in agro-industry (e.g., rubber plantations), minerals, and others; and, (iii) to mitigate risks of conflict of interest between indigenous peoples and the appropriation of economic land concessions to protect the best interests of the country.

Forestry reform

Major achievements and challenges in the implementation of the National Strategy Development Plan (NSDP) 2006-2010

The forestry-related laws and regulations were implemented with the collaboration of all concerned institutions to address forest resource management issues, such as prevention and control of illegal forest land grabbing. Reforestation and tree planting, CF establishment, forest boundary demarcation, wildlife and forest research and conservation, and the development of the National Forest Programme (NFP) were actively carried out as planned. To achieve the above goals in the forestry sector, the RGC is committed to implement an NFP with the following priorities:

- Strengthening of forestry management and conservation;

- Promoting plantations as a substitute for national forest demands by encouraging private investments and public participation;
- Promoting forestry's contribution to social and economic development;
- Promoting forestry's contribution to poverty reduction by strengthening CF initiatives and by involving local communities in forest exploitation plans; and
- Creating public awareness to enhance the replanting and use of community plantations for firewood and charcoal needs so as not to destroy forests.

The Forest Administration set up the Cambodian Forest Carbon Credit through the implementation of a sample project for carbon credit in the forest communities in Oudor Mean Chey. The initiative aims to tap the carbon market as a strategy to reduce poverty in rural areas and to mitigate the impacts of climate change and global warming.

Despite government efforts, illegal forest land clearing and land grabbing still persist. The Ministry of Interior plays an important role in issuing instructions to local authorities at all levels to strengthen related statistical data, monitor the movement and resettlement of newcomers, and to prohibit the allocation of forest areas for other purposes.

FA faces many challenges in carrying out its tasks, such as:

- lack of human resources and incentives for staff working in remote areas;
- dependence on forest by-products of people living in and around the forest areas, resulting in high pressure on the natural forests;
- difficulties in controlling illegal activities, such as illegal logging and forest land encroachment;
- difficulties in forest demarcation with encroachers destroying pole markers;
- lack of funds for forest research and development, forest management, and conservation; and,
- lack of offices and facilities for working.

Key policy priorities and actions: 2009-2013

FA continues to take action to implement the RGC's priority policies for the Fourth Legislature. The RGC's forestry policy aims to ensure SFM and the use of forests to improve the livelihoods of people living in rural areas and to contribute to economic growth. Besides banning logging for the present, the Royal Government's priorities until 2013 include establishing protected and biodiversity conservation forest areas, undertaking reforestation, formation of forestry communities, and carrying out proper boundary demarcation and strict measures to prevent, reduce, and eradicate illegal encroachments and occupation of forest land by private individuals.

The RGC considers forest communities to have an important role in forest management. In relation to this, the Royal Government of the Fourth Legislature will continue to monitor and evaluate the effectiveness and efficiency of this program in the improvement of livelihoods of the rural people, the sustainability of forest resources, and the expansion of forest communities. The Royal Government also encourages the private sector to establish commercial forest plantations in degraded forest lands based on agreed technical standards.

Further, the Royal Government will continue to monitor forest concessions to ensure that they comply with international standards by seeking external technical and financial assistance and by active and appropriate participation of civil society in monitoring. The government will continue to strictly enforce the Forestry Law and take serious measures against forestry crimes, and will continue to educate people to be aware of their responsibilities in protecting forests and stopping illegal forest encroachments.

Since forests are crucial to people's livelihoods, the RGC will enhance management efficiency of the

reserved forests and ensure their appropriate protection and development, including ecotourism, for employment generation and additional income for the people. Moreover, attention will be given to the management of the protected areas. The RGC will mobilize resources, support, and financing to participate in global efforts to address the challenges of climate change.

Past and current contribution of forestry to poverty alleviation

Subsistence use of forests and allocation of tenure over forest lands and resources

Traditional forestry

Indigenous and local communities in Cambodia have been using and depending on natural resources, especially forest resources, for their subsistence and livelihoods for generations. These communities often have long traditions of sustainable forest resource use and a wealth of knowledge and skills regarding forest resource and management.

Cambodia's natural resources provide a range of products and services to a majority of the population living in rural areas. Forests produce timber and a variety of non-wood forest products (NWFPs), and also perform important environmental functions, such as biodiversity habitat and protection of soil and water resources. Because a large proportion of the rural population in the country still live in or near forests, it is generally assumed that forest resources play a very important role in the livelihoods of a majority of Cambodia's population.

The RGC recognizes the traditional user rights of local communities and indigenous groups over forest resources. During the 1980s and the 1990s when forests were managed under the lower level of law called Anukret (Sub-Decree) No. 35, all forest uses for local people's consumption were allowed without the need for permit. Local uses included extraction of wood for house construction and collection of firewood and poles for making fences. Moreover, indigenous peoples have used forest areas near their homes as pasture areas for their cattle. Usually, during the six-month off-farm period, they would release their cattle into the forests for grazing. The latest Forestry Law 2002 clarifies traditional uses of forest products (RGC 2002). Shifting cultivation at the family scale, usually manual tree cutting and clearing, is considered by the law to be a traditional use. However, due to population increase and in-migration, shifting cultivation can cause serious problems of forest clearing. Other legal customary forest uses are the collection of dead trees and NWFPs. Customary user rights are also ensured in forest concession areas. Harvesting of trees traditionally used for resin tapping by local communities is prohibited.

The NIS survey in 2008 estimated that 82% of the households in the country live in rural areas and many of these households engage in the collection of forest products, in addition to rice-based agriculture and livestock production. Based on statistical results of the CSES 2009 conducted by the NIS, 78% of the men and 74% of women in Cambodia rely on forestry and hunting activities. Women play the main role in collecting fuelwood and important NWFPs, such as medicinal plants, poles, rattan, and wood. The year-round activities of women are very important for the daily livelihoods of local communities, as women in the rural areas are responsible for 80% of food production. More than 65% of the women in the country are farmers living within or near forests.

Some studies show that NWFPs are an important safety net for the rural poor. Firewood and charcoal are estimated to provide more than 90% of the total energy of the country. However, reliable statistical data on these products and the people engaged in their production are not available. One of the reasons is that NWFPs are mainly produced by a huge number of very small-scale producers across the country whose activities are not part of the formal sector.

Community forestry

In Cambodia, community forestry gradually developed since the mid-1990s through small pilot projects supported by the government and mainly by national and international NGOs. These projects showed that community forestry has considerable potential in protecting forests and enhancing their productivity and capacity to support rural livelihoods while, at the same time, stabilizing critical watersheds and ecosystems.

Community forestry is one of the priority areas to promote the forest sector in Cambodia. There are about 300 to 400 initiatives mostly supported by various NGOs. The Forestry Law and sub-decrees promote communities' participation in forest management, including the decision-making process for formulating management plans and internal rules. Throughout the CF planning process, local communities are encouraged to play a lead role in decision-making. Under the new organizational structure, the role of the local FA staff is to provide support, such as in providing technical assistance in the preparation of the forest management plans.

As provided under the Community Forestry Sub-Decree 2003, local communities that participate in CF projects have the right to manage and use forestlands in or near their villages for up to 15 years based on the agreement between the communities and RGC. The local communities can keep these secured land use rights as long as they abide by forest management plans that were agreed upon. A group can allocate their CF for different purposes, such as agriculture, protection, regeneration, production, and reforestation. They cannot, however, sell the land to a third party or divide it among themselves. Nonetheless, the Sub-Decree on Community Forestry does not include clear provisions about compensation for local communities if the State retakes the allocated CF lands for other uses. Through field extension efforts that explained the forestry by-laws, some community people have become aware of their rights in preventing the destruction of their resources. A lawsuit was filed against some violators of their management plans in the community. Further, active participation of women in CF management is encouraged, e.g., in their participation in the planning process and in their inclusion as members of CF management committees, as well as their capacity building and awareness raising, with assistance of international donors and NGOs.

The establishment of community forestry showed local communities that they have specific rights to participate in managing and using natural resources appropriately with the aim of contributing to upgrading the living condition of people and environment within the area (CFRP 2006).

The findings and recommendations of the Independent Forest Sector Review (IFSR 2004) based on research and consultations with forest sector stakeholders pointed out that CF should be continued and supported with a focus on developing an enabling environment to allow CF to be self-financing and self-sustainable in different settings. The IFSR also recommended piloting Partnership Forestry. The Agricultural Sector Strategic Development Plan 2006-2010 also stresses the importance of formalizing CF management. According to the economic model developed by IFSR, based on existing forest productivity and current levels of formal and informal fees, it is suggested that for a commune with 5,000 ha of reasonably good forest, the annual flow could be about US$ 150,000 (GFA II 2005). In 2006, Sub Decree No 79 or Nor Krar BorKar on Community Forestry Management was signed, which provides a basis for the formalization of CF.

The promulgation in November 2003 of the Social Land Concessions Sub-Decree by the Minister of Land Management Urban Planning and Construction, the main player in the registration and cadastral survey of all kinds of State and private lands, provides a mechanism whereby State lands can be transferred to poor people for residential and family farming purposes. However, the area for social land concessions is not defined yet. Land grabbing by local authorities and soldiers has become so critical that the Prime Minister issued an 11-point order to halt this practice.

Community forestry is based on the idea that appropriate involvement by local people in forest management will enhance the likelihood of sustainable use of forest resources and create alternatives for enhancing people's livelihood. In this regard, CF can be seen as an aspect of community development. It

is generally accepted that the existence of an effective local organization is essential to the success of a CF program. Providing resources is not in itself adequate to change a community's economic condition. The community must also have the capacity to organize and manage the use of available resources.

The implementation of CF in Cambodia to date is not able to contribute substantially to poverty reduction due to various factors. Forest-dependent communities and stakeholders have limited legal access to forest resources in terms of the extent or coverage and quality of forest resources. CFs are difficult to establish in suspended forest concessions and ELCs, regardless of community traditional use and dependence on forest resources in these areas. The relatively short duration of community rights to CFs (15 years only) implies the lack of guarantee of tenure security after 15 years elapse and the uncertainty in the evaluation criteria diminishes the incentives for communities to participate in CF management. The powers given to community forest committees to impose sanctions on illegal activities by outsiders are limited, and support of the FA is inadequate.

The community forestry program did not provide direct livelihood support to communities. In terms of economic benefits for the members, livelihood activities in CF are limited due to limitations in technologies, people's skills, and access to capital for organizations to engage in productive activities and add value to their forest products.

The success of CF depends on capable local organizations, but most of the organizations have not obtained full recognition by the government. The lack of tenure security reduces their motivation and incentive to actively participate in CF management. Also, the lack of legal status prevents communities from commercializing forest products to their full potential. The Cambodia Environment Management Project organized provincial and national CF networks in 1995 as venues for communities and other stakeholders to meet and share experiences. However, the networks were not sustained, and many became inactive when funding stopped. Also, either the assisting NGOs or the FA controlled the running of the networks. Further, the implementation of CF is in conflict with other land uses, namely, forest concessions, ELCs, plantations, agriculture, and mining. CF also suffers from the weak support and collaboration from institutions as well as the lack of capability of designated FA staff and lack of budget support for an extensive field program.

According to Sokh and Iida (2001), CF is increasingly seen as a viable strategy to improve livelihoods of the rural population and prevent further environmental problems by encouraging local communities to actively participate in the management of natural resources and in the implementation of SFM practices. Likewise, McKenney et al. (2004) showed the importance of community forestry in the livelihoods of forest-dependent communities given that forest products contribute approximately one-half of their household incomes and most forest activities are not legal.

Community-based production forestry

As a strategy toward SFM and poverty alleviation, the Community-based Production Forestry (CPF) program is an innovative form of forest management. The Wildlife Conservation Society in partnership with the FA is currently piloting CPF in the Seima area in eastern Cambodia. The site was designated as a conservation area in 2002. The system combines aspects of commercial forest management with community forestry and aims to demonstrate that a community-based enterprise can responsibly undertake commercial management of part of Cambodia's forests. The CPF initiative aims to combine biodiversity conservation with the maintenance of local livelihoods. Based on this model, community-based forest enterprises (CFEs) are to be set up at the village level, and these CFEs are then awarded timber harvesting rights. Contractors and other organizations undertake harvesting and marketing activities. Besides gaining tenure security and continued access to NWFPs, communities are to benefit financially from CFEs through direct employment in forestry operations and profit sharing. Income to the RGC will be through timber royalties and other taxes.

Cambodia Development Research Institute (CDRI 2006) reported that approximately 41.2% of all the households derive between 20-50% of their total livelihood value from the forests and almost 15%

of the households derive more than half of their total livelihood value from NWFPs. These figures clearly underline the importance of NWFPs to local livelihoods. The average absolute value of NWFP extraction for both consumption and sales is US$ 345 per year per household for households with medium income and US$ 280 per year per household for households in the low-income category. The report also showed that the value of collected forest products that are sold, traded, or exchanged for cash is surprisingly high, underlining the importance of NWFPs in the rural economy as a commodity group that is not only used as a "safety net." NWFP collection in Cambodia must be considered as a very important activity in the overall livelihood options for a majority of the rural people living in or near the forests.

The high value obtained from forest products as cash income points to the importance of trade and marketing. Very little is currently known about market linkages for NWFPs and there are very weak official channels and structures to accommodate this trade. It is therefore recommended that the trade and marketing structure of forest products be revised by removing restrictive license and fee requirements to encourage pro-poor trade and rural development, as outlined in the NPRS 2003-2005. Increased commercialization or marketing of NWFPs, however, also creates an increased need for effective and sustainable forest resource management systems.

Commercial and industrial forestry

Timber is the most valuable forest product in terms of the forestry sector's contribution to the economy, including earning foreign currency for the government. In Cambodia, large quantities of timber are used for the construction of houses and buildings and for the manufacture of furniture, bridges, wagons, and sleepers.

Forest concessions

During the 1990s and early 2000s, approximately 6.8 million ha were managed under a concession regime that contributed much less than expected (only 4-12 %) to the national GDP. The export of logs peaked in 1995 with about 590,000 cu m, then declined to 74,000 cu m in 2000, and was almost zero in 2007. The contribution of the forestry sector to the national GDP is limited but heavily underestimates

The establishment of this tree plantation by a private company on its economic land concession in a commune in Kampong Thom province was met with protests from local community members over the encroachment of the ELC into their community forest area and crop lands.

the contributions to rural livelihoods, which include NWFP collection, timber extraction for building houses and other subsistence-based products, income from unauthorized logging, as well as environmental services benefiting other economic sectors and the nation as a whole.

The forest sector needs rationalizing in terms of income generation. The concession forests area, community forests, and other production forest areas can add up to about 5.7 million ha. If estimated income is just US$ 8-10 per ha per year in timber revenue on average, there should be US$ 46-57 million in income. This potential income is not being realized at present, however. In addition, payments for the forests' environmental services through fees from ecotourism, income from carbon credits or other forest management efforts are being explored. These may provide income and other benefits more than logging and ensure sustainable revenue sources.

Almost one-half of the 4.5 million ha of production and community forests are under FA control. About 2.25 million ha can be classified as degraded forests with less production for the first 20 years. These can produce annually 0.5 cu m per ha of logs for a net value of US$ 54 per cu m (or US$ 60.75 million per year). The remaining 2.25 million ha of good and intact forest can produce 1.1 cu m per ha of logs that can have a net value of US$ 54 per cu m equivalent to US$ 133.65 million per year. Some investments in planting with natural regeneration potential will be needed.

Income for the FA, the RGC, or the economy as a whole depends on how the 10.8 million ha of forest lands are utilized. It is valid to compare the revenues from different uses of land that can be natural forests, plantations, or small-scale agricultural production. Essentially, even using conservative estimates, the forest sector can be managed along sustainable lines in accordance with the NFP and absorb NFP implementation costs while yielding a substantial revenue.

The projected revenue from production forests in the NFP Sustainable Financing Programme (Operational Framework) is rather low, considering the extent of the production forest land of 4.4 million ha (3 million ha of forest concession and 1.4 million ha of FA-controlled production forest). If there is US$ 10 per ha per annum net yield on an average, there should be a total of US$ 44 million available in the form of royalties from timber (Fraser Thomas Ltd., 2009). This could balance the cost of the entire NFP. However, if US$ 10 per ha per annum is not possible, the economic viability of the current forest cover may be questionable (Ibid.).

It is worth noting that the forest sector has an estimated sustainable annual timber harvest in the area of 4-4.5 million cu m, according to the NFP Sustainable Forest Financing Programme (Operational Framework). Assuming that only 10% will be allocated for timber production (equal to 425,000 cu m) and that the annual domestic demand is presently in the region of 283,000 cu m (FA 2008), there is a significant export potential for certified timber.

Large areas of unmanaged yet productive forests can play a direct role in improving livelihoods and providing employment through forest management activities and NWFP processing enterprises. However, forests and forest lands are under pressure from different groups of forest users and processes, such as allocation for economic concessions and internal migration, illustrating the need for management within forestry and across other economic sectors. Financial modeling based on conservative estimates indicates that the forest can be self-financing while maintaining social and environmental functions in accordance with NFP principles.

Payments for environmental services and carbon payments

Forests provide a range of environmental services that provide benefits for communities within and outside the immediate area of the forests. In Cambodia, forests provide an important protection for watersheds. In particular, they perform essential functions in ensuring fish breeding grounds and in regulating water flow to farmers in the lowlands. Forests also provide a home to a significant number of rare animals. The Cardamom protected forest covers the largest tract of primary rainforest in mainland Southeast Asia, together with other wildlife sanctuaries such as Samkos and Aural Mountains (Meta 2010).

Mlup Baitong, an environmental NGO, has been working with the villagers in Chambok to establish a community-based ecotourism (CBET) initiative with the dual aims of sustainably managing natural resources and improving the livelihoods of the people. Situated on the borders of Kirirom National Park and the community protected area, the ecotourism site covers 161 ha, with waterfalls, bat caves, lake, and forests in the community protected area that can attract visitors. The CBET in Chambok was established in 2003 and a lot of activities were conducted for natural resource conservation, income generation, and community capacity building. With the community's cooperation and facilitation by the authorities, Mlup Baitong provided training courses to community members for capacity building on forest management and for raising awareness about the importance of natural resources and their relation to ecotourism.

Through capacity building activities, the villagers are more aware of the problems caused by deforestation. They are committed to protecting the forest by conducting patrols to guard against illegal activities. Nine villages are part of the CBET project and they work together in patrolling the forest, marketing products, providing services to tourists, and managing natural resources, as well as building infrastructure such as roads and bridges and market stalls. Villagers patrol two to three times a week and report illegal activities to the FA. Through these activities, tourists are attracted to visit the plantation and the botanical garden located in the community. During visits, community members present the importance of ecotourism in their community and the conservation of natural resources. The CBET initiative is contributing to livelihoods by creating jobs for community members through related services and activities, such as homestays, plantation tours, ox-cart rides, food sales, and tour guides for swimming, hiking, and camping on the mountains.

The women in the community also formed a self-help group to save their earnings from the tourist visitor services. Chambok's community-based ecotourism has done well in natural resource management and in helping the community members improve their incomes. In 2006, the initiative was awarded a Certificate of Appreciation from the authorities and a medal from the Ministry of Tourism for their efforts.

Thirteen CFs in Oddar Meanchey province (covering over 60,000 ha) are being developed as the first pilot for marketing carbon in Cambodia. To promote forestry contribution to poverty alleviation, the FA set up the Cambodian Forest Carbon Credit through the implementation of this sample project for obtaining carbon credit for the forestry communities in Oudor Mean Chey as a strategy for rural poverty reduction and climate change mitigation.

Case studies

The three cases that follow describe the contribution of rural villagers' use of forest resources–wood and NWFPs–to their subsistence and incomes (as the main source for the poorer members or as supplementary income activities), given the limited farming and off-farm opportunities in the communes. For the first two cases, community forests were established in recent years, allowing legal access by the villagers to forest products for their traditional use, along with the efforts by assisting partners to build the capacity of the CF members to manage the forest and benefit from the resources economically and socially. Part of the challenge is developing the skills of the people to add value to their raw forest products. For the first case, the villagers' access to forests near their village is no longer allowed after the forest area was allocated for economic land concessions. Compared to the ELC, the community forest is much smaller, but supports many households depending on forest products for their livelihood. On the other hand, the case of the third site describes a situation where the concession's operation ended and the villagers have since been harvesting forest products. Their access to the forest resources allowed some households to improve their living conditions and acquire some equipment, including a means of transportation. However, the unregulated exploitation of the forest is leading to forest degradation and the deterioration of their resource base. Some households that shifted from farming to charcoal-making became poorer because of the debts they incurred. Three ELC companies that cover almost half of the commune are now threatening the village.

Case study 1: community forest in Pro Ngil commune in Pursat Province

Description of the site

Pro Ngil commune is located in Kravarng district, Pursat province. The commune consists of seven villages: Pro Ngil, Ou Srav, Ou Baktra, Svay Pak, Say, Somrong Yea, and Kampeng. There are 2,023 households consisting of 9,898 people. Infrastructure and basic services in the commune are limited. The villagers have very limited links to the outside market. The farthest village, Say, is about 16 km away from the communal town. The road that will help the people transport their agricultural and forest products is under construction. The irrigation system is insufficient: a reservoir used mainly for agriculture and three lines of irrigation system cannot irrigate the agricultural lands completely. Educational attainment and capacity of the local people are low. The lone health center in the commune cannot provide adequate services for the entire commune, especially the distant villages. There is only one secondary school, and because of poverty, most of the children stop studying after they finish secondary education as they are needed to help in agricultural activities. Shortage of clean potable water and irrigation supply are among the main problems in the villages.

According to the 2009 annual communal report, about 87% of people are farmers. Because of water scarcity during the dry season, the farmers cannot farm or increase their crop yield even though they have enough land. According to the communal clerical assistant and the head villager of Ou Baktra, the average size of homesteads is 0.25 ha while the average farm size is one hectare. The average rice yield is 1.5 tonnes per ha but this decreased since 2008 because of water shortage and low soil fertility. Farming depends heavily on the rain thus the people can do only one cropping a year. About 5% of the households have orchard plantations with mango, jackfruit and other fruit trees, and some coconuts. Some households depend on growing vegetables and a few raise some livestock. It is estimated that 52% of people in the commune are poor, 23% are well-off, and 25% are in the medium category. The poor are considered to benefit mostly from NWFPs and tree-cutting for selling to support their livelihood. Other income sources are manual labor and wood carving.

Research Team

Charcoal is a source of fuel and cash for rural families. Wood stacked in the kiln to make charcoal is mostly sourced from nearby tree stands or forests. The high demand for charcoal allows rural households to earn cash but threatens Cambodia's diminishing forests.

Some NGOs, such as CONCERN, DANIDA, RECOFTC, and the Future of Children, and the local FA, are involved in the commune to promote SFM. Their activities include forest inventory, work planning, forest management, and tree seed projects.

Forest management

The commune used to be rich in valuable resources. Some villagers recalled that from the 1970s to the mid-1990s, forest use by local people was mainly for their needs in the village and for small-scale trade. At that time, their forests were largely intact. However, from the mid-1990s to 2000, forest resources declined because of the increasing extraction of firewood for brick kiln and charcoal making, as well as wood for construction and carving. In 1999, six community forests were established for the management of the forest for sustainable use, especially for household use. There are a total of 1,625 CF members.

The forests in Pro Ngil commune administered by the Pro Ngil Forestry Administration Triage occupy a total area of 115,168 ha. Deciduous forests cover nearly 30% (33,646 ha), while less than 3% (318 ha) is degraded forests, and the rest is for other uses. The six community forests cover about 1.4% (or 1,668.8 ha) and the rest of the forest area is provided to an ELC.

Wood carving and the collection of firewood and NWFPs inside and outside the community forests are important sources of livelihood for a number of villagers. At present, these activities are reduced and woodcraft making almost stopped because of the lack of raw materials. The forest that the people were using was officially awarded as ELC to PHEAPIMEX in 2010, so they can only engage in traditional use of the communal forests, especially collecting NWFPs. Some people who rely on forest products inside and outside communal forests continue to use only the communal forests while others go to distant forests. Even though the ELC is outside the communal forests, these ELC forests still form part of the resource base of the people.

Forest utilization

People harvest forest products from the communal forests either for their household use or for selling. Almost 100% of the fuelwood is used for their household use. Tree poles are used for fencing houses and farms, while bamboo is used for making duck and chicken cages. Resin collected from inside and outside the communal forest is sold. A CF member who has a charcoal kiln collects the raw materials from his farm and other areas outside the communal forest, where he cuts trees for his kiln and also collects resin. Timber can be used either for personal construction or for selling to neighbors and other villagers. A villager whose family depends mainly upon forest resources related that her husband used to cut trees outside the communal forest to sell to the craft makers in the village and collect NWFPs only from the communal forest. At present, however, because resources in the communal forest are now reduced and a part of the forests was provided to the PHEAPIMEX Company, he has to go to another district, which is far from their home.

Only about 100 households in the commune mainly depend on collecting NWFPs, such as mushroom, bamboo, resin, vine, and charcoal, for their needs at home and for selling in the village for income. Women play an important role in collecting and selling NWFPs. During the rainy season, women collect mushrooms for food or for selling to their neighbors and other villagers. Men usually do the collection of firewood and charcoal processing, while the women do the selling.

The demand for trees for carving drives some villagers to cut the trees to generate cash. The local people involved in forest activities are mostly the poor who are landless or who may have a small piece of land.

Trading and marketing

NWFPs including resin, vine, mushroom, and charcoal are sold in the villages on a small scale. Resin is sold to the tradesman in the village who then sells these in Phnom Penh. Mrs. Phuong Ton, a resin trader, related that she always buys resin from villagers inside and outside the commune. Every year,

she can buy a total of two to three tonnes of resin to sell in Phnom Penh. However, the amount of resin has decreased because the villagers cannot collect anymore outside the communal forest.

There are four woodcraft shops in the commune. One of the owners, Mr. Kok Kung, produces tables, closets, chairs, and souvenir items in his shop. A tradesman buys his products and brings these to shops in Phom Penh and Siem Reap province. Mr. Kung buys wood and other raw material from villagers. The shops for woodcraft now face difficulties because the price of raw material has increased and there are fewer customers. Like the villagers who used to have free access to the forests, the production of the woodcraft shop owners is also adversely affected by the allocation of the forest near their village to PHEAPIMEX Company. This group of local people will now have to find other sources of income.

Contribution of forest incomes to household incomes

Farming is the main livelihood source in the commune but what people generally produce is not enough to meet their daily needs. Many families with smaller farms supplement their income by what they earn from collecting forest products or other jobs. Mr. Li Lor, for example, shares that from his one-hectare farm, he produces about two tonnes of rice, which cannot support his family. He therefore has to find other jobs, such as house construction and cow trading. Raising livestock provides a relatively high income for some of the households.

Some families earn money by collecting forest products far from their homes. They shared that their average gross income could reach US$ 200-300 a month, but were left with only US$ 50-75 a month after their expenses are deducted. They could incur lesser expenses if they cut trees in the forest near their houses. They can earn about US$ 125 a year from collecting and selling mushrooms and US$ 50 a year from resin. Charcoal making is their highest income earner, averaging more than US$ 250 a year.

In general, the study shows that forest resources are very important to the local people, as the main source of income for some, and as a source of supplementary income for others. Farming, livestock raising, and manual labor generate higher incomes than incomes from forest products. However, households who have little land depend heavily on forest resources for their household and cash needs. Before, people could obtain more income from forest resources (about US$ 200-300 a month on average) and enjoyed better living conditions. For instance, they could earn about CR 1 million a year from charcoal processing and firewood collection, depending on market demand. As such, some families were able to improve their houses (replacing thatch-roofing with tile-roofing), acquire some farming equipment, and also send their children to school.

Challenges and recommendations

Since 2009, the villagers have not been allowed access to forest areas they had been using for a long time and that are now designated as an ELC. Because of the lack of raw materials and the increase in price of wood, they were forced to discontinue their woodcraft activity. Income from NWFPs also decreased because the people could now collect them only from the communal forest. With less income, life is more difficult for a number of families. Those who depend on the forests have to find other jobs within or outside the commune.

The people are worried about deforestation, especially the loss of the commercially valuable tree species, *Dalbergia cochinchinensis* (rosewood), which is the main target of illegal loggers who are active in the area. Because of the demand for timber and charcoal, the forests in the area have been degraded. Forest degradation leads to less income for those engaged in NWFP collection, and their living conditions will suffer even further if the forests will disappear from the area. Another concern is that there may no longer be local high-value trees and enough stocks left for the next generations for their construction needs. The community forests established for the local communities are not enough for the traditional use of the communities and income sources, and are at risk of over-exploitation. The ELC does not seem to have any positive benefit for the villages in the commune. Deforestation has serious impacts on the villagers' livelihoods, such as the observed decrease in water supply that is in turn affecting their crop yield.

The people who depend on charcoal processing and selling NWFPs have difficulty in getting their products to the market and they get cheap prices for their products.

The high demand for forest resources in the area has led to the disappearance of wildlife, such as the tigers and elephants, and the loss of valuable trees.[1] At the present, there are trees with diameters of only 20 cm in the communal forest. There is a need to build the capacity of the villages for community forest management to strengthen their rights in protecting and ensuring forest sustainability. Livelihoods can be improved through providing opportunities to local people to shift to craft production using NWFPs. Other recommendations to improve the contribution of forests to people's livelihoods are identifying markets for NWFPs, providing training courses on making handicrafts from NWFP to add value to the raw products, establishing bamboo or rattan handcraft enterprises to reduce the cutting of trees for selling, increasing tree plantations in the area, and stopping illegal logging.

Case study 2: community forest in Trapang Kbal Khmoach community forestry in Kampong Thom Province

Trapang Kbal Khmoach community forest is located in Trapang Kroal village in Salavisaiy commune in Kampong Thom province. This community forest is one of 10 CFs managed by the Sala Visaiy Forestry Administration Triage. It involves 80 families and covers 907.51 ha.

Rice farming in Kbal Khmach

There are 16 families with their own rice fields or small croplands in the forest area within the CF, covering a total of 10 ha. They tap a stream adjacent to the forest to irrigate their rice field and crops.

Based on observation, rice fields in the village are less fertile since these were opened and planted for the first time in the early 1990s. The yields have been decreasing over the past decade. In the early 1990s, the rice fields had high yields ranging from two to three tonnes per ha when these were planted for the first time. Some fields, especially those closest to the natural forest area, that were planted with rice gave the highest yield of 3.5 tonnes per ha because of high soil fertility and enough rainfall. However, the rice yield decreased gradually to 1.5 tonnes per ha in 2000. This low yield could have resulted from lack of rainfall and reduced soil fertility.

The farmers in Salavisaiy commune can plant rice only during the rainy season because they solely depend on rain-fed rice farming. Toward the end of the rainy season, rainfall sometimes becomes scarce which can damage the crop. In response, the Salavisaiy commune council invested in rehabilitating the existing canals to store rainwater for irrigating their farms as the rainy season ends, in case of a drought. The capacity of the available irrigation system can cover only 20-30 ha of the rice fields in a village and can benefit only 11 out of a total of 19 villages in the commune. The people usually own land holdings ranging from two to five ha per family.

Most of the rice fields have no land tenure, issued by the village and commune chief. People who acquired their lands in the past obtained these through land allocation by the local authority and through encroachment into the forest land.

History of the Trapang Kbal Khmoach community forest

Some villagers and CF members related the background of the community forest in the village. Before 1980, the forest land was covered by evergreen forest that was abundant with different timber species and wild animals.[2] In the 1980s until the mid-1990s, timber extraction, NWFP collection, and extensive

[1] Among the valuable timber species that were cleared include: *Dalbergia bariensis*, *Pterocarpus pedatus*, *Dipterocarpus punctulatus*, *Xylia xylocarpa*, *Shorea siamensis*, and especially *Dalbergia cochinchinensis*.

[2] Many species of timber, such as *Sindora cochinchinensis*, *Anisoptera costata*, *Dipterocarpus obtusifolius*, *Vatica astrotricha*, *Melanorrhoea laccifer*, *Dipterocarpus tuberculatus* and some wildlife, such as the East Asian porcupine, slow loris, langur, red muntjac, common palm civet, fishing cat, wild pig, lesser mouse deer, and others used to abound in the forest.

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Members of the Trapang Kbal Khmoach community forest apply the skills they gained from trainings in making baskets and other handicrafts from rattan for their group enterprise.

wildlife hunting by local people gradually degraded the forest. Around the mid-1990s, they started encroaching into the forests, converting these into rice fields, croplands, and plantations. There was overhunting of wildlife, such as wild pigs, red muntjac (barking deer), snakes, Siamese hare, red jungle fowl, and other animals for food and trade. The evergreen forests were transformed into semi-evergreen and deciduous forests and fallow land. Continuing tree cutting and hunting activities by the people in the early 2000s resulted in further forest degradation, which led to the loss of some wildlife species in the area.

The establishment of Trapang Kbal Khmoach CF, as well as other CFs in Kampong Thom province, was initiated in 2003 with the help of the organization, Buddhism for Development. The CF members voluntarily participated to establish and support the CF initiative. The CF organization comprised 133 people (80 families). They organized the community forestry management committee, composed of five members who were selected by the group as prescribed under the Forestry Law. There are at present 10 CFs within the Salavisaiy commune, which has a total of 1,149 families. This year, 98 more families joined the CF organizations. Each member is required to contribute CR 200 per month (US$ 0.05) to support CF members who patrol the forests. The traditional use of forest resources is restricted for all the members and they have to request permission from the CF committee if they need a tree (or two) to build a house.

Forest resource and people's livelihoods

The forest is a source of various products, such as food products (wild vegetables, fruits, and occasionally meat), timber, poles, firewood, and traditional medicine, as well as environmental services including the role of forests in relation to improving soil fertility through soil surface decomposition and the humus soils that are transported to rice fields and plantations in lower areas.

Cutting trees and poles and collection of some NWFPs are done all-year round. Harvesting of some NWFPs, however, is short-term, depending on their seasonality. Different kinds of wild fruits can be harvested in the months of March to September. Mushrooms appear in June and July, while bamboo shoots are available in May to June.

According to a survey, around 40% of CF member families can earn some income from selling wild fruits and vegetables every year. Some families can earn CR 40,000-120,000 (US$ 1-3) or as high as CR 150,000 (US$ 3.75) from harvesting wild fruits. For example, Mr. Torn In, who is a member of the CF management committee, earned CR 120,000 (US$ 3) from collecting and selling wild fruits last year. It is usually the women who sell the wild products in the village or commune. Almost 80% of the families in the CF eat the wild vegetables and collect these from the forest nearby when needed. Some wild vegetables, when harvested in large quantities, are sold at the market in the village or in town. Honey can provide more income than wild fruits and vegetables. About 30 out of the total 98 families in the CF organization earn an income of about CR 500,000-800,000 (US$ 125-200) during the honey-collecting season. A villager reported to have earned CR 1,100,000 (US$ 275) from selling honey last year and this amount was considered the highest individual income from harvesting honey.

Firewood is used not only by the CF members, but also by all villagers in Salavisaiy commune, mainly for cooking and burning to protect their animals from insects. The average use of firewood by a family ranges from two to three carts per month (costing about CR 40,000-50,000 per cart). All 80 families belonging to the CF use the firewood they harvest for free from the community forest. As they get these for free, the families save the money they would have spent on buying firewood for their daily needs.

Based on a survey, about 50-60% of the families in the CF earned CR 200,000-500,000 (US$ 50-250) per month per family from selling firewood and poles. Before entering the community forest, the CF members must ask permission from the CF management committee. For requests to cut trees and saw wood for building a house, a member is required to submit an application to the CF committee and local FA officers. Many villagers use big and small poles to build fences around their houses, rice fields, and plantations to keep off wild animals. Today, hunting of wildlife species for food is rare because there are fewer wild animals and this activity has been declared illegal.

Wood and NWFPs are sold at Kampong Thom provincial market. Around 60% of the total forest and NWFPs (such as firewood, charcoal, small and big poles, sawn wood, and wild fruits and vegetables) supply the needs of restaurants and hotels at the provincial center. Some buyers regularly visit the villages in the commune but the quantities of local products are often too small to supply the market demand. The products manufactured from NWFPs, including bags, small and big round baskets, flat baskets, tables and chairs, and other handicrafts, are sold to traders from Phnom Penh and Siem Reap province who order these products for their shops. Similarly, honey and traditional medicines are sold to users in the commune and province and to travelers.

Income from forest products

Based on the estimates of CF members, there are 60-70% of CF members who depend on collecting and selling forest resources such as honey, wild fruits and vegetables, medicinal plants, firewood and big and small poles for selling. In general, the overall income earned is from CR 1,600,000-1,800,000 (US$ 400-450) per household per year, and this amount makes up 50-60% of the total income for a family. About 30% of the total families in the CF can earn additional incomes of about CR 2.5-3 million per year (US$ 500-750) from selling small and big poles and sawn wood.

On the other hand, based on the village head's estimation, the income from forest resources provides around 30% of the total income of a family. At present, around 15-20% of CF members can land seasonal jobs in a company that has invested in an acacia plantation in Kampong Thom province since 2007. They can earn more income for their families, thus, helping reduce pressure on the natural forests. Their wages are based on their workload, which can amount to CR 8,000-15,000 (US$ 2-3.75).

According to a survey done by Hasen and Neth for CDRI in 2006, the net conversion into cash of natural forest products used by people in Kampong Thom province was US$ 265 per year. From the forest each year, the poor could get 42% of their annual income or US$ 280, whereas families at medium level could get 30% of their annual income or US$ 345. These benefits from the forests were obtained through the sale of firewood, charcoal, resin, wild meat, fish, wild vegetables and fruits, construction materials, and honey.

Capacity building for CF members

Educational attainment among the younger members of the Trapang Kbal Khmoach CF and the population of Salavisaiy commune is relatively higher (having finished elementary or secondary education) than the older members. With the support of NGOs, CF members engaged in manufacturing NWFPs have undertaken training to develop their skills to braid rattan and to make other handcrafts. The development of their skills allows them to add value to their products and earn more than just selling these as raw materials.

Likewise, both the members and the management committee of Trapang Kbal Khmoach CF have participated in many extension activities and trainings, such as paving the firebreak, conducting forest inventory and patrols, managing organizational funds, increasing awareness of forest laws and other relevant regulations, and facilitating conflict resolution.

Trapang Kbal Khmoach CF benefits from the support of local NGOs such as Agence Française de Développement, Oxfam, Community Forestry International, and Balai Diklat Kehutanan, and government agencies such as the Forestry Administration, as well as the commune and district council. Other CFs from Kratie and Stueng Treng province and students of the Royal University of Phnom Penh organized by RECOFTC have visited to learn about the Trapang Kbal Khmoach CF's experiences. In many workshops in the province and Phnom Penh, representatives from the CF have also shared their experiences and lessons in how they are managing their organization These forms of interaction aim to establish partnership networks and find support from NGOs and other development partners to build the technical and financial capacity of the CF and improve people's livelihood by creating micro-credit services and obtaining livelihood support.

Challenges and recommendations

Trapang Kbal Khmoach community forest helps the members in addressing their poverty by providing materials for their subsistence and domestic use and income sources. Unregulated forest resource exploitation prior to the 2000s led to forest degradation. The CF was established in 2003 and has since been well-managed until now, ensuring better conditions of the forest resource to support and ensure the livelihoods of the members. The incomes derived from forest resources are variable depending on the quantity of forest resources, ways of collecting NWFPs, competition with outsiders, and market demand and access. Recommendations proposed by CF members to improve their organization and livelihoods include the following:

- Provision of trainings on manufacturing skill and marketing will improve their small enterprises through the integrated commune investment plan or CF development plan, since CF members lack professional skills to manufacture NWFPs into handcrafts and furniture.
- Provision of trainings on sustainable forest uses and management at the CF and commune level will improve their skills to harvest properly and maintain their resource base. Although people in the commune can exploit the forest and derive some benefits, they still do not know how to extract the NWFPs with minimum negative environmental impact.
- Investment projects are needed to integrate livelihood improvement into the forest-and-livelihood development plan at the levels of the commune and CF. Funding from government and development partners should be allocated mainly to establish and develop economic activities such as micro-credit, rice and animal banks, and other farming and marketing activities including integrated farming system, animal raising and production.
- Alleviating poverty depends not only on the forest but also on other sectors such as education, business, agriculture, health, and social networks. These should not be overlooked in commune investment and development plans, and must be integrated, assessed, and monitored well, and supported with sufficient funds and strong partnerships.

Case study 3: community access to a former forest concession in Reaksmei Samaki Commune, Kampong Speu province

Study site situation

Reaksmei Samaki commune is located in the province of Kampong Speu, which lies to the west of Phnom Penh City. The topography of the province varies from large areas of lowland paddy fields in the east to a mixture of lowland-upland and upland forested areas in the west. In 2004, the Ministry of Planning classified Kampong Speu as one of the three poorest provinces of Cambodia. Its average population density of 102 people per sq km is higher than that of the entire country, which is 75 people per sq km.

The 2010 annual commune database shows that Reaksmei Samaki commune has 2,977 residents or 705 families and about 42% of the households are poor. The commune has two primary schools with 10 classrooms, but these are very limited in terms of capacity to accommodate more students. The commune has a total agricultural land of 2,611 ha for rice cultivation (NCDD 2009). Each household has a paddy field of at least 0.5-1 ha on average for wet-rice cultivation, but these do not have land titles yet. According to the commune chief, wet rice and farming rice yields are very low at approximately 1.5-2 tonnes per ha, and are not sufficient in meeting a household's demand for an entire year. Aside from farming, the people in the commune are engaged in livestock production, harvesting of wild food from the forests, and fisheries. Many households cut trees for fuelwood and for charcoal making. In 2002, the Lutheran World Federation organization helped in constructing the road going to the Reaksmei Samaki commune, as well as in providing vegetable seeds and livestock and other materials for livelihood alternatives to local people such as livestock and fish production, sugarcane planting, and crop cultivation.

Research Team

With the cash that a number of households generated from forest resources, they were able to acquire various means of transportation to bring forest products to the market. This situation led to the increasing degradation and even loss of surrounding forests.

Yearly, the forest resources in the Reaksmei Samaki commune are increasingly degraded due to unsustainable use by the local people and illegal logging. Now, almost half of total forest land in the commune has been converted into an ELC to plant oil palm and jatropha.

History of utilization of forest resources in Reaksmei Samaki commune

Before 1993, Reaksmei Samaki commune had a dense forest with lots of big trees, some having diameters bigger than 50 cm. Local people cut these trees to build their houses and to sell for household income. During the Khmer Rouge regime, explosive mines were widely scattered in the forests so the local people were afraid to go in to cut trees.

After the integration of the Khmer Rouge in 1998, the government removed the landmines. The government put the public state forest land under a forest concession and a private company began to log in the area. During the concession period (1998-2002), the company owner did not allow local people to enter the forest concession area to cut trees or even collect NWFPs for traditional consumption. The restrictions of the private company badly affected local livelihoods and resulted in poorer households. In 2002, the concession stopped its operations. In 2004, the poverty rate in Reaksmei Samaki commune was 50.9% based on the poverty data of the Aoral district data book in 2009.

By 2004, after most of the luxury trees[3] and good quality timber had been cut, the company stopped operating. Households living around or near the forest then began cutting trees in the forests to construct their houses and charcoal kilns. In 2005, a few traders would come to the commune to buy firewood and charcoal from the people. The firewood and charcoal market in the commune rapidly expanded, which allowed the community members and outsiders to earn money. Consequently, the traditional use of forest products was replaced by illegal forest harvesting, though there were local households that continued to cut trees to produce firewood and charcoal on a small-scale, an activity considered as a form of traditional use.

After the concession period, some households abandoned rice farming and turned to charcoal production, expecting more income. In response, the commune authority recommended that households undertake rice planting and rice cultivation or charcoal production in the dry season. Some households also cultivated crops around their houses, such as maize, peanut, cucumber, cabbage, eggplant, pumpkin, jackfruit, mango, and pineapple.

In 2009, about 7,955 ha of the forest was allocated to an ELC company, Fortuna Plantation Ltd. The company signed a contract with the MAFF for a duration of 70 years. The purpose of the company was to invest in an oil palm and jatropha plantation.

Traditional use of forest resources

Article 40 of the Forestry Law recognizes the right of local communities which live within or near the permanent forest reserves to use all forest products and by-products (such as medicinal plants, pole trees, wild vegetables and fruits, resins, rattan and fuelwood) without acquiring a permit from the local forester. Harvesting depends on the seasonality of the NWFPs (Table II.3).

Table II.3. Seasonal calendar of forest resource gathering

Nonwood forest products	Monthly seasonal calendar											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Fire wood and charcoal												
2. Medicinal plant												
3. Wild fruit collection												
4. Mushroom												
5. Resin												

Source: Fieldwork in Reaksmey Sameakki commune, Aoral district.

As there is no medical doctor in Reaksmei Samaki commune, the people depend on traditional medicine, such as medicinal plants, based on their indigenous knowledge. They gather medicinal plants for household use during the dry season or as necessary. People collect mushrooms at the start of the rainy season (from July-August). Mushrooms, such as Kchor and Kngok mushrooms, are for household consumption only or for sharing with neighbors. Sokrom and Pchek mushrooms are collected for selling. Wild fruits are collected from the forest in the dry season from March to April. Examples of these are kuy (*Willughbeia edulis roxb*), ser moen (*Nephelium hypoleucum Kurz*) and

[3] Luxury trees are rare hardwood species that grow slowly and command high prices.

pong ro (*Schleichera oleosa [Lour.] Oken*). In the past, people would share with each other the meat of wild animals they hunted or trapped in the forest. Now, they hunt and trap illegally for selling as a source of income. The wild animals that local people hunt and trap include the Sunda pangolin, wild pig, reticulated python, Bengal monitor, and red muntjac. Selling firewood and charcoal is an important income source for the villagers that they traditionally practice during the dry season from November to June. Most people cut trees to produce charcoal in their kilns that are usually constructed behind their houses. They can produce on average approximately two kilns of charcoal per month. They also gather small pole trees and bamboo to construct fences, chicken cages, pigpens, and trellises for supporting plants or vegetables.

NWFP market and household income

Most charcoal producers transport their products to sell to individual households in Chheu Chrung, Trapeang Kroleung, and Kampong Speu province who can pay higher prices than those offered by traders in the village. There is a big market for charcoal in Phnom Penh City due to the demand among households and restaurants. However, households that do not have means of transportation sell charcoal to village traders directly. They can earn CR 500,000-1,000,000 (US$ 125-250) in a month. A small charcoal kiln can produce charcoal twice per month. The process includes cutting a tree, preparing the wood in the kiln, burning the wood until charcoal is produced, and preparing the charcoal for selling. A producer who obtains a loan from a trader usually gets a lower price of CR 300 per kg compared to the market price of CR 400 per kg if the producer has no loan from the trader.

Outside traders also buy certain NWFPs in the village, such as porpol buy bark for producing incense sticks, sokrom and phleuk mushroom. According to the village chief, sokrom and phleuk mushrooms are transported by middlemen to Phnom Penh City and then exported to China and Korea for producing medicinal products.

Table II.4: NTFPs prices and markets

Type of NTFPs	Price*/Kilogram	Market
Bark of Porpol Buy	CR 400	• Sold to traders from Trapeang Kraleung who come to the commune to buy products
Sokrom mushroom Phleuk mushroom	CR 1,500 CR 2,000	• Sold within the commune • Transported to Trapeang Kraleung for selling
Fire Wood	CR 15,000-18,000 /stack	• Sold within the commune
Charcoal	CR 300 – 400	• Sold in Chheu Chrung, Trapeang Kroleung and Kampong Speu if the farmer has advanced money from the trader

Source: Fieldwork in ReaksmeySameakki commune, Aoral district.
*Note: * CR 4,062 = US$ 1 (2007)*

The officer of the Tasal Forestry Administration Triage explained that while Article 40 of the Forestry Law allows local communities to have full rights to barter or sell forest by-products without the need to obtain a permit if these activities do not pose a significant threat to the sustainability of the forest, a trader or any third party, who collects firewood or charcoal from the local communities for trading is required to get a permit for firewood and charcoal transportation after paying royalty and premium fees.

Forests play an important role in providing jobs and incomes to local communities that live within or near the forests if they are sustainably used. However, collection and sale of porpol buy bark and mushrooms are seasonal activities, i.e., when the mushrooms are in season or during periods when there is less farming work. The chief of the commune said that poverty will be reduced in his commune if local people engage in agriculture and gathering of NWFPs or other forest resources to increase their income.

Livelihood situation after concession period

Based on the commune's poverty data, the poverty rate in Reaksmei Samaki was reduced from 50.1% in 2004 to 42.4% in 2009. This shows that during these five years, when local communities in Reaksmei Samaki commune had free access to forest resources to earn money for their family, the poverty rate decreased by 7.69%. Now, many households in the commune own vehicles or machinery, such as motorcycles, oxcarts, or power tillers they can use to bring their NWFPs (firewood and charcoal) and agricultural products to the market. NWFPs provide additional income and have allowed some households to improve their houses.

Mr. Lon Yan, a charcoal producer in Reaksmei Samaki commune, said that his family did not have the money before to buy a power tiller that they could use to transport charcoal from the forest to the village or market. He needed to pay for the cost of about CR 50,000 (US$ 12.5) for each trip to bring charcoal from the forest to his house. Using his income from forest resources, he was able to buy a power tiller and he can now save what he would spend before on the rent of a power tiller to transport his charcoal to the market and can find buyers who offer a good price for his product.

Challenges and recommendations

With the forest increasingly degraded yearly, charcoal producers need to go far from the village to gather or cut trees. For example, one charcoal producer related that in 2004, his family would rely on cutting trees behind his house to make charcoal. Now, he needs to go as far as 10 km to get trees for his kiln. People are cutting trees illegally for firewood and charcoal production, which threatens sustainable forest use. The road that the government and the Lutheran World Federation organization developed connects the villages to the markets, allowing local households who own a car or power tiller to transport their firewood and charcoal products on their own to markets to get higher prices than they would otherwise get by selling to middlemen in the commune who offer lower prices. However, the road also seems to be contributing to forest degradation as traditional use of forest resources is gradually being replaced by commercial illegal tree-cutting activities by some local people.

Some households that have abandoned their agricultural lands and now collect forest products live a hand-to-mouth existence. There are community members who borrowed money from traders or middlemen to buy motorcycles or power tillers to transport their firewood and charcoal. This did not improve their livelihoods and instead they are faced with food insecurity and debts with increasing interest charges.

Three ELC companies cover almost half of the total land area in the Reaksmei Samaki commune. According to the commune chief, the concessions overlap with the villagers' agricultural lands. The villagers filed their complaint with the court to protect their claim to their land.

Results from the study show that forests can make a significant contribution to the welfare and livelihoods of local households in Reaksmei Samaki commune. Poverty reduction and gender equity also need to be understood and resolved at the political level, and integrated in SFM. To ensure sustainable use of forest resources in Reaksmei Samaki, establishing community forests should be explored with active participation from the communities in the commune for them to gain control over the forest resources and land tenure. The socio-economic and governance context of community forest resource use is as important to the contribution of forests to local poverty reduction as the nature of the local forest resource. The local forester of the Tasal Forestry Administration Triage recommended that the participatory approach to the management of the forests in the commune by local communities and other stakeholders is necessary.

Outlook for forestry and poverty alleviation

There is a need to optimize the contribution of forests and the forestry sector to poverty alleviation and to the economy through enhanced forest management and technology. The majority of the population depends on access to forest products, especially for food, fuelwood, small-scale timber and pole

harvesting, resin tapping, fodder, and traditional medicines. Thus, local peoples' rights of access to forest resource utilization are fundamental. The contribution of forests to the national economy is not fully realized and the GDP share of the forestry sector continues to decline. The challenge is to capture revenues from extractive activities relating to forest and non-forest products and to fully account the values of biodiversity conservation and environmental services.

Economic outlook: 2009-2013

In mid-2009, the economic outlook in the very short-term faced two important downside risks. The first was the uncertainties about the severity and duration of the global financial crisis and the ongoing economic recession in developed economies, as well as the potential impact of the swine flu epidemic on the tourism sector. The second risk was a very slow pace of economic recovery in developed economies. With timely responses by the RGC in relation to the severe global financial crisis, the downside risks and the negative impact on Cambodia's economic growth as well as on the wellbeing of people, especially the poor and vulnerable, were minimized. On the other hand, the swine flu epidemic did not expand to a level that was anticipated. The country now faces a daunting challenge of finding new markets beyond the US and the European countries to return to the high rates of economic growth, with significant poverty reduction that the country achieved over the last decade.

In the past five years, RGC's sustained efforts to strengthen fiscal discipline, to put in place an increasingly credible monetary policy framework, and the implementation of structural reforms helped to produce the best economic performance in Cambodia's history since 1993. Structural changes enabled a well-performing economy in the modern history of Cambodia since 2003. During the current crisis, the Cambodian economy shows a strong degree of resilience and flexibility. The RGC is confident that continuing to vigorously pursue the implementation of its policies will greatly contribute toward improving the economy.

To achieve the target growth rate by the economic sector for 2009 until 2013, the following capital investments in forestry-related sectors are needed: about CR 11.8 billion (US$ 2.9 billion) for agriculture, fisheries, and forestry sector and CR 488.3 billion (US$ 119 million) for the forestry and logging sectors (Ministry of Economy and Finance 2002). Until 2013, the contribution of the agriculture, fishery, and forestry sector to the GDP will slightly go down (from 4% in 2010 to 3.2% in 2013), while that of the forestry and logging sector will remain constant at 1.1%.

Rural poverty reduction

Poverty reduction remains a major challenge for Cambodia. Poverty declined slightly from 39% to 35.9% between 1993 and 1999, then to 30.1% in 2007 based on the poverty headcount index. A number of challenges need to be addressed in the years to come. It is clear that poverty and hunger eradication require a multi-faceted response addressing economic, social, and governance issues. In terms of economic policies, there is a need to ensure that the growth process is increasingly pro-poor, generating benefits for those in most need. Democratic reforms must be pursued, along with progressive decentralization. On the social front, measures of effective social protection need to be strengthened and human capacities reinforced. More generally, changes in the institutional environment are required to strengthen the role of civil society and the private sector in the development process.

In addition to chronic poverty, there are major challenges associated with vulnerability and insecurity, in particular food insecurity and vulnerability to floods and droughts. As the poor are more vulnerable to disaster, specific measures to reduce the effects of shocks as well as to improve people's capacity to respond are needed. The government's capacity to manage natural disasters must be improved and, more generally, the government must position itself to provide broader social protection to those in greater need. The challenge is to find innovative approaches which complement coping strategies of rural populations and to ensure that social assistance programs are directed to those in the direst need.

Cambodia's strategies to promote socio-economic development and poverty reduction are outlined in NPRS 2003-05. The Governance Action Plan complements these documents, setting the framework

for institutional reforms. Based on NPRS 2003-05, the RGC's comprehensive framework for poverty reduction, the anti-poverty strategy must adopt measures to maintain macroeconomic stability, shift resources to more efficient sectors, and promote integration within the global economy. Through a participatory process coordinated by the Ministry of Planning, a number of actions have been suggested to improve rural livelihoods, promote job opportunities, ensure better health, nutrition and education, reduce vulnerability, improve capabilities, strengthen institutions and governance, promote gender equity, and focus on population concerns.

Forestry outlook

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

In addition, the RGC has formulated and instituted some general reforms, among others the Legal and Judicial Reform, Public Administration Reform, Forestry Reform, Fisheries Reform, Land Reform and Mine Clearance, and Armed Forces 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 attention, partnerships, and coordination of management. Recently, the Technical Working Group on Forestry and Environment has been established to ensure sustainable development and coordination of natural resources plans.

Retaining 60% of the country's land area under forest cover is the main target of the FA until 2015. The main responsibilities of the FA to achieve this objective are to stop forestland encroachment and illegal tree cutting, and attain SFM in a national and regional context of increasing demand for natural resources. This increasing demand is not only from within the country, but also from other countries in the region.

The community forest management approach to forest management is increasingly being considered among government, NGOs, private sector agencies, and research institutions. The stakeholders believe that CF should be pursued to manage the remaining forests. With the existing Sub-Decree on CF, the remaining forests should be improved and perhaps increased in the immediate future. Because of their wood and NWFP needs, local people will make sure that their CF resources are continuously available for them and the future generations. The Annual Bidding Coupe (ABC), for domestic wood supply, allows harvesting of wood in areas under production forests where harvesting is permitted to meet local wood needs of domestic markets in wood and non-wood products. The FA ensures that forests should have the capacity to meet these needs. The ABC method can also take the lead in ensuring that forest harvests are under control. As mentioned earlier, due to the shortage in the FA's human resources, it is not realistic and effective for the FA to cover patrolling in huge forest areas and responsible companies in ABC can provide help to keep the forests under control.

Conclusion and recommendations

Poverty estimates indicate that about 39% of Cambodians lived in poverty in 1993-1994, which decreased to 30.1% in 2007 (calculated as the poverty headcount index relative to the overall poverty line for Cambodia). Using the food poverty line, the poverty headcount index also decreased from 20% in 1993-1994 to 18% in 2007. However, there are significant regional differences in the poverty rate. Approximately 80% of the population depends on forest-related livelihood activities (CSES 2009).

Forests play an important role in poverty alleviation in Cambodia. Those in remote areas of the country are highly dependent on forest products for their daily needs. The forests are a resource base from which they harvest wood and other products for house construction and other subsistence needs or for cash generation to buy farming equipment and meet their other needs. Sometimes, agricultural and forestry products are used first for household consumption, and the excess is sold in the local (village

or commune) and provincial markets. At other times, the products are harvested purposely to generate cash for specific needs.

Since the forest is crucial for the livelihoods of the people, the RGC should enhance forest management efficiency of the forests and ensure their appropriate protection and development, including reviewing ELC allocation, allocating community forests, ecotourism for employment generation and additional income for the people. Moreover, attention should be given to the management of the protected areas. Based on data review and case studies from three field sites, we recommend the following:

- Forest resource management approaches need to prioritize direct access of local communities to benefit from forest resources, especially in high-value forest management areas and including protected areas.
- Commercial forest management options should be considered and optimized to ensure the forestry sector's contributions to poverty alleviation and socio-economic development.
- Improving the lives and livelihoods of the rural poor should be a top government priority, including equitable access to common property resources as a critical source of income security.
- The RGC should develop and deliver support services to rural communities, including community forestry and agro-forestry and support for the development of NWFPs for rural livelihoods and food security.
- Communities themselves must be closely involved in the development of systems and processes under which their forest will be managed and this requires the development of partnerships with other stakeholders.

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