ENABLING REGULATORY MECHANISMS FOR COMMERCIALIZATION OF MEDICINAL AND AROMATIC PLANTS IN SOUTH ASIA REGION

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PART I: GENERAL INTRODUCTION
DIVERSITY OF MAP PRODUCTS

- Diverse types of production possible; more than 8,500 MAP species
  - Extracts and exudates (essential oils, resin & gums; tannins & dye
  - Medicinal herbs
  - Aromatic, neutracutical, and dye products
  - Edible plants: spices & nuts
  - Animal medicinal products;
  - Others (Bamboo sap or Banslochan

BUT SAARC’S INTERNAL AND EXTERNAL TRADE IN MAPS IS STILL A FRACTION OF GLOBAL TRADE.
MAPS: ECONOMIC AND ECOLOGICAL IMPORTANCE FOR SAARC COUNTRIES

- High value MAP resources
- MAPs can help forest & biodiversity conservation efforts
- MAPs are valuable to improve people’s livelihoods
- MAPs can reduce malnutrition
- Provide cash income to poor
- Promote traditional knowledge and practices
### SOME BROAD INDICATORS OF THE IMPORTANCE OF MAPS

<table>
<thead>
<tr>
<th>Contribution of MAPs in traditional medicine</th>
<th>80% of the population in developing countries (WHO, 2002)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% share of MAPs in household income:</td>
<td>25% in India &amp; 40% in western Nepal</td>
</tr>
<tr>
<td>Contribution to food security and nutrition</td>
<td>40% of calcium; 25% of iron and 40% of vitamins A and C (Clendon, 2001); Source: FAO, 2009.</td>
</tr>
</tbody>
</table>
DELPHINIUM HIMALAYAI, A WELL-KNOWN AND HIGHLY TRADED MEDICINAL PLANT ENDEMIC TO CENTRAL AND WEST NEPAL
A TRADITIONAL COLLECTOR OF *DELPHINIUM HIMALAYAI*, HUMLA DISTRICT, NEPAL
Dactylorhiza hatagirea, an endangered ground orchid and well-reputed medicinal plant endemic to the Himalaya
BROAD CLASSIFICATION OF NWFPS
(source: Mr. Baba)

Non Wood Forest Products

- Medical
  - Used in Modern Drugs
  - Driven by Volumes of Specific Quality
  - Used in Traditional Medicines
    - Driven by Diversity of Commodities
- Non-Medical
  - On the basis of Utilization Levels
    - Species Currently in Use
    - Un-explored Species
      - Bio-prospecting of un-explored Species should benefit local communities
Ophiocordyceps sinensis, high value fungus grown on insect Taxus wallichiana, well-known anti-cancer medicinal plant.
High Value Food Products form the Himalayas

Some fleshy fungi wild mushrooms from Nepal

Morchella conica (High Priced Morel Mushroom)
SPICES AND CONDIMENTS (CINNAMOMUM TAMALA) BARK HARVESTING, NEPAL
GROWING ECONOMIC POTENTIALS OF MAP IN SAARC REGION

- Economically viable and environmentally sustainable MAP products available
- Multi-stakeholder and collaborative approaches widely practiced
- NTFP policies are gradually becoming business friendly
- Skilled communities are sustainably collecting and marketing NTFPs
OPPORTUNITIES

- Emergence of market & non-market mechanisms for natural products, green marketing, eco-labelling and access & benefit sharing initiatives

- Investment & employment opportunities in herbal sector development;

- Complementary and combined health services are now accepted by both AYUSH and Allopathic systems.
MAJOR PROBLEMS FOR SUSTAINABLE SUPPLY OF MAPS

- Unsustainable collection & harvesting
- Secretive and exploitative trade practices
- Poor and disorganized producers and processors
- Insecure resource tenure
- Low value addition at producer’s and aggregators’ levels
- Poor quality and unreliable supply
- Unclear policies and regulatory frameworks
PART II: COMMERCIAL POTENTIALS OF MAP IN THE SAARC REGION
# Important Medicinal Plants Used for the Treatment of Cancer

<table>
<thead>
<tr>
<th>Plant name/family</th>
<th>Drugs</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Catharanthus roseus L.</strong> (Apocynaceae)</td>
<td>Vinblastine and vincristine</td>
<td>Rasineni et al. (2010)</td>
</tr>
<tr>
<td><strong>Podophyllum emodi Wall.</strong> (Beriberidaceae)</td>
<td>Podophyllotaxin</td>
<td>Singh et al. (2009)</td>
</tr>
<tr>
<td><strong>Taxus brevifolius</strong> (Taxaceae)</td>
<td>Paciltaxel, taxotere</td>
<td>Perumal &amp; Gopala-krishnakone (2007)</td>
</tr>
<tr>
<td><strong>Mappia foetida Miers.</strong></td>
<td>Comptothecin, lrenotecan and topotecan</td>
<td>Lorence and Nessler (2004)</td>
</tr>
<tr>
<td><strong>Comptotheca acuminate</strong></td>
<td>Quinoline &amp; comptothecin alkaloids</td>
<td>Lorence and Nessler (2004)</td>
</tr>
<tr>
<td><strong>Juniperus communis L.</strong> (Cupressaceae)</td>
<td>Teniposide and etoposie</td>
<td>Gordien et al. (2009)</td>
</tr>
</tbody>
</table>
TOTAL IMPORT VALUES OF MAPS, 1996-2005

- Food and Food supplements
- Household construction materials, wares and artifacts
- Miscellaneous items
- Health-care and beauty products
- Industrial Use (non-food)

Total global import value of NWFPs (2005): US$ 14.0 billion
Total global import value of NWFPs (1996): US$ 9.0 billion

Source: Based on UN Comtrade data as on 31st August 2007
KEY INDICATORS ON COMMERCIAL IMPORTANCE OF MAP RESOURCES

- The global trade in MAPs and related products is estimated to be between 80-120 billion dollars
- MAPs are undervalued and under recognized
- Growing markets and benefits to poor community
- Increasing trade values for local and national economy
- Need for sustainable management of MAP resources
- Special significance of MAPs to conserve forests
MAPs and NTFPs provide:
1. generate cash income
2. provide food, medicine and nutrition
3. diversify and compliment agriculture
4. links producers to markets
5. support SFM
Private Sector Investment in Forestry (NRs 31.89 billion)

- Production of primary forest goods and services
- Timber processing, manufacturing & trade
- NTFP processing, manufacturing & trade
- Ecosystem services
- Forest biomass-based bioenergy processing, manufacturing & trade

www.ansab.org
### Potential Economic Growth and Employment Generation from Forest-based Industries

<table>
<thead>
<tr>
<th>Subsector</th>
<th>Economic value (million NRs)</th>
<th>No of sustainable, full time jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conservative</td>
<td>Optimistic</td>
</tr>
<tr>
<td>Timber</td>
<td>55,127</td>
<td>270,697</td>
</tr>
<tr>
<td>NTFPs</td>
<td>11,635</td>
<td>58,173</td>
</tr>
<tr>
<td>Forest Carbon</td>
<td>4,235</td>
<td>13,572</td>
</tr>
<tr>
<td>Ecotourism</td>
<td>14,572</td>
<td>21,567</td>
</tr>
<tr>
<td>Forest Bioenergy</td>
<td>2,126</td>
<td>9,107</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>87,694</strong></td>
<td><strong>373,115</strong></td>
</tr>
</tbody>
</table>

[www.ansab.org](http://www.ansab.org)
Growth Potential (NTFPs)

- World market for natural products is high and growing:
  - Global export of MAPs was US $3 billion in 2010
  - International market for MAPs is increasing at the rate of 13-18% per annum
  - Nepal’s share in the world export for MAPs was around 0.2 percent in 2010
  - NTFP contribution to total export of Nepal increased from less than 3% in 2003 to above 9% in 2012

- About 40% of the total community forests have potential for NTFPs – More than 60% of the total forests having potential for community forests

- Emerging cultivating item - Shiitake mushroom

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Bay Leaf Market Chain in and from Nepal in 2009

Regional wholesalers in India
(2150 Mt; USD 0.55-0.67/kg)

Manufacturers of herbal tea,
spices and traditional medicines from leaves.
(200 Mt/ USD 0.34-0.38/kg)

Buyers in Dhanusha and Gaur fairs
(150 Mt/ USD 0.52-0.54/kg)

Central wholesalers
(2500 Mt)

Local traders (USD 0.27-0.32/kg)

Oil processors
(250 Mt)

Collector and domesticators
(USD 0.13-0.16/kg)

HPPCL and other manufacturers using oil for making pain relief balms
(450 kg/USD 68/kg)

Product manufacturing

Selling at local fairs

Central wholesaling

Local trade

Oil processing

Collection and cultivation
- High potential to increase commercial activities
- Multi-stakeholder dialogue and policy reforms
- Documentation of traditional knowledge & good practices
- Training in sustainable collecting and marketing of products to high-end markets
- Cluster-development approach can minimize costs
Increase in annual household income from MAPs during the project period (2005-2009)

<table>
<thead>
<tr>
<th>Project area</th>
<th>MAP income before project intervention in 2005(^a)</th>
<th>MAP income after project intervention in 2009(^a)</th>
<th>Difference in MAP income</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nepal (NPR)</td>
<td>1206 (4382)</td>
<td>11,388 (12,217)</td>
<td>10,182**</td>
<td>844</td>
</tr>
<tr>
<td>Himachal Pradesh, India (INR)</td>
<td>1922 (1153)</td>
<td>5521 (2658)</td>
<td>3599</td>
<td>187</td>
</tr>
<tr>
<td>Chhattisgarh, India (INR)</td>
<td>2146 (1300)</td>
<td>6565 (4859)</td>
<td>4419*</td>
<td>206</td>
</tr>
</tbody>
</table>
INCOME DIFFERENCE FROM MEDICINAL PLANTS INTERVENTIONS

Western Nepal
HP, India
CG, India
Overall

MAP Income (b/p)
MAP income (a/p)
Diff. (INR)
NEPALESE WOMEN FARMERS BENEFITING FROM MEDICINAL HERB COLLECTION AND MARKETING
PREREQUISITE FOR IMPROVING MAPS COMMERCIALIZATION

- Development and implementation of MAPs policy
- Full and effective participation collectors, aggregators and retailers
- Secured & equitable benefits to MAP producers
- Clear decision making authority to MAPs associations
- Value chain development with access to market information
- Training and skill development
- Equitable benefit sharing mechanisms
MAPs have comparative but not competitive advantages
Markets for natural products not well developed in SAARC region
Value chain of MAP is long and opaque with a large number of intermediaries
Major obstacles relate lack of market information and government support
Research-based knowledge on quality and standards lacking
A ROADSIDE VENDOR WITH RAW HERBS IN NEPAL - OPPORTUNITY FOR VALUE ADDITION
<table>
<thead>
<tr>
<th>Management practice</th>
<th>Before</th>
<th>After</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>No processing and extraction technology</td>
<td>Processing and extraction technology introduced</td>
<td>Easier and more hygienic grinding and extraction process</td>
</tr>
<tr>
<td>Collection and harvesting practices</td>
<td>Reckless collection with disregard for maturity of products or destruction of plants</td>
<td>Selective harvest of mature and good-quality products using nondestructive methods</td>
<td>Less damage to MAPs and other NTFPs, good regeneration</td>
</tr>
<tr>
<td>Marketing</td>
<td>Individual</td>
<td>Group marketing through cooperatives and with certification</td>
<td>Increased cooperation, better trust and reliance, increased bargaining power, higher prices</td>
</tr>
<tr>
<td>Packaging</td>
<td>No packaging</td>
<td>Packaging used for some products</td>
<td>Better shelf life and higher prices for products using packaging</td>
</tr>
<tr>
<td>Processing</td>
<td>No or limited processing</td>
<td>Standard processing used</td>
<td>Processed projects sold in markets for higher price as a result of value addition</td>
</tr>
</tbody>
</table>
PART III: RECOMMENDATIONS AND CONCLUSION
KEY RECOMMENDATIONS: RESEARCH AND DEVELOPMENT (R&D)

- Scientific research needed to develop new pharmaceutical, neutraceutical, and cosmetic products;
- Multidisciplinary research needed for in-situ and ex-situ conservation;
- Multi stakeholder dialogue for policy change;
- Analyze and understand the entire supply/value chain for identifying the opportunity points for interventions;
- Improved commercialization should increase the value of entire chain.
RECOMMENDATIONS ON POLICY & INSTITUTIONAL REFORMS

- Improve trade and policy instruments (SAFTA) to provide adequate incentives for conservation and sustainable commercialization of MAPs.
- Create easy financing mechanism to promote MAPs based enterprise clusters.
- Create regional market for MAPs products and traditional and complementary medicines.
- Remove trade barriers & price distortions on organic, certified and other natural products through strong enforcements of rules and regulations.
- Strengthen public-private-NGO/CBO partnerships to develop successful regional MAPs based supply chains.
RECOMMENDATIONS ON REGIONAL CO-OPERATION

- Although costly, SAARC countries must invest in nature based solutions for solving social, economic, and health problems
- Innovative policies, financing and trade instruments on herbal sector
- Reduce costs of financing herbal business in poor SAARC countries by providing soft loans, tax benefits, and SEZ facilities;
- Fund SAARC level annual herbal industry fairs, trade shows and business partnerships;
- Develop SAARC level information portal for greater commercial exchange, regional trade, and business development
CONCLUDING MESSAGES

- MAPs are undervalued, under-researched and under-priced commercial and social product
- Free SAARC level trade can open new opportunities for MAP based products and services
- Need to integrate MAPs in participatory value chain and enterprise development programs
- Need of public-private-NGO-community partnership for achieving eco and society friendly commercialization
CONCLUDING MESSAGES

- Ensure commitment and ownership of government institutions to MAPs through a dedicated MAP policy
- Remove transport and trade barriers nationally and regionally
- Promote successful MAP business pilots in transforming SAARC economy into a greener and sustainable economy
- MAPs need more funds in doping R&D based product development and quality improvement
ACKNOWLEDGEMENT AND CREDITS FOR THE SOURCE OF INFORMATION

- Dr. Nirmal Bhattarai, Co-author; ICIMOD (nbhattarai@icimod.org);
- Takeda Shinya, ASAFAS, Kyoto University (2003)
- Dr. T. Baba, 2005; Dabur (India);
- Dyutiman Chaudhary et al, Mountain Research and Development, 2011
- Golam Rasul et al, Mountain Research and Development, 2011
THANK YOU FOR YOUR PATIENT HEARING AND Q&A