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SCIENCE-BASED
STRATEGY FOR

ORGANIC PRODUCTION AND MANAGEMENT

OF MAPs/NTFPs IN NEPAL



Proceedings of the
National Workshop held at
Kathmandu, Nepal
27-28 February 2004

Nirmal Bhattarai
Madhav Karki



HMG/Nepal

IDRC  CRDI

MAPPA



CCO



HMG/Nepal

Ministry of Forests and Soil Conservation (MFSC) is the principal agency assigned with the policy-making, project implementation, forest resource management and coordination tasks of the Government of Nepal in the field of forest and related natural resources. It has five functional departments separately for forest, soil conservation, research, wildlife and plant resources and a number of corporations. The ministry has recently set up a national level Herbs and NTFP Coordination Committee chaired by the Minister with members representing all the major stakeholders which will set policies, coordinate research and development activities and carry out, and bring various partners together for achieving the goal of sustainable use of medicinal and NTFP resources.

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The Medicinal and Aromatic Plants Program in Asia (MAPPA) is a program of strategic research, networking and collaboration to comprehensively address critical research issues related to the sustainable and equitable use of medicinal and aromatic plants in Asia. Mappa is a joint initiative of IDRC, IFAD and the Ford Foundation. Through collaboration and partnerships, and based within a regional approach to these issues, MAPPA is involved in formulating and implementing a holistic program which will complement and build on other related research and development activities in South Asia. This will be achieved by supporting strategic research, building partnerships among the key stakeholders including donors, and enhancing regional and international networking.



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LOCAL EXPERIENCE-BASED
NATIONAL STRATEGY FOR
ORGANIC PRODUCTION
AND MANAGEMENT
OF MAPS/NTFPS IN NEPAL

ORGANIC

PRODUCTION

LOCAL EXPERIENCE-BASED NATIONAL STRATEGY FOR ORGANIC PRODUCTION AND MANAGEMENT OF MAPs/NTFPs IN NEPAL

**PROCEEDINGS OF THE NATIONAL WORKSHOP HELD AT
KATHMANDU, NEPAL**

27-28 February 2004

Organized by
Ministry of Forests and Soil Conservation, HMG/Nepal

In collaboration with
Medicinal and Aromatic Plant Program in Asia (MAPPA),

International Development Research Centre (IDRC), Canada,
South Asia Regional Office, New Delhi, India

And

Canadian Cooperation Office (CCO), Kathmandu, Nepal

Editors
**NIRMAL BHATTARAI
MADHAV KARKI**

September 2004

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International Development Research Centre (IDRC)

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FOREWORD

Majority of the developing country population depends on traditional including folk medicines. Modern pharmacopoeias still contain between 25-30% drugs derived from medicinal plants, apart from many others that are synthetic analogues built on prototype compounds isolated from plants. The bulk of the medicinal plant materials traded are still harvested from the wild sources and only a small number of species are cultivated. The expanding and exploitative nature of trade has posed serious challenges to the survival of wild medicinal plant species and ecosystems.

Nepal is a small country by its geographic size, but it is vast in terms of its richness in different aspects of diversity including ethnic, linguistic,

cultural, and biological resources. Plant resources, especially non-timber forest products (NTFPs) including medicinal and aromatic plants (MAPs) have traditionally been the major source of livelihoods to majority of the rural people in Nepal. Due to population growth and increasing domestic and international market demands, recent years have witnessed rapid shrinking of the resource base of these plants mainly due to factors like deforestation, habitat loss, unsustainable harvesting, etc. This frightening trend although witnessed only a few years ago has reached an alarming level of concern today.

The planning and organization of the National workshop on *Local Experience-based National Strategy for Sustainable Production and*

Management of MAPs/NTFPs in Nepal have been supported by the International Development Research Centre (IDRC), Canada and Medicinal and Aromatic Plants Program in Asia (MAPPA) in collaboration with the Ministry of Forests & Soil Conservation (MFSC), His Majesty's Government of Nepal and the Canadian Cooperation Office (CCO), Nepal to address the above issues in a holistic manner. The broader objective of the two-day meeting was to share experiential and practical learning gained by different agencies through their work on various aspects of conservation, management and development of MAP/NTFP sub-sectors to inform and help sound planning, design and implementation of new projects and programs in Nepal. The main aim was, therefore, to discuss, share and develop experience and ideas in a participatory and multidisciplinary manner involving the policy makers, researchers, resource managers, conservation scientists, field workers, development planners and community organizers in a common platform.

The views expressed by the distinguished panel of speakers during the opening session provided an apt setting for sharing knowledge and information by the participating organizations focusing on actual works they are supporting, their programs and policies. The individual researchers' presentation also reflected their rich skills, knowledge and experience in the field of MAP and NTFPs, especially in western Nepal. On behalf of the organizers, I would like to thank the contributors of the papers and the posters for their valuable ideas and experiences.

The aim of this volume is to bring to you a useful collection of papers on various aspects

of medicinal plants and other NTFPs in Nepal. In addition to identifying information gaps and research priorities, it outlines a set of possible interventions at various levels, which could lead to the promotion of an up-scaled version of the successful initiatives. The purpose is also to generate new ideas based on our successes and failures, which could lead to a more bigger and sustainable projects in future. It is our earnest hope that the packaging of the available information will be both of practical and academic use to the readers. However, I should alert the readers that many problems and challenges facing the sustainable development of the MAP sub-sector remain inadequately addressed. They are: a) assessment and management of the resource base; b) sustainable harvesting and processing practices for different species and regions; c) trade and enterprise development issues; and d) aspects dealing with organic production, certification procedures and IPR related issues.

I express my sincere appreciation to the Honorable minister, the Secretary and other officials of the MFSC for their critical support and active participation. The three MAPPA project implementation partners, namely FECOFUN, CECI and ANSAB provided valuable cooperation, leadership and facilities to make the event successful. FECOFUN's staffs deserve special thanks for their efficient management of logistics including the excellent secretarial services provided.

I have great satisfaction to see this document come out within a short span of time. I hope that it will serve as a useful reference for all the partners involved in the development and management of medicinal plants. I am sure that

the report will be useful to government agencies, developmental planners, researchers, NGOs and donor agencies for an enhanced cooperative and collaborative work to make the sub-sector more sustainable and equitable.

Finally, I thank everyone concerned, especially Dr. Nirmal Bhattarai, MAPPA's Nepal Program Coordinator for the excellent technical coordination in bringing out this publication.

Thank you.

Madhav Karki, Ph.D.
Regional Program Coordinator
New Delhi, India
September, 2004

National Workshop

LOCAL EXPERIENCE-BASED NATIONAL STRATEGY FOR SUSTAINABLE PRODUCTION AND MANAGEMENT OF MAPs /NTFPs IN NEPAL

27-28 February 2004, Kathmandu, Nepal

Workshop Organizing Committee

1. Mr. Chandi Prasad Shrestha, Secretary, MFSC: Chair
2. Dr. Damodar Prasad Parajuli, Joint Secretary, MFSC: Member
3. Dr. Uday Raj Sharma, DG, DPR: Member
4. Dr. Madhav Karki, Regional Program Coordinator, IDRC/ MAPPA: Member
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10. Ms. Julia Snachez, CECI-Nepal: Member
11. Mr. Sagendra Tiwari, IUCN-Nepal: Member
12. Dr. Nirmal Bhattarai, Nepal Program Coordinator, IDRC/MAPPA: Member Secretary

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STATEMENTS

INAUGURAL STATEMENTS

INAUGURAL

MENTS

WELCOME STATEMENT

*Damodar Prasad Parajuli, Ph. D.
Chief, Foreign Aid Coordination Division
Ministry of Forests and Soil Conservation
His majesty's Government of Nepal*

Chairperson of this Inaugural Session & Forest Secretary Mr. Chandi Prasad Shrestha, Chief Guest & Honourable Minister of Forests and Soil Conservation Mr. Sarbendra Nath Shukla, distinguished guests, participants, ladies and gentlemen:

It is my honour and privilege to welcome the Chief Guest and all the distinguished guests and participants attending this two-day National Workshop on *Local Experience-based National Strategy for the Sustainable Production and Management of MAPs/NTFPs in Nepal*.

The importance of non-timber forest products (NTFPs) including medicinal and aromatic plants (MAPs) in poor and remote area peoples' livelihoods needs no emphasis. As NTFPs are

critical to their existence, involving local communities in the conservation and sustainable production and management of these resources should not be a very difficult task. However, there are ways to achieve this goal. We need to build the capacity of the local resource managers, by assisting and empowering them technically, socially, economically and managerially.

The ministry has been emphasizing the conservation and sustainable use of medicinal plant resources for both local health and rural livelihoods in recent years. The setting up of the high-level Herbs and NTFP Coordination Committee (HNTFPCC) under the leadership of the Minister of Forests and Soil Conservation, I believe, is a clear reinforcement of this policy.

We are committed towards the holistic development and management of the NTFP sector in the country with required policy reforms and administrative streamlining. During the last few years we have observed a phenomenal increase in the number of NTFP-oriented projects, workshops and seminars in the country with different set of recommendations to improve this sector. The Herbs and NTFP Coordination Committee has duly considered the practical recommendations in its recently drafted NTFP Policy which is expected to be approved by the government soon.

I am pleased to have received an overwhelming response to our joint invitation for this workshop by different experts, government officials, NGO representatives, international organizations, community-based organizations, farmers, traders and representatives from private sector concerns. We are also happy to have guest colleagues from India. The present workshop is aimed at discussing and recommending local and regional experience-based national strategy for the sustainable production and management of medicinal and aromatic plants and other non-timber forest products in Nepal. I very much look forward to getting valuable ideas and recommendations from this gathering of scholars and experts that could further help the Ministry of Forests and Soil Conservation and the HNTFPCC for improving the policies and practices of the Ministry.

On this occasion, I am privileged to welcome our distinguished Chief Guest, the Honourable Minister of Forests and Soil Conservation Mr. Sarbendra Nath Shukla, who kindly agreed to grace the ceremony and inaugurate it despite

his busy schedule. I sincerely appreciate the efforts of IDRC including MAPPA, Ford Foundation and the Canadian Cooperation Office (CCO) in Nepal for joining hands with the Ministry of Forests and Soil Conservation, His Majesty's Government of Nepal in organizing this important National Workshop.

Once again, on behalf of the organizers and myself, I would like to extend a very warm and cordial welcome to you all, and wish the workshop a grand success.

Thank you.

INAUGURAL STATEMENT

*Roger Finan
Regional Director
IDRC, SARO
New Delhi, India*

Mr. Chair, Chief Guest, the honourable Minister of Forests and Soil Conservation, Mr. Sarbendra Nath Shukla, Mr. Jean Marc Mangin, Mr. Rawat, Dr. Parajuli, distinguished participants, ladies and gentlemen,

On behalf of the International Development Research Centre, Canada, it is my pleasure to welcome you to this National Workshop on Local Experience-based National Strategy for Sustainable Production and Management of Medicinal and Aromatic plants / Non-timber Forest Products in Nepal. IDRC is pleased to join hands with the Ministry of Forests and Soil Conservation, Canadian Cooperation Office (CCO) and MAPPA-Nepal partners ANSAB, CECI and FECOFUN in organizing this

important National Workshop. I am very happy that our other partners ICIMOD and IUCN have also collaborated our regional effort. I welcome this multi-donor, multi-partner collaboration and am very happy that a number of senior level government officers, foresters, scientists, researchers, donor representatives, private sector partners and civil society workers are participating in this national level meeting.

I am also very pleased to see the presence of Mr. R.B.S. rawat, the CEO of the National Medicinal Plants Board (NMPB) of India in this workshop. This I consider is an example of south-south cooperation which IDRC takes pride in championing throughout the developing world.

IDRC - the International Development Research Centre, an agency of the Government of Canada, helps researchers and communities in the developing world find solutions to their social, economic, and environmental problems. IDRC connects people, institutions, and ideas to ensure that the results of the research we support and the knowledge that research generates are shared equitably among all our partners, North and South.

IDRC supports three main program areas of research for development:

1. Information and Communication Technologies for Development
2. Social and Economic Equity Program
3. Environment and Natural Resources Program

Over the last two decades, the importance of medicinal and aromatic plants (MAPs) and other NTFPs have been increasingly recognized as a key component of health, biodiversity and peoples' livelihoods. These products have been playing a unique role in preserving and improving human health, social well-being and rural livelihoods. This is especially true in the mountain country like Nepal. Globally, the demand for Medicinal and Aromatic Plant Products is increasing both in volume and value. A diverse group of products and services are based on medicinal and aromatic plants: medicines for local health care systems, foods, nutritional supplements, therapeutic services and health tourism, a few names to mention, mostly issues, which are of interest to us at this national workshop.

The importance of medicinal and aromatic plant resources in Nepal's socio-economy,

cultural heritage and biodiversity conservation needs no emphasis. However, Nepal is facing a growing and serious threat to its rich biodiversity due to increasing demand for food, fuelwood, fodder, timber, and medicinal products and grazing under conditions of growing populations and shrinking per capita land resources.

IDRC has a global program on medicinal plants. Established in 1998, the Medicinal and Aromatic Plants Program in Asia (MAPPA) has the South Asia focus. It is one of our most successful initiatives and has become a multi-donor activity with Ford Foundation, IFAD and the Canadian CIDA, all closely collaborating with IDRC.

MAPPA's mission is to *develop, provide and promote* appropriate and wise practices, critical information, sound technologies, ethical trade and business activities, and appropriate conservation and development solutions of medicinal plants to benefit the poor and indigenous peoples of South Asia. Our goal is to enhance the quality of life of poor and disadvantaged people in uplands and fragile eco-regions and to have favourable impacts on the quality of health, the livelihoods and the environment of poor and marginalized communities.

To closing, we at IDRC, Canada are very pleased to collaborate with government, NGOs, and the private sector in Nepal and the region. Our collaboration and partnership with the Ministry of Forests and Soil Conservation, HMG/Nepal, are based on a mutual interest to help develop a multi-stakeholder process in forest resource management including medicinal plants. We also work with NGO/INGO partners and

increasingly with civil society, CBOs and private sector partners so as to achieve greater impact on poverty alleviation and environment conservation.

It is heartening to find participation from a wide ranging organizations and agencies in this workshop. I am convinced that your vast experience and diverse knowledge will help achieve the objectives of the workshop.

Finally, I would like to congratulate the Ministry of Forests and Soil Conservation, the Canadian Mission in Nepal and MAPPA's Nepal partners for organizing this workshop in a coordinated manner. And, on behalf of IDRC, I warmly welcome you in this meeting.

With my best wishes for success.

Thank you.

INAUGURAL STATEMENT

Jean Marc Mangin
CIDA Representative,
First Secretary (Development) and Consul

Honorable Chief Guest Hon. Minister for Forests and Soil Conservation Mr. Sarbendra Nath Shukla, Secretary, Ministry of Forests and Soil Conservation Mr. Chandi Prasad Shrestha, Dr. Damodar Prasad Parajuli, Head, Foreign Aid Coordination Division, MFSC, Mr. Roger Finan, Regional Director, IDRC, Dr. Madhav Karki, Regional Program Coordinator, IDRC and Distinguished Guests and Participants:

- A diverse range of Non-Timber Forest Products (NTFPs), especially Medicinal and Aromatic plants (MAPs), found more abundantly in the middle hills, high mountains and Himalayan ranges in Nepal are known to provide basic health care needs as well as critical livelihood support

to the rural disadvantaged communities living in these fragile ecosystems. NTFPs comprise range of resources that could be capitalized to enhance the livelihood of the people.

- From the significant baseline work carried out in the area of NTFPs in Nepal, for example enumeration of NTFP species, distribution, ethno-biological studies, markets, micro-enterprise development, etc., it is clear that NTFP/MAPs can play significant role in upliftment of rural livelihood. Approximately 13,000 tones of NTFPs are harvested in hills and mountain of Nepal and sold in India for millions of US\$ per year.

- The impressive paradigm shift in resource management has created opportunities to tap the huge potential. The handing over of a significant part of the national forests of more than one million hectares to more than 13 thousand Community Forest User Groups (CFUGs) involving more than one million households in the last seven years is a great success story that needs continuous support and provides sound foundation for sound economic development
- Since 1980, CIDA has been supporting community-based development, which includes rural livelihood and community health.
- Efforts of Ministry of Forests and Soil Conservation, IDRC/Ford, CECI, ANSAB, FECOFUN are laudable. Looking into the future, we can ask ourselves several questions:
 - a. What are some of the lessons/experience from the ongoing "Conservation of Medicinal and Aromatic Plants for Sustainable Livelihoods" project in Baitadi and Darchula districts, Far Western Development Region, to be completed in March 2004 that can build more robust projects?
 - b. What is the relevance of NTFPs in bringing about social justice resolution?
- 2. The combination of natural conservation (*In situ*) and conservation through cultivation (*Ex situ*) are required for sustainable harvesting.
- 3. There are untapped opportunities for processing, market information and products marketing through different channels to make significant improvements in the livelihoods of poor people in the remote areas.

Based on ongoing learning process, NTFPs/ MAPs sustainable conservation and management for rural livelihoods has tremendous opportunities for creating development of rural economy. This is fully consistent with Nepal's 10th Plan.

Finally, I wish you the best that this 2-day workshop will produce meaningful, realistic and practically implementable national strategy for NTFPs/Medicinal and Aromatic Plants conservation and economic development that will benefit the needy rural communities of Nepal.

Thank you.

May I suggest the following points:

1. The public/private partnership (Government/INGO/Donor/NGO) can work at central, district, village community level.

BRIEF REMARK ABOUT THE WORKSHOP PROGRAM

*Madhav Karki, Ph.D.
Regional Program Coordinator
IDRC, MAPPA, SARO
New Delhi, India*

Chair of the session Secretary Mr. Chandi Prasad Shrestha, Respected Chief Guest, the honourable Minister of Forests and Soil Conservation; Mr. Jean Marc Mangin, Head of the Canadian Mission in Nepal, Director Roger Finan, esteemed colleague Mr. R.B.S. Rawat, CEO, NMPB, India; Dr. Damodar Parajuli, Head of the Foreign Aid Coordination Division, MFSC, distinguished participants, ladies and gentlemen:

More than 1600 plant species have been recorded as Medicinal and Aromatic Plants (MAPs) in Nepal. More than 100 species of Non-timber Forest Products (NTFPs) are harvested from different parts of the country. These NTFPs are mostly traded to Indian markets and some are sold overseas. In recent

years, their importance has witnessed opportunities on many fronts - food, medicine, dietary supplements, cosmetics, and health tourism to name a few. His Majesty's Government of Nepal has recognized MAPs/NTFPs as one of the most potential sub-sectors for rural livelihood enhancement and poverty alleviation. These products are also being managed as vehicles to conserve nation's valuable biodiversity. The setting up of the Herbs and NTFP Coordination Committee (HNTFPCC) is one of the major policy steps taken by the government to develop this sub-sector.

IDRC, Canada through its regional program has been supporting research in this area since 1998. Currently it is piloting conservation and

livelihood oriented MAP/NTFP Project in Baitadi and Darchula districts of Nepal. CCO and Ford Foundation are also supporting this project, which is being implemented by ANSAB, CECI and FECOFUN. Multi-tier coordination committees guide this project from national to local level to link research to policy and key diverse stakeholders including policy makers, development organizations, line agencies, research institutions, producers, buyers and processors. The deliberations of the workshop will hopefully lead to a broad-based strategy, practical methodology and multi-sectoral implementation framework for the NTFP sub-sector.

All the papers have already been internally reviewed and are being circulated to the participants for further review, discussions, comments and suggestions. Based on these papers, a Resource Book will be brought out for use by all partners. In order to conduct focused deliberations, three working groups are planned. The adopted recommendations will be submitted to the Ministry, which we hope, will be an important input to the ongoing NTFP sector policy formulation and implementation process. It will also be shared with all the INGOs, NGOs, CBOs and private sector concerns for use in their work. The IDRC, MAPPA and CCO partners will be using the outcome as the guidelines to prepare their second phase program.

In closing, I would like to thank the Ministry, especially the honourable Minister and the Secretary for the able leadership, inspiring guidance and purposeful direction they have provided in planning and organizing this workshop. I am sure this meeting will generate

new and practical tools, which will help us all to move forward.

Thank you for your kind attention.

BRIEF REMARK

R.B.S. Rawat
Chief Executive Officer
National Medicinal Plants Board
Government of India

Respected Chairperson and Secretary Mr. Chandi Prasad Shrestha, Chief Guest, the honourable Minister of Forests and Soil Conservation Mr. Sarbendra Nath Shukla; Mr. Jean Marc Mangin, Head of the Canadian Mission in Nepal; IDRC's Regional Director Mr. Roger Finan; Dr. Damodar Parajuli, Head of the Foreign Aid Coordination Division, MFSC, MAPPA Coordinator Dr. Madhav Karki; distinguished participants, ladies and gentlemen:

The National Medicinal Plants Board, Government of India (NMPB, GOI) was set up under a Government Resolution notified on 24th November 2000 under the Chairpersonship of the Union Health & Family Welfare Minister. Presently, various activities

and programmes related to diverse issues concerning medicinal plants are being pursued independently by numerous Ministries, Departments/ organizations, but there is inadequate coordination and an absence of a focused approach. An appropriate mechanism for coordination and implementation of policies relating to medicinal plants both at the Central and State levels is necessary to facilitate inter-Ministry, inter-State and institutional collaboration and to avoid duplication of efforts.

The activities of the Board would be focused in the following areas:

- Registration of farmers/cultivators and traders of medicinal plants to be entrusted

to the respective State Medicinal Plants Board/Vanaspathi Van Societies;

- General and specialized surveys of the international market for medicinal plants and products to be undertaken for identifying niche areas;
- Manufactures, NGOs and representative individuals to be supported for participation in international fairs, seminars & meeting with a view to create awareness and explore the international market for plant based herbal products;
- Simplification of Transit Permit/legal procurement certificate for transportation of raw drugs;
- R & D studies in the areas of post harvest management, shelf-life, storage and simple agro-techniques to be evolved with the involvement of CSIR, NBRI, CIMAP, ICFRE, RRLs, DBT, Horticulture and Forest Department;
- Constitution of State Medicinal Plants Board in every State/Union territory of the country for overall development of medicinal plants sector;
- The 32 Prioritized Medicinal Plants, which are in great demand both in domestic and international markets have been identified for cultivation, conservation and development, as per recommendations of various committees at national level.

During the first year of the Board's activities, *in situ* conservation was the priority. In the second year, *ex situ* cultivation and management has received higher priority. So

far 23,500 acres of land has been brought under medicinal plant cultivation. The Board is also building its program on the strength of India's leadership in Information Technology sector, Biotechnology, Scientific reach and dairy.

The NMBP, GOI is looking forward to work with the counterpart agency as well as other research, academic and line ministries of His Majesty's Government of Nepal. I am highly thankful to the Ministry of Forests and Soil Conservation for inviting me to share and learn from the Nepalese officials and scientists on different aspects of potential collaboration between our two countries. I am also highly appreciative of IDRC-MAPPA's efforts in developing regional collaboration and cooperation.

I wish the national workshop a grand success.

Thank you.

INAUGURAL SPEECH

*Hon. Sarbendra Nath Shukla
Minister of Forests and Soil Conservation
His Majesty's Government of Nepal*

Mr. Chairman, distinguished guests, ladies and gentlemen:

First of all, I am very happy to inaugurate this two-day National workshop on sharing national experience organized jointly by the Ministry of Forests & Soil Conservation, International Development Research Centre (IDRC), Canadian Cooperation Office (CCO) and the Conservation of Medicinal and Aromatic Plants for Sustainable Livelihoods (CMAPSL) project partners. Over the last two decades, the importance of medicinal and aromatic plants has been increasingly recognized as a key component of health, biodiversity and peoples' livelihoods in Nepal. These plants and other non-timber forest products (NTFPs) have been playing a

unique role in preserving and improving human health, socio-economic well being and rural livelihoods of our poor people. This is especially true in the hilly and remote regions of our country where other alternates are scarce.

Globally, the demand for Medicinal and Aromatic Plant products is increasing both in volume and value. Nepal being a bio-culturally rich country, it has very high potential to produce and trade a diverse group of non-timber forest products and services such as medicines, foods, nutritional supplements, therapeutic services and health tourism. However, Nepal's experience in this sector has not been very successful due to various reasons.

As demand and trade increased over time, habitat destruction in our forests and pastures

accelerated. It has resulted in serious threats to both the biological resources and the livelihoods of our people. Many of our people, who have been traditionally dependent on MAPs for health and livelihood, represent disadvantaged groups, often women, dalits and indigenous or tribal peoples, living in extremely marginal socio-economic and natural environments. Many of our valuable endemic species and their genetic diversities are being lost rapidly, through habitat destruction, non-sustainable levels of harvest, and inadequate policies. This is fuelled in part by poor economic development and lack of capacity in rural communities. Lack of market, technical and scientific information and infrastructure are another serious bottleneck.

Furthermore, knowledge and use of these plant resources and our traditional medicine such as Ayurveda and other folk medicine related traditional knowledge systems are also being threatened by rapid socio-cultural changes in our society. The consequences have been: a decreasing availability of the MAPs and NTFP resources, both for local consumption and markets, a lack of systematic scientific research, poor institutional support and uncoordinated development of the Medicinal Plants and NTFP sub-sectors. As a consequence, conservation of the biodiversity and sustainable use for health and livelihood has both become collective concerns for His Majesty's Government of Nepal. This concern led to the setting up of the National-level Herbs and NTFP Coordination Committee (HNTFPCC) under my chairmanship with its secretariat in the Department of Plant Resources.

In a short span of about a year, I am very happy to say, HNTFPCC has made good progress in

developing a draft NTFP Policy for Nepal as well as in establishing good linkages with NGOs, donors and research institutions both within and outside the country. I am very happy that the CEO of the National Medicinal Plants, Government of India is attending this workshop as our guest. His knowledge and experience, I am sure, will be useful to the HNTFPCC to plan its future institutional and program development.

I am also happy to note that IDRC, Canada and CCO mission in Kathmandu along with a number of INGOs like ICIMOD and IUCN, NGOs and government agencies like HPPCL have been supporting action research in this area that aims to link livelihoods with sustainable management of MAP resources. I understand that the projects funded through IDRC's Medicinal and Aromatic Plants Program in Asia (MAPPA) in remote Dachula and Baitadi districts will be one of the key highlights of this workshop. My own ministry is also promoting a multi-stakeholder and community-based approaches in the research and development of this sector. This policy we believe, will lead to the sustainable use of the resources and help in improving the conditions of rural and marginalized peoples. His Majesty's Government of Nepal also recognizes the importance of medicinal plants for use as a local primary health care and the interconnection with issues relating to social equity and justice. Clearly, these issues are not mutually exclusive and future action research projects must address them holistically.

In closing, once again, I am very pleased to be part of this national and regional experience-sharing workshop. We in the MFSC are looking forward to establishing collaboration and

partnership with national and international partners, especially with the institutions in our friendly neighbour India based on a mutual interest and collective goal of safeguarding Himalayan biodiversity wealth and alleviating poverty and human sufferings of our people. I am sure, the two-day deliberations of the workshop will provide clear directives to all of us to design and implement better programs and projects in the sector of MAPs and NTFPs.

I congratulate the organizers for organizing this meeting, and wish you all a grand success.

Thank you.

WELCOME SPEECH & CLOSING REMARKS FROM THE CHAIRPERSON

Chandi Prasad Shrestha
Secretary
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Chief Guest and Hon. Minister of Forests and Soil Conservation Mr. Sarbendra Nath Shukla, distinguished guests and participants:

As the Secretary of the Ministry of Forests and Soil Conservation, His Majesty's Government of Nepal as well as Chairperson of the Workshop Organizing Committee, it gives me a big pleasure to address this inaugural gathering of the National Workshop on Local experience-based national strategy for conservation and sustainable management of MAPs/NTFPs in Nepal, organized by my Ministry in collaboration with IDRC-MAPPA and Canadian Cooperation Office. I would like to extend our warmest welcome to all the distinguished guests and participants.

His Majesty's Government of Nepal has attributed high priority to biodiversity conservation for economic development in the country. Medicinal and aromatic plants (MAPs) are high value and low-volume cash commodities that are most suitable to meet subsistence and commercial goals of the rural economy. These NTFPs constitute one of the six programs in the Forestry Sector Master Plan of His Majesty's Government of Nepal. Seven NTFP sub-sectors are highlighted for promotion, viz. medicinal and aromatic plants, Daphne paper, pine resin, katha, sabai grass, canes and bamboo. The highly liberal small-enterprise development policies adopted by our Government, I hope, will help promote non-timber forest products in the country.

It is well known that majority the rural Nepalese people depend on wild medicinal plants for the major part of their health care needs. Apart, the collection and trading of MAPs and other NTFP resources have been providing a steady source of income in the rural areas of the country. The Forest Policy implemented by our Government puts greater emphasis on community participation in the management of forest resources. The fast growing forest-user group system in Nepal will assist in this by acting as the key stakeholders. The Government has fully recognized the importance and potentialities of NTFP/MAP resources as key components of health services, biodiversity conservation and rural livelihood enhancement, as well as significant contributor to poverty reduction in the country.

In Nepal, considerable number of institutions and agencies are involved in the conservation, development and sustainable management of these renewable natural resources. However, it has been experienced that the immense potentials have not so far been fully recognized and exploited. Despite a number of initiatives underway, there remains much to be done. In my view, this workshop is both timely and of immense importance to the people and environment of this country. It is timely because the rapid deterioration of biological resources in the country threatens to impact all of us. It is of immense importance to the local people, because there is a more urgent need than ever to uplift the critical socio-economic quality of the lives of people in the rural areas, which proper management and wise use of these resources may serve to accomplish. I am sure this workshop will significantly advance the efforts currently underway in these areas.

I would like to thank the distinguished guest speakers Mr. Roger Finan, Regional Director, IDRC; Mr. Jean-Marc Mangin, Head of CCO in Nepal; Mr. R.B.S. Rawat, CEO, National Medicinal Plants Board, Government of India and Dr. Madhav Karki, MAPPA Coordinator for their useful and encouraging statements.

Moreover, as representatives of international organizations, government organizations, NGOs, CBOs, universities and research institutions are gathered here, you have a unique opportunity in this forum to share your knowledge and practical experiences in Nepal's NTFP/MAP sector. This workshop is expected to come up with recommendations that, besides helping the government implement sound programs, could also facilitate formulating practically feasible national strategies for the holistic development of the NTFP/MAP sector.

Finally, I would like to thank the Workshop Organizing Committee members for their hard work and efficient management efforts. I would also like to thank IDRC-MAPPA and its partner organizations in Nepal - ANSAB, CECI and FECOFUN for their contributions necessary for this workshop.

I wish the workshop a grand success.

Thank you.

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ORAL PRESENTATION

THEM

PAPERS

STRATEGIES FOR WORKING TOGETHER

Nepal - India Collaboration for the Development of Medicinal Plants Sector

*RBS Rawat
Madhav Karki*

BACKGROUND

The Himalayas are vast, gigantic, diverse and youngest mountain system in the world. The expression – Himalaya – evokes glory and some sort of exoticness of the subcontinent on several planes: spiritual and philosophical as well as materialistic, economic and ecological. Himalayas give birth to our mighty rivers, regulate climate of the entire sub-continent and are home to world's unique biodiversity wealth. There are several valuable plant and animal species, minerals and diverse mix of human societies exclusive to the region with unparalleled bio-cultural and natural diversity. However, the difficult and rugged terrain and inhospitable and extreme climates coupled with other topographical

factors seem to impede the pace of development in the region. While there are several sub-regions intensively subjected to severe environmental degradation, many resource rich pockets still exist. Medicinal plants rich eco-regions are one of the examples, which is the subject of this paper.

The Himalayas on account of its vastness and distinct entity have biological, social and ethical diversity and problems that have far reaching local, regional and even global importance, which deserves action on priority basis. The magnitude of problems directly or indirectly related to environment and development vary from place to place. Much is known about the origin and consequences of these problems but

what remains to be done is to find out workable solutions to these multiple problems. Recurrent soil erosion, flooding and biodiversity loss are few common problems that can be listed as those needing urgent attention.

More than 3000 kms in length and 300 kms wide, the Himalayas are spread over many states of India, viz. Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya and a part of Assam and one district of West Bengal as well as Nepal and Bhutan apart from other countries. The region is characterized by sparse population, undulating terrain, far – flung small villages difficult to approach, tiny and scattered land holding more so on slopes with unstable soils, agro – pastoral economy, scanty irrigation, little use of modern technology and inputs, low productivity, etc. These difficulties, coupled with almost no industrial development and thereby low employment potential, stimulate local young men to seek employment away from their homes. The problem of youth moving to cities gets aggravated in the areas where an inhospitable climate combines with continuous neglect of their native land and their people's well being by their governments. Agriculture is the primary occupation of the people all through the region, which unfortunately has not seen the benefits of the so-called green revolution technologies.

The small size of holding in the Himalayas is combined with low productivity, adverse climates, poor education and lack of skilled people to manage agriculture.

This inaccessibility, marginality and fragility have fostered local inhabitants to depend on locally available resources for survival, leading to an extremely rich indigenous knowledge of resources such as medicinal plants among the traditional hill societies. Medicinal uses of plants widely vary among the hill societies isolated by linguistic, cultural and terrain barriers. To sum-up we can say that Himalayas are rich lands inhabited by poor people.

Medicinal plants constitute 80 % of raw material for preparation of traditional drugs. In modern drugs also, they contribute at least 25%. In the wake of rapid growth in the global and domestic demand for the medicinal plants, the traditional drug industries in the region are constantly facing the problem of decrease in raw material supply and its quality. This is specifically true in India and may be so in Nepal as well.

MEDICINAL PLANTS SECTOR IN INDIA AND IN THE HIMALAYAN REGION

India is rich in all the three levels of biodiversity, such as species diversity, genetic diversity and habitat diversity. There are about 426 biomes representing different habitat diversity that gave rise to one of the richest centres of bio-diversity in the world for plant genetic resources. Although the total number of flowering plant species is only 17,000, the intra – specific variability found in them makes it one of the highest in the world.

Medicinal plants are used at the household level largely in a self-treatment mode. One and a half million practitioners of Traditional Medicine use medicinal plants in preventive/

promotive and curative applications. There are about 5 lacs registered practitioners of Traditional Medicine using medicinal plants in the codified streams. Further, there are 9000 registered pharmacies of Traditional Medicine and a large number of unlicensed small-scale units. Besides meeting national demands, they cater 12% of global herbal medicine trade.

Thousands of medicinal and aromatic plant species have been reported so far from the Himalayan region. A majority of them are on continuous decline in their number and abundance. Threat assessment exercise as per various CAMP exercises has listed around 200 species of medicinal plants under various degrees of threat. CITES has notified 14 Indian medicinal plants in its schedule and in 1988, the Government of India has restricted the export of 29 species, which are believed to be

threatened in the wild (Table 1). Two hundred and fourteen species have been declared endangered, a large number of them belonging to the entire Himalayan region and 37 species have been entered into the schedule I of the Indian Wildlife Protection Act 1991, which needs priority attention. Considering the gravity of the situation from the loss of phyto-diversity standpoint, North-East Himalayas has been declared as one of the 18 biodiversity hot-spots of the World.

Realizing the ecological importance and economic utility of medicinal plant resources there is growing concern throughout the world about the need of their long-term conservation. During the recent past such concern has found expression in the establishment of several national and international initiatives and

Table 1. Species of plants relevant to Nepal & India that are listed in CITES appendices

SL.	SCIENTIFIC NAME	ENGLISH NAME	NEPALI NAME	APPENDIX
1.	<i>Ceropegia pubescens</i>	Milkweed	Mirkelahra	II
2.	<i>Cyathea spinosa</i>	Tree Fern	Unau	II
3.	<i>Cycas pectinata</i>	Cycas	Kalwal	II
4.	<i>Dioscorea deltoidea</i>	Potato Yam	Van Tarul	II
5.	<i>Orchidaceae spp.</i>	Many Species of Orchids	Sungabhahru	II
6.	<i>Picrorhiza kurroa</i>	Picrorhiza	Kutki	II
7.	<i>Podophyllum hexandrum</i>	May Apple	Laghupatra	II
8.	<i>Rauvolfia serpentina</i>	Serpentine	Sarpgandha	II
9.	<i>Taxus wallichiana</i>	Himalayan Yew	Launth Salla	II
10.	<i>Gentium montanum</i>	Gnetum	Bhotelahara	III
11.	<i>Meconopsis regia</i>	Himalayan Yellow Poppy	Kyasar	III
12.	<i>Podocarpus neriifolius</i>	Podocarpus	Gunsi	III
13.	<i>Talauma hodgsonii</i>			III
14.	<i>Tetracentron sinense</i>	Tetracentron	Jharikote	III

committees such as Genetic Resource Conservation Initiatives of the CBD and WHO committee on Good Agriculture and Field Collection Practices (GAFCP). Various programs have been launched and some measures have been taken to conserve the natural resources in the Himalayas.

INITIATIVES TAKEN BY THE GOVERNMENT OF INDIA

In India, for the last many years, various Ministries/Departments and Organisations have been dealing with various issues relating to medicinal plants, and a need was felt to strengthen coordination and develop linkage relating to the activities taken up by individual stakeholders. Concerns have also been expressed about the erosion and degradation of bio-diverse resources, un-sustained availability of quality raw drugs, high and fluctuating prices, improper marketing, lack of organized cultivation, secretive nature of trade and the small share in the export market.

The medicinal plants sector at present is not well organized and needs special attention. Although different Ministries and Departments in the Government sector and NGOs and individuals in the private sector are making efforts in different directions, there is a need to better coordinate and systematize these efforts. An appropriate mechanism for coordination and implementation of policies relating to medicinal plants both at the National and State levels is necessary to facilitate inter-ministry, inter-state and institutional collaboration and to avoid duplication of efforts. Therefore, a need for the establishment of a national level nodal body was felt to formulate a comprehensive policy

for the medicinal plants sector and develop the potential of this sector through schemes and projects that encourage investment in this sector.

In response to these growing problems and recommendations of various national meetings, the Government of India in the year 2000, decided to establish an independent body called "**National Medicinal Plants Board (NMPB)**" under the Chairpersonship of the Minister of Health & Family Welfare. The Board's functions include coordination with Ministries/Departments /Organisations/State/ Union Territory government for development of medicinal plants in general and assessment of demand/supply, policy matters, guidance, inventorisation, promotion of conservation/cultivation, promotion of cooperative efforts, dissemination of information on matters relating to import/export, value addition, research and development, agro-technology development, IPR protection related issues, etc. Under the Traditional Knowledge Digital Library (TKDL) project of the Council for Scientific and Industrial Research (CSIR), a Comprehensive Ayurvedic Knowledge database has already been released in five languages.

The objective of establishing the Board is to establish an agency which would be responsible for coordination of matters related to medicinal plants, including drawing up policies and strategies for conservation, proper harvesting, cost-effective cultivation, research and development, processing, marketing of raw material in order to protect, sustain and develop this sector.

The implementation work would continue to be carried out by the respective departments

and organizations but the Board would coordinate and provide a direction and an impetus to the activities. A number of academic and research institutions as well as NGOs have also been carrying out promotional and capacity building work in different parts of the country (Prajapati et al. 2003).

National Medicinal Plants Board (NMPB) has launched **Promotional** and **Commercial** schemes for all kinds of stakeholders. These schemes include production of quality planting material, conservation, extension, marketing, inventorisation, R&D, value addition semi-processing, etc. To achieve these objectives so far 30 State Medicinal Plants Boards (SMPBs) have been established. During last two years more than 1000 projects have been sanctioned worth Rs. 45 crores in different parts of India. About 25,000 acres of land has been brought under cultivation of commercially important species like – Amla (*Phyllanthus emblica*), Senna (*Cassia angustifolia*), Safed Musli (*Chlorophytum arundinaceum*), Ashwagandha (*Withania somnifera*), Kalmegh (*Andrographis paniculata*), Patharchur (*Coleus amboinicus*), Bach (*Acorus calamus*), Isabgol (*Plantago ovata*), Brahmi (*Bacopa monnieri*), Atees (*Aconitum heterophyllum*), Kutki (*Picrorhiza kurrooa*), Gudmar (*Gymnema sylvestre*), Bael (*Aegle marmelos*), etc. Website containing all information about National Medicinal Plants Board (NMPB) has also been launched (www.nmpb.nic.in). National and international bodies, working in medicinal and aromatic plants have been contacted for dissemination of information and for meaningful collaboration. IDRC, FAO, Ford Foundation, WHO and IPGRI are the

International organizations, NMPB is currently collaborating with.

The NMPB has identified 32 medicinal plants at the national level with a view to develop and promote them more intensively. Of these, the following plants are focused in the Himalayan region (Table 2).

NATIONAL MEDICINAL PLANTS BOARD'S EXPERIENTIAL LEARNING

Improvement of the medicinal plants trade may offer an alternative to poor local habitants especially at the primary stage. Improvements could take the form of harvesting and marketing co-operatives or village based processing facilities. Cultivation of threatened and other valuable species is certainly warranted, even though we do realize that the potential benefits will reach to a populace possessing limited land, labour, capital and time, at a slower pace. NMPB has now started funding pioneer NGOs like Society for Himalayan Environmental Research (SHER), Institute of Himalayan Environmental Research and Education (INHERE) and NERA Mahila Samiti, (NMS) to do such task in the state of Uttranchal whose work may be relevant for western part of Nepal.

The cultivation and use of medicinal and aromatic plants (MADPs) has a great potential for employment generation, particularly in rural sectors. The recent emphasis on tribal and rural development indicates that cultivation of the medicinal and aromatic plants can play a prominent role in this direction, if undertaken properly has been embraced by the Board in

Table 2: Common medicinal plants and their medicinal characteristics

S NO.	BOTANICAL NAME	ENGLISH NAME	PART USED	ACTION AND USES	ACTIVE CONSTITUENTS
1	<i>Aconitum heterophyllum</i> Wall.ex Royle	Indian Aconite	Tuberous Root	Antipyretic, anti periodic, astringent.	Astisine, Heteratisine, Hetisine
2	<i>Aconitum ferox</i> Wall. ex Seringe	Indian Aconite	Root	Sudorific, cardio tonic, fever, neuralgia, paralysis, skin diseases, anti-inflammatory, diuretic, diaphoretic, sedative, febrifuge	Pseudaconitine
3	<i>Aegle marmelos</i> (L.) Corr.	Stone apple	Fruit, Leaf, Bark	Aromatic, astringent, carminative, cooling, laxative, febrifuge	Coumarins, Alkaloids, marmesin, Imperatorin, Alloimperatorin, Xantholoxol, Scoparone, Scopoletin, Slimmin, Marmelide, Aegelenine
4	<i>Asparagus racemosus</i> Willd.	Asparagus	Root	Lactogenic, aphrodisiac, nervine tonic, cooling, rejuvenating, carminative, appetizer etc.	Saponins, Alkaloids, Proteins, Starch, Tanin
5	<i>Bacopa monnieri</i> (L.) Pennell	Thyme leaved gratiola	Whole plant	Nervine tonic, memory enhancer	Triterpenoid, saponins, glycosides, Brahmoside, Brahminoside, Baconides A&B, Hersaponin, Betulic acid, Monnierin
6	<i>Berberis aristata</i> DC.	Indian berberry	Root, Stem	Stomachic, tonic, diarrhoea, dysentery, jaundice, useful in eye diseases, toothaches	Berberine

S NO.	BOTANICAL NAME	ENGLISH NAME	PART USED	ACTION AND USES	ACTIVE CONSTITUENTS
7	<i>Cedrus deodara</i> (Roxb.ex D.Don) G.Don	Himalayan cedar	Wood	Skin diseases	Gum, Cholesterin, Essential oil, Ascorbic acid
8	<i>Cinnamomum tamala</i> (Buch.-Ham.) Nees & Eberm.	Indian cassia lignea	Leaf, Bark	Anthelmintic, Cardiotonic, carminative, diuretic	Essential oil, engenol, cinnamic aldehyde
9	<i>Crocus sativus</i> Linn.	Saffron	Stigma with style	Antiseptic, cooling, cloning, aphrodisiac, digestive	Croun, Picrocroun, Lycopene, a-b-canotene zearanthin
10	<i>Phyllanthus emblica</i> L.	Indian gooseberry	Fruit	Aperient, astringent, digestive, diuretic	Vitamin C, Ascorbic acid, Tannins, Emblicol, Phyllantitine, Phyllantine
11	<i>Nardostachys grandiflora</i> DC.	Musk root	Rhizome	Astringent, cooling, aromatic, antiseptic, digestive, carminative, epilepsy, hysteria, erysipelas, liver stimulant	Jatamansone (Valeranone), Spirojatamol, Patchonli alcohol, narseychelانون, Jatamol
12	<i>Ocimum tenuiflorum</i> L.	Holy basil	Seed, Leaves	Aromatic, cough, asthma, fever, stomachic, demulcent, digestive, vermifuge, diaphoretic, expectorant	Volatile oil (Engenol, b-caryophyllene), Serquiterpenes and monoterpenes
13	<i>Picrorhiza kurroa</i> Benth. ex Royle	Picrorhiza	Root	Acrid, cooling, laxative, carminative, digestive, stomachic, hepatitis, jaundice, flatulence, antipyretic, galactopurifier	Iridoid glycosides, picroside-I, Kuthoside, Picroside veroniccaside, Minecoside, Picein, Androsin

S NO.	BOTANICAL NAME	ENGLISH NAME	PART USED	ACTION AND USES	ACTIVE CONSTITUENTS
14	<i>Rauvolfia Serpentina</i> (L.) Benth. ex Kurz	Rauvolfia	Root	Hypertension, acrid, laxative, anthelmintic, appetizer, sedative	Reserpine, rescinnamine, Serpentine, Deserpidine, Yohimbine, Corynantheine
15	<i>Rhododendron arboreum</i> Smith R. barbatum Wall.ex G.Don	Rhododendron	Flowers	Fish poison, applied to forehead for headache	Ericolin, andromedotoxin
16	<i>Sapindus mukorossi</i> Gaertn.	Soapnut tree	Fruit, Fruit rind	Expectorant,	Saponin, emetic, nauseant mucorodin
17	<i>Swertia chirayita</i> (Roxb.ex Fleming) Karsten	Chiretta	Whole plant	Anti-inflammatory, antipyretic, antiperiodic, sudorific, dyspepsia, blood purifier	Amarogentin, Amarowserin, Chiratul, Mangiferin, Swertiamin, Chiratamin
18	<i>Saussurea costus</i> C.B. Clarke	Costus	Root	Acrid, Thermogenic, aromatic, cronic and foul ulcers, cough, asthma, hiccough, carminative, digestive, stimulant	Saussurne, Bitturesin, Bicyclic lactone
19	<i>Taxus wallichiana</i> Zucc.	Himalayan Silver fir	Leaf, Fruit	Antiflatulent, Antispasmodic, appetizer, astringent, carminative, digestive	Taxine, taximine

its program. In addition, these medicinal plants provide dense vegetation cover, which in turn helps to check soil erosion in the steep mountain slopes.

There are hundreds of medicinal plants found in the Himalayan region, which are having great potential. However on the basis of market potential, following species need to be

promoted for sustainable development in the Himalayan region (Table 3).

POTENTIAL AREAS FOR COLLABORATION BETWEEN INDIA & NEPAL

In the light of vast similarities in the bio-physical, socio-economical & politico-cultural

system and traditions in India & Nepal, there are certain potential areas in the medicinal, aromatic, dye plants sector for which joint working group for collaboration could be initiated. The suggested areas may be:

1. Trade regulations by bringing medicinal

plants under the ambit of bilateral trade and commerce by meeting quality, efficacy, shelf life and other good sourcing practices regime required by the GOI and WHO.

2. Setting domestic facilities for primary processing, drug manufacturing and value

Table 3: Demand projection of key medicinal plants from the Himalayas

S.NO.	NAME OF THE SPECIES	LOCAL NAME	EXPECTED DEMAND IN TONS (2004-2005) – INDIAN SUB- CONTINENT
1.	<i>Abies spectabilis</i>	Talis patra	700
2.	<i>Aconitum chasmanthum</i>	Vatsnabh	3450
3.	<i>Aconitum heterophyllum</i>	Atis	410
4.	<i>Aquilaria agallocha</i>	Agar	420
5.	<i>Bacopa monnieri</i>	Brahmi	5800
6.	<i>Berberis aristata</i>	Daruhaldi	1830
7.	<i>Carum carvi</i>	Kala jeera	101
8.	<i>Cinnamomum tamala</i>	Tej Pat	888
9.	<i>Coptis teeta</i>	Mishmiteeta	N.A.
10.	<i>Crocus sativus</i>	Kesar	N.A.
11.	<i>Ephedra gerardiana</i>	Somlata	920
12.	<i>Gentiana kurroo</i>	Kurru	1091
13.	<i>Hypericum perforatum</i>	Hypericum	144
14.	<i>Inula racemosa</i>	Pushkarmool	760
15.	<i>Nardostachys grandiflora</i>	Jatamansi	866
16.	<i>Picrorhiza kurroo</i>	Kutki	317
17.	<i>Pistacia chinensis</i>	Kakrasinghi	120
18.	<i>Polygonatum cirrhifolium</i>	Mahamaida	106
19.	<i>Rauvolfia serpentina</i>	Sarpgandha	588
20.	<i>Saussurea costus</i>	Kuth	1826
21.	<i>Swertia chirayita</i>	Chirata	1285
22.	<i>Taxus wallichiana</i>	Himalayan Yew	N.A.
23.	<i>Valeriana jatamansii</i>	Samayo	216
24.	<i>Zanthoxylum armatum</i>	Timur	23

Source: Demand & Supply assessment by Centre for Research Planning and Action (CERPA), New Delhi.

addition near to the source of collection and cultivation.

3. Integrating of Traditional Medicine with Modern Medicine at all levels with policy and implementation back-ups giving priority to primary health care system.
4. Promotion of Kitchen-herbal gardens to provide accessible and affordable health care facilities at rural areas, to empower women and to provide additional source of income generation for rural women.
5. Sharing of experiences in JFM, eco-development boards, Shelf Help Groups (SHGs) in India and Community Forestry User Groups in Nepal for integrating medicinal plants with participatory and Community Forestry activities.
6. Jointly developing and sharing policies, experience and expertise in organic and certified production of MADPs to meet the growing international concern and requirements for quality and safe products.
7. Policy reconciliation and coordination on CITES species and on emerging medicinal products like *Cordyceps sinensis* between the two countries to discourage unethical, irregular and exploitative trade practices.

MECHANISMS FOR COLLABORATION

Various Government and Non-government agencies are actively involved in the growth and development of MADP sector in India & Nepal. These bodies could act as facilitators with appropriate classification of tasks as per

their mandate and capacity of respective organisation.

The NGO and CBOs could be involved in enhancing awareness level, capacity building and imparting training and building local capacity. The leading research & training institutions in the government sector could be associated with nursery development and ensuring quality planting material production, agro-technology development, suitable harvesting mechanism, value addition, quality testing management, etc. The key players for developing linkages in India has been presented (Chart 1).

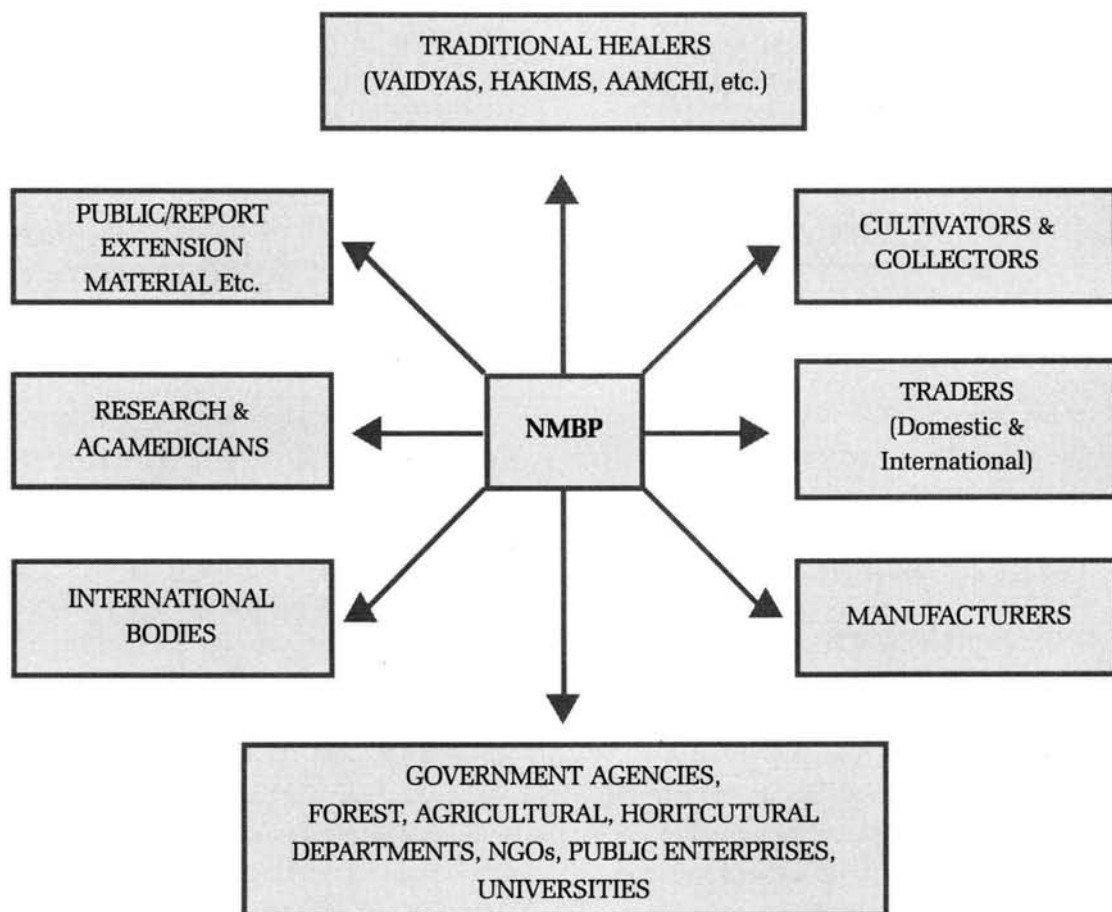
ORGANIC PRODUCTION OF MADPs

For the Hiamalayan regions of both India and Nepal, organic production of MADPs hold good promises as these regions are, infact organic. Most organic certification standards in case of wild collection emphasize on sustainable harvesting and reducing any adverse environmental impacts of the extraction process. These aspects coupled with high quality requirements of processing of forest-based food, medicine and nutrition products could be jointly developed and promoted through groups of organized collectors and cottage scale processors. Ideally, as there is an overwhelming agreement that the problems related to unsustainable collection of medicinal plants can only be addressed if *ex situ* cultivation of medicinal plants is also carried out simultaneously with the development of sustainable harvesting regimes, this can be an additional area for collaboration. The chart below indicates the nature of collaboration recommended within India (Chart 1).

For developing such linkages with the organization, institutions and universities working in the Himalayan region, which have broad mandate for the regional networking and individual MoUs can be worked out. Some of the key institutions relevant for both Nepal and India in the context of the Himalayan medicinal plants are as follows:

1. GB Pant Institute of Himalayan Environment and Development, Head Quartered at Almora, Uttaranchal,
2. Indian Council of Forestry Research and Education (ICFRE), Dehradun, Uttaranchal
3. Regional Research Laboratories of CSIR (at Jammu, Jorhat and Itanagar).
4. Herbal Research and Development Institute, Gopeshwar, Uttaranchal.
5. High Altitude Plant Physiology Research Centre, Srinagar-Garhwal, Uttaranchal.
6. Defence Research Lab (DRDO), Pithoragarh, Uttaranchal and Field Research Lab, Leh, (J&K).

Chart 1. Multi-stakeholder, participatory and collaborative approach for the medicinal plants sector development in India & Nepal



7. GB Pant University of Agriculture and Technology, Pantnagar (Uttaranchal).
8. Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow, UP.
9. Central Council for Research in Ayurveda and Siddha (CCRAS), New Delhi.
10. Forest Department, Dehradun Uttaranchal.

The Government of Uttaranchal, India has recently issued a workable Government order on **Conservation, Development and Harvesting** (CDH). For conservation, the main role is to be played by the Forest Department with active participation of community. For development, the key Government Organizations and Non-government Organizations have been designated to play pivotal role. For harvesting of medicinal plants on sustainable basis, the main role has to be played by the Forest Development Corporation along with existing cooperatives. In conservation, development and harvesting, involvement of local communities in the form of active participations of **Joint Forest Management Committees** (JFMCs) and **Van Panchayats** have been envisaged through micro-planning and management of forests and setting of specific conservation and development areas such as Medicinal Plants Conservation Areas (MPCAs) and Medicinal Plants Development Areas (MPDAs). In the case of species like *Cordyceps sinensis*, *Panax pseudo-ginseng*, *Hippophae* species, etc., there is a need to develop some workable models in the interest of the community to benefit the people of **India and Nepal** and the greater Himalayan region.

CONCLUSION

By ensuring conservation of various rare and valuable medicinal valued species and cultivation of the commercially viable MADPs and subsequently adopting sustainable harvesting practices the local community in the Himalayas can be immensely benefited. Such initiatives would generate local employment, enhance the standard of living and subsequently play an important role in the economic development of the region. There is also a need to create opportunities for increasing the flow of economic benefits derived from the collection and sale of medicinal, aromatic and dye plants, to local communities through launching other programs such as rural development, watershed management and agri-export promotion like the Government of Uttaranchal has recently launched. Local economic and social development initiatives aimed at processing and value-addition of MADPs and their products, are need of the hour for the Himalayan countries. For the long-term development of medicinal plants sector in South Asia, production of quality assured products meeting international phytosanitary standards, minimum chemical residue and microbial contamination levels and other norms is a must. We need to work together in an objective and concerted manner if the organic movement in herbal sector is to truly benefit the people and conserve our environment.

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ENTERPRISE-ORIENTED COMMUNITY FORESTRY IN NEPAL

Strategies and Lessons

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INTRODUCTION

In Nepal, the Himalayan and trans-Himalayan region people are among the poorest with lowest development index, underlining the fact that poverty, remoteness and biodiversity richness go together in developing countries. Agriculture accounts for less than 5% of the total geographical areas, and most of it is rain fed. In some parts, rocky surface and snow cover combine to account for about 60% of the area, severely restricting opportunity to bring about development. Alpine and sub-alpine meadows and forests are generally rich centers of biodiversity. Burning of forests/meadows, uncontrolled harvesting of NTFPs including MAPs, unmanaged grazing with high number of

unproductive animals, and slash and burn farming practices are indicated to be the main proximate threats to biodiversity, but the underlying cause is acute poverty (Subedi 1999; Burch et al. 2003).

However, the majority of conservation resources have been allocated to protected area system models or subsistence mode of resources management is framed, while people-centered and economic incentive based resource management strategies have received less attention. Balancing economic, social and environmental concerns is a difficult task, and there are few, if any, examples to follow in adopting a balanced approach (Subedi 2001).

This paper attempts to analyze and document the advances in community forestry evolved

from the initiatives and experiences of Asia Network for Sustainable Agriculture and Bioresources (ANSAB) in designing and implementing its approaches and strategies on enterprise-oriented community forest management in Himalayan and Trans-Himalayan regions of Nepal where Non-timber Forest Products (NTFPs) including Medicinal and Aromatic Plants (MAPs) constitute a valuable group of products for local communities. The paper also draws lessons from the IDRC supported project on Conservation of Medicinal and Aromatic Plants for Sustainable Livelihoods implemented since September 2001 in Darchula district, Nepal (Map 1).

Established in 1992, ANSAB has a vision of rich and productive biodiversity resources that are actively managed and used by local communities who are capable of addressing existing and potential threats to biodiversity and maximizing local benefits out of it and thereby harnessing social equity. ANSAB is committed to enterprise oriented solutions to biodiversity conservation and sustainable community development. It strives to translate its commitment through natural products based enterprises, community forestry and natural resources management, capacity building of key stakeholders, and creation of enabling policy environment by working directly with local community and collaborating with other stakeholders. ANSAB has a focal position in the field through its work for a decade on biological, technological, economic and socio-cultural fronts associated to people-centered conservation, management and use of biodiversity both within and outside Nepal.

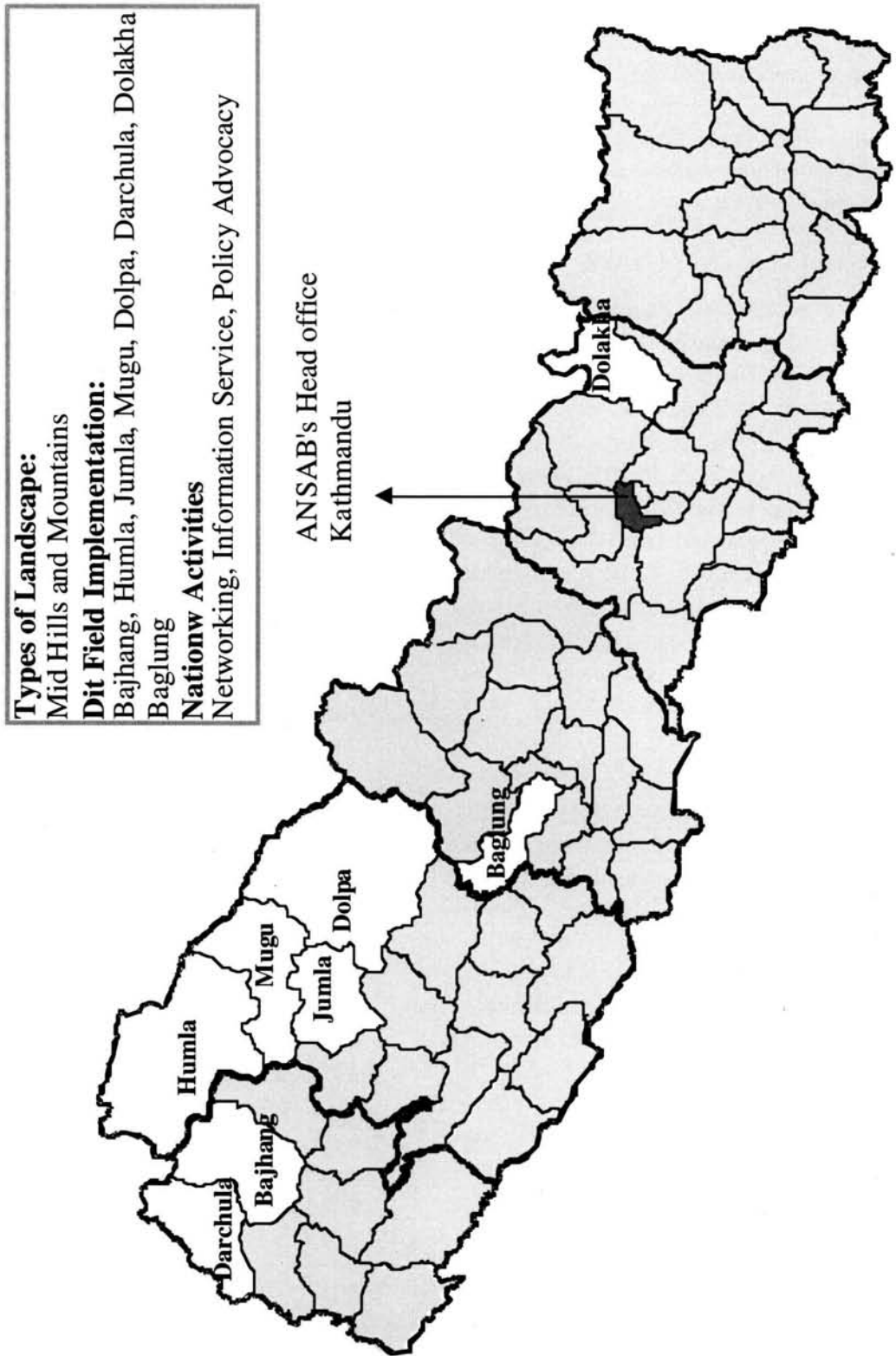
APPROACH AND STRATEGIES

Enterprise oriented community forestry is essentially a participatory process that requires strong technical assistance and encompasses sub-sector analysis, threats analysis, strategies development and planning, research, implementation and reviews. Expanding the property rights of local communities over resources and empowering them with knowledge, information, technologies and skills for forest management and institution building are the basic building blocks for the enterprise oriented community forestry. Gender and equity concerns are addressed from the program design so that the poor, women, and marginalized members of the communities receive fair benefits from the program.

The program emphasizes working with partners so that the institutional capacity at national level is enhanced and post-program sustainability is ensured. Working with local as well as national institutions, the program pools unique expertise to promote delivery of quality and critical services that are needed to local communities. The program maintains close interaction with other programs that have similar goals and field activities to avoid duplication of efforts and create synergy in service delivery.

The program promotes an approach whereby all partners and implementers maximise their learning through actions and reflections. Various mechanisms of interaction facilitate the sharing of knowledge gained at different levels of the program. The program has in-built mechanisms to facilitate synthesis and communication of learning with respect to contexts, concepts, processes, and techniques

Map 1. Districts of Nepal where ANSAB programs are being implemented



among partners and relevant stakeholders, and to make timely adaptations.

A brief description of major steps of program implementation, not necessarily in the given sequences, is given below.

Sub-sector Analysis (SSA)

Central to enterprise oriented community forestry is the concept of seeking union between biodiversity conservation and economic development of local communities. This involves identifying a sub-sector (a product or a range of products) most potential for creating economic incentives while balancing environmental and social concerns. Reviewing along the value chain (from production to consumption) SSA identifies the intervention areas that provide highest leverage both economically and environmentally in the given context (Subedi 1999).

Threats Analysis and Community Forestry Planning

With each community, participatory threats analysis, resources assessment and strategy development in terms of community forests management are undertaken. Considering the variability within and between the communities and forests, the process requires adaptation in moving forward with identified communities. As the Forest User Group (FUG) is ready, members assess resources and analyze the threat to biodiversity. Optimizing the enterprise opportunities and to address the threats, communities devise strategies for forest

management that are translated into their forest management Operational Plan (OP)¹. The process for enterprise oriented CF is more rigorous than the traditional FUG process and iterative at all stages from identification of options to management and benefit distribution.

Enterprise development planning

Possible options for enterprises are examined and prioritized considering the factors related to policy, resource abundance, market, finance, local skills, technologies, and social issues. A detailed enterprise development plan is developed for the most potential enterprise identified from the feasibility study. While it is unlikely to develop the enterprise plan without external technical assistance by local communities, their role is crucial from the inception since the success depends on community taking ownership and active role in the management.

Implementation

Proper implementation of both forest management plan and enterprise development plan is equally important, as they are interdependent to produce the desired results. Enterprise is directly dependent on the health and productive capacity of the forests, and the role of the program at this stage is to foster the positive links between the community forest management and enterprise operation. At the beginning of activities implementation, along with the direct technical facilitation to communities and enterprises local partnership

¹ A community group to formally become a FUG requires to be registered at the District Forest Office with its Constitution. The Constitution defines the social arrangement and the responsibilities and rights of the group where as the OP specifies how the forest is managed and utilized. To incorporate provisions of managing additional products or expanding the area, the OP needs to be revised and approved.

and networking among the key stakeholders is strengthened. ANSAB proceeds through a network of local NGOs and cooperatives so as to ensure sustainability of the program in the field. In addition, capacity building of key stakeholders (government, non-profit as well as private sector) is promoted for wider impact.

Monitoring and Participatory Action Research (PAR)

The enterprise oriented CF is an evolving practice and there are many unknowns and grey areas including the biology of individual species, ecosystem dynamics, product research and development, and consumer preference. Learning component is, therefore, an in-built ingredient of the ANSAB program design. Biological monitoring is introduced to ensure the sustainable supply and conservation of biodiversity. Social, institutional and enterprise performance monitoring are carried out to get the continuous feedback to the management. Building on the existing knowledge base (both indigenous and external) PAR is designed and implemented in the areas identified and prioritized together with communities. The examples include experimentations on sustainable harvesting, regeneration, productivity, cultivation, and nursery raising of important NTFP species (ANSAB 2003a).

From time to time, innovative tools and practices are identified, tested and refined for ensuring sustainability and improving production efficiency and service delivery. For example, to ensure sustainability in resource management, ANSAB is piloting Forest Stewardship Council (FSC) group certification for forest management and chain of custody in Nepal.

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Policy

Even with the most progressive policy and legislations on community forestry in Nepal, there are several challenges in provisions and practices for the promotion of enterprise oriented community forestry. The existing provisions and practices make it difficult to visualize the forest management and use beyond subsistence (ANSAB 2003b). Therefore, the program facilitates policy development process through networking, coordination, interaction and sharing of specific policy issues from the grassroots, supporting forums and federations building, and strengthening their capacity in policy analysis and advocacy.

Reviews and reflection

Regular interactions, workshops, meetings, and interactions with communities and wider audiences, visits and feedbacks, monitoring and impact studies done in a participatory way as well as occasional external evaluation provide a continuous surveillance of the program effectiveness. Lessons learned and insights gained from this reflection make the basis for new program design and development, and indeed in its implementation.

OUTCOMES

ANSAB's programs on enterprise-oriented resources management have demonstrated remarkable successes in bringing forests and upland meadows, which are globally significant for biodiversity, under improved management with community participation and developing community-based forest enterprises, generating both social and economic capitals at local levels, and in improving policy environment for the sustainable management and use of forest resources including NTFPs in Nepal.

With the initiatives of ANSAB, more than 100 FUGs have been organized and strengthened, which has brought over 60,000 hectares of forests and pastures under improved management. In addition to improved collection and trading practices by individuals and informal groups, 12 community-based enterprises are established in these remote mountain districts benefiting about 15,000 households (Map1). The increased income from the enterprise-oriented CF, enhanced capability of local institutions, and increased entrepreneurship skills among community members resulted into the various self-initiated community development activities from local communities such as infrastructure development, school, drinking water, community health, electricity, and commercial activities like production and marketing of forest products, processing and manufacturing of forest based products. Their progress on fund generation and mobilization is promising and is likely to lead towards increased income and employment in rural communities (Subedi 2002).

Through its regular business development services (BDS) and marketing information services to a wide range of stakeholders and organizations nationwide, bargaining power and ability of NTFP harvesters (majority of which are poor and belong to the marginalized sections of the society), community groups, local traders and CBFs to match the market requirements have been enhanced, and in many cases they have significantly gained from the production and trade of NTFPs.

The program has initiated market-based tools for sustainable and fair practices such as FSC certification. It has raised the awareness and strengthened the capacity of national and local stakeholders on the requirements of sustainability tools like certification. As a result, the FSC certification is now becoming a national agenda among some key stakeholders such as FECOFUN.

In most cases the SSA resulted into the policy related interventions with high potentials for generating impacts. With its founding and/or coordinating roles ANSAB promoted several forums such as NNN (Nepal NTFPs Network) and Public Private Alliance (PPA), FECOFUN and HJSS who have been generating and holding many positive recommendations in policy environment.

Our coordination and facilitating roles in policy development process in the promotion of NTFPs sub-sector has resulted into several positive outcomes. Through grassroots consultations to organizing national workshops, and contribution to drafting national NTFPs policy, ANSAB has contributed significantly. Moreover, through its research and coordination ANSAB has been able to influence the government, donors, and non-

profit and business organizations to put NTFPs high on their agenda for poverty reduction and conservation, for example, in the 10th five year plan of the Government of Nepal (ANSAB 2003b).

ANALYSIS AND LESSONS LEARNED

Enterprise oriented resource management is relatively a new concept. There is a big gap from understanding to realization regarding the potential of this approach to conservation and poverty reduction. The traditional belief that enterprise undermines sustainable use of forest resources is still prevalent among some professionals, advisors, and government authorities and policy makers. This thinking has led to the programs and policy implementation practices towards subsistence orientation and several regulatory and market related barriers for community based enterprises (Subedi and Binayee 2000).

The Community Forestry Act of His Majesty's Government of Nepal has classified the forest into five categories: government managed forests, protected forests, community forests, leasehold forests, and religious forests (HMGN 1995). Of these categories, as of February 2003, about 18% (or 939,040 ha) are under community forests, but this percentage is growing each year. Representing a third of total population, 1,321,311 households are organized into 11,920 Forest User Groups nationwide (CFD 2003). This gives an average of 0.7 ha of forest per household compared to 6.25 ha per household in ANSAB supported FUGs. This shows that the FUGs managing CF with enterprise-orientation are managing a significantly larger area of forest.

Analysis and understanding of threats, which are driven and perpetuated by economic necessity like slash and burn, overgrazing, which required economically inspired solutions, if not considered in the FUG planning and management, will lead to further degradation of resources, and ultimately increase poverty. Therefore, economic incentives are necessary for community based biodiversity conservation, and it is more relevant within the framework of community forestry in Nepal.

Looking from the perspectives of matching conservation goal with social justice, we found that NTFPs are a group of resources that has higher potential to provide access and benefits to a large rural population, especially the poor and marginalized. The landless and poor often do not have other alternatives than engaging in NTFPs collection that are available as common property resources. The abundance of resources with market demands which is growing as well as the availability of traditional skills and technologies show a great potential of NTFPs for enterprise development in the mountains of Nepal. The selection of subsector and identification of enterprise options have implications on the overall success of the program and equity development (Subedi 2001).

Communities that are not getting meaningful benefits from forest resources were found to be indifferent to the conservation practices. For example, in Humla local people used to burn their forest and pasture, destroying valuable MAPs such as *Jatamansii* (*Nardostachys grandiflora*), to promote growth of grasses for their livestock. Despite several temptations from the government and project rangers they were not interested in community forestry.

With the introduction of an enterprise in their locality, due to which they got opportunity to sell NTFPs harvested from adjacent forest, they became interested to get tenure of forest so that they could be assured of regular income from the sustainable collection of NTFPs. The enterprise oriented community forestry allowed them to exclude outsiders and manage their group members. It was worthwhile to establish enterprises that added value to the resources and allowed communities to perceive that they were making economic gain from their biological resources (Subedi and Bhattarai 1998; Subedi 2001; Burch et al. 2003).

However, the relation between conservation and enterprises are not so simple and straightforward. Extraction and production models for biodiversity conservation are not effective when they promote more of the same activities and simply link producers to a market. The interrelationships between the two are defined or at least influenced by a number of factors including policy and regulatory mechanisms, practices of resources use and management, local capacities and external supports, available technologies and enterprise modalities, nature and functioning of markets, etc. (Subedi 2001)

Therefore, it is important to provide useful and appropriate external technical assistance that fosters the link between the conservation and enterprises in such a way that the interplay of these elements leads to a balanced interface of the link without distorting the market. While facilitating the program it is important to work with local communities so that they take an active role, feel ownership, and learn all aspects of the program from the very beginning.

The technical assistance available to this field in mountains in general and more remote areas in particular are very limited, and if any technical assistance is available, that is often not useful or appropriate to communities. Very little can be expected from those who are trying to provide technical assistance to these communities with very little understanding on enterprises and their linkages with the broader conservation. The government agencies are mainly found trying to impose the restrictions and almost forget their service delivery roles to communities.

Once a program is made for the enterprise-oriented community forestry, our experience shows that the following factors are important for its success.

- Size of forests, at least to sustain enterprise operation at break even level.
- Expanded property rights to encompass the free and fair trade of the products and inspire innovations.
- Technical knowledge, skills and extension services for commercial production of selected species that provides raw materials for the enterprise. The management requires not only the knowledge of a commercial species but also the ecosystem dynamics on which the valuable products are produced.
- Enterprise management—understanding of business fundamentals by the groups managing enterprises
- Access to markets and marketing
- Access to finance

- Favorable policy support, not only in provisions but also in their proper implementation.

CONCLUSION

Forests are integral part of livelihoods in mountain region in Nepal. With community forestry initiatives, mountain communities have shown concerns on conservation and management of forestry resources. However, subsistence oriented community forest management has undermined the potentials of the resource base and has not been able to inspire communities to devise innovative solutions to biodiversity loss and poverty.

ANSAB's experience has shown that when communities are empowered to manage their resource base and provided enterprise options that are linked to biodiversity, it can generate incomes and employment to reduce poverty while providing incentives to conserve the resources. It is important, however, to note that the result depends on the quality of relationship between conservation efforts and enterprise activities. For the mountain dwellers of Nepal, the enterprise oriented community forestry appears to be the last resort for improving their livelihoods. The enterprise oriented community forest management should be promoted not only for poverty reduction but also for conservation of forests and biodiversity.

When subsistence oriented community forestry moves to enterprise oriented mode, it however elevates the concerns of equity, gender, and good governance, and adds on new challenges of enterprise management and marketing, commercial production of forest products, and ensuring biodiversity

conservation status. A program that is focused on the enterprise-oriented community forestry and complete to encompass all the steps along the value chain is likely to achieve the success in conservation and poverty reduction goals.

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USE OF TRADITIONAL KNOWLEDGE FOR PARTICIPATORY SUSTAINABLE MANAGEMENT OF MAPs/NTFPs IN THE HILLS OF NEPAL

Chhote Lal Chowdhary

ISSUES ADDRESSED

Community Forest User Groups are actively involved in the conservation, management and utilization of Non-Timber Forest Products (NTFP) in the middle hills of Nepal by conserving the naturally available NTFPs in their community forests. Rural people, including Community Forest User Group (CFUG) members, collect NTFPs from forests and posturs and trade them in the Nepalese and Indian markets. Several issues however need to be supported in order to make this a participatory and sustainable livelihood model. The **traditional knowledge** of these communities is used in the identification and

utilization of many NTFP species. But their knowledge and practices are not well studied regarding **sustainable harvesting of NTFPs**. Since the conversion of government forests into community forests, most of the high value Medicinal and Aromatic Plants (MAPs) traded in Nepal are collected from community forests, where **scientific resource management systems** are not practiced. **Domestication of MAPs** on private lands and cultivation in community forests have rarely been adopted due to the lack of adequate technical knowledge, facilities and awareness. Another important issue relates to the **equitable distribution of benefits** through such mechanisms as the representation of women and other

disadvantaged groups (DAG) in the executive and assembly of CFUGs for improved access to NTFPs. The Conservation of Medicinal and Aromatic Plants for Sustainable Livelihoods (CMAPSL) project had included all the interested groups in the different activities and decision-making processes in order to support more equitable benefits from NTFPs.

Project activity monitoring was undertaken at all levels and included the community, line agencies and political & administrative groups. Members of the District Development Committee, Village Development Committee, DFO, CFUG members and local people were involved in the monitoring process and dissemination of the results. The process for incorporating resource surveys, quantification and management of NTFPs into the **community forest operational plan (FOP)** was also supported by CMAPSL. FOP is one of the key entry points at the community level to combine the traditional knowledge, culture and technology of the communities with the technical inputs from the forestry technicians.

PROJECT AREA

The Baitadi district is located in the Far Western Region of Nepal. It is rich in plant diversity with varied altitudinal range and climate. The total area of the district is 147 678 ha and it has a population of 200 716 (CSD, 2001). Forested areas cover 52.66% (77 781 ha) of the district. A total of 292 CFUGs have been established in Baitadi which benefit 67.79 % (27,378 HH) of the district's households (DFO, 2003). The CMAPSL project, supported by IDRC and implemented by CECI in collaboration with the district FECOFUN, has been conducted in six CFUGs – Kedar, Durgabhavani, Gwallek, Sidhnath, Sigas and Niglasaini. Agriculture is the main source of income in these villages, but the collection and trade of NTFPs plays an important role in the livelihoods of many rural people, including women and disadvantaged villagers. Awareness in this district of sustainable management and utilization of NTFPs is very low. Beneficiaries from CMAPSL are 4229 people from 730 households of six CFUGs. Table 1 details the CFUGs, area covered, benefited households and the population.

Table 1: Name of CFUG, Area, HH and Population within CMAPSL project

NAME OF CFUG	AREA OF CF (HA)	HOUSEHOLDS	POPULATION
Kedar	169.43	103	751
Durgabhawani	105	124	650
Gwallek	189.32	326	1724
Sidhanath	205.9	65	405
Sigas	286.7	57	335
Niglasaini	227.4	55	364
Total area	1183.75	730	4229

DATA COLLECTION, COMPILATION AND ANALYSIS

Selection of MAPs

Medicinal plants were selected using preference ranking and pair wise ranking tools. For preference ranking, a form was developed with the criteria of economic value, traditional use, abundance and cultivation, processing feasibility and conservation status of MAPs. Participants' preference were scored for the important MAPs found in Baitadi.

Focus group discussion

Information on status, distribution, habitat, management, market and cultivation practices of MAPs, guidelines for site selection, plot preparation, study criteria, guidelines for plant material collection for chemical analysis, and monitoring of plots were gathered through primary and secondary sources.

Establishment of permanent study plots

Permanent plots were established in the community forests having more potentialities for NTFP production. For each permanent plot, type of area, altitude, habitat, aspect, soil type and water availability were recorded. Accessibility from the district headquarter to frequently monitor the sites was also taken into consideration while selecting the sites. Permanent plots were used to study the effect of different harvesting practices on regeneration, yield and quantity of MAPs. The observation helped to find the best harvesting practices for MAPs. To observe the cultivation potentiality of MAPs, domestication of MAPs under different treatments was conducted

including variations in altitude and manur. Soil type, aspect, and water availability were kept similar as that in the natural environment of the MAPs.

Regular monitoring

Domestication plots in community forests and private land were monitored once a month. During the monitoring, survival of plants, growth and other effects were recorded. CFUG members including farmers actively participated in the monitoring of these research plots.

Inventory of sampling plots

Soil samples from the six CFs under the project were collected and tested in the Regional Research Station, Banke, for pH%, OM%, total N%, P_2O_5 Kg/ha, clay%, silt% and texture of soil. For the chemical analysis, rhizomes were collected in different seasons, and were analyzed in the SION Lab oratory Kathmandu. Herbarium speci were elaborated for four community forests to identify the number of existing species. Sampling intensity was taken to represent 1 percent of the CFs. Similarly, total enumeration was carried out to survey the number of species within the CFs.

Approaches

The International Development and Research Center (IDRC), Canada has provided financial and technical assistance under this project to promote the conservation of MAPs in the Baitadi and Darchula districts. Nepal IDRC has recognized the potential of NTFPs in improving livelihoods, preserving natural ecosystems and generating employment. IDRC's research program in NTFPs especially MAPs is aimed

at achieving tangible improvements in the livelihoods of poor and indigenous communities.

- **Partnering with FECOFUN and ANSAB**

The research project “Conservation of Medicinal and Aromatic Plants for Sustainable Livelihoods in Baitadi District of Nepal” is partnered with the Federation of Community Forest Users of Nepal (FECOFUN) and the Asia Network for Sustainable Agriculture and Bioresources (ANSAB).

- **Increasing technical capacity of CFUGs**

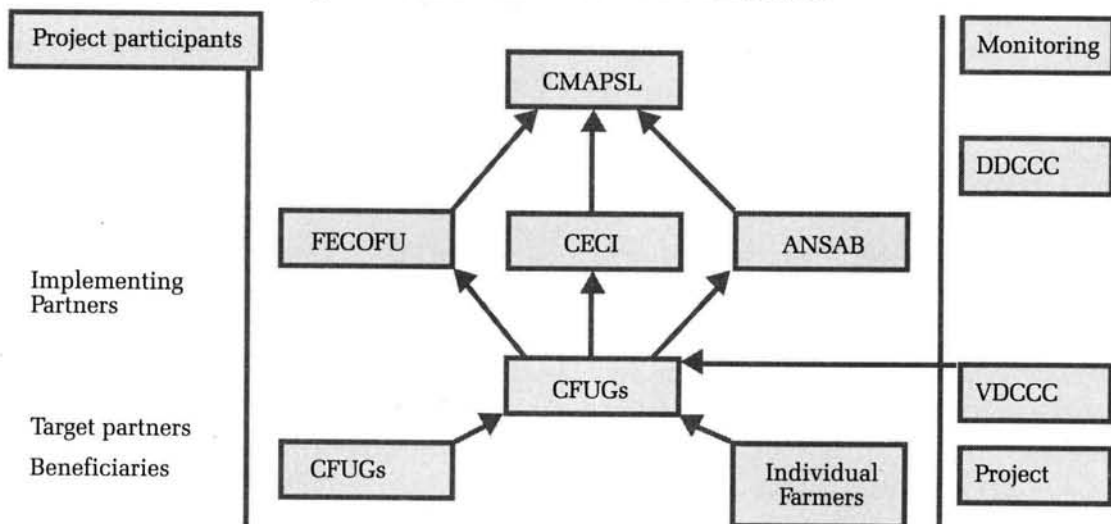
Various types of training were provided to CFUG members to increase their technical and conceptual capacity. NTFP inventory training and nursery preparation training workshops were organized. The

training was focused to provide information about the general overview of NTFPs/MAPs, inventory techniques, methods of herbarium preparation, quantification of NTFPs/ MAPs and incorporation of NTFPs/MAPs in the Forest Operational Plan (FOP) for the use and management of resources.

- **Networking with stakeholders**

The CMAPSL project has a multi-stakeholders approach. There are three main partners implementing the project: (fig.1) CFUGs and the farmers are the main beneficiaries. The monitoring and dissemination of information is done at different levels of the project, such as the district levels that comprises of the DFO, CDO, DDC and district level key leaders. The VDC Coordination Committee includes the representation of village/ward level key leaders, CFUG members and

Figure 1: Stakeholders of the CMAPSL project



traders who play a crucial role in the project. For the technical, policy and financial resources, international organizations such as IDRC, and national level organizations such as the Federation of Nepalese Chamber of Commerce and Industries (FNCCI) and representation from central levels are included.

● Resource and knowledge survey

NTFPs were surveyed at two levels, district level and CF level. District level surveys were done to determine the major NTFPs in the district that are frequently used and traded. CFUG members, collectors and farmers participated in the survey procedures. At the CF levels, a detailed inventory was carried out to identify the species, volume, collection, preference and perception of farmers on NTFP domestication.

Findings

The findings are categorized under the following headings

- A. Technical aspects
- B. Integrating technology
- C. Domestication of MAPs/NTFPs
- D. Capacity building
- E. Policy feedback and Institutional strengthening

A. TECHNICAL ASPECTS

a. Selection of Medicinal and Aromatic Plants (MAPs)

The mini-Conservation Assessment and Management (CAMP) workshop identified and ranked the most preferred NTFPs/ MAPs in the Baitadi district with preference and pair-wise ranking tools. The most preferred MAPs identified by local communities (based on economic values, traditional use, abundance, distribution, domestication potentiality, processing feasibility and conservation status) were:

1. Chirata (*Swertia chirayita* Roxb. ex Flem. Karst);
2. Sugandhwal (*Valeriana jatamansii* Jones);
3. Satuwa (*Paris polyphylla*);
4. Gannano (*Angelica glauca*); and
5. Timur (*Zanthoxylum armatum* DC.)

b. Growing stock of MAPs/NTFPs in six CFs

An inventory was carried out in NTFP effective areas of each block of the six community forests to find out the species and volume of major NTFPs. Table 2 shows the total number of plants in six CFs according to species, their density per hectare and the recommended sustainable harvesting levels.

c. Annual harvestable yield

For the sustainable management of MAPs in six CFs of the Baitadi district, annual yield of some major MAPs was calculated from the inventory data. This provided information on how much quantity can be

Table 2: Growing stock of MAPs according to CF and area covered.

NAME OF CFUG	AREA OF CF (HA)	TOTAL NO. NTFPS	AVERAGE DENSITY/HA
Kedar	169.43	3,858,027	22,771
Durgabhawani	105	6,788,824	23,679
Gwallek	189.32	4,509,665	23,820
Sidhanath	205.9	3,674,088	17,844
Sigas	286.7	5,731,015	54,561
Niglasaini	227.4	7,142,903	31,411
Total area	1183.75	31,704,522	174,086
Average		5,284,087	29,014
SD		1,492,960	13248.23
Corr. Coef. De		0.391872614	

harvested annually taking into considering the rotation period. Table 3 shows the total quantity of MAPs in each of the six CFs recommended to be harvested annually.

d. Cultivation plots

Cultivation plots were selected by using PRA methods in four CFs: (1) Niglasaini

(2) Siddanath (3) Kedar and (4) Gwallek. The NTFP species selected for the cultivation plots were Satuwa and Gannano. Each CFUG has 24 cultivation plots (12 Satuwa and 12 Gannano plots). Therefore, altogether there are 96 cultivation plots in four CFUGs. The materials used for cultivation were roots,

Table 3: Summary of the allowable cut of NTFPs

NAME OF CFUG	NTFP EFFECTIVE AREA	SPECIES WISE QUANTIFICATION (KG)						VOL. OF NTFP HARVESTABLE (KG)
		Chirayita	Sugandh-wal	Bhutkesh	Banhalidi	Pakhanb-ed	Satuwa	
Sigas	8.25	11116.11	4072.04	-	-	-	-	15188.15
Niglasaini	14.23	2307.67	2591.73	2206.21	4377.72	-	-	11483.33
Sidhanath	9.03	5329.44	1683.35	-	-	-	-	7012.79
Gwallek	37.11	1650.44	1301.95	-	-	10441.51	61.39	13455.29
Durga Bhawani	12.99	-	314.45	-	-	6288.66	-	6603.11
Kedar	22.07	1069.64	1220.7			11344.56	224	13859.5
Total	103.57	21473.3	11184.22	2206.21	4377.72	28074.73	285.39	67601.57

rhizomes and seeds. Three types of treatments and four replications were applied to the cultivation plots. Organic manure was provided at the rate of 1-2 Doko (about 25 Kg) at two-month intervals. Weeding was done once in a month and watering was done at the rate of 10 to 30 liters of water per day, depending on whether the plot was facing north or south.

Growth dynamics of Satuwa and Gannano (Vegetative growth)

The vegetative growth of Gannano under fertilizer treatment was found to be three times higher (130 cm in Nov 2003 from 45.5 cm in September 2002), but the Satuwa attained only 30.3 cm height in November 2003 against 34.25 cm in September 2002. The transplantation of Satuwa from the wild habitat gave poor growth. Gannano showed positive results under all the three types of treatments with the height doubling in a year and tripling in two years. (Table 4)

Yield of Satuwa and Gannano in cultivation plots in (community forests)

The yield growth of Satuwa and Gannano was different under similar treatments.

Table 5 shows that Satuwa was not affected by treatments but Gannano is significantly affected when it is transplanted from the wild to cultivation plots. For example, Gannano increased five times with manure treatment and six times with weeding. But the yield increment was not as successful with the watering in comparison to fertilizer and weeding treatments.

e. Enrichment plantation

Enrichment plantation refers to the supplementary plantation of different species to increase the biodiversity of the forest. Enrichment plantation was carried out in all the six community forests of the project in Baitadi district. Three major species (Chirayita, Satuwa and Sugandhwal) were used for enrichment plantations. Satuwa showed the highest yield compared to Chirayita and Sugandhwal in the enriched and non-enriched plots. The yield of Chirayita varied significantly at the three different CF sites and showed much better results in the non-enriched plots.

f. Soil condition

Sugandhwal and Timur prefer acidic soil, whereas Satuwa, Gannano and Chirayita

Table 4: Growth dynamics of Satuwa and Gannano in cultivation plots (cm)

TREATMENTS	SEP-2002		AUG-2003		NOV-2003	
	Satuwa	Gannano	Satuwa	Gannano	Satuwa	Gannano
Manuring	34.25	45.5	28.75	96.87	30.37	130
Weeding	33.5	41.25	24.25	78.75	24.5	106
Watering	24.5	34.66	25.06	56.87	24.87	101.87

TABLE 5: YIELD OF SATUWA AND GANNANO IN GRAMS IN CULTIVATION PLOTS

TREATMENTS	SEP-2002		AUG-2003		NOV-2003	
	Satuwa	Gannano	Satuwa	Gannano	Satuwa	Gannano
Manure	58.125	121.75	30.88	96.87	33.75	643.75
Weeding	43.75	90.25	25.88	78.75	26.75	500.5
Watering	34.88	260.88	19.63	56.87	20.88	381.25

preferred the neutral one. Chirayita and Timur can grow in diversified organic matter (1.88 to 4.34%), but Satuwa, Gannano and Sugandhwal can grow in a limited range of organic matter (4.13 to 4.94). Similarly, Sugandhwal and Timur have a small range of Phosphorus percentage (2.24 to 2.91), but Satuwa, Gannano and Chirayita can grow in a large range of phosphorus (2.46 to 55.02%).

g. Chemical analysis of rhizomes

Chemical analysis was done to find out the chemical constituents of the three individual NTFPs, which were collected from different plots with three treatments - watering, weeding and fertilizer in each research site. A total of 32 samples (Satuwa-14, Gannano-14, Sugandhwal-4) were collected. Out of the 32 samples, 26 were collected from cultivation plots and six from the natural forest. Active ingredients were analyzed individually.

Content of active ingredients in Gannano, Satuwa and Sugandhwal

Fertilizer and weeding treatments have significant effects; and watering treatment has a less significant effect to enrich the active ingredient of Gannano. The

minimum essential oil percentage in Gannano is 0.4% and the maximum is 1.3%. The oil percentage resulting with fertilizer was 1.2%, with weeding 0.8% and with watering treatment 0.5%.

Diosgenin, the active ingredient of Satuwa, was found to be high (1.2%) with fertilizer treatment, 0.8% with weeding and 0.8% with watering. Diosgenin is a pure organic compound. The higher the purity of Diosgenin, the better the result for marketing purposes.

The active ingredient of Sugandhwal (essential oil) was 1% in Niglasaini CF, compared to 0.5% in Kedar.

It was found that lower altitudes on northern aspects showed better oil content in Sugandhwal, fertilizer and northern aspects (shade) had a positive impact on essential oil content in Gannano, and southern aspect (Warmer condition) with fertilizer has positive (+ve) impact on biomass and diosgenin content in Satuwa.

B. INTEGRATING TECHNOLOGY

Documentation of traditional management practices

Local people use MAPs for the household medicinal purposes and have been trading thus for generations. Traditionally local people have been recorded to collect 56 species. Approximately 65% of MAPs are collected for household use, 15% medicinal and spices and 20% are used for commercial purposes.

Traditional management of NTFPs is based on local knowledge for collection, use, propagation, harvesting and post harvesting methods (see Annex 1 for brief traditional management method). Field data shows that 64.29% of farmers collect NTFPs from community forests, 25% collect from private land and 5.36% from government forests.

An adaptive technology based on the project's experiences in nursery, cultivation, harvesting and value addition for six major MAPs (Chirayita, Gannano, Satuwa, Timur, Sugandhwal and Tejpat) was developed and integrated with the communities' traditional knowledge. The integrated technology increased the germination percentage of seedlings, maximized the yield of selected NTFPs, and reduced the loss during harvesting and improper storage.

C. DOMESTICATION OF MAPs/ NTFPs

Seedlings of Chirayita, Timur, Pakhanbed and Sugandhwal and rhizome of Sugandhwal were collected from the wild and planted in the domestication plots, both inside the CFs and in th private land.

About 109 CFUG members (79 male, 13 female and 17 executive committee) were supported by capitalization funds through CFUG. Capitalization funds were established in six CFUGs with the sum of Rs. 30,000 each. Loans from capitalization funds in the range of Rs 1000 to 5000 were provided to collect and domesticate MAPs in their private land.

CMAPSL project also supported distribution of seedlings from the project managed nurseries and provided technical and institutional support for domesticating MAPs. About 97 community members domesticated 32,633 plants of Sugandhwal, Chirayita, Timur, Pakhanbed and Satuwa.

Domestication was a function of land tenure, incentive (i.e. seedling support, technology) and institution. Incentives provided to the CFUGs included seedling support, technology and nursery establishment in the community forest area. But more and more CFUG members prefer to cultivate MAPs in fallow lands rather than their farm land. Among the 97 CFUG members who participated in domestication, 68 members cultivated MAPs in fallow land where as only 29 (30%) used their best lands for domestication.

About 75.25% of participating CFUG members domesticated MAPs on land sizes less than 50 m², 19.58% on 50-100 m² and 5.15% on over 100 m². Most of the community members are small size landholders. Table 6 shows the type and

Table 6: Details of domestication in six community forests

NAME OF CFUG	#CFUG MEMBERS	# OF SEEDLINGS	FALLOW	GOOD LAND
Gwallek	12	3647	4	8
Kedar	20	6869	17	3
Sidhanath	22	8965	15	7
Niglasaini	20	4090	16	4
Sigas	15	6186	13	2
Durgabhawani	8	2876	3	5
Total	97	32633	68	29

extent of domestication of MAPs in the project CF areas.

NTFPs are an important source of income generation for community members, traders, farmers and school children. An end-of-project survey showed that NTFPs contributes 4 percent (Rs. 636 per person per year) of the total income (Rs. 11,615

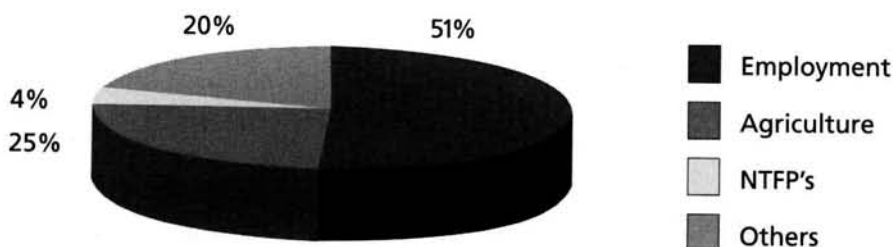
per person per year) of six CFUGs of the Baitadi district.

D. CAPACITY BUILDING

a. Training / workshop/ information dissemination

The CMAPSL project increased the technical knowledge at the community

Figure 3: Contribution of NTFPs to total income



level through NTFP inventory training, preparation of each CF's NTFP inventory, NTFP-based enterprise development training and nursery development works. They were also trained in identification of plants, estimation of growing stock of forest vegetation and NTFPs, and incorporating them in the forest operational plan (FOP) for sustainable management. A total of 287 CFUG members (170 male and 117 female) participated in the training programs.

b. Information dissemination

Price Information Systems (PIS) were established in Baitadi to provide up to date market rates for NTFPs to CFUGs, collectors and farmers. The Price Information System consisted of the buying prices of NTFPs in Baitadi by the Terai suppliers and traders of other marketing places, for example Tanakpur, Nepalgunj, Kathmandu and Delhi. This information is available to NTFP collectors on a monthly basis through a board established in the district headquarters of Baitadi and the main market place in Khodpe and additionally through the FECOFUN range chapter. These efforts showed that the bargaining capacity of collectors has increased and increased number of people are attracted towards NTFPs as an additional source of income.

E. POLICY FEED BACK AND INSTITUTIONAL STRENGTHENING

One of the lasting impacts of CMAPSL at the policy level has to do with the Forest Operational Plans (FOPs). This plan is one

of the major entry points to incorporate NTFPs into the sustainable management of CFs. To address the needs of the user groups concerning NTFPs, the inventory of NTFPs, yield regulation, and management mechanism were integrated into the FOPs. In this connection, CMAPSL project supported 6 CFUGs to renew and revise their FOPs. The previously prepared FOPs had been lacking the provision of NTFP inventory; yield regulation and their sustainable management.

A District Level Coordination Committee - which was composed of various line agencies, local leaders, development agencies and administrative units - was found to be an effective mechanism to share information and generate policy feedback and for the participation and coordination of different interest groups. Semi-Annual Review Planning and Annual Review Planning (S/ARP) processes were central to the joint planning and monitoring of the project activities. Through these mechanisms, CMAPSL was able to generate awareness and discuss about the project's experiences at the policy level.

6 LESSONS LEARNED AND CONCLUSIONS

1. Rural people are source of traditional knowledge on selection, identification, domestication, propagation, utilization and marketing of MAP/NTFPs, many of which are scientifically justifiable and environmentally suitable.

2. The project revealed that the rural people are heavily dependent on NTFPs including MAPs, which is directly linked with poverty and lack of off-farm employment opportunities.
3. The project has demonstrated that challenges exist in achieving a balance between biodiversity conservation and NTFP/MAP-based livelihood enhancement.
4. Developing participatory regulatory mechanisms for sustainable management of NTFPs/MAPs can be an effective tool to obtain sustainable livelihood options together with resource conservation.
5. Technical inputs to traditional knowledge and practices may produce better results that are acceptable culturally, socially as well as economically, with positive responses to livelihood enhancement and biodiversity conservation concerns.

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ANNEX 1: Summary of traditional management of MAPs

SN	NAME OF	FORM	USES	COLLECTION	COLLECTION METHOD	COLLECTION	STORAGE METHOD	MARKETING METHOD	PROPAGATION METHOD
1	Swertia chirayita,	Herb	Entire plant Cough, Fever, Febrifuge	69% Aug- Nov. 31% Nov- Mar	54% uprooting entire plant 46% plucking mature leaves and stems	85% from CFs 15% from private land	54% keep the dried bundles in safe place 46% in plastic bags	Local market Village traders	23% collect wild seedling for domestication
2	Valeriana jatamansii	Herb	Root Raw material for incense stick, aromatic oil	60% Nov-Dec 40% as per personal need	63% digging the root leaving some root parts, 37% entire plant	75% CF 25% private land	3-7 day dry and keep in the bag	Local traders	Roots are planted in the private land
3	Angelica glauca	Herb	Root Insect repellent in cut & wound stomach pain	Root in Feb-March Seed in Nov-Dec	Digging roots Dig out the entire plant	Mainly from private land	Air dried roots stored in open and dry place Direct sunlight avoided	Seed collected in Oct-Nov	
4	Paris polyphylla	Herb	Root	Root -71% in Jun-Jul 29% Sep-Oct	57% dig out entire root stock leaving some root parts 43% haphazardly	72% CF 28% private land plastic bag	Dried roots in the gunny bag/ Seed propagation		Propagated by root parts
5	Zanthoxylum armatum	Shrub	Fruit Spice, tea flavor Cold	58% Aug-Sep 42% Nov-Dec	75% plucking fruits 25% collect form ground	58% domesticated (private land) 42% CFs	67% plastic bag to store dried fruits 33% pots	Local market Road head traders	Seed Stem cutting

SN	NAME OF	FORM	USES	COLLECTION METHOD	COLLECTION	COLLECTION METHOD	STORAGE METHOD	MARKETING METHOD	PROPAGATION
6	Cinnamomum tamala	Tree	Bark and leaves Spice	75% for spices 25% for medicinal use	50% in Oct-Nov 50% Jan-Mar	25% branch cutting climbing the tree 75% bark removal from thick branch	67% bundle making 33% bags	Local traders	Collect wild seedling for domestication
7	Bergenia ciliata	Herb	Root Tonic	Medicinal	25% May-Jun 38% March	63% Digging root part 37% unsystematically	88% from CF 12% natural forest	Dried root in gunny bags	Wild seedlings domestication

PRIVATE SECTOR PARTNERSHIP FOR NTFPs DEVELOPMENT

Eklabya Sharma
Elisabeth Kerkhoff
C.N. Anil

INTRODUCTION

Hindu Kush-Himalayan (HKH) region is a 'mega centre' for biodiversity, one of the ten largest centres in the world, endowed with a rich variety of gene pools, species, and ecosystems of global importance. Biodiversity such as non-timber forest products (NTFPs) especially the medicinal and aromatic plants have a great potential for increasing cash economies and markets within and between the countries of the HKH region. In the past, efforts to research and develop this sector have mostly focussed on specific parts, omitting to view the value chain as a whole, and without involving the key business players. Most efforts have been limited to the national level, whereas

trade in NTFPs, both legal and illegal is a typical regional affair. Therefore the outcomes have never delivered to their potentials. The initiative presented in this paper is an attempt to involve the private (or corporate) sector in the research on and development of NTFP enterprises for poverty alleviation in the mountain areas of western Nepal. This paper deals with strategic alliances and the results of the private sector partnership on the development of NTFPs in Nepal.

As part of the pre-implementation research for the International Fund for Agriculture Development (IFAD) supported 'Western Upland Poverty Alleviation Programme' (WUPAP), ICIMOD is implementing a pilot

research activity for cultivation of selected NTFPs in collaboration with Dabur-Nepal and DEPROSC in Humla and Jumla. The objective of the trials is to identify suitable NTFPs, report their economic and social feasibility and confirm the *modus operandi* for disseminating the technology to leasehold forestry groups.

Despite modest assumptions on yields, the returns per unit of land and per day of labour for cultivation of NTFPs are estimated to be significantly higher than those of alternative crops. Estimating yield figures, by reducing those claimed by Dabur-Nepal, incremental return per hectare of land cultivated to NTFPs is estimated at about NRs 30,000 per year (Working Paper 8 on Marketing, Appraisal Report for WUPAP, September 2001). However, as there is little or no experience with the cultivation of NTFPs on farmer fields; these estimates cannot be substantiated by empirical evidence.

The partnership is envisaged to produce a list of strategic proven medicinal and aromatic plant species that can be cultivated by food insecure households. Other outputs include (i) an assessment of the benefits of NTFPs as a potential micro-enterprise, (ii) a tested *modus operandi* for effective technology dissemination under WUPAP for the final list of appropriate NTFPs; and (iii) partnerships with regards to NTFP policy. The partner company (Dabur Nepal Pvt. Ltd.) is to guarantee buy back of the produce at an agreed price.

KEY ISSUES

The key issues identified for the NTFP enterprise sector in Nepal are the following:

Erratic supply and low quality of NTFPs

For Nepal, the NTFP sector is one of great potentials, however, NTFP supply is erratic and of low quality due to unorganised and unsustainable collection methods. Smooth and consistent supply of NTFPs, due to cultivation, would stabilise market prices and reduce the market share of substitute products, hence increasing the price of respective NTFPs.

Unreliable markets for NTFPs

International markets for NTFPs are unreliable with high quality requirements; while the NTFP business in Nepal has markets mostly in India, which are speculative, controlled by cartels formed by traders and middlemen and prices change over a short period of time. The medicinal plant based companies are used to getting their raw material at very low prices. The collectors are not organised and command insignificant bargaining power; hence, their margins are less than 10 percent of the final price obtained in India. Collective marketing and forest management as well as the availability of market information would reduce premature collection as well as encroachment on highly marginal forests in high altitudes.

Unsustainable harvesting

At present, harvesting from the wild is the dominant way of collection. Figures estimate that almost 80% of the raw material procured by the companies comes from wild sources; and exploitation of natural resource takes place to the point of danger of loss of certain species. Higher prices and urgent requests from traders

sometimes cause uprooting of some species, hence jeopardising future outputs. NTFP cultivation would reduce the risk of some species becoming extinct. Furthermore, having an additional source of income from NTFP cultivation would discourage encroachment on marginal forestland for agriculture and unsustainable NTFP collection practices.

Lack of know-how

There is interest on the part of local farmers to cultivate NTFPs but they lack technical know-how and access to sufficient inputs. The relevant government organisations and many NGOs at the district level do not have adequate technical capacity to facilitate cultivation of NTFPs and promote sustainable harvesting techniques. In addition, cultivation of NTFPs is an untried technology with high degrees of associated risk, and many farmers are not in a position to take such risks. With appropriate training, farmers are ready to try cultivation of NTFPs particularly in the areas with insignificant opportunity costs, e.g. leasehold forestry land or within the community forestry land area where production of regular agricultural crops is not allowed.

Risk for the target group

The introduction of non-traditional crops in some parts of the programme area may increase

the risk of crop failure due to diseases, drought and shortage of irrigation water and hence increased vulnerability to food insecurity. In addition, exposure to the forces of market and volatile prices would also increase vulnerability to food insecurity, and farmers cannot afford to undertake such a high risk. Risk sharing with farmers would be viable after trials in the farmer fields at various altitudes.

Policy gaps

The legislation banning the collection and trading of certain NTFPs is subject to frequent changes, and enforcement of bans is not consistent throughout the country. It does not serve the purpose of protecting the species, but rather opens new ways for parallel markets and further exploitation of the collectors. In general, only a small proportion of the collected NTFPs are reported. Royalties and taxes from NTFPs have a greater growth potential; significant amounts are lost because of hidden trading. National Policy on NTFPs has been drafted and is being reviewed, which will address most of the issues raised on this section.

PARTNERS, INSTITUTIONS INVOLVED AND ROLES

Dabur Nepal¹ is responsible for setting up experimental sites / demonstration plots for cultivation of new and existing species providing saplings and necessary inputs and

¹Dabur Nepal was established in 1989, and has started research and development projects on medicinal plants in Nepal to provide the modern technology for sustainable cultivation of medicinal and aromatic plants to farmers. It has established a 'State of the Art' greenhouse facility at Banepa cultivating marketable medicinal and aromatic plants, which has with a capacity to produce 3 to 4 million saplings per annum. Moreover, Dabur has developed satellite nursery programmes to provide technical assistance for the cultivation of medicinal and aromatic plants and for demonstration to local farmers. Dabur remains the only company at the moment, which has the technology for domestication of certain species and the capacity to engage in contract farming of medicinal and aromatic plants with a buy back guarantee. The company is large enough to absorb certain risks with regard to cultivation and price fluctuation.

overall technical assistance for production and selection of sites.

Deprosc² is responsible for organising the target group, establishing satellite nurseries, and ensuring that the findings are disseminated and adopted by the target group for the Western Upland Poverty Alleviation Programme (WUPAP). The findings from the experimental sites / demonstration plots are up-scaled through the nurseries and training is provided to the DEPROSC Project staff. The nurseries in the districts serve as demonstration sites and women are to be trained to operate the nurseries and to provide technical advice to the beneficiaries.

Under the leasehold forestry and NTFP production component of **Western Upland Poverty Alleviation Programme (WUPAP)**³, development and production of domesticated NTFPs that have an identified demand is promoted as an income generating activity for the target group. Dabur Nepal is to provide the training and supervision; the Project would finance the transport costs of the saplings, costs of training DFO staff and the beneficiaries, as well as the costs of establishing nurseries.

International Centre for Integrated Mountain Development (ICIMOD) is a learning and knowledge centre working on the fundamental issues of poverty alleviation and environmental sustainability in mountain areas. ICIMOD has been entrusted with providing implementation support to the Project; it is responsible for quality control, assessments of the benefits and accessibility of the potential NTFP-based micro-enterprises by the target group with specific consideration to the socio-economic conditions, as well as ecological and environmental sustainability and field monitoring. All relevant findings are being shared with, and progress reported to WUPAP

Under the leasehold forestry and NTFP production component of **Western Upland Poverty Alleviation Programme (WUPAP)**, development and production of domesticated NTFPs that have an identified demand is promoted as an income generating activity for the target group. Dabur Nepal is to provide the training and supervision; the Project would finance the transport costs of the saplings, costs of training DFO staff and the beneficiaries, as well as the costs of establishing nurseries.

³Development Project Service Centre (DEPROSC) is a non-profit making organization, established in September 1993 under the Association Registration Act 1978 as a non-governmental organization (NGO). DEPROSC has been promoting participatory development by enabling communities to help themselves through various income generating programmes. It has extensive outreach in the remotest areas of Nepal and has deep experience in leasehold forestry, social mobilisation, microfinance and institution building.

⁴The Western Upland Poverty Alleviation Programme (WUPAP), which was made effective in 2002, has five main components: (a) labour-intensive infrastructure development, (b) leasehold forestry and NTFP production, (c) production system enhancement in agriculture/livestock (d) micro-finance and marketing promotion in support of income generating activities; and (e) institutional support. It is being implemented. The proposed project area would cover eleven upland (hills/mountains) districts in the Far and Mid Western Development Regions. The Project has begun operating in four districts during a first phase (Humla, Jumla, Bajura and Bajang). The overall responsibility for the implementation of the project rests with the Ministry of Local Development (MOLD). At the District level, the Local Development Fund Board (LDFB), which includes staff of District Livestock Services Office (DLSO), District Agricultural Development Office (DADO) and District Forest Office (DFO) plays the primary role of implementation of the Project.

METHODS FOLLOWED INCLUDING MULTI- OR TRANS- DISCIPLINARY APPROACHES

It is observed that as part of the changing scenario of development, there has been a move to encourage constructive engagement of private sector and to put in place mechanisms for transparency. In this light, ICIMOD would like to present a model that brings together, public, private and community, recognising that in working together the comparative advantages of different institutions can be capitalised upon.

Between IFAD, Dabur and DEPROSC, the initial months were spent establishing contact, clarifying the agenda and agreeing on the mode of collaboration. Extensive interaction helped to establish a common understanding of the objectives and the experimental sites and demonstration trials were planned with the full support of IFAD. It was agreed that progress be evaluated by all parties involved according to the agreed criteria, which are the following:

- a. Socio-economic adoptability by IFAD's target group ;
- b. Bio-physical appropriateness in terms of agro-ecological potential;
- c. Marketability and sustainable private sector demand; and
- d. Ecological and environmental sustainability.

Demonstration sites are established in Humla and Jumla of the western Nepal. In the demonstration, split-plot statistical

experimental design has been employed, whereby different treatments (control and compost plots) have been applied. The main demonstration plots are divided into small plots called split plots. The reason that the split plot design has been selected is because it is difficult to find suitable sites having similar characteristics. There are a total of 40 split plots and the average size of one split plot is 50 sq metres. Seven species tried are Lauth Sallo (*Taxus wallichiana*), Kuth (*Saussurea costus*), Sugandhwal (*Valeriana jatamansii*), Atis (*Aconitum heterophyllum*), Akarkara (*Anacyclus pyrethrum*), Kutki (*Picrorhiza scrophulariiflora*) and Chiraito (*Swertia chirayita*).

GEOGRAPHIC AND DEMOGRAPHIC AREAS COVERED

The Western Uplands Poverty Alleviation Programme is planned to cover 11 districts in the Far and Mid Western Development Regions. As of 2002, it has been initiated in Jumla, Humla, Bajang and Bajura, will expand to other districts such as Mugu, Dolpa, Kalikot, Jajarkot, Dailekh, Rolpa and Rukum. Demonstration sites have been set up in Jumla and Humla.

In Jumla, the Chandan Nath site is at 2570 meters, the aspect is south east, average rainfall is 667 millimetres and the maximum temperatures is 30 degrees and the minimum is minus 12 degrees. In Humla, the Simikot site is at 3100 meters, the aspect is east south, average rainfall is 815 millimetres and the maximum temperatures is 26 degrees and the minimum is minus 14 degrees.

RESULTS AND ANALYSIS

The tripartite agreement between the private sector, NGO involved in social mobilisation and ICIMOD carrying out quality control thus far has proved that with good communication, transparency of the results of research data and dissemination to organised groups and communities, the *modus operandi* is promising for providing an income generating option for upland communities. In this light, the partnership brings together, public, private and community, recognising that, in working together, we can capitalise on the comparative advantages of different institutions.

The general trend in development today is to encourage greater corporate governance and support constructive engagement of private and particularly corporate sector. International companies are beginning to make more transparent information about the environmental and social impacts of what they do, alongside the familiar financial information which they publish every year. Furthermore, private sector organizations has begun to take account of the economic, social and environmental impacts of their activities, and take complementary action to address those impacts, drawing on their own resources and expertise.

As part of the changing scenario of international development and the move towards greater corporate social responsibility, the challenge would be to put in place mechanisms so that the private sector is transparent. In this partnership with Dabur, ICIMOD has been encouraging transparent

reporting of practices including measurements of production, chemical composition, quality of species and economic returns, so that activities are shared and understood. Furthermore, the provision of consistent, timely and appropriate price and other market information would remedy some of the problems associated with volatile markets.

By partnering with Dabur Nepal there is the risk that by virtue of vertically integrating production and marketing in collaboration with government and other organizations, they would be able to increase their bargaining power and have near monopoly power, which may drive out many other small-scale traders and reduce competition in the market. Therefore, there needs to be clauses within agreements between the cultivators and larger companies so that when the offered prices do not suit them, cultivators will not be bound to an unattractive contract that they cannot get out of. The other key aspect to protect the NTFP cultivators' interests is to make efforts to change the present equation of the market from being a buyer controlled market to a seller's market, by organising the producer to do collective bargaining. In terms of competition it has to be born in mind that Dabur Nepal is the only company presently active in Nepal that is large enough to bear the risks involved in providing buy back guarantees to the farmers, and that farmers are not forced to sell their produce to this company, but at present there are very limited other options.

In remote areas, where markets are far from functioning properly, the risk of the change of

land use from subsistence to cash cropping needs to be mitigated to the extent possible. Apart from the risks of crop failure and falling prices, dependence on market forces also has implications on the food supply side. Mechanisms should be put in place to protect farmers against heavy risks (i.e. company's responsibilities in case of crop failure), but equally care is needed to supply these areas with foodstuffs that are affordable and sufficient.

LESSONS LEARNED FROM BOTH THE SUCCESSES AND FAILURES

1. *Private sector development needs to have a facilitative policy environment*

For private sector activity to be promoted; the Government needs to create a transparent environment. This is not an area where ICIMOD can play a direct role but we have begun by flagging some important policy issues, which can be picked up by the network and policy group for NTFPs that has been created. Through this group, ICIMOD has taken up the issues of cultivated species, where currently there is no clear policy by the government and provisions for collection of propagated species, which are banned from collection from the wild.

2. *The comparative advantage of the private sector can be harnessed*

In terms of technology; there are areas, like cultivation of NTFPs, for which only the private sector can provide technical assistance. Dabur has the technology for

domestication of certain species and has the capacity to engage in contract farming of NTFPs of these species with a buy back guarantee. The company is large enough to absorb certain risks with regard to cultivation and price fluctuation. This could present tremendous opportunities for farmers in the programme area.

3. *The flow of information is to be facilitated for better partnerships*

Given that these piloted activities are successful, the information will be passed on to WUPAP, so that it can be disseminated to the communities. Analysis of production, chemical composition, quality of the species cultivated and socio-economic feasibility, is to be shared with partner organisations and used as a decision making tool to identify gaps and constraints requiring corrective action. ICIMOD presence is seen as a trusted source of information by the Project.

4. *Private sector to encourage cultivation of NTFPs against collection from the wild*

Through the collaboration private sector will get better adjusted to dealing with NTFPs as a cultivated crop produced by farmers, rather than as a product collected from the wild. This is expected to have implications for quality and price standards, as well as the functioning of their contractors.

5. *Contract between cultivators of NTFPs and private sector are to be made before cultivation - The contract needs to include*

the quantity and price of specified products that the farmers agree to produce and the traders agree to purchase within a specified time frame. It is nearly impossible to predict future market prices with any degree of certainty and agreed prices are usually a guess or at best based on past trends, which may be highly under-estimate or over-estimate. Either case would have repercussions for sustainability of marketing and production. It is, therefore, important that a risk-sharing clause be added to all contracts when promoting active marketing/contract farming.

IMPLICATIONS

- Private sector development needs to have a facilitative policy environment.
- The comparative advantage of the private sector can be harnessed.
- The flow of information is to be facilitated for better partnerships.
- Private sector to encourage cultivation of NTFPs against collection from the wild
- Contract between cultivators of NTFPs and private sector is to be made before cultivation.

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REVIEWING CURRENT ISSUES AND PROSPECTS OF NON-TIMBER FOREST PRODUCT (NTFPs) SUB-SECTOR DEVELOPMENT IN NEPAL

Uday R. Sharma

Pankaj K. Das

ABSTRACT

Non-Timber Forest Products (NTFPs) are receiving increasing importance for their role in sustaining rural livelihoods and need for promoting sustainable management of the resources. The demand for the NTFP resources in national and international markets has been growing and Nepal has to take advantage of this opportunity. On the other hand, Nepal being one of the recent members of World Trade Organization (WTO) has to face the challenge of how to effectively manage these resources on sustainable basis as required by this policing body. This paper reflects the existing issues and constraints hindering the development of NTFPs sub-sector in Nepal and the policy initiatives taken by His

Majesty Government of Nepal (HMGN) towards resolving these issues for the overall development of this sub-sector. The highlight of the draft Herbs and NTFP Development Policy prepared through a consultative process throw lights on the expected course the government may take in the future.

INTRODUCTION

In Nepal, all forest products, except timber, fuelwood, and fodder are considered as non-timber forest products (NTFPs). Altitudinal and climatic variations in small area of 14.7 million hectares has made Nepal rich in biodiversity. There are all together 10091 plants enlisted with 5884 flowering plants and remaining non-flowering plants (HNTFPCC). 246 species of

flowering plants are endemic to the country. Over 700 species have been recorded to have medicinal and aromatic values among which about 238 species have been tested chemically. Likewise, the essential oil content of 219 species of aromatic plants have already been determined.

NTFPs are an integral part of the rural economy of Nepal as plenty of people in rural areas depend on this sub-sector both for subsistence and income generation. Most rural people have been traditionally engaged in the collection, cultivation, processing, and marketing of these resources. However these people have not been able to get a fair share of benefits from these activities. Similarly, several processors, traders and exporters are engaged in this sub-sector employing thousands of peoples in Nepal but they do not get proper price due to lack of marketing information, variations in quality and quantity of the products, and inappropriate policy and legislative setup in the country and across the border. In the Tenth Five Year Plan of the government, NTFPs has been given high priority because of its potential in employment and income generation and export promotion.

There is a growing international market for NTFPs and Nepal can take advantage of this opportunity. International interests in Nepalese herbs provide opportunity to position Nepalese products in international markets. However, it is also a big challenge for Nepal to organize its efforts in terms of avoiding rapid depletion of the resources and ensuring sustainable supply of the products in the long-term. Sustainable management of NTFP resources therefore is a must. Nepal's membership to the World Trade

Organization (WTO) is expected to enhance its position in participating into world economic trade where NTFP products can be promoted. The country has to be conscious however on its implications. While WTO opens the door for manifold commercial opportunities, there is a need at the same time for developing controlling mechanism for the protection of its resources and the national industrial rights by the concerned nation state.

There do exist laws and statutes that support the development forest resources, NTFPs included, in Nepal. The Master Plan for Forestry Sector (1988), Forest Act (1993), and Forest Regulations (1995) are major innovative initiatives towards the conservation and sustainable management of forest resources by His Majesty's Government of Nepal (HMGN). Nepal is also a signatory of different international treaties like Convention of International Trade on Endangered Species of Fauna and Flora (CITES) which prohibit and strictly regulate the international trade for the listed endangered species. Convention on Biological Diversity (CBD) provides the genetic rights of these resources to Nepal and promotes conservation, sustainable utilization, and equitable sharing of ensuing benefits to the local communities. Several other relevant legislations, strategies, plans, and legal provisions have been developed for the promotion of forest resources. Despite these initiatives, the NTFP sub-sector is still faced with several constraints that hinder its promotion especially the lack of specific policy and legal framework.

Nepal has a comparative advantage as source of NTFP resources. Some of its NTFP species

have unique characteristics and of excellent qualities. Nepal is endowed with traditional knowledge and practices that can be taken advantage of. To harness these opportunities, it is strongly felt that a separate policy for the NTFP be developed as the current forest policy and legislations do not clearly address the proper conservation, management and utilization issues affecting the promotion and development of the NTFP sub-sector.

ISSUES AND CONSTRAINTS IN PROMOTING NTFP SUB-SECTOR DEVELOPMENT

Below are some of the critical issues and concerns identified that hinder NTFP sub-sector development and promotion in Nepal:

- Lack of NTFPs resource management and utilization directives, guidelines;
- Ban of eight important medicinal and aromatic plants for export without local processing;
- Collection permit for government-managed forest have to be obtained from the District Forest Office (DFO) whereas Community Forestry User Group Committee (CFUGC) issues permit for collection from community forests. However in both the case DFO issues the transit permit (release order);
- Checkpoints at different places during transporting NTFPs encouraged corruption and have led the transaction cost high. In addition, taxes are levied by District Development Committee (DDC), Village Development Committee (VDC), municipalities, local clubs and schools;
- Royalty rates fixation is arbitrary and is not periodically reviewed;
- Traders pay royalty even for NTFP produced on private lands;
- Procedures for the export is too cumbersome, time consuming, and costly;
- Equitable benefit sharing provisions among the NTFP collectors, traders, and other parties are grossly absent;
- DFO, Customs Office, Police, and other authorities lack tools and knowledge to identify NTFPs, particularly restricted MAPs to prevent their illegal collection and trade;
- Lack of uniformity in naming of NTFPs mentioned in Forest Regulations 1995 and royalty rate differ sometimes even for the same species as they have different local names;
- Lack of established formal credit system for interested groups and entrepreneurs who are mostly poor;
- Lack of marketing information of NTFP among the collectors and village traders about the market, prices, grading for required quality and quantity of products; and
- Absence of legal provisions and guidelines about NTFP certification and trade labeling to conserve, sustainably utilize and monitor the resource base while maintaining the social rights of the local communities.

INITIATIVES UNDERTAKEN TO ADDRESS THESE ISSUES

Seeing the need to address the issues identified above, the government has taken a bold step in order to address them. Following are the highlights of the initiatives undertaken by the government

1) Establishment of the Herbs and NTFP Coordinating Committee (HNTFPCC)

HMGN established the "Herbs and Non-Timber Forest Product Coordination Committee (HNTFPCC)" on August 20, 2003 under the chairmanship of Honorable Minister of Forests and Soil Conservation. The Committee has a mandate to undertake the following:

- To set long term goal and formulate national policies related to NTFP;
- To formulate and implement legislation and directives for the sustainable development of NTFPs as per the policy;
- To develop strategies for programs in accordance with national policy and implement these programs through coordinating different agencies;
- To coordinate, evaluate, and monitor NTFP related activities between government, non-government and private sector;
- To establish and coordinate interrelationships of programs regarding resource conservation, research,

technology development, marketing training and publicity related to NTFP; and

- The Committee will update on going activities, at national and international levels, and exchange information with related organization. In addition, it will coordinate to apply appropriate information related to NTFP with various organizations and institutions.

2) Major steps of HNTFPCC towards NTFP promotion

The committee has met already several times since it was established and has made crucial decisions related to facilitating necessary technical, policy, and institutional support to the sub-sector.

- Review of royalty rates for all the NTFPs mentioned in the Forest Regulations 1995 has been initiated through coordinating different stakeholders.
- Recommended to uplift ban on collection of Kutki (*Picrorhiza scrophulariiflora*).
- An action research is being conducted for the sustainable utilization of root bark of Okhar (*Juglans regia*).
- Initiative has been taken for the resource assessment of five important NTFPs viz. Panchanule (*Dactylorhiza hatagirea*), Kutki (*Picrorhiza scrophulariiflora*), Yarshagumba (*Cordyceps sinensis*), Lauthsalla (*Taxus wallichiana*) and Timur *Zanthoxylum armatum*).
- A list of 30 commercially important indigenous medicinal and aromatic plants

(MAPs) has been prepared; among them 10 species have been selected for domestication and other research purposes.

- Active coordination and collaboration have been initiated with governmental organization (GOs), International/Non-Governmental Organizations (I/NGOs), donor representatives, private institutions and experts for the promotion of NTFP sub-sector in Nepal.
- A project for the establishment of Rhododendron garden and MAPs demonstration plot in the Mountain Botanical Garden Daman (declared during International Year of Mountain, 2002), has been approved.
- Documentation works and database management related to NTFP is gaining momentum.
- Draft Herbs and Non-Timber Forest Product Development Policy has been formulated through long process of grassroots and national level consultation with different relevant GOs, I/NGOs, private institutions, and experts.

3) Highlights of the draft herbs and NTFP development policy

The New Herbs and NTFP Development Policy has been drafted for the overall development of this sub-sector with following vision, policy, and strategy.

Long term vision

The long term vision of this draft policy is to make the Kingdom of Nepal well-known

worldwide as "Treasure of Herbs and NTFPs" in the global market within 2020 A.D. by increasing its production, processing, marketing and other development related activities through the conservation and sustainable management of NTFPs.

OBJECTIVES

The overall objectives of this draft policy are as follows.

1. To obtain maximum economic and environmental benefits through conservation and sustainable management of the NTFP by considering its regeneration, reproduction and other ecological factors so that there will be minimum adverse impact during collection, production and processing.
2. To help in the increment of national income and employment by focusing on the commercial cultivation of high value NTFPs.
3. To increase the income and employment opportunities of the remote and rural areas by doing primary processing works of collected NTFPs at local level. Similarly, the secondary and final processing and other value addition works should also be carried out in the accessible collection centre and commercial centre for retaining maximum economic benefits locally.
4. To contribute in the poverty reduction by improving the livelihoods condition of the poor people through providing required capital, infrastructure, technical

knowledge and skill, and marketing management know how.

5. To focus the natural resource management program based on social and gender perspective, confirming the participation of disadvantaged, poor, and women groups of the society in the collection, production, processing, sale and distribution activities of MAPs and other NTFPs.
6. To earn foreign currencies through the sales and distribution of these resources in competitive way in the global market.

HIGHLIGHTS OF THE DRAFT POLICY

This draft policy covers all aspects of NTFP sub-sector development under five different headings for achieving the above-mentioned objectives.

1. Conservation and sustainable utilization

For the sustainable management of NTFPs, resource inventory will be carried out and on the basis of the results obtained management prescriptions will be made. NTFP harvesting will follow the same prescriptions. The threatened plant species of MAP and other NTFP will be conserved through balanced program of *in-situ* and *exsitu* conservation. Similarly, "Herbal Area" will be declared on the basis of resources availability study and then intensive development, conservation and management programs will be launched.

Arrangement for the sustainable supply of NTFPs will be made from farm or forests or from both as per identified demand of national and or international markets. Finally, separate short term and long term plans will be formulated and implemented for the overall development of NTFP sub-sector in Nepal.

2. Participation emphasized

As the NTFP collection from the natural forest is not sufficient and causes resources depletion, the cultivation activities will be emphasized on the community forests, and other private land for its commercialization. Besides forest user group, user groups of conservation area, buffer zone area, and agriculture sector will be made participated. The priority for participation in benefit sharing will be primarily provided to the people below poverty line.

Priority should be given to GOs, NGOs, and private institutions for local value addition to those NTFPs that could be processed within country. Similarly, Institutional development will be carried out by bringing producers, collectors, and sellers under one umbrella and then assuring quality and quantity of production for the proper marketing management. Private and cooperative approach will be stressed in the establishment of manufacturing units, sales and distribution.

3. Certification and tax system simplified

NTFP certification and tax (including royalty) system for the private land production will be simplified and the provision should be made

for free sales and distribution either in raw or in processed form. Forest certification facilities should also be made available for the NTFPs collected from sustainably managed forests. Different facilities for the quality e.g. material safety, product analysis, product certification, etc., will be made through arrangement of the well-equipped certification laboratory at national and gradually at regional levels.

Similarly, royalty of NTFPs that is collected from forests will be determined on the basis of market values of the products at local level and royalty rate will be reviewed once in a period of maximum five years regularly.

4. Researches and development (R&D) accessible to communities

Cultivation technology for the commercially potential NTFPs will be developed through R&D and the certified technology will be transferred to communities. Similarly, arrangement should be made for bio-prospecting work by coordinating different foreign organizations and institutions for commercially potential indigenous NTFPs having demand in international markets. In such case, arrangements should be made so that Nepal could get maximum benefits from these activities. Different measures will be taken for the familiarization of high value native NTFPs in international markets.

Herbs and NTFP Coordination Committee will have major role in monitoring and evaluation of different activities carried out in NTFP sub-sector.

5. Awareness and facilities for skill development and commercialization

Awareness among peoples will be increased for the collection, cultivation, processing, sales, and distribution activities of NTFPs and also different opportunities and required facilities will be provided to them develop appropriate skills.

STRATEGY

Following strategies will be taken into consideration while implementing the aforementioned policies.

- 1) HMG will play the role of facilitator, catalyst, and regulator in the process of NTFP sub-sector development and will also have role in timely adjustment and amendment in policy through coordination.
- 2) An arrangement should be made for the loan facilities from Agriculture Development Bank and other organized sector to the land of cooperative organizations and the private institutions. Loan facilities will be provided for the cultivation, collection, processing, sales and distribution activities of NTFPs. Similarly, some funds from the "Local Development Fund" and "Poverty Alleviation Fund" will be managed for poor and disadvantaged groups of the society for commercial activities.
- 3) For the sustainable management of NTFPs, sales and distribution procedures will be adopted on the basis of annual allowable harvest data obtained through inventory

of these resources. Any biodiversity rich area will be declared "Herbal Area" and different income and employment-generating programs will be launched in such area with local people's participation for the development, conservation, and management of these resources.

- 4) An effort would be made towards the cultivation of NTFPs in agriculture land along with other agricultural crops. Similarly, focus would be given towards the cultivation of appropriate species in marginal lands and government lands without any ownership. In such kinds of activities poor, landless, and marginal families will be encouraged to participate. Cultivation technology of high value NTFPs will be developed and transferred to farmers and entrepreneurs. For focusing NTFPs cultivation works within leasehold forests and community forests, management prescription will be made in their management plan. Required technical assistance and financial support will be provided to forest user groups (FUGs). Permission will also be granted for collection and cultivation activities of NTFPs within government managed forests through private and cooperative sector approach.
- 5) Scientific storage, processing, packaging, and chemical extraction works of high potential Nepalese NTFPs will be emphasized. Priority will be given to small and medium scale industries for such kind of activities. Well-equipped laboratory will be established at both national and

gradually at regional levels for the quality control and certification of NTFPs so that supply of quality Nepalese products will ascertain its place in international markets.

- 6) Capacity of Herbs Production and Processing Company Limited will be enhanced as an institution to supply quality products of NTFP according to the market demands. Similarly, capacity building of the other GOs and NGOs working responsibly in the NTFP sub-sector will be enhanced as per requirement. Focus will be given to establish and develop ayurvedic and allopathic pharmaceutical industry within the country, which is essential for the betterment of human health. In addition, identification, collection and cultivation technologies of the MAPs required by different industries will be provided.
- 7) Foreign investment will be attracted and prioritized for the establishment of advance and large scale industry based on locally available NTFPs. Priority will also be given for domestic investment for micro and medium scale industries that can utilize the traditional knowledge and skills. During these processes, attention would be provided for the protection of domestic industry and entrepreneur rights. Act to regulate genetic resources and benefit sharing will be formulated and enacted separately for the overall legal rights of the individual, groups, and the nation upon these resources.

- 8) For the familiarization of Nepalese herbs in international markets "Herb Trade Fair" will be organized occasionally with active coordination and help from diplomatic mission situated in different country and other relevant organizations. Similarly, trade fairs will be organized at district levels within the country. Mechanism will be developed for establishing marketing information system and dissemination of required information to producers, collectors, processors, and traders of NTFPs.

CONCLUSION AND RECOMMENDATION

NTFP sub-sector has a great potential for improving the socio-economic status of local people as well as increasing national income and employment. Market is expanding at national and international levels because of people's continuing interest and belief on the efficacy of the herbal products. In this context, Nepal has a good opportunity to engage in sustainably managing and utilizing the NTFP resources in order to maximize the very economic, social, ecological benefits that can be derived from them. Although this sub-sector has several issues and constraints concerning conservation, utilization, and trade, HMGN has taken steps in the direction of making Nepal known worldwide as an herbal nation in the coming decades. Given the present status and prospects in the NTFP sub-sector, following initiatives/plans are recommended to push the development of the NTFP sub-sector forward:

- Endorse the draft policy that has been developed as soon as possible together with the action plan to implement it;
- Develop inventory and sustainable harvesting guidelines for NTFPs for their better management of the resources
- Capacity buildings of relevant GOs, NGOs for performing active role in NTFP sub-sector promotion.
- Staff involved in NTFP activities regulation should be trained in identification.
- Develop cultivation technologies for high value plants and transfer them to farmers.
- Conduct study for the uniform naming of the NTFPs and selling prices of primary collectors at local level in different parts of the country for determining royalty rates. Review royalty rates on periodic basis.
- Develop mechanisms for differentiating production from private land and from government forests. The certification and taxation system for cultivated products should be simplified.
- Develop provisions to provide credits to poor and disadvantaged people to start their own NTFP promotional activities and also to increase their bargaining power to deal with external traders.
- Develop central as well as regional marketing information centres to provide price, quality and quantity of products on

demand, and other relevant information to the NTFP collectors, cultivators, traders, and industrialists.

- Develop national NTFP certification and trade labeling guidelines for adding values to the products.

COMMUNITY BASED APPROACHES TO CONSERVATION AND MANAGEMENT OF MAPs FOR SUSTAINABLE LIVELIHOODS IN DOTI DISTRICT

Experience of IUCN Nepal

Sagendra Tiwari
Julia Robinson
Giridhar Amaty

EXECUTIVE SUMMARY

Medicinal and Aromatic Plants (MAPs) make a significant contribution to the livelihoods, health care and income for the people of Nepal. Their huge economic potential is also increasingly being recognized. Yet neither the MAPs-dependent communities nor the state have been able to make the best out of this sector and the MAPs themselves are at risk of great losses in abundance and diversity.

IUCN Nepal has been working closely with local communities in Doti district since 2000 in order to explore ways to promote sustainable livelihoods with conservation and

management of MAPs. This article presents the learning of our work on two aspects: i. to what extent the MAPs could contribute to secure the livelihoods especially of the poor and dalits in a sustainable manner; ii. What potential exists to enhance the productivity of MAPs in community forests for the desired social, economic and environmental benefits.

Out of 36 generally collected MAP species in Doti, 10 are widely traded of which 3 are often protected in the homesteads and 7 collected from forests. The project is promoting sustainable harvesting methods, building capacity for cultivation of locally suitable MAPs and group approach to addressing social and economic bottlenecks hindering MAPs

collection, and strengthening post-harvesting and marketing skills.

The learning so far indicates that although almost every type of mountain household collect MAPs for their livelihoods, including poor and relatively richer, and all castes and ethnic groups. However, the poor and landless (including dalits) are more dependent on MAPs since they lack alternative livelihood options and measures are required to see they get a fair share of the sector. Furthermore, the potential of MAPs in national and community forestlands has yet to be adequately tapped. Legal recognition of the tenure of MAPs collectors remains at the heart of the existing threats to conservation and market failure in MAPs sector. Local governance mechanisms offer a possible solution and there is a need for the coordinated efforts of MAPs collectors, traders and regulators for the desired outcomes at social, economic and ecological fronts.

The paper recommends that as a pro-poor livelihood strategy, MAPs production in community forests can be widely undertaken by the poor and landless as a sub-group within CFUGs. This requires amendments to the CF rules and guidelines to specifically favor the poor, disadvantaged and landless. A multi-stakeholder approach to developing and enforcing sustainable harvesting guidelines at national, regional and district levels is desirable. However, incentives must also be in place for collectors to adopt sustainable harvesting practices. The paper recommends a collaborative study at national level for a joint ecological and market analysis to examine the potential effects of regulations and incentives for sustainable MAPs cultivation and harvesting.

An additional study is recommended to examine existing mechanisms that support pro-poor benefit from MAPs.

INTRODUCTION

Experts estimate that 700 to 1,700 species of MAPs occur in Nepal. Out of these over 100 species are widely traded and exported. In terms of the distribution patterns of MAPs, Nepal's tropical region (below 1,000 m) holds 49 percent of them, subtropical region (1,000 to 2,000 m) 54 percent, temperate region (2,000 to 3000 m) 36 percent, sub alpine region (3,000 to 4,000 m) 18 percent and alpine region (above 4,000 m) holds 7 percent (Malla and Shakya 1986). The high mountain MAPs are widely known for their high value, and hence fetch relatively higher prices.

Traditionally considered as common property resources. MAPs are collected from the wild by villagers and traded through multiple actors and market channels within a confusing policy environment (Kanel 2001). The bulk of MAPs collected from the mountains of Nepal are eventually exported to India. MAPs are presently estimated to contribute 5 percent in Nepal's GDP (Malla et al. 1995) and have huge economic potential especially in the mountains (Olsen and Larsen 2003). They, however, constitute only 10 percent of the total annual revenue from the forestry sector (the Department of Forest's revenue records of 1997/98 quoted in Kanel 2001).

The poor, who may be largely dependent on the collection and harvesting of MAPs, have increasingly been struggling with strong

competition due to the growing market and interest of newcomers in MAPs collection. The District Forest Offices (DFOs) responsible for regulating the collection, sale and export of MAPs have so far been doing so in the absence of adequate knowledge, information and capacity. Community Forest User Groups (CFUGs) in general have rarely had the opportunity and capacity to concentrate on the MAPs and NTFPs potential of their Community Forests (CFs). Many small and mostly scattered efforts have been made under different projects for the last decade or so to promote MAPs and NTFPs sector as a viable means of boosting the rural as well as national economy but with limited success to date. The overall situation to-date indicates that:

- i. MAPs-dependents in communities are unable to get even the opportunity cost of their time invested in MAPs collection;
- ii. Local MAPs traders continue their work even when their profit margins are small, and
- iii. The forests and pastures once full of MAPs seem to be gradually getting exhausted with limited regeneration.

Since 2000, IUCN Nepal started working with communities under a collaborative action learning project in Doti district to understand and support livelihoods and conservation opportunities of MAPs in Nepal. The underlying purpose was to explore ways to promote the conservation and sustainable use of MAPs within the existing social, economic and ecological contexts. The thrust of this

project has been to enhance the livelihood opportunities through MAPs promotion and to institutionalize MAPs-based CF management among CFUGs.

This article aims at sharing IUCN Nepal's learning to date on two main aspects:

- i. The extent to which MAPs can contribute to rural livelihoods, and in particular to the poor and dalits, while ensuring their conservation;
- ii. The potential to increase productivity of MAPs within community forests as a contribution to the livelihoods of the poor within the CFUGs.

The article will first present some background to IUCN's involvement in Doti District and an overview of typical benefit flows from MAPs. It then shares IUCN's strategies for promoting sustainable harvesting and cultivation of MAPs and examines whether the benefits to date are reaching those disadvantaged in the region – the poor, dalits and ethnic groups. It then discusses strategies for sustaining benefit – from economic, social and ecological perspectives. It closes with a discussion on the implications for national policies and regulations and offers some recommendations to provide incentives for pro-poor sustainable MAPs promotion.

IUCN'S COLLABORATIVE ACTION LEARNING PROJECT IN DOTI

IUCN strives to test approaches leading towards natural resources conservation,

sustainable use and equitable benefit sharing as stipulated under the Convention on Biological Diversity (CBD). This requires working together with communities and their institutions to understand local conservation and use practices and the underlying rationales and shortfalls. It also requires the eco-biological, social/institutional, legal and economic perspectives within which the use and management decisions are taken at individual, households and community levels. The broad purpose of the project is to test and develop sustainable MAPs management approaches that ensure *in situ* conservation of MAPs and at the same time contributes to the livelihoods of those dependent on them.

Doti ranks 64th of 75 districts in Nepal according to the human development indicators (HDI)¹ and has widespread poverty and low literacy rates. Doti is representative of the districts of Far Western Development Region (FWDR) in that most livelihoods are based on forest resources and subsistence farming. MAPs constitute a prime source of income in the district and in the region as a whole. Far-western mountain districts of Nepal are connected with the major markets of Terai through Dhangadhi-Dadeldhura highway. The major portion of this highway being located in Doti, the district provides many newly emerging yet small road head markets to the rural population of the area. Most of the MAPs collected throughout the region accumulate in such road head markets prior to their transport

to Dhangadhi and/or Nepalganj for export to India.

IUCN Nepal selected Doti a representative district for the project for the promotion of MAPs basically due to:

- i. its strategic location in the far-west mid-mountains;
- ii. road links with other districts in the region;
- iii. rich forest cover and MAPs diversity;
- iv. Widespread poverty and poor development.

Located in the Seti zone of FWDR Doti is a mountainous district ranging from 305m to 2,430m above sea level and covering 2025 sq. km. The district has 53 Village Development Committees (VDCs) with a population of 177,789 in 33,562 households (HHs). The district has approximately 144,690 ha (65 percent) under forest with subtropical, tropical and temperate forests and pastures. The forests serve as a reservoir of valuable MAPs and other NTFPs. Most of the species of MAPs found in mid mountains of Nepal are found in the forests of Doti and its adjoining districts.

The official records of the Regional Forest Office in Dhangadhi reveal that a total of 10,017 tons of MAPs worth NRs. 32.4 millions (as royalty) was traded between 1995 – 2003 from this region. The contribution of Doti district alone was 1,199 tons worth NRs. 5.46 million. MAP's annual trade from Doti officially is at a scale of

¹Where 1 is the highest and 75 the lowest. Nepal Human Development Report 1998 (submitted to UNDP) by Nepal South Asia Centre.

approximately 100 tons contributing about NRs. 3.5 to 4 million into the national coffers. The actual trade figures however, should be much higher since plenty of MAPs are traded and exported unofficially to avoid paying royalty fees and due to the open border between India and Nepal. Table 1 shows a comparative situation of MAPs in Doti, Far-Western and national economy.

IUCN Nepal selected six Village Development Committees (Chhatiwon, Ghanteswor, Laxminagar, Saraswotinagar, Nirauli and Gadsera) in the Jorayal Range Post of Doti District Forest Office (DFO). A household survey was done in 2001 to understand the baseline situation related to livelihoods. It showed 3,151 households (HHs) with an average family size of 7.5 (> national average). The average land holding in case of the majority HHs is below 0.5 ha of which 2% are landless and 15% have less than 0.2 ha. While

the majority of the HHs have *bari* (rain-fed hill terraces), only 55% have *Khet* (fertile irrigable river valley lands). It also revealed that 60% of HHs earn their livelihoods through forest and livestock based subsistence farming while 40% are unable to do so. Hence, they depend on tenant farming, wage laboring and/or seasonal migration to the terai and/or India to meet their annual livelihood needs.

People depend on common property forest and pastures for the collection of MAPs because:

- i. they have traditionally easy access to forests and MAPs in there
- ii. they lack knowledge, materials and skills regarding cultivation and management of MAPs
- iii. they are not aware of the potential of sustained financial benefits from MAPs cultivation

Table 1: Contribution of MAPs to the national economy

		94	95	96	97	98	99	2000	01	02	03
National	Qty (Tons)	NA	11795	4367	3122	3761	11449	2885	3091	3113	2527
	Royalty	NA	17,277	24,479	21,142	26,344	25,818	16,994	26,414	15,329	12,748
FWDR	Qty (Tons) (NRs.'000)	5,019	398	343	517	586	678	809	561	400	708
	Royalty (NRs.'000)	7,675	777	1,932	2,796	2,936	4,512	3,822	2,966	1,745	3,332
Doti	Qty (Tons)	NA	156	42	96	126	143	116	97	97	327
	Royalty (NRs.'000)	NA	203	236	516	667	621	550	622	677	1,367

Source: District forest office records

MEDICINAL PLANT PROMOTION IN DOTI

36 species of MAPs are generally collected for various household purposes in Doti district. However, there are only 10 major widely traded MAPs species, 3 of which namely, Tejpat (*Cinnamomum tamala*), Rittha (*Sapindus mukorossi*) and Timur (*Zanthoxylum armatum*) are generally raised and/or protected in the homesteads. The remaining 7 species collected from forests and pastures seasonally include Chutro (*Berberis aristata*), Pashanved (*Bergenia ciliata*), Kachur (*Hedychium spicatum*), Jhyau (*Parmelia nepalensis*), Amala (*Phyllanthus emblica*), Chiraito (*Swertia chirayita*), and Sugandhawal (*Valeriana jatamansii*).

The *in situ* conservation of such widely traded MAPs species could be guaranteed only through their sustainable harvesting ensuring sustainable reproduction in places from where they are collected. The pressure on common property resources for these MAPs could also

be curbed through the cultivation of such species in the community and private lands. Individuals and communities have expressed interest to get involved in the production of species that are easy to grow, need minimum care and provide attractive returns in a relatively short time. More importantly there should be readily available market for farmers to get competitive prices. Farmers were also interested to produce the species that they have dealt with in the past. These were key factors to be considered in the selection of MAPs species for promotion in the area. The prevailing market prices and the traffic survey also provided a basis for selection; however price was not the prime criteria. A MAPs traffic survey revealed Lichen, Rittha, Kachur, Chutro, Tejpat, Amala, and Pashanved to be the highly preferred species for trade. Table 2 below shows the ranking of some MAPs of Doti based on their market prices in Dhangadhi and adjoining markets.

Based on these facts IUCN selected **Tejpat, Amala, Rittha, Bojho, Timur** and

Table 2: Ranking of MAPs of Doti based on their market prices

HIGH VALUE	MEDIUM VALUE	LOW VALUE
>20.0 /KG	10-20/KG	<10.0/KG
Alaichi (<i>Amomum subulatum</i>) Amala (<i>Phyllanthus emblica</i>) Chiraito (<i>Swertia chirayita</i>) Dalchini (<i>Cinnamomum tamala</i> -Bark) Gamdol (<i>Brachycorythis obcordata</i>) Sugandhawal (<i>Valeriana jatamansii</i>) Timur (<i>Zanthoxylum armatum</i>)	Bojho (<i>Acorus calamus</i>) Jhyau (<i>Parmelia nepalensis</i>) Kurilo (<i>Asparagus racemosus</i>) Satuwa (<i>Paris polyphylla</i>)	Chutro (<i>Berberis aristata</i>) Kachur (<i>Hedychium spicatum</i>) Kalchuri (<i>Litsea glutinosa</i>) Kaulo (<i>Percea bombycina</i>) Pashanved (<i>Bergenia ciliate</i>) Rittha (<i>Sapindus mukorossi</i>) Tejpat (<i>Cinnaamomum tamala</i> -leaves)

Sugandhawal for promotion through plantation and **Bojho, Pashanved, Kachur, Jhyau** and **Sugandhawal** and others based on their availability in the wild for their *in situ* conservation in the adjoining community and other forests.

Benefit flows from MAPs – the without project scenario

MAPs provide benefits to many people, both collectors and traders. Collectors gather MAPs from the wild and also cultivate some of them in their homesteads. At the onset of the project, no MAPs were being cultivated by communities in groups although some HHs did protect and manage the naturally regenerated *Ritha, Tejpat* and *Timur* as their private property.

A household survey conducted in 2001 revealed that on average 39% of the HHs

in the 6 VDCs of the project area depend on MAPs and NTFPs for household consumption and/or for income (Table 3). Of these collectors, only 11% were dalits. The contribution of MAPs to HHs annual income was reported to range from NRs. 370 to 2,366.

This finding was reinforced through a participatory assessment in 2003, which showed that 33% of HHs in 12 wards² collect MAPs (Table 4). The assessment further showed that HHs from all economic backgrounds collect MAPs Furthermore, of the 110 Dalit HHs in these wards, 25% are involved in MAPs collection. This shows that it is not only the poor and dalit groups who collect MAPs for their livelihoods. However, they may be more dependent on them as a livelihood strategy, as proposed by Olsen and Larsen (2003) who state livelihood dependency over MAPs/NTFPs varies with the HH's capital assets (land, livestock etc.) and manpower.

Table 3: HH involved in MAPs collection

VDC	TOTAL HHS	TOTAL DALIT	# HHS INVOLVED IN MAPs COLLECTION	DALIT HHS INVOLVED IN MAPs COLLECTION	TOTAL INCOME FROM MAPs/YR	AVG. HH INCOME/YR FROM MAPs
Saraswotinagar	523	NA	165 (31.5%)	14 (8.5%)	390440	2366
Laxminagar	777	NA	180 (23%)	21 (11.7%)	74306	413
Gadsera	607	84	245 (40.36%)	36 (15%)	264285	1079
Chhatiwon	461	157	98 (21.25%)	20 (4.33%)	36237	370
Ghanteswor	335	54	236 (70.4%)	35 (14.83%)	170226	721
Nirauli	448	34	314 (70%)	9 (2.86%)	405,618	1292
<i>Total</i>	3,151	329	1,238 (39.28%)	135 (10.9%)	1341,112	1083

²Where 1 is the highest and 75 the lowest. Nepal Human Development Report 1998 (submitted to UNDP) by Nepal South Asia Centre.

Table 4: MAPs collecting HHs of 12 Wards by Wealth Class (2003)

WEALTH CLASS	RICH	MEDIUM	POOR	VERY POOR	TOTAL
Total HHs	100	230	222	217	769
MAPs Collecting HHs	27 (27%)	76 (33%)	79 (34%)	68 (31%)	250 (33%)

An income ranking exercise of 12 wards of two VDCs further indicated that MAPs contribute less than 4% to annual income. Table 5 compares HH income from MAPs with overall HH income for dalit and non-dalit HHs. According to the group estimates, dalits earn NRs. 20,287 on average per year, 54% of the annual HH income that non-dalits earn (NRs. 37,791). MAPs constitute 4% of the annual income for non dalit HHs (NRs. 1,538), and only 2.3% (NRs 466) of dalit HHs.

Typically, women play a major role in the collection process, while men have the responsibility for selling. At the onset of the project, no major processing was being done for commercial purposes so there was little if any value-added happening within the communities. Some traditional practices were being done such as cleaning, drying or boiling as requested by the local traders.

Collectors also come from outside the VDCs during harvesting season, both from

neighbouring VDCs and far distances. CFUG members discussed the difficulties in excluding outsiders from harvesting their cared-for MAPs since most forests are readily accessible due to open borders. Government-managed forests are open to any collector (subject to paying the appropriate royalty fee).

The role of traders

In order to understand the trading routes and influences, traffic surveys were undertaken in 2001 and 2002 at various herb collection centres in the project area. Additionally, a workshop with local MAPs traders was held to discuss their ideas and issues concerning the project. These discussions shed light on the critical role that traders play in setting prices and influencing harvesting practices.

Basically there are local traders and commission agents of the Nepalganj and Dhangadhi-based regional traders who work at road head markets within and adjoining the

Table 5: Total annual income and income contribution from MAPs (12 wards of two VDCs)

INCOME LEVEL	NON-DALIT	DALIT
Avg. annual HH income	NRs 37,791	NRs 20,287
Avg. annual HH income from MAPs	NRs 1,538 (4%)	NRs 466 (2.3%)

project area. MAPs collection lasts from November until April. The buyers fix the opening purchase rates for all preferred MAPs and inform the collectors starting in early October. No cash advances or credit are provided to collectors within the project district. According to the collectors, the purchase rates fail to take into account the time and effort required for sustainable harvesting and transportation (for e.g. a person cannot collect > 5kgs/day of *Jhyau* and it takes two additional days for transportation, yet the person would receive only NRs.75 for 5 kgs at the road head).

To set the price, local traders develop an idea of the possible supply situation of different MAPs based on the quantity purchased during the first two months. Then they often compete with each other by raising the purchase rates of highly demanded MAPs. Such a situation is created in response to the request for supply from the regional traders, wholesalers, exporters or companies with whom the local traders deal with.

The nearer the local trader to the collector's destination, the lower generally is the purchase rate. Traders do offer relatively higher purchase rates at distant road heads, however, such higher purchase rate still does not compensate for the time invested by collectors for bringing the MAPs to the distant road head center. The opening purchase rates declared by the traders in general are 50 percent less than their selling rate allowing a 100 percent profit to traders. However, when there is a higher demand for a MAP in a particular year the trader's profit margin is reduced due to the competition. In 2002, for instance, the opening purchase rate

for *Sugandhawal* was NRs. 35 while the selling price range was NRs. 50 to 100. The purchase price increased to NRs. 60 mid season. Similarly, the purchase rate for Amala fluctuated between NRs 22 to 27 whereas the selling rate for it ranged between NRs.30 to 48 in the same year.

Local traders are often blamed for not giving fair price of MAPs to the collectors. Yet the traders expressed concern over the carelessness of collectors in post harvesting activities. For instance, collectors boil amala in iron pots that destroys its color and they do not remove seeds (this falsely increases the weight). One reason why local traders do not often pay a fair price to collectors is that the wholesalers to whom they supply MAPs often pay less due to the reduced quality of the MAPs supplied to them. Also the wholesalers often accept the supply on credit leaving no option to the local traders (who lack storage facility) and consequently, enhancing the financial risk for them. Traders need to get a permit from the regulating authority and pay the set royalty apart from buying the MAPs from the collectors. It is neither cost effective nor practical for collectors to obtain a collection permit in advance especially in situations when the designated authority is located in a distant place.

Targeting MAPs benefits to the poor

One of the key objectives of the project is to promote the sustainable cultivation and harvesting of MAPs for the benefit of the poor and disadvantaged. This section of the paper will look at the strategies adopted to see that benefit is reaching the poor and disadvantaged,

followed by an analysis of the benefit flows. Given the fact that many years are required for some of these benefits to be realized, this will look at both actual benefits to date and projected benefits.

Several strategies were adopted to target the poorer and disadvantaged groups as partners and beneficiaries. Project settlements were selected based on a series of criteria: (i) people – especially poor and Dalits - already collecting MAPs; (ii) annual income from agriculture was insufficient for 12 months for most of the HHs; and (iii) people showed keen interest and willingness to get involved in promoting MAPs as a viable livelihood option.

IUCN Nepal’s work in the project area is confined to 25 (46%) out of 54 wards of 6 VDCs and includes a total of 49 (36%) of 136 settlements. Analysis of a well being ranking exercise of the project villages in these VDCs illustrates that the villages IUCN is working with are relatively poorer than the average. Figure 1 shows the distribution of all villages in the 6 VDCs according to locally identified indicators (Annex 1a and 1b). Figure 2 shows the villages that IUCN is working with. IUCN’s project villages have a higher proportion of ‘poor’ villages, are representative of ‘very poor’ and ‘medium’ and are least representative of the relatively ‘richer’ villages.

Fig. 1: Class Wise Distribution of Total Villages of 6 VDCs in Doti District

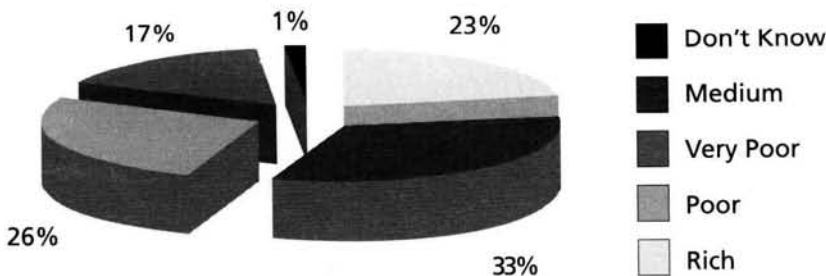
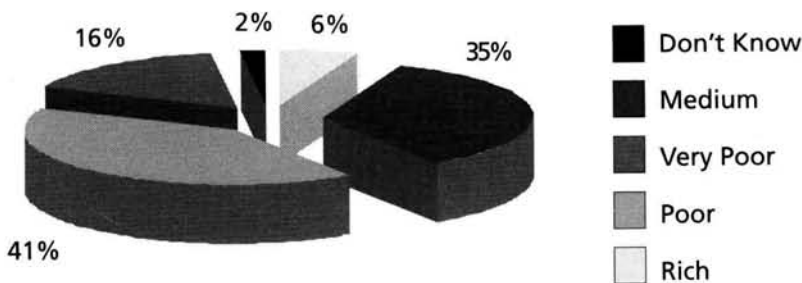


Fig. 2: Class Wise Distribution of IUCN’s Working Villages



The project staff built rapport with women and men in economically and socially marginalized communities often through small support for their immediate priority needs (drinking water, sanitation, literacy classes etc.). Small groups of people involved in the collection of MAPs and interested in generating livelihoods through MAPs promotion were then organized into MAPs conservation groups (CGs). Presently there are 54 such MAPs-CGs – 17 (31%) of them all women, 4 (7%) all men, 7 (13%) dalits and 26 (48%) mixed in composition. The average size of the groups is 20 HHs.

In order to further probe into the question of who actually benefits from our project among HHs in different class and caste/ethnic groups, a participatory assessment using well being ranking and various other participatory tools was conducted in the 25 wards of the project area. To date, the data has been analyzed for only 14 wards³. The findings of this exercise shed light on the effectiveness of our strategies for targeting the poor and disadvantaged.

Table 6 summarizes the types of HHs IUCN is working with in its project groups in 14 wards. The class analysis was based on ranking and indicators developed by community members in a well-being ranking exercise (details in Annex 2).

The findings of the equity analysis conducted in the 14 wards reveal that IUCN is working with a full representation of the community. 69% of HHs from 14 wards has been involved in MAPs promotion by IUCN Nepal. Out of a total of 996 HHs in 14 wards, 79% are Brahmin/Chhettri, 17% are Dalit and 4% are Janajati (figure 3). When a similar analysis of the HHs working with IUCN is done (figure 4), the relative proportion of these groups is very similar - 83% are Brahmin/Chhettri, 14% are Dalit and 3% are Janajati. Expressed another way, 72% of the Brahmin/Chhettri HHs; 59% of the Janajati HHs and 55% of the Dalit HHs are involved in IUCN's program.

This indicates that IUCN is working with all caste and ethnic groups in the communities,

Table 6: Equity Analysis of the 14 wards of Seti NTFP Project Area

CLASS	IUCN HHS			NON-IUCN HHS			Total
	B/C*	Janajati	Dalit	B/C	Janajati	Dalit	
Rich	81	0	4	30	1	0	116
OK	186	1	8	61	1	1	258
Poor	161	20	28	63	10	10	292
Very Poor	141	3	53	64	5	64	330
	569	24	93	218	17	75	996

* Brahmin/Chhettris

³all wards of Gadhsara; 4, 7, 8 of Nirauli; 4 of Laxminagar, and 7 of Saraswotnagar VDC.

Fig. 3: Castewise Distribution of Total HHs

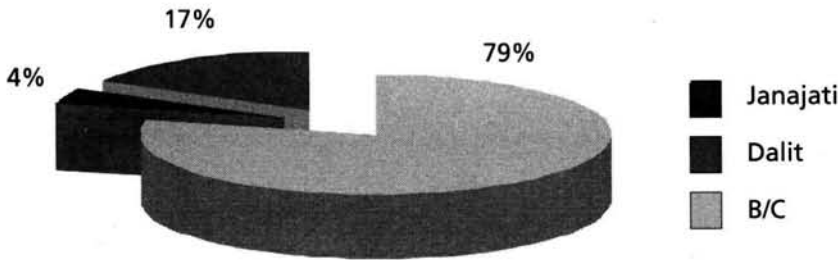
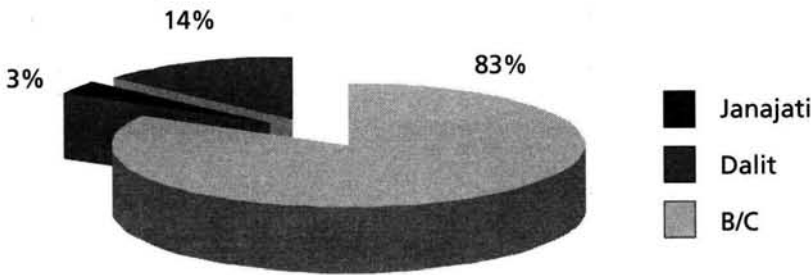


Fig. 4: Castewise Distribution of IUCN Involved HHs



in a way that reflects their distribution in that community. In terms of equity targeting, this could be interpreted in two ways. First, that IUCN has not been successful at targeting dalit and janajati HHs. Alternatively, it could be argued that without the efforts to target these HHs, even less HHs from these groups would be participating in IUCN's programme.

When the same analysis is done according to well-being or class groups, the finding is comparable. According to the well-being classes identified by the communities (see Annex 2 for indicators), of the total HHs of 14 wards, 33% are very poor, 29% are poor,

26% are manageable and 12% are rich (Annex 5).

Of the HHs participating in IUCN's project groups, 29% are very poor, 31% are poor, 28% are manageable and 12% are rich. This data is compared in Figures 5 and 6. Expressed according to the different groups, 73% of all rich HHs; 76% of all Manageable class HHs, 72% of all Poor HHs and 60% of all very poor HHs are involved in the project.

This indicates that again, IUCN is working with the full range of HHs according to well-being or class categories. While poor and very poor households are involved in IUCN's project groups, they have not been targeted at the

Fig. 5: Castewise Distribution of Total HHs

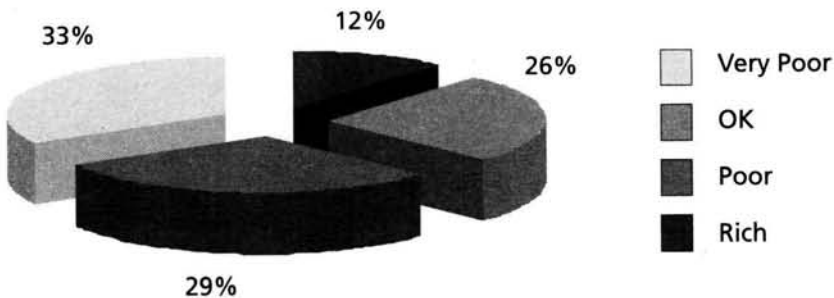
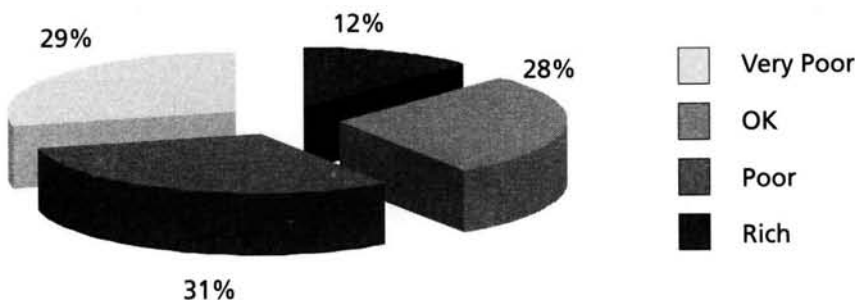


Fig. 6: Castewise Distribution of IUCN Involved HHs



exclusion of relatively better off HHs. The same comment can be made that without targeting, even less of the poorest HHs would be included. Furthermore, it must be remembered that this is a relative comparison of well being. In general, all the HHs in the far west are poor, relative to the rest of the country. A review of the indicators for these HHs reinforces this, as HHs in the 'OK' category are still only food self-sufficient for 9-12 months, have an average income between 7-15,000 NRs and have a land holding of 0.5 –1.0 ha (Annex 2).

The project focused at supporting communities for conservation and sustainable use of MAPs in the forests and also to establish and manage plantation of viable MAP species in the

communal lands, degraded forests and around the homesteads and wastelands. The impetus of the project support was:

- i. capacity building for sustainable harvesting practices;
- ii. technical and material support for establishing and managing plantations and nurseries;
- iii. social and institutional skills for group approach to MAPs and MAP-based enterprise development.

Benefits from the project can be generally categorized according to social, economic and ecological categories.

Social benefits

Many of the projects activities focus on building the skills and capacities of community members in both the technical and institutional sides of group-based MAP promotion. Understanding who participates in our groups provides the first indication of benefit. This has been presented analyzed above. Tracking the beneficiaries of training programmes is another way to see who is benefiting from the project.

Since 2001, 65 training events were held. These events were attended by 1,956 people, of whom 38.4% were women and 61.6% were men. Of 536 persons provided training for capacity and income generation opportunities in 2003, 68% were Brahman/Chhettri, 8% were Janajati and 24% were Dalit. When compared to the overall distribution of these groups in the community (Figure 3), IUCN has successfully targeted Dalits and Janajatis. Of 885 persons who attended the technical sensitization workshops, 358 (40%) were women and 527 (60%) men.

In addition to promoting plantations of MAPs, the project has supported locally feasible income generating activities through capacity as well as material support. Based on the interest and needs reflected by the communities, training on different kinds of income generating activities have been provided to 129 participants of the MAPs-CGs in 2003. MAPs/NTFP based food processing, nursery management and apiculture have been

some good examples of enterprises initiated in the area. Monitoring results of the project shows that in 2003, 34 groups consisting of 96 members have started applying their skills for IGAs through loan mobilization. Total loan flow is NRs. 123,700.00 and gross income is Rs, 59,250.00 (Annex 3). The sustainability of these income generating activities will continue to be monitored.

The project has supported the establishment of 9 community nurseries and 26 private (home garden) nurseries that provide the area with MAP saplings. The nursery caretakers have received skills in technical operation, and also in business planning, as they must be self-sufficient without IUCN's financial support. To date these nurseries have earned over NRs. 100,000 from the sale of MAPs plants, and business plans are in place to move towards financial self-sufficiency.

An additional reported social benefit is the new skills in the group operation. This has been provided through training (such as in book-keeping) and through ongoing coaching and support from the project community mobilizers. This has been particularly important for the women and dalit groups. These new or enhanced skills or capacity is essential for the groups to continue in the future, to stand up for their rights and to have the ability to recognize and resolve conflicts.

To ensure local ownership and foster longer term sustainability, IUCN required that HHs in groups contribute through labor and participation as their commitment in the MAPs promotion efforts. MAPs-CGs contributed in-

kind support⁴ of NRs. 1.44 million where as IUCN Nepal provided funding support of only 0.775 million in creating and maintaining plantations (Annex 4) in 2003. More than 16,000 human days of labor was involved in 2003 alone.

Economic benefits

As stated above, economic benefits from the MAP plantations have not yet been realized because of the time it takes for the plants to be

harvested. However, these benefits can be projected based on the plantations to date.

Since 2001 the MAP-CGs have established 312.6 ha of plantations with 153,309 plants of six different MAPs species (Table 7). The income projected to be earned from these plantations is estimated in Table 8.

A detailed account of the MAPs plantation managed by the 49 MAPs-CGs including the

Table 7: MAPs Plantation Established and Managed by MAPs - CGs

YEAR	NTFP SAPLINGS PLANTED	AREA (HA.)
2001	32043	19.6
2002	52382	96.0
2003	68884	197.0
Total	153,309	312.6

Table 8: Potential Benefit from selected MAPs Species Plantation
(Estimated from the plantation of 2003)

MAPs SPECIES PLANTED	#S OF SAPLINGS PRODUCTION	ESTIMATED PRODUCTION (KG) /TREE	TOTAL KG (NRs) (KG)	SALES PRICE/ YR TO CGS	GROSS INCOME (IN '000 NRs)
Tejpat	29,990	25 Lvs. & 12 bark	749,750 359,880	25 10	7497.5 (after 6yrs) 8997.0 (after 10 yrs)
Amala	11,046	9	99,414	7	7695.9 (after 7yrs)
Ritha	6,628	30-45	198,840	8	1590.7 (after 7yrs)
Bojho	7,300	0.15g-0.25g dry rhizomes	1,095	27	29.56 (after 2 yrs)
Timur	224	1.5-2	336	95	31.9 (after 7 yrs)
Sugandha kokila	656	55-60	36,080	55	1984.4 (after 7 yrs)

⁴In kind contribution from groups has been calculated in terms of their labor contribution in land preparation, pitting, fencing/erecting stone walls and planting etc. as per local daily wages market rates

anticipated production year and quantity as well as the gross income is presented in Annex 3. The synthesis of the potential production and income from different MAPs species once they get matured (Table 8) indicates that the annual income of a member of MAPs-CGs is expected to range from NRs. 4,600 to 28,000 after 2006 from their plantations (Annex 5). Such significant HH income through relatively small plantations should not only contribute in the sustainable livelihoods but also reduce pressure on forests for these MAPs thereby ensuring the *in-situ* conservation status.

From the *in situ* conservation, 6 MAPs-CGs conserving Sugandhawal, Amala, Kurilo, Timur, and Bojho in 6 plots (25 ha) have managed to earn NRs. 16,400 from sustainable harvesting practices of these MAPs.

In addition to expected income from the sale of MAPs, the project has supported NTFP-based enterprises in the groups. In 2003, 17 members (16 women, 1 men) from 6 MAPs-CGs who are involved in pickle making have produced 600 kgs of pickle, of which they have sold 338 kgs and earned a net income of NRs. 16,500. Similarly 14 members trained for improved bee-hive construction have constructed and sold 30 bee-hives worth NRs 12,000.

Ecological benefits

Prior to the project intervention, MAPs had seen a great decline in abundance in national and community forests. This is attributed to unsustainable harvesting practices. For example, removal of the entire branch of Amala

(*Phyllanthus emblica*) as opposed to the fruits, stripping of all bark of Tejpat (*Cinnamomum tamala*), Pawan or Kaulo (*Persea bombycina*), Kalchuri or bark of Bhorla (*Litsea glutinosa*) or the complete removal of roots, tubers, bulbs or rhizomes of plants such as Kachur (*Hedychium spicatum*), Sugandhawal (*Valeriana jatamansii*), and Satuwa (*Paris polyphylla*) which halts propagation.

The project has supported various training programmes to raise awareness and build skills on sustainable practices for harvesting MAPs. Since 2001, 292 members (143 women, 149 men) of MAPs-CGs have been technically assisted in sustainable harvesting techniques to support the management and conservation of MAPs. 6 MAPs-CGs have established 6 plots (25 ha) for *in situ* conservation of Sugandhawal, Amala, Kurilo, Timur, and Bojho. The project also prepared and disseminated sustainable harvesting guidelines for certain species in local dialect (Doteli language).

The groups report that the sustainable harvesting methods are being increasingly adopted. Trained members share their knowledge with others, for example during the days allocated for MAPs harvesting in community forests. The use of better practices has been seen during field visits to forest areas nearby the MAPS-CGs.

Sustaining the benefit

As an action learning project, IUCN wants to ensure that these benefits will be sustained beyond project support, and for the ideas tested to be able to be replicated locally and

nationally. For the benefit to be sustainable, it must be assessed from economic, social and ecological perspectives. Too often it is assumed that once communities or institutions have knowledge and skills, this will be sufficient to change behavior. However, frequently there are perverse incentives that encourage people to act differently. For example, while people may be aware of the benefits of harvesting MAPs using sustainable practices, the extra time required to do so is not always compensated for economically. Until the price for sustainably harvested MAPs is sufficiently higher than for MAPs harvested using quicker methods, it is unlikely that these new practices will be regularly adopted. This section will examine the strategies in place to sustain the benefits of the project from social, economic and ecological perspectives and discuss existing perverse incentives that need to be addressed.

i) Economic perspective: Will there continue to be economic benefit from MAPs promotion?

As a livelihood strategy, MAPs cultivation and harvesting must generate sufficient subsistence and economic benefit. This economic benefit will come through the sales of cultivated and wild MAPs, through income generating activities by the CGs, and from employment opportunities that last beyond the project (e.g. nursery or plantation management). From an economic sustainability perspective, there must be sufficient sustained benefit to the collectors and the local traders. The project is looking at strategies to enhance this benefit.

Overall, collectors feel that the purchase rates of MAPs ignore their opportunity costs. MAPs collection is basically considered an additional activity. The traffic survey found that a collector often does not recover adequate price to cover his/her time. This is exacerbated when collectors sell their MAPs on an individual basis to traders, as they lack bargaining power and frequently deal with intermediary traders who provide a lower price than road-head traders. To some extent this is a reflection of market efficiency – the price will stay low until collectors are no longer willing to collect MAPs at that price. This would require an alternate livelihood strategy with greater return than MAPs collection.

Competition among local traders to procure higher quantities of specific MAPs also results in market price distortion. This creates perverse incentives among the collectors to quickly harvest MAPs and thus typically use unsustainable harvesting practices.

The project has been addressing the issue of price fluctuations to try to maximize local benefits by organizing collector and trader groups and strengthening the links between them. The first strategy is to promote a group marketing approach by the MAPs-CGs, so that collectively they will have higher bargaining power to get a better price.

The project has also supported and facilitated dialogues and discussions among collectors, traders, VDCs, DFO and other relevant institutions. As a result 3 NTFP networks covering 5 VDCs have emerged with the objectives of:

- i. promoting group approach to marketing,
- ii. regulating harvesting within the users and ensuring the exclusion of outsiders,
- iii. educating the collectors on sustainable harvesting and post harvesting treatments.

This network will soon begin its activities.

A Trader's Cooperative has also been formed that has 9 members from the MAPs traders of all six VDCs and is known as "Shubha Laxmi Jadibuti Byapari Samuha". The objectives of this cooperative are to:

- i. take measures to ensure fair price to collectors,
- ii. enhance capacity of collectors for quality products procurement and sustainable harvesting,
- iii. eliminate competition within traders,
- iv. develop mechanisms to discourage outside traders who occasionally intervene in the area.

This cooperative is newly formed and has not yet started its activities.

The overall aim is to strengthen local institutional networks that increase the benefits to local collectors and local traders. It is too soon to gauge the effectiveness of these networks. The integration of the MAPs-CGs within CFUGs should further facilitate better prices to collectors as they can sell their MAPs using a group approach.

Another strategy to address the low return for MAPs is to focus on value-added production

or to reduce the time or effort taken to produce a higher quality MAP product. To date, IUCN's project has only addressed this in a modest way. Solar driers have been introduced to speed up drying of certain MAPs (e.g. ginger and other rhizomes). This increases their quality (which should lead to a higher price from traders) and also reduces the weight (thereby easing the burden of transferring them to the traders). Exploring other ways of value-added processing may require more attention in the future to try to increase the return to collectors.

Our work under the project with the collectors and traders indicates that the unsustainable harvesting practices are not always caused by the ignorance of collectors. Most of the collectors are aware of traditional harvesting practices that might need some modifications, yet are more or less responsive to the reproduction needs of different MAPs. The problem however, lies in the opportunities of the financial returns from the harvesting. In general, sustainable harvesting methods require more careful efforts and therefore take more time. Yet this extra time is not reflected by the purchase rates. For example, Tejpat is sold at a lower price if the leaves are still on a branch, but the price difference for separating the leaves is not great. It is not surprising, therefore, that collectors do not always use their skills of sustainable harvesting. Currently, market prices for certain MAPs serve as a disincentive for sustainable harvesting. Given the power of economic return, we need to look at MAPs pricing to find an economic incentive for collectors to regularly adopt sustainable harvesting practices.

Because royalty rates on MAPs are linked to their location, tenure issues also affect the price received by collectors. In general, MAPs collected from community forests, legally-registered private forests and homesteads are not subject to royalties, while those gathered from government-managed national forests or unregistered private lands are subject to royalties. One problem with this system is that it is difficult to trace the origin of the MAPs – collectors may falsely claim their origin, or government regulators may not believe the collectors and impose a royalty. Country-wide standards for which species are subject to royalties are difficult to be set in part because origin is also site-specific. For example, Tejpat and Rittha are not available in the national forests of our project area and therefore they should be exempt from a royalty, yet it is levied on them. When a royalty is paid, this cost is typically born by the collector in the form of a reduced price. A District-based system is required to identify the source of MAPs and apply royalties in a transparent manner. Furthermore, support is required to facilitate registration of private forests as an incentive for farmers to raise and manage MAPs in their private property without being subject to royalties. Not only will this increase the price received by farmers, but it will reduce pressures on forests.

**ii) Social and Institutional perspective –
Will the poor and dalits continue to reap
the benefits once the MAPs are harvested ?**

If MAPs are to be a pro-poor livelihood strategy, the benefits must continue to reach the poor or other disadvantaged groups. One risk is that

once the value of the MAPs becomes evident, particularly when the plantations are ready to be harvested, that powerful members of the community will try to divert some of this benefit, or threaten the livelihood security of the groups who have cared and nurtured the plants over the years. This is particularly a risk for groups who lack secure tenure.

In absence of the tenure rights, collective actions are unlikely to generate any tangible benefit to the groups. The thrust of the project in its initial years was to identify vulnerable groups of people depending on and/or interested in MAPs promotion as a viable livelihood option. Such groups of landless and poor were identified and involved in protecting their surrounding forests while concurrently establishing and managing MAPs plantations. It was realized later that most of these lands are either national forests or owned by the VDCs. The groups were at risk of losing the right to benefiting from their plantations, especially if those plantations were seen to be of high value. At a minimum, without being formally registered, they would be subject to royalties that would limit their financial returns.

In 2003 the project started initiating and facilitating the integration of the MAPs-CGs into CFs and LhFs to secure their tenure. Several MAPs-CGs could be brought together with others to integrate into an existing CFUGs or to create a new CFUG or LhFUGs. There are 22 CFUGs with handed over CFs in the project area and an additional 4 CFUGs are in the process of handover. To date, 29 of the 54 MAPs-CGs have been incorporated into 15 of

these CFUGs and an additional 3 are in process. The intent is to integrate all remaining MAPs-CGs into some form of secure tenure.

The CFUGs have agreed to honor the exclusive ownership and management rights of the MAPs-CGs over the future benefits of their plantations. The CFUG will receive a fixed percent of the net income generated (roughly 10%). This is seen as a win-win situation as the MAPs-CGs receive secure tenure for their plantations, they will not be subject to the royalty and they now enjoy the full rights and responsibilities regarding other CF resources.

In addition to securing benefit agreements for the poor and landless, this strategy focuses on increasing the production of MAPs within CFs. The experience from CF practices all over Nepal shows that CFUGs are less able to address the livelihood and poverty issues of all involved if its management focuses only on basic forestry needs e.g fuel wood, fodder and timber. There is often little point for the landless and poor to participate in CF management since those with farm land and livestock tend to benefit most. With a greater emphasis on MAPs production, the landless and land poor including dalits may be more interested in being involved in CF management. Our initial experience suggests this is the case. Before the project, there were only 18 CFs in 5 VDCs of the project area⁵. In the past, participation in CF was limited to general assembly meetings and on harvesting schedules for the collection of fuel wood and

timber. With the anticipated future benefits from MAPs, now even the landless, poor and dalit groups of the communities have shown keen interest in CF management.

To date there has been little resistance faced in integrating the MAPs-CGs into CFUGs. However, in some areas, users wanted to separate the groups according to caste, indicating that there remain social barriers to full integration of socially marginalized groups. In this case, LHF is being explored as an option for securing tenure rights for the dalits.

An additional benefit of linking with the CFUGs is the increased ability to monitor and regulate MAPs harvesting practices by the group. A MAP management committee has been established as a sub-committee of the CF executive committee. This provides a window to increase the participation of women, dalits and the poor, as the prime harvesters of MAPs, in decision-making roles in CFUGs. Not only should this enhance the relevance of MAP management decisions, but it provides an opportunity for empowerment of these groups who particularly lack a voice in far western Nepal.

The focus of the project has now shifted to assisting with the integration of MAPs into CFs to test whether MAPs can enhance forest production and provide pro-poor benefits. As this is essentially about empowering disadvantaged groups, this needs to be supported and monitored to see that benefits of MAPs continue to reach the poor and socially

⁵Gadsera VDC had no CF in the past and is now in the process of establishing 3 new CFs which will incorporate the remaining 21 MAPs-CGs.

marginalized. If successful, this experience will serve as a model that could be replicated elsewhere in the mid hills. As highlighted above, the challenge is to ensure access by the poor and dalits to forest space (i.e. underutilized forest floors) for MAPs cultivation or protection in a way that ensures their rights to manage and benefit from these resources. The project expects to come up with some concrete learning in this line in coming years.

iii) Ecological perspective – Will the MAPs continue to be harvested in an ecologically sustainable way?

The final sustainability pillar is ecological – if MAPs prove to be a valuable livelihood strategy, particularly for the poor or disadvantaged, how can it be ensured that they will be harvested in a sustainable way. What is needed to see these practices adopted in the long run, when there are so many perverse incentives? As the perceived and real value of MAPs increases, the pressures from outside the groups will also increase.

The project's strategy is to raise awareness of the benefits and techniques of harvesting MAPs more sustainably. As mentioned, this has included training of group members and the production of sustainable harvesting guidelines in the local dialect for local groups and CFUGs. The *in situ* areas serve to demonstrate how MAPs can regenerate naturally if they are protected. While cultivating MAPs in underused or degraded areas provides another source of income, it is more ecologically sustainable to support a diversity of MAPs within forests as opposed

to promoting monocultures. Once the benefits are evident, valuable MAPs can become an incentive for forestry management that promotes a diverse and productive forest ecosystem. Such in-situ conservation will also support gene pool conservation.

The project's interest in merging MAPs-CGs into existing or new CFUGs is therefore also a way to encourage longer term ecosystem health and sustainability. Currently, MAPs do not figure prominently in CFUG operational plans, and therefore, forests are not managed to conserve and promote high production of MAPs. Support to the project CFUGs focuses on including MAPs in CF inventories, operational plans and group processes. CFUGs can provide the local governance systems to better regulate whether users are harvesting MAPs sustainably. A group approach to MAPs selling will hopefully also indirectly encourage more sustainable practices, as it is expected that groups will be able to secure a higher price for the MAPs collected using better harvesting methods.

Regulations, incentives and policy implications - some recommendations

Our learning so far in Doti indicates that policy and institutional innovations are urgently needed to create incentives for communities and in particular the poor and socially deprived to get more involved in the sustainable management of MAPs resources for their livelihood security. This section sets out some ideas for creating such incentives.

Tenure and governance

A key lesson of the project to date has been the importance of securing tenure for groups that

promote MAPs cultivation. There is no point trying to economically empower poor or marginalized communities if there is no legal basis that will ensure their rights to access and benefit from these resources.

Presently no governance mechanism exists except for CF to formally ensure any kind of stewardship of those traditionally dependent on MAPs resources. Integration within CFUGs is a good strategy because of its proven abilities for local level regulation and benefit sharing, and will be explored in more detail below. However, in reality the major portion of MAPs are collected from forests and rangelands outside CFs.

Although they are supposed to regulate MAPs collection, DFOs lack adequate information about the stock, distribution and density of different MAPs to be collected. Such information however, is crucial for fixing the sustainable harvest levels and regulating the MAPs collection accordingly. Alternative local level institutions need to be explored to fill this gap, and suitable incentives provided to encourage them to play this role. Because of the critical role traders play in regulating MAPs movement, it is worth examining the potential of NTFP Networks and Traders' Cooperative for regulating and encouraging more sustainable harvesting practices.

Sustainable harvesting guidelines

Every district should have sustainable harvesting guidelines for all major commercial MAPs that are traded from that district. Such guidelines should be prepared and widely disseminated through different local level

institutions such as CFUGs and MAPs trading networks. These guidelines would outline appropriate methods for harvesting specific species and the steps to determine harvesting levels. These levels can be set and regulated by the DFO for the District or within CFUGs.

Incentives for sustainable harvesting

Recognizing that knowledge and skills for proper harvesting are insufficient to ensure these methods are consistently used, additional incentives are required. Although some perverse incentives have been identified, a more thorough analysis needs to be undertaken at a national level to explore and propose appropriate policy and regulatory mechanisms and positive incentives. This study would examine both the economic and ecological drivers for MAPs and propose mechanisms for determining appropriate prices that promote sustainable harvesting practices without distorting the market. MAPs prices need to reflect the additional time and effort invested to harvest specific MAPs following sustainable harvesting rules.

The study should begin with a market analysis of existing MAPs programmes and examine if the potential price effects of increasing the national supply of certain MAPs. This will help assess the risks of the numerous MAPs programmes throughout the country. It should also explore the benefits of a national strategy that coordinates the promotion of certain MAPs in different parts of the country. MAPs would be promoted in different regions based on ecological criteria and to avoid over supply. Is this advisable or would this degree of

coordination prompt market distortions and limit innovation?

A second major component would examine the costs and benefits of greater regulation of MAPs prices to ensure greater return to collectors who adopt sustainable harvesting practices. Price regulation could include ways to either increase the amount for the sustainably harvested MAPs, or could decrease the price for unsustainably harvested species until the price differential is significant enough to encourage proper harvesting.

Regulation could be coordinated nationally, through a certification and regulation processes, and administered through major regional trading hubs. Alternatively local mechanisms could be explored, such as identifying local institutions so that all major players at district level including DDC, DFO, traders' and collectors' associations and district level FECOFUN coordinate to fix a minimum purchase rate for all commercially viable MAPs of the district.

Promoting MAPs as a pro-poor livelihood strategy - getting the benefit to the poor and socially disadvantaged

Our preliminary project findings show that all sectors of society – poorest to relatively better off, and all caste/ ethnic groups – collect MAPs. We have yet to see major differences in the relative importance that different groups place on MAPs as a livelihood strategy, or whether specific MAPs bring greater benefits to the poor or disadvantaged.

However it is clear that if you wish MAPs to be promoted as a pro-poor livelihood strategy, targeted efforts must be made to see that the benefits reach these groups. In addition to specifically targeting certain groups and building their capacity, care should also be taken to identify specific species that are of more interest to the poorer. For example, high value MAPs may attract a greater amount of attention from elites and powerful community members, and benefits could be diverted by these groups. Landless groups are particularly vulnerable to this. An additional strategy being tested by IUCN is to promote ways for poorer groups to negotiate access to under-utilized portions of community forests for MAP cultivation. Clear agreements are required to define rights and responsibilities in the constitution or *bidan* and to ensure long-term targeted benefits to poorer groups.

The group approach to marketing of MAPs has great potential for increasing the return to collectors and should be replicated in other areas, particularly through CFUGs or LhFs.

The potential for pro-poor MAPs promotion within degraded or underused national forests should also be explored and appropriate policies established. This would benefit the poor and increase production from these areas. This may be aided by establishing MAPs domestication and cultivation centers to demonstrate to farmers which species can be easily cultivated in their areas. The emphasis should be on strengthening community-based approaches to MAPs production in these areas and foster farmer-to-farmer learning.

As a first step, it would be useful to conduct a study to draw the lessons from the experience of many organizations as to which MAPs benefits the poor, how they benefit and what mechanisms support these benefits.

MAP PROMOTION WITHIN CFS

As stated earlier, the potential for MAPs production within CFs needs greater attention. Typically resource inventories are focused on tree resources and often MAPs get ignored. Operational Plans (OP) rarely pay adequate attention to MAPs management strategies. Despite the specific guidance of CF policy for catering to the needs of the poor and those dependent on forest resources, the CF institutional arrangements get tilted towards the needs and interests of socially and economically powerful people. The poor and deprived generally get sidelined from the mainstream of CF decision-making systems. Furthermore, it is increasingly recognized that many CFs could be managed to better increase the productivity of forest resources, including MAPs. CF policies, processes and guidelines need to be refined so that the social and economic needs of the poor and deprived get priority without limiting the basic forestry needs of all CF users. This means a shift from management for primarily subsistence purposes to also include income opportunities from MAPs.

The benefit sharing arrangements being tested in IUCN's project between MAPs-CGs and CFUGs regarding MAPs production offer one possible way to enhance CF production of MAPs, increase benefits to the poor and secure

tenure for these groups. We need to learn from this experience and make appropriate policy amendments to support these initiatives. This would include requirements and guidelines for integrating MAPs into inventories and OPs, and in particular to (i) identify ecologically-appropriate MAPs that can be cultivated or promoted through *in situ* protection measures in which areas of the forests, (ii) set targets/limits for MAPs harvesting based on existing diversity, distribution and abundance, and (iii) establish group processes to regulate whether sustainable harvesting practices were being used and to impose penalty systems. If this is meant to be a pro-poor livelihood strategy, systems must be established to see that these opportunities consciously benefit these groups. One example is by setting aside certain areas of underutilized forests for the poor or disadvantaged to cultivate MAPs. Experience to date in Doti highlights the importance of clear agreements on who is responsible for managing and benefiting from the cultivated MAPs plantations and the percentage to be paid to the CFUG. The CF management, or a sub-set of MAP management committee, would have the responsibility to gather and market the collected MAPs to ensure the best possible price to collectors.

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Annex 1a: Class wise distribution of IUCN working villages in Seti Project Area.

Out of total 136 villages of 6 VDCs in Doti District, IUCN is working in 49 villages. In a PRA training, conducted in April 2003, Community Mobilizers and Participatory Monitoring & Evaluation Team categorized those villages in 4 categories based on the local indicators developed by themselves.

VDCS	# RICH VILLAGES			# MEDIUM VILLAGES			# POOR VILLAGES			# VERY POOR VILLAGES			# DON'T KNOW VILLAGES		
	IUCN	NON-IUCN	TOTAL	IUCN	NON-IUCN	TOTAL	IUCN	NON-IUCN	TOTAL	IUCN	NON-IUCN	TOTAL	IUCN	NON-IUCN	TOTAL
Laxminagar	2	4	6	2	5	7	3	5	8	2	0	2	0	0	0
Chhattiwan	1	5	6	1	6	7	0	5	5	0	2	2	0	0	0
Gadsera	0	6	6	11	0	11	8	2	10	4	1	5	0	0	0
Chanteswor	0	1	1	0	7	7	4	2	6	0	5	5	0	0	0
Nirouli	0	4	4	3	2	5	4	0	4	1	3	4	1	1	2
Saraswotinagar	0	8	8	0	7	7	1	2	3	1	4	5	0	0	0
Total	3	28	31	17	27	44	20	16	36	8	15	23	1	1	2
Percent	10	90	100.0	39	61	100	56	44	100	35	65	100	50	50	100

Annex 1b: Common indicators set by the participants

RICH	MEDIUM	POOR	VERY POOR
Road access	Agricultural land sufficient for livelihood	Very less agricultural land	Most people of this villages have very less and unproductive land
Electricity	Employment opportunity	No education facility	Big family size
More Agricultural land	Involved in income generation activities	Big family size	No education facility
Education facility	Education facility	Unemployment	No road access
Market/Business	Engaged in livestock raising		Remoteness, Unemployment

Livelihood and forestry advisor to IUCN Nepal for his constructive comments and suggestions in the preparation of this article.

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Annex 2: Participation in project according to class/ poverty: based on well being ranking and indicators identified by the community

	RICH CLASS (A)	MANAGEABLE CLASS (B)	POOR CLASS (C)	VERY POOR CLASS (D)
	<ul style="list-style-type: none"> ● Sufficient food with surplus ● Land holding more than 20 ropani ● Average annual income More than Rs. 22,000 ● More than 20 goats ● 4-5 Cows 	<ul style="list-style-type: none"> ● Sufficient for 9-12 months ● Land holding 10-20 ropani ● Average annual income Rs.15,000-22000 ● 10/15 goats ● 3-4 Cows 	<ul style="list-style-type: none"> ● Sufficient for 6-9 months ● Land holding 5-10 ropani ● Average annual income Rs. 7,000-15,000 ● 5-10 goats ● 1-2 Cows 	<ul style="list-style-type: none"> ● Sufficient for less than 6 months ● Land holding less than 5 ropani ● Average annual income less than Rs. 7,000 ● Less than 5 goats ● 1 Cow
IUCN Involved HHs	85 (12.31% of total IUCN involved HHs)	195 (28.42 of total IUCN involved HHs)	209 (30.46 of total IUCN involved HHs)	197 (28.72 of total IUCN involved HHs)
Non-IUCN HHs	31 (10% of total Non-IUCN involved HHs)	63 (20% of total Non-IUCN involved HHs)	83 (27% of total Non-IUCN involved HHs)	133 (43% of total Non-IUCN involved HHs)
Total HHs	116 12% of total HHs	258 26% of total HHs	292 29% of total HHs	330 33% of total HHs

Annex 3: Group's savings mobilization for income generation promotion

ACTIVITIES	GROUPS	MEMBER(S)	LOAN (RS.)	INCOME	REPAYMENT	PRODUCED	SALES	REMARKS
Milk production	2	♂ 1, ♀ 1	11500.00	11700.00	6600.00	945 L.	585 L.	within 6 months
NTFP nursery	1	♂ 2	3000.00	2850.00	2800.00	1900 saplings	950 saplings	@ 3.00/sapling
Orange orchard	1	♀ 2	1500.00			15 saplings planted		
Food processing and preservation	6	♀ 16, ♂ 1	8000.00	16500.00		600 kgs	338 kgs	@ 80 -110.00/kg
Ginger production	4	♂ 10	23700.00	Expted. 1,548,000.00*		8600 kgs.		@ 18.00
Poultry	4	♀ 10, ♂ 5	22300.00	11200.00	9000.00	140 chickens Eggs 250	63 chickens 250 eggs	@ 105.00/Chkn @ 4.0
Goat (s/he) rearing	9	♀ 14, ♂ 15	71000.00	16000.00	10420.00	Procured 27 Production 57	10 goats	
Vegetables	1	♂ 1	1000.00	1200.00	1000.00	135.0kg	120.0kg	Product in market
Shop and Trade	1	♂ 1	4000.00	2500 -1net *	5350.00			PA + Int. + fine
Bee hive construction	2	♂ 14				30 hives		@ 250-400/hive With out loan
Solar dryer	3	♂ 3				3 dryer		In use, With out loan

Annex 4: Community benefited (support from NTFP cultivation in 2003)

VDC	# OF NTFP MANAGEMENT GROUPS	GROUP'S CONTRIBUTION (NRS.) IN-KIND SUPPORT	IUCN CONTRIBUTION (NRS.)
Chhatiwan	9	69,080.00	70,564.00
Ghateswor	3	62,675.00	45,045.00
Saraswotinagar	3	28,825.00	21,684.00
Laxminagar	8	368,805.00	116,720.00
Nirauli	10	298,877.00	145,421.00
Gadsera	21	611,907.00	376,154.00
Grand Total	1440,169.00	775,588.00	

Annex 5: Expected income from MAPs plantation to the communities

NTFP plantation information of the groups

VDC	NTFP MGT. GRP NO.	TOTAL CGS MEMBERS	MAJOR NTFP SPS	NTFP SAPLING NO	PRODUCTION/ PLANT (KG)	TOTAL PRODUCTION (KG)	SALES PRICE /KG OR PLANT	EXPECTED GROSS INCOME (RS.)	GROSS INCOME /MEMBER
Chhatiwan	6	195	Tejpat	595	25 Lvs	14875	10	148750	
					12 brk	7140	25	178500	
			Ritha	138	30	4140	8	33120	
			Amala	542	9	4878	7	34146	
			Sugandhakokila	143	55	7865	55	432575	
			Timur	74	1.5	111	95	10545	
			Amriso	100	155slips/plant	15500	3	46500	
			Bhojho	4800	0.15	720	27	19440	
								903576	4634.0

VDC	NTP MGT. GRP. NO.	TOTAL CGS MEMBERS	MAJOR NTP SPS	NTP SAPLING NO	PRODUCTION/ PLANT (KG)	TOTAL PRO- DUCTION (KG)	SALES PRICE /KG OR PLANT	EXPECTED GROSS INCOME (RS.)	GROSS INCOME /MEMBER
Ghanteswor	2	38	Tejpat	100	25	2500	10	25000	
					12	1200	25	30000	
			Sugandhakokila	50	55	2750	55	151250	
			Chiraito	5000	0.2	1000	120	120000	
			Amriso	500	155slips/ plant	77500	3	232500	
								558750	14704.0
Laxminagar	8	319	Tejpat	2036	25	50900	10	509000	
					12	24432	25	610800	
			Rittha	1109	30	33270	8	266160	
			Amala	838	9	7542	7	52794	
			Sugandhakokila	145	55	7975	55	438625	
			Timur	100	1.5	150	95	14250	
								1891629	5930.0
Saraswoti- nagar	2	103	Tejpat	722	25	18050	10	180500	
					12	8664	25	216600	
			Rittha	330	30	9900	8	79200	
			Amala	320	9	2880	7	20160	
								496460	4820.0

VDC	NTPP MGT. GRP. NO.	TOTAL CGS MEMBERS	MAJOR NTPP SPS	NTPP SAPLING NO	PRODUCTION/ PLANT (KG)	TOTAL PRO- DUCTION (KG)	SALES PRICE /KG OR PLANT	EXPECTED GROSS INCOME (RS.)	GROSS INCOME /MEMBER
Nirouli	10	293	Tejpat	5000	25	125000	10	1250000	
					12	60000	25	1500000	
			Rittha	1750	30	52500	8	420000	
			Amala	1300	9	11700	7	81900	
								3251900	11099.0
Gadsera	21	551	Tejpat	24179	25	604475	10	6044750	
					12	290148	25	7253700	
			Rittha	5159	30	154770	8	1238160	
			Amala	7250	9	65250	7	456750	
			Sugandhakokila	137	55	7535	55	414425	
			Bhojho	5000	1.5	7500	27	202500	
								15610285	28331.0
Total gross income									22,712,600

ORGANIC CULTIVATION AND CERTIFICATION IN NEPAL

Status and Prospects

Krishna Ram Amatya

INTRODUCTION TO ORGANIC CULTIVATION

T*he criteria for a sustainable agriculture can be summed up in one word - permanence, which means adopting techniques that maintain soil fertility indefinitely, that utilize, as far as possible, only renewable resources; that do not grossly pollute the environment; and that foster biological activity within the soil and throughout the cycles of all the involved food chains."*

Lady Eve Balfour

The organic philosophy is that humans must recognise that humans can only survive and

thrive if they live in harmony with the delicate balance of nature between plants, animals, earth and humans. Under organic farming systems, the fundamental components and natural processes of ecosystems—such as soil organism activities, nutrient cycling, and species distribution and competition—are used as farm management tools.

The history of Organic Agriculture spans over seven decades and is based on biological science and a bit of ethics, sociology and philosophy. It started with Rudolf Steiner, an Austrian philosopher who conceived the idea that a good agricultural productivity can be achieved by working with the nature. He developed a form of organic agriculture known

as biodynamic, meaning moving with life. Nicholas Lampkin, another leading organic agriculture researcher defines the organic farm as “an organism in which all the component parts – the soil minerals, organic matter, microorganisms, insects, plants, animals and humans – interact to create a coherent whole. Organic agriculture also includes social considerations in its holistic approach recognising that people are as important as the organic system.

Organic agriculture adheres to globally accepted principles, which are implemented in specific social, economic, geo-climatic and cultural contexts.

BASOC PRINCIPLES OF ORGANIC AGRICULTURE

The following basic principles are to be considered closely in implementing this system:

Soil fertility

- Sustaining and improvement of the soil

Plant protection

- Biological plant protection through prevention

Animal husbandary

- Site and species appropriate animal husbandry

Ecological balance

- Maintenance of the surrounding natural landscape

Energy saving

- Least possible use of renewable energy and resources

Prohibitions:

- Genetically modified materials
- Synthetic chemical fertilisers
- Plant protection chemicals
- Synthetic storage and ripening
- Hormones, and synthetic growth regulators
- Harmful processing aids in food processing

Soil fertility and nutrient cycles

Soil is considered as

- Growth medium for plants
- Water storage and supply
- Decomposition site for organic materials
- Anti-phytopathogenic potential (suppression of soil-borne diseases)
- Nutrient reservoir and producer

Nutrients supply

The nutrient supply is maintained by minimising the loss of nutrients and keeping them recycling within the farm.

The following paragraphs give the methods followed for providing major nutrients to the crops:

Nitrogen

This is done by Legume plantation, which will fix atmospheric nitrogen from the nodule bacteria. Actinomycetes which are present in dead wood, soil bound Azobacter or Beijerinckia bacteria, which live in association with tropical fodder grass like *Paspalum notatum* and other Gramineae plants. In paddy

rice, the bacteria *Anabena azollae*, which forms symbiosis with the water fern *Azolla* can fix up to 400 kg of N per hectare.

20% of the soil surface under legumes in crop rotation or agroforestry systems.

Phosphorous

Enzymes and plant acids from the organic matter achieve solubilization of the insoluble phosphates in the soil, which would otherwise be unavailable to plants. Water soluble phosphate fertilizers are not used. Ground rock phosphate or basic slag are applied either to the field or added to the compost heaps.

Potassium

Potassium is easily leached out from sandy soils, which contain little organic matter. The following strategy is adopted to make enough of it available to the crops.

- Regular application of organic matter, which improves the absorption of potassium in the upper soil layers, where it can be reached by the plant roots.
- Using deep-rooted plants as a part of the crop cycle to mobilize K in the lower soil layers.
- Using plants with high K-uptake in mixed cultivation systems.
- A permanent mulching layer in order to reduce the leaching of K.
- Addition of potassium rocks or wood ash in case of severe deficiency.

Organic matter

The benefits of organic matter in soil are so varied and extensive that it makes one think that the claims made are extravagant. However it is true. The following are some of the important benefits of organic matter:

- Source for N
- Major source of available P and S
- Assist in the growth of soil micro-organisms
- Contributes to cation exchange capacity to the extent of 30 to 70 % of the total. CEC is an essential factor for the availability of cations. Cations like K^+ , Ca^{2+} , NH_4^+ will not move far in the soil before large portions of them adsorbed to the exchange site.
- Increases the moisture holding capacity of the soil
- Organic matter acts as a chelate, a ligand that can bond to a metal. This phenomenon assists in the mobilization of micronutrients.
- Reduces erosion, shades the soil.

Production of organic matter locally

Organic system is based on production and use of organic matter locally. The farmer has to produce enough organic matter for the crops on the available area. He/she has to take the following measures:

- Cultivation area covered the whole year round.

- Green fallow periods/legumes into the crop rotation
- Forage cultivation into the crop cycle.
- Develop mixed cultivation systems
- In permanent cropping, provide a sufficient number of leguminous trees and shrubs.
- Alley cropping with leguminous plants such as Leucena.
- Prohibit burning of the crop residue
- Crop residue is left on the soil surface or mulched in the upper layer of the soil or as fodder/bedding for animals or used directly as compost material.
- When the organic matter is burnt as fuel, the ash is fed back in the nutrient cycle via compost.

Livestock and animal husbandry

Enables the recycling of organic matter for optimizing the agro-ecosystems e.g. through the use of crop residue as fodder for the animals and by using the animal dung for the crops. The number of animals kept by a farm depends upon the fodder available or the area used for the production of the fodder.

The following conditions are to be met under the system:

Healthy living and feeding conditions

The animals are to be provided natural wholesome feed and fresh fodder not on hay alone. The Shed to live should be under natural conditions as far as possible. All organically

raised dairy animals must have access to pasture, the outdoors, shade, shelter, exercise areas, fresh air, and direct sunlight suitable to their stage of production, the climate, and the environment. Growth hormones or antibiotics are not permitted. Preventive medical cares, such as vaccines, and dietary supplements of vitamins and minerals are provided.

The system believes on Optimum performance in opposition to maximising short-term performance.

Composting

Composting is considered as an essential element of this system. This is the process that takes back the nutrients to the production cycle and makes them available to the plants. Composting requires conditions favorable for microbial growth. Aerobic decomposition is used to prevent formation of odiferous products and toxic gases such as ethylene, and plant toxic acids and to increase the rate of decomposition. For optimum decomposition, the material should be kept moist and warm and with sufficient nutrient.

Many methods of composting are practiced. Some methods use inoculums, compost fleeces, and addition of clay at 10% by volume, the addition of finished compost at 10% by volume and the inclusion of crusher. Temperature and CO₂ monitoring is also done regularly by many compost makers.

Use of earthworm in compost making (vermiculture) is also getting popular.

Biological plant protection and control of weeds:

Organic System is based on the principal prevention than curing

Biological prevention resorts to the use of predators and crop rotations, planting of trap crops, mixed cropping, etc.

Weeds are also controlled to a great extent by crop rotation and by mulching. In cases where they persist mechanical and manual method of removal is used. Use of weedicides is prohibited.

Methods followed:

- Creation of wide variety on the farm
- Crop rotation to break life cycles of pest and diseases
- Planting of hedges and trees to provide shelter for predators of insects
- Selection of resistant and healthy varieties
- Support of healthy soil

Allowed corrective measures:

- Release of beneficial organisms:
 - Broad spectrum predators
 - Pathogens for insects like *Bacillus thuringiensis*, var. *kurstaki*, *Helicoverpa nuclear*
 - Polyhedrosis virus
- Application of botanical insecticides, such as:
 - Pyrethrum extract

- Neem seed kernel extract
- Plant and animal oils

MARKET OF ORGANIC PRODUCTS

Organic agriculture is currently practised in over 120 countries. In a number of European countries such as Austria, Sweden, Switzerland, etc., organic agriculture now accounts for around 10% of farmed land. Italy leads the way with over 50,000 certified organic farmers. Australia has the largest area of land converted with 1.7 million certified organic hectares.

Hundreds of thousands farmers in the developing world practise organic farming. Organic trade is also rapidly growing. For more than a decade it has achieved annual growth rates of 20-30%. In a number of food sectors (most notably baby food) organic has moved from niche to mainstream markets in many countries.

The worldwide value of organic trade has doubled in the last 3 years and reached an estimated 25 Billion US Dollars in the year 2000. In the year 2000 the turnover in the European market was 5.6 billion US \$.

USDA estimates: U.S. certified organic cropland doubled between 1992 and 1997, to 1.3 million acres. The figures of trade for the year 1990, 1996, 1999 and 2000 are 1 Billion, \$3.3 billion, \$6.5 billion and \$7.8 billion, respectively. The growth is equal to 20 percent or more annually since 1990. The Japanese market for organic products was estimated at between \$3.7 billion and \$4.5 billion last year, compared with \$1.5 billion five years before.

PREMIUM FOR ORGANIC PRODUCTS & REGULATION OF TRADE

The premium price for organic products is from 20 % to 80 % over that of conventionally produced products. This situation can tempt traders and producers to pass conventional products as organic. In order for the organic farming to enjoy the confidence of consumer, to prevent fraudulent claims to organic status regulations is required to ensure the authenticity of organic farming methods for production, for the labelling, processing and marketing of organic products. There are now regulations covering production and quality enforced in all of the above regions. These also govern imports of organic products into the markets of most regions.

Europe

Regulation EEC No. 2092/1991] was drawn up in 1991 and, implemented in 1992, Since its implementation many farms across the EU have been converted to organic production facilities. When farmers wish to claim official recognition of their organic status, the conversion period is a minimum of two years before sowing annual crops and three years in the case of perennials. In August 1999 rules on production, labelling and inspection of the most relevant animal species were also agreed [Regulation EC N° 1804/1999] This agreement covers such issues as foodstuffs, disease prevention and veterinary treatments, animal welfare, husbandry practices and the management of manure.

Products derived from GMOs are explicitly excluded from organic production methods.

The regulations also include imports of organic agricultural products from third countries whose organic production criteria and control systems have been recognised by the EU as their equivalent.

Certification in the USA

in the early 1970's Private organizations, mostly nonprofit, began developing certification standards. In the late 1980's some States began offering organic certification services. The Organic Foods Production Act of 1990 - national standards for organically produced commodities, USDA promulgated final rules for implementing this legislation in December 2000. USDA is currently implementing these organic regulations, and all agricultural products that are sold, labeled, or represented as organic must be in compliance with the regulations after the 18-month transition period is completed in October 2002.

Organically produced food cannot be produced using genetic engineering and other excluded methods, sewage sludge, or ionizing radiation. These standards include a national list of approved synthetic, and prohibited nonsynthetic, substances for use in organic production and handling.

USDA organic standards for food handlers require that all-nonagricultural ingredients, whether synthetic or non-synthetic, be included on the national list. Handlers must prevent the commingling of organic with nonorganic products and protect organic

products from contact with prohibited substances. The new U.S. Department of Agriculture Standards for Organic Foods are stated to be fully implemented by October 2002.

Regulation in Japan

From April 1st 2001, all agricultural products (including processed food made of/from agricultural ingredients) labelled as "Organic (both in Japanese and English)" must carry JAS Organic Seal on the products (in case bulk products, JAS certification status should be declared on the invoice).

IFOAM

People who believed upon the role of organic agriculture for a sustainable and healthy world formed the International Federation of Organic Agriculture Movement (IFOAM) meant for:

- Leading, uniting and assisting the organic movement in its full diversity.
- Worldwide adoption of ecologically, socially and economically sound systems that are based on the principles of Organic Agriculture.

It has been formed as a democratic federation with all fundamental decisions taken at its general assemblies, where its World Board is also elected. Members organise themselves according to geographic regions or sector interests. The federation's activities are also carried out in various committees, working groups, and task forces.

Its Major aims and activities:

- To provide authoritative information about organic agriculture, and to promote its worldwide application.
- To exchange knowledge (e. g. via conferences, trade-fairs, and publications).
- To represent the organic movement at international policy making forums (IFOAM has for example consultative status with the UN and FAO).
- To make an agreed international guarantee of organic quality a reality.
- To establish, maintain and regularly revise the international "IFOAM Basic Standards" as well as the "IFOAM Accreditation Criteria for Certifying Programmes".
- To build a common agenda for all stakeholders in the organic sector, including producers, farm workers, consumers, the food industry, trade and society at large.

Memberships:

- Members (with voting rights at General Assemblies) can be acquired by:

Organisations, such as institutions or companies, qualifying as being "predominantly" organic can become members of IFOAM. Predominantly organic means that more than half of the budget/turnover or investment of staff time should be in the organic sector.

- Associates (same status as members, except for voting rights):

Organisations and Companies which meet the requirements, but whose activities are not (yet) "predominantly" organic.

- Supporters: Individuals.

Prior to the enforcement of organic law in European countries, USA and Japan the standards prepared by IFOAM and its accredited certification agencies were accepted as the standards for trade in those countries. It can be said that the movement by IFOAM has initiated these countries to have their own Acts, Regulations and National Standards.

There are five organizations from Nepal, which are active members of IFOAM. They are Permaculture Group, INSAN, EcoCentre, and Agroforestry Sections of UMN and CWDS.

ORGANIC AGRICULTURE IN NEPAL

Historical development

The history of sustainable agriculture in Nepal can be said to begin with the establishment of INSAN in 1986. This organization was involved in promotion of Permaculture, a system akin to organic system. It provided training, conducted research and publicity, and promoted sustainable farming at farmers' farm.

Another milestone in Organic Agriculture in Nepal is the establishment of AAA farm. This farm has been established by Judith Chase and is a good model of organic farming. It has been

organised as NGO. It has been conducting production of vegetable under this system by local participation. It provides training and conducts experiments on various aspects of organic system. The products from the activities are marketed to interested consumers.

The establishment of several NGOs followed this. Some of them are:

- Community Welfare and Development Service, 1990
- Nepal Community Service Group (NCSG), 1992
- Jajarkot Permaculture Group (JPG), 1993
- Environment Service Group, 1993
- Environment Service Centre, 1994

Some of the works, they have done are: Formation of around 34 permaculture models; organization of around 400 training workshops, where ~100,000 farmers received training on permaculture and sustainable agriculture.

There are now seven organizations devoted to total aspects of sustainable agriculture.

- i. INSAN PO Box 8162 Kathmandu, Tel: 014497452; 014496864
- ii. Grihashthashram (JPP) , Dhamboji, Nepalganj, Tel: 081 621059
- iii. Ecological Centre, PO Box No. 4, Narayangadh , Chhetrapur, Tel: 056 520574
- iv. AAA, PO. Box 2008, Gamcha Bhaktapur, Tel: 016631766

- v. U. S. C. Canada, P. O. Box 2223, Baluwatar, Kathmandu, Tel: 014426378
- vi. Sustainable Soil Management Project, PO Box No. 2223, Bakhundole, Lalitpur, Tel: 015521969, 01554391
- vii. Nepal Permaculture Group, PO. Box 8132, Kathmandu, Tel: 014252597

The following organizations are working on certain aspects of sustainable agriculture:

- i. Nepal Institute of Agroforestry (NIAF), PO Box No. 9594, Koteswore, Kathmandu, Tel: 014497672, 01 4475043
- ii. LIBIRD, PO Box No. 0615526834, 0615532912
- iii. Action Aid, PO Box No. 6257, Lazimpat, Kathmandu, Tel: 01 4410929
- iv. IDE, PO Box No. 2674, Kathmandu, Tel: 015526221
- v. ICIMOD, PO Box 3226, Jawalakhel, Lalitpur, Tel: 015525313

Besides, other organizations such as Plan International, Care Nepal, UMN, Helvetas, GTZ, SNV, WWF, GARDEP, JICA, etc., are providing support to this area through national and local organizations.

CWDC

Another organization, which has been actively engaged in this activity, is CWDC (Community Welfare and Development Society), that was established by an agricultural scientist, S. P. Yadav.

CWDS was established in 1990 and is involved in implementing Participatory Rural Development Projects since 1991. It conducted a National Workshop on Regenerative Agriculture in during 5-8 October 1991. It is a full member of IFOAM since 1992. It started production of EM in Nepal in 1996 in technical collaboration with EMRO, Japan. It has established a private company, EMCO Pvt. Ltd., for production and marketing of EM since 2001.

CWDS conducts training and extension of organic agriculture system and promotes EM.

Permaculture group: It is a networking organization of like aiming associations, which has been established with the objective of fostering sustainable agriculture. Ten such associations are members of this Group. The Chairman is elected for two years term from the member organizations. It also has individual members numbering 300.

- a) Eco Center
- b) ECCA Environment Conservation Consultancy Association
- c) JPP Jajarkot Permaculture Programme
- d) HPG Himalayan Permaculture Group
- e) TOLI Team Organization for Local Initiative
- f) LIBIRD Local Initiative for Biodiversity Research & Development
- g) NECOS Nepal Community Service Group
- h) Nari Bikash Sangh

Permaculture embraces health, education, and transport along with agriculture. This is a system that makes optimum utilization of different available resources required for maintaining life. Its main objective is to establish capable base for sustainable fulfilment of the requirement of basic requirements like foodstuff, energy, and shelter.

Certified Organic Production in Nepal

The main objective of most organizations in the field of sustainable agriculture in Nepal has been to help the farmers to have a better quality of life and to stop the degradation of soil. A study showed that only 16 % of the participants of workshop had the same objective as that of the organizers –to sustain the agriculture system. The actual percentage of the participants, who would have implemented the idea, would be much lower. The reason for the low implementation could be lack of visible financial benefit from applying the methods. Benefits could be attained only when the net income is higher than from conventional system. This could be by getting premium price for the products.

Awareness among the people on natural food and natural way of life is growing. Just like naturopathy, natural food and organic food is getting popular among a notable section of the society. It is now possible to purchase food in the market, which are sold as organic. The buyers are paying premium price. But the market is a niche one. For the products to be sold in the main stream market the premium should be less than 20 % of the conventional products.

When these products are to be marketed as organic, and when they are certified as organic, there will be confidence among the consumer regarding the quality of the product. Certification is obligatory for international market. The certification agencies need to be accredited by the government of the country where it is exported.

Certified organic cultivation has started in Nepal in 1995. National Association of Sustainable Agriculture, Australia (NASAA) is the first Agency to be involved in this activity in a regular way. It is a certification agency, which is accredited by IFOAM. It also issues certificates for JAS and USDA specifications. Prior to NASAA, some other European certifying agencies also came to Nepal and certified some enterprises. These were not continued. Other certification agencies are also entering the country.

NASAA has certified the following enterprises:

1. Kanchanjunga Tea Estate, which has been cultivating tea in Panchthar District since 1995 (75 hectares in its own land and ~50 hectares in cooperation with small farmers in the northern part of the district).
2. Shambhala Herbal and Aromatic Industry, which has been cultivating aromatic herbs since 1995 in Sunsari and Siraha Districts (about 25 hectares).
3. Coffee production in Gulmi District since 1998
4. Guranse Tea Estate located in Guranese near Hile in Dhankuta District since 1998 (about 200 hectares).

5. Purna Kalash Traders in Kathmandu valley, which has been trading since 1999 a part of the produce from Kanchanjunga Tea Estate.

Experience of Shambhala

Cultivation

Shambhala was established in 1994 with the support of a German buyer, which is marketing its products in the Europe and other countries. The Management of Shambhala implemented the system of farming under the guidance of Mrs. Brigitt Boor from Bioherb of Germany, who was a regular visitor in connection with a GTZ supported project in Gorakha district on domestication of medicinal and aromatic plants. Literature on the theory and practice of the system was used for the work. The first area tried were some plots in Babiya and Bhokra VDC in Sunsari District. A former employee of AAA farm, who had received training on the system in the USA was employed for running the farm.

The crops cultivated are: citronella, lemongrass, palmarosa, and ginger grass corn mint, chamomile, holy basil and French basil.

The disaster of flood in Sunsari in 1996 was a set back for the activity. The farm was flooded and the standing crops were completely destroyed. The local farmer who owned the farmland in Bhokra withdrew from the programme. It was inferred that lowlands are not suitable for the crops. It was decided to look for a new land for the programme. Shambhala made trial cultivation in several areas, such as Bhutaha VDC immediately on

the south of Babiya, in Durmaha VDC on the north of the highway and in a community forest in Siraha District.

The buyer with the support of GTZ under PPP programme fielded an expert from Bioherb as advisor for the strengthening of the enterprise. They provided training for the farmers and field staff through an expert from India and an assistant from Nepal. It also provided training to a senior manager in an institute in India.

The enterprise is striving to conduct the activity with the participation of the community. The policy that it is following is:

- To purchase or lease land in the minimum possible extent
- To conduct cultivation in the enterprise owned or leased land as demonstration to the community
- To attract the community members to practice organic system in their own farm;
- To give a buy back guarantee to the cultivators

Accomplishment:

- Organized small farmers groups that have been certified by NASAA
- Built self confidence to extend the activity
- Acquire the confidence of the buyer

Problems:

- Lack of education and poverty. Subsequently there is shortsightedness

- Impression that application of inorganic fertilizers and pesticides is necessary
- High rate of pesticide application
- Low land holdings
- Very little area left for trees
- Trees are considered to be encroachment into cultivable land for cereals
- Animal dung as fuel for cooking

Harvest from the wild (wildcraft)

Rhododendron anthopogon and *Abies spectabilis* leaves and twigs from three VDC in Dolakha District in partnership with a local entrepreneur.

The local partner was provided on - the - spot - training on harvesting so that the regeneration of the plants would not be affected. They were also taught to keep the records of the area and the individual trees, which were harvested. They were made to oversee that the amount of leaf and twigs harvested from an individual tree/plant will not exceed the amount that would prevent the tree/plant to regenerate. Regular cross checking monitoring was conducted. Similarly the enterprise organised plantation of fuelwood trees (*Alnus nepalensis*) and *Abies spectabilis*. Shambhala as well as the local partner monitored these activities.

Shambhala obtained organic certification of the area and exported the product as organic to its German Buyer. This activity had to be stopped. Due to the lack of market response as anticipated.

STEPS FOR STARTING ORGANIC FARMING AND CERTIFICATION

Preparations

Commitment of the farmer should be in total. He/she should understand the requirements of the crops. He should understand the elements of organic farming. Then he should work out a practical conversion plan, which will comprise of:

- Selection of cash crops and crops to support soil fertility
- Elaboration of a rotation plan
- Fertilization plan (compost, manure, source for sufficient organic matter)
- Diversification plan: besides crops to be grown, integration of hedges, trees, etc.
- Identification of source of plant based materials and other treatment methods

Documentation:

In order for accredited agencies to inspect and certify them, all processes of agricultural production, processing, storage, transportation and handling need to be documented in a suggested manner. The aim of the documentation is to make the flow of product from field to the market transparent for the certifying agency and for the controlling authority.

Steps:

- Appointments of a responsible person to collect processes and record information.

- Introduction of a filing system
- Introduction of a register of producers showing code numbers, name, address and farms size, rotation system, inputs, yields, and maps. Excluded operators and reasons for exclusion.

For production:

1. Map with identification number/code for all plots
2. Rotation plan for each plot
3. All farm activities such as sowing, plantation, weeding, irrigation, fertilization, composting, pest control, etc. Origin and type of fertilizer and the substances used for pest control should be recorded
4. The origin of all inputs with documents
5. All extension activities filled out in each visit to the individual farm
6. Contracts with the farmers showing commitment to adhere to the standards of organic farming and also sanctions for nonadherence
7. Checklists and formats for internal inspection
8. All purchases from the contract farmers

For processing:

- All the steps of processing showing the farmer and plot for the products

For storage, transport and sales

Registration of all incoming and outgoing products is vital. A system of batch number

should be used to identify the lots showing the origin from the plots to the sale to buyer.

Management

When a commercial company is conducting its activity through a group/groups of small farmers, internal control system is applicable. Its aim is to organise the contract farmers in a better manner and to give them definite responsibility within the project. This will comprise of appointment of a competent coordinator, introduction of internal standards, to have a documented contract with the farmers for conducting cultivation in accordance to the standards. The internal standards consist of summary of international standards adapted to the local conditions and compatible to the international regulations. This is written in local language for the local farmers. The contract will have a statement of commitment by the farmer to conduct the cultivation in accordance to the standards and to allow internal and external inspections. It also has a statement of sanctions in case of noncompliance with the standards.

Extension service

The farmers receive regular training in organic agriculture by local as well as external trainer as required. They will receive advice on the activities to be taken regularly and in case of only problems.

Internal inspection

All farmers registered with the commercial organic company need to be inspected at least once a year. The report of the internal inspection (audit) will help the external auditor in his work.

External inspection and certification

The farms have to be inspected by accredited certification agency. This is done once a year. Surprise inspection also is conducted. The external inspection checks and evaluates the correctness of the information provided by the internal control system. He checks the documentation of the product flow and carried out spot checks to farm level to verify the correctness of the documentation and functioning of the internal inspections. These are to be followed to comply with the requirements of control authorities.

Example of certification steps

Most certifying agencies will have steps to get certification similar to that of NASAA. Given below are the instructions that NASAA has given in its web page.

Steps for certification by NASAA

1. Read NASAA Production and/or Processing Standards
2. Apply to NASSA
3. Complete Questionnaire.

NASSA will then assess its inspection requirements and agree with you an appropriate inspection deposit.

4. Agreed payment is made and inspection is allocated. Inspection is completed and report written.
5. Inspection Review Committee recommendation
6. Contract offered with appropriate conditions and final account for fees
7. Return of signed contract and fees paid

8. Issue of Certificate of Registration
9. Annual Re-inspection (or more frequent if deemed necessary on the basis of risk assessment)

SUGGESTIONS

The reasons for promotion of organic farming are:

- for improving the soil fertility
- fetch better return to the farmer
- reduce imports

For the domestic market national system of certification may be sufficient. But for the market in the USA, European Union and Japan, where the demand for organic product is fast rising, the products will require certification in accordance to their regulations.

The following activities are required for promotion of organic cultivation in the country and certification for export:

- Formation of national standard for domestic market
- Research on the soil fertility, compost preparation at the farmer's level
- Training of farmers on organic farming and composting
- Research on the biological pest management
- Development of facilities for soil analysis on a wide scale
- Market development of organic products

- Liaison with USDA, EU, and Japanese authorities on the certification of Nepalese products

Finally many agencies are already active in one or the other of the above mentioned activities. These activities need to be coordinated so that they can all be streamlined into a coherent effort.

COMMUNITY PARTICIPATION IN CULTIVATION OF MEDICINAL AND AROMATIC PLANTS AT DAMAN AREA IN NEPAL

*Lokendra Raj Sharma
Kuber Jung Malla
Mahendra Nath Subedi*

BACKGROUND

Medicinal and aromatic plants in Nepal are mainly collected from wild. The demands for some of the items are very high in the local as well as international markets, and the species are being over exploited. His Majesty's Government had realized this scenario very early and had established Department of Plant Resources (then Department of Medicinal Plants) for the conservation and development of medicinal plants under Ministry of Forests and Soil Conservation. Since its inception in 1960, Department of Plant Resources has been engaged, among other things, in the domestication and cultivation of medicinal

plants in order to control the further degradation of medicinal plants in nature through herbal farms established at different climatic regions of Nepal. Agro-farming techniques for important species were developed and handed over to the farmers residing in the vicinity of the farms. Some of the farmers were attracted to cultivation of medicinal plants. The yieldhigh and low cost of production were encouraging. Herbal products have no domestic use for consumption as food, so the farmers did not take risk for the reason of food security. In spite of the encouraging result, the cultivation of the medicinal plants in cropland was limited. Cultivation was done by unorganized farmers in small patches, which could not meet the targeted result.

Community Forestry Programme in Nepal has been globally recognized for conservation of forests with involvement of local community. About thirteen thousand forestry users groups, recognized by the forestry legislation, are directly involved in managing the forests and biological species in over 1.06 millions ha of national forests so far. This programme has benefited 1,474,937 households (FUG database record, Feb.2004). The Department was looking for suitable mechanism for introducing medicinal plant cultivation in community forests for poverty alleviation of the rural people and realized that CFUGs could be major viable partners for the above purpose. In the mean time, His Majesty's Government formed a high level Herbs and NTFP Coordination Committee at the Coordination of Hon'ble Minister, Ministry of Forests and Soil Conservation, for the development of Herbs and NTFP in Nepal. Herbs and NTFP Development Policy 2003, is being drafted at the auspiciousness of the same committee, which encourages cultivation of medicinal plants in the forestland through forestry users groups and other private land for its commercialization.

INTERNATIONAL AND NATIONAL SCENARIO

With the coming of the International convention and treaties (CBD 1992, Agenda 21, FAO 1986) the old traditional management concept of forests for the production of timber has been replaced by multiple uses of forests. All these convention and treaties support environment friendly, socially beneficial and

economically viable management of the forests. The multiple use of forest principle has encouraged donors and INGOs to support national government also for the development of MAPs. This has resulted many NGOs and donor agencies to work together with the communities in remote areas of Nepal for the cultivation and development of MAPs. This has created congenial environment for Department of Plant Resources for increasing cooperation with donor agencies and community forestry user groups to work together for the cause of development of MAPs in Nepal and small project is being implemented in Daman area for the cultivation of medicinal and aromatic plants.

MODEL OF PROJECT

The project is based on participatory approach. The Department of Plant Resources developed a proposal in collaboration with CFUGs of Daman and DANIDA funded Natural Resource Management Sector Assistance Programme (NARMSAP) for capacity building of the forest user groups for cultivation of MAPs in Daman area. This project aims:

1. To start a participatory programme with CFUGs in collaboration of DPR and NARMSAP.
2. To build capacity of CFUGs in cultivation of MAPs/NTFPs for the sustainability of these product.
3. To make CFUGs self-dependent for the production of seed and seedlings and for marketing.

PARTNERS

In this context, participatory approach for the cultivation of MAPs in community forestry has been thought to be beneficial to the users' level. Following are main partners of the project.

1. Community forestry users groups of Daman area

This project includes 7 Community Forest Users Groups (CFUGs) of Daman Village Development Committee. Daman Village Development Committee is one of the 42 Village Development Committees of Makwanpur district of Nepal and is located at 75 kilometers south - west of Kathmandu valley connected by Tribhuvan Rajpath. The area is rich in NTFPs/MAPs. Banmula (*Dipsacus mitis*), Bhyakur (*Dioscorea deltoidea*), Bikh (*Aconitum* sp.), Bisfej (fern sp.), Chiraito (*Swertia chirayita*), Jiwanti (*Epimerantha macraei*), Lokta (*Daphne papyracea*), Majitho (*Rubia manjith*), Satuwa (*Paris polyphylla*), Sugandhawal (*Valeriana jatamansii*), Tejpat (*Cinnamomum tamala*), Timur (*Zanthoxylum armatum*), etc., are important NTFPs found in different community forests of the area. Every year nearly 80 tons of NTFPs have been estimated to be collected from wild from this area and traded towards Hetauda (Kattel 2003). At this stage, conservation and sustainable management of these resources have been felt highly necessary. Cultivation or enrichment plantation of these species is one of the steps towards sustainable management. Many Forest Users Groups have been formed in this area but none of these groups have been able to make reasonable

progress for the management of NTFPs in the forest in spite of having strong interest. One of the identified causes for this is the lack of knowledge and skill in the related field especially in cultivation aspect.

2. Department of Plant Resources (DPR)

The Department of Plant Resources is a Department under the Ministry of Forests and Soil Conservation. The DPR is organized in two divisions: the Natural Product Development Division and the Plant Research Division. The department provides services in the field of research and development of plant resources in Nepal. The coordinated and multi-disciplinary activities of the Department are concentrated on:

1. Survey and collection of plant specimens, identification and preservation at the National Herbarium located at Godavari, Lilitpur.
2. Maintaining botanical gardens, germ-plasm centers and conservatories for plant diversity conservation in different climatic regions of Nepal.
3. Conducting bio-technological research, especially tissue culture, to improve and raise plants of commercial and ornamental value.
4. Conducting phyto-chemical screening and pharmacological tests.
5. Developing agro-technology and providing services to farmers about the cultivation,

good harvesting practices and processing of the medicinal plants.

6. Provide training and services on garden development to interested farmers and entrepreneurs.
7. Germplasm conservation and research, documentation, characterization and field gene bank activities.

One of the Botanical gardens and conservatories is located at Daman, which also conducts research on domestication of medicinal plants. This botanical garden is assigned as one of the partner of this project, which is responsible for technical support for training, nursery development, cultivation, management and good harvesting practices of the medicinal plants.

3. Natural Resources Management Sector Assistance Programme(NARMSAB)

Funded by Danish Government, the Natural Resources Management Sector Assistance Program is supporting Community Forestry Programme in Nepal since 1998. The purpose of the NARMSAP is to strengthen the natural resource management sector in Nepal. The development objective of the Programme is the improved livelihood of the people in rural areas of Nepal. The immediate objective is improved management of the natural resources, based on local participant and using sustainable social, economic and environmental practices. The programme is expected to contribute to reduce poverty by promoting the social and sustainable development of natural resources.

Funding

The major funding for the present project comes from the NARMSAP. His Majesty's Government, though Herbal Promotion Project of the DPR, also has provided some contribution to this project.

Monitoring

NARMSAP and DPR will monitor the activities in technical, financial and social terms. Problems will be discussed jointly with the CFUGs. Proper evaluation will be made and necessary steps will be taken to mitigate the problems.

Activities of the project

The activities of the project are divided in two phases:

Phase 1:

After various discussions and consultations with CFUGs of the area, training on NTFPs/MAPs was identified as the basic need for the management of NTFPs/MAPs. So for the first phase it was decided to conduct training on NTFPs/MAPs. The steps being taken were as follows:

- **Selection of participants from community forestry Users Groups for training:**

Selection of the participants for this programme was very important task. So a participatory meeting with Forest Users Group members was organized in each Community Forest. District Forest Officer of Makwanpur was requested for

coordinating the meeting for selecting the participants based on the following criteria:

- person having keen interest on NTFP
- person, who can devote time in the work
- person having basic qualification to read and write
- Person, who has ability to lead other members of his Community Forest User Group.

● Training program:

The first program was started from training. The objective of the training was:

- To build capacity for the user groups on the management of MAPs in their respective community forests through conservation, plantation, and cultivation of suitable species.

- To impart knowledge on identification and conservation of locally available commercially valuable tradable MAP species.
- To develop skill on nursery management, seedling propagation techniques, management and good harvesting practices of important MAPs.
- To involve them in the income generating activities from the management of MAPs in respective community forests.

Participants: (see table below)

The training was conducted from 6-20 May, 2003. Participants were trained in identifying local MAPs, sustainable harvesting practices, conservation, nursery development and cultivation of MAPs.

Participants

There were 15 participants from 7 Community Forests (at least two from each community forest). Following 7 Community forests were selected for this program:

S. NO.	NAME OF COMMUNITY FORESTS	AREA OF CFS (HA)	NUMBER OF HOUSEHOLD
1	Aghore Mahavir Community Forest, Aghore Namtar – 3	350.75	59
2	Jhirghari Community Forest, Lamtar – 1 & 3	560	92
3	Karunabhumi Community Forest, Daman – 6, 7, 8 & 9	988	549
4	Mahankal Community Forest, Daman – 7	358	177
5	Rikheshwor Community Forest, Daman – 4 & 5	122	260
6	Shidhakali Community Forest, Daman – 6	83	275
7	Sundari Devi Community Forest, Bajrabarahi – 9	100	200
	Total	2561.75	1612

During the training period, participants selected four potential MAP species for cultivation in different community forests on the basis of local trade and suitability in the local climatic condition.

Participants also targeted to raise seedlings of four MAP species in the quantities given below for plantation in 21 hectares of the community forestland.

and potential MAP species in consultation with CFUGs for cultivation and management in seven community forests.

- **Nursery development:** Development of nursery in each Community Forestry Users Group for selected species of MAPs with technical support from DPR

Seedlings of four MAP species

S. NO.	SPECIES	NEPALI NAME	NUMBER OF SEEDLINGS TO BE PRODUCED	TOTAL AREA FOR PLANTATION
1.	<i>Swertia chirayita</i>	Chiraito	20,000 seedlings	3.5 hectares
2.	<i>Taxus wallichiana</i>	Loth sallo	5,000 seedlings	3.5 hectares
3.	<i>Valeriana jatamansii</i>	Sugandhawal	35,000 seedlings	7 hectares
4.	<i>Zanthoxylum armatum</i>	Timur	5,000 seedlings	7 hectares
Total			65,000 seedlings	21 hectares

Nursery establishment:

Site selection for nursery establishment in 7 community forests has been completed in joint effort of DPR and 7 Community Forest Users Group. Expert and technicians of DPR and Mountain Botanical Garden, Daman worked on the establishment of nursery. WINROCK provided technical assistance to this work.

Phase II:

In course of the second phase of the project, the following activities have been planned to obtain fruitful results.

Post-training program

- **Species selection:** Selection of important

- **Seedling production:** Raising Seedlings in each nursery based on the local demand for planting materials.
- **Enrichment plantation or cultivation:** Propagated seedlings will be planted in community forests areas of 7 selected CFs after the seedling will gain the planting size that includes cultivation as well as enrichment plantation.

Conclusion:

Integrating community forest with NTFP activities has given new opportunities to CFUG member to maximize the sustainable use and Management use of their community forestland. It is assumed that the project could

be replicated to other community forest in the country; if it is accomplished successfully. The project could take the advantage of the countrywide networking the Community Forests having the NTFP/MAP management, development program. The farmers will be having off-farm employment through cultivation and processing of the herbs. Another important aspect is that community forestry users groups, as an organized group of farmers, will be capable of producing large quantity of MAPs so the price of the herbs, to some extent, can be regulated by the farmers themselves as they will be in position to bargain for the adequate price.

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MARKETING NEPAL'S NON-TIMBER FOREST PRODUCTS

Challenges and Opportunities

Rana B. Rawal

ABSTRACT

Nepal's geographical, altitudinal, and climatological conditions, taken together with various local factors, account for high species richness. Among 7000 species of plants recorded in Nepal, over 1624 species are of ethno-botanical importance. However, Nepal has not been able to adequately utilize them. General lack of sustainable production practices, inappropriate harvesting and post-harvest practices, product adulteration, in appropriate value-addition, poorly organized marketing price information system, and lack of standardized production system has hindered international recognition of Nepali Non Timber

Forest Products (NTFPs) as major challenges to maximize equitable economic returns. The existing support services such as communication, storage, organization, transportation, and credit facilities are also the added challenges of marketing system in Nepal.

NTFPs can provide a range of social and economic benefits at local, regional and international levels. One emerging opportunity is through a system of recognized certification whose aim is to optimize and maximize the economic potential of certain marketable NTFPs, in order to provide a larger economic return from a given area for local growers and collectors, without adverse impact on the resource base. Appropriate policies and

regulation are very much essential in the NTFPs sub-sector to overcome the marketing challenges in order to reap the larger benefits.

Key words: Non Timber Forest Products, Marketing, Organic, Certification, Nepal.

BACKGROUND

In the Central Himalayas, Nepal occupies relatively a small area of 147,181 square kilometers in the northern part of the Indian sub-continent. In Nepal, with increase in altitude, vegetation changes its character from tropical, through sub-tropical and temperate, to alpine. Nepal's geographical, altitudinal, and climatological conditions, taken together with various local factors, account for the richness of Non-Timber Forest Product (NTFP) species.

The flora of Nepal contains about 1000 economic plants species (14% of the vascular plants of the country). These include 440 species of wild food plants, 71 species of fibre-yielding plants, 50 species used as fish poison, 30 species of fodder-yielding trees (Malla and Shakya 1984). Among these, about 100 species of Medicinal and Aromatic Plants (MAPs) are currently exploited for commercial purposes (Rawal 1995).

Nepal is rich in traditional medicines. Ayurveda, Tibetan medicines, Siddha, Unani, Naturopathy, and Homeopathy have been practiced for centuries. The major source of such medicines is plants and plant products. The rural poor in the mid hills and mountains have been involved in the collection and sales of these species since time immemorial.

However, most collectors do not know what products are in demand for what price, other than the ones traded locally. There are no systems in place for them to acquire this information. In recent years, the greater quantities of these plants, having medicinal and aromatic properties, have been indiscriminately collected for export to India, China, and overseas. Because of overuse, these species are now in the depleted stage (Edwards 1994, 1996a and b, Malla et al. 1995, Hertog 1995, Rawal 1995, Karki 1996, Sharma 1996).

The liberalization of international trade régimes has created significant opportunities for, as well as challenges to, the sustainable use and conservation of forest resources. However, whatever information is available indicates that the general flow of trade in NTFP species is diverted mostly from the resource-rich & technology-poor south to the biodiversity poor & technology-rich North. The total world import of NTFPs is of the order of US \$11 billion in terms of its value of which about 60% is imported by USA, Japan and European community (Iqbal 1995).

This paper focuses on the marketing related challenges and opportunities of the NTFPs in Nepal. This paper also covers the relevant issues on NTFPs as a whole. The reflection is based on the lessons learned from past experience; some suggestions on policy changes are made for improving the living conditions of the people through improved marketing.

MARKETING CHALLENGES OF NTFPs

About 90 percent of the total export of NTFPs is still in the raw form. Local processing is limited because of insufficient knowledge of modern technology and the world market for the processed products (Rawal 1995).

Marketing challenges and constraints include:

- Inconsistent supply of quality raw materials,
- Scattered sources of raw materials and the lack of marketing networks at the local level. These cause availability problem on the part of buyers (wholesalers and/or final buyers),
- Inconsistent/irregular demand for various raw materials on the part of buyers (wholesalers and/or final buyers),
- Inadequate knowledge of products and markets on the part of collectors/producers, causing lack of access to favorable markets and prices,
- Lack of awareness and recognition of Nepali NTFPs by international market organizations of environmentally and commercially sound. Minimum Nepali attendance at expositions such as international trade fairs and exhibitions result in poor linkages with related international traders,
- Lack of clear-cut policy on NTFPs so that there are irrational royalty fixation and collection, different form of informal taxes, unnecessary regulatory barriers. (The support of MAPPA-IDRC in facilitating the establishment of Nepal Herbs and NTFPs Coordination Committee is remarkable in the development of NTFPs in Nepal. This forum can be utilized in devising the Nepal NTFPs policy)
- Some regulatory policies that are not conducive for marketing, and provision on strict rule on export against advance payment or Letter of Credit has been adding up hurdles in exportation of value added products at importers preference.
- Lack of support services such as communication, storage/warehouse, certifying agencies, organization and transportation and credit facilities play a critical role in enhancing local benefits through marketing.
- The technology itself is a big challenge in some of the NTFPs/MAPs based industries. For example, isolation of active chemical compounds from essential oils and extracts is yet to be introduced in the country, because of lack of know how on commercially viable technology.
- Unhealthy and tough competition in domestic market for consumer products: The country is importing many products from neighboring countries regardless of its quality. This situation is causing tough competition with low quality low price imported products in the domestic market.
- Limited availability of resource

1. Over-extraction of NTFPs leads to dwindling supply.
 2. Inappropriate NTFPs collection or harvesting practices is responsible for low production or even destruction.
 3. Mortality of NTFPs by frequent fire and indiscriminate collection.
- Poor Marketing and Market Information System

Inappropriate collection/harvesting and post-harvest technologies result in poor or uneven quality, which is the major constraint to successful marketing. The lack of appropriate market price information system at the rural, district, regional, national and international level is also hindering the NTFP related business.

- Lack of Institutional Support

The limited skill and capability of collectors/harvesters and processors are compounded by lack of institutional support. Very little efforts have been made to improve the level of, quality standards and appropriate technology.

- Lack of Linkages and Networking

A major drawback is the lack of linkages between different institutions involved in researches of NTFPs collection/harvesting. Interaction between relevant stakeholders such as, universities, research institutions and industries is poor, resulting in a substantial proportion of the research finding remaining unused.

- Community Participation in Research

NTFPs collection/harvesting has failed to take recognition of local technical know-how and

to facilitate local innovations. At the operational level, the traditional separation between research, training and extension must disappear to facilitate regular interaction between researcher and local communities. Due recognition and reward of local initiatives will go a long way to demystify research and researchers and to bring scientific thinking to the grassroot level.

- Issues on Intellectual Property Rights (IPR) and Trade Related Intellectual Property Rights (TRIPs)

The concept of present Intellectual Property System has been rooted since 19th century in this modern world. It was initiated as an effort to promote the interest of private industry in scientific and industrial growth. An intellectual property right used when inventors do not wish to patent in order to protect themselves from competitors. Unlike patents, these do not require that inventors register them and have no limit. This IPR is conceptualized in five forms such as Patents, Plant Breeders' Rights (PBR), Copyright, Trademarks and Trade Secret. Nepal is very much silent in working in line with IPR and TRIPs resulting very low documentation system on the traditional knowledge and technologies in the NTFPs.

MARKETING SCOPE AND OPPORTUNITY OF NTFPs

The current global resurgence in the consumption of 'green' products, especially drugs, flavors and fragrances of natural origin have indeed amplified the scope of the utilization of indigenous or spontaneous flora as well as suitable exotic species. The vital

question here is to tackle the situation judiciously so that long-term benefits may be enjoyed without any harm to the fragile Himalayan ecosystem. World Trade in Essential Oil averages over US \$ 1.1 billion annually or around NRs. 8000 Crores (Principal Import Markets – EU, USA and Japan – Over 70%), (ITC, 1995). The entry of Nepal in the World Trade Organization (WTO) and South Asian Free Trade Agreement (SAFTA) would give a great opportunity to take the benefit in reaching regional and global markets. The scope and opportunity in the use of NTFPs are enumerated below:

■ Plant products are used as

- Foodstuffs
- Fragrance, flavoring and spices
- Perfumes and cosmetics
- Pharmaceutical and biological agents
- Nutraceutical
- Industrial uses (Paints, Fiber, Paper manufacturing, Tea, etc.)

■ About 80% of the population in developing countries depend on NTFPs for their primary health, care, nutritional needs & income generation activities (FAO, 1995)

■ Over 120 compounds from 90 plant species are available as prescription drugs.

- Preventive herbal well being products or medicines (intelligent nutrition, nutritional therapy etc.) will be more important – Yarsagumba related products.

- Many new diseases among the poorest due to microbial resistance and water shortage.
- More acceptances for the phytotherapy.
- Use of biotechnology and genetic engineering for the production of Aroma-based medicines (Cell culture, targeted biosynthesis, etc.).
- Demand of Aroma-based medicines for age-related diseases (autoimmune and degenerative diseases).
- Sources of new drugs (especially for cancer, HIV-AIDS, Hepatitis, etc. – e.g. Taxol from *Taxus wallichiana*).

In this era of the globalization of economics and knowledge systems, the fate of the NTFP is being determined as never before, by millions of unseen hands, from those of forest collectors to that of titans of food and drug companies sitting in far away places. The growth in demand for phytomedicine and natural products fueled by rapid population growth in South, and high per capita consumption in the North is outpacing the production of these resources on a global scale.

Benefits of appropriate certification of NTFPs

NTFPs can provide a range of social and economic benefits at local, regional, and international levels. One emerging opportunity is through a system of appropriate certification (organic, fair trade or eco etc..) whose aim is to optimize and maximize the economic potential

of certain marketable NTFPs, in order to provide a larger economic return from a given area for local growers and collectors, without negatively impacting the resource base of these species. Appropriate certification doesn't create imbalance in existing traditional management system, many of which are based on complex histories of bio-fertilizer use and belief in natural systems. Organic certification efforts attempts to minimize any potentially negative impacts of market forces on traditional local use and management of resources by building organic practices on local people's strength and developing necessary technical and managerial capacity, required infrastructure such as indigenous and affordable system of certification and quality monitoring.

While there are certain niches that can potentially capture green premiums as a direct result of appropriate certification, it is likely that certification can be a tool for the better marketing of already established high-value NTFPs. Once certified, conscious consumer is willing to pay a higher price for these NTFPs (Hansen and Panches 1998).

Environmental impact of appropriate certification of NTFPs

Certifiable NTFP management shall ensure long-term ecological viability of NTFP populations. NTFP harvesting and management generally have lower impacts on forest ecosystems than timber harvesting; but care must be taken that species are not over harvested, and appropriate protection must be provided for vulnerable species in residual stands.

ECONOMIC BENEFITS

NTFPs can provide a range of social and economic benefits at local, regional, and International levels. The intent of NTFP certification is to optimize the socio-economic potential of certain marketable species, in order to provide a larger economic return from a given forest area for local communities and forest managers, without negatively impacting local use of NTFP species.

At present, some national and international processing enterprises have been established in the country. For example; a total of 39.5 tons of essential oils have been exported annually from Nepal (HPPCL, 1999). There is a promising market of NTFPs in Nepal because the traditional healing systems in this country heavily rely on medicinal plants. The global market for Nepal's medicinal plants is also large because the developed countries have been attracted to alternate medicines and natural products (Subedi 2000). However, most of the established enterprises in Nepal have not been able to run at full capacity because of lack of sufficient raw materials available at affordable prices (Annex 1). At the same time the R&D activities are minimal in the established enterprises in order to reap the expected economic benefit from the NTFP sub sector.

PRODUCT QUALITY AND QUANTITY

The markets for raw NTFPs materials outside Nepal have quality requirements. These products offer higher prices only if quality items (cleaned, dried, and graded products) are supplied in large quantities. A very low

quantity of improved product is of no interest to outside buyers and even to the traders/intermediaries supplying it. Even for large quantities, local and road-head traders show interest only if they know that the price differences between India and Nepal are high. At present, collectors perceive a very low incentive to invest additional labor in order to improve the quality of raw materials such as through selecting better seed stock, improving harvesting techniques or from value added activities such as cleaning, drying, and grading. This is because many traders/intermediaries dealing at the village do not pay attention for high quality materials (Edwards 1996a). Usually payments are made on the basis of weight or volume, regardless of quality. Thus, improper harvesting and poor post-harvesting practices affect the quality of many NTFPs.

Some road-head traders have started to differentiate prices for certain specific products such as Ritha (*Sapindus mukorossi*), though the price difference is less than 10 percent (Edwards 1996b).

Similarly, some buyers in Kathmandu and Terai have started to distinguish the quality of Timur (*Zanthoxylum armatum*) on the basis of seed size and maturity, harvest time, sources of origin and price them accordingly. This is done for qualifying smell, taste, etc., and oil content to be used as spices and other specific purposes. Thus, quality production at local level is important for efficient trade in the long run. Unfortunately, information related to quality is not well-documented and communicated to the collectors or to intermediaries working in remote areas. When the quantities from individual sources are

small, collectors and even the intermediaries are forced to combine high and low quality raw materials to obtain a marketable load.

Furthermore, addressing quality improvements at the primary level and at different levels to improve value addition (Total Quality Management-TQM, Good Manufacturing Practices-GMP) will benefit local communities, entrepreneurs as well as the end users.

MARKETING CHAIN

In Nepal, market and trade channels of most of the NTFPs follow the following pattern: forests/meadows to hamlets to road head or local markets to larger regional trade centers (such as Terai-based wholesalers) to India or other countries (Annex 2). This channel requires transit permits that often involves illegal financial transactions.

The NTFPs collected in remote areas are scattered at household and group levels and their consumption is in nominal quantities. In general, the demand for NTFP is from foreign countries. Most of the products, either in raw or in semi-processed form, are exported to India through legal and illegal routes. Export of NTFPs to a third country (other than India) is very small. The products are sold through a long market channel, which is inefficient in terms of cost. The present trade channels do not provide good profits to the collectors. These rural markets have been operating for decades but are still dependent on a limited numbers of wholesalers. The local traders are less competitive and less informed. Consequently, they are more vulnerable to prices provided

by the intermediaries. Some road-head traders in Central and Western Nepal dominate the collectors and pay less than half of the current price paid at competitive road heads in the Eastern Nepal (Edwards 1996a). Thus, the trade chain of MAPs is quite complex.

MARKET AND PRICE INFORMATION

The market and price information for NTFPs is not easily available in Nepal. Neither the government nor any other organizations updates market and price information for NTFPs. Intermediaries generally control price information. Information related to quality is not well-documented and communicated to collectors or intermediaries. The mistrust and non-transparent nature of the pricing process, market and price control by few buyers, artificially created fluctuation in demand from the buyers or processors, and the lack of knowledge by the collectors are the main drawbacks in the marketing of NTFPs.

Most of the individuals involved in the collection of NTFPs are the members of poor families. Few wholesale traders in the Terai and major cities of the country not only determine the price of the products, but also supply the capital in advance through various channels to the rural collectors at a very high interest rate. They disburse their cash to the collectors well in advance of the collection period. The collected products ultimately reach these wholesalers. Therefore, there is a direct link between the marketing of collected products and cash flow. Those involved in

collection take advance loans at an interest rate of 3 to 5 % per month, and the products are sold to the same moneylenders as the payment of the principal plus interest. The collectors do not obtain substantial benefits from the marketing of NTFPs.

The NTFP-based industry cannot make progress without a free flow of market information. Therefore, wider dissemination of the market price of NTFPs at different levels will benefit all stakeholders. If the collectors cannot get such information, their bargaining power cannot be enhanced. In this regard, EFEA had initiated and developed a Market and Price Information System for potential NTFPs at the Mid-Western Development Region in Nepalgunj, in collaboration with Nepalgunj Chamber of Commerce and Industries and has, since 2000, initiated dissemination of market and price information at the interval of two months. This system needs to be linked with the central level, and other regions such in Kathmandu, Birganj, Biratnagar, etc., with the Market Information System recently established at the Asia Network for Small-Scale Agriculture and Bio-resources (ANSAB), Kathmandu, Nepal.

RELATION BETWEEN MARKETING AND CONSERVATION OF NTFPs

Indiscriminate and illegal collection of NTFPs, particularly collection of premature plants for economic reasons, is the greatest threat for conservation of the most traded NTFPs in Nepal. Such collection is associated with rural livelihood. As these products are being collected haphazardly in the wild, mainly from

the government-managed forests, concerns have been raised over how the plants have been regenerated. For example, in Dolpa, Amchis (traditional healers) do not know much about the specifics of harvesting practices as dictated by Tibetan medical texts. They also lack information and training about sustainable harvesting techniques, often picking plants indiscriminately (Gurung et al. 1996).

There is a close relation between the trade and conservation of NTFPs. Nepal has a long history of trade in medicinal plants (and their derivatives) and wildlife, between China and India. Since the year 600 AD, Tibet has had a thriving trade in medicinal materials across borders with Nepal (Xiao et al. 1993, in Sung and Yiming 1998). Wildlife and medicinal plants found in the Himalayan Region are used in traditional Chinese and Tibetan medicines in a major way. About 100 species of plants used in Tibetan medicines come from Nepal and India (Yang and Chu 1987, in Sung and Yiming 1998). For example, Yarchagumba (*Cordyceps sinensis*) is one of the much-traded species since long time. Though trade promotes economic development in border areas, it may also involve illegal transactions in wild species. The international border between Nepal and India is open to the citizens of these two countries. The control of illegal cross-border trade is vital for the survival of endangered species that are vulnerable to human activities. Being signatories of CITES, both Nepal and India have the shared responsibility to control illegal trade of protected species. Similar is the case with

China (Tibet). Most of the officials responsible for the control of illegal trade of NTFPs, such as in the check posts in border areas, are not able to identify plants, their products, and uses. Consequently, information on NTFPs trade is far from sufficient. Common issues such as uncontrolled harvesting and illegal trade in valuable NTFPs transcend political boundaries, and therefore requires joint action. This requires mechanisms to develop common legal frameworks and collaborative action on enforcement. Trans-boundary conservation among Nepal, India, and China (Tibet) offers great potential for the conservation of NTFPs from both production and marketing point of views. Increase in communication, dialogue, information share, and joint research; coordination in policies and law enforcement; and joint action on common issues could be effective means for the trade and conservation of NTFPs.

CONCLUSION

Nepal has a large potential for NTFP in local, national and global markets. This is important not only from their present market value but also from social and environmental perspectives. There is a vast scope to improve the policy and regulatory environment in this sub-sector to promote production efficiency, conservation, sustainable use and equitable sharing of benefits. Poor reconciliation of values, gaps and contradictions, implementation irregularities, and more importantly, the defective policy formulation process are unable to create an enabling

environment to harness full benefits from NTFP sub-sector.

In spite of all these challenges, opportunities exist to promote sound ecological and social practices in NTFP management and trade through market tools such as certification, and their potential realization on practice could enhance to gain access to new markets.

The appropriate method of harvesting and post-harvesting techniques and sustainable production and value addition techniques (high value extracts, health related food products, cosmetic product, etc., have to be adapted to maximize the returns for collectors, entrepreneurs and users.

Organic and certified production of NTFPs holds great promises in promoting economic growth and social equity in poverty-stricken but biodiversity rich rural areas of the Himalayas.

A proactive marketing strategy has to be devised to realize better marketing. Provision of capital to the collectors, free flow of market and price information, and clearly defined property rights are equally important. Furthermore, there should be well-established market and price information systems with better market channels at district, regional, national and global level.

The complex policy and weak law enforcement system in Nepal needs to be rectified in order to have rational royalty system, and transparent taxation policies and minimal regulatory barriers. It is also important to have R & D back-

up in order to have appropriate collection/harvesting, cultivation, and processing, marketing and end product development methods in the development of NTFPs in Nepal.

RECOMMENDATIONS

1. Formulate Clear-cut NTFP Policy after consultation with relevant stakeholders (Holistic and comprehensive approach as against piece meal approach).
- Present Forest Act and Regulations need to be made simple and practical for the utilization and development of NTFP sub-sector.
- Royalty rates needs to be revised based on the judgment made at the extent of market price of the NTFPs. Similarly, one section with the provision of benefits needed to be added in the Forestry Act and Regulation wherever appropriate to encourage local people in promoting cultivation and local value addition business.
- Export policy should be revised for giving preference to importer's choice. An export against advance payment or Letter of Credit has been adding up hurdles in exportation of value added products.
- NTFPs based industries should be given national priority to financing and export promotion.
2. With a view to eliminate the over-exploitation of valuable NTFPs from the natural environment, the Government of Nepal should encourage Research and

Development (R&D) on biology of plant species and high value product development. Guidelines on the sustainable levels of harvest of various species based on ecological studies should be developed involving field-based. NGOs and local experts as well.

3. Build up reliable and transparent Market Price Information System to enhance the linkages and to lead to unfair and inequitable trade practices between processors, traders and collectors. The NTFP related market and price information system centers should be strengthened and developed at the national level. Dissemination of information generated should be done through IT, print, radio and TV to ensure it reaches local collectors, producers, and other stakeholders.
4. Need to identify different Quality Parameters at different stages of production and value addition, as required by the industries and exporters. It is also necessary to set-up or strengthen existing private or government owned quality control facilities at the central as well as in the NTFP marketing centers of the country.
5. Develop appropriate Certification System, Nepali branding, labeling and standards for selected products.
6. Facilitate support services such as communication, storage, organization, transportation and credit facilities, which play a critical role in enhancing local benefits through marketing.

- Marketing infrastructures such as Godowns, Drying Yards, Quality Control Facilities and Credit Institutions at the district, road head and regional centers need to be created urgently.
7. Need to document traditional knowledge documentation of NTFPs and work on issues related to Intellectual Property Rights (IPR) and Trade Related Intellectual Property Rights (TRIPS) for the benefit the country and its people.
 8. Need to empower the entrepreneurs to enjoy benefits of being member of the World Trade Organization (WTO) and South Asian Free Trade Agreement (SAFTA).
 9. Trans-border cooperation should be enhanced among Nepal, China, and India.
- To control the illegal trade of rare and endangered NTFPs;
 - To increase communication and dialogue, collect and share information and experience, conduct joint research, coordinate in policy related issues, develop common legal frameworks and enforce laws;
 - To conduct collaborative actions on common issues on conservation and trade;
 - To develop capacity of the relevant authorities that play a direct and important role in monitoring and managing trans-border trade in MAPs/NTFPs through training programs for customs staff at border check points.

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Annex 1

Major NTFP related enterprises in Nepal

NAME OF ENTERPRISES	TYPE OF PLANTS USED	PRODUCTS OF THE ENTERPRISE	INVOLVEMENT
Singh Durbar Vaidyakhana, Singh Durbar, Kathmandu.	Medicinal plants	Ayurvedic medicines	Production and sales
Herbs Production & Processing Co Ltd., Koteswar, Kathmandu	Medicinal and aromatic plants	Essential oils, herbal extracts, herbal care, rosin and turpentine oil	Production domestic sales, and export
Everest Herbs Processing Pvt. Ltd, Buddha Nagar, Kathmandu	Medicinal and aromatic plants	Herbal products, essential oils and herbal extracts	Production domestic sales and export
Royal Drugs Ltd. Babar Mahal, Kathmandu.	Essential oils and medicinal extracts of medicinal and aromatic plants	Allopathic medicines	Production and distribution

NAME OF ENTERPRISES	TYPE OF PLANTS USED	PRODUCTS OF THE ENTERPRISE	INVOLVEMENT
Shri Krishna Aushadhalaya, Keltola, Kathmandu	Medicinal plants	Ayurvedic medicines	Production and sales
Unani Aushadhalaya, Bagbazar, Kathmandu	Medicinal plants	Unani medicine	Production and sales
Natural Products Industries, Chanauta, Krishna Nagar	Medicinal and aromatic plants	Essential oils and extracts	Production and export
Himalaran Ginger Gorkha	Medicinal and aromatic plants	Essential oils	Production and export
Gorkha Ayurved Co., Chhetrapati, Kathmandu	Medicinal plants	Ayurvedic medicines	Production and export
Kunfen Aushadhalaya, Chhetrapati, Kathmandu	Medicinal plants	Tibetan medicines	Production and sales
Dabur Nepal, Tinkune, Kathmandu	Medicinal and aromatic plants	Herbal medicines and cosmetics	Production and export
Nepal Lever Ltd. Hetauda	Aromatic plants	Cosmetics	Production and export
Cosmos Herbal Pvt. Ltd. Baluwatar, Kathmandu.	Medicinal and aromatic plants	Herbal medicines and cosmetics	Production and export
Community based local processing units in Jumla, Dolpa, Dolakha and Lalitpur-14 units	Medicinal and aromatic plants	Essential oils Massage	Production and sales
Vaidyas, Dhamis and Jhankris	Medicinal and aromatic plants	Traditional ayurvedic preparation	Practitioners
Nepal Rosin & Turpentine Co. Ltd. Dhangadhi, Nepal	Pine trees	Rosin and Turpentine oil	Production and export
Luxmi Rosin & Turpentine Pvt. Ltd., Nepalgunj	Pine trees	Rosin and Turpentine	Production and export
Acme Rosin & Turpentine Co.	"	"	"
Surya Rosin & Turpentine Co.	"	"	"

Annex 2

Guchichyau – Himalayan Morel Mushroom (*Morchella conica*)

Traditionally local people in the high mountains were harvesting or collecting Guchichyau for local use as a substitute of vegetable and as a delicious food stuff, but this practice is not very common now a days because of its increasing market demand and thus, it is mostly sold to traders and ultimately exported to international market. Guchichyau is consumed for the preparation of delicious food (from the Himalayas) in expensive international star hotels and restaurants mostly in Europe and Japan (Market Study - EFEA, 1997).

CURRENT Market ChannelNational Forest/Community
Forest/Private Land

Farmer/collector



Middleman/local traders



Wholesalers



Exporters

Table 1. Guchichau Price Information

MARKET CENTERS OF GUCHICHAU	PRICE OF GUCHICHAU		MARKET AREA	DIFF IN PRICE
	NRs	USD		
Dolpa	2500	34.25	NA	NA
Nepalgunj	5500	75.34	Dolpa/Nep	41.10
Tanakpur	4480	61.37	Dolpa/Tanakpur	27.12
Delhi	6400	87.67	Dolpa/Delhi	53.90

Present marketing trend

The trade of this Guchichyau started recently. According to the traders, more than 5 tons (dry) every year could be easily collected from the Karnali Zone for the business. Because of increasing demand in international market, many traders even from Kathmandu go to different parts of Karnali Zone like, Dolpa, Humla, Mugu, Jumla to buy this product for the export. Obviously, the selling price is varied at different market centers.

COMMERCIALIZATION OF MEDICINAL, AROMATIC AND OTHER NTFPs IN NEPAL Self-Reflections and Cross Learning

Madhav Karki
Arun Nagpal

INTRODUCTION

About 1624 plant species have been recorded as Medicinal and Aromatic plants in Nepal (Shrestha et al. 2000). More than 100 species of Non-timber Forest Products (NTFPs) are harvested from middle hills and high mountains of Nepal. These NTFPs are mostly traded to Indian markets while some to Nepal and overseas markets. *Cordyceps sinensis* (Yarsa Gumba), *Valeriana jatamansii* (Sugandhwal), *Nardostachys grandiflora* (Jatamansi), *Picrorhiza scrophulariiflora* (Kutki), *Rheum australe* (Padamchal) and other MAPs are harvested from temperate to alpine zones in the hills and mountains of Nepal. *Sapindus mukorossi*

(Soapnut or Ritha), and dye plants like *Woodfordia fruticosa*, *Acacia catechu*, *Albizia* and *Erythrina* spp. are the other major groups of plants collected and traded from the middle and foot hill regions.

Most high-value MAPs are harvested in government-managed forests. The increasing poverty and rapid population growth of the country has resulted in extreme pressure on the resource through over-intensive harvesting practices and lack of scientific resource management system. Due to small size of farms, local farmers and collectors do not generally practice cultivation of MAPs on private farmlands. Cultivation in community forests and degraded wasteland is also limited because

of lack of technical knowledge and assured markets. The lack of proper management of MAPs and the increasing market demand has resulted in an alarming decrease in the diversity, quality, quantity and availability of MAPs in the middle and high hills of Nepal. The consequences are serious for plant biodiversity and for local harvesters who depend on the trade of MAPs to meet their livelihoods.

Very little information is available in Nepal regarding wise commercial management practices of MAPs on a large scale to date. Technical information required for sustainable utilization of MAPs could be obtained through a research project on growth of MAPs in different ecological conditions in community as well as the government-managed forests.

The commercialization of MAPs in Nepal: Why?

There is widespread unanimity among the development planners and thinkers that the production and trade of non-timber forest products (NTFPs), especially MAPs can contribute significantly to improve the livelihoods of poor people in an environmentally sustainable manner. It is also believed that the continuing inequity prevailing in the otherwise successful community forestry program of the government can also be addressed through greater incorporation of NTFPs-based activities in the management plans of the community-managed forests (CMF). This view is becoming stronger based on the growing resurgence of medicinal products and nutraceutical markets

throughout the globe, especially in the developed world (Table 1).

From the conservation perspectives, the common assumptions has been that the NTFP commercialization can provide much needed economic incentives to practice environmentally sound harvesting practices and may lead to ploughing back some of the revenues generated back into conservation. It is believed that increasing demand for NTFP, especially MAP products from a forest and forest-like environment will translate effectively into demand for more forest (Belcher et al. 2003). Perhaps based on the premise that conservation-compatible livelihood and income generating activities may attract both the government and local community to promote conservation, many local NGOs and international conservation organizations have been prominent among the advocates of NTFP commercialization.

This paper examines the lessons learned from past experiences both within and without the country and lists some ideas for future actions:

Persisting Problems & Key Issues in Commercialization of NTFPs:

Inequitable trade:

Based on various data, it is fair to say that the margins between the collection points in Nepal and the main market at the border points like Nepalganj, Tanakpur, Birganj may be between three to ten times the purchase price at the collection points. According to ANSAB (2003), NTFP trade onwards to Delhi tends to show an additional margin of 60% over Nepalganj

prices, following the trader's rule of thumb that the Delhi markets pay roughly the same amount in figures, but in Indian currency. These ratios indicate that the collectors get generally a very limited margin share in the trade of NTFPs. This situation appears to be even worse when the collection of a species is forbidden or otherwise restricted. Another study (Regmi and Bista 2001) indicated the benefit shares of 11%, 43% and 12% for primary collectors, Jumla-based traders and Nepalganj-based traders, respectively, when dealing with non-restricted herbs. With restricted species, the respective benefit shares are 7%, 22% and 52% respectively.

Table 2

NEPAL: SOME BACKGROUND STATISTICS

1. 88% of the population lives in rural areas
2. 80% of labor force engaged in "agriculture"
3. Average GDP/capita Nepal is USD 246
4. Average GDP/capita in the "agricultural" sector is USD 140
5. Per capita annual growth in the "agricultural" sector is + 0.12%
6. Average land holding is 0.94 ha
7. More than 40% of agricultural households have less than 0.5 ha
8. Poorer households have poorer quality land;
9. Most of the NTFP rich forests are in the relatively inaccessible hills and mountains

Continuing policy gaps:

A large number of study (Kanel 2002; Winrock 2002; ANSAB 2003) have repeatedly mentioned that there is a lack of clear policy on the NTFPs sector, which is severely hindering the business at local level. There is no proper guideline in fixing the royalty and restriction on collection and trade of the NTFPs. The existing royalty rates range from as low as 4 percent to a high of 83 percent of the market price. The royalty rate for Pakhanbed (*Bergenia ciliata*) is 125 percent of the market price. For timber, there are restrictions for sales outside the CFUGs, a tremendous disincentive against rational use of these resources, and possibly one of the causes of the observed under-use of timber in community forests (Karki et al. 2003).

The existing permit regimes have been historically designed to control the harvesting, utilization and marketing of MAPs which are costly to enforce and in most cases, the total cost of getting the permit and its enforcement is greater than the benefits from the marketing of the products. Policies do not recognize environmentally and commercially sound harvested or processed NTFP

Wild harvesting and Cultivation
Dichotomy:

The major NTFP-based materials are currently harvested from more or less extensively managed 'wild' sources (ranging from forests to grasslands). But discussions and activities are increasingly focusing on ways in which commercialization may shift production from the wild to a domesticated (actively cultivated)

source on farm, forests and degraded wastelands. This shift is basically happening to address the issue of quality and required volume on a consistent manner. As well, on global markets, buyers are increasingly demanding standardized and quality assured MADP products. We are therefore, seeing a prospect of an NTFP-based cultivation and trade beyond the collection and local level.

Globally, countries like Indonesia, which has been traditionally a timber exporting country, has recently declared that NTFPs might surpass the timber export value soon. In India, there is much optimism among NGOs and government that NTFPs can offer a means to alleviate rural poverty (Belcher et al. 2003). Bhutan is currently debating a community-based natural resources model based on forested medicinal products such as *Cordyceps* and Matsutake mushrooms (Namgyel 2004).

GLOBAL MARKET PROSPECTS OF MADPs

The last ten years have seen a great increase in the popularity of plant-based medicines. Phyto-remedies are increasingly becoming mainstream consumer products manufactured by multinational corporations among others, and sold in supermarket chains and in a variety of other outlets globally. A parallel development has been the incorporation of plant derivatives into an increasing number of health foods and dietary products. The combined market is now a multibillion dollar industry in which hundreds of medicinal herbs are being sold in an ever increasing variety of

forms such as whole dried plants (ginseng), raw herbs (dried or fresh), selected plant parts, ground powders, fresh liquid extracts, semi solid extracts, freeze dried powders, tinctures (an infusion of herbs in alcohol) and extracts (greater concentration of the active material of the plant with the aid of a solvent).

The cosmetics industry uses a large number of medicinal plants as ingredients in soaps, lotions, ointments, shampoos and natural colors among other products – witch hazel, calendula and aloe vera, to name a few. Some medicinal herbs (e.g. turmeric, saffron, sage and indigo) are sources of natural coloring used in other applications as well - regional cuisines, textile industry and religious ceremonies, to name a few (Nagpal 2004).

There is increasing consumer interest in all things natural. Consumers are calling, across sectors, for healthier and more natural products. Increased consumer sophistication and awareness of ingredients, performance and health benefits are changing the personal care and cosmetics industry. This has led to increased use of new, active ingredients, including natural products with defined constituents and specific biological effect. The increasing popularity of aromatherapy - the use of essential oils obtained from plants, to promote balance and harmony between mind and body is a good example of the trend towards “therapeutic” products (worldwide growth of the aromatherapy industry will provide healthy opportunities for fragrances and essential oils). Next to aromatherapy, spa treatments and traditional recipes of historical significance such as Ayurveda are important

segments of the cosmeceutical market. Moreover, lifestyle shopping trends, general public knowledge and extensive R&D budgets from mass manufacturers will also positively affect cosmeceuticals.

Most natural dyes produce dull shades and very few of them provide for fast colors. Industrial dye manufacturers have over the years, developed a new product line of organic dyes as a replacement for natural dyes, which offer the same color quality with minimal toxic residue. This has resulted in a decline in the natural dyes market world wide, especially in the textiles sector. However, use of dyes as natural colorants for food, drug and cosmetic applications is likely to see steady growth due to increased sensitivity of consumers towards natural foods and cosmetics. To sum up, MADPs can only be expected to continue growing at a brisk pace.

SUGGESTED MARKETING STRATEGIES FOR MAPs & NTFPs IN NEPAL

Key lessons from the region:

- The driving force should be enterprise promotion along various value addition chains of timber and non-timber forest products, to be determined based on the establishment of a chain of production-to-consumption and marketing system. However, an exclusive focus on some few selected value addition chains, at the start, would be too risky, given the rapid evolution of demand and quality requirements in international markets. Moreover, the Value-Chain-focused

approach would probably not be conducive for vigorously pursuing the income and livelihood improvement goal as indicated in the logical framework. In many CFUGs, which have forest products surplus to subsistence needs, these often include a wide range of products.

- The framework of a holistic MAP/NTFP Planning and model should necessarily be a multi-stakeholder by nature. This responds to the complexity of the issues at stake, and to the multitude of functions and stakeholders involved in the management forest resources management, use, processing and marketing. Its organizational set-up is complex, but builds on interfaces, service provider pools and organized target populations that do already exist. Hence, its approach is based on the principle of subsidiarity, meaning that it will only assume functions that other stakeholders do not hold presently.
- There must be a policy dialogue component within the FRPP, consistent with the identified constraints. Policy dialogue is meaningful only if all relevant stakeholders participate, and if demand for policy change can be substantiated by tangible and first-hand experience from all levels where policies matter. Consequently, a project focusing on policy dialogue alone would probably not have critical mass.

Value-chain management:

Given the wide variation in international prices of raw materials/commodities, it is recommended that the fundamental objective

of any sustainable initiative must be to hedge against such variations by moving progressively up the value chain, offering semi processed and processed material, and even finished products wherever possible. Some simple examples of such activities have been identified. A logical further extension would be into the area of services, where eco-tourism, hotel supplies, and spa treatments could be major potential areas, with high growth rates as well. Some recent examples are herbal drinks, herbal toiletries, and herbal massages.

The regulatory environment, particularly in the EU countries and the US, is becoming increasingly more stringent apart from adding considerably to the time, efforts and expense involved in breaking into the market for medicinal products. In view of this, it would be prudent, in the initial stages of the sector development, to focus more on the market for food supplements, and personal care/cosmetic products, such as creams/body lotions, shampoos, mouth wash, scrubs, henna powder, etc., in both the national and international markets. At the same time, the lucrative and far larger medicinal products market cannot be ignored, and a parallel objective should be to prepare the ground to address these markets as well, preferably through strategic relationships with Companies already in the field in the markets of the US and Europe. Regional markets in South Asia should of course, always remain a priority

Strategic relationships with organizations in the field of MAPs, as well as in related areas would be a key success factor for the MAP

sector in its commercialization drive, particularly from the point of view of leveraging existing relationships, knowledge and expertise already available in the field, and to avoid repeating the learning curve. While this is a strategic objective in any case and needs to be examined in greater detail, some potential strategic partners have been identified – corporate entities in the agri-business/exports area, industry associations, specialized buyers of raw materials and extracts, and retail organic food chains. Some initial contact has already been established by the IDRC/FAO/IFAD/Ford funded MADP project with organizations such as ITC, M&M and ADMA – while it is obviously too early to provide for any definitive or concrete plan of action in this regard, the initial response has been sufficiently positive to state that it is worth a serious examination and attempted move forward (Nagpal 2004).

While the role of the middleman has largely been portrayed as a negative one in MADP related transactions, the middleman does bring some undisputed strengths to the table, so to say, and there could be ways in which their involvement on a selective basis can be woven into the overall sub-sector framework.

While there is obviously a huge and lucrative global market for MADPs and related products, it would be incorrect to ignore a large domestic market in the individual countries as well (a) from the point of view of a large percentage of the population which is unable to afford western medicine in any case, and (b) for a growing base of the elite who are increasingly turning to natural forms of treatment, medical as well as beauty and 'wellness'. Drawing a leaf

from China's handling of a similar scenario, and understanding the strides made by the Chinese Govt. in effectively combining modern Western systems of medicines with TCM, the respective Govts. In South Asia would do well to similarly encourage the sustained parallel development of MADPs in conjunction with that of modern western medicines, in their own domestic markets as well (Nagpal 2004).

RECOMMENDATIONS

The fundamental guiding factors in the analysis and assessment of available information, and in making recommendations have been:

Leverage existing assets and relationships

- Resources are always scarce and will continue to be so. The MADP sub-sector has ambitious targets to be achieved within a relatively short time span, before the same can be scaled up to a full-fledged development project. Leveraging the available knowledge base, skill sets and existing relationships within the stakeholders, as well as with other organizations in related areas where synergies could exist, will be a key factor contributing to the success of the sub-sector.

A value proposition for everyone

- The sub-sector must seek to generate a win-win situation amongst all concerned – customers, suppliers as well as intermediaries. It is only this approach,

which will ensure that players with likely divergent viewpoints and priorities will come together to ensure the success of the overall sub-sector.

Co-opt stakeholders in designing solutions

- This has been an integral part of the sub-sector philosophy since its inception, which was reflected in the conduct of the stakeholders meeting in Jan. '03, and in all subsequent sub-sector related activities. The Desk Research report and recommendations also seek to reflect a similar philosophy and approach.

CONCLUSION

There is growing agreement among the experts on the basic approach in uplifting the medicinal plants sub-sector in the Himalayan region. This approach is to organize cultivation, collection, processing and value addition of medicinal and aromatic plants with a commercial focus to enable production of quality assured sustainable quantities of products to meet the growing demand of trade and processing industry. Success of any commercial or business venture depends on a number of factors but most important of all are, the timely availability of quality inputs, services and policy support. While the governments are increasingly showing their willingness to provide the necessary policy and administrative support, non-availability of good planting materials and quality extension, but the market service remains a major bottleneck. Our experience of the quality and delivery of

these services by the existing organizations in farm or forest production sectors have been largely unsatisfactory. As well, considering the nascent stage of the MAP sub-sector, there is a clear need, both to develop capacity of existing organizations and more importantly for the long-term benefits, to develop business-based approach in input delivery, extension, marketing, processing, certification and value addition related activities. One of such approaches is creation of business platforms. The basic concept of the business platform or the small and medium enterprise (SME) structure is to assign the task to each player in the chain based on her/his inherent expertise. For example, a general farmer or herb collector should be focusing on her/his best skills or core competence i.e., collection and farming. This is absolutely essential to MAP sub-sector for heading towards a more specialized production system such as organic or good practice system due to the nature and diversity of product demand, involvement of skill-based activities and documentation. Marketing, processing and value-addition by their nature have to be managed by specialized groups with business philosophy and interest for their sustenance and client-focused production.

It is obvious that business platforms need to be managed by professionals under the guidance of a multi-stakeholder controlled management structure. The platforms should have strong stake for the participating collectors and farmers. Appropriate institutional structures need to be designed and developed at different levels to link the producers to consumers. A critical requirement of a successful business platform has to be, to

ensure that the farmers and collectors receive assured and remunerative market for their produce. Besides, s/he should also have a share of the profits generated by the business structure over a period of time.

As conservation of biodiversity – both natural and agriculture-based – has to be an integral objective of the MAP Sub-sector development part of the profits earned by the business should also be ploughed back into conservation related activities at the local levels. Such approach will then can be truly a bio-partnership projects and initiatives with environmental, social and economic sustainability built into it.

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Table 1: Commercially Important Medicinal Plants of Indian Sub-continent

S. NO.	NAME OF THE ITEM	BOTANICAL NAME AS DEFINED IN API	PART USED	APPROX. DEMAND IN MT P.A.	REMARKS IF ANY
1	Satawari	<i>Asparagus racemosus</i>	Roots	690	Covers the kitchen use volumes also
2	Ashwagandha	<i>Withania somnifera</i>	Roots	820	
3	Karkatshringi	<i>Pistacia chinensis</i>	Galls	200	
4	Amla Dry	<i>Phyllanthus emblica</i>	Pericarp	1400	
5	Pushkar Mool	<i>Inula racemosa</i>	Roots	370	
6	Haritaki Chhilka	<i>Terminalia chebula</i>	Pericarp	1200	
7	Ashok Chhal	<i>Saraca indica</i>	Bark	970	
8	Bedarikand	<i>Pueraria tuberosa</i>	Tuber	700	
9	Dhat-Ki-Pushpa	<i>Woodfordia fruticosa</i>	Flowers	1100	Often, Ipomoea digita is used but incorrect API seeks p.tuberosa
10	Bedang	<i>Embelia ribes</i>	Fruits	230	
11	Jasti Madhu	<i>Glycerrhiza glabra</i>	Roots	600	
12	Shankh Pushpi	<i>Convolvulus pluricaulis</i>	Whole plant	700	
13	Jiwanti	<i>Leptadenia reticulata</i>	Roots/stem	200	
14	Barahikand	<i>Dioscorea deltoidea</i>	Tuber	650	
15	Kutaki	<i>Picrorhiza kurrooa</i>	Rhizome	65	
16	Neel Kamal	<i>Nymphaea stellata</i>	Flowers	250	
17	Chandan White	<i>Santalum album</i>	Heartwood	15	Use fo essential oil in lieu of crude drug is on rise
18	Sona Chhal	<i>Oroxylum indicum</i>	Bark (1)	400	
19	Chitrakmool	<i>Plumbago rosea</i>	Root	300	
20	Nagkeshar Dana	<i>Mesua ferrea</i>	Stamen	150	
21	Amlaki Bhumi	<i>Phyllanthus amarus</i>	Whole plant	800	Flowers are widely used as there is no practice of collecting stamens
22	Guruchi	<i>Tinospora sinensis</i>	Stem	700	
23	Kantkari	<i>Solanum xanthocarpum</i>	Aerial parts	500	
24	Punarnava	<i>Boerhaavia diffusa</i>	Roots	400	
25	Chiraita	<i>Swertia chirayita</i>	Aerial Parts	150	
26	Agarkasth	<i>Aquillaria agallocha</i>	Heartwood	350	
27	Gokshur	<i>Tribulus terrestris</i>	Roots	500	
28	Gugglu Black	<i>Commiphora mukul</i>	Resins	85	
29	Gambhar Chhal	<i>Gmelina arborea</i>	Bark (1)	380	
30	Parul Chhal	<i>Stereospermum suaveolens</i>	Bark (1)	380	

S. NO.	NAME OF THE ITEM	BOTANICAL NAME AS DEFINED IN API	PART USED	APPROX. DEMAND IN MT P.A.	REMARKS IF, ANY
31	Ghore-Botch	<i>Acorus calamus</i>	Rhizome	180	Larger volume is used in coffee industry
32	Katchur	<i>Cucuma zedoaria</i>	Rhizome	370	
33	Kasani	<i>Cichorium intybus</i>	Roots	200	
34	Bahera Chilka	<i>Terminalia billirica</i>	Pericarp	1400	Shortages of supplies are often for this material
35	Mustak	<i>Cyperus rotundus</i>	Rhizome	400	
36	Bel Chhal	<i>Aegle marmelos</i>	Bark (1)	350	
37	Kaknasha	<i>Martynia annua</i>	Fruits	350	
38	Jatamanshi	<i>Nardostachys grandiflora</i>	Roots	85	
39	Gulabanafasa	<i>Viola odorata</i>	Flowers	25	
40	Agnimonth	<i>Clerodendrum phlomidis</i>	Roots	375	
41	Revand Chini	<i>Rheum australe</i>	Rhizome	150	
42	Sugandhbala	<i>Pavonia odorata</i>	Roots	45	
43	Senna pods	<i>Cassia angustifolia</i>	Pods	200	
44	Bala	<i>Sida cordifolia</i>	Aerial Parts (2)	450	
45	Bhringraj Dry	<i>Eclipta prostrata</i>	Aerial parts	250	
46	Manjistha	<i>Rubia manjith</i>	Roots	90	
47	Lodhra Chhal	<i>Symplocos racemosa</i>	Bark	200	
48	Basak Leaves	<i>Justicia adhatoda</i>	Leaves	370	
49	Prishnaparini	<i>Uraria picta</i>	Roots	370	
50	Brihati	<i>Solanum indicum</i>	Roots	370	
51	Khadir Kasth	<i>Acacia catechu</i>	Heartwood	180	
52	Brahmi	<i>Bacopa monnieri</i>	Whole plant	200	
53	Salparni	<i>Desmodium gangeticum</i>	Aerial parts (2)	350	
54	Atich	<i>Aconitum heterophyllum</i>	Rhizome	12	
55	Mudgaparini	<i>Termnus labialis</i>	Aerial parts	350	
56	Sarpagandha	<i>Rauvolfia serpentina</i>	Roots	25	
57	Mashparini	<i>Phaseolus trilobus</i>	Aerial parts	280	
58	Anantmool	<i>Ichnocarpus fruitiscens</i>	Roots	50	
59	Arjun Chhal	<i>Terminalia arjuna</i>	Bark	200	
60	Nisoth	<i>Operculina turpethum</i>	Rhizome	690	
61	Kutaj Chhal	<i>Holarrhena pubescens</i>	Bark/Seeds	150	
62	Chabya	<i>Piper refractum</i>	Roots	60	
63	Amaltas	<i>Cassia fistula</i>	Fruits	200	
64	Babul Chhal	<i>Acacia nilotica</i>	Bark	145	
65	Kapur Kachri	<i>Hedychium spicatum</i>	Rhizome	34	
66	Jawasa	<i>Alhagi psuedalghi</i>	Aerial parts	95	
67	Chandan Red	<i>Pterocarpus santalinus</i>	Heartwood	45	More often used as substitute for Sandalwood

MEDICINAL PLANTS TRADE BETWEEN NEPAL AND INDIA

Regulatory Framework, Implementation Problems and Solutions

Janak Raj Rawal

INTRODUCTION

Nepal and India have traditional cultural and commercial links. Amongst other items of commerce between the two countries, trade in medicinal plants is age old as the two countries share the traditional system of Ayurveda as a common heritage.

The author has been researching the medicinal plants trade between the two countries since 1999 AD. Based on the same as well as secondary research of published literature the following picture regarding the trade between the two countries emerges:

enumerated in Nepal, around 500 are used in medicine. (Amatya, 2003).

- b) The main sources of herbs are the hill and mountain districts. According to a Environment and Forest Enterprises Activity (EFEA) project study in 1999, among the NTFP's collected from the project area, only 1% was collected from Banke and Bardia districts in the Terai region and the rest (99%) was collected from the hill and the mountain districts.
- c) India is the ultimate destination of around 97% of all medicinal plants collected in Nepal. The collected herbs are being exported either through the traders of Terai

- a) Of the 5484 species of vascular plants

or after being processed in the country. About 20 species of medicinal plants are being traded regularly between Nepal and India in significant quantities despite the fact that few are either under banned in The Forest Act, 1993 or comes under CITES (Appendix - 1).

Current regulatory framework:

Following Ministries in the His Majesty's Government deal directly or indirectly with the export trade in herbs from Nepal:

- a) Ministry of Foreign Affairs

Appendix – 1

Top 20 medicinal plants of Nepal origin being traded in India

SL. NO.	SCIENTIFIC NAME	TRADE NAME IN INDIAN MARKETS	NEPALI NAME	PART	CITES/BANNED
1.	<i>Acacia rugata</i>	Shikakai	Sikakai	Fruit	
2.	<i>Acorus calamus</i>	Bach	Bojo	Root	
3.	<i>Asparagus racemosus</i>	Shatawar	Satawar	Root	
4.	<i>Berberis aristata</i>	Daruhaldi	Daruhaledi	Bark	
5.	<i>Bergenia ciliata</i>	Pakhanved	Pakhanbhed	Root	
6.	<i>Cinnamomum tamala</i>	Tej/Dalchini	Dalchini	Bark	
7.	<i>Cinnamomum tamala</i>	Tejpat	Tejpat	Leaves	
8.	<i>Desmotrichum fimbriatum</i>	Jivanti	Jibanti	Whole Plant	
9.	<i>Phyllanthus emblica</i>	Amla	Amla	Fruit	
10.	<i>Juglans regia</i>	Datun	Okhar	Root-bark	Under Forest Act, 1993
11.	<i>Juniperus indica</i>	Dhoop-lakkad	Dhup/Dhupi	Wood	
12.	<i>Nardostachys gandiflora</i>	Jatamansi	Jatamansi	Root	Under Forest Act, 1993
13.	<i>Parmelia spp.</i>	Chadila	Jhyau	Thallus	Under Forest Act, 1993
14.	<i>Picrorhiza scrophulariiflora</i>	Kutki	Kutaki	Root	Under CITES & Act also
15.	<i>Rauvolfia serpentina</i>	Sargandha	Sarpchandha	Root	Under CITES & Act also
16.	<i>Sapindus mukorossi</i>	Reetha	Rittha	Fruit	
17.	<i>Swertia chirayita</i>	Chirayita	Chiraita	Whole Plant	
18.	<i>Valeriana jatamansii</i>	Tagar	Sugandhwal	Root	Under Forest Act, 1993
19.	<i>Zanthoxylum armatum</i>	Timur	Timur	Fruit	
20.	<i>Zingiber officinale</i>	Sonth	Sutho	Root	

- b) Ministry of Forests and Soil Conservation
 - i) Department of National Parks and Wildlife Conservation
 - ii) Department of Forest
 - iii) Department of Plant Resources
- c) Ministry of Finance (Department of Customs)
- d) Ministry of Industry, Commerce and Supplies (Department of Commerce)

- b) The Forest Regulation, 1995
- c) National Parks and Wildlife Conservation Act, 1973
- d) His Majesty's Government – Trade Policy
- e) Export Import (Control) Act
- f) Export Import Regulations, 1977
- g) CITES, 1975

The forest Act, 1993 has regulated collection, use, sale, transportation and export of 18 plant species including medicinal plants as under:

(see Plants under legal protection)

The collection, trade and export of medicinal plants in Nepal are regulated by:

- a) The Forest Act, 1993

Plants under legal protection
(In pursuant with section 70(a) of the Forest Act, 1993)

Plants banned for collection, uses, sale and distribution, transportation and export

SL. NO.	SCIENTIFIC NAME	ENGLISH NAME	LOCAL NAME
1.	<i>Dactylorhiza hatagirea</i>	Orchid	Panch Aunle
2.	<i>Juglans regia</i>	Walnut	Okhar
3.	<i>Picrorhiza scrophulariiflora</i>	Gentian	+Kutki

Plants banned for export except processed with permission of Department of Forest

SL. NO.	SCIENTIFIC NAME	ENGLISH NAME	LOCAL NAME
1.	<i>Nardostachys grandiflora</i>	Spikenard	Jatamansi
2.	<i>Rauvolfia serpentina</i>	Rauvolfia Root	Sarpgandha
3.	<i>Cinnamomum glaucescens</i>		Saugandhakokila
4.	<i>Valeriana jatamansii</i>	Valerian	Sugandhwal
5.	<i>Parmelia spp.</i>	Lichen	Jhyau
6.	<i>Abies spectabilis</i>	East Himalayan Silver Fir	Gobre Salla
7.	<i>Taxus wallichiana</i>	Himalayan Yew	Launth salla
8.	<i>Cordyceps sinensis</i>		Yarsagumba

Plants banned for transportaion, export and commercial purposes

SL. NO.	SCIENTIFIC NAME	ENGLISH NAME	LOCAL NAME
1.	<i>Michelia champaca</i>	Mangnolia	Chamo
2.	<i>Acacia catechu</i>	Cutch Tree	Khair
3.	<i>Shorea robusta</i>	Common Sal	Sal
4.	<i>Bombax ceiba</i>	Silk Cotton Tree	Simal
5.	<i>Dalbergia latifolia</i>	Rose Wood	Satisal
6.	<i>Pterocarpus marsupium</i>	Indian Kino Tree	Bijasal
7.	<i>Juglans regia</i>	Walnut	Okhar

Source : Nepal Gazette, February 2001

Convention on international trade in endangered species - CITES

Till recently the Department of Plant Resources was the CITES Management Authority for plants in Nepal, who were charged with providing the CITES permits for Export and Imports. Presently the

Department of Forests in the Ministry of Forests and Soil Conservation has been given the charge of Management Authority of CITES in Nepal for plants, with the Department of Plant Resources having become a Scientific Authority for plants in Nepal.

Following species of plants are listed in CITES appendices as under:

SL. NO.	SCIENTIFIC NAME	ENGLISH NAME	NEPALI NAME	APPENDIX
1.	<i>Ceropegia pubescens</i>	Milkweed	Mirkelahra	II
2.	<i>Cyathea spinosa</i>	Tree Fern	Unau	II
3.	<i>Cycas pectinata</i>	Cycas	Kalwal	II
4.	<i>Dioscorea deltoidea</i>	Potato yam	Ban Tarul	II
5.	<i>Orchidaceae spp.</i>	Species of Orchid	Sungabha	II
6.	<i>Picrohiza kurrooa</i>	Kutki	Kutki	II
7.	<i>Podophyllum hexandrum</i>	May Apple	Laghupatra	II
8.	<i>Rauwolfia serpentina</i>	Serpentine	Sarpgandha	II
9.	<i>Taxus wallichiana</i>	Himalayan Yew	Launth Salla	II
10.	<i>Gentum montanum</i>	Gnetum	Bhotelahra	III
11.	<i>Meconopsis regia</i>	Himalayan Yellow Poppy	Kyasar	III
12.	<i>Podocarpus neriifolius</i>	Podocarpus	Gunsi	III
13.	<i>Talauma hodgsonii</i>			III
14.	<i>Tetracentron sinense</i>	Tetracentron	Jharikote	III

CUSTOMS CLEARANCE AT NEPAL / INDIA BORDER

Source : Nepal exporters handbook, 2000

A. Customs clearance at Nepal/India border :

When exporting to India, clearance at the customs offices/check post at Nepal/India border is normally sufficient. But, dispatching the goods towards third countries destinations via India requires further clearance procedures at Nepal/India border points and Kolkata Port. Generally, arrangements for transporter to the destination is required to be undertaken by the exporter or the authorised agent.

1. Documents required for clearance

- Customs Transit Declaration (CTD) in quadruplicate duly endorsed by Nepalese Customs Office.
- Commercial Invoice.
- Packing List
- L/C copy authenticated by the concerned Nepalese bank or the Certificate of Advance Payment.
- Authorisation letter in the name of the forwarding agent.

2. Indian customs procedures

- The declaration on the CTD and other documents are examined.
- The One-Time-Lock (OTL) of containerised cargo towards third country is checked and

if found intact is allowed further transportation.

- If OTL found defective or broken, the cargo is checked and verified with the CTD, a fresh OTL is put on the container and then after allowed for further transportation towards the destined sea port (Kolkata).
- As to the non-containerised goods, such goods is verified and examined on the basis of CTD. If found correct. The consignment is cleared for further transportation.
- All the four copies of CTD are endorsed by the Indian Border Customs. Out of the four, two copies (second and third) are sent to the Kolkata Customs, the first copy is returned to the exporter / clearing agent and the fourth copy is retained with the Customs Office for the record.
- For the imports into Indian Territory, import duty is leviable according to Indian Tariff Schedules.

B. Border customs office

According to the Nepal/India Treaty of Trade renewed on 6th December 1991 for 10 years until 5th December, 2001 following 22 land routes at Nepal-India border have been named to conduct mutual trade between Nepal and India. Accordingly, 22 custom offices of both the sides at these points have been made responsible for customs clearance passing through these points. Goods exported to India by surface transport is to exit from one of these points (see overleaf):

NEPAL	INDIA
1. Pashupatinagar (Ilam)	Sukhia Pokhari
2. Kakarbhatta (Jhapa)	Naxalbari
3. Bhadrapur (Jhapa)	Galgalia
4. Biratnagar (Morang)	Jogbani
5. Setubandha (Sunsari)	Bhimnagar
6. Rajbiraj (Saptari)	Kunauli
7. Siraha (Siraha)/Janakpur (Dhanusha)	Jayanagar
8. Jaleswor (Mahottari)	Bhittamore (Sursand)
9. Malangawa (Sarlahi)	Sonabarsa
10. Gaur (Rautahat)	Bairganja
11. Birgunj (Parsa)	Raxaul
12. Bhairahawa (Rupandehi)	Sunauli
13. Taulihawa (Kapilbastu)	Khunwa
14. Krishnanagar (Kapilbastu)	Barhni
15. Koilabas (Dang)	Jarwa
16. Nepalgunj (Banke)	Nepalgunj Road
17. Rajapur (Bardiya)	Katarniyaghat
18. Prithvipur/Sati (Kailali)	Tikonia
19. Dhangadhi (Kailali)	Gauriphanta
20. Mahendranagar (Kanchanpur)	Banbasa
21. Jhulaghat (Baitadi)	Jhulaghat (Pithoragarh)
22. Darchula (Darchula)	Dharchula

a) According to the Nepal-India Treaty of Trade, the Government of India provides access to the Indian market free of customs duties and quantitative restrictions for all articles manufactured in Nepal.

b) There is also another facilitating provision according to which the following primary products of Nepalese origin are eligible for preferential treatment.

- Agricultural, horticultural and forest produce and minerals which have not undergone any processing.

- Timber
- Ayurvedic and Herbal Medicines

IMPLEMENTATIONS & PROBLEMS

1) Non implementation of legal prohibitions :

It has been observed that despite the following species being banned for collection, use, sale and distribution, transportation and export have been found to be freely exported and traded in the Indian markets :

- 1) *Dactylorhiza hatagirea* (Salam Panja/
Panch Aunle)
- 2) *Juglans regia* (Akhrot/Okhar)
- 3) *Picrorhiza scrophulariiflora* (Kutki)

The above fact points to non-implementation of regulations by all the concerned agencies of the government.

In addition it is interesting to note some facts which are species specific as under:

- a) *Nardostachys grandiflora* (Jatamansii) :

The species has been regulated as under:
“ banned for export except processed with permission of Department of Forest”

The ground reality is that there two kinds of Jatamansii originating from Nepal and entering the Indian markets. One called Jatamansii No.1, which is found in, raw and with oily quality and is available at a rate of INR 140 per Kg. in the Delhi market.

The other, called the dry quality is the left over material from which processing units have extracted oil. The Delhi rate (wholesale) of this is INR 60 per Kg.

- b) *Rauvolfia serpentina* (Sarpgandha):

The species has been regulated as under:
“ banned for export except processed with permission of Department of Forest”

Despite ban, this species is being frequently traded in large quantity in the Indian markets at the wholesale rate of INR 90 per Kg.

- c) *Cinnamomum glaucescens*
(Sugandhkokila):

The said species of Nepal origin though banned also for export except processed, is available in the Indian markets at the wholesale rate of INR 70 per Kg.

- d) *Valeriana jatamansii* (Sugandhawal) :

The said species of Nepal origin though banned also for export except processed, is available in the Indian markets at the wholesale rate of INR 100 per Kg.

- e) *Parmelia spp.* (Jhyau) :

The said species of Nepal origin though banned also for export except processed, is available in the Indian markets at the wholesale rate of INR 40 per Kg.

All the above mentioned banned species are being openly traded in all major markets in India such as Delhi, Kolkata, Patna, Lucknow, Kanpur, Hyderabad, Kannauj, etc.

I) CITES restrictions :

It has been observed that the following CITES listed species cross the international border without having a CITES permit for export as required under the provisions of CITES.

- i) *Dioscorea deltoidea*
- ii) *Rauvolfia serpentina*

II) Common malpractice :

It has been found that often the banned species are exported misdeclared as a non regulated species in common trade such as

Cinnamomum tamala (Dalchini), *Asparagus racemosus* (Satawar), *Rubia manjith* (Majitho), etc.

III) Publicity :

It has been found that while on the one hand various organizations tend to highlight the market demand and rates therein (Nepali as well as Indian markets) there is little attempt to publicize the legal situation including bans if any on collection, trade and exports, etc., by them.

WHY IS THIS HAPPENING?

- a) Lack of local demand for wanting of manufacturing units within Nepal
- b) Lack of awareness within the Regulatory agencies
- c) Lack of Identification skills within the Regulatory agencies
- d) Despite rampant illegal trade having been highlighted by various researchers, little action seems to have taken place on the ground in practice.

PROPOSED SOLUTIONS

- a) Establishment of local processing and manufacturing units within Nepal, if need be through government subsidy.
- b) Organisation of sensitization and training courses / workshops for the regulatory agencies
- c) Rationalization of regulatory mechanisms like permits and taxes to make them

facilitating rather exploitative in application.

- d) The CITES Act may be soon promulgated to highlight the importance of the same to all concerned.
- e) Research on 'opportunity cost' of increasing export in the raw rather than in the processed form needs to be conducted to understand and to suggest the development planners and policy level personnel for the refinements in rules and regulations, if needed.

POSTER PRESENTATIONS

POSTER

TIONS

ACTION RESEARCH OF SAFE CONCERN ON MEDICINAL AND AROMATIC PLANTS

Results Obtained and Experiences Gained

*Damodar Prasad Parajuli
Ram Kumar Deo*

INTRODUCTION

Importance of non-timber forest products (NTFPs) has been increasingly recognized because of their commercial, socio-economic and ecological values. SAFE Concern has realized the need for provision of sustainable income generating activities to farmers and community forest user group (CFUG) members through action research on non-timber forest products (NTFPs), especially medicinal and aromatic plants (MAPs) to make a positive transition from subsistence to market economy with equitable benefits to the producers/users. This paper highlight some of the major activities and the results obtained by the SAFE Concern in course

of the IDRC/MAPPA funded project implemented during 1999-2004.

Project area

The project area covered two Village Development Committees (VDCs) each in Kabhrepalanchok ((Dhungkharka and Nala Tukucha VDCs) and Bhaktapur (Tathali and Nagarkot VDCs) districts, central Nepal. The vegetation ranges from sub-tropical to temperate types. Dhungkharka VDC lies in the temperate zone while the other three fall in the sub-tropical zone.

Average household size of the VDCs range from 5.13 to 6.27 while the population ranges from 1414 to 6630. Size of land holdings are

generally small, and 70 % households have less than a hectare of land holding. The average livestock holding is 2.6 per household, which is the principal source of income and manure to the farmers. Thirty-seven percent of the population is literate with comparatively low literacy rate for women.

The wild medicinal plant species available in the project area having commercial values are *Acorus calamus*, *Asparagus recemosus*, *Bergenia ciliata*, *Gaultheria fragrantissima*, *Phyllanthus emblica*, *Swertia chirayita*, *Taxus wallichiana*, *Valeriana jatamansii*, *Zanthoxylum armatum*, etc. In addition, the local inhabitants in traditional home remedies and folk healing systems use a large number of plant species.

Focus activities

SAFE Concern has focused the project activities mainly on:

- Knowledge and skill development on NTFP/MAP production and management;
- Capacity and capability enhancement of local farmers and CFUG members, and
- Promotion of income generation activities through NTFP/MAP production and management.

PROJECT ACHIEVEMENTS

Training programs

One week duration training have been provided to 300 farmers and CFUG members, in 10 batches. The training program involved general introduction and uses of locally

available NTFP/MAP resources, resource assessment, nursery practices, cultivation, sustainable harvesting, primary level value addition/processing and marketing. In addition, the training programs also included familiarity with the NTFP/MAP-related laws, rules, regulations and other relevant issues.

Nursery and plantation

In order to develop nursery practices, to raise seedlings, and to train local people including farmers and CFUG members, medicinal plant nurseries have been established in the respective CFs using locally available resources like farm-yard manure, organic compost, vermi-compost, etc.

Propagation of *Launth salla* (*Taxus wallichiana*) from stem cutting has been successfully carried out. *Chiraito* (*Swertia chirayita*) has been propagated from seeds as well as from the splitting of clumps. Medicinal species like *Tejpat/Dalchini* (*Cinnamomum tamala*) and *Timur* (*Zanthoxylum armatum*) have been successfully propagated from seeds. Other important planting materials produced in these nurseries are *Valeriana jatamansii* (Sugandhawal), *Asparagus racemosus* (Kurilo), *Acorus calamus* (Bojho), *Mentha spicata* (Babari), *Ocimum sanctum* (Tulsi), *Morus alba* (Kimbu), *Chammomile*, etc.

The local farmers and CFUG members have become quite familiar with these propagation techniques. Planting materials produced in these nurseries together with necessary farming tools and equipment have been provided to the training participants and local farmers for plantation in community/leasehold forests and

private land for their commercial production. The nurseries are still having 13,000 seedlings of *Taxus wallichiana*, 8,900 seedlings of Tejpat/*Dalchini* (*Cinnamomum tamala*), 300 seedlings of Timur (*Zanthoxylum armatum*), 12,000 slips of lemongrass, half kg seeds of Chiraito (*Swertia chirayita*), and two kg seeds of Chamomile, waiting for distribution to interested farmers and CFUG members.

Study/observation tour

A study/observation tour to different parts of the country has been conducted every year, focused on the various MAP-related issues like identification, cultivation, management, value addition/processing and marketing. The study/observation sites included different herbal farms, processing facilities and market places. The participants got opportunities to observe cultivation and management techniques on various NTFPs available and/or suitable for their localities. These study tours have been successful in providing knowledge and information regarding cultivation, management, storage, and processing of the various NTFPs that also has encouraged people towards MAP/NTFP-based enterprise establishment. Based on impression generated in course of the study/observation tour, some farmers have started the cultivation of lemon grass, chamomile, citronella, babari (*Mentha spicata*) and French basil in their private land and have initiated the manufacture of herbal tea for domestic as well as commercial uses. In the same line, CFUG members and local farmers of Dhungharka village are planning to install a essential oil distillation unit in coordination with the Community Forest User

Committee as aromatic plants like Dhasingare (*Gaultheria fragrantissima*) and wild basil are available in abundance in the area.

Skill development, marketing and networking

Targeted beneficiaries in the area have started preparing herbal tea, incenses, and some Ayurvedic medicines based mainly on their farm produce and local collections. People are now familiar with different herbal markets, herbal traders and manufacturers together with the market values of their produces. The primary collectors and herbal farmers have established networks for MAP-based enterprise development which they call as Jadibuti Uddham Vikas under the guidance and assistance of SAFE Concern in Kavrepalanchok district. Farmers and collectors have also initiated the establishment of a herbal cooperative for easy access to markets with increased bargaining power.

LESSONS LEARNED

- The strategy to promote MAPs and other NTFPs must be based on people's participation.
- Good linkage and networking has to be established with concerned stakeholders for the success of any MAP/NTFP oriented project.
- Peoples' capacity building for managing MAPs and other NTFPs must be strengthened through education,

information sharing/dissemination, training, observation/study tours and access to markets.

- NTFP/MAP-oriented farmers/CFUG members should have the guarantee for marketing their products with more returns in comparison to the traditional crop farming.
- Action Research needs to create economic incentives to farmers for effective conservation and management of NTFP/MAP resources.

NON-TIMBER FOREST PRODUCTS AND COMMUNITY DEVELOPMENT IN DANG-DEUKHURI, MID-WEST NEPAL

*Krishna K. Shrestha,
Sangeeta Rajbhandary
Narendra N. Tiwari*

ABSTRACT

The Non-timber Forest Products (NTFPs), one of the important components of forest biodiversity, has been explored and assessed in Dang-Deukhuri, Midwest Nepal, during 2002-2003. In order to assess the NTFPs resources, the household survey and group discussion through PRA and RRA methods with the Community Forest User Groups, government officials, as well as forest plotting and resource mapping of selected community forests was conducted. Indigenous knowledge of local communities on NTFP utilisation and conservation practices was also compiled to identify the contribution of NTFPs in community development. Two

hundred and two species of NTFPs belonging to 69 families have been documented, among them 155 species are having medicinal uses, followed by 62 species of edible plants. Based on the field observations and group discussions, 25 species of NTFPs are recommended as high value potential species *in situ* management and sustainable for commercial cultivation.

INTRODUCTION

Non-timber forest products (NTFPs) including Medicinal and Aromatic Plants (MAPs) play vital role in Nepalese livelihood, health, and socio-economic prospects. More than 1,600 species of medicinal and aromatic plants are

known to occur in Nepal, of which many species are used in folk medicine and few species are traded (Shrestha et al. 2001). Basnet (2001) has reported 61 species of NTFPs from the Terai Arc Landscape area, all having medicinal value. Shrestha et al. (2003) reported 270 species of NTFPs from western TAL region (Dang to Kailali), of which nearly 70% species are medicinal and aromatic plants, followed by 20% species of wild edible plants. Ethnobotanical studies in Dang district were carried out by Manandhar (1985), Acharya (1996), and Poudyal (2000), and reported several species of NTFPs, particularly the medicinal plants as used by the local communities.

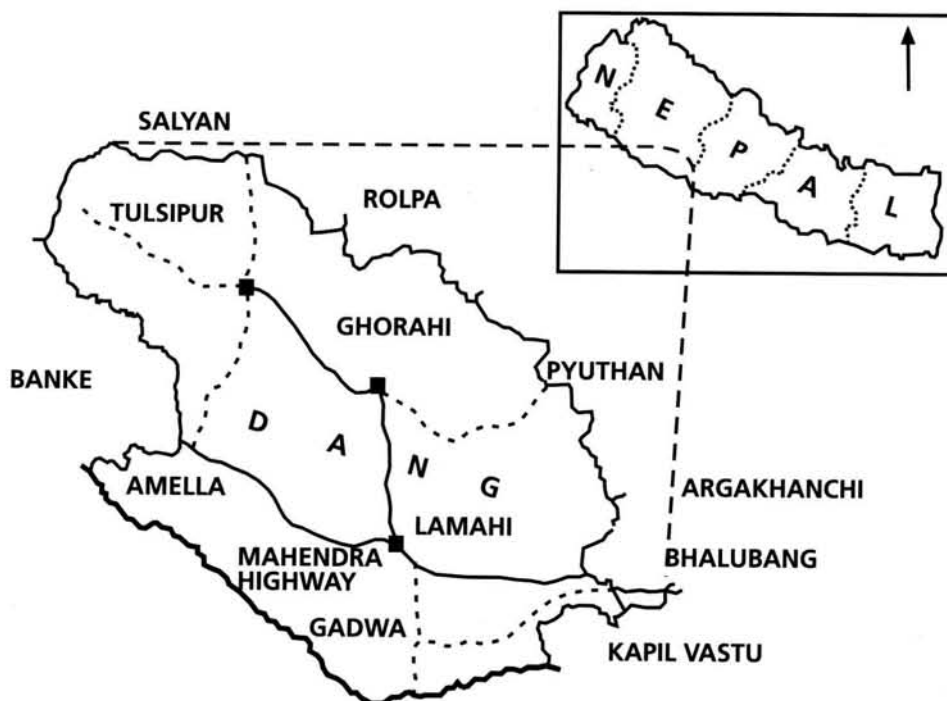
Major objective of this study was to explore the diversity of NTFPs in Dang-Deukhuri area,

documentation of indigenous knowledge on the utilisation of NTFPs, their management practices by local communities, and prioritisation of potential NTFP species for domestication, sustainable management and community development.

STUDY AREA

Dang district is located in the Rapti zone of Mid-west Development region of Nepal, and lies between 27°37' - 28°21' N Lat. and 82° 02' - 82°54' E Long. (Fig1). It extends over an area of 2,337 sq. km and a range of altitude from 150 m to 2060 m above sea level. The study area extends from Bhalubang (east), Amiliya-Lamahi (west), Gadwa-Koilabas (south), Tulsipur-Salyan border

Fig. 1 Location map of the study



(NW) and Ghorahi-Pyuthan border (NE), ranging from 200 to 1100 m.

The study area has subtropical type of climate and consists of three distinct seasons. From October through early April the weather is dry, from April to June the temperature extends up to 400 C in May, this is followed by the monsoon rain that lasts till September.

The geological formation is the alluvial plains in the valleys while the rest of the area in tertiary siwaliks. The district has 81,900 ha of land, which is suitable for cultivation, whereas 1,980 ha is covered with forest (DDC, 1999). The Dang valley is characterized by upper tropical to subtropical vegetation type, and the Deukhuri valley comprises predominantly the lower tropical vegetation type. In general, major floristic composition of the area consists of Sal (*Shorea robusta*), Chilaune (*Schima wallichii*), Saaj (*Terminalia alata*), Khayar (*Acacia catechu*), Dhayero (*Woodfordia fruticosa*), Bhorla (*Bauhinia vahlii*), Thakal (*Phoenix humilis*), Bel (*Aegle marmelos*), Chutro (*Carissa carandas*), Barro (*Terminalia bellerica*), Harro (*Terminalia chebula*), Tendu (*Diospyros tomentosa*), Piyar (*Buchanania latifolia*), Chilaune (*Schima wallichii*), Malagiri (*Cinnamomum glaucescens*), etc.

Major inhabitants include Tharu, Brahmin and Chhetri along with other ethnic groups like Thakuri, Kami, Sarki, damai, Gaine etc. Tharu comprises about 40% of the total population (DDC 1999) and lives in dense clusters generally mixed with Brahmin and Chhetri communities. The main occupations of the

people are agriculture and animal husbandry and depend mostly on the production of agriculture crops, vegetables and fruits.

Methodology

The study is focussed on primary data collection in the field, supplemented by relevant secondary information available in various forms (articles, reports, books, etc). Most of the community forests in the study area were visited, along with the local Community Forest User Groups. During the study, documentation of NTFPs and utilisation data were collected. RRA and PRA techniques were the major source of information, which were employed to gather confirm and validate biological information. Focus was made on group discussion with key people of the study area along with a semi-structured questionnaire. Discussion was made with different persons (local healers, senior citizen, village heads, community forest heads, etc. During the interview, emphasis was given on relevant information, such as: plant name (Latin and local names), ethnobotanical information, parts used, local status, commercial status, existing conservation practices, etc. Emphasis was also given to compile information on source/access, threat of NTFPs, contribution in household income, etc. Plant specimens of economic values were collected with the help of local people. Herbarium specimens were prepared and identified at Central Department of Botany (TUCH), Kirtipur and National Herbarium (KATH), Godawari, Lalitpur, Nepal.

Results and discussion

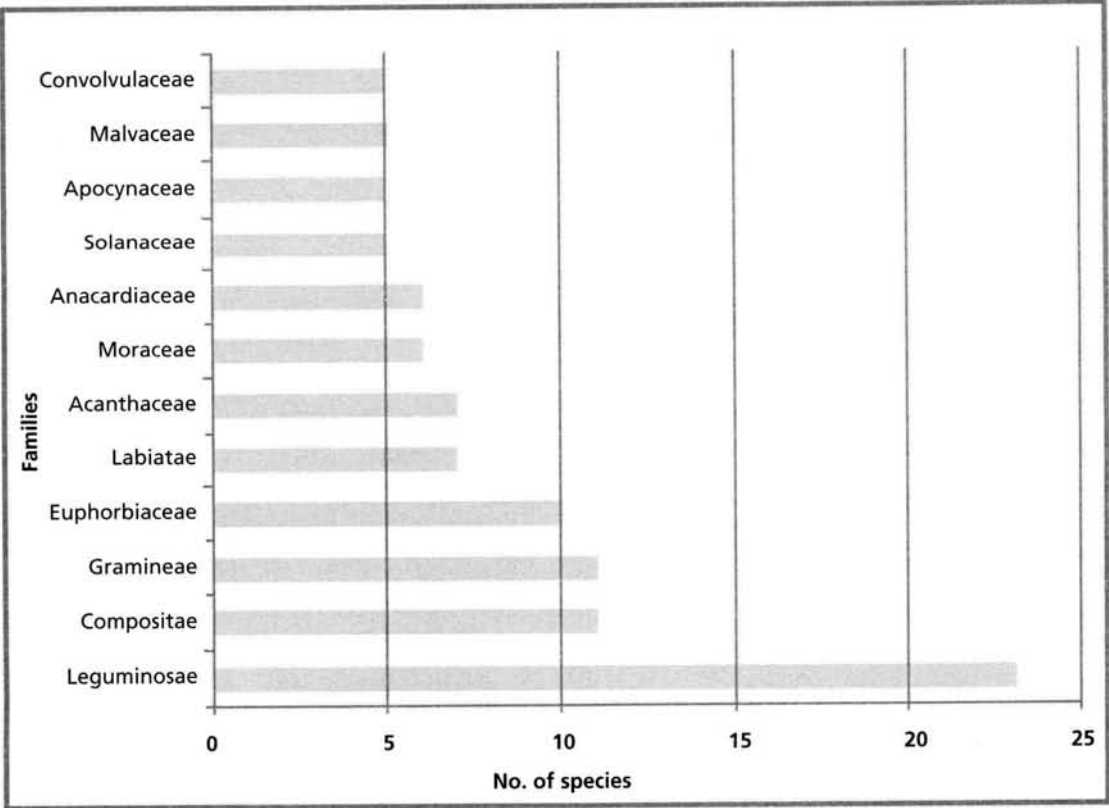
Information based on field survey and seconday sources (Acharya 1996, Manandhar 1985, Poudyal 2000, Shrestha et al. 2003) revealed 202 species of NTFPs, representing 166 genera and 69 families of vascular plants (Table1). Out of these families plants of Leguminosae depicted highest number (23 species), Compositae and Gramineae comprising 11 species each, and Euphorbiaceae having 10 species. (Fig. 2). Several families represent only species of NTFPs, such as Berberidaceae, Capparaceae, Chenopodiaceae, Cyperaceae, Onagraceae,

Papaveraceae, Scrophulariaceae, Umbelliferae, etc.

In the habit categories of NTFPs, herbs are most dominant comprising 102 species, followed by 52 species of trees, 30 species of shrubs, and 18 species of climbers (Fig. 3).

Based on the uses of 289 considered NTFP species, medicinal plants comprised of the highest number with 155 spp. (53.63%), followed by wild food (62 spp.; 21.45%), fodder (25 spp.; 8.65%), miscellaneous uses (23 spp.; 7.95%), green manure, fibre,

Fig. 2: Dominant 12 families of NTFP species (Total families 68)



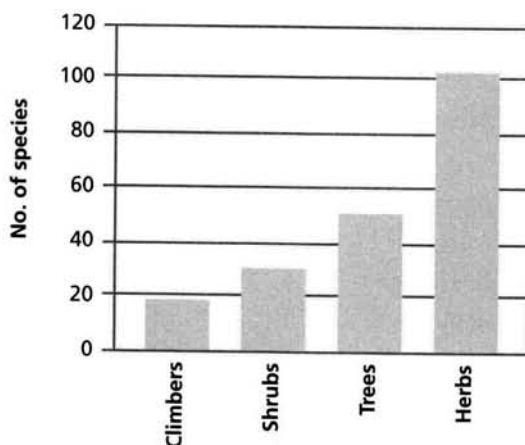


Fig. 3 Habit Categories of considered NTFPs

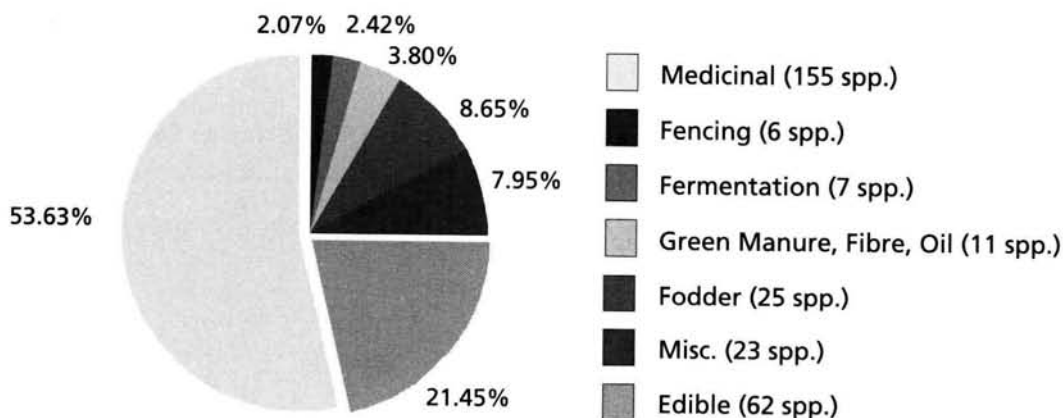


Fig. 4 Various categories of NTFP

oil, etc. (11 spp.; 3.80%), fermentation (7 spp.; 2.42%), and fencing (6 spp.; 2.07%) (Fig. 4).

Plants parts used

Entire plant of 55 species are used, followed by leaves (51 spp.), root (39 spp.), fruits (38 spp.), stem (27 spp.), etc. In some cases same plant part may be used for a number of purposes, while in some plant various parts of plants may be used only for one purpose.

NTFPs HAVING MEDICINAL EFFICACY

Traditional medication is mostly handled by traditional practitioner or religious practitioners. Most of these practices involve the use of simple as well as compound plant formulations. Local healers as well as individuals utilise wide variety of plants to treat different types of diseases or disorders, for example, 21 species in cuts and wounds, 20

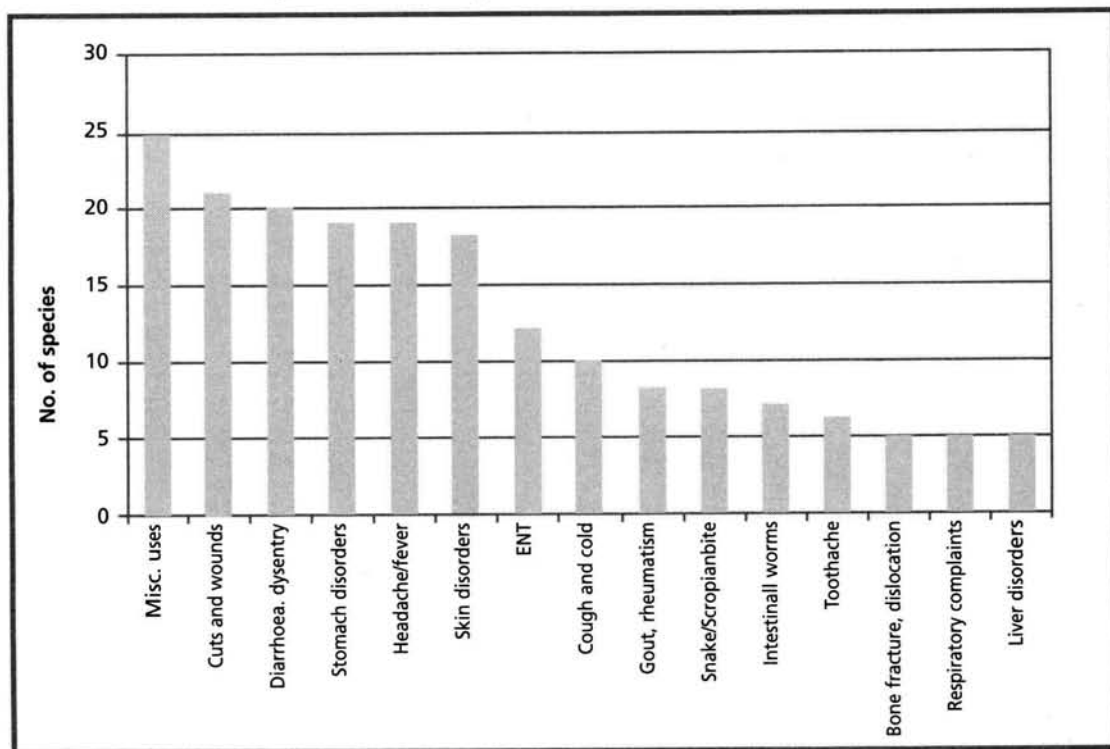
species in diarrhoea and dysentery, 19 species in stomach disorders, 19 species in fever and headache, followed by and skin diseases, ENT, cough and cold, respectively (Fig. 5). Similarly, 25 species of NTFP species are used for other types of health problems, such as tonic, aphrodisiac, leucorrhoea, heat stroke, anti-thirst, vomiting, etc. It is also noticed that usually fresh plant extract or decoction of plant parts such as crushed root, stem and leaves are widely used by the local healers to treat the patients. Similarly latex of plants or paste of plant parts are applied externally in the affected areas to treat in cuts and wounds, burns, skin diseases, etc.

Community forests, user groups and conservation of NTFPs

Non-timber Forest Products (NTFPs) are an important part of Nepalese rural economy. The expanding market of NTFPs, on the one hand, and the challenge of improving rural livelihood on the other hand demand a more sustainable, efficient and equitable management of NTFP resources in a framework that provides opportunities to collectors, local traders and the end consumers.

Community forestry has been regarded as a successful approach in natural resource management in Nepal. The approach has been

Fig. 5: Number of species used for different ailments



successful not only in the hills but also getting success in the Terai. Conservation of biodiversity in community forest through

people's participation have been experienced to have far reaching impacts on long-term conservation.

Table 1. Enumeration of NTFPs of Dang-Deukhuri

SN	SCIENTIFIC NAME	LOCAL NAME	HABIT	USE	USE PERSPECTIVES
ACANTHACEAE					
1.	<i>Andrographis paniculata</i> Nees	Kalapnath (Th)	H	M	Whole plant used in fever.
2.	<i>Barleria cristata</i> L.		H	M	Leaves and root: in cough and inflammations
3.	<i>Hemigraphis hirta</i> (Vahl) T. Anderson	Ban pan	H	M	Plant juice in throat problem (Manandhar 1985).
4.	<i>Hygrophila auriculata</i> (Schumacher.) Heine	Talmakhana	H	M	Seed used as tonic and aphrodisiac.
5.	<i>Justicia adhatoda</i> L.	Rush (Th), Asuro	S	Fe, G, M	Plants: in fencing, green manure. Leaf: in asthma, bronchitis, as haemostatic.
6.	<i>Peristrophe bicalyculata</i> (Retz.) Nees		H	G	Plant used as green manure (CSIR 1986).
ADIANTACEAE					
7.	<i>Adiantum incisum</i> Forssk.		H	M	Whole plant used as antiseptic.
8.	<i>Adiantum philippense</i> Forssk.	Ratmul	H	M	Root in fever and burns.
ALISMATACEAE					
9.	<i>Alisma plantago-aquatica</i> L.	Mudkiya (Th)	H	E	Seeds used as pickle; leave used as vegetable.
10.	<i>Sagittaria guyanensis</i> Kunth	Banarbhega	H	M	Plant decoction in fever (Manandhar, 1985).
11.	<i>Sagittaria trifolia</i> L.	-	H	M	Tubers used in skin disorders; leaves in sore throat, inflammation of breasts (CSIR 1986).
AMARANTHACEAE					
12.	<i>Achyranthes aspera</i> L.	Ultakur (Th), Apamarga	H	M	Root used in diarrhoea, dysentery, delay in child delivery, snake bite, toothache and vomiting.
13.	<i>Alternanthera sessilis</i> (L.) DC.	Bhiringijhar, bhiringraj	H	M	Plant paste mixed with water to bath and to treat heat stroke.
14.	<i>Amaranthus spinosus</i> L.	Marso (Th)	H	E	Leaves used as vegetable.
ANACARDIACEAE					
15.	<i>Buchanania latifolia</i> Roxb.	Piyar	T	E, M	Seeds edible, tonic. Leaves in fodder.

SN	SCIENTIFIC NAME	LOCAL NAME	HABIT	USE	USE PERSPECTIVES
16.	<i>Lannea coromandelica</i> (Houtt.) Merr.	Dabdabe	T	F, M	Leaves juice used in cuts and wound; and as good fodder.
17.	<i>Rhus chinensis</i> Miller		T	M	Bark powder: in swollen leg due to mud.
18.	<i>Mangifera indica</i> L.	Aam (Th), Aamp	T	M	Bark juice used in pneumonia, stomach pain. Seed kernel used in diarrhoea.
19.	<i>Semecarpus anacardium</i> L. f.	Bhela, Kuma (Th)	T	E, M	Fruit juice applied in chapped feet. Fruit cup edible.
20.	<i>Spondias pinnata</i> (L.f.) Kurz.	Amaro	T	E, M	Unripe fruits used in pickle. Roasted fruit in cough; lactation in animal.
ANNONACEAE					
21.	<i>Annona squamata</i> L.	Sarifa	T	E, M	Fruit edible. Leaf paste applied around boils; applied to kill lice.
APOCYNACEAE					
22.	<i>Alstonia scholaris</i> (L.) R. Br.	Chhatiwan	T	M, P	Root juice used in fever; and fruit juice for fish poisoning.
23.	<i>Carissa carandas</i> L.	Chutro, Karaunti	S	E, M	Fruit edible, used as stomachic. Root juice used in abortion.
24.	<i>Holarrhena pubescens</i> (Buch.-Ham.) Wall. ex G. Don	Kachari (Th), Dudhi	T	M	Bark juice in diarrhoea, dysentery. Latex applied in scabies.
25.	<i>Ichnocarpus frutescens</i> (L.) R. Br.	Ghhegard dhudi (Th), Dudhe lahara	C	M	Root/stem decoction used as blood purifier. Entire plant as fodder.
26.	<i>Plumeria rubra</i> L.	Gulapi (Th), Golainchi		E	Flowers consumed as vegetable (Paudyal 2000).
27.	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Sarpagandha	H	M	Root juice in gastric problem, snake bite, fever and insomnia.
ARACEAE					
28.	<i>Acorus calamus</i> L.	Bach (Th) Bojho	H	M	Rhizome in dysentery, cough, sore throat.
29.	<i>Arisaema tortuosum</i> (Wall.) Schott	Baanko	H	E	Aerial parts: good vegetable.
30.	<i>Pistia stratiotes</i> L.		H	E, G, M, P	Plant: excellent food for fishes; leaves cooked and eaten; valued as manure and applied in ringworm (CSIR 1986).

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31.	<i>Scindapsus officinalis</i> (Roxb.) Schott	Gaj pipal	H	M	Roasted fruit given to cattle as anthelmintic.
ASCLEPIADACEAE					
32.	<i>Calotropis gigantea</i> (L.) Dryand	Madar , Aank	H	Fi, M	Latex used in snake, crab bite; low back pain, sinusitis, constipation. Flowers used in dog bite. Fibre from fruit pod used in filling pillows and mattress.
33.	<i>Calotropis procera</i> (Aiton) Dryand.	Aankh (Th)	H	M	Latex applied to remove thorn from skin.
BERBERIDACEAE					
34.	<i>Berberis aristata</i> DC.	Chutro	S	M	Root bark decoction in malaria fever (Acharya, 1996).
BIGNONIACEAE					
35.	<i>Oroxylum indicum</i> (L.) Kurz	Tatelo	T	M	Bark: in diarrhoea and dysentery.
BOMBACACEAE					
36.	<i>Bombax ceiba</i> L.	Simal	T	E, F, M	Leaves: fodder, flowers edible, used in diarrhoea; and gum used in indigestion.
BOTRYCHIACEAE					
37.	<i>Helminthostachys zeylanica</i> (L.) Hook.	Mayur khutti (Th), Kamraj	H	M	Rhizome juice applied in toes of ox when infected by worms. Roots are used as tonic and aphrodisiac.
BURSERACEAE					
38.	<i>Garuga pinnata</i> Roxb.	Jhengra	T	F, M	Latex applied in cuts and bone fracture; good fodder.
CACTACEAE					
39.	<i>Opuntia monacantha</i> (Willd.) Haw.	Paate Siundi	S	Fe, M	Plants: green fence. Fleshy part used in boils.
CANNABACEAE					
40.	<i>Cannabis sativa</i> L.	Ganja	H	M	Paste of inflorescence in stomach pain of cattle (Acharya, 1996).
CAPPARIDACEAE					
41.	<i>Cleome viscosa</i> L.	Hurhur	H	E, M	Leaf to treat earache. Seeds used as substitute of 'methi'.

SN	SCIENTIFIC NAME	LOCAL NAME	HABIT	USE	USE PERSPECTIVES
CHENOPODIACEAE					
42.	<i>Chenopodium album</i> L.	Bethe	H	E, M	Young tender parts used as vegetable and as appetiser.
COMBRETACEAE					
43.	<i>Anogeissus latifolius</i> (Roxb. ex DC.) Bedd.	Baudhara	T	F, M	Leaves: fodder. Bark used in diarrhoea and dysentery.
44.	<i>Terminalia alata</i> Heyne ex Roth.	Asana (Th), Saj	T	F, M	Leaves: fodder. Bark used in diarrhoea and dysentery.
45.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Bahera, (Th, Rp), Barro	T	E, M	Leaves: fodder. Kernel eaten like groundnut; used in cough and cold.
46.	<i>Terminalia chebula</i> Retz.	Harro	T	M	Roasted immature fruit: in bronchitis. Unripe fruit: in diarrhoea and dysentery; ripe fruit: in constipation, cough, gastric.
COMPOSITAE					
47.	<i>Ageratum conyzoides</i> L.	Ganaura (Th, Rp)	H	F, M	Paste of leaves or whole plants in cuts and wounds. Fodder.
48.	<i>Artemisia indica</i> Willd	Patee	H	M	Leaf juice applied in ring worm and nasal bleeding, in wounds and scabies.
49.	<i>Centipeda minima</i> (L.) A. Br. ex Aschers	Chhiunke jhaar	H	M	Seeds used in cold.
50.	<i>Cirsium wallichii</i> DC.	Markatiya	H	M	Root powder given in stomach inflammation (Manandhar, 1985).
51.	<i>Cotula hemispherica</i> (Roxb.) Wall. ex C.B. Clarke	Achchhyun jhar	H	M	Aerial part used in sinusitis.
52.	<i>Eclipta prostrata</i> (L.) L.	Bhangeriya (Th, Ab)	H	F, M	Leaves used to cure skin sores caused by mud. Fodder.
53.	<i>Elephantopus scaber</i> L.	Laepase (Th)	H	Fr, M	Entire plant: as fermenting material "marcha", and used to check bleeding.
54.	<i>Launaea aspleniifolia</i> (Willd.) Hook. f.	Bankobi	H	M	Plant paste in skin irritation (Manandhar 1985).
55.	<i>Spilanthes calva</i> DC.	Marrati (NP)	H	M, P	Flowers in toothache (taken mixed with tobacco). Plant extract in fish poison.
56.	<i>Tridax procumbens</i> L.	Aathauil (Th) Dhuseri	H	M	Plant paste in boils or pimples. Entire plant: fodder.

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57.	<i>Xanthium strumarium</i> L.	Kuchahu-chiya	H	M	Fruit used in conjunctivitis (Manandhar 1985).
CONVOLVULACEAE					
58.	<i>Cuscuta reflexa</i> Roxb.	Akasveli	C	M	Plant paste used externally for itching; and in fever.
59.	<i>Ipomoea quamoclit</i> L.	Chhotaki gurubans	C	M	Plant decoction in blood vomiting (Manandhar, 1985).
60.	<i>Operculina turpethum</i> (L.) Silva	Nisodh	C	M	Root: in hyperacidity.
61.	<i>Evolvulus nummularius</i> (L.) L.	Dinghumni phul	H	M	Plant paste in scabies.
62.	<i>Ipomoea carnea</i> Jacq. subsp. <i>fistulosa</i> (Mart.	Besaram Behaya (Rp, Th)	C	Fe, M, P	Plants used in fencing, partition wall in house ex Choisy) D.F Austin construction. Latex used in wounds, poisonous to man and animal.
CUCURBITACEAE					
63.	<i>Coccinia grandis</i> (L.) Voigt	Golkaankari Kunaru	C	E	Young leaves and unripe fruits used as vegetable.
64.	<i>Cucumis sativus</i> var. <i>hardwickii</i> (Royle) Kitam.	Arelu, Airelu	C	M	Fruits: in body and naval swelling.
CYPERACEAE					
65.	<i>Eriophorum comosum</i> (Wall.) Wall. ex C. B. Clarke	Rani babyo	H	F, Mi	Fodder. Plants used in ritual ceremony in 'Saaune Sankraanti' (Rajbhandari, 2001)
DIOSCOREACEAE					
66.	<i>Dioscorea bulbifera</i> L.	Tarul	C	E	Tuber: vegetable.
67.	<i>Dioscorea belophylla</i> (Prain) Voigt ex Haines		C	E	Tuber: vegetable.
68.	<i>Dioscorea pentaphylla</i> L.	Mitho Githo	C	E	Tuber: vegetable.
DIPTEROCARPACEAE					
69.	<i>Shorea robusta</i> Gaertn.	Sakhuwa, Sal	T	Mi, O	Leaves: in making plate; seeds yield oil. Leaves as fodder.
DRYOPTERIDACEAE					
70.	<i>Dryopteris cochleata</i> (D. Don) C. Chr.	Neuro, Kochiya	H	E	Young shoots: vegetable.
71.	<i>Tectaria coadunata</i> (Wall. ex J. Smith) C. Chr.	Kalo neuro	H	E, M	Young shoots: vegetable; root medicinal.

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EBENACEAE					
72.	<i>Diospyros tomentosa</i> Roxb.	Tendu	T	E, Mi	Leaves used to make 'Bidi patta'. Ripe fruits edible.
EQUISETACEAE					
73.	<i>Equisetum diffusum</i> D. Don Aankhle jhar	Jortora (Th),	H	M	Root paste in fractured or dislocated bones.
EUPHORBIACEAE					
74.	<i>Antidesma acidum</i> Retz.	Dakhi (Th)	S	E, F, M	Fruit edible. Young leaves taken as pickle, and mature leaves as good fodder.
75.	<i>Euphorbia hirta</i> L.	Dudhiya (Th) Doodhe jhar	H	M	Plants: in cuts and wounds, and dysentery.
76.	<i>Euphorbia prostrata</i> Aiton	Dudhi (Th).	H	M	Plant paste in snake-bite (Manandhar 1985).
77.	<i>Euphorbia royleana</i> Boissier	Siudi	H	M, P	Latex mixed with cow's milk in 'Aankha Phulo Pareko'. Latex used in fish poisoning.
78.	<i>Jatropha curcas</i> L.	Sajiban	H Mi	Fe, M,	Plants used in fencing; seeds: emetic. Stem used as toothbrush.
79.	<i>Mallotus philippensis</i> (Lam.) Mull. Arg.	Rohina, Rohini	T	M	Bark: in dysentery; stellate hairs and glands in worm infestation. Leaves as fodder.
80.	<i>Phyllanthus amarus</i> Schumach. & Thonn.	Chhotaki dahi gola	H	M	Leaf juice in pimples (Manandhar 1985).
81.	<i>Phyllanthus emblica</i> L. Amala	Auraha (Th),	T	E, M	Fruits edible, pickled; used in hyperacidity, spongy gum and as tonic.
82.	<i>Ricinus communis</i> L. Ander	Suliyar (Th),	S	M	Hot petiole blown into ear to treat deafness. Seed oil in rheumatism, and leaves used to tie in joint pain.
83.	<i>Sapium insigne</i> (Royle) Benth. ex Hook. f.	Khirro	T	P	Leaf juice used as fish poison.
GRAMINEAE					
84.	<i>Apluda mutica</i> L.		H	F	Leaves used as fodder.
85.	<i>Bambusa balcooa</i> Roxb. Bhalu baans	Kathebars,	H	E, Mi	Young shoots edible; used in construction works. Leaves as fodder.
86.	<i>Chrysopogon aciculatus</i> (Retzius) Trinius	Sarauth (Th)	H	M	Root paste in boils and wound (Manandhar, 1985).

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87.	<i>Coix lachryma-jobi</i> L.	Guinji (Th)	H	Mi	Fruits used as decorative along the edge of the basket (dhakiya).
88.	<i>Cynodon dactylon</i> (L.) Pers.	Duba (Th)	H	M, Mi	Plant religious value, and stem paste in headache. Entire plant: fodder.
89.	<i>Desmostachya bipinnata</i> (L.) Stapf	Kush	H	M, Mi	Root: in leucorrhoea; whole plant used in rituals.
90.	<i>Eulaliopsis binata</i> (Retz.) C. E. Hubb	Bankash, Babiyo	H	Fi	Entire plant used for cordage.
91.	<i>Imperata cylindrica</i> (L.) P. Beauv.	Siru	H	M	Root juice used in worm infestation. Entire plant: fodder.
92.	<i>Saccharum spontaneum</i> L. (Th), Kans	Bhangra, SETHA	H Mi	Fi, M,	Plant is used as materials for roofing, partition, in making rope, and grain storage (dalia). Root decoction used in urinary problem.
93.	<i>Themeda arundinacea</i> (Roxb.) Ridl.	Kadora (Th, Rp)	H	Mi	Materials for partition and roofing.
94.	<i>Themeda triandra</i> Forssk.	Khar	H	Mi	Aerial part used as thatching material.
LABIATAE					
95.	<i>Colebrookea oppositifolia</i> Sm.	Thulo bhatena, Dahigota (Th, Rp), Dhurse	S	M, Mi	Leaf juice used in common cold and headache, in eye problem; used to ripen banana.
96.	<i>Leucas cephalotes</i> (Roth) Spreng.		H	E, M	Plant juice in liver disease, fever; and tender parts as vegetable.
97.	<i>Mentha spicata</i> L.	Pudin (Th)	H	E, M	Leaves used as pickle; in vomiting and cooling agent.
98.	<i>Ocimum basilicum</i> L.	Babari	H	M	Leaves in common cold.
99.	<i>Ocimum tenuiflorum</i> L.	Tulsi	H	M, Mi	Leaves in common cold; ceremonial.
100.	<i>Pogostemon benghalensis</i> (Burm. f.) Kuntze	Mas ko pida (Th, Rp), Rudilo	S	M	Leaves, tender shoots in fever, common cold, headache (Manandhar, 1985).
101.	<i>Vitex negundo</i> L.	Sewali (Th)	S	M, Mi fencing.	Dried leaves in headache and
LAURACEAE					
102.	<i>Cinnamomum glaucescens</i> (Nees) Hand.-Mazz.	Malagiri, Sugandha kokila	T	Mi	Seed oil used in perfumery, and as incense.
103.	<i>Litsea monopetala</i> (Roxb.) Pers.	Kutmira	T	M	Bark juice used in cuts and wound. Leaves: a good source of fodder.

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LEGUMINOSAE					
104.	<i>Abrus precatorius</i> L. Lalgedi	Titihir (Th),	C	M	Paste of seed taken in constipation.
105.	<i>Acacia nilotica</i> (L.) Willd. ex Delile	Babur	T	E, M	Paste of burnt fruit applied in boils, headache. Seeds edible.
106.	<i>Acacia pennata</i> (L.) Willd.	Aili (Th, Rp)	S	E, P	Tender leaves as vegetable and fruits for fish poisoning.
107.	<i>Acacia catechu</i> (L.f.) Willd.	Khayar	T	M	Latex ('kattha') used in cuts and wound.
108.	<i>Acacia farnesiana</i> (L.) Willd.	Babul, Jatasankar	T	M, Mi	Stem used as toothbrush, in fever, headache, wounds and blisters.
109.	<i>Albizia chinensis</i> (Osbeck) Merr.		T	P	Young leaves and buds poisonous to animals, but used as insecticide.
110.	<i>Bauhinia tomentosa</i> L.	Amilo taanki	T	M	Leaves used in scorpion sting.
111.	<i>Bauhinia vahlii</i> Wight & Arn.	Mahurain (Th), Malu, Bhorla	C	E, Fi, Fr	Roasted seeds edible. Bark used as rope. Bark-juice used as fermenting material. Good fodder.
112.	<i>Bauhinia variegata</i> L.	Koiralo	T	E, M	Seed powder taken to control indigestion and stomachache. Flowers: good vegetable. Leaves: good fodder.
113.	<i>Butea buteiformis</i> (Voigt) Grierson	Bhujetro	S	M	Seeds used as wormicide.
114.	<i>Butea monosperma</i> (Lam.) Kuntze	Dhaka (Th., Rp.)	T	M	Leaf used as appetiser and anthelmintic (Acharya, 1996). Leaves: used in rituals, and fodder.
115.	<i>Caesalpinia bonduc</i> (L.) Roxb.	Kadanja (Ab), Bokshi Kanda	C	Fe, M	Plants used in fencing. Seeds: in stomach pain, malarial fever.
116.	<i>Caesalpinia decapetala</i> (Roth) Alston	Karauji	S	E	Leaves: in burns; as fodder.
117.	<i>Cassia mimosoides</i> L.	Chotaki ail (Th)	H	M	Plant paste used in leprosy (Manandhar, 1985).
118.	<i>Cassia tora</i> L. (Th)	Sano chakaun	H	E, M	Young leaves and tender parts used as vegetable. Seed used against dry cough.
119.	<i>Crotalaria albida</i> Heyne ex Roth		H	E	Fruits edible.
120.	<i>Crotalaria prostrata</i> Rottb. ex Willd.	Ban san (Th)	H	M	Plant paste in wound (Manandhar, 1985).
121.	<i>Dalbergia sissoo</i> Roxb. ex DC.	Sisawa (Th), Sisau	T	M	Bark decoction in gout, and leaf paste in fever (Manandhar 1985).

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122.	<i>Erythrina stricta</i> Roxb.	Jingal, Faledo	T	M	Leaf juice as vermifuge for cattle.
123.	<i>Mucuna pruriens</i> (L.) DC.	Kauso	C	M	Seeds as tonic.
124.	<i>Phyllodium pulchellum</i> (L.) Desv.	Basanta (Th., Rp)	H	Mi	Plant used to make brooms.
125.	<i>Pterocarpus marsupium</i> Roxb.	Chhattin kath (Th), Bijayasal	T	M	Water soaked with wood taken to relief bone and rheumatic pain; and in diabetes.
126.	<i>Spatholobus parviflorus</i> (Roxb.) Kuntze	Bhamiri (Th), Debre lahora	C	F, M	Stem juice used in cuts and wound; good fodder.
127.	<i>Vicia sativa</i> L.	Aakanda (Th)	H	E, F	Good fodder. Seeds edible.
LILIACEAE					
128.	<i>Aloe vera</i> (L.) Burm. f.	Ghiu kumari	H	M	Latex in stomach pain, in boils and burns and over heat.
129.	<i>Asparagus racemosus</i> Willd.	Kurilo	H	Fr, M	Root used to make fermenting material "Marcha"; used as tonic and in lack of lactation.
130.	<i>Chlorophytum nepalense</i> (Lindley) Baker	Banpyaj	H	M	Root paste mixed with mustard oil in joint pain (Manandhar, 1985).
LINACEAE					
131.	<i>Linum usitatissimum</i> L.	Arsi (Th), Aalas	H	E, M	Seeds used in pickle. Smoke of dry plant to heal mud infected part; to subside the abscess.
132.	<i>Reinwardtia indica</i> Dumort.	Pyauli	S	M	Root paste in headache (Manandhar, 1985).
LYTHRACEAE					
133.	<i>Lagerstroemia parviflora</i> Roxb.	Sidha (Rp), Dhyra paati (Th)	T	M	Heart-wood: antidiabetic.
134.	<i>Woodfordia fruticosa</i> (L.) Kuntz.	Dhaiyero, Dhayera	S	M	Flower juice used in urine with blood. Bark juice with milk used in dysentery. Bark paste applied on burns.
MALVACEAE					
135.	<i>Abelmoschus moschatus</i>	Lata kasturi	H	M	Root juice used in typhoid.
136.	<i>Gossypium arboreum</i> L.	Ruwa (Th), Kapas	H	M	Root: abortifacient (for abortion); ash (cotton) is used in wound.
137.	<i>Sida acuta</i> Burm. f. Th), Bishakhopara	Chir chira (Rp,	S	Fi, M	Bark for cordage. Whole plant used as broom. Root and seed decoction as tonic (Manandhar, 1985).

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138.	<i>Sida cordata</i> (Burm. f.) Borss. (Syn. <i>Sida humilis</i> Willd.)	Bish khopada, Biskapre	S S	M	Plant juice applied in scorpion sting and in boils.
139.	<i>Sida rhombifolia</i> L.	Balu jhar	S	M	Plant mixed with mustard oil used in boils and wounds.
MELIACEAE					
140.	<i>Azadirachta indica</i> A.Juss.	Neem	T	Fr, M	Leaves used to make fermenting material "Marcha". Bark juice used in headache.
141.	<i>Trichilia connaroides</i> (Wight & Arn.) Benth.	Purbe jengra (Th), Jingat	T	F	Leaves and twigs: fodder.
MENISPERMACEAE					
142.	<i>Cissampelos pareira</i> L.	Batul pate	C	M	Leaf juice used in crab bite. Root juice in stomachache.
143.	<i>Stephania japonica</i> var. <i>discolor</i> (Miq.) Forman	Batulpate	C	M	Root: in gastric problem and cuts and wounds. Leaves: fodder.
144.	<i>Tinospora sinensis</i> (Lour.) Merr.	Gurja (Th), Gurjo	C	M	Stem juice used in dysentery and fever.
MORACEAE					
145.	<i>Artocarpus integra</i> (Thunb.) Merr.	Katahar	T	Fr, M	Leaf used to make fermenting material "Marcha". Latex used in toothache.
146.	<i>Ficus hispida</i> L.	Thote	T	E	Fruit edible, used as pickle. Leaves: fodder.
147.	<i>Ficus lacor</i> Buch.-Ham.	Kabro, Gular	T	E, M	Young shoots: vegetable. Fruits used in diarrhoea, dysentery.
148.	<i>Ficus racemosa</i> L.	Dumre	T	E, F, M	Leaves as fodder. Fruits edible, used in diarrhoea and dysentery, and latex also for the same purpose.
149.	<i>Ficus semicordata</i> Buch.-Ham. ex Sm.	Khanneu	T	E, M	Fruits edible; used in diarrhoea.
150.	<i>Morus nigra</i> L.	Kimbu	T	E, M	Fruits edible, as anti- thirst.
MYRTACEAE					
151.	<i>Psidium guajava</i> L.	Ambaa, Belauti	T	E, Fr, M	Fruits edible, Leaf juice used as fermenting material "Marcha". Young shoot juice used in diarrhoea, toothache.
152.	<i>Syzygium cumini</i> (L.) Skeeel.	Jamun	T	E, M, P	Fruits edible. Bark juice used in abdominal pain and diarrhoea. Also used as fish poison.
NYCTAGINACEAE					
153.	<i>Boerhaavia diffusa</i> L. Gaja purna	Churchuriya (Th),	H	M	Plant used in snake bite and night blindness.

SN	SCIENTIFIC NAME	LOCAL NAME	HABIT	USE	USE PERSPECTIVES
154.	<i>Mirabilis jalapa</i> L.	Barka gurubans (Th), Malati	H	M	Root powder in menstrual disorder.
NYMPHAEACEAE					
155.	<i>Nelumbo nucifera</i> Gaertn.	Kamal	H	E, M	Flower juice, seed powder, in jaundice. Green seeds edible.
ONAGRACEAE					
156.	<i>Ludwigia octovalvis</i> (Jacq.) P.H. Raven		H	M	Plant juice used in wound caused during rainy season (Manandhar, 1985).
OPHIOGLOSSACEAE					
157.	<i>Ophioglossum reticulatum</i> L.	Ek patiya (Th), Jibre saag	H	E	Whole plant: good vegetable.
ORCHIDACEAE					
158.	<i>Vanda roxburghii</i> R. Br.	Hadjor	H	M	Entire plant paste used in fracture.
OXALIDACEAE					
159.	<i>Oxalis corniculata</i> L. Chamseer (Th)	Amchocha,	H	E, M	Leaves used in earache, fever and dysentery; also used to make sour pickle.
PALMAE					
160.	<i>Phoenix humilis</i> Royle ex Becc & Hook.	Thakal	S	E, Mi	Leaf: thatching material and as broom. Fruit edible and used in wine preparation. Tuberous root used as vegetable.
PAPAVERACEAE					
161.	<i>Argemone mexicana</i> L.	Bharbhanda (Th), Katara kanda	H	M	Seed juice in indigestion; sap in wounds and blisters, and eye infection.
PIPERACEAE					
162.	<i>Piper longum</i> L.	Pharipiper (Th), Pipla	H	Fr, M	Root used as fermenting material "Marcha". Fruits used in jaundice.
POLYGONACEAE					
163.	<i>Persicaria hydropiper</i> (L.) Spach.	Bish jare, Biriya (Th)	H	E, Fr, M, P	Tender shoots eaten as vegetable. Entire plant juice used as fish poison and as fermenting material "Marcha". Juice also applied in headache and colic.
164.	<i>Polygonum plebejum</i> R. Br.	Chiraik gor (Th)	H	M	Plant paste in wound caused during rainy season (Manandhar, 1985).
165.	<i>Rheum australe</i> D.Don	Padamchal	H	M	Root juice used in conjunctivitis.

SN	SCIENTIFIC NAME	LOCAL NAME	HABIT	USE	USE PERSPECTIVES
166.	<i>Rumex nepalensis</i> Spreng.	Dhaldhaliya (Th)	H	E, M	Leaves eaten as green vegetable. Seeds used in chicken-pox (Manandhar, 1985).
PTERIDACEAE					
167.	<i>Cheilanthe bicolor</i> (Roxb.) Griff. ex Fras.-Jenk.	Dude jhar, Dude sinki	H	M	Plant juice used in cut, and in abdominal pain.
RANUNCULACEAE					
168.	<i>Ranunculus scleratus</i> L.	Nakapolava (Th)	H	M	Plant juice in gastric inflammation (Acharya, 1996).
RHAMNACEAE					
169.	<i>Zizyphus mauritiana</i> Lam.	Bayar	S	E, M	Stem juice used to apply in leg swelling. Fruit used in diarrhoea, dysentery and also in cough; fruits edible.
RUBIACEAE					
170.	<i>Adina cordifolia</i> (Willd. ex Roxb.) Benth. & Hook. f. ex Brandis	Haldu (Th, Rp), Thulo karma (Th)	T	M	Bark juice used in cuts and wound.
171.	<i>Borreria alata</i> (Aubl.) DC.	Paundhi (Th)	H	M	Plant juice in bone fracture of cattle (Manandhar, 1985).
172.	<i>Hymenodictyon excelsum</i> (Roxb.) Wall.	Bhurkuti (Th)	T	M, Mi	Bark powder in snake bite, and wood to make musical instrument 'Mandra'.
173.	<i>Xeromphis spinosa</i> (Thumb.) Keay	Maen	S	E, M, P	Fruit juice and ash used as fish poison. Unripe fruits as pickle. Seeds used as emetic.
RUTACEAE					
174.	<i>Aegle marmelos</i> (L.) Corr.	Bel	T	M	Fruit juice applied in cuts and stomach-ache.
175.	<i>Murraya koenigii</i> (L.) Spreng.	Binbinveria (Th)	S	E, P	Leaves used as insect repellent and insecticide. Fruits eaten raw.
176.	<i>Zanthoxylum armatum</i> DC.	Timur	S	E, M	Fruits in skin irritation, toothache; and as spices.
SAPINDACEAE					
177.	<i>Schleichera oleosa</i> (Lour.) Oken.	Kusum	T	E, F, M	Leaves: fodder. Fruits edible; seed oil used in skin diseases.
SAPOTACEAE					
178.	<i>Aesandra butyracea</i> (Roxb.) Baehni	Chiuri	T	P	Seed cake (Pina) used as fish poison.
179.	<i>Madhuca longifolia</i> (J. Konig) J. Macbr.	Mahuwa	T	E, M, Mi, O	Latex used in cuts. Flowers used to prepare local wine and bread. Seed oil used in cooking.

SN	SCIENTIFIC NAME	LOCAL NAME	HABIT	USE	USE PERSPECTIVES
SCHIZACEAE					
180.	<i>Lygodium flexuosum</i> (L.) Sw.	Kali dabai Kochya (Th)	H	M	Plant used in skin diseases.
SCROPHULARIACEAE					
181.	<i>Scoparia dulcis</i> L.	Bhera chachura (Th), Chini Jhar	H	Fr, M	Plant juice used in fever, headache, boils; and as fermentation material "Marcha".
SOLANACEAE					
182.	<i>Datura metel</i> L.	Dhatur (Th)	S	M	Leaves, fruits: in stomach pain.
183.	<i>Solanum anguivi</i> Lam.	Bhomara (Th)	H	E, M	Plant decoction in bronchitis; young shoot eaten as vegetable.
184.	<i>Solanum melongena</i> L.	Bhanta	H	M	Root tied in the pregnancy to facilitate easy labour.
185.	<i>Solanum nigrum</i> L. Kamain phal	Mukaia (Th),	H	E, M	Fruits edible; used to induce sound sleep. Tender shoots as vegetables, and used in jaundice.
186.	<i>Solanum surattense</i> Burm. f.	Kacheriya (Th), Kacharehata	H	M	Root and plant decoction: in bronchitis.
TAMARICACEAE					
187.	<i>Tamarix dioca</i> Roxb. ex Roth	Jhauwa (Th)	S	Mi	Stem used as 'Jhauwa' (basket), and broom.
TILIACEAE					
188.	<i>Grewia helicterifolia</i> Wall. ex G. Don	Gadsukri	S	E	Fruits edible.
189.	<i>Grewia optiva</i> J. R. Drumm. ex Burret	Pona (Th)	S	Mi	Bark fibre: in ropes, nets, etc. Light wood used to prepare plough.
190.	<i>Grewia sclerophylla</i> Roxb. ex G. Don		S	E	Bark fibre: in ropes. Fruits edible.
191.	<i>Grewia subinaequalis</i> DC.	Phursi (Th)	T	E	Fruits edible.
UMBELLIFERAE					
192.	<i>Centella asiatica</i> (L.) Urb.	Golpate (Th), Ghodtapre	H	M	Plant used as astringent and cooling.
URTICACEAE					
193.	<i>Boehmeria platyphylla</i> D. Don	Khasreti	S	M	Plant juice applied to stop bleeding.
194.	<i>Girardinia diversifolia</i> (Link) Friis	Allo	H	M	Root juice given to drunkard for cooling.

SN	SCIENTIFIC NAME	LOCAL NAME	HABIT	USE	USE PERSPECTIVES
195.	<i>Urtica dioca</i> L.	Sisnu	H	E	Leafy part vegetable.
VERBENACEAE					
196.	<i>Callicarpa macrophylla</i> Vahl	Dahigola (Th)	S	E	Fruits edible.
197.	<i>Clerodendrum viscosum</i> Vent	Titebhati, Bhattena (Th, Rp), Bhaat	S	Mi	Leaf juice used to remove lice in man and animal. Stem used as tooth brush.
198.	<i>Lantana camara</i> L.	Ginauna (Rp), Kalgedi	H	Fe	Plants used in fencing.
199.	<i>Phyla nodiflora</i> (L.) Greene	Kurkure jhar	H	M	Plant paste used in eczema.
WOODSIACEAE					
200.	<i>Diplazium esculentum</i> (Retz.) Sw.	Neuro, Kochiya	H	E	Entire plant: vegetable.
ZINGIBERACEAE					
201.	<i>Curculigo orchioidea</i> Gaertn.	Kalo muslee, Musal leri	H	M	Root juice used in boils, leucorrhoea, as aphrodisiac; to enhance lactation, and breast abscess in cattle.
202.	<i>Curcuma angustifolia</i> Roxb.	Harjor	H	M	Rhizome: in cough, cold, and swelling; and in fractured and dislocated bones.

Local name: Abadhi (Ab), Rajput (Rp), Tharu (Th); all other names are Nepali names.

Habit: Climbers (C), Herbs (H), Shrubs (S), Trees (T)

Use categories: Edible plants (E), Fodder (F), Fencing (Fe), Fermenting material (Fr), Medicinal (M), Miscellaneous (Mi), Oil-yielding plants (O), Poisonous plants (P).

NTFPs with potentials for trade and domestication

Potential species of NTFPs has been identified on the basis of their market value and local utilisation. Twenty-five species have been identified as potential species (Table 2). Abundance of the species is ranked from five to one on the descending order of their availability. Similarly trade value and domestication for each of the species have been identified based on the field survey, PRA and RRA techniques. Species, which are very useful and valuable item for trade, are highly priced are considered as highly traded species. Similarly species commonly available and traded and have high demand, but due to less quality and quantity, not meet the market demand is considered as moderately traded.

Table 2. Species of NTFPs potential for trade and domestication

SN	BOTANICAL NAME	LOCAL NAME (S)	ABUNDANCE	TRADE VALUE	DOMESTICATION	REMARKS
1	<i>Acorus calamus</i> L.	Bojho	3	3	1	
2	<i>Aegle marmelos</i> (L.) Correa (RUTACEAE)	Bael, Bel, Ber (Mag.)	1	2	1	

SN	BOTANICAL NAME	LOCAL NAME (S)	ABUNDANCE	TRADE VALUE	DOMESTICATION	REMARKS
3	<i>Andrographis paniculata</i> (Burm. f.) Nees (ACANTHACEAE)	Kalapnath	3	0	0	
4	<i>Asparagus racemosus</i> Willd. (LILIACEAE)	Jhirjhire kanda, Kurilo, Kurla (Th)	1	3	1	
5	<i>Azadirachta indica</i> A. Juss. (MELIACEAE)	Neem	1	1	1	
6	<i>Buchanania latifolia</i> Roxb. (ANACARDIACEAE)	Piyar/Piyari	5	0	0	Imported from India
7	<i>Curculigo orchoides</i> Gaertn. (HYPOXIDACEAE)	Kalo Musuli	2	2	0	
8	<i>Eulaliopsis binata</i> (Retz.) C.E. Hubb. (GRAMINEAE)	Bankash, Babiyo, Ranguwa (Th)	3	3	0	
9	<i>Holarrhena pubescens</i> (Buch.-Ham.) Wall. ex G. Don (APOCYNACEAE)	Dudhe, Ban khirro	1	1	0	
10	<i>Ichnocarpus frutescens</i> (L.) R. Br. (APOCYNACEAE)	Chhegad dudhi	1	0	0	
11	<i>Madhuca latifolia</i> (Roxb.) J. Macbr. (SAPOTACEAE)	Mahuwa	3	1	1	
12	<i>Murraya koenigii</i> (L.) Spreng. (RUTACEAE)	Binbinveria, meetha neem, currypatta	4	0	0	Exported from India
13	<i>Operculina turpethum</i> (L.) Silva (CONVOLVULACEAE)	Nisodh	1	0	0	Imported from India
14	<i>Phoenix humilis</i> Royle ex Becc. and Hook.f. (PALMAE)	Thakal, Khajur (Th)	4	2	0	
15	<i>Phyllanthus emblica</i> L. (EUPHORBIACEAE)	Amala	2	3	0	
16	<i>Piper longum</i> L. (PIPERACEAE)	Pipla, Pharipipper	3	2	1	
17	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz (APOCYNACEAE)	Sarpagandha	3	2	1	
18	<i>Ricinus communis</i> L. (EUPHORBIACEAE)	Ander, Aril (Th), Raine (Th)	3	0	0	Traded in India

SN	BOTANICAL NAME	LOCAL NAME (S)	ABUNDANCE	TRADE VALUE	DOMESTICATION	REMARKS
19	<i>Saccharum munja</i> L. (GRAMINEAE)	Munj, Munje (Th)	3	1	1	
20	<i>Terminalia bellirica</i> (Gaertn.) Roxb. (COMBRETACEAE)	Barro	2	2	1	
21	<i>Terminalia chebula</i> Retz. (COMBRETACEAE)	Harro	2	2	1	
22	<i>Tinospora sinensis</i> (Lour.) Merr. (MENISPERMACEAE)	Gurjo	2	0	0	
23	<i>Vetiveria zizanioides</i> (GRAMINEAE)	Sikhul (Th), Sinkh, Barni	2	1	0	
24	<i>Woodfordia fruticosa</i> (L.) Kurz (LYTHRACEAE)	Dhayera, Dhayero	4	1	0	
25	<i>Zanthoxylum armatum</i> DC. (RUTACEAE)	Timur	1	2	1	

Source: Field Survey (2003).

PS. Abundance: 5 = Dominant, 4 = Common, 3 Less common, 2 = Frequent, 1 = Rare.

Trade value: 3 = High, 2 = Moderate, 1 = Low, 0 = Not known

Domestication: 3 = Large scale, 2 = Moderate scale, 1 = Low scale, 0 = Not cultivated

Most of CFUGs have prepared their operational plan by themselves with the help of concerned District Forest office personnel. Mostly, NTFP issues have not been adequately addressed in their OPs.

The communities have caused, managed and used several NTFP species on traditional manner. However, due to the lack of adequate knowledge on NTFP resources, most CFUGs are not able to take maximum benefit from one of their CFs. There are several constrain regarding the conservation and management of NTFPs. Lack of identification and documentation of potential NTFPs, their sustainable collection methods, utilisation,

harvesting, processing, value addition and marketing ignorances are the major constraints for the sustainable management of NTFPs. Besides, several issues related with the government's rules, regulation, royalty rates, taxes, permission procedures to collect and transports, lack of informations on markets, and marketing channels are the major issues that are responsible for the adequate promotion of NTFPs.

CONCLUSION AND RECOMMENDATIONS

From the present study, it has been revealed that the local people of Dang district, who

belong to the indigenous and lower income group will continue collecting and using wild plants from their near by locality since they consider it as their traditional right as well as having no alternative choices.

Based on the availability, utilisation, market value and local people's interest, top priority species includes *Azadirachta indica* and *Rauvolfia serpentina*, second priority species are *Aegle marmelos*, *Holarrhena pubescens* and *Andrographis paniculata* and third priority species include *Buchanania latifolia*, *Asparagus racemosus*, *Eulaliopsis binata*, etc.

Domestication of about 10 species of native medicinal plants, such as *Acorus calamus*, *Asparagus racemosus*, *Piper longum*, *Rauvolfia serpentina*, etc., and small-scale cultivation of few species of exotic and naturalized species such as *Mentha arvensis*, *Cymbopogon flexuosus*, etc. have been practised in couple of nurseries managed by the CFUGs of Dang-Deukhuri area. Provision of adequate training and capacity building initiatives to there pioneer NTFP farmers on different aspects of NTFP production, development and management could uplift the status of NTFPs both in the forest and in the farm.

NTFP based and Community Forest User Group managed small-scale industries and co-operative enterprises should be established for promoting trade of high value NTFPs to improve people's livelihood. The necessary encouragement and support for all others realeated stakeholders is a must in this regard.

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HERBS PRODUCTION & PROCESSING COMPANY LIMITED

Experience gained and lessons learned

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INTRODUCTION

Herbs Production and Processing Company Limited (HPPCL) was established in 1981 as an undertaking of His Majesty's Government of Nepal (HMGN). The company's authorized capital is NRs. 5,00,000,00 while the issued and paid-up capitals are NRs. 3,86,00,000 and 2,75,17,000 respectively. The 5-membered Board of Directors include representatives of different line agencies and is chaired by the Joint Secretary, Ministry of Forests and Soil Conservation.

OBJECTIVES

The following are the major objectives of the Company:

- a. Collection and processing of wild herbs for export
- b. Assist the collectors in conserving the natural resources of MAPs with sustainable harvesting procedures
- c. Cultivation and processing of medicinal and aromatic plants for selling in national and international markets
- d. Encourage and facilitate private farmers for the cultivation and management of medicinal and aromatic plants in the country
- e. Make available the necessary raw materials in the processed/semi-processed forms to the local pharmaceutical, Ayurvedic and aroma industries

- f. Create additional employment opportunities in the country and facilitate in uplifting the economic standard of low level income groups of people
- g. Formulate and manufacture herbal health care products for local market and export

COMPANY'S FACILITIES AND ACTIVITIES

Central office and production/processing unit

The company's central office with herbal production/processing facility is situated at Koteshore, Kathmandu spread over 1.5 ha. Apart from general administration, this unit is engaged in manufacturing different types of herbal health care products that are used locally as well as exported.

Tamagadhi herbal farm

Located in Bara district and covering 350 hectares, Tamagadhi herbal farm is engaged in the cultivation and processing of medicinal and aromatic plants. Local villagers have been trained and technically assisted on various aspects of medicinal and aromatic plant cultivation in their private land with buy-back guarantees.

Local villagers, mostly those having no private land and including women and members of disadvantaged communities, have been provided with some portion of the farm's land under conditions providing opportunities to cultivate recommended medicinal plants with buy-back guarantee. As the result, some Community Forest User Group Members also

has started cultivating medicinal plants in the community land.

Cultivation extension programme

The company's Tarahara and Belbari herbal farms, situated in east Nepal are cultivating and processing medicinal and aromatic plants in their respective land. The adjoined CFUGs have been encouraged to cultivate recommended MAPs in their respective CFs with buy-back guarantee. The company's Tikapur herbal farm unit, Kailali district is engaged in promoting the cultivation and processing of medicinal and aromatic plants in the far-western region of the country.

Resin Collection Centres

The company's 3 Collection Centres at Dhankuta, Parbat and Myagdi districts are engaged in collecting pine-resin in coordination with the local community forest users group members.

Activities

HPPCL has recently initiated the cultivation of different types of essential oil bearing herbs like Citronella, Lemongrass, Palmarosa, Camomile, *Mentha arvensis*, etc., in the eastern region of the country. The collection and processing of Wintergreen leaves (*Gaultheria fragrantissima*), Sunpati (*Rhododendron anthopogon*) and Dhupi (*Juniperus indica*: leaves and berries) have been carried out since last fifteen years in Dolakha, Ramechhap and Lalitpur districts. Resin of *Pinus roxburghii* is collected for processing Rosin and Turpentine oil in Makwanpur, Dhankuta, Parbat, Myagdi and Lalitpur districts. The company's strategies,

major achievements, challenges are given below.

Company's strategies

- Organic production and management of MAPs
- Development of improved technologies for collection, cultivation, management and processing of MAPs
- Encouraging farmers to cultivate suggested MAPs, also Providing portions of the company's farmland to the villagers at vicinity for MAP cultivation
- Production of quality seed/seedling for cultivation and distribution to farmers
- Training and capacity building opportunities to stakeholders together with technical assistance
- Buy back guarantee for the cultivated MAP products
- Innovate and standardize herbal products
- Market research and information dissemination

Industrial products of HPPCL

ESSENTIAL OILS:	EXTRACTS:
Artemisia Oil Anthopogon Oil Camomile Oil Calamus Oil Citronella Oil Eucalyptus Oil French basil Oil Kachur Oil Mentha arvensis Oil Juniper berry Oil Jatamansii Oil Lemongrass Oil Palmarosa Oil Sugandha kokila Oil Tejpat Oil Turpentine Oil Wintergreen Oil Zanthoxylum Oil	Amala extract Belladonna extract Chiraita extract Lichen extract Rosin Taxus extract
HERBAL CARE PRODUCTS	
Oral use and massage: Anti-leech Oil Himalayan Massage Oil Nepal Oil SANCHO Shilajeet Herbal Drink	Inhale and fragrance: Decongestant Refreshing Tension Reliever Kanchangungha (perfume for Male) Manakamana (for Female)

Annual rate of production

Essential Oils:	24 Metric Tons
Rosin & Turpentine:	100 Metric Tons
Herbal Care :	2200 thousand
Products	pieces

Markets

Essential oils and extracts of medicinal and aromatic plants are mostly exported to Europe and the Asia Pacific regions. Rosin and Turpentine are supplied to the domestic and Indian markets. Herbal Care Products are mostly consumed in the domestic markets.

EXPERIENCES GAINED AND LESSONS LEARNED

- Community forests and other community-owned/managed land are the most fertile avenue for the sustainable management of MAPs, especially when the income generation opportunities for the poor and disadvantaged groups of the communities are focused.
- Farmers are interested in MAP cultivation when market is assured and return more.
- Value-addition and processing on medicinal and aromatic plants are the musts for better return from the forest as well as the farm products.
- Capacity-building efforts like training, technical assistance, and provision of some resource inputs are the basic requirements for the motivation of farmers and villagers in the production and management of MAP resources.

COMMUNITY INITIATIVES IN CONSERVATION, DEVELOPMENT AND MANAGEMENT OF MAP/NTFP RESOURCES IN UDAIPUR DISTRICT, NEPAL

*Nirmal Bhattarai
Pradip Maharjan*

INTRODUCTION

International Development Research Centre (IDRC), Medicinal and Aromatic Plants Program in Asia (MAPPA) provided a two-year project to the Herbs Production and Processing Company Limited (HPPCL) for developing local initiatives in conservation, development and management of medicinal and aromatic plant (MAP) resources in Udaipur district, Sagarmatha zone, Nepal. The District Forest Office, Udaipur supported the project implementation as the local project partner.

PROJECT DISTRICT

Udaipur, the project district, occupies an area of 2063 sq. km. with a population of 221256

distributed among 40570 households. The altitude ranges from 800m to 2300m and includes the warm and humid region of Terai, Churia Hills (Siwalik Range) and the southern slopes of the Mahabharat Range. The vegetation in the district is mainly tropical and sub-tropical with sal (*Shorea robusta*) as the dominant tree species. Commercially valued MAPs available in the district are *Acorus calamus*, *Asparagus racemosus*, *Cinnamomum tamala*, *Holarrhena pubescens*, *Piper longum*, *Rauvolfia serpentina*, *Sapindus mukorossi*, etc., in addition to a large number of species used in local remedial and healing purposes.

PROJECT AREA

Out of the 95 community forests handed over to the communities in the district, 11 were considered for the project activities. These represented different ecological zones, viz. Inner Tarai (Asari and Bansbari community forests), Churia Range (Bahuna, Janajyoti, Rajdevi, Ramjanaki and Sharaswoti community forests), and the Mahabharat Range (Annapurna, Navajyoti, Puware and Trishakti community forests). The total area covered by these community forests is 3700 hectares with 2442 households using them.

ISSUES CONSIDERED

A pre-feasibility study revealed the following NTFP/MAP related facts and issues in the district in general and the project area in particular:

- The district has long remained a leading supplier of many potent herbs to the domestic and Indian markets.
- NTFPs/MAPs are being collected indiscriminately from the wild, and the unmanaged harvesting practices have threatened their resource-base at many places.
- Local collectors are ignorant of primary processing like cleaning, grading, drying and packing procedures, resulting on inadequate benefits out of their collections.
- Local communities have a vested interest in maintaining the natural resources on which they depend but lack of capacity-building incentives and management

practice options seemed to be the limiting factors.

- There is immense potentiality for the cultivation of some commercially valued MAPs. While the local farmers are interested, shortages of planting materials including ignorance on the production of seedlings and their propagation seemed to be the major limiting factors.

ACTIVITIES CONDUCTED AND THE RESULTS OBTAINED

Training programs

- Practical training on resource assessment, conservation, development, management and sustainable harvesting practices, value-addition and local-level processing of NTFPs/MAPs was provided to 125 CFUG members including 57 women and representing all the considered 11 community forests.
- Training on nursery practices of some locally available and commercially valued medicinal plant species (e.g. *Acorus calamus*, *Asparagus racemosus*, *Cinnamomum tamala*, *Piper longum*, *Rauvolfia serpentina*, *Sapindus mukorossi*, etc.), followed by the establishment of 3 community-managed medicinal plant nurseries in Ram Janaki CF (Jogidaha), Bansbari CF (Gaighat) and Trishakti CF (Murkuchi) was accomplished.

Nursery at Tarahara herbal farm

A master nursery in Tarahara herbal farm of HPPCL was established for the mass

production of seedlings of some commercially important MAPs including *Piper longum*, *Cinnamomum tamala*, *Rauvolfia serpentina* and *Asparagus racemosus*. The seedlings produced were distributed to the CFUG members for plantation in their CFs and private land.

Nursery at District Forest Office, Gaighat

A master nursery was established in the District Forest Office campus with the technical assistance of the district forest office personnel for the production of *Cinnamomum tamala* and *Sapindus mukorossi* seedlings. The produced seedlings (5000 seedlings of *Cinnamomum tamala* and 6000 that of *Sapindus mukorossi*) were provided to the project CFs and their users for plantation in the CF as well as in private land.

Enterprise development and networking

A training participant from Trishakti CF, who was also a local herbal trader, established an essential oil distillation unit at Murkuchi. The unit has started its activity with the distillation of *Cinnamomum tamala* (Tejpat) leaves, distilling 300 kg of leaves/day with the production of 3 kg of essential oil. HPPCL has supported the enterprise with technical assistance and buy-back guarantee of the produce at the rate of NRs. 3500/kg of essential oil. This enterprise has also been successful in establishing a network among the Tejpat collectors, farmers, traders and other stakeholders for their collective benefits.

Likewise, a CBO named Sanjiwani Jadibuti Samrakhsan Samuha (Sanjiwani Medicinal

Plants Conservation Group) has been established at Murkuchi involving the trainees from Trishakti, Pubare, Navajyoti and Annapurna community forest user groups. This forum regularly meet to assess the status of MAPs in their respective CFs and discuss on issues related with their conservation and sustainable management.

EXPERIENCES GAINED AND LESSONS LEARNED

- MAPs and other NTFP resources can be sustainably managed with the initiatives of local communities.
- Demonstration, training and capacity building opportunities are the necessary prerequisites to local biodiversity conservation and management programs.
- Provision of seeds, seedlings, farming tools, etc., are the basic requirements of the communities at the initial stage of their shift from wild collection to cultivation.
- Local level participation for the sustainable management of the NTFP/MAP resources is possible by providing immediate and clearly visible economic gains, such as providing increased values and guaranteed market for their products.

COMMUNITY INITIATIVES IN CONSERVATION AND SUSTAINABLE MANAGEMENT OF NTFPs

Experiences from Ghodaghodi Lake System, Far-western Nepal

Yam Bahadur Bam

INTRODUCTION

The Ghodaghodi Tal area in Kailali district, Far-western Nepal is spread over 2563 hectares with 13 lakes covering 138 hectares. This area, designated as the Ramsar Site on August 2003, is the biggest natural wetland system in the Terai region of Nepal and is spread over three Village Development Committees, Darakh, Ramshikhar Jhala and Sandepani. The population of the area is 43,687 distributed in 6110 households. Tharus dominate the population (51.3%), followed by migrants from hilly regions (47%), and others. The literacy rate is poor and farming is the main occupation supplemented by livestock rearing, firewood

collection, fishing, snail collection and collection of other NTFPs including medicinal and aromatic plants. The present paper is based on the activities conducted in the Ghodaghodi Tal area under IUCN-Nepal funded Ghodaghodi Area Conservation Project.

FOREST RESOURCES

The forest in the area is dominated by Sal (*Shorea robusta*) with associates like *Acacia catechu*, *Bombax ceiba*, *Butea monosperma*, *Dalbergia latifolia*, *Diospyrus montana*, *Oroxylum indicum*, *Pterocarpus marsupium*, *Terminalia bellirica*, *T. chebula*, *T. tomentosa*, etc.

Out of the recorded 260 wild plant species, 46 are edible and 105 are having local traditional

medicinal uses. In addition, a large number of plant species are having various other household uses. The commercially valued NTFPs/MAPs are *Acacia rugata*, *Acorus calamus*, *Asparagus racemosus*, *Curculigo orchioides*, *Gloriosa superba*, *Piper longum*, *Tinospora sinensis*, *Tribulus terrestris*, etc.

CHALLENGES TO CONSERVATION AND SUSTAINABLE MANAGEMENT OF NTFP RESOURCES

The major challenges to conserve the forest resources for sustainable management included:

- Over/unsustainable exploitation of NTFP resources
- Increasing market demand and price for certain species
- Excessive dependence of the local communities on forest resources for the domestic as well as commercial purposes
- Lack of awareness and technical know-how
- Environmental degradation and biodiversity loss
- Inadequate documentation on indigenous knowledge and practices

ACTIVITIES CONDUCTED

- 5 Community Forests have been considered under the project activities for the conservation and management of non-timber forest resources.
- Involvement of local communities for the conservation and management of wetland

and forest biodiversity through awareness creation, demonstration, training, skill development and capacity building efforts.

- Trained the local communities to identify important NTFPs and to adopt sustainable harvesting practices.
- 15 Forest User Groups including 7 women groups have been formed.
- 5 Eco-clubs in highschools have been formed.
- Community-managed NTFP nurseries have been established, and seedlings raised for *Asparagus racemosus*, *Bombax ceiba*, *Moringa oleifera*, *Mukuna pruriens*, *Acacia rugata*, *Acacia catechu*, lemongrass and rattan.
- Enrichment plantation with 15000 seedlings of Sikakai (*Acacia rugata*), 20,000 seedlings of rattan, 500 seedlings of Simal (*Bombax ceiba*), 2000 seedlings of Khayar (*Acacia catechu*), 10000 seedlings of Kauso (*Mucuna pruriens*) and 20000 seedlings of Lemongrass has been done in the community forests as well as different landscapes including the lake banks, irrigation canals, degraded land, etc.
- Encouraged the local farmers to initiate NTFP cultivation in their private land with the provision of planting materials, farming tools and technical assistance.

RESULTS OBTAINED

- Increased local initiatives in the conservation and management of local

biodiversity and preservation of the ecosystem.

- Sustainable utilization of forest resources resulting into their conservation and efficient management.
- Production of MAPs/NTFPs in private land with considerable cash income to the communities
- Empowered women resulting into their active participation in biodiversity conservation and management resulting in assured supply of NTFPs for household uses and considerable income generation.

LESSONS LEARNED

- Local communities are the most import forces for the conservation, development and management of the local biodiversity resources and the corresponding ecosystems.
- Awareness creation through demonstration, training and capacity-building opportunities is the necessary pre-requisites for the sustained management of the renewable natural resources.
- Incentives like planting materials farming tools, technical assistance and market guarantee to the communities are the effective efforts to decrease local pressure on forest resources.

CINNAMOMUM SPECIES

Potentialities for Better Income Generation through Improved Management Practices

Bhaweshwar Das

INTRODUCTION

C*innamomum*, a genus of evergreen shrubs and trees, is distributed in the tropical and subtropical regions of Nepal. Some wild species available in Nepal are economically important, viz. *Cinnamomum tamala* and *Cinnamomum glaucescens* that are being traded since decades. Their management and development can be important forest and farm resources for a better income generation activity (IGA), both for individual farmers and the community forest user group (CFUG) members. This study focuses on the products of the Nepalese *Cinnamomum* species in trade, chemical constituents of the essential oil and market

status of the products with recommendations for better economic gains from the resources.

THE CONTEXT

In course of our assignment with LISP/Helvetas between July 2001 to August 2003, an interest group lead by Mr. Narayan G.C., Chairperson and Mr. Bhupati Pandey Secretary of the local Community Forest User Committee showed interests and requested suggestions in establishing a herbal processing center (Jadibuti Prosodhan Kendra) to initiate local-level value addition/processing on Tejpat (*Cinnamomum tamala* leaves) and Dalchini (*Cinnamomum tamala* stem bark) in Palpa district. The present documentation details the

information gathered and analyzed to support the interest group.

ISSUES CONSIDERED

The study was focused on the following relevant issues in order to develop recommendation for the interest group to manage the resources in the wild as well as in the farm for better income generation:

Market price

Market prices of *Cinnamomum tamala* (leaves and bark), and *Cinnamomum glaucescens* (fruits) during the 3rd week of July, 2001 in some of the major markets showed

big variations, mostly dependent on the distances between the source and the market (Table1)

Global prices of Cinnamom leaf oil

Cinnamomum tamala leaf oil, in contrast, has been in the range of US\$ 6.5- 7.5/kg for most of the last years. Its price fell gradually from about US\$ 7.5 in early 1991 to US\$ 6.5 in mid-1993. In late 1993 it had risen again to US\$ 7.3/kg and in early 1994 it was US\$8.25/kg. Although it is comparatively low-priced oil it is still expensive than clove leaf oil, which was approximately US\$ 2.7 in early 1994. Both the oils are used as sources of eugenol.

Table. Market price of *Cinnamomum* species at different herbal trade Centers (July, 2001; NRs./kg)

ITEM	DOVAN (PALPA)	BUTWAL (NEPAL)	KATHMANDU (NEPAL)	DELHI (INDIA) (RS./KG)
<i>Cinnamomum tamala</i> (Leaf)	5/-	14/-	42.5 to 50/-	20/- to 40/-
<i>Cinnamomum tamala</i> (Bark)	32/-	40/-	135/-	72.5
<i>Cinnamomum glaucescens</i> (Fruit)	57.5	61.25	x	x

Price change between 1992 and 2001

The following table (Table 2) shows the increase in market prices of *Cinnamomum* species between 1992 and 2001 (NRs.).

Table 2. Change in market prices of *Cinnamomum* species between 1992 and 2001

ITEM	1992	2001
<i>Cinnamomum tamala</i> (Leaf)	5/-	14/-
<i>Cinnamomum tamala</i> (Bark)	25.5	40/-
<i>Cinnamomum glaucescens</i> (Fruit)	9/-	61.25

Chemistry and uses

Cinnamomum tamala leaf oil has a warm, spicy, but rather harsh odor, lacking the rich body of the bark oil. Its major constituent is eugenol rather than cinnamaldehyde. It is used as a flavoring agent for seasonings and savory snacks. As a cheap fragrance it is added to soaps and insecticides. The oil's high eugenol content also makes it valuable as a source of the chemical for subsequent conversion into iso-eugenol, another flavoring agent. Further, spice, cosmetic and medicinal demand helps the growth in demand.

Interaction with local traders

Dalchini (*Cinnamomum tamala* bark) have been traded from Palpa district since decades. The product is mostly traded in the Butwal market. The rate quoted by the Butwal trader on July 24th was NRs 90/- per dharni (approximately 2.5kg). On July 23rd the price for Dalchini in Indore (India) was IRs. 82/- (NRs. 131.2) per kg.

When inquired, the Nepalese trader was convinced that the Dalchini of Indian origin was of higher quality evidenced by comparatively sweeter and stronger taste and flavor, and hence the price was higher. The trader also attributed quality to harvesting and post harvest techniques. The trader added that in India, the product is harvested from plants of definite age, in definite season, dry it properly and store at better condition. Therefore the product has better quality.

Field study on diversity in *Cinnamomum tamala* (Ham.) Nees & Eberm.

In India, Dalchini is obtained from *Cinnamomum zeylanicum* Breyn. While in Nepal it is obtained from *Cinnamomum tamala* (Ham.) Nees & Eberm. Back at Hekalang and Satyabati, Palpa district, it was confirmed that there were two different types of Dalchini (*Cinnamomum tamala*), one called 'Bhale' and the other 'Pothi'. It was also evidenced that the bark of 'Pothi' was sweeter than that of the 'Bhale'.

Marketing trial and outcome

In June-July 2003 we noticed that despite our recommendation the Jarubuti Prashodhan Kendra run by the cooperative had distilled *Cinnamomum tamala* leaf with about 150 kg of oil trapped in economy trap. We communicated with some US buyers who needed sizable amount of the oil. After pretty long communication the buyer finally informed that the price demanded by us was not at all acceptable to them.

CONCLUSION AND RECOMMENDATION

The undertaken study revealed the following conclusions:

- The demand for raw materials from *Cinnamomum tamala* is global in character. The price trend for both leaf and bark is favorable.
- The essential oil distilled from the raw material (leaf and bark) does not necessarily add value to the raw material, as the

investment is generally high in comparison to the return. Hence, value addition or processing is not always favorable in terms of demand and price.

- The species being an evergreen tree, commercial farming strategy with definite harvest cycle could help boost the economy of farmers as well as the CFUG members.
- *Cinnamomum* species currently traded in Nepal are known by various local/trade names, viz. Tejpat, Sinkauli, Bhale Sinkauli, Pothi Sinkauli, Kokila, Malageri, Sugandhakokila, etc. Detailed field survey and scientific investigation to ascertain the taxon and quality of each local/trade name is highly desirable.
- The product quality and price will not be compatible with the global quality and price as long as randomly collected *Cinnamomum* is processed and many species/varieties may disappear without notice from the vegetation.
- *Cinnamomum tamala* (Ham.) Nees & Eberm. "Pink flushing variety" is recommended for commercial farming for leaf and bark harvest.
- *Cinnamomum zeylanicum* Breyn. should be commercially propagated for harvesting the bark and for both leaf and bark oil production.
- Legal barrier on trade of *Cinnamomum glaucescens* (Nees ex Wall.) Drury should be revisited as the material is collected in Nepal but is neither processed nor exported as evidenced in the custom records.
- *Cinnamomum* can be an important genus for eco-friendly income generation activity, both for individual farmers and the CFUG members if commercial cultivation is encouraged and conducive policy is brought into action.

ORGANIC PRODUCTION AND CERTIFICATION IN NEPAL

Sample Checklist for Pre-Feasibility Study

Maheswar Ghimire

INTRODUCTION

After the accession of Nepal to WTO it has been an obligatory task of the government to provide reliable, effective and nutritious medicines and food to its citizen. It is obvious that grower or producers should capitalize the existing opportunities for high price of their certified organic products that could provide them premium prices. Consequently, the increased level of earning can be mobilized for investments providing additional opportunities for increased income and generation of additional employment opportunities in the country. The present pre-feasibility study format has been developed

considering the present status of organic farm operators in Nepal and their requirements in regards to the more efficient production, quality control and certification during production and for marketing. At the same time, the present communication is based on the author's personal experiences with the organic agricultural farming systems in the country accompanied by interactions with various organic certifying agencies abroad.

JUSTIFICATIONS

The following are the major justifications for the adoption of organic production and certification in Nepal:

- Prospects of organic products, both in the local and international markets

- Production potentials of some of the high value crops considering their market potentiality within and outside the country
- Building relationships with potential certifying agencies for the possible collaboration in the joint certification schemes
- Possibilities of utilizing the existing human resources with expertise on production, inspection and facilitation for organic production and certification
- Minimizing the financial burden due to the utilization of external evaluator and certifying agencies that create heavy financial involvement
- Strengthening the capacity of existing Inspectors on Promotion, Inspection and Certification process.
- Inception work for the establishment of local certification body, which can work for the promotion of organic products in the local markets with assistance from the international certifying agencies.
- The locally developed man-power and expertise may be able to certify products for the international markets as well, under joint certification schemes
- The Government of Nepal has already initiated the National Organic Agriculture Programme in its 10th Five-Year Plan, and hence needs appropriate recommendations to start working on the issue.

- Study can explore some information about the potential international market at present as well as in future conditional to the assurance of product quality including the certification of products.

SAMPLE CHECKLIST

- Concept of Certification - What is certification, its definition, certification mark, certification and regulations
- Basic Concepts - Inspection and Certification body in accordance with the rule and regulation in EU, USA, Japan, Australia, etc.
- Direct Certification
- Co-Certification - Supervision of Local Inspection and Joint Certification body in the Third World
- Local Certification - International Accreditation
- Compliance with ISO 65 or EN 45011 and adaptation of guidelines provided by Codex Alimentarius.

ORGANIC PRODUCTION CERTIFICATION PROCESS

Organic Producers should be well aware of the organic standard of their products, and should have the following basic requirements:

- Organic Certifying Inspectors should be trained according to the principles of organic inspection process and principles.

- The Organic Standard is applicable not only in the production site but also on the processing unit
- Information and Technologies including Organic Agriculture Production Training
- Information about Production Process and its Application
- First Inspection at the site of production
- Second Inspection at the site of processing unit
- Unannounced Inspections for maintaining check and balances
- Process for Certification according to the report of Inspector

BENEFITS AND CONSTRAINTS OF CERTIFICATION PROCESS

Benefits:

- Lower cost for high-value production
- Keeping money within the country
- Higher level of solidarity and understanding between producers and certifiers minimizing the possible chances of fraud
- Better opportunities to conduct unannounced inspections
- Better information flow to and from the certifying agencies

Constraints:

- Lack of competence on the start-up phase

- Lack of information on start up phase
- High level of investment in the beginning
- Chances of conflict of interests
- Difficult to get international accreditation and recognition

Basic criteria and necessities for the organic certification system involving local bodies:

- Competence
- Independence
- Accountability and responsibility
- Objectivity
- Credibility
- Quality Improvement and Internal Review
- Access to Information
- Confidentiality
- Participation
- Non-discrimination
- Cost effectiveness
- General Service Image
- Value of the Certified Commodities
- Voluntary services

OTHER PROCESSES

- Structure and Organization
- Standards
- Rules and Procedures
- Inspection
- Approval of Certification and Handling of Violations and any other Disputes
- Management

- Labeling
- Information
- Costs

What certification/inspection body and inspectors should do regarding information, promotion and marketing:

- Information to public on its programs and processes
- Publish a list of its Certified Operators
- Promote the certified production in generic manner
- Present the Certified Products in a discriminative way
- Facilitate producers and customers in a discriminative way
- Certification body and its staff should not be involved in the marketing of organic products certified by them



RECOMMENDATIONS

WORKSHOP

RECOMMENDATIONS

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WORKSHOP RECOMMENDATIONS

Theme

QUANTITATIVE RESOURCE ASSESSMENT, CONSERVATION AND SUSTAINABLE MANAGEMENT OF IMPORTANT NTFPs/MAPs

Recommendations

1. Quantitative resource assessment should be prioritized with the following considerations:
 - Develop standard method that is adjustable to different geographic and physiographic regions including species-level diversity, frequency and distribution;
 - Incorporation of the concerns of diverse groups of stakeholders;
 - Provide criteria for species prioritization;
 - Adequate methodology and guidelines for the District Forest Offices to develop district-level NTFP management plan and also help Community Forest User Groups (CFUGs) to incorporate MAPs/NTFPs promotion strategies in their Operation Plans.
2. Prioritize and promote areas for *in situ* conservation and *ex situ* cultivation.
3. Develop community oriented MAP/NTFP-based enterprises, exclusively involving women, landless, poor and Dalits.
4. Apply multidisciplinary approach to conservation, including research and development, business, marketing and bio-prospecting.
5. Develop general sustainable harvesting guidelines, based on categories of MAPs/NTFPs at the national, district and local levels.

6. Refine the community forestry process for incorporating exclusive access and lead role of women, landless, and poor in cultivation of potential MAPs/NTFPs in the community forests and community land.
7. Create incentives (e.g. technical services, financial assistance, buy-back guarantee, etc.) for farmers at household level for MAPs/NTFPs cultivation.
8. Remove impractical regulatory provisions that hinder MAP/NTFP cultivation transition and trade (e.g. royalty over resources grown at private land, transportation/export facilities, etc.).
9. Create mechanisms and an institution at major MAP/NTFP trade centers to stabilize the price range for major MAPs/NTFPs traded in the area, involving major stakeholders. This should also involve systematic record keeping and dissemination through media.
10. Provide conducive policy mechanisms to attract collaboration for adaptive technological support/input for MAPs/NTFPs production.
11. Establish action research and demonstration centres at regional level, covering major ecological zones. This should serve various purposes including varied research and dissemination of the findings.
12. Open door for the private sector through policy innovation for their partnership for investment, technology support, buy-back guarantee and providing vision for risk factors at collectors'/producers' levels.
13. Policy on MAPs/NTFPs should address the threat status and conservation needs of CBD and CITES appended plant species through threat assessments, periodic monitoring and adequate conservation programs.
14. Policy should open windows for the compliance as per CBD and CITES appended species in collaboration with neighboring/exporting/importing countries to discourage illegal trade.

Theme
**VALUE-ADDITION/PROCESSING AND TRADE/MARKETING OF
MAPs/NTFPs**

Recommendations:

15. Local application and commercialization prospects of MAPs/NTFPs of the locality should be documented and disseminated in local languages/dialects, possibly in visual forms.
16. Collectors and farmers should preferably organize themselves in cooperatives to promote efficient collection/production, value addition and marketing practices.
17. All collectors, farmers, traders, and other stakeholders should be registered in the district level (DFO/CDO) authority.
18. District level system should be networked with national level hub/boards.
19. All CITES-listed/nationally banned MAPs and NTFPs should be gradually brought into domestication and mass farming practices. Those already under cultivation in private lands/CFs should be managed for enrolling with the DFOs/national bodies and be exempted from royalty/VAT, etc.
20. Knowledge and skills in the perspective of both domestic and external marketing of crude herbs, value added products, industrial and consumer products should be made accessible to at least the district level stakeholders.
21. Bilateral and multilateral treaties and agreements that hinder the pro-poor perspectives should be moderated accordingly.
22. National certification programme should be initiated for MAPs/NTFPs collected from national forest or community forests as wild and state land products.
23. All cultivated MAP/NTFP products should have national organic certificate from an internationally accredited body.
24. National and regional-level quality assurance laboratories should be developed at state and public/private levels for crude drugs, value added products, and consumer and industrial products.
25. Aggressive marketing tools such as international trade fairs and marketing arrangements should be initiated, supported and facilitated.
26. National initiatives for access of funds to deprived group of collectors and farmers, ethically committed traders, and processors through banks and financing institutions should be managed in collaboration with Nepal Rastra Bank. A separate norm for this facilitation should be brought into action.
27. Harmonized System (HS) code for all MAPs/NTFPs and their derivatives should

- be developed and all import and export statistics should be documented and made accessible to everyone interested.
28. A mechanism for sealing of goods at the point of origin to both domestic and global destinations should be developed to avoid unwanted hassles during transportation.
29. A sense of faith/coordination among different line agencies and departments should be developed and maintained.
30. MAP/NTFP trade among nations should have common understanding and realization through regular exchange of information and frequent trans-boundary meeting at different levels.
31. Training, academic programs and research should focus on creating opportunities for employment and health alternative based on locally available MAP/NTFP resources.

Theme

ORGANIC FARMING/PRODUCTION AND CERTIFICATION OF MAPs /NTFPs

Recommendations

32. Formation of a national-level organic production and promotion coordination body.
33. Setting up criteria for selection of pilot sites and MAP/NTFP species
34. Community forest should be the entry point for the organic production and management of MAPs/NTFPs.
35. Pocket approach for initiating organic farming/production and management (Regions, Agro-ecological zones, etc.), and extension programs should be formulated.
36. Maximum use of existing R & D facilities and technical expertise available in the country.
37. Strengthening and motivation of existing R & D, technical and education institutions
- in the government and public/private sector.
38. Awareness creation and motivation through observation/study tours, training, capacity building, etc.
39. Policy formulation procedures should consider the organic producers in terms of tax motivation, subsidy, crop insurance, etc.
40. Technical and training supports should be provided to the collectors, farmers, traders and Other stakeholders on compost making system, pest management, post-harvest treatments, etc.
41. Incorporation of alternative farming systems (Organic, Permaculture, Agroforestry, etc.) in the curriculum of academic institutions (viz. IOF, IAAS, Universities, etc.) should be initiated.

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MAPPA Publications

The Medicinal Plants Sector in India by Jason Holley & Kiran Cherla

Priority Species of Medicinal Plants in South Asia by Madhav Karki & J.T. Williams

Priorities for Medicinal Plants Research and Development in Pakistan by J.T. Williams & Zahoor Ahmad

Tribal Folk Medicinal Plant Resources of South Asia by Radhika Johari & Madhav Karki

The Role of Medicinal Plants Industry in Fostering Biodiversity Conservation and Rural Development by Madhav Karki & Radhika Johari

Some Important Medicinal Plants of the Western Ghats, India-a profile by P.K. Warriar, V.P.K. Nambiar and P.M. Ganapathy

Conservation Assessment & Management Plan Workshop Report (CAMP-Nepal) by Vinay Tendon, Nirmal Bhattarai & Madhav Karki

Sharing Local and National Experience in Conservation of Medicinal and Aromatic Plants in South Asia by Nirmal Bhattarai & Madhav Karki

A Study on Marketing Opportunities for Medicinal, Aromatic and Dye Plants in South Asia by Arun Nagpal & Madhav Karki

In Nepal, like in many other developing countries, the great majority of the non-timber forest products (NTFPs) including medicinal and aromatic plants (MAPs) used locally or entering into trade comes from wild harvesting which also constitutes a critical source of livelihoods of thousands of poor people. Being a secretive and exploitative practice, this practice urgently needs better understanding and suitable reforms.

A transparent, participatory and equitable production to consumption and marketing chain is the need of the future. Evidences of ecosystem degeneration, habitat degradation and biodiversity loss are observed widely mainly due to unsustainable extraction of commercially valuable plant resources such as MAPs. Research results have demonstrated that an integrated approach of conservation and development can lead to an establishment of a balance between sustainable use level and conservation needs. What may be needed is a shift from over-harvesting to sustainable harvesting and predominance of wild collection to complementary cultivation. The conservation and management initiatives launched by different GOs, NGOs, INGOs and donors in the MAPs/NTFPs sector of Nepal have started to provide some generalizable lessons and good practices which needs to be shared among all.

This publication is a compilation of the views expressed and the papers presented at the National Workshop on "Local Experience-based National Strategy for the Sustainable Production and Management of MAPs/NTFPs in Nepal" held in Kathmandu, Nepal. It represents the most recent and comprehensive attempt to address the complex set of issues facing MAPs/NTFPs. It also contains compilation of the field-based research actions of leading researchers and institutions.

The proceedings of the two-day workshop contains the generated recommendations on future strategies for the conservation, sustainable use, development and management of MAP/NTFP resources in Nepal. The volume compiles reliable source of knowledge and information on MAP/NTFP research projects and institutions, which are of interest to a variety of actors and organizations in the domains of research, development, management and policy.