CONTENTS

1. INTRODUCTION 1

2. WORKSHOP PROGRAMME 5

PART 1: INDOOR LEARNING SESSION (1-8 & 13-14 NOVEMBER, 2019) 5

PART 2: FIELD TRIP (09-12 NOVEMBER, 2019) 10

3. LIST OF PARTICIPANTS 12

4. PROFILES OF RESOURCE PERSONS 13

5. OUTLINES OF KEYNOTE LECTURES 18

ATTACHED FILES: 33

1. PPT SLIDES OF KEYNOTE LECTURES 33

2. PPT SLIDES OF PARTICIPANT PRESENTATIONS 33

3. READING MATERIALS 34

APFNet Workshop on Forestry and Rural Livelihood Development

01 - 14 November 2019 Yunnan Province, China

1. INTRODUCTION

APFNet's thematic workshops

The Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet) was established with the main mission of promoting and improving sustainable forest management and rehabilitation in the Asia-Pacific region. One of the main missions of APFNet is to strengthen the human resource capacity; this is being accomplished through a number of programmes, including thematic workshops aimed to enhance knowledge especially through sharing of experience gained within and outside the Asia-Pacific region.

Under APFNet's Strategic Framework with its mission of adding green for Asia and the Pacific since 2009, APFNet-KTC has been organizing two thematic training workshops on the specific themes (1) Degraded Forest Rehabilitation and Management and (2) Forestry and Livelihood Development, and both themes are key priority areas for almost all the economies in the region. Up to date, there are 21 training workshops has been successful conducted with the fully involvement of 320 participants from 21 APFNet Member Economies in the Asia and Pacific Region. The Workshop is expected to significantly enhance the knowledge of forestry professionals in helping to improve the contribution of sustainable forest rehabilitation and management.

Forestry and Livelihood Development

Forests and forestry play important roles in the livelihood of people in all societies though the nature of livelihood derived varies in time and space. According to the estimate by the World Bank, there are around 1.6 billion people dependent on forests for their livelihood directly and indirectly, and the impact of forestry development on people's livelihood has been extremely varied while some have helped to improve livelihoods through provision of goods and services as also income from forestry based activities.

Most developing economies in the Asia-Pacific Region is still heavily relying on forest resources for rural community livelihoods and economic productivity despite of economic

development efforts in the region, forestry agencies are facing a immense challenges of deforestation and forest degradation as well as marginalization of forest dependent communities in meeting the diverse demands on forests. Protecting the vast forest areas and helping to restore degraded forest areas, conserve biodiversity in the context of limited fiscal and human resources requires well-designed and well-implemented policies and programs that improve forest resources management contributing to income generation and livelihood improvement of local communities.

The Training Workshop

In order to provide a better understanding of the forest-livelihood linkages and what may be done to enhance forest's contribution to improve rural livelihood, APFNet Kunming Training Center (APFNet-KTC) will continually organize thematic training workshop on "Forestry and Rural Livelihood Development" during the period of November 1st to 14th, 2019 in Kunming City, Yunnan Province in Southwest China. Total participants will be limited around 15 from the APFNet member economies in the Asia &Pacific Region, and this workshop proposed to provide the maximum learning and sharing opportunity to the participants.

Objectives

The main objectives of the workshop are to:

1. Assess the linkage between forest management and rural livelihood improvement and explore the ways in which the livelihoods of rural communities might be improved through better forest management;
2. Provide an overview of the experiences and best forestry practices aimed at enhancing rural livelihood development;
3. Analyze and assesse implications of key policy, institutional and technological developments and the potentials and limitations for forestry based livelihood improvement.

Main Topics/Areas

The workshop will attempt to provide a broad analytical framework to assess the current state of rural livelihood improvement specifically focusing on the following:

- Forests and livelihoods: past, present and future.
- Policies and institutions in support of enhancing the livelihood roles of forests.
- Indigenous communities and traditional knowledge: Myths, realities and the way forward

- Payment for environmental services: Potentials and constraints in improving the livelihood of forest dependent communities
- Urban forestry and livelihoods
- Protected areas and livelihoods: People and wildlife from conflict to co-existence.

Workshop Structure and Training Approach

The workshop structure is designed to provide the maximum learning opportunity to the invited participants and the entire thrust will be on dialogue, group work, discussions and field observations.

- **Thematic lectures:**

  Resource persons will present an in-depth assessment of different aspects relating to livelihood improvement and forest management.

- **Participant presentation:**

  Participant's presentations will be sharing their own experiences and cases in managing forests accommodating livelihood concerns at the national programme and project level.

- **Group works:**

  Group works including panel discussions and debates as an integral component of the workshop, and all participants are encouraged to actively participate in these. As part of the group work participants will be required to prepare policy briefs related to strengthening the livelihood contribution of forests.

- **Field trip:**

  Field trip to Pu'er City of Yunnan Province will be providing an opportunity to observe how livelihood dimensions are taken into account in natural forest management, forest plantations and management of protected areas at different land use systems.

Workshop Outputs

Participant papers will be edited and published as an important workshop output for information sharing, it will be disseminated on both APFNet and APFNet-KTC websites. In addition, a synthesis report as another important workshop output with summarized key issues from workshop discussion will also be accessible to a wider audience.

Requirements for Participation

Eligibility

The workshop is open to senior policy makers and planners working for governmental authorities, universities, research institutions and civil society organizations involved in the management of natural resources, in particular forests. Priority will be given to those specifically involved in addressing the livelihood needs of rural communities and female participants are highly appreciated in order to ensure a better gender balance.

For those invited participants, APFNet-KTC will cover the costs associated with the Workshop including the round-trip airfare for international travel (economy class only), a full-board accommodation and a certain amount of per diem. Participants/sponsoring agencies will have to bear other costs which are not mentioned as above, including costs of domestic travel, visa fee and other personal expenses.

Workshop Venue

Name: Center for International Exchange and Cooperation, Southwest Forestry University

Address: #300 Bailongsi, Kunming City, Yunnan Province, P.R. China

Phone: (+86) 871 63863956 or (+86) 63863983

Contact Information

For further details about the course and the various arrangements please contact:

Ms. ZHANG Wanjie

Programme Officer, APFNet Kunming Training Center

Southwest Forestry University

#300 Bailongsi, Kunming City 650224, Yunnan Province, China

Email: apfnetktc@apfnet.cn

Tel: (+86) 871 63862860 (office) (+86) 136 88710596 (cell)

2. WORKSHOP PROGRAMME

PART 1: Indoor Learning Session (01 - 08 & 13 – 14 November, 2019)

(Center for International Exchange and Cooperation, Southwest Forestry University)

Time	Agenda	Presenter/Facilitator
DAY 1: (Friday/November 01, 2019)	**Arrival of workshop participants and registration**	
DAY 2: (Saturday/November 02, 2019)		
08:30 - 09:00	**Opening Ceremony** • Welcome remarks • Vote of thanks	SWFU, YPFGA APFNet - KTC
09:00 - 09:30	**Group photo and Coffee break**	APFNet - KTC
09:30 - 10:00	• Overview of APFNet Thematic Trainings • Introduction to the course	Workshop Facilitators
10:00 - 10:30	**Ice breaker – Getting to know each other**	Workshop Facilitators
10:30 - 12:00	**Lecture 1:** Changing role of forests in people's livelihood: Past, present and future. --- Q & A	Dr. C.T.S. Nair
12:00 - 14:00	**Lunch**	Center for International Exchange and Cooperation
14:00-15:30	**Lecture 2:** Costs and benefits of community forestry --- Q & A	Dr. Stephen Elliott
15:30 - 16:00	**Coffee break**	
16:00 - 17:30	**Lecture 3:** Kandyan homegardens and rural economy	Mr. Dissanayake Wasantha Tikiri Bandara
18:30 - 20:00	**Welcome dinner**	APFNet-KTC

DAY 3: (Sunday/November 03, 2019)		
08:30 - 08:40	Overview of presentation on Day 2	Selected Participants
08:40 - 10:10	**Lecture 4:** Forest policies, institutions and management: How they have accommodated livelihood concerns --- Q & A	Dr. C.T.S. Nair
10:10 - 10:40	**Coffee break**	
10:40 - 12:00	**Lecture 5:** Tourism - Forest interaction case studies --- Q & A	Dr. Stephen Elliott
12:00 - 14:00	**Lunch**	Center for International Exchange and Cooperation
14:00 - 14:45	**Participant Presentation 1:** Bangladesh	Mr. Mostafizur Rahman
14:45 - 15:30	**Participant presentation 2:** Cambodia	Mr. Tal Makara
15:30 -16:00	**Coffee break**	
16:00 - 17:00	**Group Discussion:** Poverty reduction through forestry: SWOT analysis of different options	Facilitators
17:00 - 18:00	**Group Work:** Preparation of policy brief	Facilitators
DAY 4: (Monday/November 04, 2019)		
08:30 - 08:40	Overview of presentation and discussions on Day 3	Selected Participants
08:40 - 10:10	**Lecture 6:** The pros and cons of community forestry in protected areas (Debate) --- Q & A	Dr. Stephen Elliott
10:10 - 10:40	**Coffee break**	
10:40 -11:25	**Participant presentation 3:** Fiji	Mr. Josefa Dakuinamako Kalounivalu Matagasau
11:25 -12:10	**Participant's Presentation 4:** Indonesia	Mr. Agus Wiyanto
12:10 -14:00	**Lunch**	Center for International Exchange and Cooperation
14:00 -14:45	**Participant presentation** 5**:** Indonesia	Mr. Zawil Hijri Muaz

14:45 -15:30	**Participant's Presentation 6:** Lao PDR	Mr. Somphavy Keoka
15:30 - 16:00	**Coffee break**	
16:00 - 17:30	**Group Work:** Preparation of policy brief	Facilitators
DAY 5: (Tuesday/November 05, 2019)		
08:30 - 08:40	Overview of presentations and discussions on Day 4	Selected Participants
08:40 - 10:10	**Lecture 7:** Livelihood improvement through payment for ecosystem services: Opportunities and challenges --- Q & A	Dr. C.T.S. Nair
10:10 - 10:40	**Coffee break**	
10:40 - 12:00	**Lecture 8:** The development of NTFPs for improving livelihood of rural people in mountainous area- A case study from Lin'an of Zhejiang Province, China --- Q & A	Prof. Jiang Chunqian
12:00 - 14:00	**Lunch**	Center for International Exchange and Cooperation
p.m.	**Free**	Participants
DAY 6: (Wednesday/November 06, 2019)		
08:30 - 08:40	Overview of presentations and discussions on Day 5	Selected Participants
08:40 -10:10	**Lecture 9:** Urban Forestry --- Q & A	Dr. Preecha Ongprasert
10:10 - 10:40	**Coffee break**	
10:40 - 12:00	**Lecture 10:** Co-management as conservation discourse for improving community livelihoods --- Q & A	Dr. Wu Yusong
12:00 - 14:00	**Lunch**	Center for International Exchange and Cooperation
14:00 -14:45	**Participant's Presentation 7:** Malaysia	Mr. Muhamad Bin Abdullah
14:45 - 15:30	**Participant's presentation 8:** Malaysia	Mr. Silvester Jemat Anak Arbit
15:30 - 16:00	**Coffee break**	

16:00 - 17:30	**Group Work:** Preparation of policy brief	Facilitators
DAY 7: (Thursday/November 07, 2019)		
08:30 - 08:40	Overview of presentations and discussions on Day 6	Selected Participants
08:40 - 09:25	**Participant presentation 9:** Myanmar	Ms. Su Myat Hnin
09:25-10:10	**Participant presentation 10:** Mongolia	Mr. Isheekhuu Dorj
10:10 - 10:40	**Coffee break**	
10:40 - 11:25	**Participant presentation 11:** Nepal	Mr. Madhav Prasad Deo
11:25-12:10	**Participant presentation 12:** Papua New Guinea	Ms. Ako Aina
12:10 - 14:00	**Lunch**	Center for International Exchange and Cooperation
14:00 - 15:30	**Group Work: Preparation of policy brief**	Workshop facilitators
15:30 - 16:00	**Coffee break**	
16:00 -17:30	**Group Work: Preparation of policy brief**	Workshop facilitators
DAY 8: Friday/November 8, 2019		
08:30 - 08:40	Overview of presentations and discussions on Day 7	Selected Participants
08:40 - 09:25	**Participant presentation 13:** Sri Lanka	Mr. Wijeratna Mudiyanselage Hemantha Wijeratna
09:25 - 10:10	**Participant presentation 14:** Thailand	Ms. Sasima Aree
10:10 - 10:55	**Participant presentation 15:** Viet Nam	Mr. Phan Van Thang
10:55 - 11:15	**Coffee break**	
11:15-12:00	**Group Work:** Preparation of policy brief	Workshop facilitators
12:30 - 14:00	**Lunch**	Center for International Exchange and Cooperation

14:00 - 15:30	**Presentation of group work on policy brief**	Group Leaders
15:30 - 16:00	**Coffee break**	
16:00 - 17:00	**Briefing on field trip**	APFNet-KTC
Day 9 to day 12: (Saturday - Tuesday/November 09 - 12, 2019) Field Trip to Pu'er City and visit to different areas focusing on forestry and rural livelihood development		
DAY 13 (Wednesday/November 13, 2019)		
08:30 - 08:40	Overview of presentations and discussions on Day 8	Selected Participants
08:40 - 09:00	Overview on field trip in Pu'er City	Selected participants
09:00 - 09:30	An overview of the Workshop and Course evaluation	Workshop Facilitators
09:30 - 10:00	**Coffee break**	
10:00 - 11:00	**Closing Ceremony** o Award of certificates o Remarks o Vote of thanks	Guests Participants APFNet-KTC
12:00 - 13:30	**Lunch**	Center for International Exchange and Cooperation
p.m.	Free	Participants
18:00 - 19:30	**Farewell dinner**	APFNet-KTC
DAY 14 (Thursday/November 14, 2019) **Participants Departure**		

PART 2: Field Trip (09 - 12 November, 2019)

(Pu'er City, Yunnan Province, China)

Saturday / November 09, 2019

07:00 - 07:45	Breakfast at Center for International Exchange and Cooperation
07:50 - 08:00	Boarding bus
08:00 - 12:00	Drive from Kunming to Mojiang County
12:00 - 13:00	Lunch in Mojiang County
13:00 - 15:00	Heading to Pu'er City and check-in at Hotel
16:00 - 17:30	Introduction to forestry development and management in Pu'er City
18:00 - 19:00	Dinner (hosted by Forestry Bureau of Pu'er City)

Sunday / November 10, 2019

08:00 - 08:30	Breakfast at Hotel
08:30 - 10:00	Visit program of upland agroforestry practice of coffee intercropping with Tea
10:00 - 12:00	Visit cultivation base for rare and high value medicinal herbs under natural forests; the nursery base of medicinal herbs
12:00 - 13:00	Lunch
13:00 - 15:30	Pu'er Forestry Research Institute
15:30 - 17:30	Visit Pu'er Fine Variety Ecological Tea Garden and Tea Research Institute
17:30 - 19:00	Dinner

Monday / November 11, 2018

08:00 - 08:30	Breakfast at Hotel
08:30 - 11:30	Visit the demonstration site of Logging Ban Programs of Protection Forests for Ecological Function in Wanzhangshan forest farm
11:30 - 13:00	Lunch
13:00 - 15:00	Visit rosin and turpentine production
15:00 - 17:00	Visit composite wood products factory
18:00 - 19:00	Dinner

Tuesday / November 12, 2018

07:30 - 08:30	Breakfast at Hotel
08:30 - 09:00	Check-out
09:00 - 11:30	Drive from Pu'er City back to Kunming,
11:30 - 12:30	Lunch in Mojiang County
12:30 - 16:30	Drive from Mojiang County to Kunming City
16:30 - 17:00	Arrive in Kunming and check-in at Center for International Exchange and Cooperation
18:30 - 19:30	Dinner

Profile of Kunming City

Kunming, the capital of Yunnan Province, dates back more than 2400 years and owes its importance as the gateway to the celebrated Silk Road that facilitated trade with Tibet, Sichuan, Myanmar and India. Today, the city is the political, economic and cultural center of Yunnan and the provincial center for transport, science and technology. Consequently, it has become the most popular spot for tourism in Southwest China. Kunming enjoys a pleasant climate and does its best to live up to its title of 'the City of Eternal Spring'. The average temperature is expected to be 15℃-23℃ during September, with slightly lower temperatures in the morning and evening.

Some 25 ethnic minorities such as Yi, Bai, Miao, Dai, Hani inhabit the region and each group has its own festivals - the Torch Festival and the Golden Temple Fair, for example. The hugely successful 1999 International Horticultural Exposition enhanced Kunming's influence in the world and, as a result, more and more foreigners come to discover this enchanting part of China. Its alluring highland scenery, bewitching karst landform, varied and exotic habitats and customs, and places of historical interest can be found at major scenic spots such as Dianchi Lake, Stone Forest, the Village of Ethnic Culture, and Grand View Pavilion. Kunming is also renowned for many delicious local dishes, the most famous being Across the Bridge Rice Noodles and Xuanwei Ham. You can enjoy them both at local restaurants or the night markets where you will find many pubs, bars and cafes that serve good quality meals.

3. LIST OF PARTICIPANTS

No.	Name	Nationality	Title/Organization	E-mail
1	Mostafizur Rahman	Bangladesh	Assistant Conservator of Forest, Social Forest Division, Dinajpur	mostafiz.acf@gmail.com
2	Tal Makara	Cambodia	Technical Officer, Institute of Forest and Wildlife Research and Development	makaratal169@gmail.com
3	Josefa Dakuinamako Kalounivalu Matagasau	Fiji	Forester - Extension (Northern Division), Ministry of Forestry, Fiji	j.matagasau@gmail.com
4	Agus Wiyanto	Indonesia	Lecturer/Trainer, Center of Education and Training for Human Resources of Environment and Forestry, Ministry of Environment and Forestry	dewijanto@yahoo.com
5	Zawil Hijri	Indonesia	Trainer, Environment and Forestry Training Center of Pekanbaru (Balai Diklat LHK Pekanbaru)	bdkpekanbaru@gmail.com
6	Somphavy Keoka	Lao PDR	Technical Officer, Forest Inventory and Planning Division, Department of Forestry	somphavy.keoka@gmail.com
7	Muhamad Bin Abdullah	Malaysia	Director of Forest Plantation & Protection, Forest Department Peninsular, Malaysia	matdollah@forestry.gov.my
8	Silvester Jemat Anak Arbit	Malaysia	Executive Forester, Forest Department Sarawak	silvesja@sarawak.gov.my
9	Su Myat Hnin	Myanmar	Range Officer, Forest Research Institute, Yezin, Myanmar	sumyathnin1990@gmail.com
10	Isheekhuu Dorj	Mongolia	Adviser, Initiative for Conservation and Sustainable Development NGO	Dorj2009@gmail.com
11	Madhav Prasad Deo	Nepal	Divisional Forest Officer, Division Forest Office, Sarlahi, Nepal	devmadhav84@gmail.com
12	Ako Aina	PNG	Project Supervisor - Omosis Plantation, PNG Forest Authrity (National Forest Service)	Swapu1209@gmail.com
13	Wijeratna Mudiyanselage Hemantha Wijeratna	Sri Lanka	Assistant Conservator of Forests, Forest Department of Sri Lanka	dfopolonnaruwa@yahoo.com
14	Sasima Aree	Thailand	Foreign Relations Officer, International Special Program Section, International Forestry Cooperation Office, Royal Forest Department, Bangkok, Thailand	Youh_r@hotmail.com
15	Phan Van Thang	Viet Nam	Director, Non Timber Forest Products Research Center, Vietnamese Academy of Forest Sciences	phanthanglsng@gmail.com

4. PROFILES OF RESOURCE PERSONS

1. Dr. C.T.S. Nair (ctsnair47@gmail.com)

Dr. Nair is currently a freelance consultant in natural resources management based in India. He has a multi-disciplinary academic background (Bachelor's degree in Zoology, Diploma in Forestry, Master of Philosophy in Development Economics and Ph.D in Forest Economics) as also a diversified experience profile with over 45 years' experience in various capacities in different organizations. He was in the Indian Forest Service for about 20 years fulfilling various responsibilities with the State and Central Governments including as Director, Kerala Forest Research Institute and as Deputy Inspector General of Forests, Ministry of Environment and Forests.

Dr. Nair was with the Food and Agriculture Organization for about 20 years and worked in Sudan, Thailand and Rome in various capacities, including as (a) Forest Economist in Sudan (b) Senior Programme Advisor, Forestry Research Support Programme for Asia and the Pacific, Bangkok, and as (c) Senior Forestry Officer, Chief of Planning and Statistics, Chief of Forest Economics Service and Chief Economist in the Forestry Department, Rome. At the FAO Forestry Department, he coordinated the various forestry perspective studies including a number of regional outlook studies. After retirement from FAO he worked in India in Kerala state as Executive Vice President of the State Council for Science, Technology and Environment as also the Principal Secretary, Science and Technology Department.

Dr. Nair's main areas of interest are assessment of long-term changes in the use of natural resources, policy and institutional analysis and science and technology management. Since 2013 Dr. Nair has been coordinating the FAO Executive Forest Policy Course and has been supporting APFNet in organizing its thematic workshops since 2014. He has played a key role in the preparation of FAO's Asia-Pacific Forestry Sector Outlook Study III, published in June 2019.

2. Dr. Stephen Elliott (stephen_elliott1@yahoo.com)

Dr. Stephen currently serves as a senior scientist, working in Forest Restoration Research Unit, Biology Department Science Faculty, Chiang Mai University of Thailand. Since he did his a PHD in forest ecology at Edinburgh University, he has joined in Biology Department, Chiang Mai University (CMU), Thailand as a lecturer in plant ecology and wildlife from 1986 up to now. He also is a co-founder and research coordinator of CMU's Forest Restoration Research Unit (FORRU) since 1994.

Dr. Stephen has shouldered a responsibility to supervise a wide range of research projects by FORRU staff and CMU students on forest tree phenology, seed germination, planting stock propagation, tree planting techniques, post-planting silvicultural treatments and monitoring biodiversity recovery and carbon sequestration. This has resulted an effective "framework species" approach to restore forest ecosystems, combining ANR with tree-planting. Results have been published both in scientific papers practical manuals and form the basis of training programs for NGO's, forestry officials, local communities etc.. This has enabled replication of their approach in neighboring economies (e.g. China, Lao PDR, Philippines, Vietnam, and Cambodia etc.). Recently, he has started to work on developing automated forest restoration techniques, using drones. There are some of his publications shown as below:

- Elliott, S, D. Blakesley and S. Chairuangsri, 2008. Research for Restoring Tropical Forest Ecosystems: A Practical Guide. Chiang Mai University, Forest Restoration Research Unit, Thailand. 144 pp.
- Elliott, S., D. Blakesley and K. Hardwick, 2013. Restoring Tropical Forests: A Practical Guide. Royal Botanic Gardens, Kew; 344 pp.
- Elliott, S. D., 2016. The potential for automating assisted natural regeneration of tropical forest ecosystems. Biotropica 48(2):825-833.

More publications please visit http://www.forru.org/en/content.php?mid=53.

3. Mr. Dissanayake Wasantha Tikiri Bandara (dissaforest@yahoo.com)

Mr. Dissanayake Wasantha Tikiri Bandara obtained basic degree in biological science with second class upper division honest, and also won the Coomaraswami Prize awarded to the best biological science student in 1985. He has two master degrees in Forestry, and obtained his second master degree from the Wageningen Agricultural University of the Netherlands with the specialization Social Forestry.

Now he works as the Additional Secretary in-charge of Environment Policy and Planning, he is one of the senior most government officials in the Ministry of Mahaweli Development & Environment of Sri Lanka with more than 30 years working experience in the environment sector.

Mr. Dissanayake Wasantha Tikiri Bandara served in the forestry sector for over two decades in different capacities covering several geographical areas in Sri Lanka. After moving into the headquarters of the Forest Department and serving there two years as the Conservator of Forests (Planning & Monitoring) he was promoted to the Ministry to the current post in 2016. During his career, he have participated in number of overseas trainings and international events. Furthermore, he have provided his services to different international organizations such as AUSAID, IUCN, UNDP, and UNCBD.

As the Additional Secretary (Environment Policy and Planning) Mr. Dissanayake Wasantha Tikiri Bandara has an overall supervision on matters related to environmental policies, including policy reforms and development of new environment related policies for Sri Lanka. In addition, he is involved in planning, designing, negotiating, and implementing different environment related projects and programs under the Ministry. He is entrusted to supervise and guide five major divisions of the Ministry, namely Biodiversity Secretariat, Climate Change Secretariat, Environment Pollution Control & Chemical Management Division, and Environment Planning & Economics Division. Except the regular duties, he also holds some international and national portfolios:

- Board Member – APFNet
- Governing Board Member – Specific International Program of the Minamata Convention
- Panel member – Voluntary Peer Review Panel of UNCBD
- National Committee Member – IUCN Sri Lanka
- Board Member – Atomic Energy Regulatory Commission
- Board Member – National Cleaner Production Center
- Acting Chairman – Marine Environment Protection Authority of Sri Lanka

4. Dr. Preecha Ongprasert (preecha_ong@yahoo.com)

With a long experience in Forestry, Dr. Preecha Ongprasert currently works as Chief of International Special Program Section, International Forestry Cooperation Division, Planning and Information Technology Bureau, Royal Forest Department, Thailand.

Educational background

- BSc (Wildlife Management): Faculty of Forestry, Kasetsart University
- MSc (Forest Biology): Faculty of Forestry, Kasetsart University
- PhD (Urban Forestry): School of Agriculture and Forest Sciences, University of Wales, Bangor, United Kingdom

Working experiences

- 1991-1995: Researcher, Faculty of Forestry, Kasetsart University
- 1995-1998: Forest Officer, Permission Division, Royal Forest Department
- 1998-2010: Forest Officer, Bureau of Community Forest Management, RFD

- 2013-2015: Director, Training Division, Central Administration Bureau, RFD
- 2011-2017: Director, International Convention and Commitment Division, International Forestry Cooperation Office, RFD
- 2017-present: Chief of International Special Program Section, International Forestry Cooperation Division, Planning and Information Technology Bureau, RFD
- 2015-present: Chairman, Regional Model Forest Network-Asia (RMFN-Asia)
- 2015-present: Chairman, APFNet Council

5. Prof. Jiang Chunqian (jiangchq@caf.ac.cn)

Dr. Jiang Chunqian had completed a BSc (Biology) from the Anhui Normal University, China (1982-1986) and MSc (Botany) from the Institute of Applied Ecology, Academia Sinica, China in 1991. He completed his PhD on Silviculture in 2003 from the Chinese Academy of Forestry China. He has published over 100 journal articles and 11 books. He had been a chair of Regional Model Forest Network-Asia during 2008-2013, and is a Professor and Director of International Farm Forestry Training Center, Chinese Academy of Forestry since 2013.

Dr. Jiang Chunqian is an expert on sustainable forest management, from the Research Institute of Forestry, Chinese Academy of Forestry. His areas of expertise also include forest policy, climate change and rural development. He has over 30 years' of working experience in forest management planning and policy, and forest carbon accounting. He has received many competitive research grants from NFSC, CAF and State Forestry Administration (SFA) and made significant policy contributions. Some relevant projects include: (1) Forest restoration at landscape level in Asia funded by Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet); (2) Methodologies and modalities of land-use, land-use change and forestry (LULUCF) under Kyoto Protocol funded by NDRC of China; and (3) Carbon flow of harvested wood products in China supported by Ministry of Science and Technology, China. There are some of his publications shown as below:

- Application on the Participatory Forest Management Planning at Village Level, China Agriculture Press, Beijing 2013.
- Study on Forest management Policy in China's Collective Forest, China Agriculture Press, Beijing 2013.
- Status and Development of Strategies for Forest Tenure Trade Centers in China's Collective Forests, China Agriculture Press, Beijing, 2012.
- Study on Forest Farmer Cooperatives in China's Collective Forests, China Agriculture Press, Beijing 2012.

- Carbon Accounting on the Forest Management. World Forestry Research, 2013, 26 (5):1-7
- Key Issues in Production, Transportation and Consumption of Ecosystem Services. World Forestry Research, 2011(4): 19-23
- Definitions and Carbon Stocks Accounting Approaches of Harvested Wood Products in Climate Change Negotiation, Scientia Silvae Sinicae. 2011, 47(1): 158-164
- Progress in Negotiations on Harvested Wood Products. Advances in Climate Change, 2010, 6(1):60-64
- Tissue Culture and Rapid Propagation of Ceratonia siliqua L. Journal of Northwest A&F University, 2011, 39(12): 81-86
- Carbon Stock and Potential of Emission Reduction of Harvested Wood Products in China. Acta Ecologica Sinica, 2009, 29(9):399-405
- Study on the Tissue Culture of Auxiliary Bud and Rapid Propagation in Capparis spinosa. Forest Research, 2009, 22(4):321-525

6. Dr. Wu Yusong (1460087510@qq.com)

Dr. Wu Yusong is an associate professor of Center for Rural Development Studies, Yunnan University.

With more than 25 years of rich experiences in working with international NGOs, aid agencies and research institutes, Dr. Wu mainly focuses on political ecology field, especially on the areas of poverty alleviation, biodiversity conservation, good water governance in Lancang Mekong watershed, climate change and locals adaptation, China's overseas investment in Southeast Asia and South Asia.

Dr. Wu has translated, co-authored and edited many training materials and books related to integrated conservation and rural development, forest resource conflict management, and published many articles in international and domestic academic journals.

Dr. Wu has long experiences of working as a consultant to international and domestic development and conservation agencies such as World Bank, ADB, UNDP, UNEP, WWF, IUCN, SFA and MEP etc.

Over the years of working with multi-stakeholders, Dr. Wu and her team has developed good partnerships and network with government agencies at different levels, research institutes, private sectors, NGOs and local communities.

5. OUTLINES OF KEYNOTE LECTURES

Lecture 1: Changing role of forests in people's livelihood: Past, present and future

--- Dr. C.T.S. Nair

Forests form an important livelihood asset providing food, fuel, medicines and materials for shelter for millions of people in addition to a wide array of life sustaining ecological services for the present and future generations. However, the nature and extent of livelihood dependence are highly context specific and changes over time and space. People living in or close to forests with limited access to other resources are particularly dependent on forests for meeting their subsistence needs. As the distance from forests increases the nature of dependence changes and increasingly indirect dependence gains prominence. For example, in the urban context forests provide a variety of products as industrial raw material and more importantly ecosystem services like watershed protection, amenity values, climate change mitigation, etc. For many urban dwellers amenity values provided by green spaces are more important than the production of wood and other products.

In most countries wood production has been the main objective of forest management for a long time and the traditional livelihood functions were often considered as antagonistic to the wood production objective. This has led to an "exclusion approach" pushing livelihood activities to the informal/ illegal domain. Since the 1970s, and more particularly the post-1990 period, there have been major changes in forestry objectives, with social dimensions, especially livelihood improvement, receiving increased attention. High levels of poverty in forest rich areas certainly led to a reexamination of forest-livelihood linkages. Accomplishment of UN Sustainable Development Goals warrants major shifts in forest policies, legislation and management practices. However, many challenges exist in ensuring that the full livelihood potential of forests is realized. Some of the major challenges in this regard are:

- Inadequate information on the extend of livelihood dependence on forests: This has led to generalizations based on scant and sometimes inaccurate information;
- A significant share of livelihood is derived in the subsistence segment for which no reliable information is available. While the importance of forests is widely recognized, absence of data precludes their consideration in the planning process.
- Most often livelihood is related to access to and control of resources including access to information and knowledge. Although many countries have initiated forest tenure reform, many challenges exist and often progress in meaningful forest tenure reform is a very slow process. Further tenure reform, though necessary, is not a sufficient condition to improve livelihoods.

- Livelihood is very much dependent on the appropriate combination of different assets/ income portfolios. Asset and income diversification options are not available to many forest dependent communities.

It is possible to visualize different scenarios as regards direct reliance on forests for livelihood, depending on the growing significance of other assets – human capital, physical capital, financial capital and social capital.

Key take home messages from the presentation are:

1) Forests-livelihood linkages are multiple, highly context specific and extremely dynamic.
2) Though direct dependence on forests for livelihood is declining, still millions of people continue to depend on forests for a wide array of livelihood needs.
3) Absence of reliable data remains a major challenge in making a realistic assessment of the livelihood contribution of forests, partly because of the preponderance of informal transactions.
4) The long-term trend as regards forests and livelihood relates to the shift from production of livelihood goods – food, fuel, medicines - to the provision of ecological services and fulfilment of aesthetic and cultural needs.
5) Different scenarios could be visualized as regards the future of forests-livelihood linkages. While forests will remain important, the nature of dependence will however undergo changes, and this will require changes in policies, legislation and institutions.
6) There is a need to go beyond the boundaries of forests and to consider livelihood in a landscape context giving due consideration to the role of all land uses in an integrated manner.

Lecture 2: Costs and benefits of community forestry

--- Dr. Stephen Elliott

Community Forestry

Community forestry refers to forest management by local people. Usually government-controlled forests are handed over to local communities for communal management – under a national law/forest plan. Management agreements among community committees and government agencies usually set rules and limits – and stipulate penalties for transgression. Under such agreements, usually, forest "cover" must be maintained (but rarely quality/ biodiversity) and any exploitation must be "sustainable". A local (or joint) management committee – organizes "sustainable" exploitation and benefit sharing.

Costs

Costs can include both time and money.

Time costs

Villagers must sacrifice time that could be spent on agriculture for meetings to set up the community forest and administer it, including – regulation, dispute resolution, reporting, accounting and benefit-sharing.

Financial costs

Financial costs can include legal/admin fees, survey costs (e.g. for baseline carbon, timber and NTFP's) and forest maintenance/ management costs, particularly fire prevention. Financial costs should also include the income forgone from not converting forest to agricultural land. Where forest is absent or severely degraded the cost of restoration must also be included.

Benefits

Community forestry provides five categories of benefit: forest products, watershed services, carbon sinks, biodiversity conservation and opportunities for ecotourism.

Products

At least 150 different forest products, including rattan, bamboo, nuts, essential oils and pharmaceuticals, traded internationally, contribute about US$ 4.7 billion/year to the global economy. Products from community forests can include foods (e.g. game, wild vegetables, mushrooms etc.), fuel-wood, medicines and household products (e.g. glues, resins, rubber, oils, fibres etc.). Many of these products are gathered by rural people and are often not bought or sold. Their value, therefore, is not included in economic indices such as GDP. However, it can be estimated in terms of the money that would have to be spent to replace these products, if they were not gathered from the wild. For example, indigenous people living in Sabah would have to spend $40 million/year on meat, to replace the wild pig meat they obtain from hunting. Some products (e.g. fish and timber) are traded internationally and are therefore accounted for in the world's economy. Other products include new species of plants and animals domesticated and used for agriculture. Often nature provides ideas for new products, without providing the products directly. For example, many drugs, originally discovered in wild herbs, are now synthesised chemically. About 25% of the world's drugs originate from wild plants and animals

Harvesting of NTFP's should be carried out sustainably. This involves measure the standing crop and growth rate of the product, then ensuring that the annual harvest does not exceed the annual production. This is usually achieved by setting quotas and issuing permits. The total harvest must be recorded, as well as the harvest effort (number of permits issued or time spent by the collectors). How the yield changes over time (quantity collected/effort) indicates if the resource is being under- or over-exploited - so that appropriate changes can be made in the

number of permits issued. Often, the costs of administering such systems are higher than the value of the products collected.

Therefore, the trend is to bring NTFP's into cultivation. This can actually encourage forest clearance, to provide land to cultivate valuable former-forest products. The exception is mushrooms of mycorrhizal fungi that are totally dependent on forest trees as their hosts.

Watershed Services

Deforestation increases water yield (as transpiration through tree crowns is reduced) but outflow becomes more seasonal. Tropical forests add enormous quantities of organic matter to soils, which increases their field capacity (gm water stored per gm dry soil). Such soils soak up water during the rainy season (reducing floods) and release it gradually during the dry season (reducing droughts). Deforestation exposes the soil to erosion and compaction. Absorptive top soil is rapidly lost. Infiltration is reduced and runoff increases, resulting in flash floods & landslides. Sedimentation of watercourses lowers their volume, resulting in higher floods. Blockage of irrigation systems lowers agricultural productivity.

Carbon Sinks

Tropical forests (in general) absorb more CO_2 than they emit about 1.3 gigatonnes of carbon (GtC) per year (Lewis et al., 2009) – equivalent to 16.6% of carbon emissions from burning fossil fuels and the cement industry, and 60% of the sink provided by all of the terrestrial vegetation on Earth. The carbon sink size depends on the type of forest. Natural forests are 6 times better than agroforestry and 40 times better than plantations at storing carbon (Lewis et al., 2019).

Tropical forests store about 240 tC/ha in trees/soil - crop lands, about 80 tC/ha, mostly in soil. So, clearing 1 ha of tropical forest emits about 160 tC and also reduces subsequent sequestration rate. Agriculture also releases methane, which is 20 times more efficient at trapping heat than CO_2 is.

Carbon Credits

Trading in carbon credits could turn the carbon storage potential of forest restoration projects into cash. Carbon dioxide is the most important greenhouse gas. Power stations that burn coal or oil release CO_2 into the atmosphere, while tropical forests absorb it. So, if a power company pays for forest restoration, they could continue to emit CO_2 without actually increasing the atmospheric CO_2 concentration. A company that buys carbon credits buys the right to emit a certain amount of CO_2.

The money paid for those carbon credits could then be used to finance forest restoration thereby increasing the capacity of the global carbon sink. Carbon credits are traded, like stocks and shares. So, their prices can go up or down according to demand. There are two kinds:

1) Compliance credits are bought by corporations and governments in order to meet their obligations under national; laws or international agreements, thereby offsetting some of the carbon they emit. The protocol's Clean Development Mechanism (CDM) channels the credited money into projects that absorb CO_2 or reduce emissions.
2) Voluntary credits are bought by individuals or organisations seeking to reduce their 'carbon footprints'.

The 'voluntary market' is much smaller than the compliance market and the credits are cheaper because the projects supported by it do not have to meet the stringent requirements of the CDM. At present, few forest restoration projects have been approved for support under the CDM, because it is difficult to measure the amount of carbon stored in forests, which have very variable growth rates and which could easily burn or become degraded. So, several obstacles must be overcome before compliance credits could generate income for forest restoration projects. The voluntary principle, however, is proving to be much more successful. All over the world, corporations are sponsoring tree planting, partly to off-set their carbon footprints, but also to promote a cleaner, greener image.

REDD+, stands for 'reducing emissions from deforestation and forest degradation'. This is a set of policies and incentives being developed under the UN Framework Convention on Climate Change (UNFCCC) to reduce CO_2 emissions derived from clearing and burning tropical forests. The concept was recently expanded to include the 'enhancement of carbon stocks', i.e. forest restoration to actually increase CO_2 absorption. This international framework provides approved funding and monitoring mechanisms for both forest conservation and forest restoration projects that enhance the net global forest 'sink' for CO_2, while also conserving biodiversity and benefiting local people. Funding comes from both established carbon credit markets and specially created international funds. The success of REDD+ will depend on considerable improvements in forest governance, as well as capacity-building at all levels, from villagers to policy makers. Despite these challenges, several pilot REDD+ projects are already underway, which will provide valuable lessons for the future development of the program.

Biodiversity – values

"Diversity" itself is difficult to monetarize. It can be viewed as the sum of the values of products/services from all species combined – with the added value of economic security. The latter arises from the fact that when harvesting a diversity range NTFP's (for example) villagers can switch from one product to another in response to fluctuating market prices. This is difficult or costly with conventional mono-culture plantations (e.g. converting from rubber to oil palm). Mono-culture plantations are therefore high-risk/low-security systems, whereas diverse forests offer lower risks and higher security.

Pollination is one of the few environmental services that results directly from diversity. Crops, grown near to forest, often have high yields and are of high quality, due to the presence of a diverse community of pollinating animal species that depend on forest habitats to complete their life cycles (Ricketts et al., 2004).

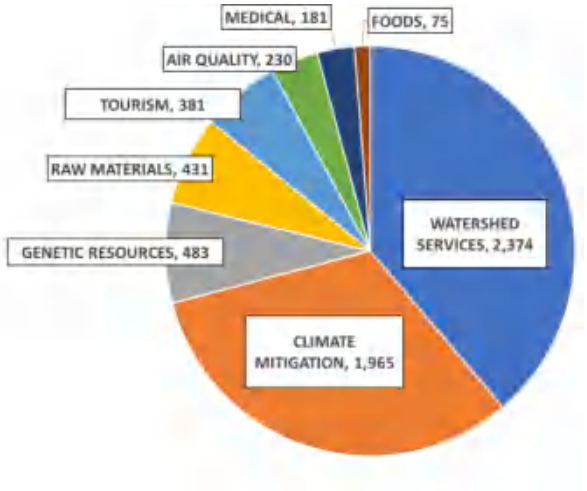
Ecotourism

Ecotourism is another source of income that depends on the maintenance of biodiversity, provided that wildlife and scenery are the main attractions. Interactions between tourism and forests will be covered in detail in the next lecture.

Realizing total value

The value of all products and services combined, in 1 ha of intact tropical, exceeds 6,000 US$/ha/y – about 10 times the income from 1 ha of oil palm in southern Thailand. But "value" is not the same as "income". Converting value into income requires good governance (e.g. laws, tenure, and institutes) that allows local people to access diverse income streams that could potentially flow from intact forest ecosystem, whilst simultaneously regulating for sustainable management. Access to venture capital is needed to start new businesses. Investment in human resources would also be needed – training and skills development to enable local people to produce novel products and services. Skilful marketing and advertising would also be needed, to persuade potential customers to buy new products and services and to pay for resources (e.g. flood prevention, water, carbon storage), which were formerly regarded as free or very low cost.

The economic elegance of community forestry is that it generates diverse income streams shared amongst diverse stake-holders. So, if the market price of one service/product falls, others can be developed to maintain profitability. Community forestry could well become a highly lucrative global industry. One day money really will grow on trees!



Potential value of ecosystem products/services from 1 ha of tropical forest (US$/y) exceeds 6,000US$ (according to TEEB)

Lecture 3: Kandyan homegardens and rural economy

--- Mr. Dissanayake Wasantha Tikiri Bandara

Home gardens have usefully been defined as "a small scale, supplementary food production system by and for household members that mimics the natural, multi-layered ecosystem". (FAO, 2004). The basic structures of the home garden varied from place to place, based on their ecological, socio- economic and cultural factors.

Kandyan Home Gardens (KHG) of Sri Lanka are economically efficient, socio-culturally and politically embedded, ecologically sustainable unique places (Pathmasiri et al., 2016), which are managed by dwellers predominantly through their idle family labour with minimum agro-chemicals or high inputs, based on the knowledge that transmits over generations. This system, which almost simulates a tropical rainforest ecosystem, predominates in Kandy District of the wet zone of the central province of Sri Lanka. (Jacob and Alles, 1987).

In Kandyan homegardens, trees and shrubs of more than 30 species are grown in a multi-tiered arrangement where the canopy is at different levels and virtually closed (Nanayakkara, 1992). They consist of annual, biennial and perennial crops and often includes livestock. Households derive food supplements, traditional medicines, low cost building materials, fuel wood and supplementary income. KHG systems therefore contribute to rural food security directly by supplying food sources and indirectly by escalating household income. According to Gunathilake et al, (1991) the contribution of home garden products to low income families accounted for up to 31% of their total income.

The potentials for income generation using the resources within the KHG system is enormous (Perera and Perera, 1997). Commercial development addressing market interests such as value addition, certification schemes, or development of marketable goods with reduced post-harvest loss, could make a lock-in effect of the systems and their users. However, it is important to conserve the stability and the sustainability of the system while ensuring the maintenance of ecosystem services such as biodiversity and water regulation.

Rapid urbanization leading to land fragmentation in populated areas, uncontrolled increase of wild animals, adverse impacts of climate change are important challenges for the development and maintenance of homegardens in present day context. In addition, availability of skilled labor, understanding market dynamics, and conducive government policy are essential factors determining the success of efforts to commercialize Kandyan homegardens for increased income.

Lecture 4: Forest policies, institutions and management: How they have accommodated livelihood concerns

--- Dr. C.T.S. Nair

Whether forest management will be able to fulfill livelihood objectives or not is very much dependent on the combined effect of policies, legislation and institutions, both within and outside the forest sector. In this regard it is also important to consider the spatial dimension, in view of the increasing linkages between global, national and local developments. For example, international trade policies could have significant impacts on the livelihood of forest dependent people much more than what is envisaged by local level forest policies. Therefore, any analysis of policies, regulations and institutions should consider the full canvass, transcending the sectoral and national boundaries.

Forest policies, legislation and institutions have undergone important changes and during the recent decades the pace of change has accelerated considerably. The situation however varies considerably between countries. Global, national and local developments have led to revision of forest policies in most countries and social aspects in particular livelihood improvement of forest dependent communities have become an important objective of national forest policies. However often policy objectives are not always translated effectively into concrete action on account of deficiencies in legal and institutional framework. Many countries still rely on a legal framework, built on an "exclusion approach" often treating use of forests for livelihood as a forest crime. Failure to repeal older rules and regulations have led to severe conflicts. Some of the general trends as regards changes in policies, legislation and institutions that impact the livelihood role of forests are summarized below:

1) Most of the countries in the Asia-Pacific region have revised their forest policies especially in the post 1980 period and the revised policies reflect the larger changes in the socio-economic conditions. Social considerations like poverty alleviation and livelihood improvement have been mainstreamed in most of the recent forest policies.
2) Several initiatives have been implemented to facilitate increased participation of communities in the management of forests. Institutional arrangements like forest user groups, community forestry, joint forest management, etc. have enhanced local community participation in forest resource management, enabling increased attention to livelihood dimensions.
3) The developments on the legal front have been somewhat mixed. Though some countries continue to rely on archaic legislation developed almost a century ago, there are also very forward-looking legislation that aims to empower local communities including through

tenure reforms. Also, while farmers and communities are getting actively involved in tree growing, vestiges of old legislation persist creating disincentives.

4) The institutional arrangements are also quite varied. Increased involvement of community organizations in forest management had a positive impact on fulfilling the livelihood needs of rural communities.
5) Livelihood aspects of forestry were earlier addressed in a paternalistic manner and it was assumed that forest based industrial development provided the most effective option for livelihood improvement through employment generation. However, this has changed and there is realization that forests could address several livelihood issues directly. In fact, in many situations the quest for industrial forestry had net negative impacts on livelihoods.
6) Many management practices need to be reviewed and improved to enhance forestry's contribution to livelihood improvement.

Overall there is increasing convergence of policies, legislation and institutions and certainly there is greater emphasis on objectives like livelihood improvement. Many challenges need to be overcome, one of the most important being the resistance to change from those who benefit from current policy, legal and institutional framework. Further changes in policies, legislation and institutional arrangements need to be a continuous process adapting to the larger changes.

Lecture 5: Tourism - Forest interaction case studies

--- Dr. Stephen Elliott

Eco-tourism – defined

"Minimum-impact" tourism, where ecosystems and wildlife are the main, income-generating attractions, which:

- generates revenue for ecological conservation and/or
- contributes labour or expertise to conservation and/or
- educates or inspires tourists to become conservationists.

Revenue from eco-tourism should fund direct conservation activities and/or provide incentives to local people to reduce their negative impact on ecosystems and wildlife. Clear mechanisms must exist to ensure that a substantial percentage of the revenue from eco-tourism supports conservation and supports the local economy and does not merely provide profits for private enterprises that move elsewhere when forests become degraded.

This lecture covers 5 cases studies from Doi Suthep-Pui National Park in northern Thailand, where interactions between tourism and forests have had various effects. As is typical in developing countries – none of the examples can be said to meet the pure ideals of eco-tourism.

Case Study 1 – Ban Doi Pui

Increased income from the development of conventional mass tourism freed up formerly cultivated land for forest regeneration. Other factors included implementation of a top-down government reforestation project and the organization of local fire prevention teams (needed to prevent fire from deterring tourists).

Case Study 2 – Ban Khun Chiang Kien

Benign neglect of an experimental coffee plantation (owned by Chiang Mai University) led to forest regeneration and the planting of wild cherry trees. During their short flowering season (January), the latter attract vast numbers of tourists into an area that was formerly rarely visited. This provides local people with a seasonal income boost and an incentive to conserve the trees.

Case Study 3 – Ban Mae Sa

A scientific research project resulted in a series of experimental forest restoration trial plots, which developed into an attraction for educational events ("edu-tourism"). The project evolved into an early example of Forest Landscape Restoration (FLR), as a result of collaboration between a university, local community and a national park authority. The Chrono sequence of trial restoration plots (established 1996 to 2013) tested the framework-species method of forest restoration. The project developed successful restoration techniques and gained insights into the factors that influence villagers' participation in forest restoration. Recovery of forest biomass, carbon storage, structure, biodiversity and ecological functioning exceeded expectations. Villagers appreciated the improved water security that resulted from the project, as well as a better relationship with the park authority and increased land security. Recently, however, tree chopping and a breakdown in fire-prevention measures (perhaps symptoms of "project fatigue") have threatened the sustainability of the plot system, possibly because the benefits from tourism were not spread evenly across the community. Recent efforts by the park authority to ban any further ecotourism development in the area now threatens the sustainability of the forest established under this project.

Case Study 4 – Mon Cham

Development of a major tourist attraction, consisting of a view point and famous restaurant, encouraged restoration of forest on nearby slopes, to improve the aesthetics of the area. The need was to create a positive landscape image for visitors. The restoration was successful and now provides a potential educational opportunity for visitors. Furthermore, restoration was encouraged under government efforts to prevent floods, following the disastrous 2011 floods which killed >800 people. However, the park authority's recent clamp down on tourism in this area has led to removal of restaurant and decommissioning of the car park, effectively removing the incentive to continue with forest restoration activities and prevent fires.

Case Study 5 - Ban Pong Khrai

A local water bottling company (Aura) was encouraged by an international project (LEAF) to provide funds to restore forest to an upper watershed, as part of a "Payments for Ecological Services" model project (PES) on the communal land of Ban Pong Khrai. The villagers had been "pre-sensitised" to the concept of PES as a result of receiving annual payments from an "eco-tourism" development – the Flying Squirrel Zipline. So, in this case, payments from an existing tourist attraction paved the way for villagers to co-operate with a forest restoration project. The benefits from tourism had been spread evenly across the whole community.

- Income from tourism can free up land for forest restoration.
- Forest restoration can attract tourists and contribute to village economies.
- Tourism can encourage implementation of restoration for aesthetics.
- Exposure of villagers to eco-tourism can encourage them to participate actively in forest restoration projects.
- Failure to evenly distribute the benefits of tourism among all community members can lead to destruction of restored forests.

Lecture 6: The pros and cons of community forestry in protected areas (Debate)

--- Dr. Stephen Elliott

Introduction

This debate will address the widely-held view that state-run forestry departments have largely failed to protect biodiversity over the past few decades and have also failed to deliver meaningful benefits to communities in or near forests. Forest loss and species extinctions continue, despite the creation of so-called "protected" areas. Local people often feel compelled to destroy forest, because it does not belong to them and they feel they have to "grab forest resources before someone else does". Handing over forest management to local communities is proposed as a way to conserve biodiversity, since local people may take better care of forest habitats, if they own them and can pass them on to their descendants. In contrast, conservationists argue that villagers have no interest in conserving dangerous or non-economic species and that community forests inevitably degenerate into cultivated agroforestry systems, where the original wildlife is replaced with ubiquitous, domesticated species.

Objectives:

Session 1 (costs/benefits) and session 2 (ecotourism) provides many examples of the advantages and disadvantages of community forestry. This session is designed to encourage students to critically evaluate these examples and integrate them with their own experiences

and reading to develop a deeper overall understanding of community forestry issues - then test that understanding against opposing views.

Procedure

The class will be divided into 2 equal teams. Team 1 will propose the motion and argue in favor of it (the affirmative team), whilst Team 2 will oppose the motion (the opposing team). Students will be assigned to a team regardless of their personal opinions, so some may have to argue from a position with which they disagree personally.

Instructions:

Hold team meetings in advance to: -

1) compile a list of arguments for/ against the motion
2) nominate 2 **speakers** in your team to formally propose/oppose the motion,
3) consider what arguments the other side will make and how will you counter them and
4) nominate a **recorder** for your team who will summarize the arguments as concise
5) bullet points as they arise

Format

The format of the debate will be formal, as follows: -

1) first speaker proposes the motion and presents the strongest arguments in support of it (5 minutes),
2) the first speaker on the opposing team presents the strongest arguments against the motion (5 minutes),
3) the second speaker on the affirmative team presents further arguments in support of the motion resolution, identifies areas of conflict, and addresses questions that may have been raised by the previous opposition speaker (5 minutes),
4) the second speaker on the opposing team presents further arguments against the resolution, identifies further areas of conflict, and answers questions that may have been raised by the previous affirmative speaker (5 minutes),
5) short break to prepare rebuttals (10 minutes),
6) rebuttal by opposing team – defends or augments opposing arguments to counter the supporting arguments (5 minutes) – delivered by other members of the team (***not*** the main speakers),
7) rebuttal by affirmative team (5 minutes) – same format as 6),
8) closing arguments supporting the motion, by the **recorder** of affirmative team (5 minutes) &
9) closing arguments opposing the motion, by the **recorder** of opposing team (5 minutes).
10) Judges' comments and voting.

Protocol

No interruptions are permitted. Students must wait their turns. Students will not address each other directly. They must direct their comments/question through the chairperson and refer to each other as "the distinguished representative of (country)" - in the third person - UN-style. e.g. "Mr Chairman, the distinguished representative of China makes a valid point"

Lecture 7: Livelihood improvement through payment for ecosystem services: opportunities and challenges

--- Dr. C.T.S. Nair

Payment for ecological services is often considered as a win-win option helping to protect the environment and to enhance income of rural communities. The presentation examines the evolution of PES, how PES is put into practice and the opportunities and challenges in making it relevant to enhancing the livelihood of rural communities.

Increased awareness about the ecological services of forests has led to a shift in forest management objectives giving greater attention to forest's functions like watershed protection, climate change mitigation and adaptation, biodiversity conservation and provision of amenity values. Large tracts of forests earlier managed for wood production have been set aside for the provision of ecological services. Natural disasters like floods and cyclones have encouraged several countries to impose logging bans and to manage forests entirely for their environmental values. Similarly, climate change concerns are impacting forest policies, and most countries have included forests as a key component in their climate change adaptation and mitigation strategies.

A shift from wood production to provision of ecological services raises the question as to who will pay for the provision of ecological services and to what extent payments for ecological services will help to improve the livelihoods of rural communities. Traditionally the costs of conservation have been borne by the public at large – by governments which was justified considering that there are no markets for ecological services, and, further that most of the environmental services accrue to society, including future generations. However, in recent decades, there has been significant efforts to bring environmental services within the purview of market mechanism so that beneficiaries pay for the provision of such services which in turn provides the necessary incentives to the suppliers of such services, namely forest owners. Several countries have put in place systems for payment for ecological services. This presentation addresses some of the pros and cons of the experience of PES implementation focusing on the following:

- Conditions under which PES can generate adequate income encouraging the provision of environmental services; and

- Factors that help to ensure that a significant share of PES helps to alleviate poverty and to improve the livelihood of rural communities.

There are several examples of PES in respect of watershed protection, carbon sequestration, biodiversity conservation and provision of amenity values. However there are many uncertainties as to how much of the realizable potential will accrue to those whose livelihoods need improvement which will depend very much on to what extent they are participating in the provision of the services either as owners of forests or as participants in the delivery of services.

Important take home messages as regards development and implementation of PES are:

- Whether the full potential of PES to contribute to livelihood improvement will be realized or not depends on (a) The larger socio-political, economic and institutional environment; and (b) the socio-economic conditions of the households.
- Ownership of land and forests is an important requirement for realizing PES benefits by rural communities. Tenure reform is hence most critical.
- There is a need to consider the opportunity costs of provision of ecological services. Income from PES may not be commensurate with the income from foregone opportunities.
- PES is highly context specific: "One size fits all" approach is bound to fail.
- Developing a PES system is an extremely challenging task. It requires a wide array of policy, institutional and technical interventions to work in unison. Livelihood improvement makes it even more complex.
- Bundling of different environmental services and adoption of a landscape approach could help to address some of the economic challenges in enhancing the livelihood role of PES

Lecture 8: The development of NTFPs for improving livelihood of rural people in mountainous area- A case study from Lin'an of Zhejiang Province, China

--- Prof. Jiang Chunqian

Lecture 9: Urban Forestry

--- Dr. Preecha Ongprasert

Urban forestry is a new paradigm for sustainable forest management. The management itself has to integrate various disciplines such as forestry, architecture, horticulture, engineering, agriculture, etc. to ensure the long term management.

In order to make a linkage with urban people and livelihood to the urban forestry, it is necessary to understand the philosophy, scientific, and social dimensions of urban forestry management.

As a consequence, the presentation for the above-mentioned topic will include 4 topics as listed below:

1) Concept and Definition
   - Definition of the term "urban"
   - Definition and concept of "urban forestry:
2) The discipline of urban forestry
   - A new approach to the potential of urban forestry in developing countries
   - Urbanization in the third world: development and trend
   - Growing environmental concern
3) Potential of urban forestry indifferent urban zones
   - Biographical zonation
   - Land ownership and tree resources
   - A simple spatial model for urban forestry
4) Potential benefits for urban livelihood and problem
   - Material benefits
   - Environmental benefits
   - Potential problems

Lecture 10: Co-management as conservation discourse for improving community livelihoods

--- Dr. Wu Yusong

Reducing extreme poverty and hunger is an internationally agreed goal. Achieving this goal should seek to work across sectors and disciplines. Conservation can never be the solution to extreme poverty, but it can play a role, particularly in rural areas where poor communities are dependent on natural resources, and conservation can help find equitable and ecologically sustainable solutions. This presentation is based on the 10 years co-management project demonstration in Baimaxueshan Nature Reserve, and the case was selected as the top 20 best by IUCN and ADB in 2003.

ATTACHED FILES

1. PPT SLIDES OF KEYNOTE LECTURES

1) Changing role of forests in people's livelihood: Past, present and future.

   --- Dr. C.T.S. Nair

2) Costs and benefits of community forestry

   --- Dr. Stephen Elliott

3) Kandyan homegardens and rural economy

   --- Mr. Dissanayake Wasantha Tikiri Bandara

4) Forest policies, institutions and management: How they have accommodated livelihood concerns

   --- Dr. C.T.S. Nair

5) Tourism - Forest interaction case studies

   --- Dr. Stephen Elliott

6) Livelihood improvement through payment for ecosystem services: Opportunities and challenges

   --- Dr. C.T.S. Nair

7) Urban forestry

   --- Dr. Preecha Ongprasert

8) Co-management as conservation discourse for improving community livelihoods

   --- Dr. Wu Yusong

2. PPT SLIDES OF PARTICIPANT PRESENTATIONS

1) **Bangladesh:** Making livelihood work for conservation : The case of Chunoti wildlife sanctuary Bangladesh
2) **Cambodia:** Benefits of none-timber forest product collection on livelihood improvement: Case study of the collections of seed and the analysis of collecting barometer earthstars (Astraeus *hygrometricus* (piers) Morgan)

3) **Fiji:** Efforts on forestry and rural livelihood development in Fiji
4) **Indonesia:** Contribution of planting coffee under forest stands to income and livelihood for people living in near forest (case location forest farmers group Giri Senang Bandung, West Java, Indonesia)
5) **Indonesia:** Protected areas and livelihoods: KHDTK-HDBS and community, an initiation from conflict to partnership
6) **Lao PDR:** Current situation, issue & future direction of forestry in Lao PDR
7) **Malaysia:** Forests and rural livelihood development in Peninsular Malaysia
8) **Mongolia:** Impact of "Forest Cleaning Programme" on livelihood of people in Mongolia
9) **Myanmar:** Survey on sustainable management of bamboo through pilot bamboo community forestry in Tharyarwady District, Myanmar
10) **Nepal:** Socio-economic impact of pro-poor leasehold forestry program: A case study of Sarlahi District, Nepal
11) **PNG:** Forestry and rural livelihood development in Papua New Guinea
12) **Sri Lanka:** Forestry and rural livelihood development in Sri Lanka
13) **Thailand:** The role of community forestry in rural livelihood and poverty alleviation in the Great Mekong Region: A case of Thailand
14) **Viet Nam:** NTFPs contributions from natural forests to income and livelihoods for people living in the buffer zone of the nature reserve of Vietnam

3. READING MATERIALS

A. Reading materials provided by Dr. C.T.S. Nair

Lecture 1: Changing role of forests in people's livelihood: Past, present and future.

1) Angelsen Arild & Sven Wunder 2003: Exploring the Forest-Poverty Links: Key Concepts, Issues and Research Implications. CIFOR Occasional Paper No. 40
2) Center for International Forestry Research (CIFOR). 2007. Poverty and forests: Multi-country analysis of spatial association and proposed policy solutions. CIFOR Info brief No.12. Bogor, Indonesia, Center for International Forestry Research (CIFOR). 4p.
3) Chomitz, Kenneth. 2007. At Loggerheads? Agricultural Expansion, Poverty Reduction, and Environment in the Tropical Forests. World Bank Policy Research Report. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/7190 License: CC BY 3.0 IGO. https://openknowledge.worldbank.org/handle/10986/7190

4) FAO 2018. The State of World's Forests: Forest Pathways to Sustainable Development, FAO, Rome.
5) FAO 2014. State of World's Forests: Enhancing socio-economic benefits from forest, Food and Agriculture Organization of the United Nations, Rome.
6) FAO 2014. Contribution of forestry sector to national economies 1990 – 2011, By A Lebedys and Y. Li, Forest Finance Working Paper FSFM/ACC/09, FAO, Rome.
7) Vira B, Wildburger C & Mansourian S. 2015. Forests, trees and landscape for food security and nutrition: A global assessment report, IUFRO World Series Vol 33, IUFRO, Vienna.

Lecture 4: Forest policies, institutions and management: How they have accommodated livelihood concerns

8) FAO 2008. Reinventing forestry agencies: Experiences of institutional restructuring in Asia and the Pacific, RAP Publication 2008/05, FAO Regional Office for Asia and the Pacific, Bangkok. http://www.fao.org/docrep/010/ai412e/ai412e00.HTM
9) FAO, 2010. Forestry policies, legislation and institutions in Asia and the Pacific, Trends and emerging needs for 2020, RAP Publication 2010/10, FAO Regional office for Asia and the Pacific, , Bangkok. http://www.fao.org/docrep/013/i1722e/i1722e00.pdf
10) FAO, AFN and APFNet 2012. Making forestry work for the poor: Assessment of the contribution of forestry to poverty alleviation in Asia and the Pacific, FAO Regional Office for Asia and the Pacific, Bangkok
11) FAO 2014. Strengthening evidence-based forest policy-making: Linking forest monitoring and national forest programmes, Forest Policy and Institutions Working paper 33, FAO, Rome. http://www.fao.org/3/a-mk788e.pdf
12) FAO 2015. Strengthening public forestry institutions, FAO Policy Brief, FAO, and Rome.

Lecture 7: Livelihood improvement through payment for ecosystem services: Opportunities and challenges

13) Arild Angelsen et al 2014. Environmental income and rural livelihoods: A global comparative analysis, World Development, Open-access article, http://dx.doi.org/10.1016/j.worlddev.2014.03.006
14) Jeffrey C Milder, Sara J, Scherr and C. Bracer 2010. Trends and future potential of payment for ecosystem services to alleviate rural poverty in developing countries, Ecology and Society 15(2) 4. On-line publication: http://www.ecologyandsociety:org/vol15/iss2/art4

15) Forest Trends' Ecosystem Market Place 2017.Unlocking potential: State of the voluntary carbon markets 2017. Forest Trend's Ecosystem Market Place, Washington DC

16) Sunderlin W, et al 2004, Livelihoods, forests and conservation in developing countries: An overview, World Development Vol 33 No 9, pp1383 – 1402

17) Wunder S, Angelsen A and B. Belcher 2014. Forests, livelihoods and conservation: Broadening the empirical base, World Development 64, pp S1-S11.

Preparation of policy briefs

18) FAO Preparing Policy Briefs http://www.fao.org/docrep/014/i2195e/i2195e03.pdf

19) IDRC. How to write a policy brief, https://www.idrc.ca/sites/default/files/idrcpolicybrieftoolkit.pdf

20) Laura ffrench-Constant How to plan, write and communicate an effective policy brief: Three steps to success, Research to Action, https://www.researchtoaction.org/wp-content/uploads/2014/10/PBWeekLauraFCfinal.pdf

B. Reading materials provided by Dr. Stephen Elliott

Lecture 2: Costs and benefits of community forestry

1) Lewis, S. L.., G. Lopez-Gonzalez, B. Sonke´, K. Affum-Baffoe, T. R. Baker, L. O. Ojo, O. L. Phillips, J. M. Reitsma, L. White, J. A. Comiskey, M.-N. Djuikouo K., C. E. N. Ewango, T. R. Feldpausch, A. C. Hamilton, M. Gloor, T. Hart, A. Hladik, J. Lloyd, J. C. Lovett, J.-R. Makana, Y. Malhi, F. M. Mbago, H. J. Ndangalasi, J. Peacock, K. S.-H. Peh, D. Sheil, T. Sunderland, M. D. Swaine, J. Taplin, D. Taylor, S. C. Thomas, R. Votere and H. Woll, 2009. Increasing carbon storage in intact African tropical forests. Nature, 457: 1003-1007.

2) Lewis, L, C. Wheeler, E. Mitchard & A. Koch, 2019. Restoring natural forests is the best way to remove atmospheric carbon. Nature 568: 25-28

3) Ricketts, T., Daily, G., Ehrlich, P. & Michener, D., 2004. Economic value of tropical forest to coffee production. PNAS 101 (34) 12579-12582; DOI:10.1073/pnas0405147101

Lecture 5: Tourism - Forest interaction case studies

4) Elliott, S., S. Chairuangsri, C. Kuaraksa, S. Sangkum, K. Sinhaseni, D. Shannon, P. Nippanon & B. Manohan. 2019. Collaboration and Conflict - Developing forest restoration techniques for northern Thailand's upper watersheds whilst meeting the needs of science and communities. Forests 10(9): 732; https://doi.org/10.3390/f10090732

Lecture 6: The pros and cons of community forestry in protected areas (Debate)

5) Elliott, S., 1994. Can community forestry save biodiversity? Nat. Hist. Bull. Siam Soc. 42(2): 150-152.

C. Reading materials provided by Mr. Dissanayake Wasantha Tikiri Bandara

Lecture 3: Kandyan homegardens and rural economy

1) Galhena DH, Russell Freed and Karim M.M., 2013. Home gardens: a promising approach to enhance household food security and wellbeing. Agriculture & Food Security 2013, 2:8
2) McConnell D.J., 1992. The forest garden farms of Kandy, Sri Lanka. FAO, Rome
3) Mohari, H., Lahoti, S., Saito, O., Mahalingam, A., Ginathilleke, N., Irham., Hoang, V.T., Hitinayake, G., Takeuchi, K., Herath, S., 2013. Assessment of ecosystem services in homegarden systems in Indonesia, Sri Lanka and Vietnam. www.elsevier.com/locate/ecoser.
4) Pushpakumara, D., A. Wijesekara and D. Hunter., 2010. Kandyan Homegardens: A Promising Land Management System in Sri Lanka. Sustainable use of biological diversity in socio-ecological production landscapes, 102.
5) Thamiem, S., Weerahewa, J., Pushpakumara, D.K.N.G. and V.P. Singh, 2011. Trade Competitiveness of Agroforestry Crop Sector in Sri Lanka. Tropical Agricultural Research Vol. 22 (4): 338 – 347

D. Reading materials provided by Dr. Preecha Ongprasert

Lecture 9: Urban Forestry

1) Northeast Center for Urban and Community Forestry, 2004. A guide: Developing a street and park tree management plan. Available from: http://www.umass.edu/urbantree
2) Fabio S. et al 2016. Guidelines on Urban and Peri-urban Forestry. FAO Forestry Paper 178, Rome.
3) Stephen C.G. et al 2008. Urban Forestry: Mississippi Urban and Community Forestry Management Manual. Forest and Wildlife Research Center, Mississippi State University.
4) Craig H. 2017. Rural-Urban Linkages in the Context of Sustainable Development and Environmental Protection. Global Land Outlook Working Paper, United Nations Convention to Combat Densification.
5) Montri I. et al 2017. Urban Forest Assessment in Bangkok, Thailand. Journal of Sustainable Forestry, Vol. 36, No. 2:148-163. Available from: http://dx.doi.org/10.1080/10549811.2016.1265455

Attached Files: PPT Slides of Keynote Lecture

Lecture 1: Changing Role of Forests in People's Livelihood: Past, Present and Future

--- Dr. C.T.S. Nair

APFNet

APFNET WORKSHOP ON
FORESTRY AND RURAL LIVELIHOOD DEVELOPMENT
1-14 November 2019 Yunnan Province, China

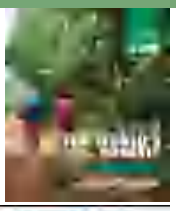
CHANGING ROLE OF FORESTS IN PEOPLE'S LIVELIHOOD: PAST, PRESENT AND FUTURE

Dr C T S Nair

Sponsored by:
Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet)

Organized by:
Southwest Forestry University (SWFU)
Forestry and Grassland Administration of Yunnan Province (FGAYP)
APFNet Kunming Training Center (APFNet-KTC)

WHY LIVELIHOOD ISSUES ARE IMPORTANT?



- Forests are a source of a wide array of products and services that contribute to people's livelihood.
- The extent of poverty is very high among people who live in or close to forests.
- Policies at the national and global levels are giving increased thrust on livelihood roles of forests.
- It is in this context that APFNet has chosen rural livelihood improvement as the theme of one of its two annual workshops.

SOME IMPORTANT QUESTIONS

- Are forests really critical in meeting the livelihood needs of rural communities?
- Why people are dependent on forests for livelihoods?
- What are the direct and indirect roles of forests in improving livelihoods of people, especially in rural areas?
- What are the future scenarios as regards dependence on forests for livelihoods?
- What should be done to enhance the livelihood contribution of forests?

WHY BRING FORESTS TO THE LIVELIHOOD DISCOURSE?

- Increased understanding of the role of forests in providing livelihood security.
- Although poverty has declined during the last two decades we still have a large number of people still live below the poverty line.
- Overlap of distribution of forests and distribution of poverty – "Rich forests – poor people" syndrome.
- Failure to mainstream livelihood consideration undermines conservation and sustainable management of forests.

LIVELIHOOD: DEFINITION

- In very simple terms a livelihood is:

"a means of making a living. It encompasses people's capabilities, assets, income and activities required to secure the necessities of life"

- Sustainable livelihood:

"A livelihood is sustainable when it enables people to cope with and recover from shocks and stresses (such as natural disasters and economic and social upheavals) and enhance their well-being and that of future generations without undermining the natural environment and resource base".

LIVELIHOOD: SOME BASIC ISSUES

- Livelihood and hierarchy of needs.
- Different assets and their implications on livelihood.
- Forests – A natural capital generating a stream of goods and services directly and indirectly impacting livelihoods.
- Explaining the "Rich forests – Poor people" Syndrome.

LIVELIHOOD ASPECTS

- Two aspects of forest related livelihood issues have received considerable attention:
  - The number of people who are dependent on forests for livelihood.
  - The degree of dependence.

HIERARCHY OF HUMAN NEEDS

- While considering livelihood, we need to understand that there is a hierarchy of needs as elaborated by Abraham Maslow in 1943.
- There are different types of needs, the most fundamental being physiological needs – food, water, air, clothing, shelter, etc.
- Once needs at a lower level are satisfied, humans strive to satisfy the needs at the higher level.

LIVELIHOOD AND FORESTS: A GENERAL FRAMEWORK

- Livelihood and hierarchy of needs.
- Different assets and their implications on livelihood.
- Forests – A natural capital generating a stream of goods and services directly and indirectly impacting livelihoods.
- Explaining the "Rich forests – Poor people" Syndrome.

EXTENT OF FOREST DEPENDENCE

- No precise estimates are available on the number of forest dependent people.
- Essentially this is related to what we mean by forest dependency.
  - The World Commission on Forests and Sustainable Development (1997) – 350 million people are almost entirely dependent on forests for their subsistence and another 1.00 billion rely on trees and woodlands for food, fuel, fodder, etc. in varying degrees.
  - World Bank in 2002 estimated the number of forest dependent people as 1.6 billion.
  - More recent assessment – Chao 2012 – puts the number of forest dependent people as 1.2 to 1.6 billion

EXTENT OF FOREST DEPENDENCE

- Studies on the degree of dependence on forests:
  - There have been several studies that attempted to measure the extent of forest dependence.
  - Degree of dependence is linked to the social, economic and ecological settings and hence highly context specific.
  - As the socio-economic conditions change over time, so will forest dependence.

FOREST DEPENDENT PEOPLE AND POVERTY

DISTRIBUTION OF RURAL PEOPLE LIVING ON LESS THAN USD 1.25 PER DAY AND RESIDING IN OR AROUND TROPICAL FORESTS AND SAVANNAHS

	Africa	Latin America	Asia	Total tropics
Forest population (millions)	284	65	451	800
Forest population living on under USD 1.25/day (millions)	159	8	84	251
Forest population living on under USD 1.25/day as percentage of total rural population living on under USD 1.25/day	56%	12%	27%	42%

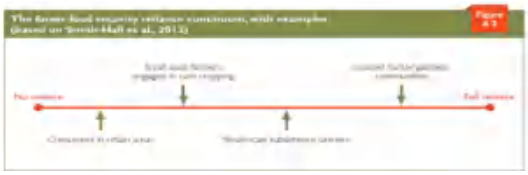
SOURCE: FAO, 2014; Sunderlin et al., 2004

FAO 2018 – State of World's Forests

DIVERSE NATURE OF FOREST DEPENDENCE

- Provision of livelihood on a regular and continuing basis (For example forest dependent communities derive a significant share of their livelihood from forests).
- Forests as a livelihood safety net: Especially when other sources of livelihood becomes difficult (People relying on forests as a short term option).
- Forests and trees as a source of income during emergencies (especially to meet large unanticipated expenditure).
- Forests helping to build other forms capital and thus escape from poverty.

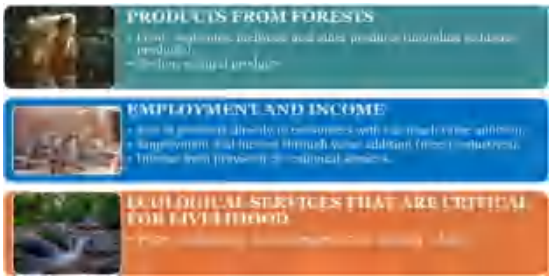
FOREST-LIVELIHOOD CONTINUUM



EVOLVING SOCIETIES AND FOREST DEPENDENCE

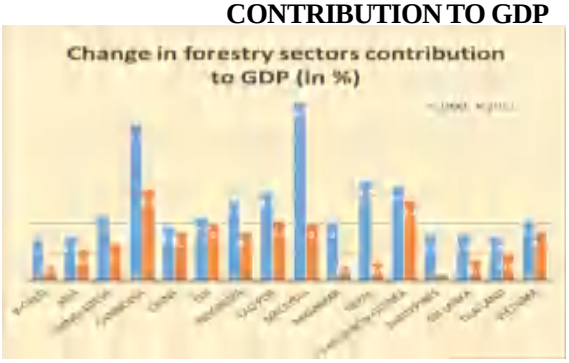
Pre-agrarian societies	• Almost complete dependence on forests for livelihood. • Primarily subsistence economy.
Agrarian societies	• Significantly reduced dependence – Mostly seasonal for products, employment and income
Industrial societies	• Direct dependence on forests declines. Emphasis on producing raw materials that contributes to livelihoods through income from employment in manufacturing and raw material production.
Post industrial society	• Rises forward to environmental values, especially amenity, health benefits, etc, and the provision of clean water, air, etc.

FOREST'S CONTRIBUTION TO LIVELIHOOD

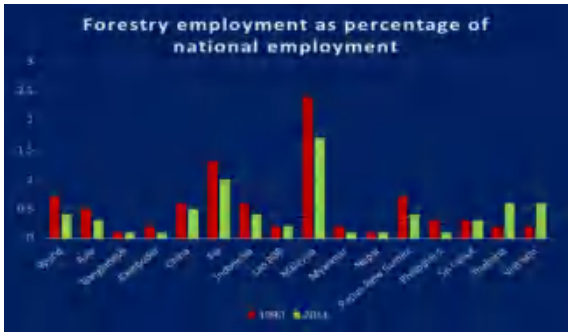


INCOME AND EMPLOYMENT FROM FORESTRY

FOREST SECTOR'S CONTRIBUTION TO GDP



FOREST SECTOR'S CONTRIBUTION TO EMPLOYMENT



FOREST SECTOR'S CONTRIBUTION TO GDP AND EMPLOYMENT

- **Defining forest dependence: There are no objective and accurate measures of forest dependence. Many types of dependence, which varies across space and time and it is unclear whether the numbers are comparable.**
- **Inadequacy of information to determine the actual level of dependence. Even when data is collected, quality variations are quite significant.**
- **GDP and employment estimates capture only a fraction of the actuals.**
- **A significant share of livelihood benefits have not been quantified and valued.**

In 2013, the number of people employed (full time equivalent) in forestry in the formal sector is estimated at 13.2 million. In addition it is estimated that another 41 million are employed in informal activities in the forest sector

ASSESSMENT OF LIVELIHOOD CONTRIBUTION: THE CHALLENGE

- **Modern forestry has primarily evolved to manage forests for timber production, especially for trade or industrial processing.**
- **Success in forest management largely determined on the basis of volume of timber produced or revenue generated.**
- **Fulfilment of livelihood needs takes place in the informal domain, which is not captured in national forest statistics.**
- **Anything that is not measured is more likely to be neglected.**

A SYSTEM APPROACH TO LIVELIHOOD ANALYSIS

For a better understanding of livelihood aspects we need to focus on the following:

- **Assets people depend up on.**
- **Strategies they develop to use the assets to make a living.**
- **The larger context within which a livelihood is developed; and**
- **Factors that make a livelihood more or less vulnerable to shocks and stresses.**

LIVELIHOOD ASSETS AND CONTEXT

APPROACHES TO IMPROVE LIVELIHOOD

- **Natural capital route: Access to products and services: Through rights over forests or rights to specific products**
  - **For subsistence consumption.**
  - **For sale of products/ services for income.**
- **Human capital route - Income from employment**
  - **Production of wood and other products and services (logging, plantation related activities, forest conservation, etc.)**
  - **Value addition – Processing of wood and other products.**

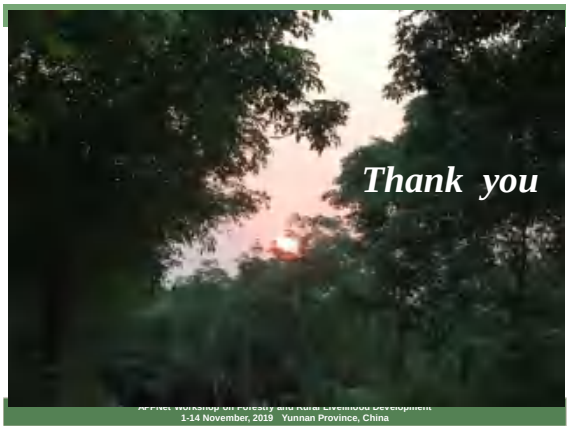
FORESTS, LANDSCAPES AND LIVELIHOODS

FORESTS, LANDSCAPES AND LIVELIHOODS

- **The realization that forests alone will not be able to address livelihood issues in isolation, increasing emphasis is being given to the adoption of a landscape approach.**
- **It involves the pursuit of an integrated approach, taking into account the linkages – economic, ecological, social and cultural - between different land uses.**
- **However, the pursuit of landscape approaches poses several challenges, the most critical being the shift from the traditional sectoral approach.**

TAKE-HOME MESSAGES

- **Forests – livelihood linkages are multiple, highly context specific and extremely dynamic.**
- **Direct dependence on forests for livelihood is declining, largely related to social and economic development.**
- **Data limitations affect our ability to make a realistic assessment of the extent of livelihood dependence.**
- **Need to shift from forest-centric to people-centric approaches. Livelihood should be looked at from the demand side (from the side of people) and not from the supply side (from what is produced by forests).**
- **Divergent nature of forest-dependence implies that forest management will have to address potential conflicts by building consensus on trade-offs between competing demands.**



Web: www.forru.org
Email: forru@science.cmu.ac.th

Facebook: Forru Cmu

For: APFNet Workshop on Forestry and Rural Livelihood Development
1 – 14 November, 2019 Yunnan Province, China

Costs and Benefits of Community Forestry

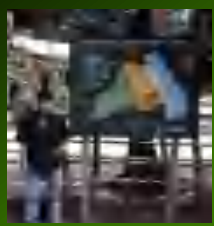
Stephen Elliott

Forest Restoration Research Unit
Biology Department
Faculty of Science
Chiang Mai University, Thailand

What is community forestry?

- Usually government-controlled forests handed over to local communities for communal management – under a national law/forest plan.
- Management agreements set rules and limits – and stipulate penalties for transgression.

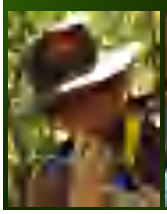
- Usually, forest "cover" must be maintained (but rarely quality/ biodiversity) & any exploitation must be "sustainable".
- Local (or joint) management committee – organizes "sustainable" exploitation and benefit sharing.



Management costs of an existing community forest

TIME

- Conception/management – meetings
- Administration – regulation, dispute resolution, reporting, accounting, benefit sharing
- Training



Management costs of an existing community forest

MONEY

- Legal/admin fees
- Survey costs – baseline carbon, timber and NTFP's
- Forest maintenance/ management – paid labour or voluntary?
- Particularly FIRE PREVENTION

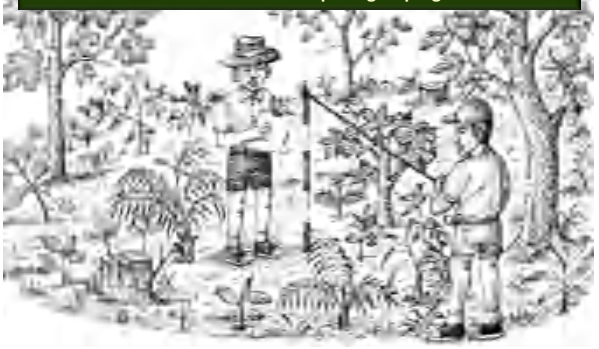
Production Value Foregone

Production Value Foregone

S. Thailand – current income from oil palm about 600 US$/ha/y from 7 to 15 years after plantation establishment.

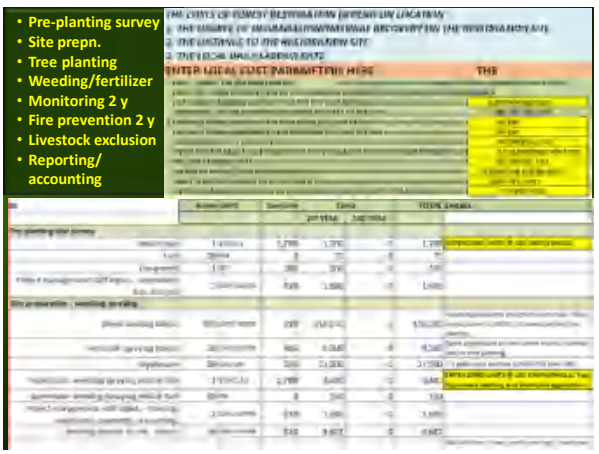
Pre-planting rapid site assessment

Measures the density and species richness of natural regeneration and identifies factors impeding its progress

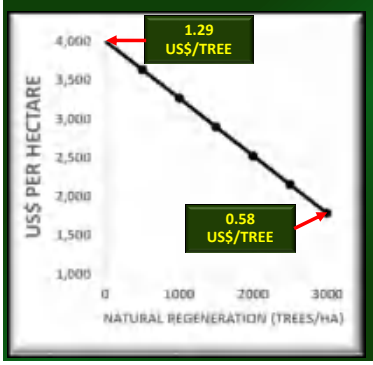


Collaborative Costing

- Pre-planting survey
- Site prepn.
- Tree planting
- Weeding/fertilizer
- Monitoring 2 y
- Fire prevention 2 y
- Livestock exclusion
- Reporting/ accounting



CURRENT FOREST RESTORATION COSTS, N. THAILAND

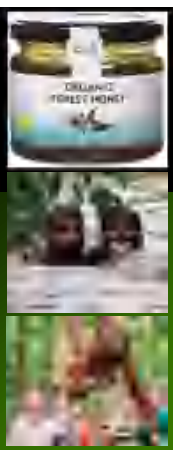


Including …

- DAILY LABOUR 10 US$/DAY
- SITE SURVEY AND PLANNING
- TREES AND PLANTING
- WEEDING AND FERTILIZER APPLICATION FOR 2 YEARS + FIRE PREVENTION.

Five main benefits

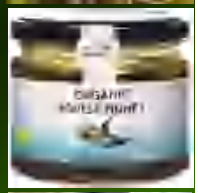
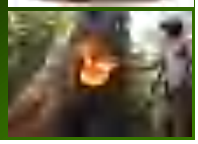
- Forest products
- Watershed functions
- Global climate change mitigation
- Biodiversity conservation
- Ecotourism



NTFP's Global Trade

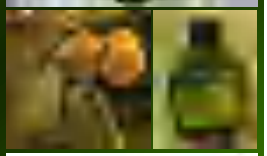
At least 150 different forest products, including rattan, bamboo, nuts, essential oils and pharmaceuticals, traded internationally, contribute about US$ 4.7 billion/year to the global economy.

Compared with NATURAL RUBBER - 13.1 billion US$ (2018) *-22.1% drop in value since 2014 when natural rubber shipments were worth $16.8 billion. Year over year, exported natural rubber depreciated by -19.9% from 2017 to 2018*

But … NTFP trade requires …

1) Sustainable management, by monitoring and research
2) Appropriate land tenure, taxation and legislative systems
3) Access to global markets – promotion advertising
4) Integration of traditional knowledge into NTFP research and management


NTFP's - subsistence

- Some forest-dwelling people depend on forest products for subsistence – but the numbers are probably declining.
- More often gathering or selling such products provides a safety net for the rural poor when times are bad.
- Value is quantified as "replacement" costs

Achieving Sustainable Harvesting

- Measure standing crop and growth rate
- Annual harvest must be ≤ annual production.
  - Calculate quotas
  - Issue permits
  - Record total harvest and harvest "effort"
  - Enforcement – dealing with transgressors
  - Cost of administration > income from product?

Danger in relying on NTFP's as community forest "value"

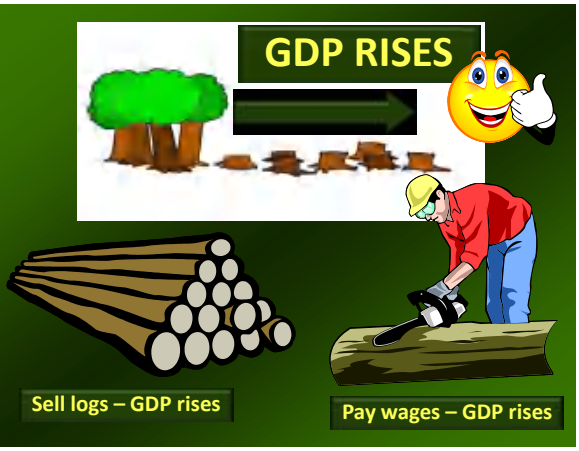
- Trend is often towards domestication – which can provide an incentive to deforest
- Exception – mycorrhizal fungi which grow associated with forest trees


Traded products contribute towards GDP. Subsistence products do not. But replacement products do.

GDP rises
Economic Growth

GDP falls
Recession

GDP RISES



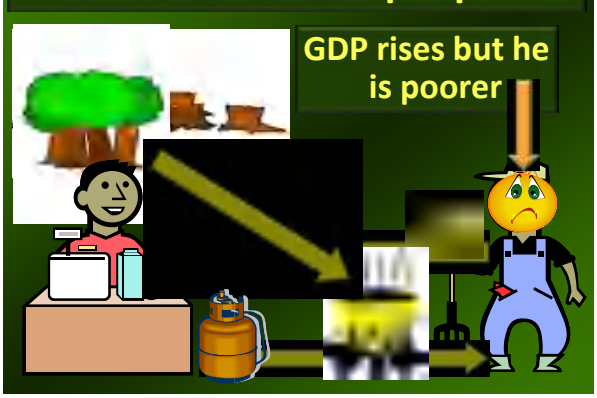
Sell logs – GDP rises

Pay wages – GDP rises

But are we really richer?

Productive	Degraded
NTFP's Water Carbon storage Biodiversity	Few usable products Soil erosion Global warming Species loss

What about local people?



GDP rises but he is poorer

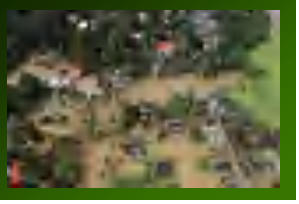
So, forest destruction *always* results in net economic loss at the national and local levels.

By measuring prosperity by GDP, we don't value *all* the benefits of forests.

So should governments invest in community forestry?

Watershed Services

- Deforestation increases water yield (as transpiration through tree crowns is reduced) but outflow becomes more seasonal.
- Tropical forests add enormous quantities of organic matter to soils, which increases their field capacity (gm water stored per gm dry soil). Such soils soak up water during the rainy season (reducing floods) and release it gradually during the dry season (reducing droughts).



Watershed Services

- Deforestation exposes the soil to erosion and compaction. Absorptive top soil is rapidly lost. Infiltration is reduced and runoff increases, resulting in flash floods & landslides.
- Sedimentation of watercourses lowers their volume, resulting in higher floods. Blockage of irrigation systems lowers agricultural productivity.

Table 4.

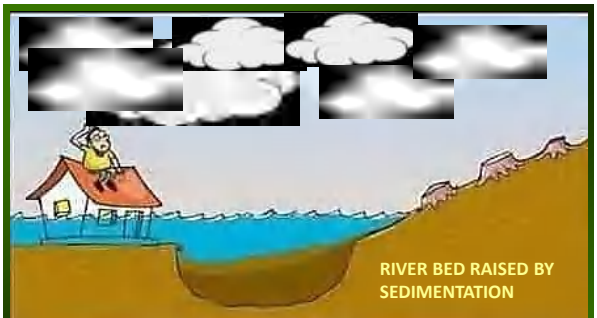
Relationships between surface runoff, soil erosion and canopy cover. From Ruangpanit (1985)

	Surface runoff (m^3 ha^{-1})			Soil erosion (kg ha^{-1})		
Crown cover%	Total*	Average	Cumulative	Total	Average	Cumulative
20-30	194.2	4.7	21.8	652.8	15.9	62.8
40-50	177.8	4.3	17.1	512.3	12.5	46.9
50-60	183.4	4.5	12.8	456.9	11.1	34.4
60-70	113.2	2.8	8.3	372.5	9.1	23.3
70-80	121.3	3.0	5.5	298.0	7.2	14.2
80-90	102.3	2.5	2.5	285.1	7.0	7.0

* For 41 runoff-producing storms totalling 1,128 mm rainfall.

Flow is lower but more constant in all seasons. Sedimentation low.

Flow is higher in rainy season. High sedimentation begins to reduce river channel volume.

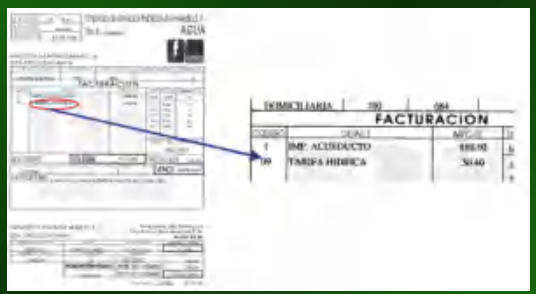


RIVER BED RAISED BY SEDIMENTATION

INCREASED RUNOFF + REDUCED RIVER CHANNEL VOLUME = FLASH FLOODS

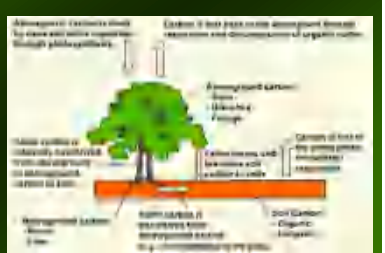
Thailand Floods 2011: 815 deaths and 42 billion US$ damage to infra-structure and industry. The 7th costliest disaster in human history.

How to monetarize watershed services?



Community forests as carbon sinks

- Tropical forests (in general) absorb more CO_2 than they emit about 1.3 gigatonnes* of carbon (GtC) per year (Lewis et al., 2009)
- = 16.6% of carbon emissions from burning fossil fuels and the cement industry
- = 60% of the sink provided by all of the terrestrial vegetation on Earth.



Lewis, L. S., et al., 2009. Increasing carbon storage in intact African tropical forests. Nature, 457: 1003-1007

… but it depends on what kind of community forest …

Lewis L. S. et al, 2019. Nature, 568, 25-28

Global Climate Change

- Tropical forests store about 240 tC/ha in trees/soil.
- Crop lands - 80 tC/ha mostly in soil.
- So clearing 1 ha of tropical forest emits about 160 tC & also reduces subsequent sequestration rate.
- Agriculture also releases methane, which is 20 times more efficient at trapping heat than CO_2 is.

How to monetarize carbon? – carbon credits

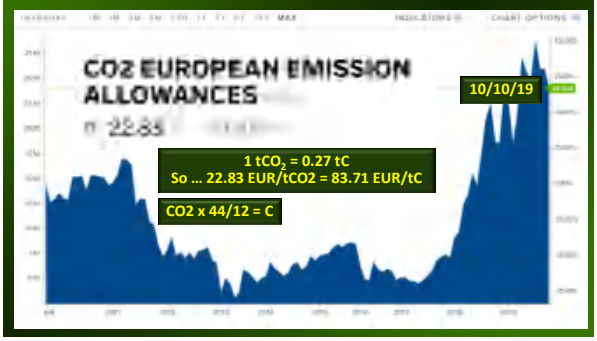
Carbon Credits

Carbon credit - tradeable certificate that represents the avoidance or removal of 1 t of carbon dioxide emissions. Credits are invested in emissions reduction (e.g. renewable energy replacing fossil fuels) or carbon sequestration (e.g. tree planting).

Compliance credits (CER's) – governments and corporations legally obliged to buy credits to meet targets set by national laws (in accordance with international agreements). Usually credits fund projects under the Clean Development Mechanism (CDM).

Voluntary Credits (CCX's or CRT's) – individuals or organizations taking responsibility for their own carbon foot prints. Projects do not have to meet CDM regulations.

Carbon credits are traded on international markets. Prices fluctuate a lot! But unlike rubber and palm oil, the recent trend is *UP.*



Restoration by framework species method: carbon in trees goes back to normal levels in about 16 years

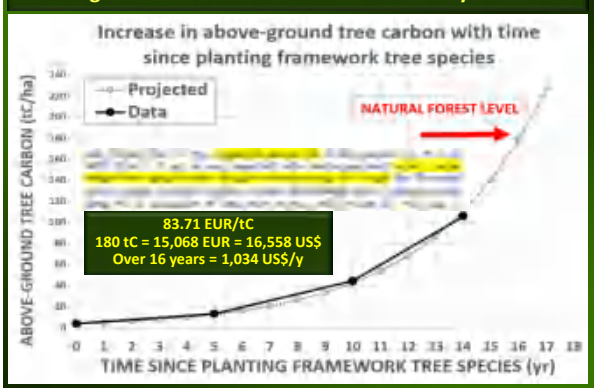


Table 7.2. Carbon standards organisations

Organisation	Notes	Website
Carbonfix	Simplified, user-friendly standard that guarantees high-quality carbon credits. Adaptable to the needs of project developers and funders. Recommended for restoration projects	www.carbonfix.info
Verified Carbon Standard (VCS)	A high-quality standard that guarantees that the carbon credits are real, verified, permanent, additional and unique. Provides detailed methodologies to quantify reduced carbon emissions	www.vcs-i.org
Plan Vivo	Projects are allowed to develop their own methodologies in association with research institutes or universities. Operations include a positive impact on rural communities. Quantification of carbon accumulation lacks the general rigour of other standards	www.planvivo.org
Climate, Community & Biodiversity (CCB) standard	Quantifies the co-benefits of socio-economic and biodiversity factors, but advises use of VCS to certify carbon credits	www.climate-standards.org

REDD

Policies and incentives under the UN Framework Convention on Climate Change to reduce CO_2 emissions from clearing/burning forests.

- **R**educing
- **E**missions from
- **D**eforestation &
- **D**egradation

Basically, paying people ***NOT*** to cut or burn forests.

Potential problems with paying people NOT to deforest

- People who had no intention of clearing forest, may start deforestation to get payments.

So … is REDD the world's largest 'protection' racket? (pun intended)

Potential problems with paying people NOT to deforest

- Project periods are limited – when payments stop, people may protest by clearing more forest.

REDDD?

RED*elayed*DD?

Better to pay people to do something positive – like forest restoration – than to 'bribe' them ***not*** to do something negative.

So now, REDD also includes…

"…enhancement of carbon stocks …"
COP15 2009 4CP/15.

i.e. forest restoration to absorb CO_2 by tree planting or assisting natural regeneration.

REDD++

+ *"full and effective engagement of indigenous people and local communities …"*
+ Safeguard (e) *"… consistent with conservation of natural forests and biodiversity …"*

REDD++

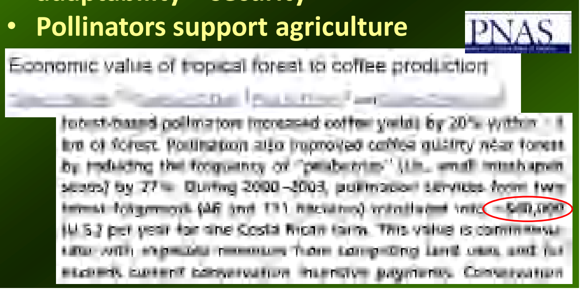
- Funding - from carbon credit markets and specially created international funds (GEF etc.)
- No formal international agreement reached yet.
- REDD+ success depends on improved governance and capacity-building at all levels.
- Despite these challenges, pilot REDD+ projects are underway.

Why is REDD++ failing?

- Top-down approaches often sacrifice local needs to achieve national/international targets.
- Local people struggle to understand REDD+.
- Training at local level *ad hoc* and inadequate
- Administration and monitoring costs grab most of the income.
- REDD "readiness" phase – too slow
- Participating countries have yet to show a reduction in forestry-related emissions

Biodiversity - values

- Biodiversity = NTFP diversity = economic adaptability = security
- Pollinators support agriculture

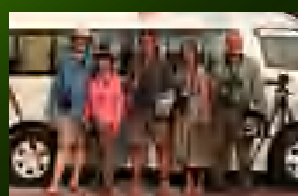

PNAS

Economic value of tropical forest to coffee production

Biodiversity - values

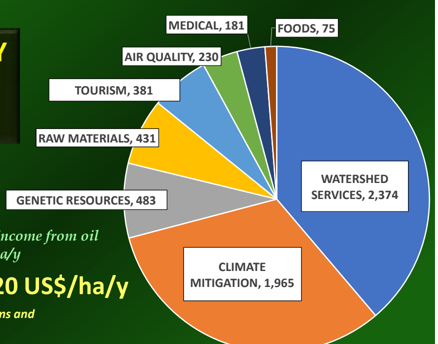
- Wildlife tourism

1-day Bird Tour Khao Yai:
66 – 237 US$/day



Potential value of ecosystem products/services from 1 ha of tropical forest (US$/y)

DIVERSITY REDUCES RISK



S. Thailand – current income from oil palm about 600 US$/ha/y

TOTAL = 6,120 US$/ha/y

The Economics of Ecosystems and Biodiversity (TEEB) study.
www.teebweb.org

But turning "value" into "income" depends on:-

- Good Governance – enabling legal frameworks
- Investment – start-up funding
- Capacity building
- Marketing

- The economic elegance of community forestry is that it generates diverse income streams shared amongst diverse stake-holders. So, if the market price of one service/product falls, others can be developed to maintain profitability.
- Community forestry could well become a highly lucrative global industry.
- One day … money *really will* grow on trees!

Website:
www.forru.org

Facebook:
Forru Cmu

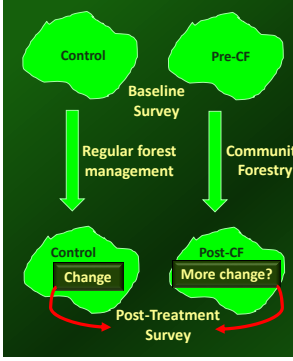
FORRU - CMU
Thank you for listening

Biology Department
Faculty of Science
Chiang Mai University

Want to know more?
See me for a copy of …

HOW DO WE KNOW IF IT WORKS?

Baselines, Controls & Replication



Lecture 3: Kandyan Home Gardens and Rural Economy

--- Mr. Dissanayake Wasantha Tikiri Bandara

Kandyan home gardens and rural economy

OPPORTUNITIES AND CHALLENGES

Contents....

- Homegardens
- Kandyan homegardens
- Ecosystem services of KHG
- Constraints
- Opportunities
- Challenges

Home gardens

- Home garden is a land use with definite boundaries and a house, which is usually (but not always) a mixture of annual, perennial plants and animals and serves as variety of biophysical, economics and sociocultural functions for the owner (Soemarwoto and Soemarwato, 1985)
- Homegardens are multi-species, multi-tier agroforestry production systems often in small parcels of land surrounding homesteads that integrate tree-crop-animal components and largely confined to humid tropics. (Kumar and Nair, 2004)
- A small scale, supplementary food production system by and for household members that mimics the natural, multi-layered ecosystem" (FAO, 2004)

Characteristics of a homegarden

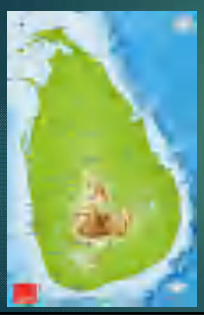
Five intrinsic characteristics of home gardens (Michelle and Hanstad, 2004)

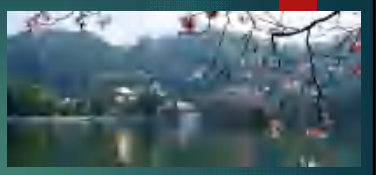
1) are located near the residence;
2) contain a high diversity of plants;
3) production is supplemental rather than a main source of family consumption and income;
4) occupy a small area and
5) are a production system that the poor can easily enter at some level

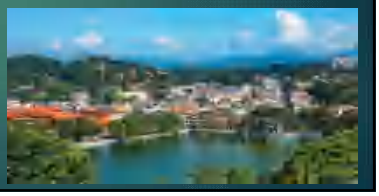
Key characteristics of a typical home garden (Ninez,1987)

Characteristic	General Practice
Species Diversity	High
Species type	Staples, vegetables, fruits, medicinal plants,
Production objective	Home consumption
Labor source	Family (women, elderly, children)
Labor requirements	Part-time
Harvest frequency	Daily, seasonal
Space utilization	Horizontal and vertical
Location	Near dwelling
Cropping pattern	Irregular and row
Technology	Simple hand tools
Input cost	low
Distribution	Rural and urban areas
Skills	Gardening and horticultural skills
Assistance	None or minor

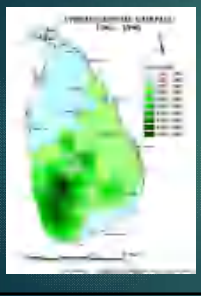
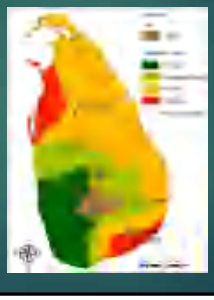
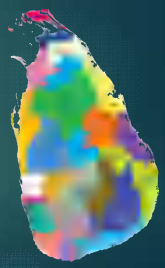
Sri Lanka -Kandy



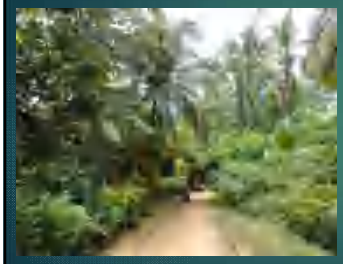




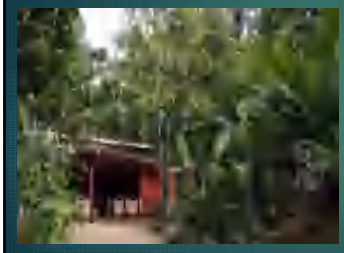
Climatic and topographic factors

Kandyan home gardens




Kandyan homegardens




Schematic view of KHG (Mohri et al, 2013)

Definitions…

- Kandyan homegardens are one of the major designs of sustainable land use systems that have evolved over hundreds of years incorporating high biodiversity and providing a diverse and stable supply of socio-economic products and service benefits to householders in Sri Lanka. (Samaranayake et al.)
- Kandyan Home Gardens (KHG) of Sri Lanka are economically efficient, socio-culturally and politically embedded, ecologically sustainable unique places, which are managed by dwellers based on the knowledge that transmits over generations. (Pathmasiri et al., 2016)

Descriptions…

- In Kandyan homegardens, trees and shrubs of more than 30 species are grown in a multi-tiered arrangement where the canopy is at different levels and virtually closed. It is a traditional system of mixed cropping of trees yielding timber, fuelwood, fodder, food, nuts and medicines (Nanayakkara, 1992)
- This system, which almost simulates a tropical rainforest ecosystem, predominates in Kandy District of the wet zone of the central province of Sri Lanka. It has been reported that farmers who practice this forest garden system enjoy a relatively better level of living by virtue of returns from both the economic cash crops and subsistence products (Jacob and Alles, 1987)

Descriptions…

- Being a highly popular agricultural land use with lot of promising ecological features, Kandyan Home Gardens (KHGs) have strong economic and social functional relationships with the occupants. Most homegardens have developed out of long term efforts of household members which often extend to multiple generations. Wide variety and adaptation found in homegardens even within relatively small areas with approximately similar agro climatic and physiographic conditions strongly indicate the high influence of socio economic factors on composition and structure of homegardens. (Senarathne et al.)

Characteristics of KHG (Pushpakumara et al., 2010)

Characteistic	Range
Size	0.05 – 2.5 ha (mean 0.4ha)
Altitude (msl)	400 – 1050 m
Rainfall	2000 – 2500mm
Temperature	24° – 26°C
Relative humidity	65 – 80% day and 75 – 90% night
Population density	500 - 699
Family size	2 – 9 members
Number of vertical canopy strata	3 - 5
Canopy coverage	45 – 98%
Dominant soil type	Reddish-brown lateritic – immature brown loam
Average slope	10 – 40
Number of species	37 - 143
Number of woody trees	11 – 39
Tree species density/ha	92 - 3736
Plant species density/ha	654 - 5663
Land tenure	Mostly private ownership

Vertical stratification in KHG (McConnell, 2003)

Stratum	Height in meters	Vegetation
Ground Level	< 3	Vegetables, medicines, spices, fruit trees, subsistence and cash crops - *Okra, eggplant, beans, tea, cassava, ginger, turmeric, anthurium, pineapple, chili, pepper*
Lower stratum	3 – 10	Medicines, food staple, subsistence and cash crops - *Vanilla, banana/plantain, cacao, coffee, passion fruit, betel vine*
Lower-middle stratum	10 – 15	Subsistence food staple, seasonal fruits, cash crops - *Papaya, pepper, avocado, mangosteen, breadfruit, rambutan, citrus*
Upper-middle stratum	15 – 25	Fruits, timber, medicines, cash crops - *Mango, bamboo, areca palm, nutmeg, clove, rubber, wild breadfruit, fishtail palm*
Upper stratum	25 – 30	Timber, cash crops, fiber, oil seed crops - *Durian, talipot palm, jackfruit, coconut palm, kapok*

Ethno-botanical values of KHG plant species
(Pathmasiri and Bandara, 2016)

Structure	Purpose	No. of species	Percentage
Religious	Rituals & ceremonies	54	15.7
Medicinal	Domestic remedies	45	13.0
Subsistence economy	Vegetables	35	10.1
	Leaf vegetables	35	11.0
	Fruits	62	18.0
	Spices	21	06.1
	Beverages	04	01.2
	Timber	65	18.8
	Fuel wood	52	15.1
Market economy	Direct selling	50	14.5
	Inputs	31	09.3
Others	Animal foods	15	14.5
	Fencing	223	64.6
	Erosion control	13	03.8
	Water conservation	8	02.3
Total		**354**	**100**

Ecosystem services of KHGs

- Provisioning services
- Regulating services
- Cultural services
- Supporting services

Provisioning services

- Food products
  - Crops
  - Livestock
- Fiber products
  - Timber
  - Fuel wood
- Animal foods
  - Fodder
  - Wild plants
- Genetic resources
- Natural Medicines
- Ornamentals
- Nutrients

Provisioning services of KHGs (Pushpakumara et al, 2010)

Provisioning Service		Product
Food	Major food crops	Rice, maize, green gram, cowpeas, cassava, coconut, jackfruit, sweet potato, taro, yam, jaggary and trickle from fishtail palm (kithul)
	Major cash crops	Cacao, cloves, coconut, banana, coffee, jackfruit, nutmeg, pepper and other spices, several timber species
	Livestock	Poultry and cattle (15% of householders rear livestock)
	Wild plant and animal food	Local breeds of chicken, eggs, goat, and cow milk
Fiber	Timber	Supplies 48% of the total saw log demand of the country
	Fuel wood	Supplies 38% of the total biomass fuel demand of the country
Genetic resources		Provides habitats for a wide range of species; from soil microbes to insects including pollinators, trees to mammals, birds and other wildlife.
Natural medicines		Most herbs and trees are used as medicines. e.g. turmeric, ginger, vanilla, areca palm, clove, nutmeg etc.

Nutrient supply from food trees found in KHG (Marambe et al., 2014)

Tree species	Protein	Fat	Carb	Ca	Fe	Mg	P	K	Na	Zn	Vitamins
Annona reticulate			■		■						■
Annona muricata			■		■						■
Artocarpus heterophyllus			■					■			■
Artocarpus altilis			■		■			■			■
Manilkara achras			■		■						■
Citrus aurantifolia			■		■						■
Citrus aurantium			■								■
Citrus grandis			■								■
Cocos nucifera		■			■						
Durio zibethinus		■	■								■
Garcinia mangostana			■								■
Mangifera indica			■								■
Moringa oleifera	■		■		■	■	■	■		■	■
Muntingia calabura											■
Nephelium lappaceum			■								■
Persea Americana		■									■
Phyllanthus emblica			■		■						■
Psidium guajava			■								■
Punica granatum			■								■
Sesbania grandiflora	■		■		■	■	■	■			■
Syzygium jambos			■					■	■		■
Tamarindus indica					■		■	■			■

Regulating services

- **Climate regulation**
  - Global – regulation of macroclimate (carbon sequestration)
  - Local – regulation of microclimatic conditions (air temperature, radiation flux, soil moisture, wind speed) and maintain ambient temperature
- **Erosion regulation** – Soil erosion in KHG ≈ 0.05t/ha/year (Wagachchi and Wiersum, 1997)
- **Waste treatment** – livestock feeds, compost, energy source (biogas)
- **Water purification**
- **Pest regulation**
  - Natural predators
  - Due to high species diversity
- **Pollination and seed dispersal** – provide habitats for small mammals, birds, bats and insects

Cultural services

- Symbol of social status
- Recreation/aesthetic
- Community social networking through benefit sharing
- Employment
- Tourism – spice gardens

Supporting services

- Nutrient recycling and soil formation
- Habitats for flora and fauna
- Biodiversity conservation

Vertebrate species	Number (Samaranayake et al., 2012)	
Amphibians	07	14 Endemic species 71 Native species 04 introduced mammals 02 migrant birds
Mammals	23	
Birds	43	
Reptiles	20	

Constraints

- Limited access to agricultural inputs such as seeds, planting material, tools and capital
- Shortage of land and lack of land tenure security
- Inadequate access to water
- Damage due to insect pests, diseases, animals and theft
- Lack of knowledge, information, and advisory services
- Shortage of family or hired labor
- Poor soil fertility and soil erosion
- Limited access to quality livestock breeds
- Limited marketing opportunities
- Excessive post-harvest losses
- Social and cultural barriers

Opportunities to enhance household economy

- Commercialization
- Development of marketable goods
- Certification schemes
- Value addition
- Control of post-harvest loss
- Tourism

Ten non-traditional crop products and major export destinations (Thamiem et al, 2011)

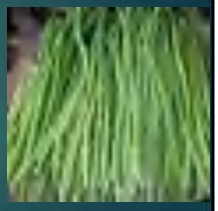
Crop products	Major export destinations
Cinnamon	Mexico, USA, Colombia
Cloves	India, USA, UK
Pepper products	India, USA, Pakistan, UAE
Avocados (dried)	Qatar, Saudi Arabia, UAE
Papaya (fresh)	Japan, Austria, UAE
Manioc	UK, Kuwait, UAE
Arrowroot	Canada, Bahrain, Germany
Pineapples	UAE, France
Cashew nuts	France, Japan, Malaysia, Germany
Guava, Mangoes, Mangosteen	UAE, Japan

Spices

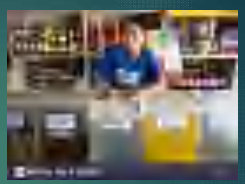

Spices

Superfoods





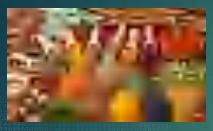
Marketing….

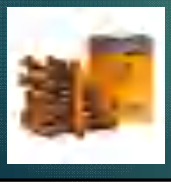



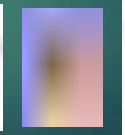

Value addition



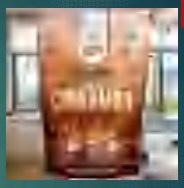
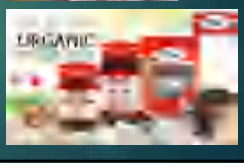
Value addition



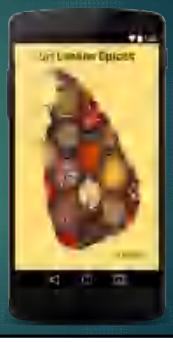




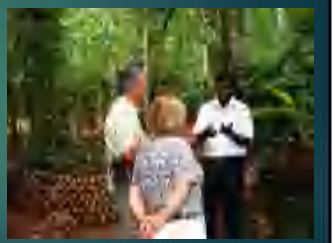

Certified Products

New marketing strategies



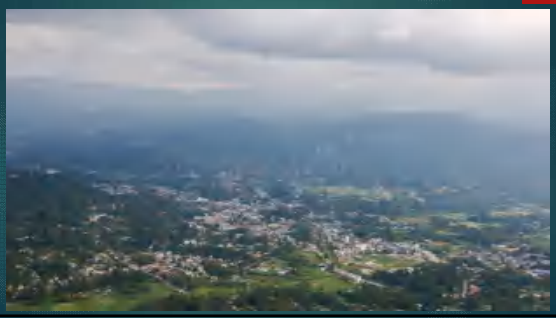
Tourism

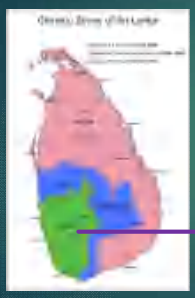
Challenges…

- Fragmentation
- Climate change
- Increase of wild animals
- Invasive alien species
- Loss of genetic diversity
- Lack of hired/skilled labor
- Market fluctuations
- Changing policies

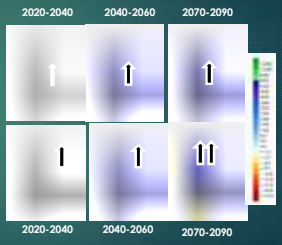
Fragmentation



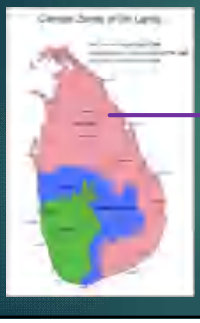
Climate change impact projections



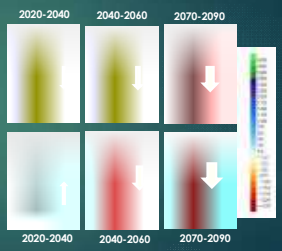
Multi-model Ensemble Projection for South-West Monsoon Rainfall



Climate change impact projections



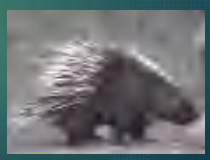
Multi-model Ensemble Projection for North-East Monsoon Rainfall



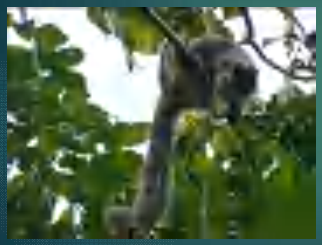
Severe droughts in the dry zone

Heavy floods in the wet zone

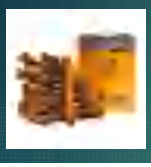
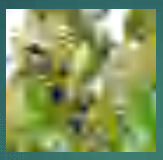
Wild Animals

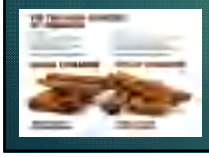
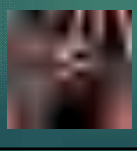


Wild animals



Skilled labor requirement

Skilled labor requirement…..



Policy implications…..
- Pepper example (Auditor General's Report)

Year	Production /MT	Imports/MT	Total/MT	Exports/MT	Consumption /MT (approx.)	Excess/MT
2012	18,604	13.96	18,617.96	11,542.51	5,000	**2,075.45**
2013	28,686	114.05	28,800.05	21,933.63	5,000	**1,866.42**
2014	18,660	374.34	19,034.34	8,048.57	5,000	**5,985.77**
2015	27,233	276.47	27,509.47	18,157.16	5,000	**4,352.31**
2016	18,476	759.63	19,235.63	8,450.83	5,000	**5,784.80**
2017	29,546	1,458.78	31,004.78	16,429.15	5,000	**9,575.63**

Estimated shares of wood supply in Sri Lanka (Forest Department, 2006)

National Forest Policy – 1995

3. Policy on management of private forests and tree resources

3.1 Tree growing on homesteads, and other agroforestry, will be promoted as a main strategy to supply wood and other forest products for meeting household and market needs.

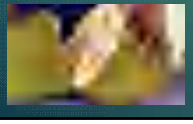
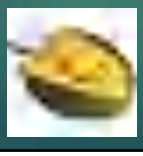
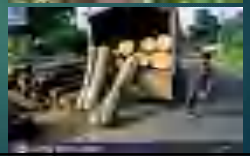
3.2 The establishment, management, and harvesting of industrial forest plantations by local people, communities, industries, and others in the private sector will be promoted.

4. Policy on wood and non-wood forest products

4.3 The state will facilitate the harvesting and transport of forest products grown on private lands.

Jackfruit



APFNet

APFNET WORKSHOP ON
FORESTRY AND RURAL LIVELIHOOD DEVELOPMENT

1-14 November 2019 Yunnan Province, China

FOREST POLICIES, INSTITUTIONS AND MANAGEMENT: HOW THEY HAVE ACCOMMODATED LIVELIHOOD CONCERNS

Dr C T S Nair

Sponsored by:
Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet)

Organized by:
Southwest Forestry University (SWFU)
Forestry and Grassland Administration of Yunnan Province (FGAYP)
APFNet Kunming Training Center (APFNet-KTC)

INTRODUCTION

- Whether forests will be able to make a significant contribution to improve livelihood or not depends on the policies, rules and regulations, institutions and management practices.
- But let us be aware that:
  - Forests and forestry alone will not be able to deal with rural livelihood issues all the time. Forests and forestry are certainly important in certain situations.
  - Much depends on what happens outside the forest sector also. So it becomes imperative to consider the larger canvass of all policies, legislation and institutions.

INTRODUCTION

- Policies, legislation and institutions determine the overall direction of resource management, thus determining whether a particular resource will be managed for livelihood improvement or not.
- Apart from the stated national forest policies, governments have been implementing sub-policies relating to different segments within forestry and these often tends to have significant impacts on people's livelihoods.
- It is in this context that we need to examine the policy, legal and institutional framework in relation to whether it is geared to contribute to rural livelihood enhancement.

SOME QUESTIONS

- To what extent forest policies, legislation and institutions have accommodated rural livelihood considerations in the management of forests?
- Considering the conflicts in the use of forests for diverse objectives, to what extent policies have provided an acceptable framework for establishing trade-offs between meeting livelihood needs and other objectives?
- Are there conflicts between stated policy objectives and their actual implementation?
- What is the progress in making forest laws pro-livelihood?

SOME QUESTIONS

- What has been the implications of some of the major policy interventions in forestry on the livelihood of rural communities? – For example logging bans, expanding the extent of protected areas, stopping shifting cultivation, promotion of industrial forestry, conferring forest rights to indigenous peoples, etc.?
- How are institutions accommodating livelihood considerations? How far we have progressed in building up institutions that give priority to livelihood aspects of forestry?
- To what extend management practices have accommodated livelihood concerns?

STRUCTURE OF PRESENTATION

- The larger framework
- Forest policies and livelihood.
- Forest laws, regulations and rules and livelihoods.
- Institutional framework.
- Take home messages.

THE LARGER FRAMEWORK

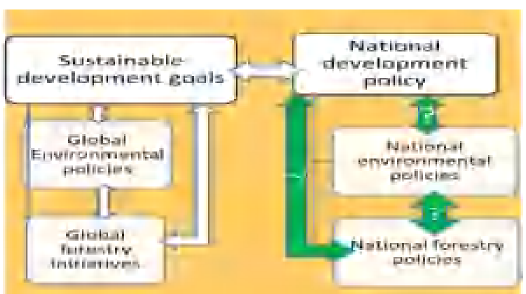
- While assessing the livelihood implications of the use of any resource we need to consider the linkages between the different spatial dimensions - sub-national, national and global.
- These linkages affect all sectors including forestry, having positive and negative impacts.

THE GLOBAL POLICY ENVIRONMENT

- Broader global developments are impacting forests and forestry and livelihoods. These include:
  - [illegible]
  - [illegible]
  - [illegible]
- Policies, legislation and plans in other countries (For example logging bans, agricultural development plans);

APFNet Workshop on Forestry and Rural Livelihood Development
1-14 November, 2019 Yunnan Province, China

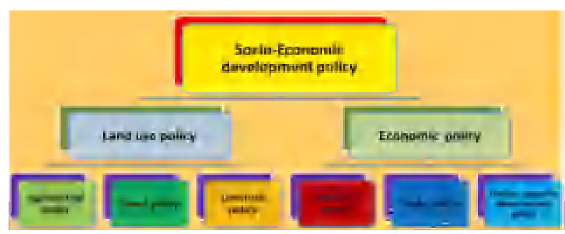
POLICY CONVERGENCE AT NATIONAL AND GLOBAL LEVELS



APFNet Workshop on Forestry and Rural Livelihood Development
1-14 November, 2019 Yunnan Province, China

NATIONAL POLICY ENVIRONMENT

- As in the case of the global situation at the national level too there are several policies jointly impact forests and forestry and the objectives of forest management, including meeting livelihoods.
- How the different policies are formulated and implemented will have direct and indirect impacts on rural livelihoods.



LIVELIHOOD ASPECTS IN FOREST POLICIES

Overall situation	Focus of forest policies	How livelihood aspects were addressed
Resource abundance and low demand	Most needs were met even in the absence of an explicitly stated policy	Livelihood needs were met without any planned efforts
Increasing demand for timber for industrial needs and revenue	Timber focused management of natural forests. Curtailment of rights of local communities	[illegible]
Continued expansion of forest industries and increasing timber demand.	Large scale plantations. Thrust on fast growing species.	Significant negative impact on livelihood on account of curtailment of access to resources
Growing concern about social and environmental issues. National poverty reduction strategies	Policies giving increased emphasis to enhancing livelihoods	[illegible]

APFNet Workshop on Forestry and Rural Livelihood Development
1-14 November, 2019 Yunnan Province, China

LIVELIHOOD AND FOREST POLICIES

- Historically in a resource abundant situation livelihood aspects did not require explicit mention in forest policies.
- Increasing demand brought about fundamental changes in the way forests are managed.
- Forests were seen as a capital to be drawn down to support the development of other sectors.
- Direct livelihood roles of forests did not receive much attention in government policies. Often forest policies seldom provide a clear framework for prioritization of different objectives and to determine the trade-off between competing objectives.

APFNet Workshop on Forestry and Rural Livelihood Development
1-14 November, 2019 Yunnan Province, China

LEGISLATION IN SUPPORT OF LIVELIHOOD IMPROVEMENT

- Forest laws, rules and regulations form an important tool in the implementation of forest policies.
- The general trend as regards forest legislation is towards redefining forest ownership and one of the major thrust is towards increased devolution of responsibility to local communities.
- Several countries have made significant progress in the reform of forest tenure, helping to enhance income and thus the livelihood of rural communities.

FOREST TENURE REFORM AND LIVELIHOOD IMPROVEMENT

Forest tenure - A bundle of rights

Forest tenure components

1. Access
2. Use or withdrawal
3. Management
4. Exclusion
5. Alienation

Some notable examples of tenure reform in the Asia-Pacific.

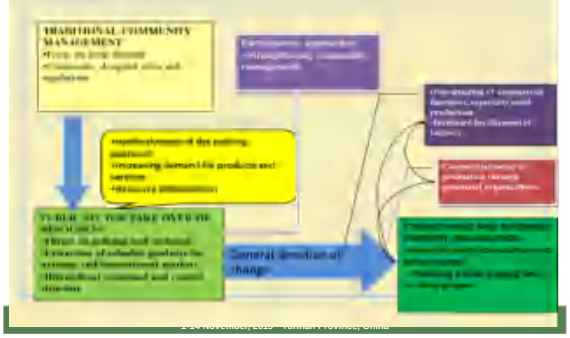
- Reform of the collective forests in China.
- Joint Forest Management in India.
- Forest user groups in Nepal.
- Social forestry in Indonesia.
- Forest Rights Act in India 2006

TARGET AREA FOR COMMUNITY MANAGED FORESTS IN SELECTED ASIAN COUNTRIES

Country	Existing area of community based forestry (2017) (1 000 ha)	Target		Target as proportion of total forest area (%)
		Area (1 000 ha)	Year	
Cambodia	460	2 000	2029	23.0
Indonesia	800	12 700	2019	6.3
Myanmar	160	919	2030	17.4
Philippines	6 350	9 000	2009	70.6
Thailand	480	1 600	2025	30.0
Viet Nam	1 130	4 000	2020	28.3

Source: FAO 2019

INSTITUTIONAL CHANGES



INSTITUTIONAL ARRANGEMENTS

- Whether policies and legislation will be put into practice or not depends on the institutional framework.
- Increasingly there has been a shift towards a pluralistic institutional framework. This included:
  - Increased involvement of local communities.
  - Farmers and land holders getting involved in the management of tree resources.
  - Private corporate players investing in agriculture and forestry.
  - Emergence of national and international civil society organizations playing a catalytic role in natural resources management
- The institutional scene has changed significantly during the last few decades, and this had multiple impacts on the forests-livelihood linkages.

FOREST MANAGEMENT AND LIVELIHOOD

- What we should be considering is the outcome of policies, legislation and institutions on forest management. Specifically the issues are:
  - To what extent forests are producing goods and services that are directly and indirectly relevant to improving the livelihood of local communities.
  - Extent of income generation –direct and indirect – that helps in livelihood improvement.
- Every intervention - whether it be related to managing natural forests, forest plantations, agroforestry, non-wood forest products, provision of ecological services, etc. - should be considered from the perspective of their direct and indirect impacts on livelihoods.

IMPORTANT CHALLENGES

Certainly there is a lot of progress and there has been a shift in policies, legislation, institutions and management practices in favour of meeting the livelihood needs of rural communities. However many challenges persist and the pace of change is extremely varied. Some of the challenges in this regards are:

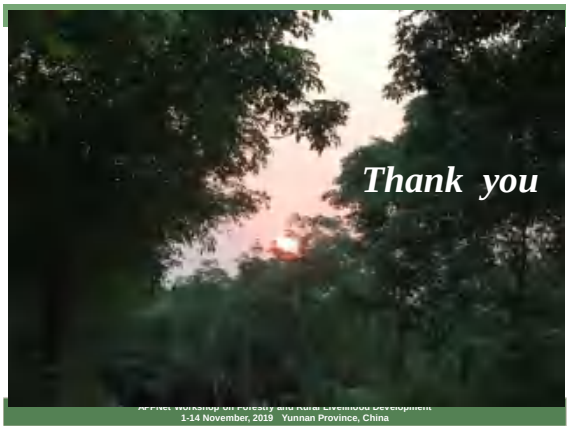
1. **The science base of policies remains weak and most often policies are formulated without a proper analysis of critical issues and evidences.**
2. **Contradictions between different policies, largely due to fragmentation of policy processes and lack of understanding of inter-sectoral linkages.**
3. **Contradictory objectives and very little effort to specify how trade-offs are established between competing objectives.**

IMPORTANT CHALLENGES

4. **Bringing about changes in legislation and institutional framework is a slow process. This severely affects the implementation of new policies.**
5. **There is always a constant tussle between old rules and regulations and new ones as also between old and new institutional arrangements.**
6. **Tools are available to undertake systematic analysis of the impact of different interventions on livelihoods.**
7. **Yet many decisions are taken without systematic analysis of the different options.**

TAKE-HOME MESSAGES

- **There has been significant efforts to reform policies, legislation and institutions especially as social aspects are being given increased emphasis.**
- **Forest policies of many economies have been revised to highlight the social dimensions of forestry, explicitly giving thrust to livelihood improvement of local communities.**
- **However many challenges persist in translating this into concrete action.**
- **While forest laws have been reformed, and the trend towards increased community participation is evident, in many cases vestiges of old legislation and institutions linger on undermining the implementation of the more forward looking policies.**
- **Much more efforts need to be invested to undertake rigorous social cost benefit analysis to decide investment priorities.**



Website: www.forru.org Facebook: Forru Cmu

For: APFNet Workshop on Forestry and Rural Livelihood Development
1 – 14 November, 2019 Yunnan Province, China

TOURISM – FOREST INTERACTION CASE STUDIES

Stephen Elliott

Forest Restoration Research Unit
Biology Department
Faculty of Science, Chiang Mai University

ECO-TOURISM

"Minimum-impact" tourism, with ecosystems & wildlife as the main attractions, which:

1) generates revenue for ecological conservation and/or
2) contributes labour or expertise to conservation and/or
3) educates or inspires tourists to become conservationists.

NET POSITIVE BENEFIT FOR ECOSYSTEMS AND WILDLIFE

Revenue from ecotourism should…

1) fund direct conservation activities and/or
2) provide incentives to local people to reduce their negative impact on ecosystems and wildlife.

Global income from visitors to protected areas:

Around 600 billion US$

(direct in-country expenditure from computer models)

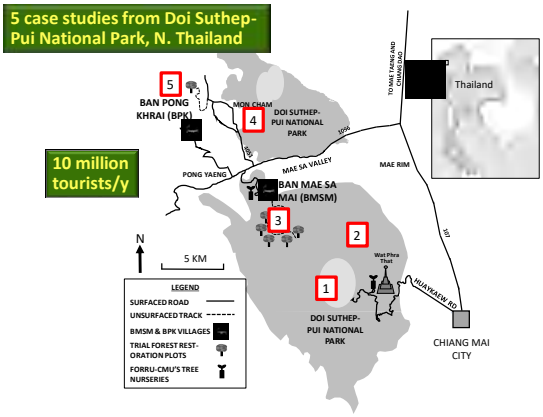
… compared with <10 billion US$ spent on PA management around the globally.

"Thus, even without considering the many other ecosystem services that PAs provide, our findings underscore calls for greatly increased investment in their conservation."

Balmford A, Green JMH, Anderson M, Beresford J, Huang C, Naidoo R, et al. (2015) Walk on the Wild Side: Estimating the Global Magnitude of Visits to Protected Areas. PLoS Biol 13(2): e1002074. doi:10.1371/journal.pbio.1002074

Clear mechanisms must exist to ensure that a substantial percentage of the revenue from eco-tourism supports conservation and supports the local economy and does not merely provide profits for private enterprises that move elsewhere when forests become degraded.

5 case studies from Doi Suthep-Pui National Park, N. Thailand

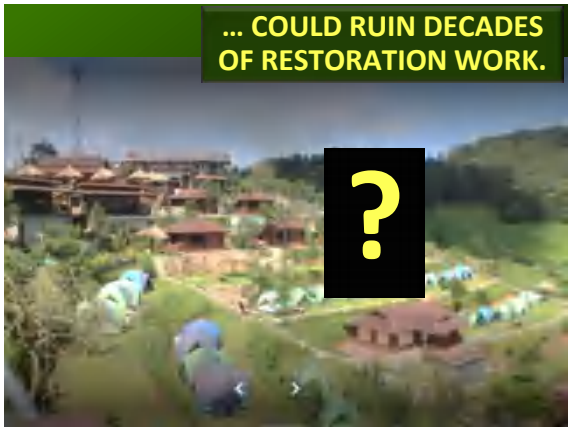


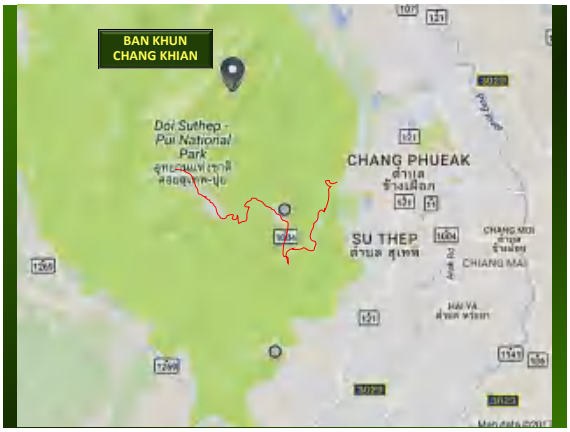
Interactions with Tourism

Income from tourism meant that villagers no longer needed to exploit the upper watershed, freeing up the land for forest restoration.

Other Factors?

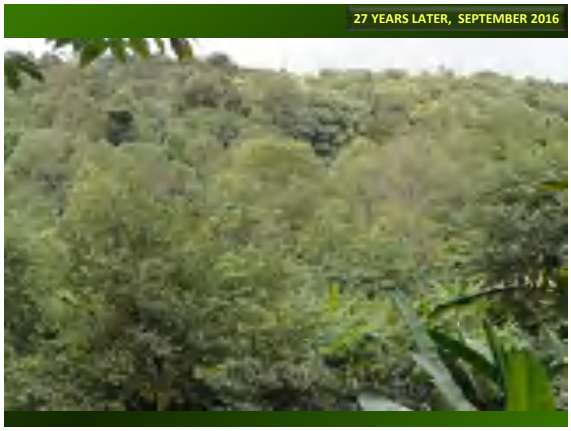
- **Strong government effort "Plook Pah Chalerm Prakiat".**
- **Fire prevention became better organized.**


… COULD RUIN DECADES OF RESTORATION WORK.
?


BAN KHUN CHANG KHIAN
Doi Suthep - Pui National Park
CHANG PHUEAK
SU THEP
CHIANG MAI


SITE "A" CMU AGRICULTURE FACULTY COFFEE STATION MAY 1989


27 YEARS LATER, SEPTEMBER 2016


27 YEARS LATER, SEPTEMBER 2016


REGENERATING FOREST IS MORE ATTRACTIVE TO TOURISTS THAN A COFFEE PLANTATION?

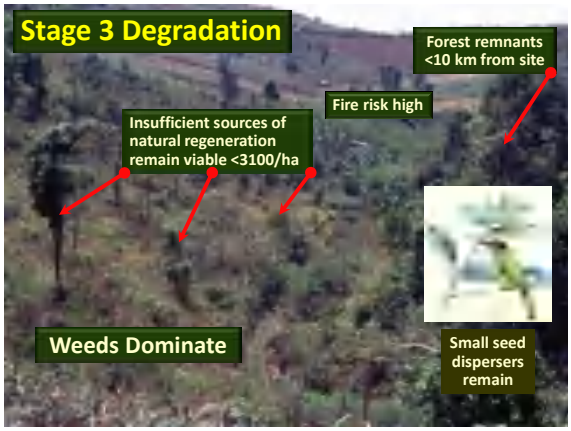
Interactions with Tourism

- Restoration (particularly the wild cherry trees) has attracted tourists, making the forest more valuable to the villagers than the coffee research trials.

Other Factors?

- Benign neglect – allowed natural regeneration to restore the forest without the need for tree planting.

The Forest Restoration Research Unit FORRU-CMU
Founded in the Biology Department of Chiang Mai University, November 1994

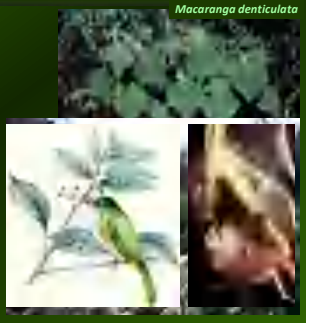


Framework species method

Planting 20-30 indigenous forest tree species, which enhance natural forest regeneration

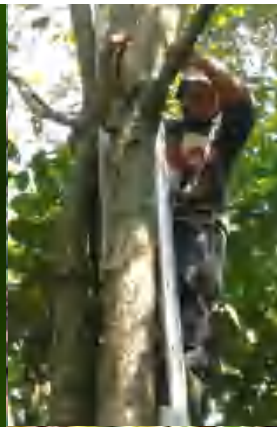
Search for and test forest tree species with:

- High survival, rapid growth
- Dense spreading crowns - shade out weeds
- Attract seed-dispersers with fruit, nectar etc.

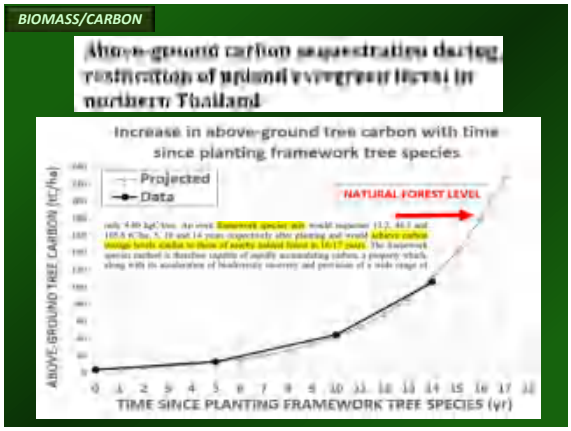


SCIENTIFIC RESEARCH

- Tree propagation (>470 species tested in the nursery)
- Field trials – compare species and silvicultural treatments
- Monitor biodiversity recovery and carbon storage

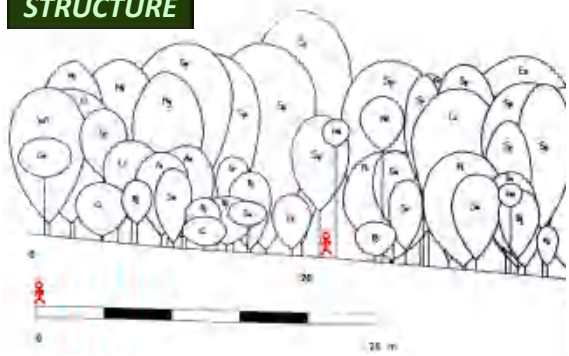


BIOMASS/CARBON



6 years after planting – multilayered canopy; weeds replaced by leaf litter, competition-free conditions for tree seedling establishment.

STRUCTURE



BIODIVERSITY – rapid recovery

The **leopard cat** (*Prionailurus bengalensis*)

BIODIVERSITY – rapid recovery

The Asian palm civet (*Paradoxurus hermaphroditus*)

BIODIVERSITY – rapid recovery

The large Indian civet (*Viverra zibetha*)

BIODIVERSITY – rapid recovery

The hog badger (*Arctonyx collaris*)

BIODIVERSITY – rapid recovery

The Indian muntjac (*Muntiacus muntjak*)

BIODIVERSITY – rapid recovery

The Indian muntjac (*Muntiacus muntjak*)

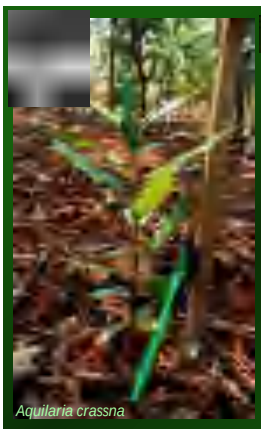
BIODIVERSITY – rapid increase

Biodiversity Recovery, N. Thailand, Evergreen Forest Zone, after planting 29 FW tree species

- **Bird species richness increased from 34 to 88[1] in 6 years**

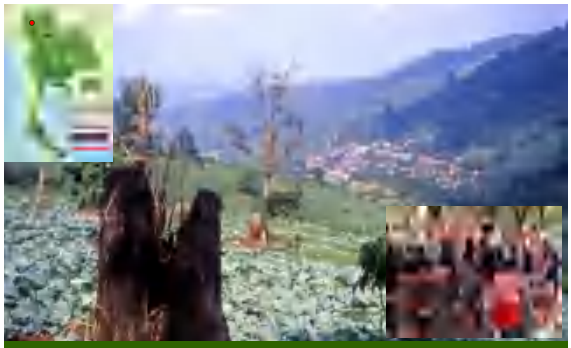
[1]*Toktang*, [3]*Nandakwang*, [4]*Phongchiewboon*

ECOLOGICAL FUNCTIONING



Seedling dynamics – self sustained forest ecosystem

Planting 30 framework tree species fostered the recruitment of an additional (non-planted) 72 tree species within 8-9 years (Sinhaseni, 2008).



Our initial field trials were done in partnership with the village communities of the upper Mae Sa Valley, in Doi Suthep-Pui National Park, northern Thailand.

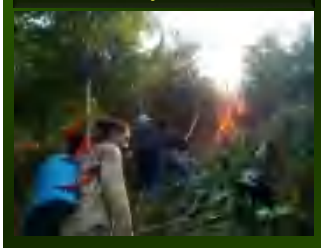
FORRU and the community worked together from early planning to planting, maintenance and monitoring.

- Conservation club.
- Experience of tree planting.
- Already designated 50 ha for reforestation.
- Political – right to remaining in national park

…to growing the trees …

… in a community tree nursery, sponsored by FORRU-CMU

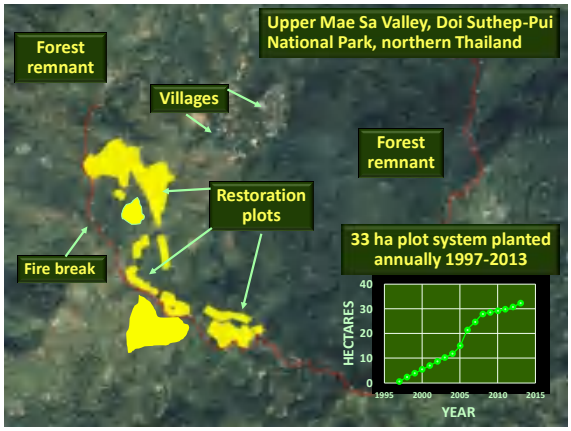
Weeding and fertilizer applied 3 times in each of 1st and 2nd rainy seasons after planting. Fire prevention/suppression in dry season.



… and finally monitoring success.

Inputs from the community

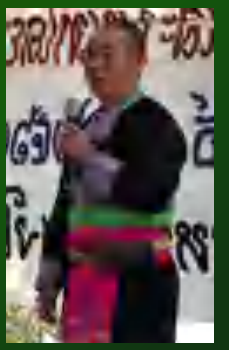
- Indigenous knowledge and local seed sources – species selection
- Local tree production nursery
- Test bed for the social acceptance of scientific methods
- Source of field labour



Project benefits perceived by villagers (structured interviews 2005-07)

Social Benefits

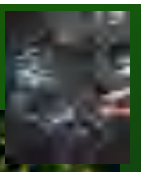
- An "understanding" – villagers restore the forest in exchange for right to remain in the park.
- "Improved relationships" with local government and NGO's – attracting matching funds for social projects
- "Improved social harmony" - by reducing internal conflicts over resource shortages



Project benefits perceived by villagers (structured interviews 2005-07)

Environmental Benefits

Improved water quality - more reliable supply of water in the dry season.



Project benefits perceived by villagers (structured interviews 2005-07)

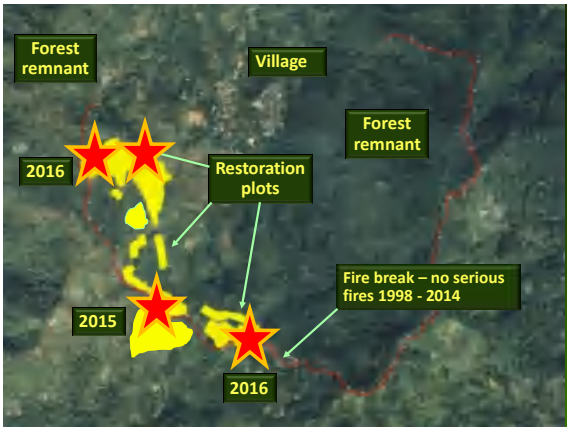
Tangible Economic Benefits - Not highly valued!

- Payments from the project for labour etc.
- Non-timber forest products – estimated at US$ 20-314 per household per year.
- Ecotourism income – but benefit not shared equally across the village

The project has attracted thousands of "edu-tourists"

The villagers built eco-tourism bungalows funded by Royal Project and also operate homestay accommodation, but few families have benefitted.

Challenges

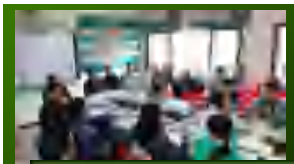


Encroachment – conversion back to agriculture (planted 2009)

… and yet the villagers continued to organize their own tree planting events.

2014 - 2016

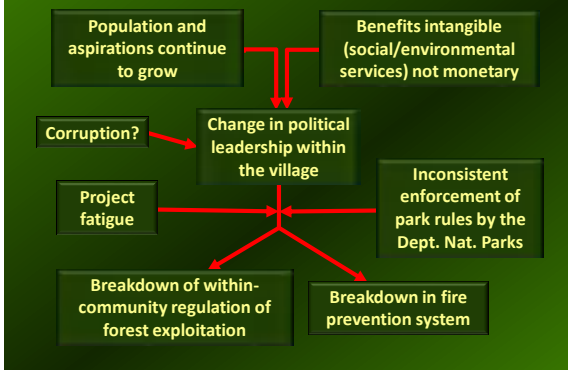
… and in 2018, all 12 nearby Hmong communities pledged to eradicate fire in a public show of commitment.



Stakeholders' meeting at BMS (16/08/19)

- Park officials announced agriculture will no longer be tolerated in NP & rejected ecotourism as alternative.
- FORRU-CMU presented evidence of villagers' support of restoration since 1996 and net increase in forest cover/quality – but to no avail.
- Villagers considering withdrawing support for restoration and fire prevention.

Fluctuating Factors

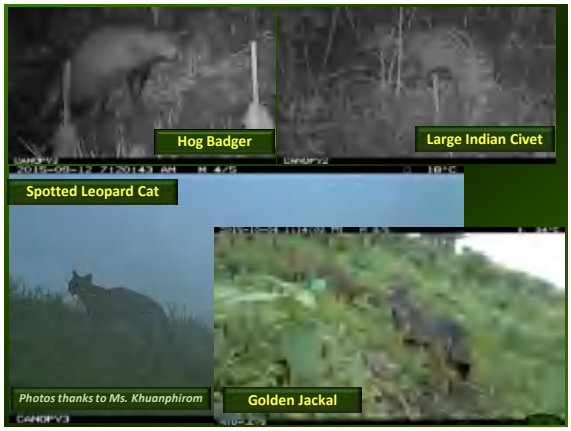


Interactions with Tourism

- A forest restoration project generated a tourist attraction for a niche market: "*edu-tourism*".
- But the benefits of tourism are not shared across the whole community.
- Legal/governance issues may limit ecotourism benefits

Other Factors?

- Started with the "Plook Pah Chalerm Prakiat" project.
- Interactions with CMU.



Interactions with Tourism

- An existing tourist attraction created demand for a more attractive and natural backdrop.
- Need to create a positive image for tourists.
- Potential to educate tourists about local tree flora and restoration techniques.

Other factors

- The 2011 flood galvanized DNP and Royal Project – strong response to government policy.
- More funding sources emerging – PATT, RIF etc.

Payments for Ecological Services (PES)

Users of an ecosystem service (*e.g.* water consumers) pay those who maintain or improve it (*e.g.* tree planters who restore watersheds), effectively monetarizing some of the less tangible benefits of forest restoration

Payments for Ecological Services (PES)

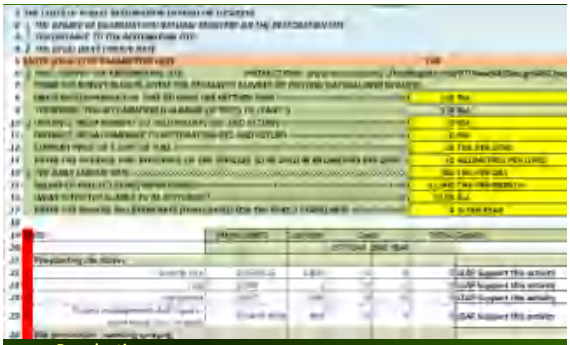
Users of an ecosystem service (*e.g.* water consumers) pay those who maintain or improve it (*e.g.* tree planters who restore watersheds), effectively monetarizing some of the less tangible benefits of forest restoration

Payments for Environmental Services

- FACILITATOR – L.E.A.F. (Lowering Emissions from Asia's Forests)
- SERVICE PROVIDER – Ban Pong Krai lowland Thai community. Watershed services through forest restoration.
- SERVICE CONSUMER – AURA Water (=Tipco Juices) – reliable supply of clean water.
- TECHNICAL SUPPORT – FORRU-CMU

Pre-planting rapid site assessment

Collaborative Costing



- Pre-planting survey
- Site prepn.
- Tree planting
- Weeding and fertilizer 2 y
- Monitoring 2 y
- Fire prevention 2 y
- Livestock exclusion
- Reporting/accounting

Result

Total costs 260,000 THB for 10 Rai (1.6 ha)

AURA budget limit 200,000 THB

Plant less? … Ask donor for more money?

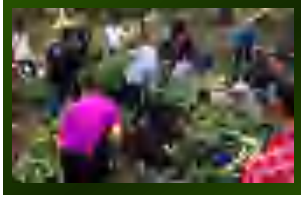
Or … Cut costs

Villagers opted to cut costs and removed their labour costs from the budget

FORRU-CMU discounted tree costs

Budget reduced to 170,000 THB

With 30,000 THB spare, the villagers decided to invest it in a tree nursery. LEAF hired FORRU-CMU to provide a workshop on nursery establishment and tree propagation methods.



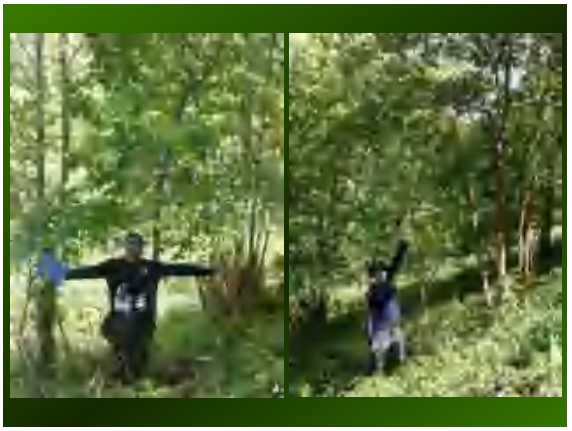
Ban Pong Khrai 2016 Plots

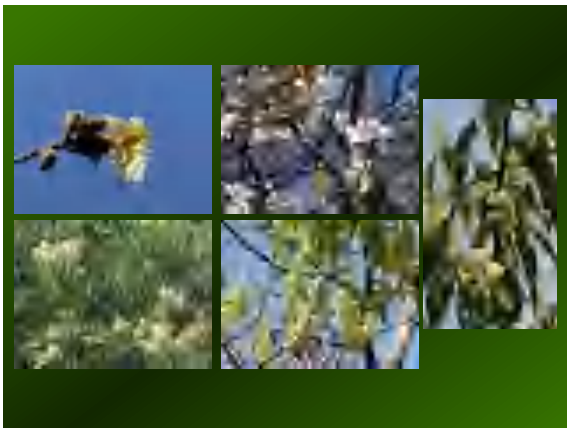
Starting Condition – June 2016

Ban Pong Khrai 2016 Plots

Latest Condition

13th February 2019





Interactions with Tourism

- Payments from an existing tourist attraction paved the way for villagers to co-operate with a restoration project.
- Benefits from tourism spread evenly across the whole community.

Other Factors?

- Re-affirming territorial claims.
- PES funding.
- Technical support from FORRU-CMU.

Tourism/Restoration Positive Links

- Income from tourism can free up land for forest restoration.
- Forest restoration can attract tourists and contribute to village economies.
- Tourism can encourage implementation of restoration for aesthetics.
- Exposure of villagers to eco-tourism can encourage them to participate actively in forest restoration projects.

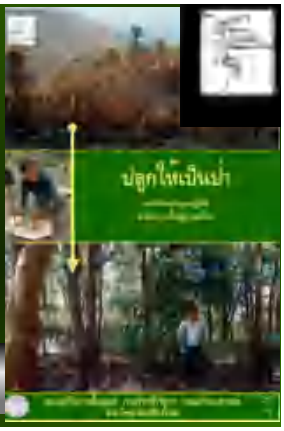
Tourism/Restoration Negative Links

- Too much tourism development (cable cars, accommodation construction etc.) can destroy restored sites.
- Failure to evenly distribute the benefits of tourism among *all* community members can lead to destruction of restored forests.

Website:
www.forru.org

Facebook:
Forru Cmu

FORRU - CMU
Thank you for listening



Biology Department
Faculty of Science
Chiang Mai University

APFNet

APFNET WORKSHOP ON
FORESTRY AND RURAL LIVELIHOOD DEVELOPMENT

1-14 November 2019 Yunnan Province, China

LIVELIHOOD IMPROVEMENT THROUGH PAYMENT FOR ECOSYSTEM SERVICES: OPPORTUNITIES AND CHALLENGES

Dr C T S Nair

Sponsored by:
Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet)

Organized by:
Southwest Forestry University (SWFU)
Forestry and Grassland Administration of Yunnan Province (FGAYP)
APFNet Kunming Training Center (APFNet-KTC)

INTRODUCTION

- "PES" or Payment for Ecological Services" is being pursued as a "win-win" option to accomplish environmental and social objectives in the use of natural resources, especially forests.
- As more forests are excluded from wood production and set aside for provision of ecosystem services, need for generating income from such services have become imperative.
- This makes it necessary that we assess the effectiveness of PES in generating income and enhancing the livelihood of rural communities.

ISSUES ADDRESSED

- Justification for PES
- Current state of PES - Different ecological services and how systems of PES applied.
- Making PES work for livelihood improvement.
- Take home messages.

WHY PAY FOR ECOSYSTEM SERVICES?

- Although forest derived ecological services are critical to life, society fails to give adequate importance to sustain and improve their availability. Products and services that are marketed get a priority.
- Setting aside land and forests for provision of ecosystem services results in loss of income from their use for production of products.
- In general environmental services are not easily traded and owners of resources are unable to capture their benefits.
- PES enables resource owners to benefit from the services they provide, thus incentivizing them to protect the environment.

DEVELOPMENT OF PES

- Systems of PES are created through:
  - Policy interventions (Government directives or legislation) mandating payments.
  - True markets emerging through direct interaction between sellers and buyers
- In most cases policy interventions - in varying degrees – play a major role in the creation of markets for environmental services.

ECOSYSTEM SERVICES FOR WHICH PES HAS BEEN DEVELOPED

PES has been developed for the following services:

- Watershed protection: Largely local / national market
- Carbon sequestration: Global/ national market
- Biodiversity conservation: Future markets
- Amenity values: Local, national or global

Systems of PES are easy when there is a direct link between providers and users of environmental services.

PES FOR WATERSHED PROTECTION

- Watershed protection is one of the ecosystem service having a long history of PES.
- Resource owners in uplands are paid to adopt land use practices that safeguard the interests of down-stream people.
- Several countries are implementing PES for watershed protection at different scales.
- Most often payment for watershed services is mediated through public or private utility companies – especially those supplying electricity and drinking water supply.
- .

AN OVERVIEW OF WATERSHED PROTECTION PROGRAMMES (2015)

Description	Asia	Latin America & Caribbean	Oceania	World
Operational programmes	169	47	6	419
Value (USD)	14.2 Billion	65.9 Million	52.3 Million	24.6 Billion
Land area managed (Ha)	426.6 million ha	2.8 million ha	26,000 ha	486.7 million ha

AN OVERVIEW OF WATERSHED PROTECTION PROGRAMMES

- In 2015 governments, water utilities, companies and communities spent about USD 24.60 billion for green infrastructure to improve water supply.
- A total of 419 programmes in 62 countries invested in the natural ability of forests, wetlands and other ecosystems to ensure clean and reliable water supplies.
- This covered about 487 million ha globally.
- Land A total of USD 15.8 billion was paid as subsidy to land holders for good stewardship and another USD 7.6 billion was spent on the protection of public lands.

• Source: **Forest Trend's Ecosystem Market Place 2016**

AN OVERVIEW OF WATERSHED PROTECTION PROGRAMMES (2015)

- Globally China dominates the system of payment for watershed services. Public support for watershed improvement amounted to USD 13.5 billion in 2015.
- Vietnam's PFES is another most important system for watershed protection. Some 355000 rural households received payments to improve watersheds through water utility providers.
- Mexico is another leader in compensating land owners for watershed services accounting for about USD 60 million or about 70 percent of the watershed PES in Latin America and the Caribbean.

CARBON SEQUESTRATION AND PRICING

- Payment for carbon sequestration is primarily an outcome of UNFCCC and the various policy regulations to limit emissions, especially the cap and trade arrangements.
- There are two approaches to reduce carbon mission:
  - A tax on carbon so that there is an incentive to go for low carbon foot-print products and services.
  - Implement a system of offsets through a cap and trade system enabling the development of a carbon market.
- In 2017 there are 57 carbon pricing initiatives – 28 on carbon taxes and 29 on emission trading schemes

CARBON TAX AND EMISSION TRADING SCHEMES

- Report of the High-Level Commission on Carbon Prices:
  - A well-designed carbon price is an indispensable part of a strategy for reducing emissions in an efficient way.
  - Explicit carbon-price level consistent with achieving the Paris temperature target is at least US$40–80/tCO2 by 2020 and US$50–100/tCO2 by 2030.

FORESTS, CDM AND REDD+

- Considerable thrust has been given to forest based emission reduction and sequestration.
- The Clean Development Mechanism under the Kyoto Protocol opened the way for supporting carbon sequestration through afforestation and reforestation generating certified emission reduction.
- REDD+ broadened the scope to reward those conserving and sustainably managing forests.
- Notwithstanding the efforts during the last one decade, we are yet to make any significant progress as regards realizing "results-based payments" under REDD+.
- Loss of primary forests persist in the context of land use options that are more profitable in the short term – For example oil palm and rubber plantations. Many of these spearheaded by large corporations also negatively affect rural livelihoods.
- There are reports that often REDD+ initiatives have negatively affected livelihoods of rural communities.

CARBON MARKET CHALLENGES

- Market volatility: Carbon prices have declined over the last few years undermining the reliability of market mechanism to reduce emissions.
- High transaction costs: This significantly affects the market participation of small producers.
- Governance of carbon markets : The Interpol has underpinned the high vulnerability of carbon trade for fraud, money-laundering and illegality.

PES FOR BIODIVERSITY PROTECTION

BIODIVERSITY CONTRIBUTES TO:

- PRODUCTIVITY: More diverse plant systems tend to be more productive.
- RESILIENCE: Diversity promotes stability as they are more resilient to external disturbances.
- INSURANCE: Diversity provides insurance against catastrophic events.
- KNOWLEDGE: Biodiversity can be used as a source of knowledge to develop new products in the biotechnology industry or pharmaceuticals.

PES FOR BIODIVERSITY PROTECTION

- Development of PES for biodiversity conservation is much more challenging, considering that the beneficiaries of conservation are invariably future generations.
- Biodiversity generates two types of values:
  - Values for the present generation by way of various products.
  - Values for future generations.
- In general values accruing to present generations are amenable to assessment.
- This is however not the case with the values accruing to future generations, which remain extremely challenging.
- Considerable difficulties exist in identifying beneficiaries among future generations and the precise nature of benefits they derive.

PES FOR BIODIVERSITY CONSERVATION

- Different approaches have been adopted to encourage biodiversity conservation through rewarding/ compensating those conserving biodiversity. These include:
  - Payment for bioprospecting rights.
  - Private protected areas.
  - Conservation easements; and
  - Biodiversity offsets
- The Nagoya Protocol of the CBD provides the framework for accessing and equitable sharing of benefits from biodiversity.
- However, many challenges – mostly in the realm of governance – persists in making biodiversity conservation economically viable and more importantly to enhance its contribution to rural livelihoods.

PES FOR AMENITY VALUES

- Amenity values is one of the fastest growing segment of the PES with considerable potential to improve rural livelihoods.
- Growing demand for out-door experience from among a rapidly growing urban population.
- Several examples of community managed ecotourism.
- The challenges:
  - Ensuring sustainability and preventing the degradation of the site.
  - Equitable sharing of benefits.

CHALLENGES IN THE DEVELOPMENT OF PES

- **Development of ecosystem services markets are related to the state of social and economic development. Even in most developed economies PES markets remain undeveloped.**
- **Main challenges**
  - **Policy, legal and institutional issues.**
  - **Technical problems.**
  - **Economic aspects: Some PES efforts have high transaction costs which could far exceed the benefits.**
  - **Potential for aggravating poverty.**
  - **Potential for accentuation of forest related conflicts.**

MAKING PES TO WORK FOR LIVELIHOOD IMPROVEMENT

Livelihood improvement through PES has to deal with multiple challenges – Economic, social, institutional and technical. It has to satisfy a number of necessary conditions including:

- **Effective regulatory framework.**
- **Favourable land and resource tenure.**
- **Industry and consumer preference.**
- **Public sector support.**
- **Effective local institutions.**
- **Knowledge and knowledge sharing arrangements**

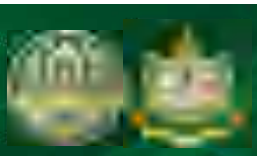
TAKE HOME MESSAGES

- **Whether the full potential of PES to contribute to livelihood improvement will be realized or not depends:**
  - **The larger socio-political, economic and institutional environment;**
  - **The socio-economic conditions of the households.**
- **Ownership of land and forests is a key issue as regards realizing PES benefits by rural communities. Tenure reform is hence most critical.**
- **Need to consider the opportunity costs of provision of ecological services. Income from PES may not be commensurate with the income from foregone opportunities.**
- **PES is highly context specific: "One size fits all" approach is bound to fail**

MAKING PES TO WORK FOR LIVELIHOOD IMPROVEMENT

"Without proactive efforts to shape ecosystem payment systems and markets, there is no reason to believe that low-income land-stewards will receive more than a small share of the spending"

Milder J C *et al* 2010



Urban People, Livelihood and Forests

Preecha Ongprasert
Chief of International Special Program
International Forestry Cooperation Division
Planning and Information Technology Bureau
Royal Forest Department, Thailand

APFNet Training and Workshop on Forestry and Rural Livelihood Development
6 November 2019, Kunming, PR China

Outline of the Talk

1. Concept and Definition
   - Definition of the term "urban"
   - Definition and concept of "urban forestry:
2. The discipline of urban forestry
   - A new approach to the potential of urban forestry in developing countries
   - Urbanization in the third world: development and trend
   - Growing environmental concern
3. Potential of urban forestry indifferent urban zones
   - Biographical zonation
   - Land ownership and tree resources
   - A simple spatial model for urban forestry
4. Potential benefits for urban livelihood and problem
   - Material benefits
   - Environmental benefits
   - Potential problems

Outline of the Talk (cont.)

5. Social and cultural aspects
   - A participatory approach
   - Gender aspect
   - Cultural and religious aspects
   - Local knowledge and attitudes
6. Urban tree practices
   - Aboricultural practices
   - Urban tree inventory
7. Examples of best practices in urban forest management
   - Singapore
   - Thailand

1. Concept and Definition

1.1 Definition of the term "urban"

1. The United Nations (1991)
   - over 20,000 people as 'urban'
   - over 100,000 as 'cities'
   - over 5 million as 'big cities'.

2. What about Pacific Island countries where population less than 20,000?

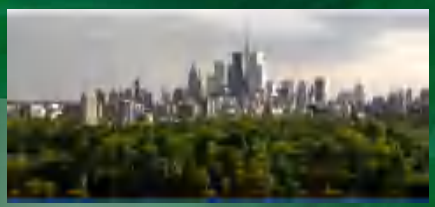
3. Thailand: administrative territory of municipality (2,200 municipalities)



1.2 Definitions and concepts of "urban forestry"

- Urban forestry was conceptualized in the late 1960s in North America, and grew out of what was initially termed environmental forestry.
- The definition of urban forestry (Grey and Deneke, 1986)
  "*Urban forestry is the management of trees for their contribution to the physiological, sociological, and economic well-being of urban society. Urban forestry deals with woodlands, groups of trees, and individual trees, where people live - it is multifaceted, for urban areas include a great variety of habitats (streets, parks, derelict corners, etc) where trees bestow a great variety of benefits and problems*"

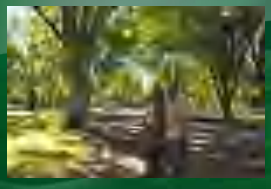
- Peri-urban forestry is loosely defined as forestry on the fringe of urban settlements




2. The discipline of urban forestry

2.1 A new approach to the potential of urban forestry in developing countries

1. **Focus on the trees themselves; the potential benefits** that may be expected from their cultivation in an urban environment
   - how they may be managed to maximize the urban tree
   - what threats an urban environment pose to their survival



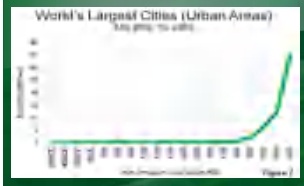

2. The discipline of urban forestry

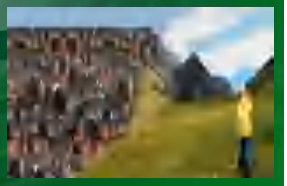
2.1 A new approach to the potential of urban forestry in developing countries

2. **Focus on the residents of urban areas**, their needs and the nature of their invariably diverse living conditions, and then to consider how trees might be of benefit to them
   - wide variety of disciplines, including urban forestry, arboriculture, community forestry, landscape architecture, geography, sociology and economics.


2.2 Urbanization in the third world: development and trend

- United Nations (1991): in mid-1990, 45% (2.4 billion) of the people of the world were living in towns or cities, and that this will have increased to 51% in the year 2000 and 65% in the year 2025.
- In developed countries, in mid-1990 some 73% of the population was classified as urban, 37% in less developed countries.



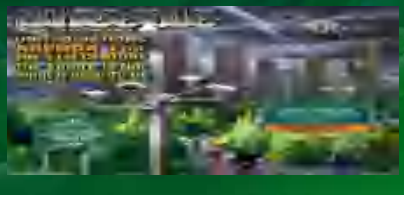


2.2 Urbanization in the third world: development and trend

"*Fuelled by changes in the countryside, high rates of fertility, falling death rates and rapid cityward migration, most Third World countries have been transformed from rural to urban societies in two or three decades. The larger cities have been expanding rapidly, often doubling in size every fifteen years*." (Gilbert and Gugler, 1992)

2.3 Growing environmental concerns

- With the rapid growth of Third World towns and cities, there have been huge accompanying environmental problems
- The Earth Summit in Rio de Janeiro (1991) focused global attention on environmental problems, and many of those that are found in Third World cities feature in Agenda 21, one of the Summit's documents



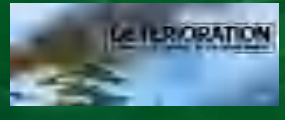
3. Potential of urban forestry indifferent urban zones

3.1 Biographical zonation

- Urban environment which has been heavily modified by man so that some living organisms are eliminated while others invade, colonize and multiply.

-Much urban soil being fill, or rubble, or compacted soil on which it is difficult for many native plants to become established.

-Introduction of exotic species and modification of the plant nutrient status of soils by fertilizers, compost, dumping of wastes or pollution.



3.2 Land ownership and tree resources

1. **Tree planting on land privately owned or occupied**
   - tree planting is a symbol of land ownership: ; trees planted for ornamental and material benefits

3.2 Land ownership and tree resources

2. **Tree planting on company land**
- Much potential for tree cultivation may exist as a means of creating a successful corporate image (offices surrounded by landscaped greenspace generally create a more favourable impression than concrete): trees around premises planted for environmental enhancement

3.2 Land ownership and tree resources

3. **Tree planting on public land**

-Most trees on 'public' land are generally planted and/or maintained for environmental purposes in Third World cities
-Different tree species and spatial arrangements are chosen according to different specific objectives

3.3 A simple spatial model for urban forestry

1. **Fuelwood**

-The primary source of energy in many towns and cities of the Third World is wood fuel, either as wood or charcoal.
-Poorer people collect small twigs and leaves to be burned for fuel.
-Most wood fuel is brought in from peri-urban areas or beyond

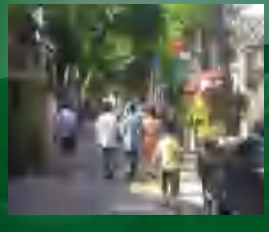
3.3 A simple spatial model for urban forestry

1. **Fuelwood**

-FAO funded 'green-belt' projects in periurban areas in Africa, on the outskirts of Ouagadougou (Burkina Faso) and Kinshasa (Zaire), N'Djamena (Chad), Nouakchott (Mauritania), Maputo (Mozambique), etc.
- Peri-urban plantations around Addis Ababa of Ethiopia provide an example of how *Eucalyptus* plantings may come represent a very important source of fuelwood for an urban population.


2. Food

- Some of the trees provide food - particularly fruits, edible leaves, shoots and even flowers.
- In Beijing, persimmon and walnut trees are grown in parks,
- Housing Authority of Singapore has a policy of growing fruit trees in housing areas for the benefit of elderly people




2. Food

- In Bangkok, fruit trees like jackfruit, mango, tamarind have planted along the main road in Bangkok since 1885
- Planting edible plants in front of household in Bangkok


2. Food

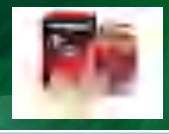
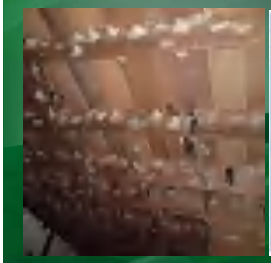
- Urban agriculture is an important source of food and income for many residents of Third World towns and cities,
- Food-producing trees are often found combined with other food crops in agroforestry systems.
- An example is provided by the floating urban gardens in Bangladesh


2. Food

- Growing plants within the buildings in Germany

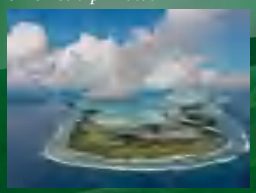
2. Food

- Bird nest for swollows in Thailand

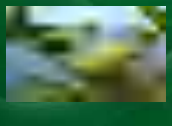

2. Food

-In the Pacific islands, homegardens are a ubiquitous feature of urban areas.
-In Kiribati, the main staples are coconut, bread-ruit, *Musa* clones, pandanus, and *Ficus tinctoria*, papaya, citrus species, avocado, guava, *Annona*, *Syzygium* and *Terminalia* spp., *Spondias dulcis*, and *Pometia pinnata*.




2. Food

-Consumption of fruit and vegetables from homegardens can alleviate a serious health problem from the consumption of traditional foodstuffs and towards imported foods of inferior nutritional value in Pacific Island countries.
-In Solomon Islands, people without homegardens were found to have a lower intake of iron and vitamins A and C.
-In Kiribati campaigns have been held to promote homegardening and the consumption of both traditional foods and the edible leaves of local trees such as *Morinda citifolia*, *Pisonia grandis* and *Polyscias* spp.

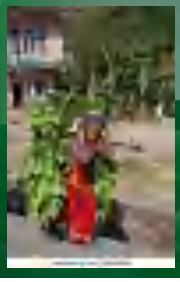
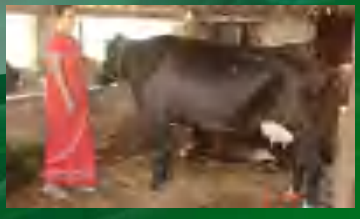


3. Fodder

-Livestock raising is a common practice in many towns and cities of some Third World countries
-Six Kenyan cities found that 17% of all households kept livestock with them in the urban area where they live.
-Totally 1.4 million head of livestock were kept in all towns in Kenya

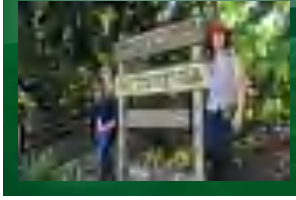

4. Grazing for livestock

- Urban greenspaces and peri-urban forests provide grazing to livestock belonging to urban residents
- In Nepal, fodders cutting from urban tree foliage is common

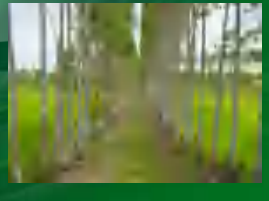
5. Timber and poles

- Urban settlements consume many timbers for the construction of buildings and furniture.
-In Baltimore, *Paulownia* is cultivated for export to Japan as veneer timber.
-Britain urban foresters are actively examining the possibility of using the various exotic species grown in urban areas as a source of craft and timber




5. Timber and poles

- In Europe, peri-urban forests used primarily for recreation are also managed for limited timber production.
-Peri-urban forests and plantations in developing countries probably consists mostly of supplying poles rather than larger timber,
e.g. fast-growing tree species such as *Eucalyptus* spp or bamboo

5. Timber and poles

- Street trees in Beijing provided material for temporary shelters after catastrophic earthquakes which occurred in 1976


6. Spices, fibre, medicines and other non-timber products

- In Asian and African countries, some amenity trees are used by local people for medicinal
-Some species of *Melaleuca* in Sri Lankan towns (originating from Australia), the bark is reportedly an important ingredient of ayurvedic medicine


6. Spices, fibre, medicines and other non-timber products

- In urban homegardens, trees valued for spices, fibre, mushroom cultivation, perfume, handicrafts, dyes, etc.

-Thaman (1987) reports medicinal plants to be a "critical economic and cultural resource" in the Pacific Islands

-Of the 93 medicinal plant species found in native urban gardens in Fiji, Tonga, Kiribati and Nauru, 55% were trees and another ten were woody shrubs

6. Spices, fibre, medicines and other non-timber products

- Sacred or perfumed plants were also widely cultivated for income generation as well as household use, their flowers, leaves, fruits and bark being sold for use by the tourist industry

-Mushrooms being cultivated in urban forests

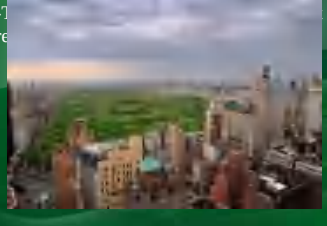
-Trees may also provide materials for building shelters. The leaves of palms are commonly used as roofing by many poor urban dwellers

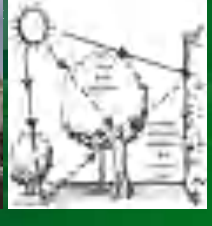
4.2 Environmental benefits

1. **Landscape enhancement**

-In urban settlements, trees are planted for the purpose of enhancing their visual character and adding variety and richness to urban landscapes from different foliage and blossoms, heights, colours and shapes

-T
re





4.2 Environmental benefits

1. **Landscape enhancement**

-Urban forestry and the concept of a "green city" can be a source of civic pride and used to attract investment into an area

-Well-known examples is Singapore, garden festival programme in Netherland,

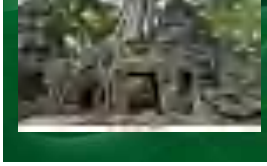
-The potential role of businesses in supporting urban forestry because of the economic benefits to be gained from an attractive urban

4.2 Environmental benefits

1. **Landscape enhancement**

-Tree species under which Lord Buddha gained enlightenment, *Ficus religiosa*, is commonly allowed to grow wherever it comes up in Sri Lankan towns and in other countries where Buddhism is strong.

-Jim (1991) "*Trees constitute an important ingredient of the cultural landscape of human settlements…. Amenity trees in a given city can….be interpreted as an interplay between nature and culture*."

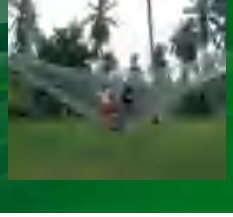


4.2 Environmental benefits

2. **Recreation**

-Urban parks and peri-urban forests are an important recreational grounds

-At a smaller level, even a small patch of ground supporting a few trees can have great recreational value to children as a playground



4.2 Environmental benefits

3. **Educational value**

-Urban parks, and particularly botanical gardens with their wide collection of trees and other plants, have a huge educational potential as an education tool
-The remnant rainforest park at Bukit Temara, Singapore is used extensively as an educational resource for students.
-In Hong Kong the Urban Services Department has established tree trails in some of its parks


4.2 Environmental benefits

4. **A sense of well-being**

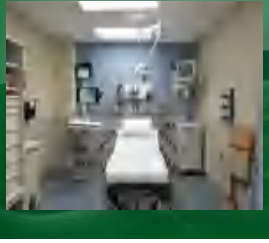
-Ulrich (1990), people derive quantifiable benefit from the passive experience of viewing trees, the positive effects being both psychological and physiological.
-*"Compared to urban scenes lacking vegetation, views containing trees and other vegetation elicit preference or liking and can have positive influences on a range of other important feelings having a central role in psychological wellbeing.…many scenes dominated by trees foster [psychological] restoration because they elicit positive feelings; reduce negatively toned emotions such as fear, anger, and sadness; effectively hold interest; and, accordingly, might block or reduce stressful thoughts."*


Moving the meeting from the meeting room to be under the tree shading, can reduce some conflict among the group and get conclusion of the meeting quicker

4.2 Environmental benefits

4. **A sense of well-being**

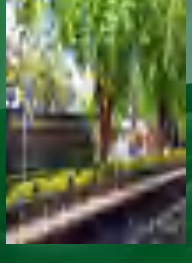
-*"Twenty-three surgical patients assigned to rooms with windows looking out on a natural scene had shorter postoperative hospital stays, received fewer negative evaluation comments in nurses' notes, and took fewer potent analgesics than 23 matched patients in similar rooms with windows facing a brick wall."*




4.2 Environmental benefits

4. **A sense of well-being**

-Somdet Chaopraya Institute of Psychiatry Hospital in Bangkok, Thailand
"Big trees conservation for psychiatric patients treatment and rehabilitation"




4.2 Environmental benefits

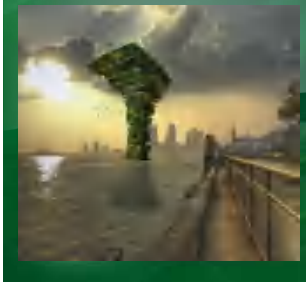
5. **A habitat for wildlife**

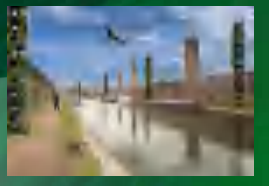
-The diversity of habitat provided for wildlife by urban forestry is valued in many developed countries, and particularly by conservation groups.
-Different cultures and in different groups of the same society (wildlife conservation concerns being often a prerogative of the middle classes).
-In India, there is a considerable conservation lobby, among whom urban parks and gardens are valued as a wildlife habitat
-*Ficus* spp. in Bangalore parks provides food for birds and small mammals


4.2 Environmental benefits

5. **A habitat for wildlife**

- Urban wildlife architect





4.2 Environmental benefits

6. **Climatic modification**

-Trees can have a significant and quantifiable effect on the immediate local climate
-Miller (1988) divides potential climatic modification into two main categories; direct effect on human comfort, and effect on the energy budget of urban buildings.

4.2 Environmental benefits

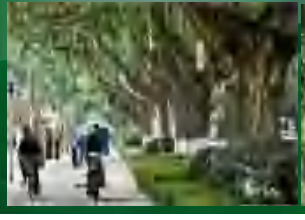
6. **Climatic modification**

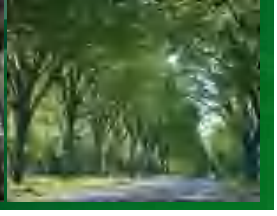
- "Heat island" describes built up areas that are hotter than nearby rural areas.
- The annual mean air temperature of a city with 1 million people or more can be 1–3° C warmer than its surroundings.
- In the afernoon, the difference can be as high 12° C.
- Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality

4.2 Environmental benefits

6. **Climatic modification**

- Chinese urban foresters claim to have markedly altered the climate of some cities through widespread tree planting
-Since 1949, some 34 million trees are reported to have been planted in and around Nanjing city with the specific objectives of reducing summer temperatures and generally regulating the local climate; purifying the air; and beautifying the environment.





4.2 Environmental benefits

6. **Climatic modification**

-In Nanjing, a drop in the average summer temperature from 32.2° C to 29.4° C over the period 1949 to 1981 is directly attributable to the cooling effect of trees planted during this time.
-Over the 32 years, some 23 trees per city inhabitant were planted.
-Tree plantings have included block afforestation of degraded hillsides, windbreaks, triple rows of trees along railways, and the lining of street sides.

4.2 Environmental benefits

6. **Climatic modification**

- Tree plantings have included block afforestation of degraded hillsides, windbreaks, triple rows of trees along railways, and the lining of street sides.

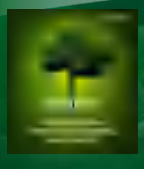
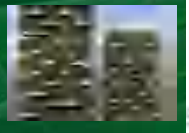
4.2 Environmental benefits

7. ***Energy budget of buildings***

- Surrounding vegetation to reduce the costs of the winter heating and summer cooling of buildings.

-Miller (1988) "*..vegetation can significantly affect building heating budgets. Windbreaks have been found to reduce home heating costs by 4 to 22 percent, depending on site windiness and how airtight the structure is. On the other hand, vegetation that shades a home in winter can increase heating costs*"

-Costs of air-conditioning a building can be reduced by up to 50 – 60%, depending on the location of the building and the trees around it

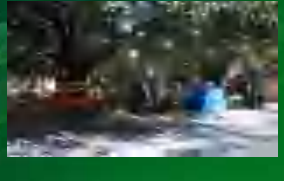

4.2 Environmental benefits

8. ***Human comfort***

- Perhaps the most important contribution of trees to human comfort in hot countries is shade, both directly and indirectly (by covering surfaces that reflect heat).

-They also provide protection from heavy rain, and for the urban poor are a commonly used shelter, both at night for sleep and during the day.

-street trees in Third World towns and cities are often used by small businesses for the shelter that they provide to the trader and client alike

4.2 Environmental benefits

8. ***Human comfort***

- 400 avenue trees growing along a 4.6 km stretch of the Barrackpore Trunk Road in Culcutta of India, 142 were associated with some kind of human activity as religious (52 trees), public utility (54 trees) and economic (99 trees).

-The most common activities classified as public utilities were benches for rest (14 trees), and notice boards/advertisements (10 trees)

-Frequently recorded economic activities were tea shops (14 trees), pan shops (13 trees), barbers shops (9 trees), tyre shops (6 trees) and cobblers (4 trees).


4.2 Environmental benefits

8. ***Human comfort***

-Species chosen for street planting should be evergreen to ensure shade throughout the year.

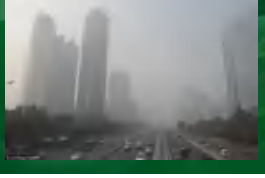
-Other desirable characteristics were that the trees should be native, fast growing, sturdy enough to withstand storms, have a high probability of survival, and should provide fruit and nesting facilities for birds

4.2 Environmental benefits

9. **Air quality**

-Recently, Beijing has recorded an annual average concentration of sulphur dioxide that was more than twice the WHO recommended average, with peak concentrations during the winter.

-Air pollution may be compounded by local conditions, notably air inversions (warm air lying over cold air) which trap polluted air over cities or towns for prolonged periods. Examples of this phenomena include Mexico City and Kathmandu, Nepal.




4.2 Environmental benefits

9. **Air quality**

-The Capital Iron and Steel Corporation in Beijing is now considered to be "just like a garden".
-Over the 12 years prior to 1991, the Corporation has planted 3,390,000 trees, such as white poplar, paulownia, Chinese little-leaf box, pine and bamboo. It has also planted out an area of 904,000 m^2 with grass and 8,590,000 flowers.
-The walls of the tall buildings inside the factory grounds are covered with climbing plants, the vertical green area reaching 46,500 m^2.
-In 1990 the output of steel increased 2.37 times over that in 1979. The amount of smoke and dirt emitted dropped by 50%.
-The sky above the plant is now reportedly always clear and bright and the air is clean, providing favourable working and living conditions for the factory employees as well as improving the quality of the environment throughout the region.

4.2 Environmental benefits

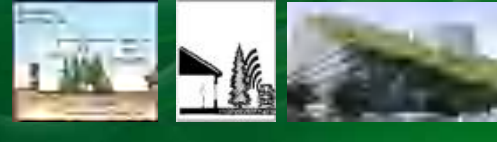
10. **Noise reduction**

-Noise in urban environments is always found at high frequencies (short wavelengths)
-In Mexico City it is reported that noise levels intermittently reach 100 dB(A)
-Loss of hearing can be caused after prolonged exposure (of more than eight hours) to noise levels of 85 – 90 dB(A)
-Trees may help to reduce it to possibly more acceptable levels, especially if combined with other measures aimed at controlling noise emissions

4.2 Environmental benefits

10. **Noise reduction**

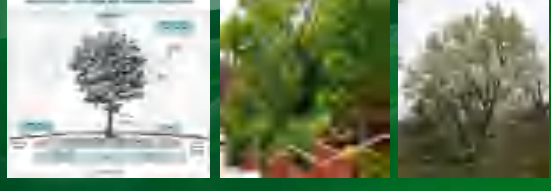
-Cook (1978) found that trees and other vegetation in conjunction with landforms reduced highway noise by 6 – 15 dB, while trees in combination with solid barriers reduced noise by 5 – 8 dB
-Noise pollution is reduced by trees through five mechanisms, notably sound absorption, deflection, reflection, refraction and masking.
-Trees absorb high frequencies at a greater rate than low frequencies, meaning that they selectively remove the frequencies most distressing to human ears.
-The effectiveness of noise deflection, reflection and refraction depends on the configuration in which trees are planted



4.2 Environmental benefits

11. **Erosion control**

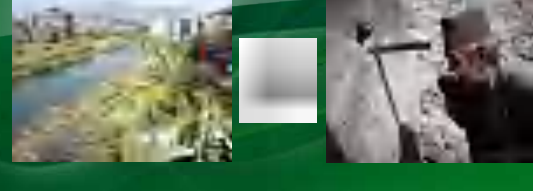
-Tees and forests in controlling soil erosion is that of their use as a watershed catchment cover
-Trees can help control such soil movements will depend to a certain extent on the nature of the slope and local conditions.
-Raindrops falling from a tree canopy may easily reach terminal velocity before they hit the ground



4.2 Environmental benefits

12. **Watershed management: peri-urban forests as catchment cover for urban water supplies**

-FAO has supported watershed management schemes for the urban water supplies of Kathmandu, Nepal; Freetown, Sierra Leone; and Tegucigalpa, Honduras
-In Kathmandu (the 144 km^2 Shivapuri watershed), the management of peri-urban water catchment areas for the benefit of urban water consumers can engender a clash of interests



4.3 Potential problems

1.Cost

-Urban forestry initiatives beyond small homegardens can cost a large amount of money to implement.
-For examples, large saplings require intensive care
-Maintenance costs, in particular irrigation, can be very high
-Poorly run tree planting campaigns can also prove to be very costly, if mortalities are high as a result of inadequate or misdirected support


4.3 Potential problems

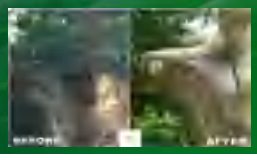
2. Threats to human safety

-Poorly planted or inappropriate tree species can hazard to urban inhabitants
-Direct falling branches or the falling over of the entire tree
-In Kenya, "*trees blocking highways and falling on roofs of houses are common in urban areas*." Onganga (1992)


4.3 Potential problems

2. Threats to human safety

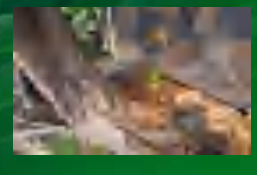
-Indirect threats to human safety caused by trees include branches catching in overhead power lines, tree canopies obscuring vision and thus causing accidents, and trees serving as a screen for assailants.
-Careful planting and choice of species, regular maintenance and a clear line of responsibility for dealing with dangerous trees would help to increase human safety

4.3 Potential problems

3. Structural damage

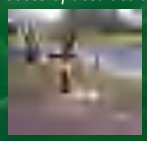
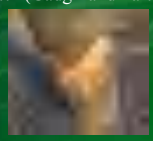
-The roots of street trees often cause the cracking of roads and pavements and sometimes water pipes.
-Urban trees can also cause structural damage to buildings, both at foundation level due to their roots, and through the falling of whole trees or branches.
-Careful species choice and maintenance can minimize the problem

4.3 Potential problems

4. Vandalism and browsing

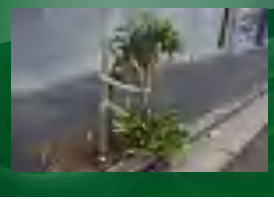
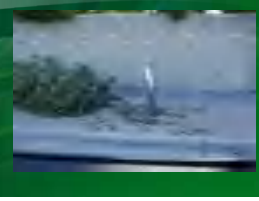
-Damage may be inflicted on trees from intent to destroy, disregard, a consequence of harvesting tree products, browsing livestock, etc.
-Gaining local people's support for and active involvement in tree cultivation can minimize the problem
-Experience from observations of street trees in Bangalore, India. "*The extent of mutilation is clearly inversely proportional to the extent of tree cover in a locality. The fewer the trees, the more insidious the process of destruction…*" (Gadgil and Parthasarathy, 1977)

4.3 Potential problems

4. Vandalism and browsing

-"*It is common in Kenya, during funerals of important people or when a home team wins a prestigious cup, for people to cut trees and carry branches as a sign of sorrow or victory. One day's riot can leave an entire park stripped of thousands of trees*."
(Onganga, 1992)

Vandalism to Dipterocarp trees in Chiang Mai of Thailand

4.3 Potential problems

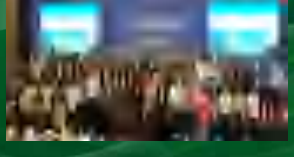
5. Unorganised waste disposal

-"*Urban forests are considered by many people as the most ideal place to dump industrial waste. This is a major problem which is not easy to solve in Kenya because it involves very rich and influential people. Waste from tires, bottles, and other industrial by-products quite often covers several acres that otherwise could be used for tree planting. These waste products have also become a health hazard to the urban dwellers*" (Onganga, 1992:219).

5. Social and cultural aspects

1. Participatory approach

-"*Combining the interests and concerns of all sections of the urban community into an overall strategy and management plan for the urban forest is essential*" (Johnston, 1992)
-People's needs, opinions and preferences should be incorporated into the planning and management process



5. Social and cultural aspects

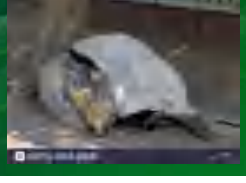
1. Participatory approach

-Local participation may be assisted through tree warden or similar schemes, whereby individuals volunteer to take responsibility for the care of trees planted in their area.
-In Longyan of South China, within commercial areas, shopkeepers have encouraged to ensure that nearby trees are well tended

5. Social and cultural aspects

2. Meet the needs of the poor

-Uurban trees already provide poor people with shade, recreation, fuel and food, among other benefits
-Fuelwood collection from peri-urban areas may also be an important source of cash income
-In Delhi, poor people gain income from the harvesting and sale of a number of products from trees



5. Social and cultural aspects

3. Gender aspects

-The main participants urban agriculture are women (Niñez, 1985).
-In Lima of Peru, men being more interested in cash production while women are more interested in subsistence production
-In West Africa, women are generally the main traders of produce from homegardens (Diarra, 1975).

5. Social and cultural aspects

4. Cultural and religious aspects

-"Many traditional beliefs do not hold strong in urban settings with mixed populations.
-Trees in urban landscapes can be of high cultural significance, and cultural or religious beliefs may strongly influence their management.
-In Calcutta, if a street tree was worshipped, its chances of survival were "almost 100 per cent"

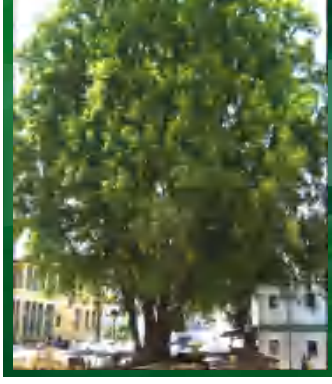
6. Urban tree practices

6.1 Aboriculture

-A discipline regarding to individual tree management
-A specialist will be called as "Arborist"
-Well-trained in multi-discipline related to tree care and management
-Skillful in mechanical utilization
-Full awareness in public safety
-Understanding "Art" and "Beauty of nature"
-Skillful in tree climbing

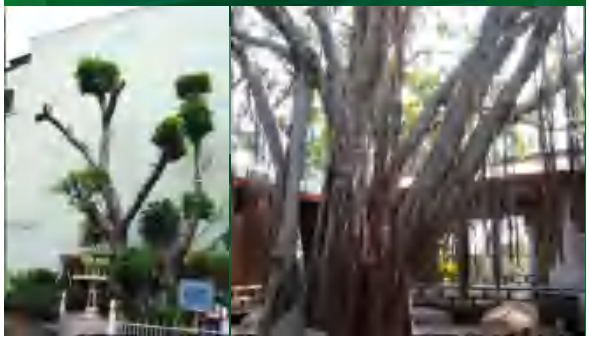


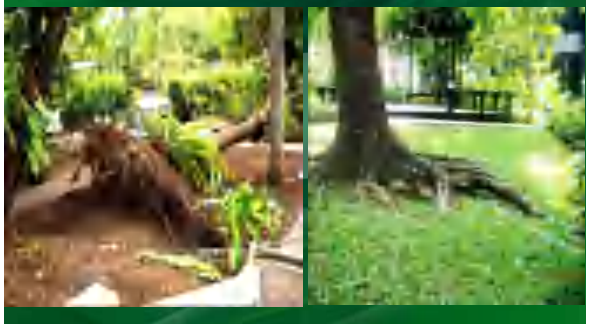

Ficus tree in the National Bank of Thailand, Bangkok



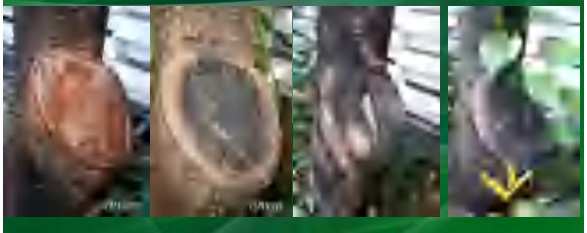
Understanding tree habitat, physiology and biology before bringing the tree to plant in the urban areas

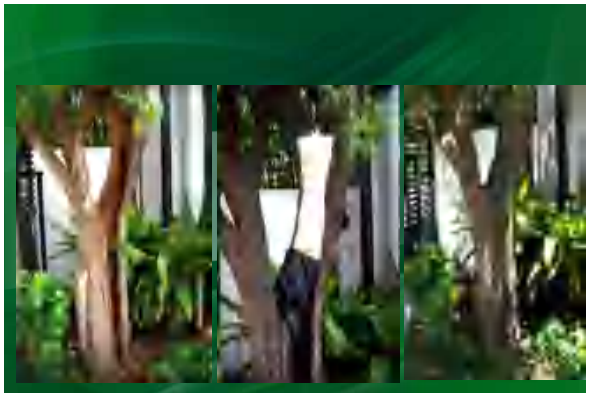

Example of bringing evergreen tree to plant individually in urban town





Resulting from correct way of tree pruning





6.2 Urban tree inventory

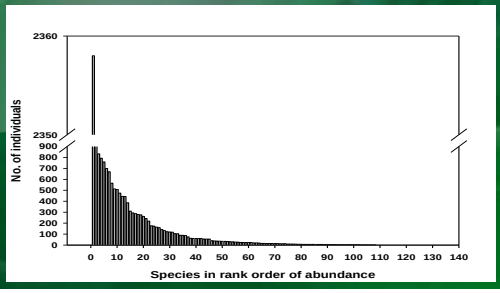
-Sustainable urban forest management

1) Species diversity
2) Healthy tree
3) Enough crown cover of local stand to be genetic source for conservation

Rule of 10-20-30 for species diversity (Santamour, 1990) Urban trees should be composed of more than:
1) 10% of single species
2) 20% of single genus
3) 30% of single family

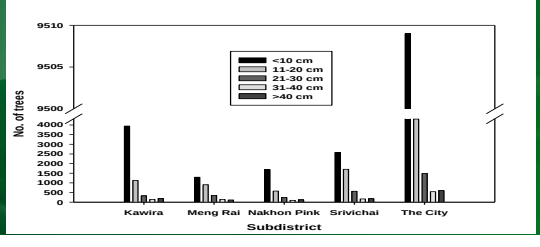
Street tree composition of Chiang Mai Metropolitan (2007)
(Wind shield technique)

Largerstroemia loudnii found moer than 14.8% of the city street following with *Pterocarpus indicus* 6.9%, *Largerstroemia floribunda* 5.2% and *Cassia fistula* 4.9%



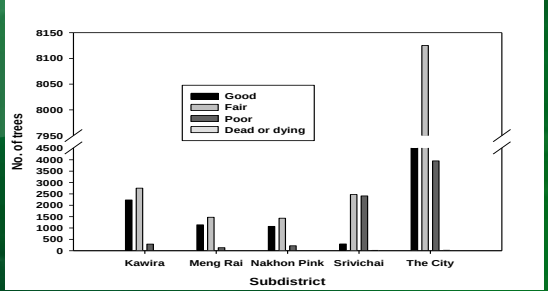
Street tree composition of Chiang Mai Metropolitan (2007)

- 87% of Chiang Mai's street trees composed of tree with dbh lower than 20 cm
- Large tree such as Samanea saman, Delonix regia, Ficus religiosa, Tamarindus indicus, Dipterocarpus alatus, etc. still remained within old settlements and public lands



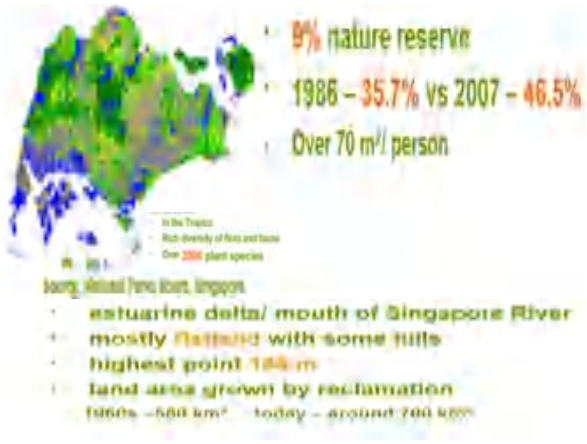
Street tree composition of Chiang Mai Metropolitan (2007)

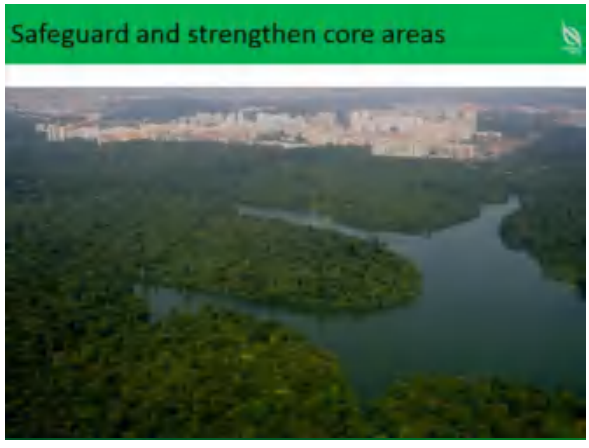
- Over 70% of Chiang Mai's street trees maintained their good helth condition

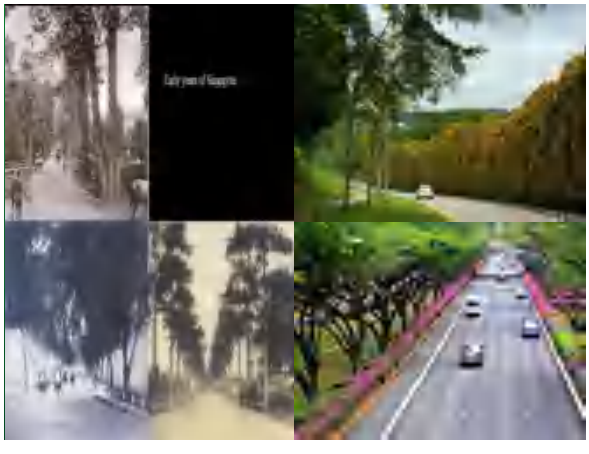


6. Examples of best practices in urban forest management

1. Singapore: Country level


9% nature reserve
1986 – 35.7% vs 2007 – 46.5%
Over 70 m²/ person
estuarine delta/ mouth of Singapore River
mostly flat(er) with some hills
highest point 164 m
land area grown by reclamation


Safeguard and strengthen core areas




NATURE WAYS
structure


Commitment and Leadership
- Building on a Legacy of 40 Years
'Greening ... a big part of Nation Building'
– strong leadership + steadfast commitment + adequate resources
Garden City Action Committee
- closely monitored by the Prime Minister
- Greening –> upgrade to a world class city and attract talent


Policy Commitment
"Quality of Life
competitive
Greening
value
beginning
planning process
perseverance and
determination
mindset


Singapore - Achievement
- From Garden city to
City in a Garden
- Greening- quality of environment ->Competitiveness
- Emphasis on Quality
Not only quantity of planting
- Integrated approach


City in a Garden
Imagine Singaporeans having a home within a garden, instead of just having a garden outside a home.


Streetscape Greenery
Backbone of the Garden City


Park Connector

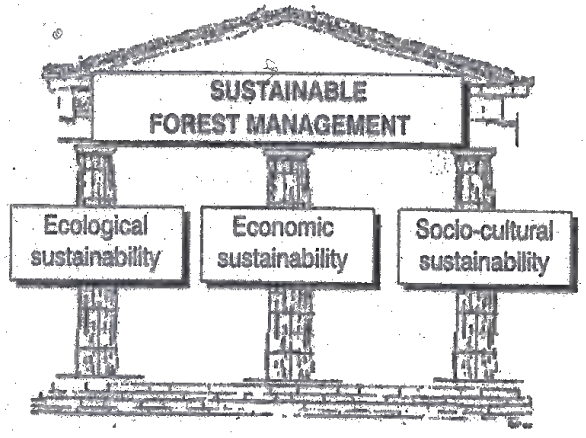

Green Urban infrastructure –
Ecological Connectivity
• Eco-link@BKE

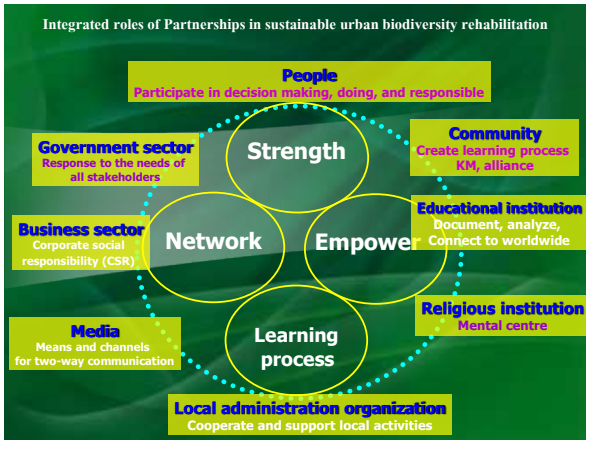

Green Urban infrastructure –
Streetscapes

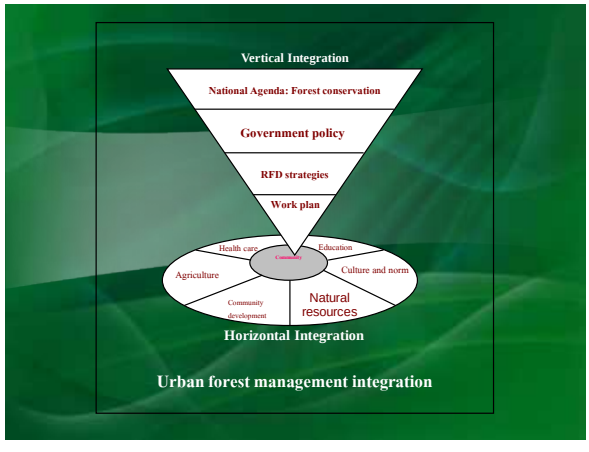
6. Examples of best practices
in urban forest management

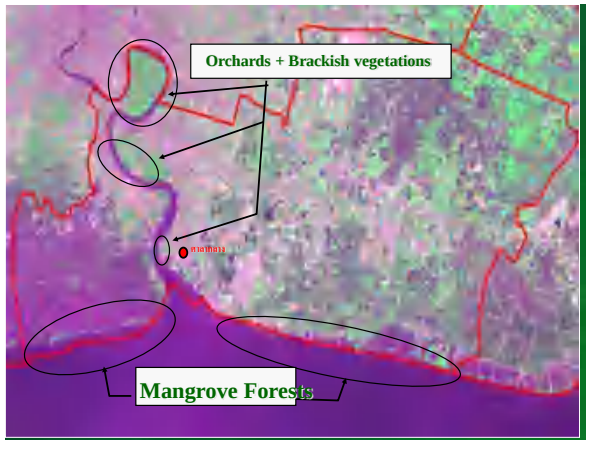
2. Thailand: Community level

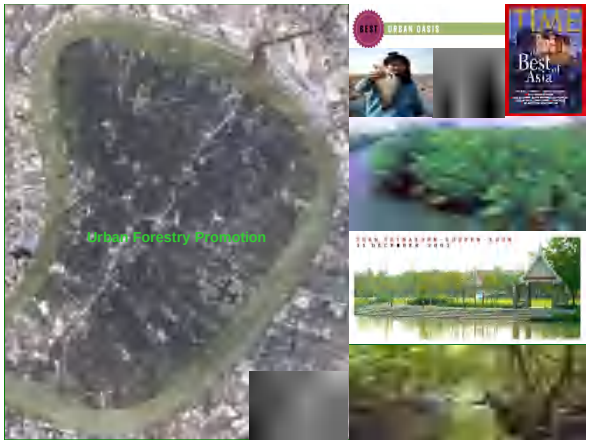
Bang Kchao, Prapadaeng District
Samut Prkarn Province
(Urban community management)









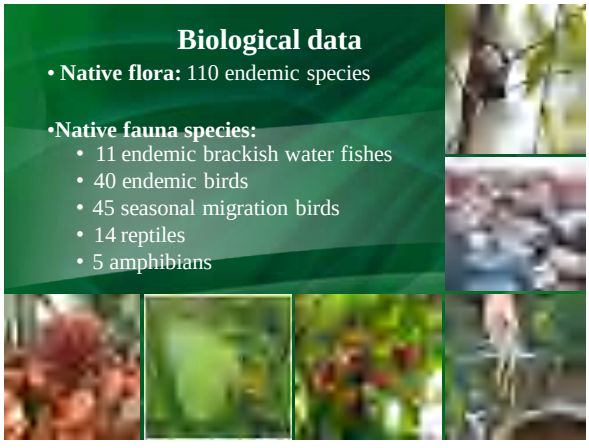

Urban Forestry Promotion
BEST
URBAN OASIS
TIME
Best
Asia

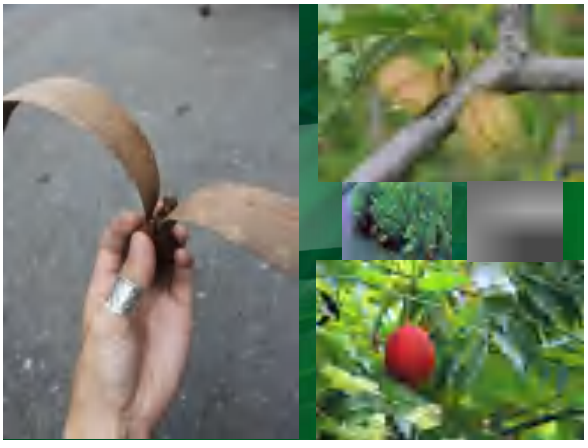

WE KEEP THIS GREEN AREA FOR WHOM?

Biological data

- **Native flora:** 110 endemic species

- **Native fauna species:**
  - 11 endemic brackish water fishes
  - 40 endemic birds
  - 45 seasonal migration birds
  - 14 reptiles
  - 5 amphibians





In 2006: Voted by Time Magazine as "the best urban oasis of Asia"

Best of Asia 2006

Management Dimension

• The largest green area close to Bangkok

- 1987: Cabinet agreed to preserve it as a green area for Bangkok and suburban areas
- 1991: The Cabinet declared the " Garden in the Middle of the Metropolis Project" to the public
- 1992-1999: The Government purchased 1,276 rai (225 ha) or 546 parcels of land from local inhabitants
- 2002: Establishment of "Suan Sri Nakhon Khuen Khan Park" covering 148 rai (25 ha)

Total land area: 1,920 ha
State lands: 546 plots
Approx. 225 ha
Population: 24,650
Village: 68
Household: 2,635

Relevant Law and Regulation Dimensions

- 1992 City Planning Act
- 2002 Ministerial Decree

•The followings are prohibited
(1) Land allotments
(2) Multiple joined houses
(3) Condominiums
(4) Large dwelling construction
(5) Commercial buildings
(6) Factories

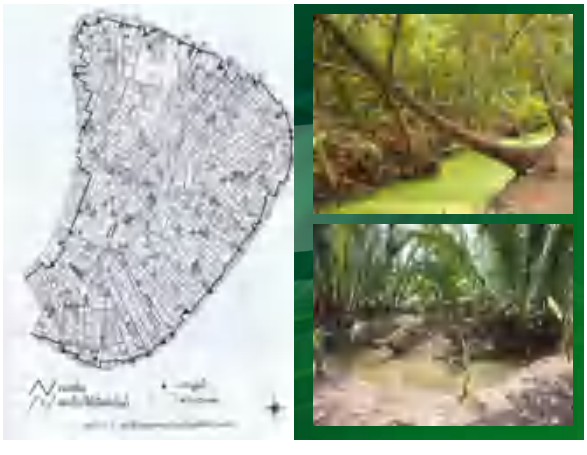
Requirements
• 6 m buffer along streams
• 15 m space along main road

Green Area Management Dimension

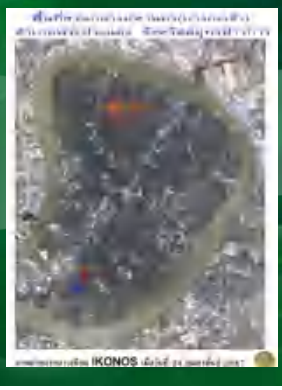
Sri Nakhorn Khuan Khan Green Area Management Center

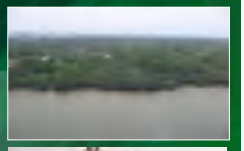
Problem arising within the area

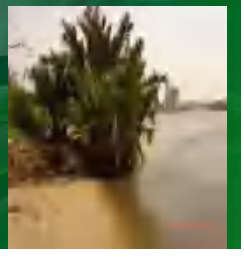
1. Increasing of non-residents or temporary migrants
2. Community fragmentation
3. Ecosystem transitioning from irrigation system establishment
4. Increasing of pollutions from residential and industrials
5. Lost of local genetic sources and endemic species of both flora and fauna
6. Invasion of exotic species
7. Lost of traditional agriculture practices



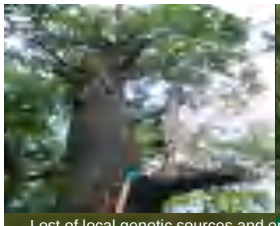
Increasing of pollutions from residential and industrials



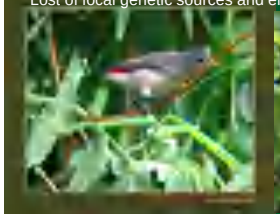


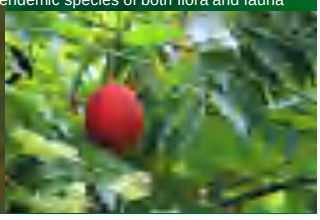


Lost of traditional agriculture practices



Lost of local genetic sources and endemic species of both flora and fauna



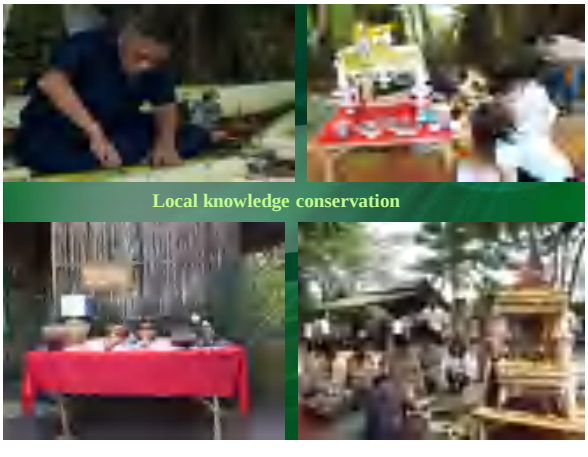


Strategies application to promote biodiversity conservation and rehabilitation

Improving information and facilities for management


Urban community forest management program


14 February 2008 Community forum for urban community forest establishment


Local knowledge conservation

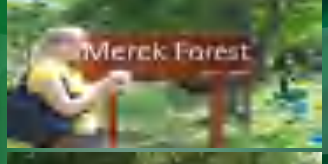

Art and cultural conservation: weekend school for kids

Seedlings of more than 60 endemic species a year are prepared for distribution with in community nurseries

Local seed tree conservation by youth group

Rehabilitation campaigns

Corporate Social Responsibility (CSR) from Business Sector



Local school curriculum implementation
and outdoor classroom

Eco-tourism promotion

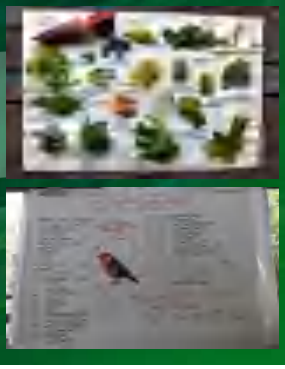
Research-based implementation program

Academic research cooperation program

Chemistry: Chantarakasem U.
Botany: Chulalongkorn U.
Ecotourism: Hua Cheaw U.
Land-use: Kasetsart U.
Public health: Mahidol U.
Forestry: Kasetsart U.
City Planning: King Mongkut U.

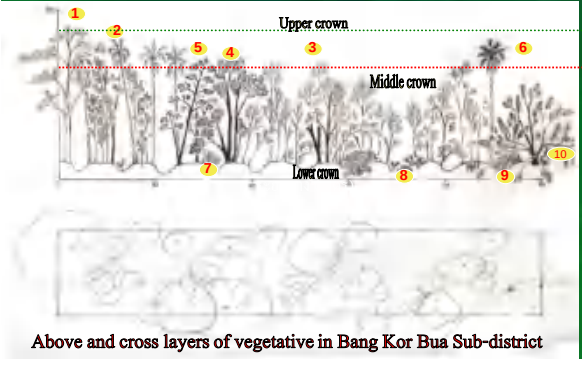
Summary results of Bio-Blitz

Mammal	10 spp.
Bird	83 spp.
Reptile	16 spp.
Amphibian	8 spp.
Fish	25 spp.
Molluck	51 spp.
Insect	123 spp.
Non-vertebrate	34 spp.
Plant	170 spp.
Algae and plankton	42 spp.
Fungi	58 spp.
Lichen	17 spp.
Total	**637 spp.**

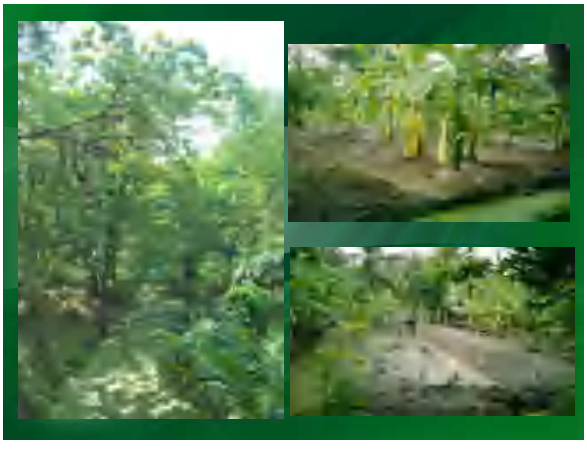


Ecosystem rehabilitation

1 = *Acacia lebbec* 2 = Betel nut 3 = Acacia sp. 4 = *Strebus asper* 5 = *Terminalia catappa*
6 = *Intsia bijuga* 7 = *Cycas rumphii* 8 = *Acanthus ebracteatus* 9 = Nypa palm
10 = Coconut

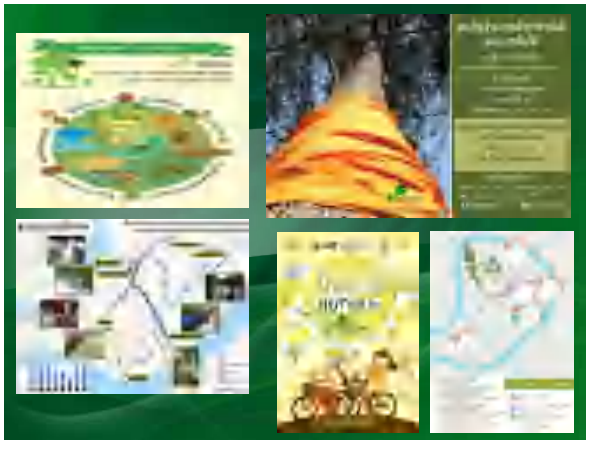


Above and cross layers of vegetative in Bang Kor Bua Sub-district



Ecosystem restoration of cork tree (*Sonneratia caseolaris*) for enhancing habitat of Firefly (5 spp. Which 2 spp. are new world records)

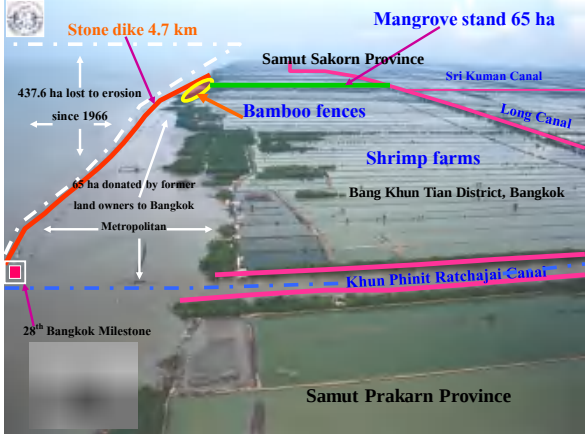
Public outreach campaigns

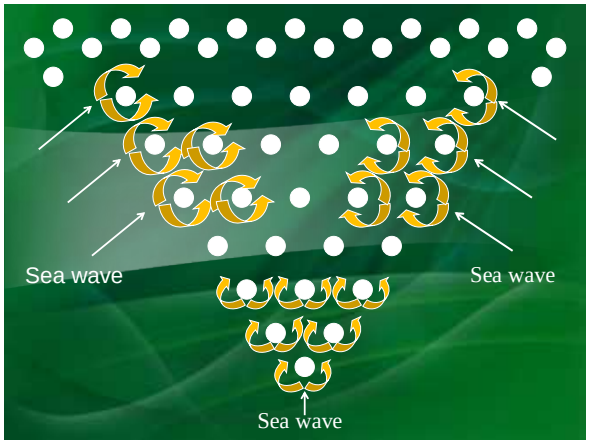


6. Examples of best practices in urban forest management

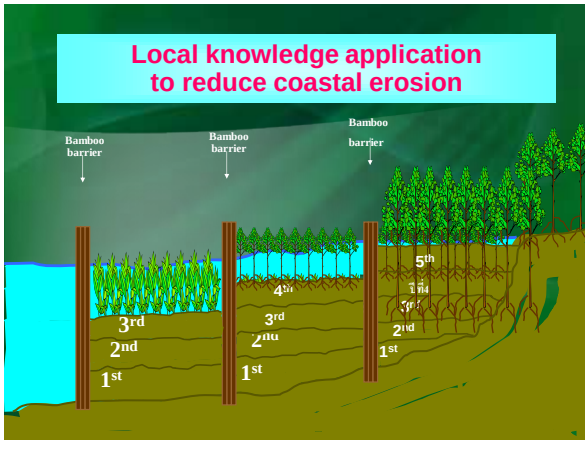
3.Thailand: Community level

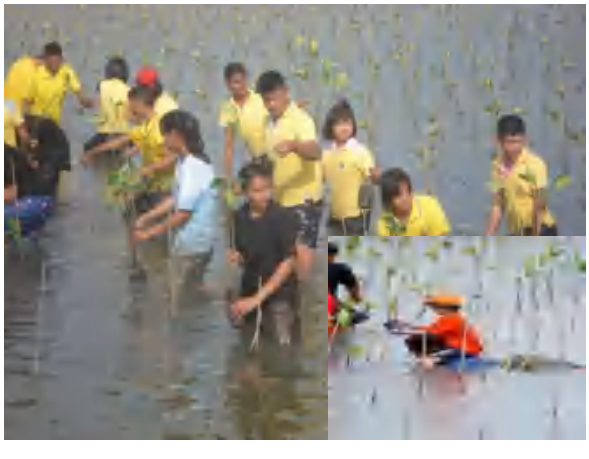
Bang Khuntian Community, Bang Khuntian District, Bangkok (Local knowledge application for minimizing coastal erosion)




Sea wave
Sea wave
Sea wave


Artificial forest stand for sediment retention


Local knowledge application to reduce coastal erosion
Bamboo barrier
Bamboo barrier
Bamboo barrier
3rd
2nd
1st
4th
3rd
2nd
1st
5th
2nd
1st



Challenges

- Overlapping in responsibility of the area management schemes causing difficulty in integrating activities among designated agencies
- Urban development planning and problems resolutions have been obscured
- Instability of political atmosphere makes no concrete and effective to continue developing scheme
- Increasing demands of land transferring to other purposes would make unsecure to maintain green area and urban biodiversity conservation

"In the end we will conserve only what we love;
we will love only what we understand;
and we will understand only what we are taught."

- Baba Dioum, 1968

Lecture 10: Co-management as Conservation Discourse for Improving Community Livelihoods

--- Dr. Wu Yusongg

Co-management as Conservation Discourse for Improving Community Livelihoods

Yusong Wu
Yunnan University
6th Nov 2019 Kunming

Challenges from sustainable development

- MDG by 2015
  - Eradicate extreme poverty & hunger
  - Universal primary education
  - Gender equality and empower women
  - Reduce child mortality
  - Improve maternal healthcare
  - Combat HIV/AIDs, malaria and other diseases
  - Ensure environmental sustainability
  - Develop a global partnership for development

Challenges from sustainable development

- After years efforts and big achievements accomplished in many countries, the challenges is still there, due to
  - ✓ Economic growth and development have not done as much to reduce poverty as was hoped.
  - ✓ The extent to which growth has benefitted the poor differs hugely between countries.
  - ✓ The condition of natural resources and ecosystems continues to decline.
  - ✓ More can be done and more need to be done.

Livelihood and Conservation

- What is poverty?
  - Although poverty is often defined in absolute terms, it can also be seen as having multiple dimensions.
- World Bank (2001) , three dimensions
  - lack of assets, powerlessness and vulnerability
- What is livelihoods?
  - Livelihoods can be thought of as the ways in which people make a living, which include the capacity, assets and action.
  - Poverty can be thought of as a state of reduced or limited livelihood opportunities.
  - Multi-choice of livelihoods is critical to many rural poor people.
  - Livelihoods is not only a needs, but a type of rights.

Livelihood and Conservation

- What is conservation?
  - Conserving natural resources can have important direct positive benefits on livelihoods, particularly those of rural people, for direct consumption and for income generation.
  - Maintenance of diverse natural resources can be particularly important in providing livelihood security in times of seasonal shortage and in times of crisis.

Livelihood and Conservation

- Threats to livelihoods from development
  - Ineffective economic development policies and practices pursued by governments, sectoral development and large-scale infrastructure projects and macro-economic reform have all too often jeopardized poor peoples' livelihoods by destroying the resource base.
- Threats to livelihoods from conservation
  - Conservation practices can have serious negative effects on livelihoods by limiting access to the resources necessary for subsistence, livelihood security or income generation.

Linkages between poverty and Environment

- All conservation initiatives should strive to ensure that they do not make the poor worse off.
- The cost of conservation should not be imposed on those least able to absorb them.
- Best practice designed to offset the impact of conservation activities should maintain, can not put people in a poverty trap or a condition of "sustainable poverty".
- Conservation ought to contribute actively to poverty reduction more broadly where it can, as in the restoration of ecosystems, simply because it can.
- Strengthening or guaranteeing access to natural resources will contribute to secure livelihoods for the people who depend on them.

Co-management

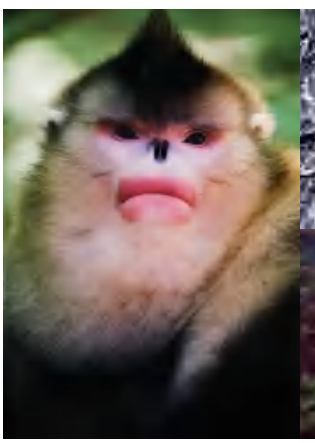
- Before co-management, there are many other approaches for forests protection, such as CBNRM, ICDP etc.
- Co-management is widely used as an effective approach to solve the conflicts on natural resource management in protected areas.
- co-management is generally considered to be a way for bringing about more effective governance of natural resources.

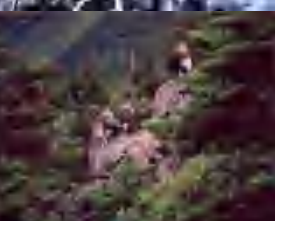
Co-management

- Co-management involves a partnership between stakeholders, especially protected area authorities and local communities as well as private sectors.
- The concept of co-management in natural resource management and environmental protection has grown into an accepted idea
- Co-management should be considered as a new paradigm of shifting from needs base to rights base.

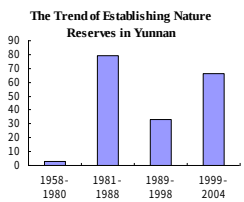
Co-management

- Co-management was actively promoted by a series of international cooperation initiatives and it deeply influenced natural resource conservation actions in China
- But it would be a mistake to simply ignore the thousands of different kinds of management systems, approaches and methodologies that have been used by local communities for a long time.





Co-management



✓Most of China's reserves were established on land in which rural people were already living and depending on resources for productive activities in order to support their livelihoods.

✓The regulations of nature reserve forbid use of reserve land for productive activities.

Conflicts between reserve and communities

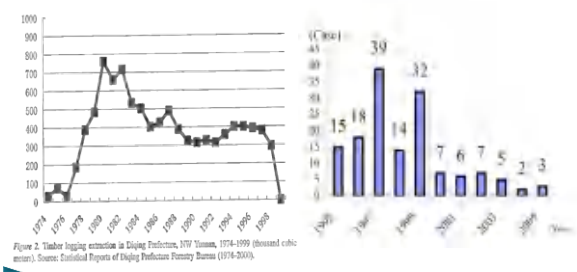
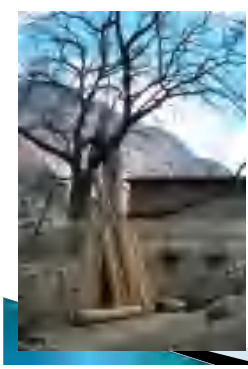


Figure 2. Timber logging extraction in Diqing Prefecture, NW Yunnan, 1974-1999 (thousand cubic meters). Source: Statistical Reports of Diqing Prefecture Forestry Bureau (1974-2000).

Deqin County



- Location
  - –Northwest corner of Yunnan
  - –Bordered by Sichuan/ Tibet
  - –Elevations between 1500-5400 m
  - –Total 5,504 square km
- Population
  - –58,168 people
  - –7.75 persons per square km
  - –total of 13 minority group, 98% of the population
  - –Tibetans making up over 80% of the total

Deqin County

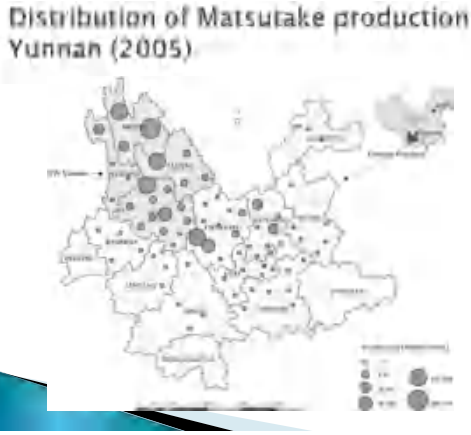
- Economy
  - –85% of county government revenues from logging before 1998
  - –economy is predominantly agricultural, forestry, animal husbandry and collection of NTFPs
  - –a national-level “Poverty County”
  - –only 0.103 ha of farmland per capita
  - –63% of the population under the poverty line

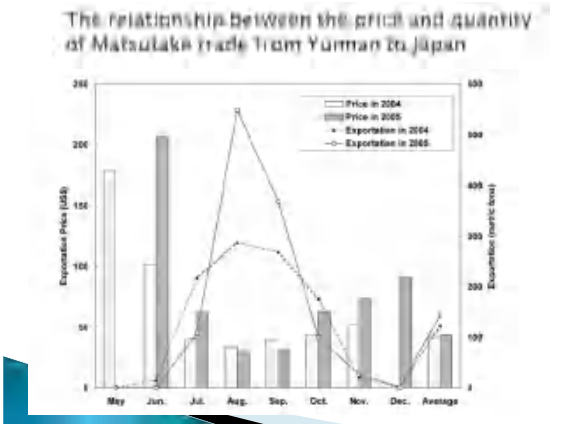
Baimaxueshan NR

- ✓ Founded in 1983
- ✓ Originally cover 190,000 ha, cover 1/4 of the territory of Deqin
- ✓ In 2000, the reserve expanded to 280,000 ha, cover 1/3 of the territory of Deqin
- ✓ Over 10,000 species of higher plants along with a large number of endemic birds and mammals can be found here.

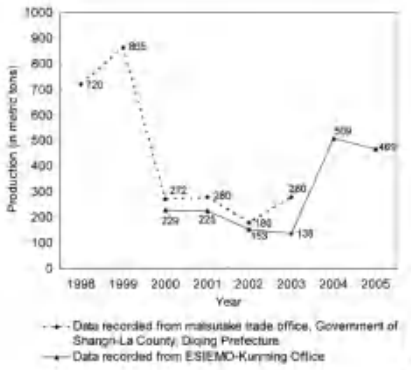
Why Working in Baimaxueshan

- ➢ Bio-diversity
  - ➢snow mountains, coniferous forests, wetlands, grasslands - home to endangered species such as the Yunnan snub-nosed monkey, snow leopard, and clouded leopard
- ➢Culture diversity
  - ➢Religion
  - ➢Ethnic groups
- ➢Close link between environment and poverty

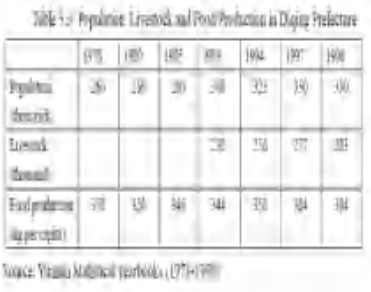




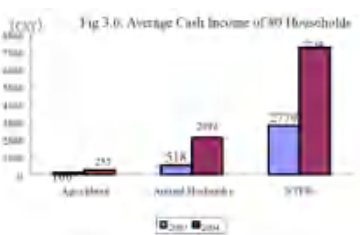
Matsutake Production from Deqin County



Agriculture can not fully respond the needs of local livelihoods



Livelihoods heavily depends on natural resources



Multi-livelihoods

Table 4.2 Livelihood diversity and time/labor arrangement in study villages

Item	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Labor use												
Caterpillar fungi			X									
Yellow morels				X	X							
Matsutake						X	X	X	X	X		
Hunting					X	X	X	X	X	X		
Cash crop									X	X	X	X
Crop plantation			X	X	X	X	X			X		
Water plantation			X	X		X		X			X	X
Bees plantation						X	X	X		X		X
Labor out			X	X	X					X	X	

Source: Field research data in 2009

Project Site

- The two communities are ethnic Tibetan, and daily livelihoods are heavily dependent on the forest.
- One is Tongduishui village, which is located inside the Baimaxueshan Nature Reserve;
- Another is Gulongpu village, which is outside of Baimaxuehsan Nature Reserve.
- In both communities, households depend on complex livelihood strategies.
- A typical family plants staple grains (maize, mountain barley, winter wheat), has grazing animals (goats, cows, yaks), tends a few apple or walnut trees, and cuts wood for fuel and construction.
- Cash incomes derive from collection of edible fungi, sale of firewood and in a few cases, wage labor outside the village.

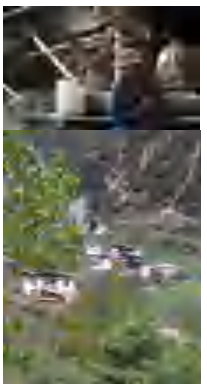
Project Site

➢Golongpu is an village outside of reserve with only 12 households.
➢Before 2008, it had no truck road to the outside.
➢This limitation on transportation helped greatly with forest conservation and allowed the village to benefit from mushroom collection later on.

- The locals has very good system on mushroom collection regulation, labor use, patrolling system, financial arrangement and conflict resolution etc.

Project Site

- Tongduishui is located inside the Reserve, with 19 households and very limited arable land
- Suffered from a lack of technical farming knowledge, generally led to food shortages
- Grazing is main productive activities that supports their livelihoods, but cattle also consume a large portion of crops.
- Have relatively large area of community forests and contribute to their main income.

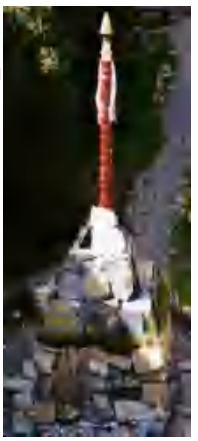


Project Site

- Before 1998, their income from helping logging companies with timber transportation, labor contribution, and opening small restaurants & shops, average USD 1000.
- Because of this high level of income, more than half of the households bought a vehicle and serve to logging companies to earn their living.
- After 1998, these became a nightmare; they not only suddenly lost their income source without any compensation but also needed to pay back car loans to the bank.
- After that, government management officials were confronted every year with cases of illegal logging in the Tongduishui community forests which make up 60% of illegal cutting cases.

Project Activities

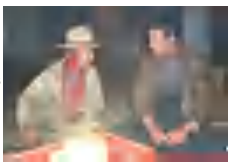
- From 2000, integrated approaches conducted includes agriculture, alternative energy use, animal husbandry, community forests restoration, sanitary and environmental education etc.
- The trust between reserve staff and local community established with the process of livelihoods improvement and forests restoration.
- Local people start to discuss and modify their local regulation relating community forest management and organize themselves for regular patrolling.
- People also start to discuss how to link sustainable livelihood development and conservation together, Matsutake over collection raised as key issue for discussion.

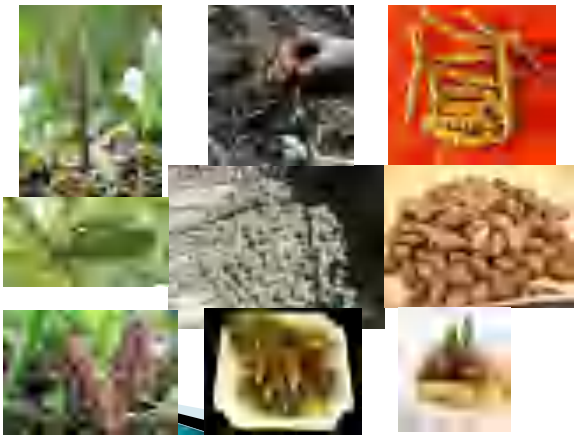


Co-management network

➢A study tour with 12 sub-village in BMXS to visit Gulongpu village and learn their experiences.
➢Villagers start to discuss how to apply in their own village and how to deal with the relationship with other villages around.
➢The project facilitated local communities to initiate a sustainable Matsutake co-management network.
➢The reserve authority also participated the network and help to construct new market, forbid selling the baby mushroom etc.

- The network extended to over 100 villages with 2 years.
- Local livelihoods increased dramatically and forests vegetation improved as well as the relationship between reserve and local communities.

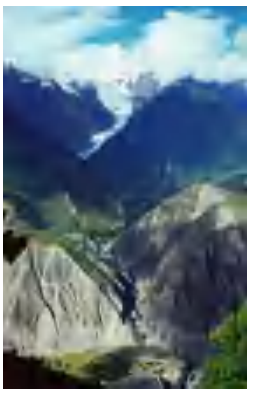




Policy advocacy at national and international level

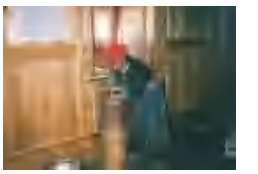
Questions

- Whether co-management is a methodology or a kind of ideology.
- Is co-management for meeting the needs of locals by bettering their livelihoods and resource base, or is a process for decentralizing decision-making?



Findings

- If co-management is stop on methodology level, it will not be able to achieve legal recognition for power-sharing and decentralization, and cannot get enough recognition and support to be included in the legal and policy framework.

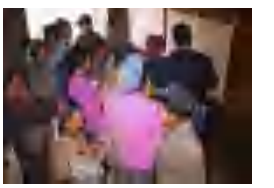


Findings

- Co-management cannot be imposed from the top down, its emergence can be assisted by creating a favorable environment through enabling legislation to recognize local rights over land and resources.

Findings

- Not only can local institutions be assisted by capacity building, but appropriate government institutions also need to be developed and put into place.



Attached Files:

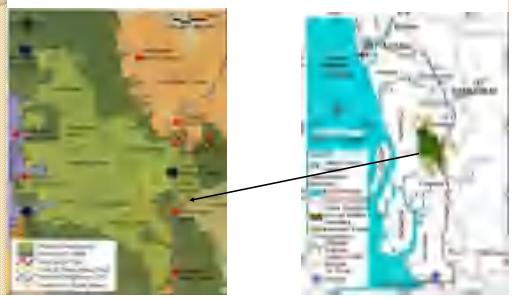
PPT Slides of Participant Presentations

Bangladesh: Making Livelihood Work for Conservation: The Case of Chunoti Wildlife Sanctuary Bangladesh

Making Livelihood work for Conservation : The case of Chunoti wildlife Sanctuary Bangladesh

Mostafizur Rahman,
Assistant Conservator of Forests
Bangladesh Forest Department

Introduction: Map of Chunoti Wildlife Sanctuary



Introduction

- The Chunoti Wildlife Sanctuary (CWS) was notified in 1986
- Located in Chittagong District
- breeding ground of globally threatened Asian elephant
- 50,000 people living in and around CWS in 60 village,
- They are dependent on the sanctuary and nearby forests for their livelihoods
- Since 2005, the sanctuary has been managed through co-management system

Biodiversity of CWS

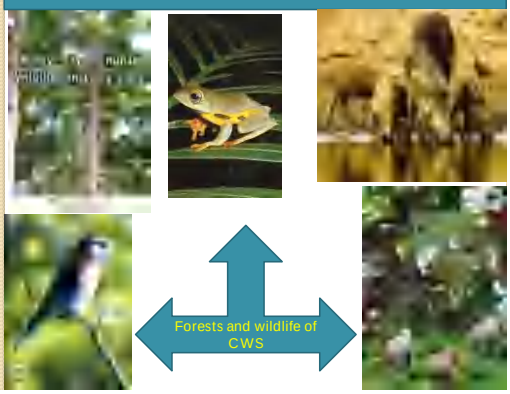
Fauna :

- Birds-244 SPP(60 SPP migratory),
- Mammals-39 spp
- Reptiles-52 spp
- Fishes- 28 spp
- amphibians-23 spp
- invertebrates100 spp

Floral:

- Trees-240 spp
- Shrubs-102 spp
- Herbs-211 spp
- Climbers-106 spp
- Ferns-19 spp
- Epiphytes-7 spp
- Parasitic Plants-6 spp

Biodiversity in Chunoti WS



Wildlife of Chunoti Wildlife Sanctuary

Anthropogenic disturbances in CWS

Livelihood development in Chunoti Wildlife Sanctuary

Project title: Livelihood Development of Forest Dependent Communities in and around Chunoti Wildlife Sanctuary (LDFC-CWS)' (January 2012-June 2015)
Partners: Bangladesh Forest Department, Society for Health Extension and Development (SHED), Arannayk Foundation, GIZ (Donor agency)
General objective: to conserve the forest and existing biodiversity resources of Chunoti Wildlife sanctuary by reducing the livelihood dependency of about forest dependent families
Specific : Promotion of alternative livelihood of the forest dependent poor people of the project area through development of their skills, institutions and access to capital and market;

Institutional Development:

Village Conservation Forum (VCF): is a village based organization of 60-70 forest dependent people which is mainly managed by an Executive Committee consisting of 5 members, democratically elected for two years by its members

Union Federation: each Union Federation is formed with the VCFs present within the area of the Union ((lowest tier of local government). All members of each VCF democratically selected 3 members who represented the VCF in Union Federation. Every UF is run by a 5- member Executive committee, elected democratically by its members.

Community Based Patrol group (CPG): A key element of Collaborative Forest Management . Members come from forest dependant households.

Institutional Development:

- 60 Village Conservation Forums (VCF),
- 08 VCF-Union Federations, and
- 12 Community Petrol Groups (CPG)
- involving 2627 poor forest dependent households
- 60 villages

Training on:

- Organizational development and management (ODM)
- Financial management
- exposure visit to related organizations
- Training provided to: 315 leaders (Male- 199 & Female- 116)

Good Governance Development:

- Constitution, policies and by-laws related to operation and management of VCFs/VCF-Union Federation were introduced to assure good governance,
- 08 VCF Union Federation offices established
- Every VCF and Union Federation meets once a month

Good Governance Development:

- Points of discussion in the meeting: VCFs, itself review their organizational activities, collect monthly savings, review and approve loan applications, collect repayments of loans, discuss about AIGA issues, cooking stoves, conservation of the forest (CWS), etc.
- Preparation of minutes: leaders also write minutes of the meeting and maintain account books and ledger with the help of project staff.
- Circulation of minutes: both Union Federations of VCFs had regularly sent their meeting minutes and financial reports including the status of their savings and revolving *loan fund (RLF)to the project team and FD*

Training sessions

Developing alternative livelihood options of forest dependent people

Three strategies have been involved:

- identification of recipients, exploring their skills
- training need assessment,
- development of demonstration

The first strategy:

- Identification of non- forestry based traditional livelihood skills of project participants
- Identified 17 traditional IGAs using FGD and key informant interviews.
- participants were in need of soft loans
- As such, the project created a Revolving Loan Fund (RLF)

The second strategy:

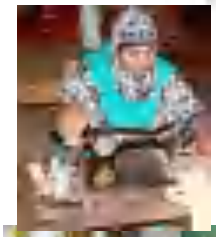
- Training Need Assessment
- Training and coaching
- Skills promoted: vegetable cultivation, homestead agro-forestry development, poultry & livestock rearing, fish culture and seedlings production
- 211 participants have received training,

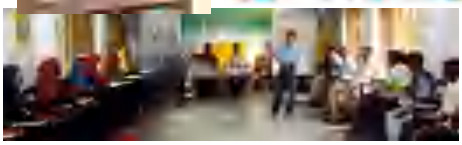
Training Sessions

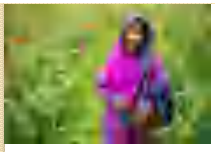
The third strategy:

- homestead based production agro-forestry model in the village by providing critical input support to selected households to create motivation and confidence among the participants on such production systems;
- The project established demonstrations on bio-intensive homestead agro-forestry model in 60 households
- input support : (i) vegetable seeds and fruit saplings of improved varieties to (2627) households (ii) 2550 local poultry birds to 510 Households

AIGAs

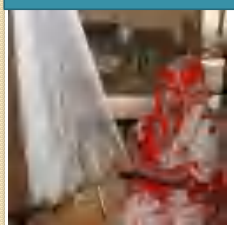







Model Demonstration


Alternative income generating activities




Establishment Revolving Fund:

- Recipient households 1511, female 936 (61.9%), Male 576(38.1%)
- 632 beneficiaries adopted large scale (commercial) vegetable cultivation in their own land and /or leased land,
- 311 beneficiaries adopted rice production on leased land ,
- 293 beneficiaries adopted cow rearing,
- 44 beneficiaries adopted rickshaw van pulling,
- 41 beneficiaries involve handicrafts making,
- remaining beneficiaries adopted various small businesses (13%),
- BDT 7.48 million RLF fund established
- 1.78 million has contributed by project participants through monthly savings
- cumulative amount of the disbursed loans was BDT 11.77 million
- Return rate of the RLF loan is around 99%.

Impact of AIGAs on household Income

- average monthly household income BDT12000.00 IN 2014
- 2060 households adopted Improved Cooking Stoves (ICS) installed, ICS requires less (around 50%) and eliminates kitchen smoke
- 1000 households adopted sanitary latrines were
- Over all 58 % participants adopted 3-5 AIGAs and
- average Household income increased by around 40%.
- 1500 households completely shifted to AIGAs giving up forest resources extraction to maintain their livelihood

Community based forest Patrol Group (CPG)

- 12 CPGs including 2 female CPGs consisting of 274 members from VCF (Male- 228 & Female- 46)
- BDT 1.45 million was provided to 11 CPGs as grant money
- CPG savings of BDT 0.28 million.
- The group business initiative is also developing their cooperative spirit and enthusiasm to engage in forest patrolling along with the FD staff.
- CPG investment 1,624,925
- 07 CPGs adopted cattle farming, 01 CPG adopted pond fish culture and 01 CPG adopted floriculture and vegetable cultivation

Conservation Education Program(CEP)

- 2000 High school students of 10 secondary schools adjacent to Chunoti WS
- 500 primary school students of CWS adjacent 10 primary schools
- a non-formal education module was developed
- 20 teachers of those schools were trained as mentor
- World Environment Day (WED) observed
- National tree plantation campaign
- Communication materials such as leaflets, folders and booklets
- 30 beneficiaries have been trained on CCB treatment treating bamboo, wood, sun-grass etc. for increasing the lifespan of the forest resources,

Conservation monitoring:

- identified 56 forest entry points
- monitoring exercise in 15 entry points
- 30 data collectors (school students and CPG members) were trained
- natural regeneration of trees increased by 8.4 % (Mahfuz et al)
- Forest coverage has increased by 13.61% (Mahfuz et al)

Forest Resouces Monitoring


Nature of Forest resources extraction

Cambodia: Benefits of None-Timber Forest Product Collection on Livelihood Improvement: Case Study of the Collections Seed and the Analysis of Collecting Barometer Earthstars

IRD
Institute of Forest and Wildlife Research and Development

Workshop on Forestry and Rural Livelihood Development

Benefits of None-Timber Forest Product Collection on Livelihood Improvement: Case Study of the Collections of Seed and the Analysis of Collecting Barometer Earthstars (Astraeus *hygrometricus* (piers) Morgan)

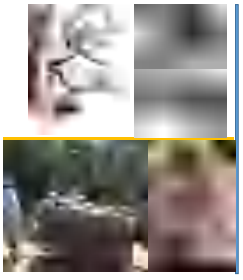
1 - 14 November, 2019 Yunnan Province, China

Content

I. Introduction
II Research Questions
III Research Methodology
IV Result and Analysis
V Conclusion and recommendation

2

3



- Two of main NTFP products (wild seed and collection) were selected to highlight in this review activities.
- Beside genetic resource conservation, wild seed collection for seedling production and selling has been an intrinsic activity because contributes to rural livelihood development.
- Collection of Barometer Earthstars (Astraeus *hygrometricus* (piers) Morgan) has been popular in the last 5 years.

4

Research Questions

5

- What factors and relations between livelihood and forest resources?
- What are the economic benefits of mushroom collection for the farmers?
- What are the prerequisite things to do that are important for the farmers to ensure the sustainability of the mushroom collection?

6

Research Methodology

7

❑Seed collection(

Desk review from relevant article (one case study was selected)

❑The collection of Barometer Earthstars (Astraeus *hygrometricus* (piers) Morgan)

Media content analysis(from online newspapers)

8

RESULT AND ANALYSIS

9

• Key Findings (Seed collection):

❑Around 15,000 kg of seed was used for national seedling productions in 2015 (some 24.9% offered by Community Forests). The main buyers were land concession companies (IRD,2015).

❑There were assumptions by some seed experts and national seedling producers that seed supplies have increased around 600kg annualy (FA,2016).

❑One case study indicated that a community member offers 160 USD per kilogram of *D. Cochinchinensis*. Currently he manages to supply 20,000 seedlings every year from his nursery to middleman(the cost was 0.75 -1 USD per plant) (IRD, 2018).

❑Beside daily expenditure and he bought two plots of land, he constructed new house, bought two motto cycles and sent his daughter study bachelor degree since started this business (IRD, 2018).

10

Key Findings (The collection of Barometer Earthstars (Astraeus *hygrometricus* (piers) Morgan)

❑A couple could earn as much as 200USD per day (RFA, 2016) and 50 to 400 USD per day for middleman (Post News, 2019)

❑Around 700-1000 people deployed per plot of forest area to explore the Barometer Earthstars and there were many plots in forest areas (RFA, 2016).

❑One border checkpoint export from 2000 kg to 3000 kg per day and The demand of Barometer Earthstars has increased every year (Koh Santepheap, 2019).

11

Analysis

❑Integration of seed and seedling production is very fundamental and would be a good sustainable business model.

❑The farmer has no standard seed store in the community to keep in long period with good quality, this is the main challenge for farmer.

❑In terms of the sustainability of seed and seedling businesses, the farmer informed that numbers of his customers have increased and he has many network of suppliers.

❑Seed and seedling demand has increased every year to supply state reforestation program and private farmers and companies. Therefore, the business of seed and seed business would never collapse.

12

Analysis

- Around 610 CFs and 506,601 ha. (FA, 2018) which would insure the sustainability of collection of Barometer Earthstars in this areas.
- While local consumption of Barometer Earthstars is limited and the market depends on exporting to Thailand. This is the main challenge for the sustainable business of Barometer Earthstar collection.

Conclusion and recommendation

Both businesses contribute significantly to improve livelihood of poor people and they don't require high educated people.

Recommendation for Seed Collection

- CF members have opportunity to create seed and seedling business because they receive comprehensive technical training on seed and seedling productions from experts.
- Seed and seedling productions should be run together.
- It is highly recommended to formulate the a qualified seed store system, farmers would acquire more benefit and credibility.
- CF community members should reinforce the business collective to and packing technique should be applied.

Recommendation for the collection of Barometer Earthstars

- Barometer Earthstar product should be promoted for local consumption rather depend heavily on Thai traders. Therefore, this business would be highly feasible to run sustainably.
- From April to July the concession lands that have Barometer Earthstars be allowed to be accessed by local people to collect it. This is very fundamental to increase the product.

Reference

- (n.d.). Retrieved 09 18, 2019, from http://library.cmu.ac.th/ntic/en_lannafood/detail_ingredient.php?id_ingredient=133
- (2016, 05 26). Retrieved 9 15, 2019, from PostNews: https://postnews.com.kh/local/20593
- Fisheries, M. o. (2010). *National Forest Programme 2010-2029*. Phnom Penh. Retrieved 09 20, 2019, from http://www.cdc-crdb.gov.kh/cdc/documents/Sector_Strategy/6_Forestry_Reform/National_Forest_Programme_2010_2029_Eng.pdf
- (2015). *Report on Tree Seed Demand in Cambodia*. The Institute of Forest and Wildlife Research and Development, Phnom Penh. Retrieved 9 20, 2019, from http://www.irdfa.org/wp-content/uploads/2015/12/Technical-Report-Tree-seed-demand-survey-2015.pdf
- Selling Seeds and Seedlings for Livelihood Development, 001 (June 15, 2018).

In English and Khmer Language:

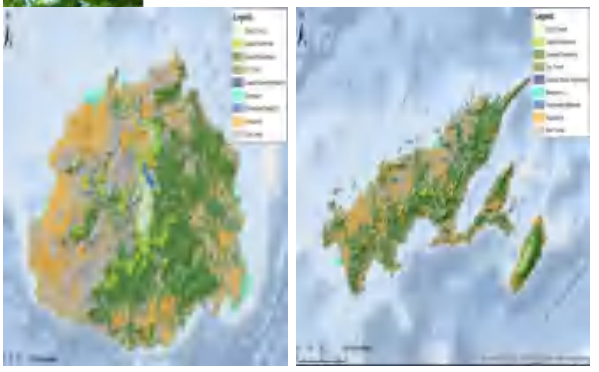
- [illegible]. (2016, 05 21). *Radio Free Asia*. Retrieved 09 18, 2019, from https://www.rfa.org/khmer/news/social-economy/Pursat-villagers-harvesting-mushroom-05212016034022.html
- [illegible]. (2019, 05 04). [illegible] Retrieved 9 17, 2019, from https://www.information.gov.kh/detailnews/295212.html
- [illegible]. (2018, 10 [illegible]). *Kspg Website*. Retrieved 9 20, 2019, from [illegible]: https://kohsantepheapdaily.com.kh/article/843246.html
- [illegible] (2015, 09 17). Retrieved 9 20, 2019, from https://opendevelopmentcambodia.net/km/topics/community-forest/

Thank you for your attention ☺

Objective

1. **Background**
2. **An overview on the efforts on Forestry & Rural Livelihood Development in Fiji**
3. **What has been done during the past few decades**
4. **Way Forward**

Forest Types in Fiji

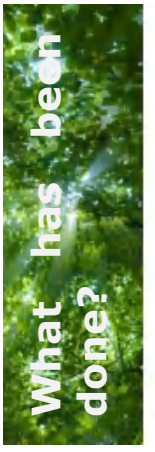


An overview on the efforts on Forestry & Rural Livelihood Development in Fiji

- The alleviation of poverty is high on the Government's agenda, and strategies are in place to effectively address and enhance forestry & rural livelihood development in Fiji
- One of the key areas of the Government focus is to ensure effective and meaningful participation of forest resource owners in the social and economic development of their forest resource.
- Under the Government's affirmative action programme, various forms of assistance are channeled through several Government agencies and financial institutions, to ensure economic participation of forest owners in this regard.

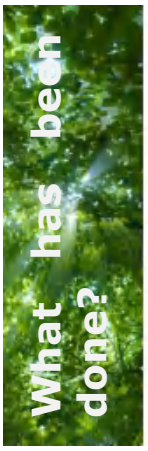
Projects and Initiatives – Improving Rural Livelihood

- National REDD+ Programme
- Drawa Forest Carbon Project
- Sisi Initiative - Natewa Tunuloa Important Bird Areas
- Fiji Ridge to Reef (R2R) Project
- Reforestation of Degraded Forests 2015 - 2018
- 4 MILLION TREES IN 4 YEARS INTIATIVES (4MT4Y) - 2019 to 2022



2015-2018 Reforestation of Degraded Forest Project

Species	Number of seedlings	Area covered (ha)
Mahogany	199,860	718.92
Native	34,233	123.14
Sandalwood	14,485	13.03
Pine	107,502	96.76
Food security	8,145	29.29
Fuel wood	4,000	14.38
Total	368,225	995.72



Fiji Land Degradation Project (UNCCD National Action Program) 2015-2019

Key Results:

- 2 000 ha to be restored
- 1 million seedlings to plant
- 8 000 kg of seeds to sow
- 6 200 people to be reached
- 900 people to be trained

National REDD+ Program

Key Results:

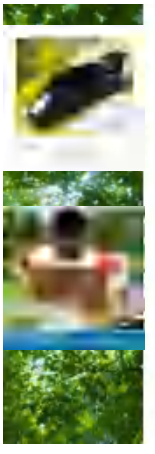
- **Fiji Accepted into World Bank Carbon Fund in July 2019.**
- **Fiji's forestry sector has been in the readiness phase in regards to reducing national emissions in the last 10 years with extensive consultations and capacity building undertaken with various stakeholders and local communities.**
- **Fiji's ERP is titled 'Reducing Emissions and Enhancing Livelihoods in Fiji'.**
- **The program describes the measures Fiji will take to ensure long-term reduction of greenhouse gas emissions in the forestry sector, while at the same time ensuring that the livelihoods and well-being of local communities are enhanced; that social and environmental safeguards are strengthened and all activities contribute to the sustainable development of our nation.**

Page 8

Drawa Forest Carbon Project

- Through this project, the Drawa rainforest also provides valuable protection from cyclones, floods and droughts for the Drawa local people and those living downstream in their catchment.
- These landowners have given up rights to logging timber in exchange for the opportunity to sell rainforest carbon offsets as a way of generating revenue for local economic development.
- This project will generate 18,800 carbon credits annually.

Page 9



Sisi Initiative – Natewa Tunuloa Important Bird Areas

- Established in late 2005 to conserve the Natewa Tunuloa Important Bird Area (IBA) on the island of Vanua Levu in Fiji's Northern Division
- It is a community-based volunteer group that works with a range of stakeholders to develop sustainable, environmentally friendly initiatives for communities living in and around the IBA
- This initiatives – which included sustainable agriculture projects, ecotourism, and bee-keeping – have afforded community members a means by which to live in greater harmony with their natural environment, reducing threats to the forest and securing it for future generations.

Page 10

Fiji Ridge to Reef (R2R) Project

The Fiji R2R Project intends to :

- Preserve biodiversity,
- ecosystem services,
- sequester carbon,
- improve climate resilience and sustain livelihoods through a ridge-to-reef management of six (6) priority water catchments on the two (2) main islands of Fiji. The catchments include Waidina-Rewa, Tuva and Ba on Viti Levu and Labasa, Vunivia and Tunuloa on Vanua Levu.
- Funded by the Global Environment Facility (GEF) - USD 1.5 million

Page 11

4 MILLION TREES IN 4 YEARS INTIATIVES (4MT4Y) – 2019 to 2022

- **Launched in January this year**
- **Planting Target of 1,000,000 a year (Jan - Dec) - As of 10th October planting update stands at 779,995. (Source: RDF Office)**
- **this initiatives recognizes the significant contributions that forest resources provide in terms of economic benefits, environmental and ecological services, conservation of biodiversity and sustaining livelihoods.**
- **The initiative also demonstrates Fiji's tireless effort in the fight against climate change and protecting our environment and rich biodiversity.**

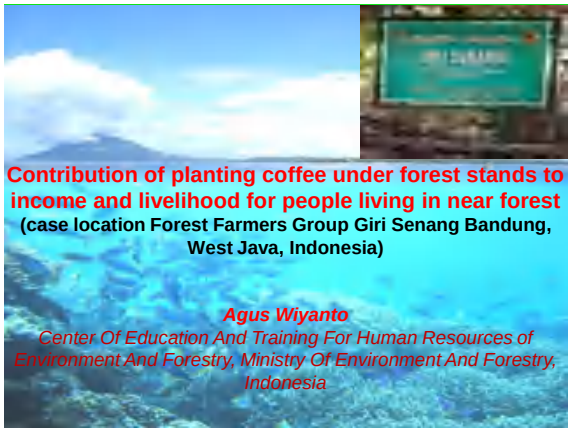
Page 12

Way Forward

To enhance the livelihood roles of forests, the government under the Fiji Forest Policy has set the following key directions;

- Forest management should be implemented in a way that local communities are actively involved in its planning, implementation, monitoring and evaluation.
- Through active participation in the administration and implementation of sustainable forest management, the resource owner should receive stable income from forest products and diversified employment opportunities.

VINAKA/
THANKYOU /
谢谢



Contribution of planting coffee under forest stands to income and livelihood for people living in near forest
(case location Forest Farmers Group Giri Senang Bandung, West Java, Indonesia)

Agus Wiyanto
Center Of Education And Training For Human Resources of Environment And Forestry, Ministry Of Environment And Forestry, Indonesia

OUTLINE OF PRESENTATION

1. **Multi Functions Forest in Indonesia**
2. **Social Forestry Programme**
3. **Activities in Forest can be used source of livelihood**
4. **Forest Farmers Group Giri Senang**
5. **Lessons Learnt**
6. **The Way Forward**
7. **Summary**

Intoduction :

Name : Agus Wiyanto

Trainer/Lecturer in Centre For Education and Training for Human Resources Development of Environment and Forestry, Ministry of Environment and Forestry, Indonesia

BSc (Sarjana/Ir) in Forestry, Bogor Agricultural University, 1982

Post Graduate in Rural and Ecology Survey, ITC, The Netherlands, 1988

MSc in Rural and Ecology Survey, ITC The Netherlands, 1990

ASSALAMU-ALAIKUM

BACKGROUND

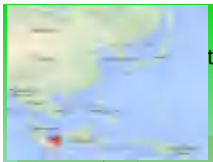
Forestry is more about the people rather than about the forest itself

Arguments:

- *People are parts of the forest ecosystems,*
- *People are mostly poor and marginalized, both economically as well as politically,*
- *People who have traditional right (democratic rights) to set any policies, including in natural resources utilization,*
- *People who have huge power, either positively or negatively.*

Forest Land Use Data
(December 2012)

Forest Function	Total Area (m.ha)	%
Conservation (NO TIMBER CUT)	22.25	11,74
Protected (NO TIMBER CUT)	30.097	15.87
Limited Production	27.874	14,70
Production	30.180	15,92
Convertible	17.818	9.40
Total Forest	128.225	67,63
Other land use	61.375	32.36
Total Land	189.600.	100.00

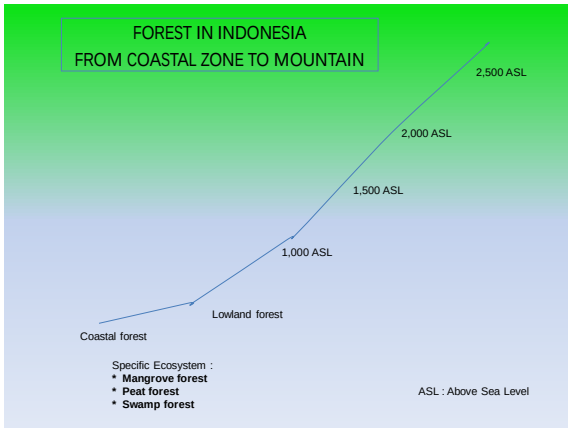


Indonesia's Forests
tropical region, 11 hours-365 days)
Forest Land Use System
based on Forests Function

Conservation Forests 25.3 m ha. → Protected Forests 30,9 m ha → Production Forests 80.4 m ha → **Community Forests**

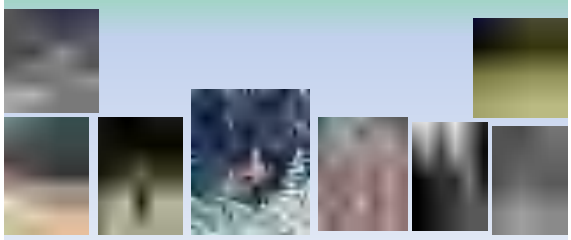
Ecosystem/ Environment | Services/ Commodity | Renewable Energy (Wood pellet, Methanol)

VALUE RELATED TO CLIMATE CHANGE (CO2/C CYCLE), Green Renewable Products (biomass – energy, fiber



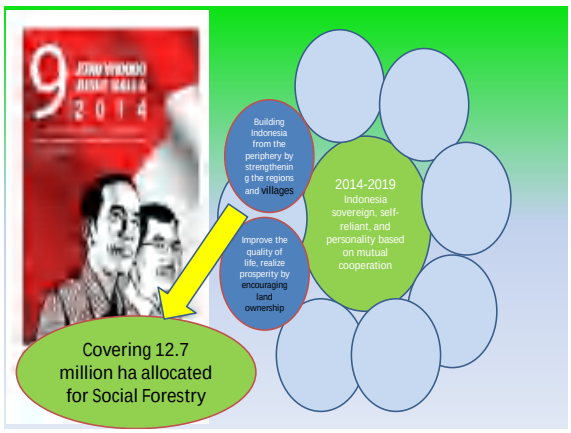
People and Forest Management

Local people have strong relationship with the forest especially to fulfill daily needs



Government Policy Related to Social Forestry

- Indonesia's current government, the period 2014-2019, led by Jokowi-JK launched 9 (nine) "Nawa Cita" to realize "sovereign, self-governing Indonesia and personality based on mutual cooperation".
- Five of the nine "Nawa Cita" are related to the environment and forestry (Nurbaya, 2015).
- Two of the five "Nawa Cita" related to the environment and forestry are directly related to the welfare of the community, namely: 1) building Indonesia from the periphery, and 2) improving the quality of human life of Indonesia.
- The Government of Indonesia has targeted social forest allocation covering 12.7 million hectares of forest area (PSKL, 2017).



Social forestry programmes

By Perum Perhutani (Forest State enterprize in Java & Madura Island)

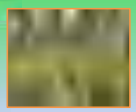
- Mantri-Lurah Program (Forest ranger and Head of village)
- Village Community Forest Empowerment-PMDH
- Community Based Forest Resources Management-CBFM (Joint Forest Manegement)

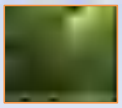
By Ministry of Forestry (now Ministry of Environment and Forestry)

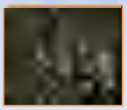
- Community Forestry (HKm),
- Village Forest (HD),
- Community PlantationForest (HTR),
- Forestry Partnership, and
- Customary Forest (HA)

SOCIAL FORESTRY SCHEME

1. Village Forest
2. Community Forestry
3. Community Plantation Forest
4. Forestry Partnership
5. Customary Forest
6. Izin Pemanfaatan Hutan (IPHPS), khusus di areal kerja hutan perhutani





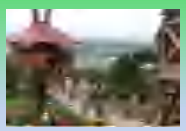


SOCIAL FORESTRY

	VILLAGE FOREST	COMMUNITY FORESTRY	COMMUNITY PLANTION FOREST	FORESTRY PARTNERSHIP
PROTECTION FOREST	NTFP AND ENVIRONMENTAL SERVICES;	NTFP AND ENVIRONMENTAL SERVICES;	NOT ALLOWED	NTFP AND ENVIRONMENTAL SERVICES
PRODUCTION FOREST	Timber, NTFP and ES	Timber, NTFP and ES .	Timber from planted forest, NTFP and ES	Timber, NTFP and ES
CONSERVATION FOREST	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED	NTFP and ES

*) NTFP = Non Timber Forest Products ES = Environmental Services

SOCIAL FORESTRY FORM FOR TOURISM



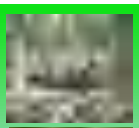
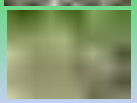
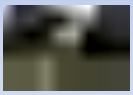
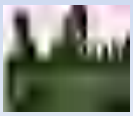
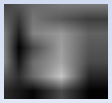
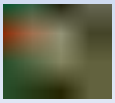
HUTAN NAGARI SUNGAI BULUH

Memanfaatkan Ekowisata sejak 8 Oktober 2016. Jumlah pengunjung rata-rata 1.890 orang/bulan. Pendapatan rata- rata Rp.18.100.00/bulan. Selain itu masyarakat juga memanfaatkan HHBK Rotan dan Kayu Ransam dijual rata- rata Rp.1.000.000/bulan. Pemanfaatan lain yaitu budidaya jamur tiram menjadi makanan olahan nuget dan jamur total pendapatan Rp.2.400.000 /bulan.

HUTAN KEMASYARAKATAN KALI BIRU

Menjual jasa keindahan alam dengan pendapatan Rp.267 juta per bulan untuk kesejahteraan anggota

ONE FORM OF FOREST MANAGEMENT FORESTRY PARTERSHIP

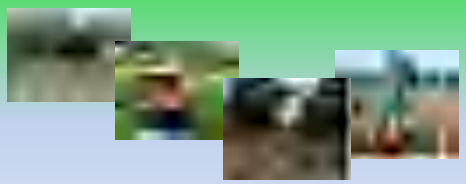







COMMUNITY BASED FOREST RESOURCES MANAGEMENT-CBFM (JOINT FOREST MANEGEMENT)

An example CBFM IMPLEMENTATION

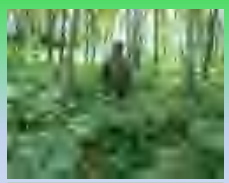
An example CBFM IMPLEMENTATION

An example CBFM IMPLEMENTATION



FOOD CONTRIBUTION FROM FOREST AREA

An example CBFM IMPLEMENTATION



Planting Porang under forest stands in FMU Nganjuk

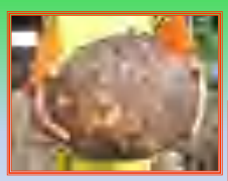
Planting soybean between rows teak stands in FMU Ngawi

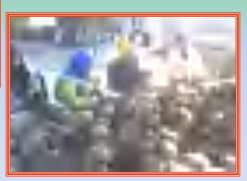
FOOD CONTRIBUTION FROM FOREST AREA

GROWING PORANG UNDER TEAK FOREST STANDS

22

PORANG QUALITY FOR EXPORT





23

INFORMASI TEKNIS BUBUK PORANG (KONJAC FOODS USA)
info@konjacfoods.com

KONJACGLUCOMANNAN (KGM) KOMERSIAL MEMILIKI SIFAT MENYERAP AIR 100 X LIPAT DARI VOLUME AWALNYA.

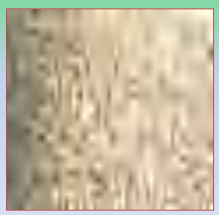
1% KGM DALAM AIR MEMILIKI VISKOSITAS 20,000 – 40,000 cP @ 30 0C.

PENCAMPURAN KGM + XANTHAN GUM (XG)/CARRAGEENAN/RUMPUT LAUT (0,02-0,03% KGM + 1% XG MENINGKATKAN 2-3 X LIPAT VISKOSITAS AWALNYA.

24

HASIL OLAHAN PORANG BERUPA TEPUNG

KASAR



TEPUNG HALUS

25

PROCESSING PRODUCTS FROM PORANG

SPAGHETTI PORANG 250 gram

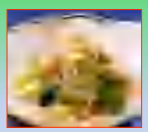
LASAGNE PASTA

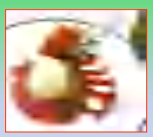
26

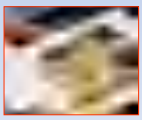
PORANG NODDLE / GLUKOMANAN

27

BERBAGAI MAKANAN DARI PORANG DI JEPANG

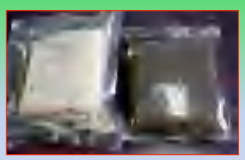




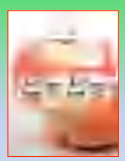


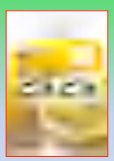
28

OTHERS PROCESSING PRODUCTS FORM PORANG



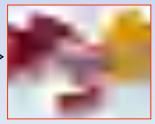
BENTUK TAHU





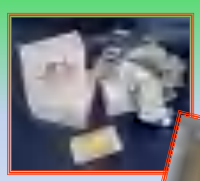
JELLY DRINKS

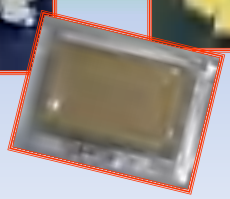
JELLY PADAT



29

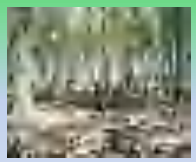
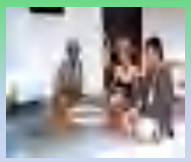
OTHERS PROCESSING PRODUCTS FORM PORANG





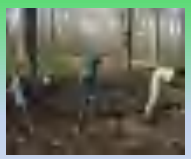
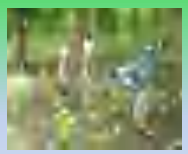
30

An example CBFM IMPLEMENTATION

PENYERAPAN TENAGA KERJA (PEMUNGUTAN BENIH JATI)

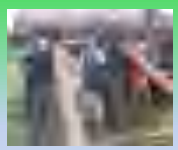
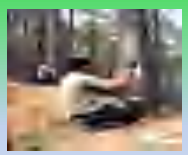
An example CBFM IMPLEMENTATION

Land preparation | Planting trees

PROVIDE WORKFORCE

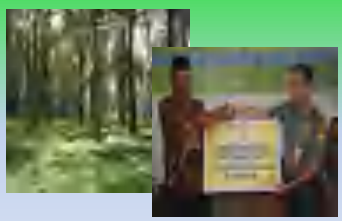
An example CBFM IMPLEMENTATION

TIMBER TRANSPORTATION | TAPPING PINE RESIN

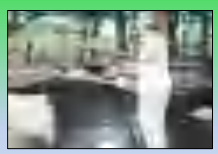
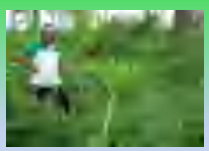
PROVIDE WORKFORCE

An example CBFM IMPLEMENTATION



PENYERAHAN BAGI HASIL KAYU KEPADA LMDH

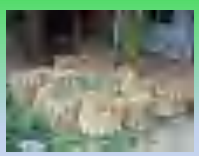
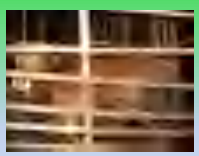
An example CBFM IMPLEMENTATION

Making Manure | Planting porang under forest tree stands

INCREASING PRODUCTIVE BISNIS BY LOCAL COMMUNITY

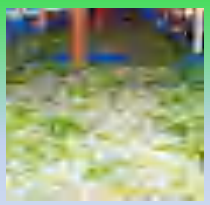
An example CBFM IMPLEMENTATION

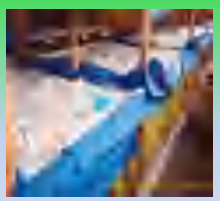



Seedling for fodder | Fatty Cattle

INCREASING PRODUCTIVE BISNIS BY LOCAL COMMUNITY

An example CBFM IMPLEMENTATION

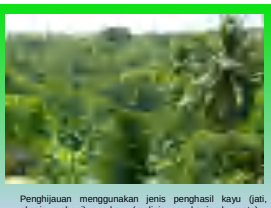




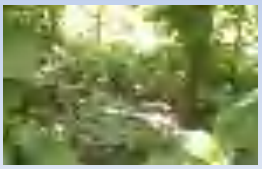
BUDIDAYA ULAT SUTRA

PRODUKSI KOKON LMDH SUKAMANAH

PENINGKATAN USAHA PRODUKTIF LMDH

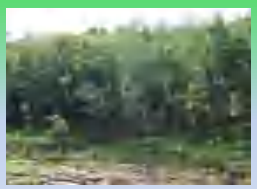


Penghijauan menggunakan jenis penghasil kayu (jati, akasia, mahoni), non-kayu (melinjo, nangka, jambu mete)

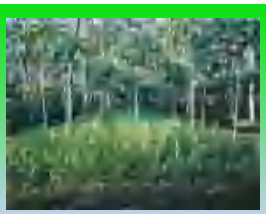


Penanaman penghijuan yang diarahkan untuk pembentukan multi-strata

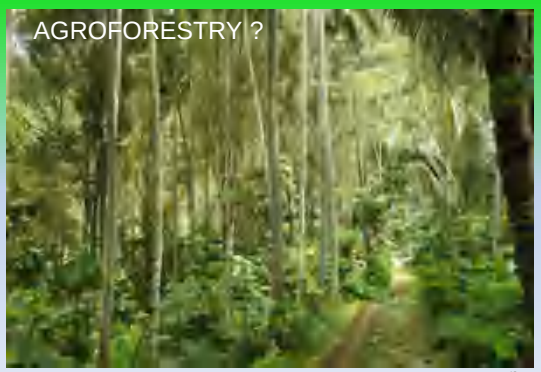
Regreening and Reforestation



Using floor of forest under forest stands by using planting various types of spices And medicinal plants



AGROFORESTRY ?

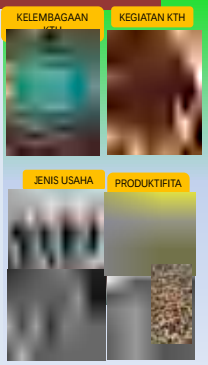


40

KTH GIRI SENANG (Jawa Barat)

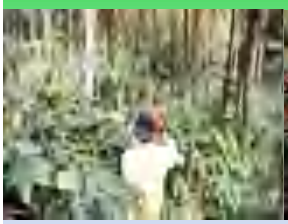
PROFIL KTH
- Giri Mekar Village, Cilengkrang Sub District, Bandung District.
- Number of members: 147 people
- Forestry extension officer: Muhammad Yusuf
- PKSM : 4 orang
- As location of forest education and training for other FFG
- Comodity Coffee Robusta dan Arabica dengan Productivity : 1.000-1.500 tonnes/ year in form of cherries.
- Absorb ± 250 workers
- Income ± Rp. 30 millions/month/ person
- Coffee land management area ± 1 ha/org

Achievement :
- Wana Lestari Champion FFG Category KTH th 2016

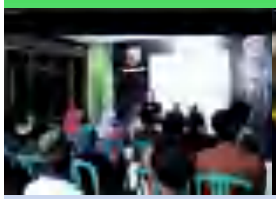


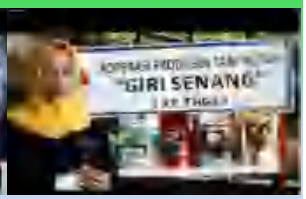
Using land under pine forest stands by planting coffee

The area of forest planted with coffee in the area is about 155 hectares.



Cultivation coffee under pine forest stands





Forest Farmers' Group Giri Senang

Giri Senang Forest Farmers Cooperative

As place of education

Lesson Learnt

Many activities that can be carried out by the community around the forest can be used as a source of livelihood for people living in and around the forest.

To increase the income of the community around the forest, the production of plants under the forest stands is not sold in the form of raw materials, but must be processed and packaged attractively to increase the value of sales. Promotion, marketing and network factors are very important to expand marketing and increase the income of coffee farmers in the village. The institution of forest farmer groups must also be strengthened. Forest farmers' groups need to establish business groups such as cooperatives as a vehicle to sell their production and place to obtain production facilities such as fertilizers and production equipment. Forest farmer group business development can be developed as a place of recreation, education and training.The success of the Forest Farmers Group Giri Senang is because there is assistance from a forestry extension worker and guidance from the local government. Forestry extension worker always gives encouragement to all members of forest farmer groups in order to develop the coffee business that they have produced.

The Way Forward

- The need for intensive assistance in the utilization and marketing of non-timber forest products in the short term. This is because the results of the timber long enough to be perceived benefits.
- The need for periodic evaluations to ensure that management rights do not change hands.
- The village government and the rights holder group or or Forest Farmers Group or the management permit need to budget and schedule the arrangement of work area boundaries in the field. If there is a boundary problem with the village area, in order to resolve the village boundary first.

Summary

Many activities can be carried out in the forests that can be used as a source of livelihood for the people living in and around the forests. Planting productive plants under a forest stands can be one of the livelihood alternatives for people who live around the forests.

The success of the Forest Farmers Group Giri Senang is because there is assistance from a forestry extension worker and guidance from the local government.

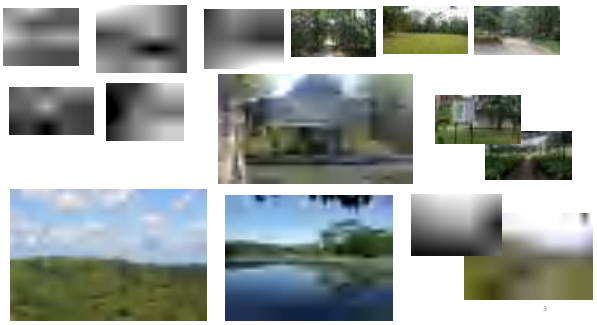
Empowering of forest farmers Group Giri Senang is important in order to strengthen forest farmers, establish business and cultivation of coffee plants in the land under pine forest stands

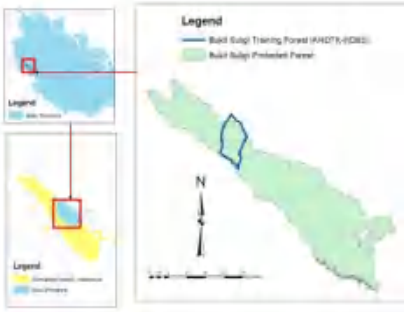
Summary

- The social forestry program : Mantri-Lurah, Social Forestry, Integrated Village Community Development (PMDHT), PMDH, PHBM (CBFM) , and PHBM Plus.
- MoF: Community Forest, Village Forest, Community Plantation Forest, Forest Partnership, and Customary/Indigenous Forest
- Social forestry conducted by Perhutani opened community access to 2,216,225 hectares of land. Social forestry at the MoF targeted at 2.5 million ha in 2010-2014 reached 607,269.63. The target of social forestry in 2015 to 2019 is 12.7 million hectares which is still Indipatif Maps (PIAPS).

The hystory of KHDTK-HDBS degradation and community livelihood

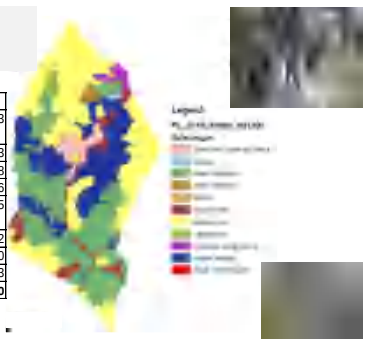
- Ministry of Environment and Forestry hand over a Special Purpose Forest Areas (Kawasan Hutan dengan Tujuan Khusus/ KHDTK) called Bukit Suligi Training Forest (Hutan Diklat Bukit Suligi/ HDBS or KHDTK-HDBS) to the Pekanbaru Environment and Forestry Training Center (Pekanbaru LHK Training Center).
- Bukit Suligi Training Forest/ **HDBS or KHDTK-HDBS (2,183**ha) and is a part of the Bukit Suligi **Protected Forest area**, which has a total area of **33,000 ha.**
- In 1995-1997 illegal logging small volumes.
- 1997 (The culmination of a change in the KHDTK-HDBS's ecosystem) when the euphoria of reform and the storm of the crisis-hit Indonesia.

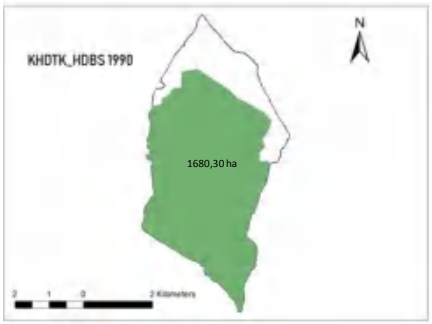


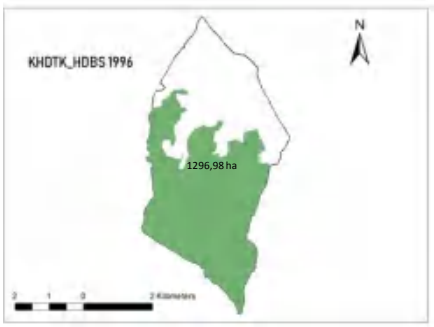


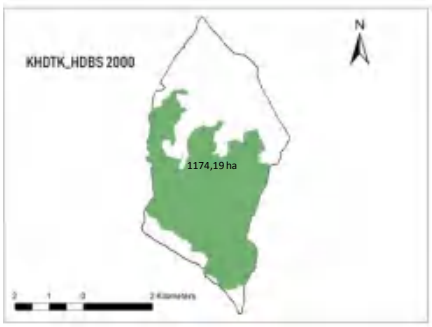
Oil Palm in KHDTK-HDBS 2019

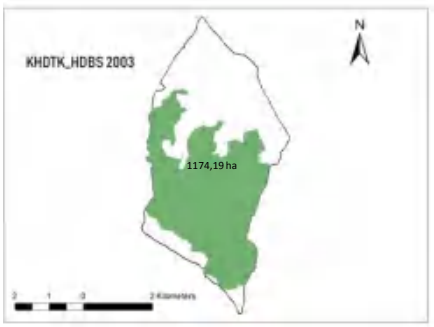
No	Jenis Tutupan	ha	%
1	Hutan lahan kering sekunder	684,01	31,33
2	Hutan tanaman	20,29	0,93
3	Pemukinan	1,65	0,08
4	Perkebunan/Kebun	920,41	42,16
5	Pertanian lahan kering campuran	29,56	1,35
6	Semak belukar	495,87	22,72
7	Tanah Terbuka	26,26	1,20
8	Tubuh air	4,95	0,23
Total		**2.183**	**100,00**

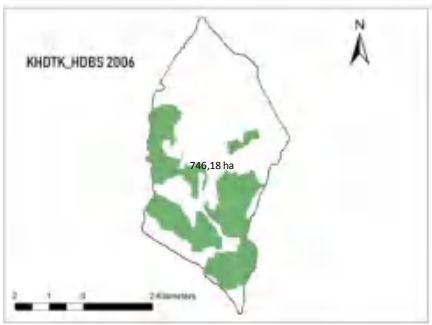


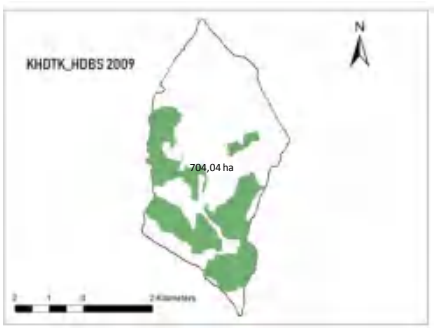

KHDTK_HDBS 1990
N
1680,30 ha
2 1 0 2 Kilometers


KHDTK_HDBS 1996
N
1296,98 ha
2 1 0 2 Kilometers

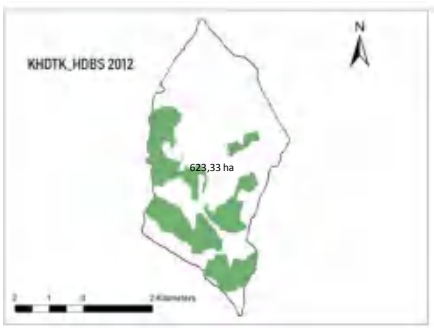

KHDTK_HDBS 2000
N
1174,19 ha
2 1 0 2 Kilometers


KHDTK_HDBS 2003
N
1174,19 ha
2 1 0 2 Kilometers

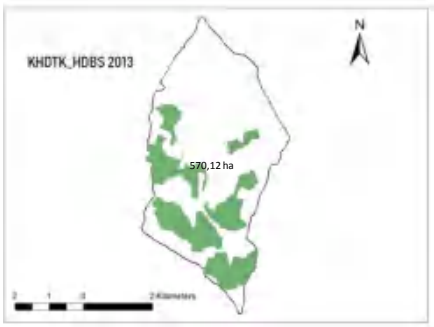

KHDTK_HDBS 2006
N
746,18 ha
2 1 0 2 Kilometers



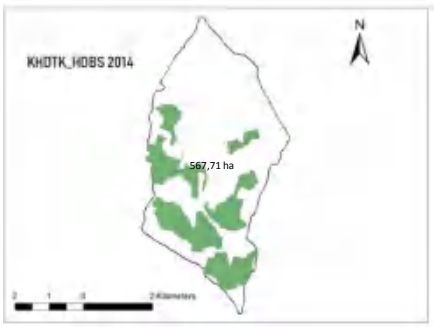
13



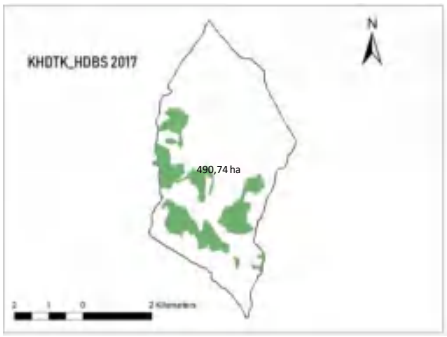
14



15



16



17

Economic and social of community

- About 85% of the people living around the Bukit Suligi Training Forest (HDBS) work as a farmer.
- The economic facilities of Village around the KHDTK-HDBS are quite sufficiently.
- The population growth in the villages around the Bukit Suligi training forest area is increased time by time

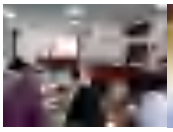
18

The Wild Life in Protected Area

- The types of animals in the Bukit Suligi Diklat forest include: Elephant (*Elephas maximus*), Sumatran Tiger (*Panthera tigris sumatrensis*), Deer (*Muntiacus muntjak*), Deer (*Cervus sp.*), Hornbill/ Enggang (*sulalarcas caster*), Honey Bear (*Helarctosos malayanus*), monkeys (*Macaca fascicularis*), and other animals such as Siamang, porcupines/ landak, anteater/ Trenggiling, Kuaw bird, partridges/ Ayam hutan, tapirs etc. (wahyudi,2004). However, now some animals (such as the Sumatran Elephant and Tiger) are rarely encountered in the Bukit Suligi Training Center.
- The native fauna species in Bukit Suligi training Forest (HDBS) include the types of *Shorea spp* (Meranti), *Dipterocarpus spp* (Keruing), and *Anisoptera spp* (Mersawa). There are also other commercial types such as *Palaqium sp* (Nyatoh), *Litsea sp* (Medang), *Calophillym sp.* (Bintangur), *Kompassia sp* (Kempas), and *Scorodorcarpus sp.* (Kulim). There are also protected plant species such as *Shorea stenoptera* (Tengkawang) and Orchid (*orchideceae*).

19

Initiating of programs




20

The Program objectives

The purpose of managing KHDTK-HDBS set forth in the vision of KHDTK-HDBS that is **"to realize the KHDTK-HDBS as a vehicle for education and training based on environment and forestry"**.

To carry out the vision, then described in the mission, namely:

1. Developing the potential of the area to support forestry education and training implementation in a professional manner.
2. Increasing protection in KHDTK-HDBS as an effort to restore forest sustainability.
3. Optimizing the use of the area and its resources in a sustainable and socially equitable way through the participation of the community and partnership relations with various parties.

Several programs are planned in carrying out this vision and mission including:

A. Restoration of KHDTK-HDBS functions through activities:

1.Land Rehabilitation, Illegal Palm Oil Injection/ Eradication
2.Building and Maintaining Demonstration Plots
3.Routine Patrol and Forest Fire Prevention

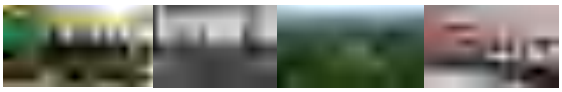
B. Community Development and increasing public awareness of KHDT-HDBS Sustainability through activities:

1.Creating an Agreement with Community/KTH (Forest Farmer groups) and Gempala (Nature Care Youth Movement) in KHDTK Management Activities.
2.Promoting the Benefits of KHDTK
3.Illumination and Coordination with Communities around KHDTK.
4.Training for Community

21

The forward influencing of programs

Pekanbaru LHK Training Center (Pekanbaru LHK Training Center) has the function for education and training of the state civil apparatus and non-state civil apparatus and the community. Therefore, the experience of successful management of KHDTK_HDBS can be shared with many parties so that it will make a positive contribution to better forest management on a large scale



22

Accomplishments



23

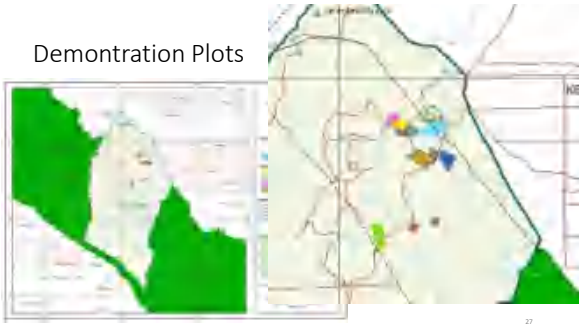
NO	PROGRAM	ACHIEVEMENT	IMPACT
1	2	3	4
A	**Restoration of KHDTK_HDBS functions through activities:**		
1.1	Land Rehabilitation, and Illegal Palm Oil Injection/ Eradication, etc.	- Eradication of illegal palm oil plants - Land rehabilitation - Eradication of illegal house/ hut	- The increasing the area of secondar forest and primary forest
1.2	Building and Maintaining Demonstration Plots	- The establishment of several demonstration plots	- Creating new practical locations for education, training, and research relevant to developing some particular plants, ecosystem, social forestry, etc.
1.3	Routine Patrol and Forest Fire Prevention	- Prevention of new occupations and relatively zero fire from 2017-2019	- Restraining the occupation for new land clearing at KHDTK-HDBS
B	**Community Development and increasing public awareness of KHDT-HDBS Sustainability through activities:**		
2.1.	Creating an Agreement with Community/ KTH (Forest Farmer groups) and Gempala (Nature Lover Youth Movement) in KHDTK Management Activities.	- Replanting degraded forest land by forest replanting cooperated with Gempala Community.	- Creating a good communication between the community group and the management of KHDTK-HDBS - Creating a participative community forest protection
2.2.	Promoting the Benefits of KHDTK	- Socialization to the public during routine patrols - Socialization of early environmental awareness to students	Increasing the public awareness of Protected forests area sustainability
2.3.	illumination and Coordination with the around KHDTK Communities.	- Visiting several communities for talking about the sustainability of protected forest area and Partnership	- Initiating forest management throu a partnership system - Initiating of an agreement to replac oil palm plants with allowed plants planted in the KHDTK-HDBS
2.4.	Training for Community	- Training of Sugar Palm Cultivation	- Preparing The knowledge about the allowed plant in the partnership program

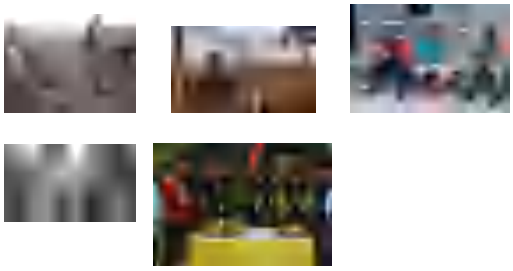
24

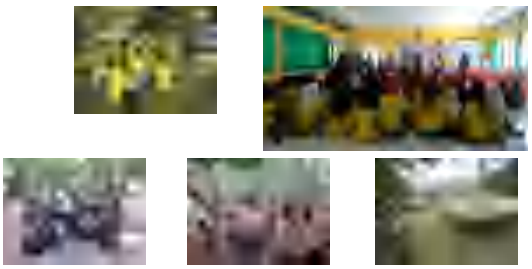
2015…

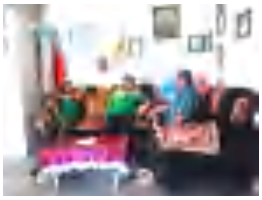
Patrol

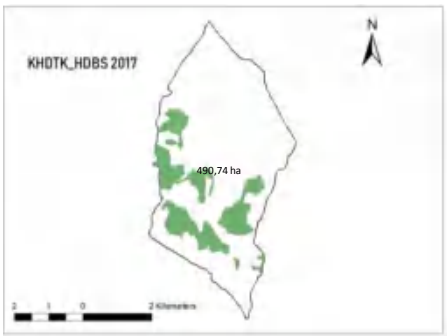
Demontration Plots

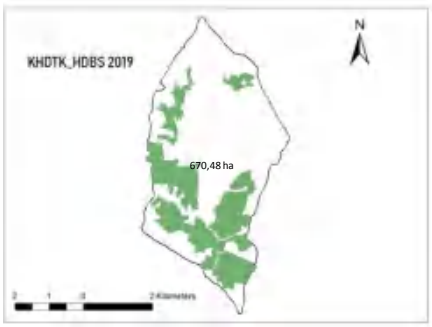


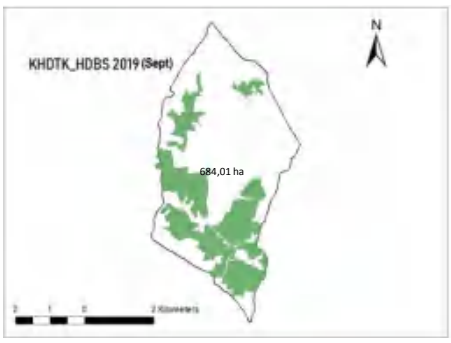







KHDTK_HDBS 2017
N
490,74 ha


KHDTK_HDBS 2019
N
670,48 ha


KHDTK_HDBS 2019 (Sept)
N
684,01 ha

KEY ELEMENTS RELATING TO THE CASE STUDY

37

Problems of illegal land tenure as a source of livelihood

- In the period from 1990 to 2017, there has been an activity to utilize the KHDTK-HDBS area for livelihoods
- The beginning activities was illegal logging then continued with land occupation activities.
- The land occupation activities cultivate the area for palm oil plantations
- Most of the population of the Village around KHDTK-HDBS are people who follow the transmigration program from Java Island.
- The commodities plants in transmigration program for creating prosperous of the community were plants for oil palm production
- Most of the illegal oil palm plantations within the HDBS KHDTK have already produced
- To bring together the realities between a large amount of land controlled by the community with the desire to preserve the area, then the partnership may be one of the ways out solutions.
- It is not easy to make people accept the idea of the partnership.

38

issues

- In 2008, strict action was taken in the form of eradication illegal oil palm in an area of 130 ha brought The Rokan Hulu District Forestry and Plantation Service as a leader of the action.
- eradication of the illegal house was carried out in 2015
- still many people who want to make plantations in KHDTK for being a source of livelihood.
- Socially, fears of jealousy by the community due to the existence of some other community plantations in KHDTK poses a threat to the emergence of new land claims.

39

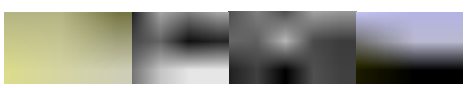
Financial issues

- **the State Budget (APBN) largely funds each activity of KHDTK-HDBS.**
- **Source From another legally budget can help to develop the quality of the forest**

40

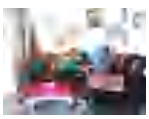
Reason for Sustainability of the program

- Creating KHDTK-HDBS be a good infrastructure of training become important for preparing Civil Servant of Environment and Forestry Ministry even Province and District that work in Environment and forestry field and moreover for the community.



41

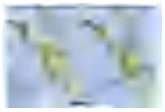
LESSONS LEARNT

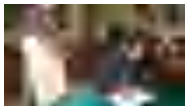


42

How to accomplish the program

- Based on the research of Gaveau et al. (2009) shows that forest destruction in Sumatera Island tends to be unstoppable
- Related to the existing regulations, Forestry partnership solutions are possible that can be carried out at KHDTK_HDBS





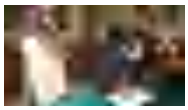
43

No	Year	Forested Area (Hectares)
1	2	3
1.	1990	1680,30
2.	1996	1296,98
3.	2000	1174,19
4.	2003	1174,19
5.	2006	746,18
6.	2009	704,04
7.	2012	623,33
8.	2013	570,12
9.	2014	567,71
10.	2017	490,74
11.	2019	670,48
12	2019 (sept)	684,01

44

Indicators of performance

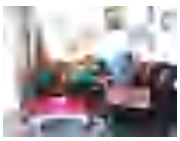
1. An increase in forested land cover in 2019 that exceeded the forested land cover area in 2012.
2. The existence of cooperation among several elements of the community to be involved in the management of KHDTK_HDBS.
3. The interesting of some community to change their oil palm plantation in KHDTK-HDBS with sugar palm in the partnership program.


45

The Way forward

- **Strengtening the Forest Protection**
- **Development of the forestry partnership and the agroforestry system in KHDTK-HDBS**



46

Overcoming of the deficiencies

1. Increasing Cooperation with the community
2. Involving of all stakeholders
3. Collaboration for more financial support
4. Developing of management quality
5. Strengthening human resource
6. Creating of Adequate funding supporting


47

48

Somphavy Keoka
Staff Officer, Forest Inventory and Planning Division, Department of Forestry

Contents

Overview of the Current Situation

Introduction to the PAREDD Approach

Case Study: Livelihood and Capacity Development Strategies

Overview

Current Situation

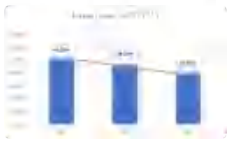
Country Profile

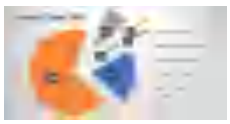
Lao People's Democratic Republic

Forest Definition and Land/Forest Classification in Laos

Forest Definition of Lao PDR
DBH minimum of 10 cm
Crown Density minimum of 20%
Area minimum of 0.5 ha

Forest Resources and Forest Cover





Source: DOF

Forest Management System

Production Forest 51 areas
(3.1 Million ha)

Conservation Forest 24 areas
(4.7 Million Ha)

Protection Forest 49 areas
(8.2 Million ha)

Production Forest
Management Plan

Policy, Laws, Rules and Regulations of Forestry

Revised and Amended No 64/NA by National Assembly 13 June 2019

Forest Cover Change

Deforestation over 5 years period estimate about 1.5%

60.20%

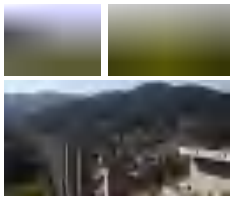
59.30%

58%

Causes of Deforestation in Laos

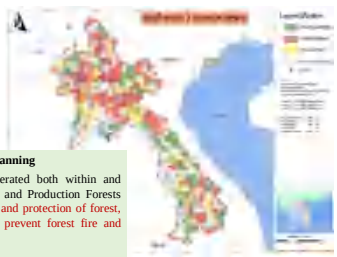
Direct Causes
1. Agriculture land Expansion
2. Shifting Cultivation
3. Infrastructure Developments (Hydropower Dam / Road / Railway)
4. Illegal Logging
5. Mining

Indirect Causes
1. Lack of land use policy in the past
2. Weak law enforcement
3. High market demands for forestry products
4. Weak collaboration among stakeholders
5. Poverty and limited job opportunity
6. Increasing population



Village Level Forest Management

Villages in and **around state forests**
- Protection F : 1,870 Villages
- Conservation F : 340 Villages
- Production F : 650 Villages
- Outside State F : 5,630 Villages



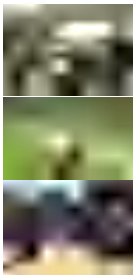
Article 39 (new) Village Forest Management Planning

Village forest management planning is operated both within and outside Protection Forests, Conservation Forests and Production Forests for the village to take leadership in management and protection of forest, plant and rehabilitate degraded forest, resist or prevent forest fire and encroachment of forest and forestland…

Introduction to PAREDD Approach

Introduction to The PAREDD Approach

Mitigation measure for reducing deforestation and forest degradation at village and village cluster level to provide assistance to local communities to build framework for management of natural resources in northern Laos where excessive slash and burn agriculture is laid as a cause of deforestation and forest degradation.



The Approach consists of the following:

1. Land and forest use planning at village and village cluster level
2. Activities for reducing deforestation
3. Land use and land/forest cover monitoring at village and village cluster levels

Stages and Step of PAREDD Approach

Planning Stage
To agree with not only the village but also concerned District authorities approve its Village Agriculture and Forest Land Use Zoning as well as its activity plan and budget for the mitigation activities, namely Forest Recovery Program, Livelihood Improvement Program, and Common Infrastructure Development Program

Launching Stage
To put such zoning and mitigation activities into practice realistically and effectively, various trainings and procurements are provided in Launching Stage

Sustaining Stage
To realize successful and sustainable of the mitigation activities the LFMC must monitor the progresses of these activities periodically, The "Sustaining" Stage means so as to manage all project-related activities and incidents by villagers themselves in near future.

Design and Structure of the PAREDD Approach

Land and Forest Management Committee (LFMC)
Playing central role for comprehensive development at village level, to ensure coordination of various development work
VDF Management Unit
Plans, manages, and monitors VDF of their village in consultation with LFMC and District to govern the fund. The Unit also makes an annual plan and report of the fund, which need to be approved by the whole village.
Activity Groups for Livelihood Improvement Program
Enable to effective and equitable operation of alternative income generating activities in Livelihood Improvement Program. Each of the Activity Groups serves as a working unit in planning, implementing, and monitoring the activities, while making rules for its group members for their effective activities.

Case Study

Developing Livelihood and Capacity Development Strategies

Case Study: Developing Livelihood and Capacity Development Strategies

Objective
To assess the current socio-economic situation of the village and develop sustainable livelihood strategies

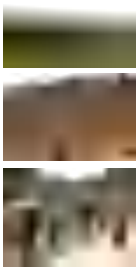
Methods
Participatory method was applied to gather information from the villages

Tools
The Project Cycle Management (PCM) tool was used to assess the present situation of the village

Result of the study

Direct driver of deforestation
- Forest concession
- Shifting cultivation
- Forest encroachment for agricultural land expansion uncontrolled livestock grazing in forest
- Fuel wood-based energy for cooking and heating

Indirect driver of deforestation
- No forest management activity exists in the village except the recent zoning enforcement that has divided village forest into production, conservation and protection forests.
- The zoning regulation restricted villagers to access in the conservation and protection forests.
- The zoning regulations are not strictly followed as the majority of them don't have options but to expand their fallows for rice production which is only or major livelihood option in the village.



Root of the problem

Shifting cultivation is not an isolated problem but in the result of many other root problems exist in the village.

- It is traditional and subsistence agriculture practice which doesn't involve any land management activity.
- lack of enough labors and irrigation facilities have forced people to rely on shifting cultivation for their livelihoods.
- lack of market system for agriculture products has discouraged people to produce fruits, vegetables, and other cash crops in large scale, which have great market potentials.

Conclusion

complete abolishment of the current slash and burn practice is not feasible option.
A phase wise and gradual approach should be adopted.
In the short run

- the focus should be given to improve the livelihood condition of people by improving the current agricultural practices and developing agricultural market system.

In the long run

- people should be encouraged to adopt permanent agriculture system with intensive farming by applying scientific land use and management practices.
- The current shifting cultivation practice has to be gradually improved by improving cultivation practices such as soil management, fertilization, agro-forestry and integrated cropping.
- Villagers should be encouraged to cultivate market potential cash crops such as coffee, tobacco, and mulberry tree in the old fallows to maximize income from their farmland.
- agricultural re-zoning should also be applied to consolidate scattered lands with clear land tenure policy.
- Village market and credit systems should be developed to increase productivity and sales of the agricultural products

FORESTS AND RURAL LIVELIHOOD DEVELOPMENT IN PENINSULAR MALAYSIA

By

Muhamad bin Abdullah

Forestry Department Peninsular Malaysia, Ministry of Water, Land and Natural Resources, Malaysia

OUTLINE OF PRESENTATION

1. INTRODUCTION
2. KEY ELEMENTS RELATING TO THE CASE STUDY
3. LESSON LEARNT
4. THE WAY FORWARD
5. SUMMARY

INTRODUCTION

Mangrove forests are a unique ecosystem generally found along sheltered coasts where they grow abundantly in saline soil and brackish water subject to periodic fresh and salt water inundation.

Kuala Gula, Perak is a coastal mangrove area that covers 6870.36 hectare. It is situated at Kerian district. Kuala Gula encompasses a multitude of habitats including the buffer areas of a river and its tributaries, mangrove islands and mangrove coastal forests.

INTRODUCTION

It is an area of importance in fishing activities which has supported the livelihood of the local communities. The mudflat and the swampy areas of the Kuala Gula mangroves have been the place of stopover and feeding for various species of migratory and resident birds.

Kuala Gula has been identified as one of the 10 eco-tourism areas in Perak State and also proposed as a Ramsar site in 2003.

Archaeological studies which were conducted in the early 1980s indicate that the area may have been inhabited as far as 2000 years ago. This study was carried out by historians from the National Museum and Universiti Sains Malaysia (USM).

INTRODUCTION

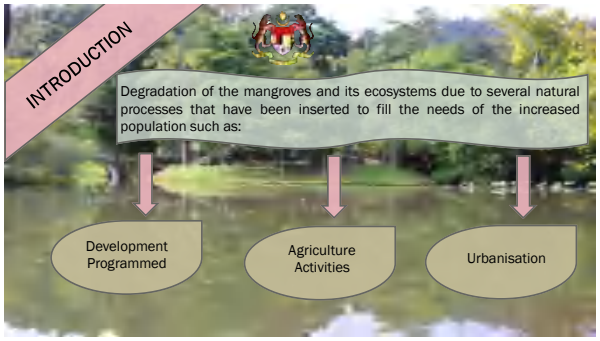
INTRODUCTION

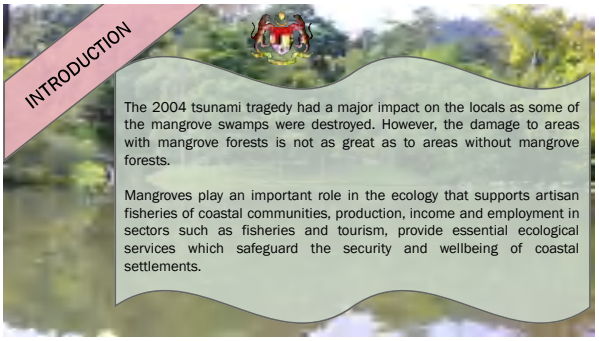
Six (6) Permanent Forest Reserve at Kuala Gula with **11,304 hectare**

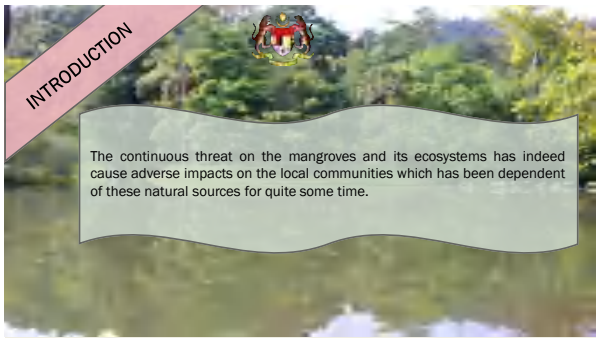
Pulau Gula FR 1,240 hectare	**Cabal Malai FR** 1,254 hectare
Pulau Kelumpang FR 4,090 hectare	**Sungai Baharu FR** 931 hectare
Sungai Sepetang FR 845 hectare	**Pulau Selinsing FR** 2,944 hectare

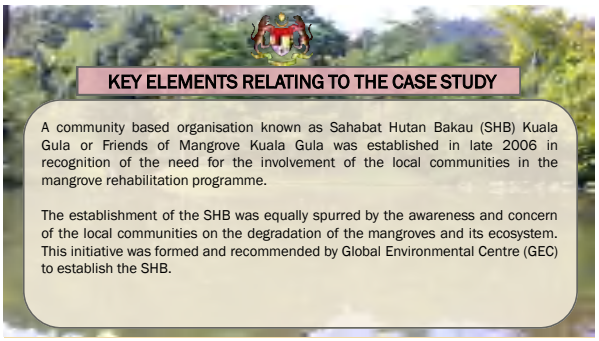

INTRODUCTION
The main attraction in Permanent Forest Reserve at Kuala Gula is a habitat for **migration bird** such as **milky stork (*Mycteria cinerea*)** and **lesser adjuntant (*Leptoptilos javanicus*)** which listed as vulnerable under IUCN. Most of them can be found at Stork lake in compartment 1, Pulau Kelumpang Forest Reserve.
lesser adjuntant (*Leptoptilos javanicus*)
milky stork (*Mycteria cinerea*)


INTRODUCTION
Almost 7000 people live in Kuala Gula. Most of the population is directly involved in the fishing industries through activities such as fish and prawn catching as well as cockles rearing. In addition, they are also involved in trickled-down fishing activities such as fish, dried shrimp and shrimp paste


INTRODUCTION
Degradation of the mangroves and its ecosystems due to several natural processes that have been inserted to fill the needs of the increased population such as:
Development Programmed
Agriculture Activities
Urbanisation


INTRODUCTION
The 2004 tsunami tragedy had a major impact on the locals as some of the mangrove swamps were destroyed. However, the damage to areas with mangrove forests is not as great as to areas without mangrove forests.
Mangroves play an important role in the ecology that supports artisan fisheries of coastal communities, production, income and employment in sectors such as fisheries and tourism, provide essential ecological services which safeguard the security and wellbeing of coastal settlements.


INTRODUCTION
The continuous threat on the mangroves and its ecosystems has indeed cause adverse impacts on the local communities which has been dependent of these natural sources for quite some time.


KEY ELEMENTS RELATING TO THE CASE STUDY
A community based organisation known as Sahabat Hutan Bakau (SHB) Kuala Gula or Friends of Mangrove Kuala Gula was established in late 2006 in recognition of the need for the involvement of the local communities in the mangrove rehabilitation programme.
The establishment of the SHB was equally spurred by the awareness and concern of the local communities on the degradation of the mangroves and its ecosystem. This initiative was formed and recommended by Global Environmental Centre (GEC) to establish the SHB.

KEY ELEMENTS RELATING TO THE CASE STUDY

The objectives of SHB

To support the involvement of local communities in the rehabilitation of mangrove at Kuala Gula

To provide framework for collaboration among government agencies, private sector, NGOs and local communities in mangrove forest management.

KEY ELEMENTS RELATING TO THE CASE STUDY

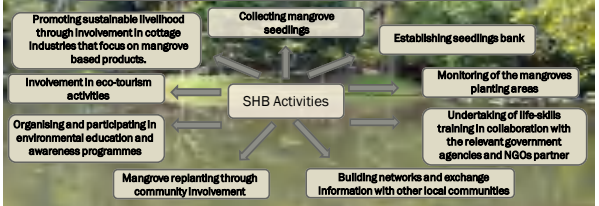
The establishment initiative of the SHB has received tremendous support from the local communities of Kuala Gula, Perak, where the mangrove rehabilitation programmes are being spearheaded by the GEC. The SHB pilot programme is a community based mangrove conservation programme which begin in 2007.

The SHB consists of members of the local communities who are responsible for the rehabilitation, protection and management of the mangrove. In their partnership, the SHB shall act as the monitoring group as well as the machinery for public awareness activities.

KEY ELEMENTS RELATING TO THE CASE STUDY

The SHB activities is being spearheaded by the Global Environment Centre (GEC) and supported by Ministry of Water, Land and Natural Resources Malaysia, Forestry Department of Peninsular Malaysia, Perak State Forest Department, Force of Nature Aid Foundation (FON), CIMB Foundation and Shell Malaysia.

KEY ELEMENTS RELATING TO THE CASE STUDY

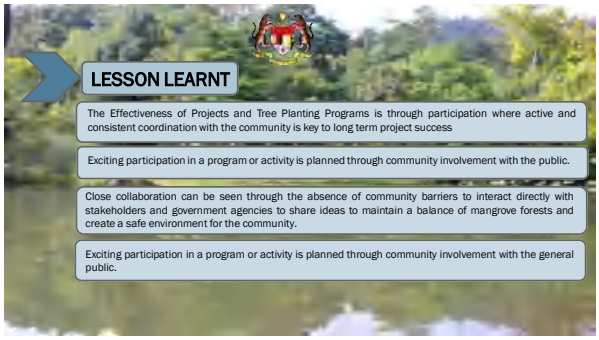


KEY ELEMENTS RELATING TO THE CASE STUDY

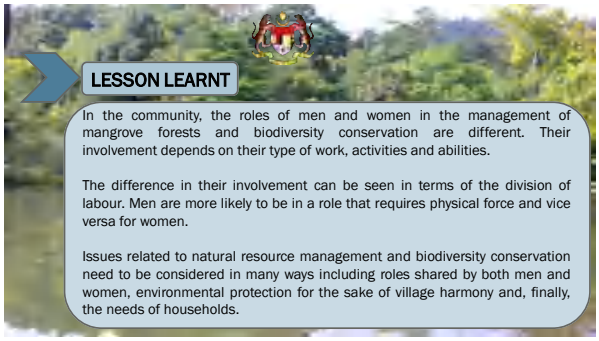
KEY ELEMENTS RELATING TO THE CASE STUDY

SHB Achievements

- ✓ The establishments of community's mangrove nursery in Kuala Gula which initially cover 5,000 seedlings in 2007 but are now able to accommodate 25,000-30,000 seedlings.
- ✓ Planted 114,198 mangrove seedlings in area covering 70 hectares of Teluk Rubiah.
- ✓ 10,000 people from more than 100 visiting groups in the mangrove rehabilitation programme and invited to various mangrove related educational exhibitions in recognition of the SHB contribution and experience in mangrove rehabilitation programme.
- ✓ Monitoring and patrolling the mangrove area from encroachment and illegal activities, participate in public events and conferences to disseminate and exchange information on mangrove issues at local to national level.


LESSON LEARNT
The Effectiveness of Projects and Tree Planting Programs is through participation where active and consistent coordination with the community is key to long term project success
Exciting participation in a program or activity is planned through community involvement with the public.
Close collaboration can be seen through the absence of community barriers to interact directly with stakeholders and government agencies to share ideas to maintain a balance of mangrove forests and create a safe environment for the community.
Exciting participation in a program or activity is planned through community involvement with the general public.

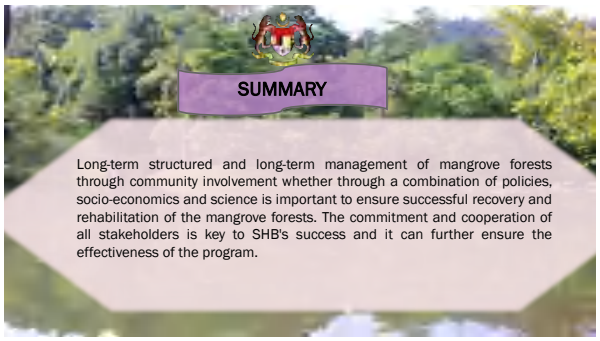

LESSON LEARNT
Methods to ensure community participation
Consultation and Support
Understand the project
Income boost
Executive committee member
Sustainable management
Community Support
Reparation


LESSON LEARNT
In the community, the roles of men and women in the management of mangrove forests and biodiversity conservation are different. Their involvement depends on their type of work, activities and abilities.
The difference in their involvement can be seen in terms of the division of labour. Men are more likely to be in a role that requires physical force and vice versa for women.
Issues related to natural resource management and biodiversity conservation need to be considered in many ways including roles shared by both men and women, environmental protection for the sake of village harmony and, finally, the needs of households.


THE WAY FORWARD
Project activities provide an opportunity for the community to increase interaction with the government in order to conserve the mangrove forest. Here are two (2) ways can be taken by government to involve community in conserving mangrove forests and increasing community socio-economic:
Government recognition
Government cooperation


THE WAY FORWARD
In 2019, SHB Kuala Gula has been allocated RM10,000.00 by the Ministry of Water, Land and Natural Resources Malaysia to carry out the programmed regarding the mangrove forests conservation such as community tree planting activities.
In addition, the Perak State Forestry Department has also selected and announced SHB Kuala Gula to participate in the Perak State Forestry Department's Community Tree Program where the department will supply at least 3000 seedlings annually to SHB Kuala Gula to carry out forest conservation activities. The announcement was made during the State of Perak International Conservation Ecosystem Conservation Day Celebration on 1 September 2018.


SUMMARY
The world is confront the challenges of mitigating and adapting to climate change while meeting the demands of a rapidly-growing global population, it is vital that we find the balance between conserving and regenerating mangrove forest areas with economic growth for poverty reduction. Mangrove forests support community economies in many ways and create jobs and wealth for populations with few alternative off-farm employment options. Besides, mangrove forests provide critical ecosystem services important to people and economies such as habitat for biodiversity, water and climate cycle regulation, erosion prevention, and wave control.


SUMMARY
Long-term structured and long-term management of mangrove forests through community involvement whether through a combination of policies, socio-economics and science is important to ensure successful recovery and rehabilitation of the mangrove forests. The commitment and cooperation of all stakeholders is key to SHB's success and it can further ensure the effectiveness of the program.


THANK YOU

Malaysia: Upper Baram Forest Area Conservation and Sustainable Development Plan

2

INTRODUCTION

1. In Sarawak, there are 27 ethnic community and make up 50% of 2.6 million people.
2. Heavily dependence on forest.
3. Extensive logging and land development brought drastic changes
4. Logging has affected the lives of four ethnic communities
5. The Penan community led a protest against logging in early 1990s
6. Possitive approach done by establishing “Penan Peace Park” to overcome
   a. land tenure
   b. improving livelihood

3

DEMOGRAPHIC

1. Penan population is estimated around 16,000 people in Sarawak
2. Reside around Miri, Ulu Limbang, Ulu Baram, Baram and Belaga (Northen Sarawak)
3. Ulu Baram Forest Area (UBFA) ethnic encompasses
   i. Penan - 19 villages with 2,635 people;
   ii. Kenyah - 9 villages with 3,369 people;
   iii. Kelabit/ Saban - 5 villages with 1,283 people

4

UPPER BARAM FOREST AREA (UBFA)

1. Penan Peace Park name changed to UBFA
2. Key problems that concern the local communities are:
   a. insecurity of land tenure as their native customary land are not recognized by government;
   b. long standing land disputes;
   c. impacts of logging on the environment
   d. lack of facilities like roads, water and power supplies;
   e. alternative income;
   f. capacity building and skills to enggage in sustainable economic activities
3. Integrated management approach is needed to address the above problems

5

UPPER BARAM FOREST AREA (UBFA) MAP

6

VILLAGES CONCERN

7

Total Area-283,500 ha

Core zone (Primary Forest) -28%-79,000 ha

Agriculture zone 23%-65,000 ha

Buffer zone (Forest already logged) 49% -139,000 ha

8

OBJECTIVES

To manage UBFA for ecosystem conservation and socio-economic development for the benefits of local communities

Specific objectives is to promote rural economic transformation throught sustainable resource development with good governance

PROJECT RATIONALE

a. Institutional setup and organizational issues
b. Stakeholder analysis
c. Problem analysis

9

RELEVANCE TO MALAYSIA POLICIES

1. Malaysia National Policy (revised 1993) - to conserve and manage national's forest
2. Forest Policy (1954) - forest resources must be managed in perpetuity by maintaining a balance between protection and commercial use
3. Rural Transformation Programme - to ensure balance in socio-economic development between the urban and rural populations
4. Forest Ordinance (1997) - serves to regulate commercial logging to safeguard timber production
5. National Parks and Nature Reserves Ordinance (1998) and Wild Life Protection Ordinance (1998 - serve to establish national parks and wildlife sanctuaries
6. Transboundary Biodiversity Conservation Area - Malaysia (Sarawak) and Indonesia have been active partners in transboundary cooperation since 1994
7. Heart of Borneo (HoB) Initiative - the project is in line with the Declaration signed by the three member countries (Malaysia, Indonesia, Brunei)

10

TARGET AREA

1. Geographic location
   a. located at Upper Baram northern Sarawak area
   b. riparian and alluvial vegetation occupy the flat terrain
   c. mix dipterocarp forest dominates hill and ridges
2. Socio-cultural aspects
   a. Kenyah scattered along the Baram
   b. Penan live along the river
   c. hunting and gathering are important activities, while many have started rice farming and plant fruit trees
   d. rich folklore knowledge on uses of plants for medicinal purposes
3. Economic aspects
   a. all communities still actively engaged in subsistence farming, hunting, fishing and selling surplus for cash.
   b. mats, baskets and bracelets made from rattan for sale

11

TARGET AREA

4. Environmental aspects
   - Forest ecosystems in UBFA are classified as follows
   i. 300-800m - mixed dipterocarp forest
   ii. 800-1200m - lower montane forest and mosses begin to grow on trees
   iii. 1200-1800m - upper montane forest with stunted trees not exceeding 5m
   iv. not much is known about local fauna except for mammals, birds, reptiles

12

Expected Outcome

1. UBFA secured with government integrated management policy and framework for conservation, community use and sustainable development
2. Process to resolve land use conflicts between communities and individuals initiated and operational
3. Productivity of degraded forests restored throught enrichment planting and with suitable indigenous tree species
4. Platform for integrated management development to coordinate, communicate and consultation

13

Expected Impact Indicator for Development Objective

1. UBFA endorsed by government for integrated management with institutional arrangements;
2. Threats on biodiversity and environment reduced;
3. Good progress in land conflict resolution (process is very complicated and tedious);
4. A large tract of primary MDF secured as core area for conservation and R&D;
5. Sustainable livelihood development models for communities created and replicated in at least two ethnic community groups;
6. Platform for government-people communication and consultation established;
7. Ten-year integrated management plan for UBFA developed.

14

Expected Impact Indicator for Specific Objective

1. Baseline data for ecosystems, flora and fauna collected, and suitable resources for sustainable development by communities identified;
2. Development models for enhancing livelihood demonstrated through best practiced land use;
3. Assistance to build basic infrastructure (bridges, mini-hydropower, water supply) in selected villages provided;
4. Training and capacity building conducted;
5. Improved community well-being with regular incomes;
6. Dependence on forests reduced.

15

Description of Project Intervention

Three outputs have been defined corresponding to the main causes of problems to be addressed by the project, as follows:

Output 1: Studies on zoning for ecosystems, biodiversity and land use carried out.

Output 2: Process to resolve land use conflicts in UBFA initiated and demonstrated.

Output 3: Sustainable development planning models for enhancing community livelihood initiated and applied.

16

Implementation Approaches and Methods

1. recognizes that forest is fundamental to biodiversity conservation, environmental health, and providing the needs for socio-economic well-being of the people.
2. will address the very important and long standing issue of community land use conflict resolution which is necessary to enable plans for sustainable development to be fully demonstrated and advanced.
3. is defined to enable sustainable development planning and activities to be executed and replicated in phases.

17

Assumptions, Risks and Sustainability

1. Assumptions and Risks
   The key assumptions as regards achievements of the project's outputs and objectives are closely related to commitment and political decision of the State Government towards UBFA for conservation, sustainable development and community use, as well as full cooperation of local ethnic groups, local NGOs, land owners and farmers, and the private sector, which are all beyond the control of the project.

2. Sustainability
   Sustainability of the project will depend on full cooperation from local communities and private sector, and government commitment. Dialogues and road shows in 2016 and 2017 have indicated majority support from the people.

THANK YOU

Workshop on Forestry and Rural Livelihood Development

IMPACT OF "FOREST CLEANING PROGRAMME" ON LIVELIHOOD OF PEOPLE IN MONGOLIA

I.DORJ, Senior Officer, Forest policy and coordination Department of Ministry Environment and tourism of Mongolia

1 - 14 November, 2019 Yunnan Province, China

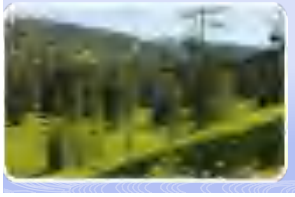
About of opportunities to improve livelihood of people in Mongolia :

- Thinning,
- Cleaning,
- Non timber forest product,
- Healing forest activities,
- Tourism development in forested area,
- Establishment of tree nursery for industry development,
- Selling planted forest to government,
- Acquire planted forests under private ownership,
- Develop agro-forestry.

Thinning

Opportunities and present situation:

- 103,710.0 hectares of forest need to be maintained /thinning/,
- Job opportunities can be increase,
- Will be provides demand for trees.



Problems:

- Capacity is weak,
- Legal regulation is poor

Non timber forest product

Opportunities and present situation:

- legislation and regulation is enough,
- Traditional knowledge of non-timber forest products
- Opportunity to improve local people's livelihood
- Non timber forest product resources are available

Problems:

- Capacity is weak,
- Weather conditions
- Can not produce the final product

Develop agro-forestry

Opportunities and present situation:

- legislation and regulation is enough,
- Opportunity to improve local people's livelihood,
- Reducing land degradation from desertification

Problems:

- Capacity is weak,
- Policy is inadequate

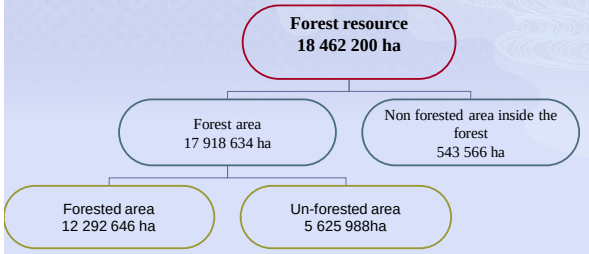
Population and Geography

- Population - 3,2 million,
- Ulaanbaatar, the capital and also the largest city, is home to about 44% of the population
- Ranked135 in the world by population,
- The population density - 1.8 people / km2
- The most sparsely populated countries

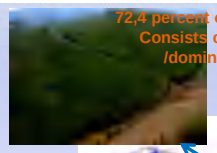
Mongolia is located in the central part of the Asian mainland (between latitudes 41 ° 35' and 52 ° 09'N and longitudes 87 44' and 119 ° 56E).
Territory- 1.5 million sq. km
Gross domestic product per person is 10,159.3 thousand togrog.
Economically active population is 1.34 million, 1,26 out of them employed and 0.08 are unemployed. Average monthly income and expenditure per household is 1.1 thousand togrog

6

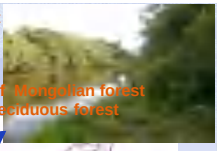
Forest resource of Mongolia



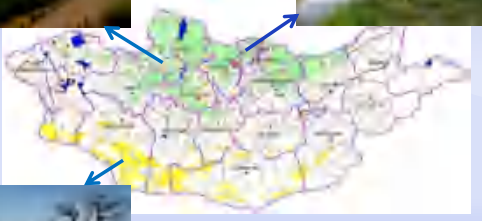
Forest of Mongolia covers 11.8 percent of total area of the country which is equal to 18 446.2 thousand hectare

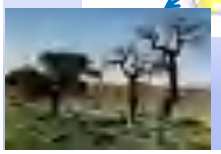


72,4 percent of Mongolian forest Consists coniferous forest /dominated by larch/



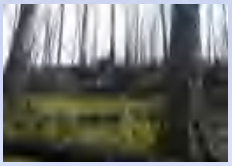
12,2 percent of Mongolian forest consists deciduous forest





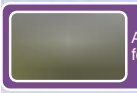
15,4 percent of Mongolian forest consists Saxaul forest

Background of "Forest cleaning programm"



- 40.3 million m^3 dried tree,
- 29.99 million m^3 fallen trees,
- 2.7 million hectare forest area need to be cleaning,
- 3.2 million m^3 wood and wooden materials needs per year in nationwide

Background of "Forest cleaning programm"



Approximately 70% of Mongolia's forests are aging and mature forests, and forest resources are very high for forest cleaning

Increases the degree of forest fires

Forest pest insects outbreaks

Problems of forest rehabilitation and natural regeneration

Objectives of the "Forest cleaning programme"

- Implement forest cleaning without negative impact on vulnerable ecosystems of forest,
- Improve state of healthiness of forest, and maintain natural regeneration of forest,
- Introduce advanced technology and methodology in forest cleaning,
- Improve the capacity for forest unit, forest enterprises and forest conservation community groups,
- Improve livelihood of people,
- Decrease illegal logging,
- To supply demand for timber and wood,
- Encourage the production of final products by using woods from forest cleaning through advanced technology.

Main results of the "Forest cleaning programme"

- Total of 145.4 million hectares forest was cleaned and the state of the forest was improved ;
- Fuel materials that cause fire risk decreased by 3,561.0 thousand m^3 in 145.4 thousand hectare forest fire risk decreased two times;
- Stem and bark insect pest attacks were prevented.
- Forest conservation community groups and forest enterprises who conducted "cleaning" carried out forest rehabilitation action in 6.4 thousand hectares;
- 2,774.3 thousand m^3 fire wood and 786.7 thousand m^3 for household usage were prepared. It supplied certain demand of wood;
- Illegal logging decreased significantly;

Main tesults of the ”Forest cleaning programme”

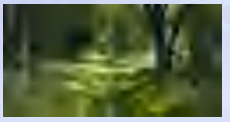
- Short term course were organized. 38 individuals received certificate;
- Total of 2946 people were trained on how to implement ”Forest cleaning programme”;
- Each year, average of 2013 people from 175 forest conservation community groups, and 104 forest enterprises from 39 soum (administration unit) of 7 aimag were used to participate “forest cleaning”.

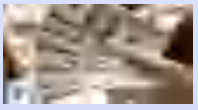
How to improve livelihood of people in Mongolia through ”Forest cleaning programme”:

- Each year, average of 556 individuals were provided permanent and temporary job;
- Forest conservation community groups and forest enterprises are empowered;
- The price of wooden products decreased.

What thing hinder the implementation of the “Forest cleaning programme”

Lack of road access to forest make forest inaccessible. Therefore some area were not cleaned yet

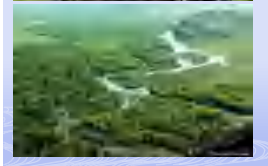




Lack of investment, insufficient availability of loans hinders enterprises to adopt advanced technology

Not sufficient legal support

Dried standing and fallen trees have following ecological importance:



- Prevent permafrost thaw;
- Regulate water cycle and protect soil;
- Standing and fallen trees are natural component of ecosystems;
- It is habitat for biodiversity.

Forest cleaning policy and legal structure

Developing trend of ”Forest cleaning programme”

"Forest cleaning programme" should be continued after 2020. Following action need to be father taken:

- Road planning in the forest need to be conducted and roads need to be built based on comprehensive assessment and studies;
- Encourage investment to introduce advanced technology and improve tools and equipment used by forest enterprises;
- Briquette that substitute fire wood need to be developed and wooden extracted plates;
- Need to be produced by using twigs and saw dust;
- Government should introduce incentives for trade of wooden materials from forest cleaning;
- Methodology and guidelines for implementation of "Forest cleaning programme" should be developed. This need to be updated;
- Capacity-building programme and livelihood improvement progromme should be improved;
- Forestation and rehabilitation must be taken place after cleaning.

Myanmar: Survey on Sustainable Management of Bamboo through Pilot Bamboo Community Forestry in Tharyarwady District, Myanmar

Survey on Sustainable Management of Bamboo through Pilot Bamboo Community Forestry in Tharyarwady District, Myanmar

Daw Su Myat Hnin
Range Officer
Forest Research Institute, Yezin

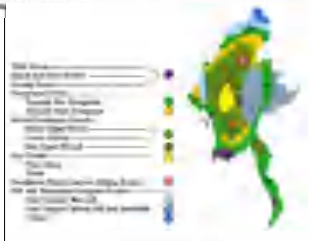
September 30, 2019

Outlines

- Introduction
- Objectives
- Literature review
- Study area
- Materials and Equipment
- Methodology
- Results and Discussion
- Conclusion
- Recommendation

Introduction

- Great diversity of bamboo (23 genera, 107 species) (Htun, 1998; Kress et al., 2003).
- Bamboo occupies 2.5% of the total forest cover (FAO, 2010).
- The resource has been depleting and its size and quality has been reducing due to
  - population growth (35 million in 1983 to 51 million in 2014)
  - Heavy reliance for basic needs and income
  - lack of management and over harvesting.



Source: Adapted from Kress et al. (2003); Ohrnberger et al. (1999)

Introduction(Cont.)

- An effective management of the reserves or a plantation or community forest is recommended (BIF, 2015).
- Community Forestry Instruction (2016)
- The important role of traders in sustainable management and commercialization
- Pilot bamboo community forestry in 2014
- 6 years of the initial duration of managing bamboo forest
- An assessment on the performance and desire of the User Groups was necessary.

Objectives

- To survey the existing bamboo resource in the pilot bamboo CF in Tharyarwady District, Myanmar.
- To analyse the tree species composition of the pilot bamboo CF.
- To investigate the current bamboo forest management by the CFUGs.
- To assess the socio-economic condition of the CFUGs.

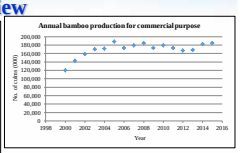
Literature review

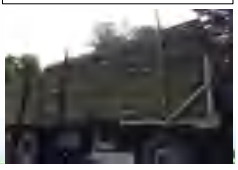
Heavy reliance on bamboo resource

Literature review

Production and Supply System

- bamboo as minor forest product (Forest Law, 1992)
- free to exploit
- little tax payable for commercial production and internal trade
- 1.5 billion culms covering all kinds of production which is fed by bamboo in natural forest (FD, 2015)
- Extraction of bamboo is not completely recorded or controlled
- Bamboo reserves are diminishing in quantity and quality (BIF, 2015)
- shortage of bamboo for use as a raw material
- small scale bamboo plantation and community forest

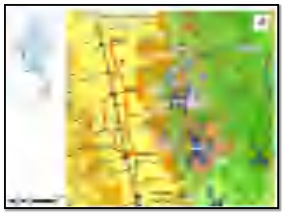




Literature review

- The **Community Forestry Instruction 2016** stipulated that the local community itself is involved in sustainable management and utilization including establishing new plantations and managing the existing forest to create employment and income opportunity from subsistence level to commercial purpose; stabilize ecosystem and improve environmental status and generate food.
- The role of the traders has to be acknowledged for sustainable management of the resource and commercializing bamboo products.
- Pilot bamboo community forest in 2014.

Literature review



Location of the study area

- Bamboo CF was established in Tharyarwady, Minhla, Latpadan and Oakpho townships, Tharyarwady district, Bago region, Myanmar in 2014.
- 72,622 acres
- 25 CFUGs
- Management and utilization right of bamboo resources was transferred to CFUGs for the initial duration of 6 years.
- Assessment on the management system and socio-economic condition of CFUGs was necessary.

Literature review

Aims of pilot bamboo CF

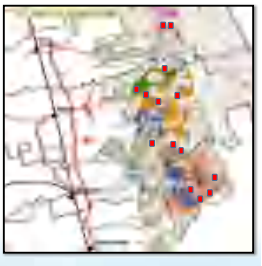
- To utilize the bamboo resource sustainably through participatory management.
- To promote job opportunities and uplifting the socio-economic condition of local people.
- To follow the falling rules suggested by Chaturvedi (1988) for sustainable utilization of quality culms.
- To conserve the natural forest.
- To produce value-added bamboo products.
- To develop a model bamboo CF.

Literature review

Annual allowable cut of bamboo culms in pilot bamboo CF in four townships in 2014

Township	AAC per acre (no. of culms per acre)	Area (acre)			AAC per felling coupe (no. of culms)		
		Felling coupe 1	Felling coupe 2	Felling coupe 3	Felling coupe 1	Felling coupe 2	Felling coupe 3
Tharyarwady	113	9,597	9,715	11,319	1,084,461	1,097,795	1,279,047
Minhla	55	1,949	1,782	2,189	107,195	98,010	120,395
Oakpho	65	1,083	1,226	1,142	70,395	79,690	74,230
Latpantan	138	11,505	10,782	10,333	1,587,690	1,487,916	1,425,954

Study area



- 72,622 acres in area.
- Among 25 CFUGs in the study area, 19 CFUGs which were implementing the management activities according to their CF management plans.

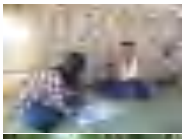
Materials and Equipment

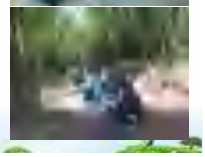
- Study area map
- GPS
- Measuring tape
- Questionnaire forms
- Inventory sheets

Methodology

Questionnaire survey

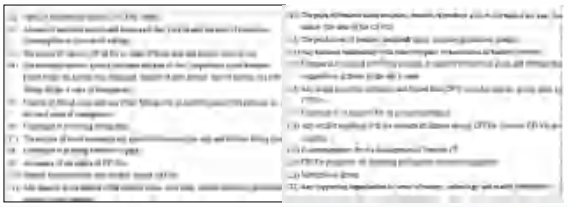
- Among 320 CF users, 65 samples (25% of the population) were surveyed.
- CF users in each CFUG were categorized into 3 groups: bamboo cutters, head of cutters and the head of the CFUG.
- The questionnaire form was prepared for assessing the existing management of bamboo resource was investigated, based on the felling rules for the management of natural mixed bamboo forests by Chaturvedi (1988) and on the management plan of the CF and CFI (2016).





Methodology

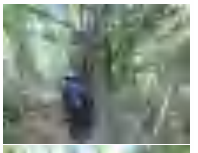
Questionnaire survey



Methodology

Vegetation survey

- 41 sample plots of 104× 104 ft (0.25 acres) were randomly established in 14 CFs: specifically 2 in Minhla, 5 in Tharyarwady, 2 in Oakpho and 5 in Latpantan Township
- Trees with DBH of 0.3 m and above were recorded and their GBHs were measured.
- All bamboo clumps were recorded of their number of culms per clump, and GBH and age (1, 2, 3 years old) of culms.
- Sampling intensity - 0.01%



Data analysis

Social data analysis

- Average number of bamboo culms harvested and income per day, month and year was analyzed by using the descriptive statistics.

Vegetation analysis

- Average number of bamboo clumps per acre, number of culms per clump and GBHs of culms were assessed by using descriptive statistics.
- Tree species were grouped into 5 different timber groups.
- Trees were categorized into six GBH classes.

Results and Discussion

Social Survey

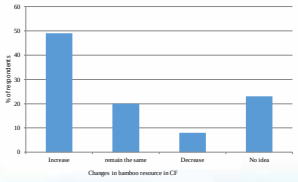
Average number of culms harvested by CFUGs and average income of CFUGs.

Groups	Average number of culms harvested per day (culms)	Average income per day (Kyats)	Average number of harvest days per month (days)	Average number of harvest month per year (days)	Average income per year (Kyats)
Cutter	58 (±5)	6,000 (±346)	22 (±0.7)	7 (±0.5)	820,000 (±62,000)
Head of cutter	580 (±86)	18,000 (±2800)	22 (±0.7)	7 (±0.5)	2,402,000 (±278,000)

Results and Discussion

Social Survey

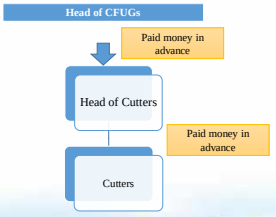
Respondents' response on the changes of bamboo resource in CFs



Results and Discussion

Social Survey

Institutional structure and benefit sharing



Results and Discussion

Social Survey

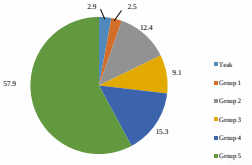
Implementation of the management plan

- 3-year-rotation harvest in accessible area
- 25% of the cutters followed the felling rules
- Tending operations were conducted only in the small area of CFs
- Few conservation activities

Results and Discussion

Vegetation Survey

Percent contribution of tree species to five timber groups categorized by Forest Department



Results and Discussion

Vegetation Survey

Annual allowable cut of bamboo culms in pilot bamboo CF in four townships

Township	AAC per acre in 2014 (no. of culms per acre)	AAC per acre in 2019 (no. of culms per acre)	Area (acre)			AAC per felling coupe (no. of culms) in 2019		
			Felling coupe 1	Felling coupe 2	Felling coupe 3	Felling coupe 1	Felling coupe 2	Felling coupe 3
Tharyarwady	113	272 (±19)	9,597	9,715	11,319	2,610,384	2,642,480	3,078,768
Minhla	55	379 (±28)	1,949	1,782	2,189	738,671	675,378	829,631
Oakpho	65	361 (±20)	1,083	1,226	1,142	390,963	442,586	412,262
Latpantan	138	306 (±30)	11,505	10,782	10,333	3,520,530	3,299,292	3,161,898

Conclusion

- AAC increased due to the sense of ownership, the willingness of the heads of CFUGs to follow the felling rules.
- Lack of technology and market accessibility hindered the maximal utilization of the resource.
- Sense of membership was lost due to the instability of cutters in CFUGs and lack of organizing meeting within the user group.
- Conflicts occasionally occurred between CFUGs and non-CFUGs.
- Despite setting the rotational harvest in 3 felling coups, the actual harvest was conducted in accessible areas.

Conclusion

- High extraction cost for the head of CFUGs due to inaccessibility resulted in the low income of the cutters.
- Bamboo CFs provided the job opportunities and generated income to CFUGs, and contributed above 63 % of the total revenue collected on bamboo extraction in Tharyarwady, Minhla, Oakpho and Latpantan townships.

Recommendation

- Management plan of CFs for the next period of 24 years should be developed for the area where the temporary forest road could reach and felling operations conducted.
- The silvicultural operations for promoting natural regeneration of tree species are recommended to be included in the management plan.
- Developing a network among the stakeholder in the bamboo industry and training on the technology is recommended.
- information sharing and regular meetings among CF users, and between CF users and township FD staffs are strongly recommended.

Thank you.

Socio-economic Impact of Pro-poor Leasehold Forestry Program: A Case Study of Sarlahi District, Nepal

Madhav Prasad Deo
Divisional Forest Officer
Division Forest Office, Sarlahi

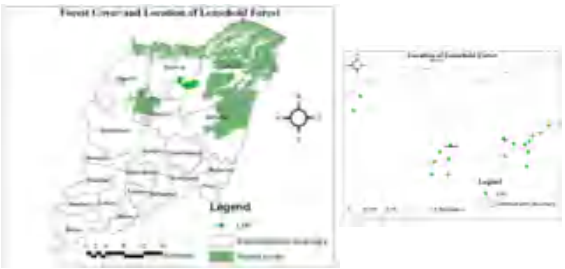
Presentation outline

- Introduction -Study area and Program
- Technical, policy and financial issues
- Sustainability of the Program
- Achievements and lesson learnt
- Way forward

Introduction (Target area)

- The case study has been carried out in **Lalbandi Municipality of Sarlahi district** situated in **Province number Two** of Federal Democratic Republic of **Nepal**.
- The **poverty rate** of the **district is 26.4** percent and the rate is **11.23 percent for the target study area**.

Introduction (Target area)



Introduction (Target area)

- The study is targeted towards leasehold forest user groups (**LHFUG**s) of the same municipality.
  - These groups are formed and registered in Division Forest Office, Sarlahi.
  - **Nineteen** LHFUGs situated in Lalbandi Municipality.
  - Each group consists of **nine to eleven** poor households.
  - Each group has access on **three to four hectare** of **degraded and encroachment prone** forest land.
  - The households are **dependent on forest resources** for food, fodder, firewood and timber.

Introduction (Target area)

- The LHFUGs are managing **sixty five hectare** of the degraded forest land with twin **objectives** of forest landscape **restoration** and **livelihood** enhancement.
  - 213 **households** involved.
  - 1193 **members** benefited.
  - The households have access on **less than 0.16 hectare** of land including residential and farmland.
  - They have to depend upon daily wages and forest land for meeting basic needs.

Introduction (Target area)

- The major activities of LHFUGs are;
  - **NTFPs** cultivation:- Chamomile (*Matricaria chamomilla*), Citronella (*Cymbopogon winterianus*), Palmarosa (*Cymbopogon martinii*), Lemongrass (*Cymbopogon citratus*)
  - **Multipurpose trees** plantation and **Fodder tree species** plantation
  - **Grass species** (Broomgrass, Napier, Molasses, Stylo) cultivation, bamboo plantation and
  - **Cash crop** (such as ginger and turmeric) cultivation



Introduction (Target area)

- The major activities of LHFUGs are;
  - Saving and credit mechanism.
  - Monthly meeting to discuss forest management activities, livelihood activities and utilizing the collected money.
  - Most of loans are utilized for cattle farming, agricultural activities, rural shop and other household needs fulfilling at soft interest.
- At the same time, they are conscious in protecting natural regeneration of pioneer tropical tree species such as *Shorea robusta, Adina cardifolia and Terminalia alata.*

Introduction (Leasehold Forestry Program)

- Leasehold forest is a part of national forest with less than 20 percent crown cover handed over for a lease period of forty years either
  - to an **institution/corporate** for producing raw materials of industry, agro-forestry purposes as well as for insect and wild life farming, promoting ecotourism
  - or to a **community** of people living below poverty line
- Legal provisions of leasehold forestry program are;
  - Forest act, 1993 and Forest regulation, 1995
  - Leasehold forest policy, 2002
  - National forest policy, 2018

Introduction (Leasehold Forestry Program)

- Leasehold forestry program initiated in 1993 considering;
  - **livelihood issues** of community residing nearby forest area
  - **conservation issues** of degraded and encroachment prone forest land
- Coverage of leasehold forestry program in Nepal;
  - 40 districts
  - 7484 leasehold forest user groups (LHFUGs)
  - 71753 households
  - 43317 hectare of leasehold forests
  - 0.6 hectare leasehold forest/households
  - 5.78 hectare leasehold forest/LHFUG

Introduction (Leasehold Forestry Program)

- **Government's input** for promotion of leasehold forest program are;
  - Group formation.
  - Social mobilization support.
  - Operational plan with livelihood improvement plan.
  - Hand over of leasehold forest.
  - Seed money for saving and credit mechanism and other income generation activities.
  - Provides seeds and seedlings of grass and multipurpose trees.
  - Capacity development opportunities (Training, workshop, exposure visit etc)

Technical, policy and financial issues

- The **major technical challenges** to uplift the leasehold forest program in the study area are;
  - lack of **marketing knowledge** of NTFPs,
  - lack of **access on private land** for extension of NTFP cultivation and performing agricultural activities,
  - **capacity development** of LFUGs and
  - lack of **production input** such as irrigation, store room and processing plants.

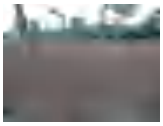


Technical, policy and financial issues

- In order to address marketing issues
  - a **district level network** of NTFP cultivators has been formed
  - network with **Shambala Herbal Private Limited**, a Kathmandu based herbal company
- In order to address lack of access on private land for extension of NTFP cultivation and performing agricultural activities,
  - about **38 percent of total households** have taken **private land on lease** to extend the NTFPs cultivation and performing agricultural activities,

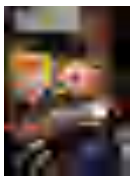
Technical, policy and financial issues

- In order to address financial support for production input,
  - DFO has been **providing small grants** to **establish store room and processing plants** in recent years.
- Still, the LHFUGs have a **limited access on financial** support for irrigation facility because
  - Some of NTFPs such as **chamomile cultivation needs more and frequent irrigation** to enhance raw material production for essential oils.



Technical, policy and financial issues

- In order to address capacity development issues, DFO also contributes through
  - organizing exposure visit,
  - leasehold forest management training,
  - providing forest management tools,
  - recruiting social mobilizers,
  - organizing prizes for the best LHFUGs and
  - reviewing operational plans of LHFUGs.



Technical, policy and financial issues

- **The five year and three year development plans** of National Planning Commission (NPC) in general, advocate for leasehold forest development in order to
  - **produce raw materials** for industry, to promote tourism activities and
  - **to raise living standards of poor people.**
- But quantitative and qualitative targets have not been envisaged in each of the plan.

Technical, policy and financial issues

- Inspite of enabling rules and regulations for leasehold forest, there are still some issues which are hindering leasehold forest development program to achieve its twin goals of livelihood and conservation.
  - The prevailing laws **do not allow LHFUGs to perform agro-forestry activities** with **agricultural crops** in leasehold forest area.
  - There is **no provision for use of trees present in the leasehold forest** at the time of agreement.
  - **Identification** of the encroachment prone area and the **degraded forest.**

Technical, policy and financial issues

- **Government's policy level interventions are;**
  - There is provision of annual royalty for industrial and tourism leasehold forestry groups.
  - While pro-poor leasehold forestry groups are **escaped from the royalty.**
  - The **hand over authority of leasehold forest** to the **people living poverty line** has been **transferred to DFO** in order to ease the hand over process.

Technical, policy and financial issues

- In the study area, DFO has been playing an important role **to combine LHFP** with other **line agencies** in order to
  - **have access on income generation activities** implemented by district level **livestock and agriculture office** during initial stage of leasehold forest development.
  - have access on market and price information from **Shambala herbal company limited.**

Technical, policy and financial issues

- Initially, the Leasehold forestry program was financially supported by
  - International Fund for Agriculture Development (**IFAD**)
  - Financial support of the **Government of Finland**.
  - Biodiversity Sector Program for Siwalik and Terai, a bilateral program financed by SNV/the Netherlands (**BISEP-ST/SNV**)
- **Currently**, LHFP is being implemented by **Government of Nepal from its own initiatives**.

Technical, policy and financial issues

- In the study area, LHFP is being scheduled in Government's **annual program since 2004**.
- This program was supported by **Biodiversity Sector Program for Siwalik and Terai**, a bilateral program financed by **SNV/the Netherlands**, **from 2001 to 2009.**
- The **Government's annual budget** for the implementation of the program is **negligible** in comparison of other program such as community forest, national forest and NTFP development program.

Sustainability of the program

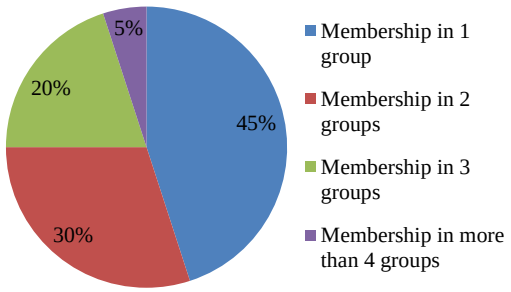
- Theoretically, if **users get benefited** from a development program, they **easily adapt** the program and **follow the norms** of the program implementation.
- The leasehold forest users are **improving their livelihood** condition through **income generation activities**
- **Assurance of market of the product** harvested from the leasehold forest has also encouraged leasehold forest users to take part in the program.

Achievements and lesson learnt

- The **main objective of the case study** is to assess socio-economic impacts of leasehold forestry program.
- **The findings are based on**
  - responses of 60 respondents **(28 percent)** out of total 213 leasehold forest user households from 19 LHFUGs.
  - Three to four household members were selected randomly from each of the group.

Achievements and lesson learnt

Access on membership in other groups



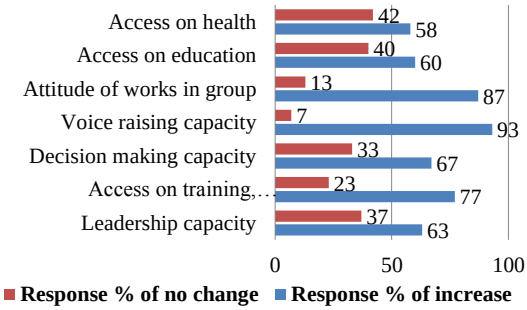
Achievements and lesson learnt

Membership in saving and credit (s/c) groups

- All of the LHFUG members
- **Deposit Nrs 100 to Nrs 500** per month per household.
- The **saving amount** in LHFUGs ranges from **Nrs. 200,000.00 to Nrs 400,000.00.**
- More than three-fourth of respondents (**76 percent**) have **taken loan from the scheme** at the rate of **12 percent interest per year**.
- **Out of 56 loan takers** at the time of study period, the proportion distribution of **consumptive and productive** loan is **79 and 73 percent respectively**.

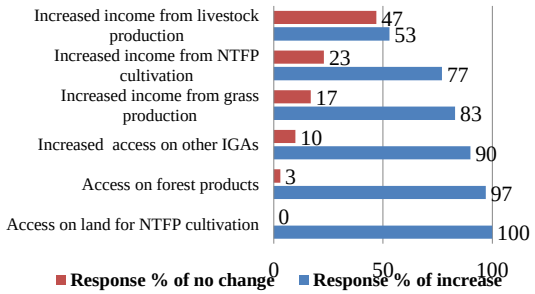
Achievements and lesson learnt

Change in social benefits after initiation of LHFP



Achievements and lesson learnt

Change in economic benefits after initiation of LHFP



Achievements and lesson learnt

Tangible economic gain from NTFP cultivation

- The input cost and output profit was calculated for NTFP production in leasehold forest for four major NTFPs (Lemongrass, citronella, palmarosa and chamomile).
  - In case of Lemongrass cultivation

  - Input cost per hectare is Nrs 46,000 (Land preparation cost-Nrs 5,000, slips/seedlings purchase-Nrs. 16,000, planting cost-Nrs 15,000 and harvesting cost-Nrs 10,000)

Achievements and lesson learnt

Tangible economic gain from NTFP cultivation

- Ten kilogram of essential oil is produced from raw materials per harvest cultivated in one hectare of leasehold forest land.
- The herbal company buys the produced essential oil at the rate of **Nrs 1,700 per kilogram**
- If the raw material is extracted four times then total income will be Nrs 68,000
- LFUGs get land preparation cost and slips/seedlings from Shambala herbal company as incentive for the production.
- Thus production cost is Nrs 25,000 and net profit per hectre is Nrs 43,000. (Nrs 68000-Nrs 25000)

Achievements and lesson learnt

Tangible economic gain from NTFP cultivation

- The production cost per hectare is same (Nrs. 25,000) for **palmarosa and citronella.**
  - Raw materials can be **harvested three times.**
  - **Twenty five kilogram** of essential oil is produced from raw materials **per harvest** cultivated in one hectre of leasehold forest land.
  - The herbal company buys the produced essential oil at the rate of **Nrs 1,300 per kilogram**.
  - Thus users get a net profit of **Nrs 72,500** from cultivation of these NTFPs in one hectare of leasehold forest. **(25*3 *1300-75000).**

Achievements and lesson learnt

Tangible economic gain from NTFP cultivation

- Similarly, the production cost is Nrs 75,000 for one hectre **chamomile cultivation**.
  - Raw materials can be **harvested two to three times**.
  - **Four and half kilogram** oil is produced **per harvest** from raw materials cultivated in one hectare of leasehold forest.
  - The herbal company buys the produced essential oil at the rate of **Nrs 25,000 per kilogram**.
  - Thus, users get net profit of **Nrs 150,000.00 (25000*2 *4.5-75000).**

The way forward

- With learning and experience of successful implementation of HLFFDP and LFLP in 22 hilly areas of Nepal, **GoN** has been **implementing** leasehold forest program in **40 districts**.
- The prevailing laws and policies also advocate the **promotion of the program in all of the districts** of Nepal so that
  - **degraded and encroachment prone forest** land could be **restored** and
  - utilized by **identified poor and for the poor**.

The way forward

- There is also an **opportunity to develop** leasehold forest program in
  - the **other wooded land** (0.65 million hectre)
  - the 95000 hectre **encroached area**
- The leasehold forestry program has also shown **positive impacts in**
  - increasing productivity of degraded forest land with minimal efforts of government.
  - Restoring degraded land along with forest for wild animals and birds.

The way forward

- Therefore, leasehold forest program has been proved to be an appropriate program
  - not only **for generating income and employment** to people living below poverty line
  - but also **for restoring degraded forest** and encroachment prone forest area.
  - It has contributed to **improving their livelihoods** by transferring knowledge and hands on skills of intensive grass cultivation, non-timber forest products cultivation and multipurpose trees plantation.

The way forward

- In order to make the program to cover more poor effectively, there is need of certain mechanisms. Such as;
  - **To link up these groups with development agencies** such as small cottage and industry office, agriculture development office and livestock development office **so that they could have access on income generation activities.**
  - **Basis of identification** of the community living below poverty line should be **practical, obvious and transparent**.

The way forward

  - Collective **market** and transparent marketing mechanism for primary producers.
  - **Follow up** support for LHFUGs.
  - **Technical and financial support** for establishing store house and processing plants.

1.00 OUT LINE PRESENTATION

- Introduction
- Papua New Guinea Forest Authority Structure
- Policy Objectives
- Major Organisation Challenges
- Land Use & Forest Extent
- Resource Replacement
- My Responsibilities

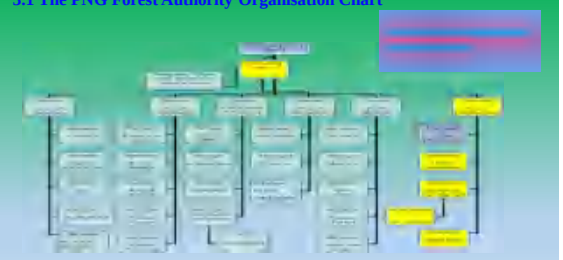
2.00 Introduction
Locality Map of The Independent State Of Papua New Guinea

3.00 The Organisation Structure– PNG Forest Authority

The Papua New Guinea Forest Authority was established in 1993 under the under the Forestry Act 1991, replacing the former Department of Forest. The National Forest Structure comprises of the National Forest Board, Managing Director and Six (6) Directorates sourced from its core functions;

1. Corporate Service Directorate – *Finance and Administration*
2. Forest Research Institute – *Research & Development*
3. Policy & Planning - *Forest Policy Matters and Forest Mapping and Planning*
4. Allocation- *Project Allocation and Licensing*
5. Field Services – *Natural Forest harvesting monitoring and Management*
6. Forest Development Directorate – *Tree Plantation Development and Marketing*

3.1 The PNG Forest Authority Organisation Chart



4.0 Forest Policy Objective

- Management and Protection of the nation's forest resources as a renewable natural asset[1].

4.1.0 Corporate Objective-Tree Plantation

- To promote and facilitate Tree plantation Management to secure the forest resources as a renewable asset for the benefit of present and future generations on an environmentally sound and socially friendly basis.

4.2.0 Our Mission Statement

- **To** develop and manage Tree Plantation as a **"renewable and commercially viable asset"** by increasing resource base to supply the industry from a sustainable forest estate, with the intention to protect biodiversity in areas we operate in.

5.00 Major Challenges -PNG Forest Authority

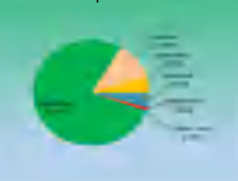
The Major challenges facing PNG Forest Authority in year 2019 amongst others are;

- **National Forest Inventory, Phase1 completed in July 2019**
- **Forest Plantation development for Resource Replacement**
- **Log Export Ban by year 2020 and increase downstream processing for both planted and Natural Forest.**

6.0 PNG – Land Use Composition at Year 2015

• Total Land Area: 46.1 million ha

Land Use Composition



Data & Photo Source PNGFA -NFI

6.1.0 Forest Extent at Year 2015

Afforestation - Grasslands

• Major Forest Types

6.2.0 Forest Degradation & Resource Replacement

6.2.1 Land Available For Resource Replacement

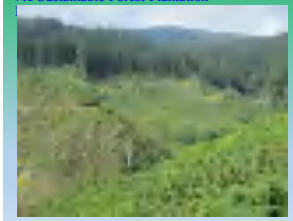
Total Land area (10.9million hectares)	Percentage	Million (ha)
Degraded Forest	77.7%	8.45 (35.94ha)
Grassland	22.3%	2.43
		10.9

6.2.20Forest Degradation Drivers

7.0 Resource Replacement

The rate of Resource replacement is slow against the annual Natural Forest Harvest Area due many challenges faced to Replace the resource through Plantation Development.

7.1 Sustainable Forest Plantation



7.2 Afforestation on Grassland Areas

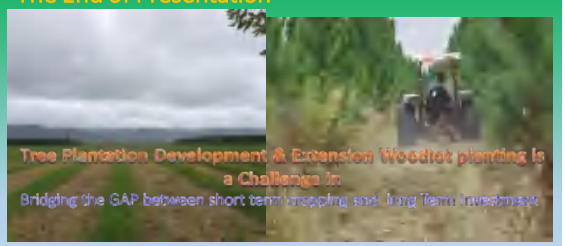
8.0 MY Entrusted Responsibilities are:

- Conduct Land acquisition programs for Tree Plantation Development
- Develop Annual Budget & Work Program for Markham Valley Projects
- Manage PNGFA Manpower, Contractors, Assets for Program Implementation
- Conduct supervision, certify quality and audit on committed programs for contractual service payments
- Development Annual operational Report on the overall Performance of the Projects
- Ensure and Generate Seedling Production in lieu with annual Planting Target
- Develop Public Relation with other Government agencies, stakeholders on the benefits of Reforestation Program and to promote community forestry through forest extension programs

8.1 My position in the organisational structure

The Markham Valley Project Supervisor Manages Three (3) Satellite Projects at Strategic locations in the Valley

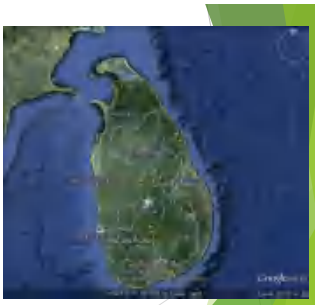
The End of Presentation



Forestry and Livelihood Development in Sri Lanka

W.M.H.WIJERATHNA
Assistant Conservator of Forest
Forest Department
Sri Lanka

- Located in the Indian Ocean
- Between 5 54 and 9 52 North Latitude 79 39 and 81 53 East Longitude



Sri Lanka

- Total Area - 65610 sq. Km
- Population-21.0 million (population Density 335 person/sq. km)
- % of poor households 5.3
- Unemployment rate Male-3.1 Female-6.5

Current status

- Middle income country
- Majority of people live in rural areas
- High population density
- High literacy rate -free education& health care
- Unequal distribution of natural resources-Forest

Facts about Forestry in Sri Lanka

- Sri Lanka is classified as a low forest cover country with low rate of deforestation.
- All forms of biological diversity in forest are very high and Sri Lanka together with western Ghats of India has been declared as one of the 34 biodiversity hot spots in the world.
- Protected areas occupy considerable extent of land when high population density is considered
- Existing Forest cover (29.7% of total land area) to be increased to 32% by 2030

Forest Department of Sri Lanka

The Vision

To conserve and develop the Forest Resources in Sri Lanka.

To ensure the prosperity of the nation

The Mission

Sustainable management of natural forests, and tree Resources to meet the increasing Requirement of timber and forest to provide environmental services for the well being of people and the economy.

National forest policy -1995

National forest policy of Sri Lanka has three policy objectives

Forest policy Objective -1

- To conserve forest for posterity with particular regard to biodiversity, soil, water, and historical cultural, religious and aesthetic values

Objective -2

To increase the tree cover and productivity of forest to meet the needs of present and future generations for forest products and services

Objective-3

- To enhance the contribution of forestry to the welfare of the rural population and strengthen the national economy , with special attention paid to equity in economic development

Extent of forests by forest types in 2010

Forest Type	Extent ha	percentage
Low land Rain Forests	123,302	1.9
Moist Monsoon Forests	117,885	1.8
Dry Monsoon Forests	1,121,392	17.1
Montane Forests	44,758	0.7
Sub Montane Forests	28,513	0.4
Riverine Dry Forests	2,425	0.0
Mangrove Forest	15,669	0.2
Savannah Forest	68,043	1.0
Operand Sparse Forests	429,485	6.5
Total	1,951,472	29.7

Forest Types and Climatic Zone in Sri Lanka

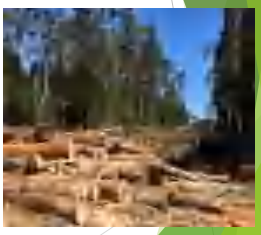
Destroying Forest in Sri Lanka

- Forest degradation and Deforestation

i. Shifting cultivation
ii. Cattle Damages on Natural Regeneration
iii. Illegal cultivation
iv. Encroachments
v. Illicit felling of trees
vi. Forest fires
vii. Spreading of invasive Species
viii. Planned Development Projects

Forest fires , and cattle damages


Cultivation and felling of trees

Forestry and Livelihood Development

Involve local communities in forest managements while ensuring conservation of forest through improvement of livelihoods of local community

Community Forestry in Sri Lanka

- Taungya System –slash & burn, agriculture with Teak

- External assistance

I. 1982-1990 Community Forestry Project
II. 1993-2000 Participatory Forestry project
III. 2003-2006 Natural Resources Management Project
IV. 2007-2011 Natural Resources Management Project (Phase 2)
V. 2012-2016 Sri Lanka Community Forestry Project
VI. 2017- Ecosystem Conservation and Management Project

Community Forestry Project

- Formed Village Forest Societies
- Farmers wood lot development

  Degraded government land were allocated to selected farmers of the community on a 25 year lease agreement
- Home garden development
- Stablish fuel woodlot

Participatory Forestry Project

- During 1993-2000 in order to reduce deforestation and to improve community livelihoods

The P F P promoted the

- Farmers woodlot
- Protective woodlot
- Home gardens
- Village reforestation(Agroforestry)

Farmers Woodlot

Natural Resources Management Project

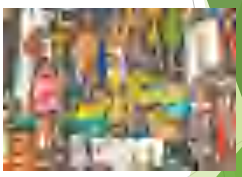
- 2003-2006 Phase 1
- 2007-2011 Phase 2
- Supported by the Australian government
- Implemented in five district in Sri Lanka
- Formed registered Community Based Organization(C B O s)

Sri Lanka Community Forestry Program

Improve the management of natural resources to support livelihoods and contribute to poverty reduction in the dry and intermediate zones of Sri Lanka

Number of district	17
Number of sites	167
Area of forest(ha)	23000
Participating house holders	10000
Total beneficiaries	90000

Income Generation Activity



Ecosystem conservation and Management Project (Escamp)

- Escamp to improve the management of ecosystems in selected locations in Sri Lanka for conservation and community benefits
- The project comprises of four components
- The second component sustainable use of natural resources for livelihood enchantment
- This component shall finance the identification and implementation of biodiversity friendly and climate-smart existing or new livelihood option through participatory community Action Plans(C A P s)

Escamp

- Strengthening the community based organization (C B O s)
- Establishment of Woodlots
- Improving the productivity of home gardens
- Promotion of sustainable agricultural and non agricultural income-generation activities
- Development of agroforestry
- Development of community based ecotourism

Lessons learned

- Forest department continuous leadership is essential as there is no substantial income generated through C B O activities
- Home garden as the most inputter source of timber and fuelwood
- Sustainable markets and quality assurance of products

Way forward

- Forest cover of Sri Lanka to be increase from existing 29.7% to 32% of the total land area.
- Development of Eco tourism industry
- Sustainable income generating activities for communities living in the peripheries of forest.

THANK YOU

The Role of Community Forestry in Rural Livelihood and Poverty Alleviation in Great Mekong Region: A case of Thailand

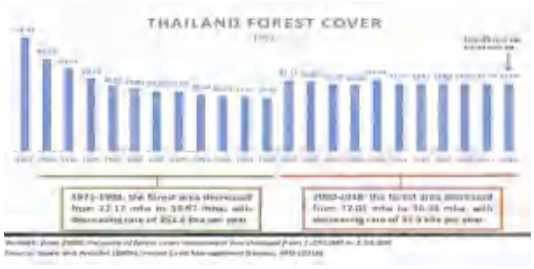
MS. SASIMA AREE

Official Officer
Office of Forestry Foreign Affairs (OFFA)
Royal Forest Department

CONTENT

1. Forest in Thailand
2. Forest Policy and Decision Making in Thailand
3. Introduction: Community Forestry
4. Forest Resources in GMR
5. Community Forest Management in Thailand
6. Institutional framework for community forest management
7. Assessing The Poverty Level in Great Mekong Regions
8. Discussion
9. Conclusion and Remark
10. Recommendations

1. FOREST IN THAILAND

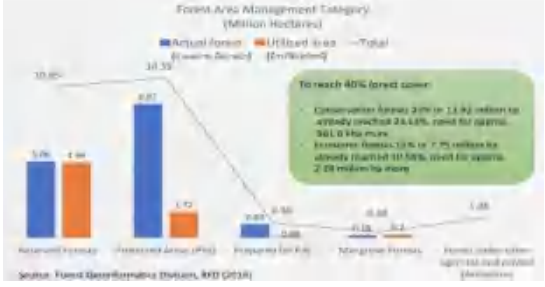


Source: Forest Land Management Bureau, RFD (2018)

❑ ***Forest types:***

- Mixed deciduous forest	**7.5**	**mha**
- Dry evergreen forest	**2.2**	**mha**
- Moist evergreen forest	**1.9**	**mha**
- Dry dipterocarp forest	**1.9**	**mha**
- Montane forest	**1.7**	**mha**

❑ ***Forest area management category***



❑ ***Potential of forest***

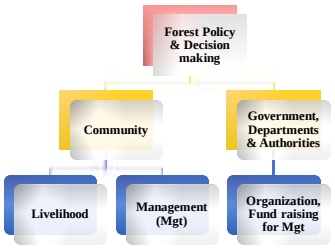
Forests and biodiversity

- Thailand is in Indo-Burma hotspot, the 8th highest biodiversity in the world and the 3rd highest within ASEAN countries (NSTDA, 2011)
- 10% of flora and fauna found in the world (NSTDA, 2011)
- Economic gain for local community 1-4 million baht per community/year or 75,000-300,000 million baht per year (World Bank, 2004)
- Thai herbal products have annual market value between 30,000-40,000 million baht, with an average growth rate for 10-20% per year (ONEP, 2015)

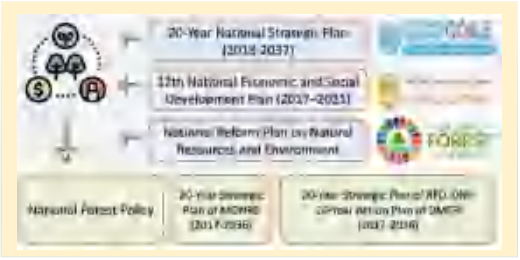
Forest products

- Wood products; wood products export from Thailand worth 98.1 billion baht in 2018 (Customs Department, 2018), and the study of domestic demand for wood products in 2014 was 58 million tons and could increase up to 156 million tons in 2036 (RFD, 2019)
- Non timber forest products; approximately 5 million rural people dwelling nearby forests are partly dependent on non-wood forest products fore their subsistence and extra incomes (RFD, 2009).

2. FOREST POLICY AND DECISION MAKING IN THAILAND



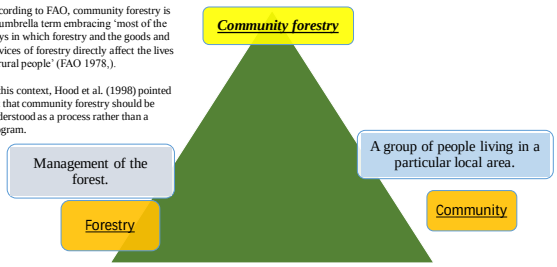
❑ *Forest Policies and Plans*



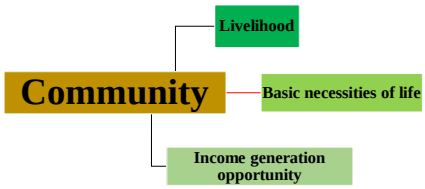
3. INTRODUCTION: COMMUNITY FORESTRY

According to FAO, community forestry is an umbrella term embracing 'most of the ways in which forestry and the goods and services of forestry directly affect the lives of rural people' (FAO 1978,).

In this context, Hood et al. (1998) pointed out that community forestry should be understood as a process rather than a program.



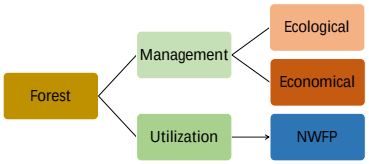
❑ *Rural livelihood and poverty*



Rural livelihood and poverty alleviation have thus become an important argument in advocacy for the adoption of community-based forestry approaches to water resources management (FAO, 2004).

In Thailand like any other country, community forestry has grown rapidly in recent years, and rural livelihood and poverty alleviation is one of the stated goals behind community forestry development.

❑ *Primary Aims & Objectives of C.F*



- ❑ Halt deforestation by maintaining or increasing forest cover (Ogar *et al*. 2003)
- ❑ Development of indigenous people through alleviate poverty (Tewari and Tiwari, 1997; Chijioke, 2003; Ikojo et al., 2003)
- ❑ Promote sustainable development (Agbogidi et al., 2005)
- ❑ Environmental protection (Kirishnaswanny, 1995; Agbogidi, 2005)

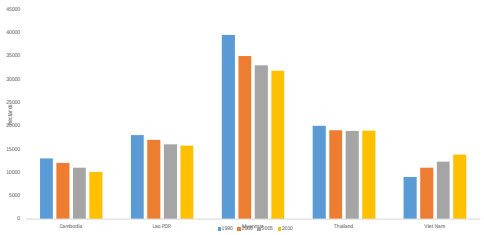
4. FOREST RESOURCE IN GREAT MEKONG REGIONS

Table 1: Area of forest and other wooded land in the GMS in 2010 and rate of change in forest area excluding China

Country	Forest Area 2010 (000 ha)	Forest Cover (%)	Annual Change in Forest Area (%)			Area of other wooded land 2010 (000 ha)
			1990-2000	2000-2005	2005-2010	
Cambodia	10,094	57	-1.1	-1.5	-1.2	133
Lao PDR	15,751	68	-0.5	-0.5	-0.5	4,834
Myanmar	31,773	48	-1.2	-0.9	-0.9	20,113
Thailand	18,972	37	-0.3	-0.1	0.1	0.00
Vietnam	13,797	42	2.3	2.2	1.1	1,125
GMR	90,387	48	-0.5	-0.3	-0.4	26,204

Source: FAO (2010)

❑ *Forest area in GMS countries , 1990-2010 Source: FAO (2010)*



5. COMMUNITY FOREST MANAGEMENT IN THAILAND

There are at least four major types of CF in Thailand:

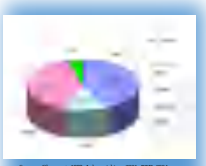
1. Newly organized community protected forests, which have emerged as a response to illegal logging;

2. Monastery (wat) forests, which are restricted areas where plants and animals are protected;

3. Wetland forests, which communities protect to ensure that there is a breeding ground for fish, frogs, and crabs, and a source of bamboo, timber, and fuelwood; and

4. Cultural forests, which have economic, historical or religious significance (Poffenberger, Soriaga and Walpole, 2005).

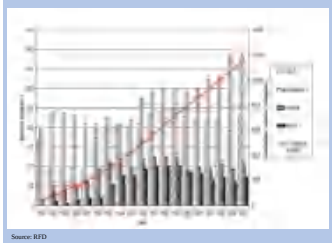
Area of CF projects approved by RFD by region to 2005



Sources: Charoptat, 1998; Lakanavichian, 2001; RFD, 2004

Figures show the areas of CF projects already approved by RFD.

Number of community forest by region, 1987 to 2005



Source: RFD

6. INSTITUTION FRAMEWORK FOR COMMUNITY FOREST MANAGEMENT

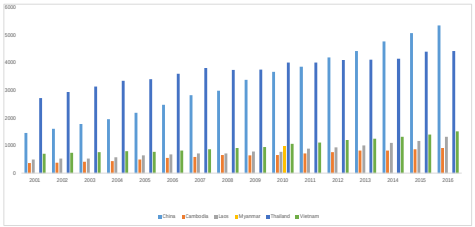
As the name implies, the Bureau of Community Forest Management oversees this programmed. The chain of command and institutional composition are shown in Figure

Administrative flow chart of Bureau of Community Forest Management

Source: http://www.forest.go.th

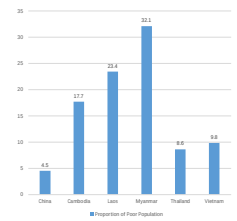
7. ASSESSING THE POVERTY LEVEL IN GREAT MEKONG REGIONS

❑ *Net National Income Per Capita*



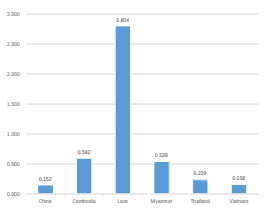
Source: World Bank, 2010

Proportion of Poor population



Source: FAO, 2010

Per capita forest area (hectare)



Source: FAO, 2010

8. DISCUSSIONS

➢ Rural livelihood and poverty alleviation have thus become an important argument in advocacy for the adoption of community-based forestry approaches (FAO, 2004).

➢ In Thailand, community forestry has grown rapidly in recent years, and rural livelihood and poverty alleviation is one of the stated goals behind community forestry development in the country.

➢ I observed that there are three elements that constitute the concept of community forestry in Thailand and the finding is in conformity with Brendler and Carey (1998):

❖ According to Brendler and Carey (1998), the most importantly in this concept, the community should have the right to make their own decisions about their forests.

❖ That is,

❖ McDermott (2009) noted that community forestry reduces poverty only when it adopts a goal to get the benefits.

❖ The poor households are more dependent on non-timber forest products (NTFPs), which make an important contribution to rural livelihood through the use and sale of products (Paumgarter et al. 2009).

9. CONCLUSION AND REMARK

Community forests form a safety net for the rural poor with many people rely on forest resources in these areas and is based on this that these forest dependent people are classified into four groups:

1. People who heavily depend on forests but are more likely to choose agriculture to get out of poverty,
2. people who use nearby forests for some revenue,
3. people who make use of trees on their own land, and
4. process and trade forest products

Hence, if community forestry is to serve well as a vehicle for rural livelihood and poverty alleviation in these areas particularly Thailand, then its potential for doing so must be examined, and course corrections must be made where necessary

9. CONCLUSION AND REMARK (Cont'd)

✓This will plays a key role in rural community development by helping the poor to increase their economic income, reducing their burdens, protecting forest resources, improving the quality of the environment, providing employment opportunities for the people, and therefore facilitating harmony between man and nature.

✓It will also builds the capacity of poor farmers in self-development, self-help and self-management, which is necessary for them to escape from the vicious cycle of poverty.

✓Further, it will serve as a way of training those farmers who have skills to take the lead in fighting poverty.

✓Moreover, through protection and sustainable utilization of natural resources, it will provides village surplus labor and especially women with employment opportunities, which is important for social stability in rural areas.

✓It is through this effort that farmers can increase their incomes and their ability to take care of their basic needs

10. RECOMMENDATIONS

➢ There is a need for government to continue to play a catalytic role by ensuring an effective policies implementations in the rural areas.

➢ Continued support is recommended for:

✓subsidy to local community so as to encourage them to actively participate in forest management

✓Educating and awareness

****

THANK YOU
FOR YOUR ATTENTION!!!

****

NTFPs CONTRIBUTIONS FROM NATURAL FORESTS TO INCOME AND LIVELIHOODS FOR PEOPLE LIVING IN THE BUFFER ZONE OF THE NATURE RESERVE OF VIETNAM

Dr. Phan Van Thang
Vietnamese Reserch Centre for Non Timber Forest Products

November 01-14, 2019, Kunming City, Yunnan Province, China

WORKSHOP ON
FORESTRY AND RURAL LIVELIHOOD DEVELOPMENT IN ASIA AND PACIFIC REGION

NTFPs CONTRIBUTIONS FROM NATURAL FORESTS TO INCOME AND LIVELIHOODS FOR PEOPLE LIVING IN THE BUFFER ZONE OF THE NATURE RESERVE OF VIETNAM

1. Introduction.
2. Objectives and scope
3. Approach and methodology
4. Results
5. Lessons learnt
6. Conclusion
7. Recommendations

INTRODUCTION OF NTFPRC

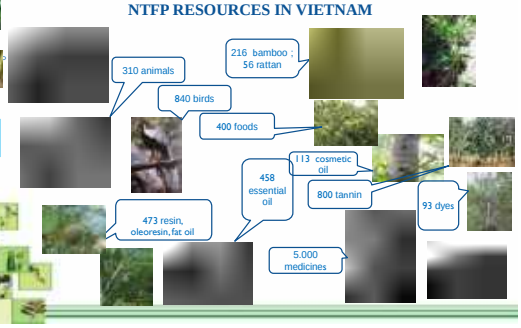
Non Wood forest products Research Sub Institute (20/11/1978) → Research Centre For Non Timber Forest Products (27/09/1995)

- Research Centre For Non Timber Forest Products (NTFPRC) was founded in 1978 and renamed in 1995.
- The NTFPRC is now the specialized institution in charge of NTFP research and under the Vietnamese Academy of Forest Sciences (VAFS).
- The Centre is the "national hub" for R&D on NTFPs in Vietnam.
- Having lots of experience studying NTFP production and market trends.
- Having lots of good cooperation with national and international stakeholders to study NTFP production and market trends for a long time.

INTRODUCTION OF VIETNAM

- Located in the Southeast Asia
- Land area: 33 million ha
- Length: 1,652 km
- Width: 632km of the widest, 42 km of the narrowest
- 2/3 of the mainland territorial area covered by hills and mountains, the highest mountain Fansipan with 3,143m
- There are 2,360 rivers and streams and a coastline of 3,444km
- Climate: Northern hemisphere tropical monsoon, close to equatorial climate, inpacted by the Northest and Southest Asian monsoon
- Population: 96,2 million (in 7/2019)
- GDP: US$ 240.5 billion (in 2018) with GDP per capita of US$ 2,587
- Forest area: 14,491,295 ha
- Natural Forest: 10,255,525 ha
- Plantation: 4,235,770 ha
- Many different types of forests

NTFP RESOURCES IN VIETNAM



INTRODUCTION OF NTFP RESOURCE IN VIETNAM

- NTFPs affect the livelihoods of people living near forests and national economic development.
- NTFPs provide food, medicines, construction materials, income and employment for millions people from ethnic communities living in mountainuos areas.
- Sustainable use of NTFPs is considered an effective solution to improving local community livelihood and conserving forests.
- However, the shortage of information hinders NTFP conservation and development in Viet Nam.

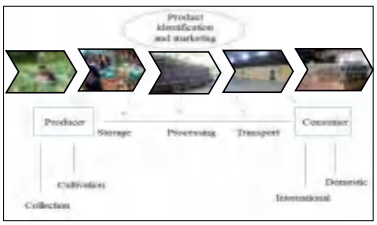
OBJECTIVES

- **Specific objectives are to:**
  - ✓ Learn harvesting and marketing skills for NTFPs (selected) by the local community;
  - ✓ Assess the contribution of NTFPs to HH income;
  - ✓ Identify factors affecting the extraction and consumption of select NTFPs;
  - ✓ Clarify the impact harvesting of NTFPs has on forests;
  - ✓ Provide recommendations on the use, conservation and development of NTFPs.
- **The following questions will be addressed**
  - ✓ How are selected NTFPs extracted & traded by forest adjacent households?
  - ✓ To what extent do selected NTFPs contribute to the HH income?
  - ✓ How does the extraction of selected NTFPs effect forests?
  - ✓ What are the key factors that influence the extraction and trade of selected NTFPs?
  - ✓ How can the selected NTFPs be sustainably used, developed and conserved?.

SPECIES STUDY

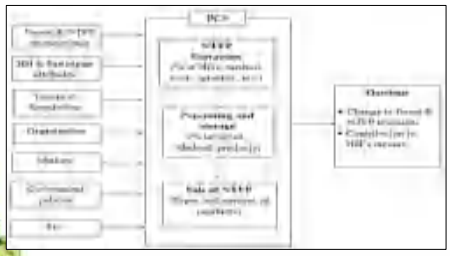
Codonopsis javanica – Son La *Daemonorops poilanei – Quang Tri* *Amomum longiligulare – Kon Tum*

STUDY APPROACH



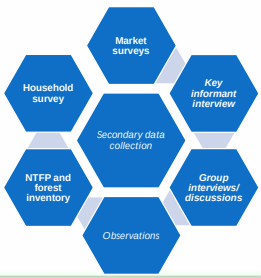
The production-to-consumption system
Source: Belcher and Schreckenberg 2007: 4

RESEARCH METHODOLOGY



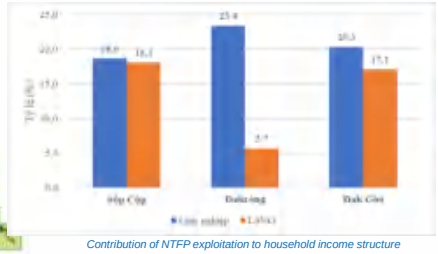
Conceptual framework of research

METHODS OF DATA COLLECTION



RESULTS

Contribution of NTFPs to household income



Contribution of NTFP exploitation to household income structure

Contribution of NTFPs to household income

Contribution rate from major NTFP exploitation, high value to income of each household in the buffer zone of 3 NRs

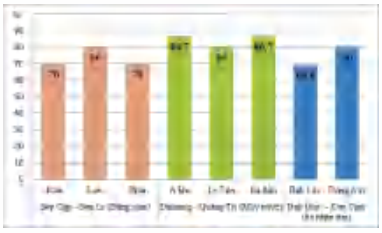
	Location/Place	Contribution rate (%)		Sig
		Poor and reached poor	Average and above	
1	Sop Cop – Son La	8,1	4,8	0,00
2	Đakrong – Quang Tri	6,0	4,2	0,00
3	Ngoc Linh – Kon Tum	16,2	9,4	0,00

Current situation of NTFP exploitation

Characteristics of forests with NTFP resources are often exploited by people in the buffer zone of three NRs

TT	Characteristics	Nature Reserve Sop Cop		Nature Reserve Dakrong		Nature Reserve Ngoc Linh	
		TB	S%	TB	S%	TB	S%
1	Place	buffer zone and core		buffer zone and core		buffer zone and core	
2	The average distance (km)	5,0		4,5		4,8	
3	Forest type	Poor secondary		Rich Secondary		Average secondary	
4	Wood species composition	Castanopsis		Cinamomum		Fabace	
5	Tree density (tree/ha)	408,3	3,5	766,7	2,2	529,5	63,4
6	Height (m)	9,9	7,6	16,2	9,7	12,6	2,4
7	Diameter at breast height (cm)	15,4	2,3	21,8	9,4	20,2	21,4
8	Forest reserves (m^3/ha)	41,7	12,5	208,5	4,4	174,0	47,9
9	Density of regenerated wood (tree/ha)	817,0	35,5	1.466,7	3,9	3.510,5	20,2
10	Density of NTFPs (tree/ha)	325,0	7,7	263,7	10,2	450,0	40,9
11	Production of NTFPs (kg/ha)	65,0	7,7	2.500	9,7	400,0	35,4

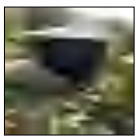
Current situation of NTFP exploitation, processing and consumption



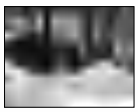
Percentage of households exploiting NTFPs in villages

Current situation of NTFP processing

- Depending on the type of product that people prepare, post-harvest processing varies. It is often not processed by people before selling, but this stage is usually done at purchasing agents in large quantities.
- Purchasing agents often process with 2 main methods which are natural drying or drying in small-scale manual kilns, low efficiency, large fuel consumption, low economic efficiency. Methods of primary processing and processing are mainly at medium scale, equipment and technology are still manual.
- As for NTFP products, it is like fruits of purple *Amomum longiligulare* , most of the people after collecting are sold immediately to the buyers.
- The most NTFPs are exploited are not processed by households that are sold directly to the purchasing agent.

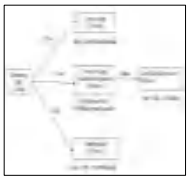


Bulb dried oven



Current situation of NTFP consumption

- The consumption channels of NTFP products in the buffer zone of Sop Cop, Dakrong and Ngoc Linh NRs are quite simple, with few intermediaries, with the participants having diverse functions and capacities.
- The chain has two main NTFP consumption channels.
- Post-harvest NTFP products are sold directly to collectors buying sugar, markets or selling to collection agents. After that, collectors will sell to provincial / regional agents. These agents transport to processors, general agents in big cities or sell Chinese traders directly to transactions in Vietnam for NTFP products as medicinal materials.
- The amount of NTFP consumed through this channel is about 90% of the total production.
- The remainder is collected by dealers directly to processing, trading and import-export establishments in big cities like Hanoi, Da Nang and Ho Chi Minh City.

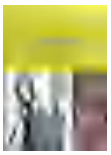


Trading and consuming *Cononopsis javanica* in Kha village

Factors affecting to NTFPs exploitation, processing and consumption

- ***Policy on management of special use forests and buffer zones*** : the 2017 Law on Forestry Protection and Development. These regulations generally stipulate that access/people are used, whether or not the species is exploited, protected, licensed, paid fees, mining taxes, NTFP business processing and sanctions when violating. However, these regulations are not clear and specific for each forest species.
- ***Organization of management, exploitation and consumption:*** 3 main units directly related to the management, exploitation and consumption of NTFPs, including 3 units: Management Board of Nature Reserve, Forest Protection Department and Commune People's Committee. However, in reality, the control of NTFP exploitation and consumption by these 3 units is not strictly implemented and has many limitations.
- ***Market and prices:*** demand, prices, market access, buyers play important roles that directly affects the NTFP exploitation activities of the people. Local collectors are a key actor in the extraction and consumption chain. They have an important role and greatly influence the exploitation and consumption of NTFPs of households and also play a role in determining the price of purchasing and consuming the majority of NTFPs harvested by households in the villages. Market demand and market access also have certain impacts on NTFP exploitation.

LESSONS LEARNT



- Policy

+ It is necessary to promulgate specific and harmonious policies between forest conservation and livelihoods, ensuring income from NTFPs for people living near NR forests, especially for the poor, ethnic minorities and remote areas. Especially, regulations on management and exploitation of NTFPs in natural forests in buffer zone and special-use forests.

+ Continuing to pilot the model of collaborative management for special-use forests for communities and households living in the buffer zones of NRs.

- Management organization: pay attention to well implement regulations related to NTFP management in natural forests in special use forests and outside buffer zones and conservation areas.

- Science and technology:

+ Supporting households and communities living near forests to conserve and develop NTFPs through models of NTFP exploitation conversion in natural forests by NTFP cultivation models on production forest land.

+ Building a model of cooperation in NTFP value chains among the parties, focusing on linking households with collectors, processors and enterprises in each stage of exploitation, processing and consumption.

CONCLUSIONS

- Harvesting and trading system of these NTFP of household in conservation areas is a spontaneous system developed by themselves without a plan, investment and cooperation. Most of the household (70%) in research areas participating in harvesting NTFP activity. A household will harvest NTFP when they have a signal from trader without planning. There is lack of NTFP harvesting plan and forest management plan which developed by the local community.
- NTFP is one of income sources which significantly contribute to the livelihood of local household, and more important for poor households compare to medium and rich households. The contribution of NTFP in total household's income in Sop Cop, Đak Rong and Ngoc Linh are 15,7 %, 5,1% and 12,0 % respectively.
- Market is main factor influence above NTFP harvesting and trading activity by local people who living in conservation areas. The other factors such as forest tenure right, regulation, and existing forest management institution have less effect on NTFP harvesting and trading activities. Middleman is an important link on the chain of harvesting and trading NTFP from forest to the market.
- The unsustainable harvesting activity of *NTFP* cause to the reduction of NTFP resource as well as harm to forest. Thus, the unsustainable harvesting activity will lead to unsustainable of harvesting and trading NTFP system. For long term effect, there would be a lack of NTFP for the market

RECOMMENDATIONS

- Government should pay attention to balance between conservation including NTFP and income from NTFP of local people. Poor management such as lack of investment on conservation lead to degradation of these resource in natural and effect to forest quality as well as forest biodiversity. Moreover, the poor management of NTFP will effect to income of local community.
- Allocating and sharing forest tenure right for local community on forest used and management will encourage local community on forest management, forest protection and sustainably used of NTFP.
- There is a need of supporting and encouraging policy to support local community who living close to forest setup and implement the regulation on forest management.
- Activity such as support and building capacity for the local community to cooperative with state organization on forest management (Forest conservation management board) might be the effective solution to improve management, used and development of NTFP in conservation areas.
- Support local household to conserve and develop NTFP (growth, conservation, protection, harvesting, processing), material support (seedling, fertilize, machine for processing,…).

The government should pay attention to support to build linkage and cooperative models between households, between household with NTFP traders, business and factories on NTFP harvesting, processing, and trading to help local household maximize their benefits from NTFP as well as make the harvesting and trading system is more sustainable.