Assessment of Chiuri (*Diploknema butyracea*) resources and it’s potential for commercialization (Marma Rural Municipality, Darchula District Nepal)

Presented by

Durga Datta Regmi

Consultant
Outline of the Presentation

- Methodology
- Preliminary finding of Chiuri (*Diploknema butyracea*) resource assessment
- Preliminary finding of selection of potential value chain for Marma rural municipality
**Assignment:** Assessment of Chiuri (*Diploknema butyracea*) Resource and its Potentiality for Commercialization (Marma Rural Municipality; Darchula District Nepal)

**Key Deliverables:** A comprehensive report on feasibility of commercialization of Chiuri (*Diploknema butyracea*) resources in Marma Rural Municipality.

**Additional Deliverables**  Identification of potential value chain for RVWRMP intervention in Marma Rural Municipality
Current Situation of Non Timber Forest Products (NTFPs) / Medicinal and Aromatic Plants (MAPs)

POTENTIAL

- Attractive bio-diversity; Altitude from 70 – 5,000 metres.
- 1,800 species of which 701 recognised medicinal plants.
- 20,000 CFUGs (approx 40% of pop.) that manage approx. 1.2 million ha of forest.
- Around 5,000 tonnes could be harvested annually.
- Now 20-30% is collected, processed and sold.

Top species which make up 52% of the total volume (Olsen 2005)
- Jatamansi (Nardostachys grandiflora)
- Chiraito (Swertia chirayita)
- Timur (Zanthoxylum armatum)
- Rittha (Soapnut) (Sapindus mukorossi)
- Lichens
Major Trade Routes

- Kathmandu
- M. Nagar
- Dhangadhi
- Nepalgunj
- Bhairawaha
- Yari-Hilsa
- Taklakot
- Kathmandu
- Rui
- Kerung
- Tatopani
- Walangchung Gola
- Mechi
- Birgunj
- Biratnagar
Major NTFP Traded form Darchula District

1. Amala
2. Barro
3. Chiraito
4. Jatamansi
5. Kutki
6. Padamchal
7. Pakhanbed*
8. Ritha*
9. Satawari
10. Satuwa
11. Sugandhawaal
12. Tejpat*
13. Yarsagumba**

*Comes under top 3 ranking in terms of volume ** 1st rank in terms of value

Marma Hub/market center: approx. 250 tons of different wild crafted herbs
Methodology : Value Chain Selection

Final selection

Prioritizing VCs - SWOT analysis

Determine selection criteria - Value chain ranking

Collection of information on pre-selected VCs - Value chain map,

Pre-selection of value chains - Attractiveness matrix

Rapid assessment of potential VCs - Listing the potential value chain

Group discussion in Simalta, Marma - 4
Methodology

- Review of existing studies of donors, government, projects, private company, research institution and academic institution
- Direct interview and discussion with collectors
- Discussion with focus group and key informants
- Discussion with stakeholders (E.g. Sector Forest Officer)
- Identification of Pocket Areas - Chiuri sampling, observation and yield calculation.

Listed 60 products
Methodology

- Listing the potential value chain
- Prepared the value chain criteria
- Attractiveness matrix
- Value chain ranking
- Value chain map
- SWOT analysis
General Criteria Adopted for Value Chain Selection

- Prospects for success
- Outreach
- Competitiveness
- Unmet market demand/growth potential/potential for value addition
- Comparative advantage in local, national and export market
- Potential for income and employment creation
- Relevance to the poor; social inclusion, SMEs participating
- Program related aspects (livelihood opportunities, no. of targeted beneficiaries - women and marginalized group, number of total beneficiaries, location, contribution to family nutrition ....... etc.)

Chiuri trees in Padpada Tapoban
**Attractiveness Matrix - Helps to narrow down sub-sector**

<table>
<thead>
<tr>
<th>High Market price and Potential to Generate Additional Employment</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
<td></td>
<td>Very Attractive</td>
</tr>
<tr>
<td>Medium</td>
<td></td>
<td></td>
<td>Not Attractive</td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Adopted from Lusby & Panibuton, 2002
<table>
<thead>
<tr>
<th>Mushroom, Honey, Large Cardamom, essential oils, Rajma, fishery /trout fish</th>
<th>High value low volume NTFPs /MAPs including Yarsaguma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bamboo Products, Low value high volume NTFPs, Sheep</td>
<td>Citrus, Cinnamon , Garlic, Sugarcane, Ginger , Turmeric, Potato, fresh vegetables , goat keeping , fruits, dairy</td>
</tr>
<tr>
<td>Soybean</td>
<td>Onion</td>
</tr>
</tbody>
</table>

**Attractiveness Matrix for Short Listing of Potential Value Chains**

**Market Demand and Growth Potential/ Employment Generation Potential**

- **High**
- **Medium**
- **Low**

**Potential to Impact no of Beneficiaries**

- **Low**
- **Medium**
- **High**
## Ranking Matrix

### Value Chain

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Chiuri</th>
<th>Rittha</th>
<th>Amala</th>
<th>Chiraila</th>
<th>Spices</th>
<th>Vegetables</th>
<th>Fruits</th>
<th>Dairy</th>
<th>NTFP</th>
<th>Bee Keeping</th>
<th>Goat Farming</th>
<th>Potato</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential for employment generation (5)</td>
<td>5x4 = 20</td>
<td>15</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>20</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Potential to address GESI (3)</td>
<td>3x4 = 12</td>
<td>12</td>
<td>20</td>
<td>12</td>
<td>12</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Potential for private sector investment (3)</td>
<td>3x4 = 12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>9</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Market price (4)</td>
<td>4x3 = 12</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>16</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>16</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Market Demand (4)</td>
<td>4x5 = 20</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Prospects of value addition at local level (3)</td>
<td>3x5 = 15</td>
<td>12</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Resource availability, sustainability (5)</td>
<td>5x5 = 25</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Technical knowledge and technology (4)</td>
<td>4x3 = 12</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>16</td>
<td>12</td>
<td>8</td>
<td>16</td>
<td>4</td>
<td>8</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Local interest (5)</td>
<td>5x5 = 25</td>
<td>15</td>
<td>20</td>
<td>20</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Potential to contribute in Nutrition (3)</td>
<td>3x3 = 9</td>
<td>3</td>
<td>9</td>
<td>-</td>
<td>12</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td>15</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Physical infrastructure (3)</td>
<td>3x5 = 15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>9</td>
<td>15</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Climate Friendly (2)</td>
<td>2 x1 = 10</td>
<td>20</td>
<td>10</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Total weight</td>
<td>212</td>
<td>179</td>
<td>197</td>
<td>175</td>
<td>187</td>
<td>177</td>
<td>166</td>
<td>171</td>
<td>132</td>
<td>160</td>
<td>147</td>
<td>152</td>
</tr>
<tr>
<td>Ranking</td>
<td>I</td>
<td>IV</td>
<td>II</td>
<td>VI</td>
<td>III</td>
<td>V</td>
<td>VIII</td>
<td>VII</td>
<td>XII</td>
<td>IX</td>
<td>XI</td>
<td>X</td>
</tr>
</tbody>
</table>
## Selected Value Chain

<table>
<thead>
<tr>
<th>Rank</th>
<th>Value Chain</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>*Chiuri</td>
<td>212</td>
</tr>
<tr>
<td>2</td>
<td>*Amala</td>
<td>197</td>
</tr>
<tr>
<td>3</td>
<td>Spices</td>
<td>187</td>
</tr>
<tr>
<td>4</td>
<td>*Rittha</td>
<td>179</td>
</tr>
<tr>
<td>5</td>
<td>Vegetable</td>
<td>177</td>
</tr>
<tr>
<td>6</td>
<td>*Chiraita</td>
<td>175</td>
</tr>
<tr>
<td>7</td>
<td>Dairy</td>
<td>171</td>
</tr>
<tr>
<td>8</td>
<td>Fruits</td>
<td>166</td>
</tr>
<tr>
<td>9</td>
<td>Bee Keeping</td>
<td>160</td>
</tr>
</tbody>
</table>

Chiuri, Rittha and Amala found in same habitat.

*All are forest crops. Chiraita can cultivate Beekeeping can do together with Chiuri
CHIURI VALUE CHAIN

Marma I Paribagad, Junde
Introduction

- Deciduous, medium size tree about 20 meters height native to Nepal.
- Nepali Name: Chiuri; English Name: Butter tree and Botanical Name: *Diploknema butyracea*
- The tree produces flowers from November to January and fruits from April to June and propagates by seeds.
- It grows mainly in the sub-Himalayan tracts on steep slopes, ravines and cliffs at an altitude of **300 to 1500 meters from east to west Nepal. (52 districts)**
- The main product of the tree is ghee or butter, extracted from the seeds and popularly known as “Chiuri butter”.

[Map of Nepal showing resource availability of Chiuri in Nepal]
Availability and Distribution

- The total number of Chiuri trees in Nepal is estimated to 10.8 million with 5.6 million trees at the fruit bearing stage.
- Estimated quantity of Chiuri seeds in Nepal is 94,000 MT with the potential to produce 37,000 MT of butter per year.
- There is a vast potentiality in terms of resource availability to produce Chiuri butter in Nepal.

### Seasonal Calendar

<table>
<thead>
<tr>
<th>Activities</th>
<th>Months/Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit Collection</td>
<td>Apr/May</td>
</tr>
<tr>
<td>Drying</td>
<td>May/Jun, Jun/Jul, Jul/Aug</td>
</tr>
<tr>
<td>Oil processing</td>
<td>Aug/Sep, Sep/Oct, Feb/Mar</td>
</tr>
</tbody>
</table>

Source: MEDEP 2010, HBTL 2015
Current Annual Production of Chiuri Butter
Approx. 30-40 MT

Domestic consumption

- Estimated to 18-25 MT per year
- Mainly as a cooking oil in rural parts of Nepal, soap and candle manufacturing (Monasteries)

Export

- Approximate 10-12 MT (EU, US, Japan)
- R&D on product development and testing is ongoing
- Kathmandu traders are trying to positioning Chiuri products in international market
Commercial uses of Chiuri Butter

- Chiuri butter can be used as an alternative to 
  Shea butter in the cosmetics industry for skin and hair related products.
- Pharmaceutical
- Confectionery
- Candle manufacturing
- Soap making and raw materials for other cosmetics
Key Finding: Chiuri Value Chain

Chiuri tree in Marmati, Marma -4
Local Uses: Chiuri as a Multipurpose Tree

- Pulp: consumed as a refreshing juice and provides significant nutritional value
- Butter: used as a cooking oils
- Cake: used to treat rheumatic pain, indigestion and skin infections
- By-product: used as manure and organic pesticide
- Timber is used for door and widow making
- Leaves: used as fodder and bedding materials
Local Processing Technology

1. Raw Seed
2. Boiling and Removal of Seed Coat
3. Heating the Okhal
4. Roasting
5. Beating/Crushing the Roasted Seed
6. Oil Collection
7. By Product (Oil Cake)
8. Repeated the Process Again Steps 3, 5 and 6
## Processing with Mustard Oil Expeller

<table>
<thead>
<tr>
<th>Roasted seeds cotyledons</th>
<th>Oil extraction with expeller</th>
</tr>
</thead>
</table>

Service Charge: NRs 20-25 rupees/kg of roasted seed, Expelled approx 6 ton/year
### Estimation: Approx. no of Trees and Quantity of Seed Collection

<table>
<thead>
<tr>
<th>SN</th>
<th>Name of the village/pocket (1)</th>
<th>No of HHs (2)</th>
<th>Estimated no of Tree (3)</th>
<th>Quantity of seed collection (ton) (4)</th>
<th>Total amount roasted seed in ton (80% of No 4)</th>
<th>Total amount of ghee production in ton (50% of No 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Judi, Parbisa, Darma, Paribagad,</td>
<td>95</td>
<td>800</td>
<td>7</td>
<td>5.6</td>
<td>2.8</td>
</tr>
<tr>
<td>2</td>
<td>Shim, Daang, Oangada, Chaudeli, Laubisa, Okhadan, Chhayanpani, Ghopte</td>
<td>32</td>
<td>125</td>
<td>1</td>
<td>0.8</td>
<td>0.4</td>
</tr>
<tr>
<td>3</td>
<td>Chiurani, Badhure, Bhadi, Kopare, Nalbagad</td>
<td>74</td>
<td>600</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Padpada /tapoban, Madda</td>
<td>180</td>
<td>1500</td>
<td>13</td>
<td>10.4</td>
<td>5.2</td>
</tr>
<tr>
<td>5</td>
<td>Bajhkot, Dharigand, Bimti, Simalta</td>
<td>120</td>
<td>1800</td>
<td>14</td>
<td>11.2</td>
<td>5.6</td>
</tr>
<tr>
<td>6</td>
<td>Marmati, Baban, Pantbagad, tak</td>
<td>95</td>
<td>2000</td>
<td>17</td>
<td>13.6</td>
<td>6.8</td>
</tr>
<tr>
<td>7</td>
<td>Melbisha, Bhorau, Ganedi, Linktad, Thulisalli, Maliseri, Seri, Dhadiya, Jayathala, Ghat, Siroli, Chhipan</td>
<td>156</td>
<td>4360</td>
<td>32</td>
<td>25.6</td>
<td>12.8</td>
</tr>
<tr>
<td></td>
<td><strong>Total (9 pockets from 39 village)</strong></td>
<td><strong>752</strong></td>
<td><strong>11185</strong></td>
<td><strong>89</strong></td>
<td><strong>71.2</strong></td>
<td><strong>35.6</strong></td>
</tr>
</tbody>
</table>

**Other pockets:** Dethala, Chhola, Luita, Rajju, Chiuribagad (Naugand), Gotheudi, Dhulgada, Gokuleshower, Sarmoli, Rithachaupata, Bohorigoan, Shankarpur, Huti, Basedi, Hunainath, Dattu, Dhap, Khalanga, Bramadev: **approx 50 tons from 19 pockets**

- No of collectors/ HHs involved in Darchula: approx. 5000 HHs
- No of local Okhal: approx. 500
- No of small scale expeller: 2
- No of Local Koll: NA
- No of local level traders: NA
- No of district level traders: NA
- No of Manufacturers: NA
### SWOT Analysis of Chiuri Value Chain

#### STRENGTH
- Available abundantly in farm land
- Suitable geography and climate and easy propagation from seed
- Local processing skills and technology available
- Seed can store for long time
- Multipurpose tree
- Favorable policy

#### WEAKNESS
- Seed collected manually and time consuming, no seed collection technology adopted
- No appropriate technology available at local level for value addition and processing
- No idea about the possible range of Chiuri products and product diversification
- High cost of international organic certification (FSC, ECOCERT, USDA, ……)

#### OPPORTUNITY
- Road access
- Rural Municipality priority sector
- Support available from RVWRMP
- Possible to value addition and processing at local level
- Good demand of butter and soap both in local, national and international market
- Employment generation at local level

#### THREATS
- Difficult to meet quality standard required to export
- Bank may not ready for investment
- Fluctuation of production due to seed year
Example: Audit mission of Auracasia (US based company) on Good Agriculture and Collection Practices (GACP) of Rittha for USDA Certification of National Organics Private Limited Kathmandu
Chiuri Value Chain Map and Area of Upgrading: Marma Rural Municipality

Domestic market and Export: Not available

Retailing: 

Processing and manufacturing: 

Processing at local level:

Seed collection:

Raw material supply:

Approx 5% of total collection, NRs 50/Kg

Local Okhal: approx 400
Expelled approx 15 ton
roasted seed/year

Local farmers/collectors: approx. 2000 HHs

No of micro enterprise
eg soap making: 0
No of expelling Koll: 0

Local level Mustered
expeller: 2; Expelled
roasted seed approx. 6
 ton/year

Farm Land

Community and Government Forest

Sector Forest Office

WDO, DCSEO, NGOs

DCCI, ……..

Business Support Organization

MoC, TEPC, DPR, ……..

Not available

Not available

Approx 6 ton/year

Expelled approx 15 ton
roasted seed/year

Approx 400

Local farmers/collectors: approx. 2000 HHs

Local Okhal: approx 400

Expelled approx 15 ton
roasted seed/year

Local level Mustered
expeller: 2; Expelled
roasted seed approx. 6
 ton/year

No of micro enterprise
eg soap making: 0
No of expelling Koll: 0
# Chiuri Based Enterprise Planning and Upgrading Strategy
*(Where we are now?)*

<table>
<thead>
<tr>
<th>Identification of Value Chain</th>
<th>Value Chain Mapping</th>
<th>Preparing Market Map</th>
<th>Upgrading Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free Listing</td>
<td>✓ Qualitative tools</td>
<td>✓ Relationship of actors</td>
<td>✓ Finalization of business model</td>
</tr>
<tr>
<td>Attractiveness matrix</td>
<td>✓ Focus group discussions</td>
<td>✓ Key constraints and opportunities</td>
<td>✓ End market visioning</td>
</tr>
<tr>
<td>Ranking Matrix</td>
<td>✓ Identifying role and function of actors</td>
<td>✓ Estimation of total production</td>
<td>✓ Firm level upgrading</td>
</tr>
<tr>
<td>Investment Perspective</td>
<td>✓ Value addition</td>
<td>✓ Relationship of actors</td>
<td>✓ Product</td>
</tr>
<tr>
<td>Employment Perspective</td>
<td>✓ Market Price</td>
<td>✓ Key constraints and opportunities</td>
<td>✓ Process</td>
</tr>
<tr>
<td>Market Demand</td>
<td>✓ Market Demand</td>
<td>✓ Estimation of total production</td>
<td>✓ BDS including financial services</td>
</tr>
<tr>
<td>Value addition</td>
<td>✓ Value addition</td>
<td>✓ Relationship of actors</td>
<td>✓ Business plan: Chiuri processing enterprise</td>
</tr>
<tr>
<td>Resource availability</td>
<td>✓ Resource availability</td>
<td>✓ Key constraints and opportunities</td>
<td>✓ Area of project intervention</td>
</tr>
<tr>
<td>Local Interest</td>
<td>✓ Local Interest</td>
<td>✓ Estimation of total production</td>
<td>✓ Sustainability strategy and exit strategy</td>
</tr>
<tr>
<td>Project perspectives</td>
<td>✓ Project perspectives</td>
<td>✓ Relationship of actors</td>
<td>✓ Sustainability strategy and exit strategy</td>
</tr>
<tr>
<td>Technical Knowledge</td>
<td>✓ Technical Knowledge</td>
<td>✓ Estimation of total production</td>
<td>✓ Sustainability strategy and exit strategy</td>
</tr>
</tbody>
</table>
Preliminary Recommendation

**Option A**
- Establish a cooperative that deals with Agri. business in share holding basis in PPP model
- Also include the pocket areas other than Marma Rural Municipality
- Soap manufacturing in local level targeting to local market, Ghee sell to Kathmandu based traders
- Area Expansion: Chiuri plantation in fallow land both in personal and community forest

**Option B**
- Establishment of a private company in share holding basis in PPP model
- Also include the pocket areas other than Marma Rural Municipality
- Soap manufacturing in local level targeting to local market, Ghee sell to Kathmandu traders
- Area Expansion: Chiuri plantation in fallow land both in personal and community forest
NTFPs /MAPs TRADE : CURRENT PRACTICES OF NEPAL

Indian, American and European Companies selling to Retail Stores

National and International Wholesale

Local Traders

Regional Traders

Local Farmers/Collectors

Local Farmers/Collectors
Value addition and trade form one big cooperative

OR

Company

National and International Manufacturers and Retailers

Regional Traders

Local Traders

Individual SMEs, entrepreneurs, collectors
Some Glimpse of Other Promising Sector

Soap nut
Sustainable Harvesting of Wild Aromatic Herbs and Distillation to Produce Essential Oils

<table>
<thead>
<tr>
<th>SN</th>
<th>Company</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Provital-France</td>
<td>France</td>
</tr>
<tr>
<td>2</td>
<td>NATEVA</td>
<td>France</td>
</tr>
<tr>
<td>3</td>
<td>Fytosan</td>
<td>France</td>
</tr>
<tr>
<td>4</td>
<td>Golgemma</td>
<td>France</td>
</tr>
<tr>
<td>5</td>
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<td>Azelis</td>
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<td>Italy</td>
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<td>10</td>
<td>Maharishi Ayurved</td>
<td>Netherlands</td>
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<tr>
<td>11</td>
<td>Union Nature Phyto-Inc/Divine Essence</td>
<td>Canada</td>
</tr>
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</table>

Potential: Abies oil, Anthopogon oil, Artemisia oil, Juniper berry oil, Juniper needle oil, Jatamansi oil, Valerian oil
Other Potential Wild Herbs for Sustainable Management and Cultivation

Chiraita  
Timur  
Seabuckthorn  
Kutki  
Sugandhawal
Distinctive Local Faces Met During the Field Visit
Team Work Wins the Game

Thank You