PROMOTING ENTREPRENEURSHIP (LIVELIHOOD) & HUMAN WELFARE

FOCUS ON HIMALAYAN REGION

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INDIAN HIMALAYAN REGION

A DISTINCTIVE CLIMATE OF ITS OWN THAT INFLUENCES THE CLIMATE OF MAJOR AREAS OF ASIA

11: HIMALAYAN MOUNTAIN STATES

4% OF THE INDIAN POPULATION LIVES IN THE MOUNTAIN STATES

Indian Himalayan region (IHR), supports nearly 50% of the total flowering plants in India of which 30% flora is endemic to the region consisting of:

- **816 tree species**, 
- **675 edibles part species**
- **1743 species of medicinal value**
The Himalayas has the third largest amount of ice and snow, after the poles. Glacial network feeds Asia’s major rivers including the Ganges, Indus & Brahmaputra. The Himalayas are not only a remarkable expanse of natural beauty, but are also crucial for survival of inhabitants.
MAINTAINING THE ECOLOGICAL INTEGRITY OF THESE MOUNTAIN RANGES IS NOT ONLY

• IMPORTANT FOR THE WELLBEING OF THE HIMALAYAN PEOPLES,

• BUT THE DESTINY OF THE INDIAN SUBCONTINENT ITSELF IS DIRECTLY LINKED TO THE HEALTH OF THE HIMALAYAS (RAMAKRISHNAN et al. 1994).
MAJOR CHALLENGES OF HIMALAYAN REGION

- Land Degradation & Deforestation
- Invasive Species Infestation
- Forest Fires
- Water Scarcity
- Increasing Waste Land
- Poor Infrastructure & Market
- Limited Employment Opportunities
- Soil Erosion & Decline in Fertility
- Declining Biological Richness
## DEVELOPMENT OPPORTUNITIES AND CHALLENGES IN HIMALAYAN REGION

<table>
<thead>
<tr>
<th>CHALLENGES</th>
<th>EFFECTS OF GEOGRAPHIC SPECIFICITY</th>
<th>OPPORTUNITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limitations for agriculture</td>
<td>Harsher climate</td>
<td>Potential for renewable energies</td>
</tr>
<tr>
<td>Transport infrastructure limited</td>
<td>Rough terrain</td>
<td>Eco-Tourism potential</td>
</tr>
<tr>
<td>Access to services costly</td>
<td>Population densities</td>
<td>Biodiversity repository</td>
</tr>
<tr>
<td>Fewer employment &amp; education opportunities</td>
<td>Significant area under forest cover</td>
<td><strong>FOREST BASED ENTERPRISE</strong></td>
</tr>
<tr>
<td>Unbalanced demography</td>
<td>Origination of Major rivers</td>
<td>Climate Change adaptation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Attractive living area</td>
</tr>
</tbody>
</table>
NICHE SECTORS IN THE HIMALAYAS FOR FOREST BASED LIVELIHOOD OPTIONS

✓ VISUAL & PERFORMING ARTS
✓ ECOTOURISM
✓ HANDLOOM & HANDICRAFTS
✓ MEDICINAL & AROMATIC PLANTS
✓ AGRO-FORESTRY BASED PRODUCTS
✓ NURSERIES
MAJOR ISSUES IN FORESTRY SECTOR

- Sustainable management of ecosystems
- Climate change adaptation and mitigation
- Biodiversity conservation
- Livelihood generation

☑️ Research & Development
☑️ Technology Transfer
☑️ Capacity Building

Sustainable management of ecosystems
TECHNOLOGY HAS THE POTENTIAL TO PROVIDE SUSTAINABLE SOLUTIONS TO THE NEGATIVE IMPACT OF CONTEMPORARY DEVELOPMENT

SPECIFIC INTERVENTIONS BY BLENDING OF TRADITIONAL WISDOM AND TECHNOLOGIES
ENTERPRISES DEVELOPMENT

✓ SAMRIDDHI-SERICULTURE
✓ DISTILLATION UNIT FOR EXTRACTION OF ESSENTIAL OILS
✓ BAMBOO BASED ENTERPRISES
✓ MUSHROOMS-CULTIVATION
  • KIRAJARI (Cordyceps sinensis)
  • LAL KHUMBI (Ganoderma lucidum)
✓ MEDICINAL PLANT PROPAGATION TECHNIQUES
✓ GENETIC IMPROVEMENT
✓ NATURAL DYES FOR COTTAGE INDUSTRIES
✓ AGROFORESTRY
SAMRIDHI- WAS SUCCESSFUL IN DEALING WITH THE PROBLEMS FACED BY THE SILKWORM FARMERS.

INCREASE IN GOOD QUALITY COCOONS FROM AN AVERAGE 50% TO 95%.

FARMERS OF CHAKARATA AND DEHRADUN HAVE USED THE TECHNOLOGY WITH OUTSTANDING SUCCESS.
Background

Aromatic crops, viz- Lemon grass, Citronella, Eucalyptus hybrid and Eucalyptus citriodora are in great demand in present days. Steam distillation of these crops produce valuable fragrant products- called essential oils, which find use in soap industry, perfumery, cosmetic, drugs etc. The essential oil industry generally uses conventional distillation units that are mostly installed in places where water and fuel wood resources are easily available. But high cost of transportation of bulky raw material from field to industry and other constraints of local need have hindered installation of more distillation units.

People living in rural areas and adjacent to forest areas grow aromatic plants of commercial importance on their lands as well as collect the plant products from forests. However, the economic gains from this activity are very limited as there are problems of transporting raw material to the place of distillation. In many cases, growers have developed their own traditional units for this purpose. These units are traditional, simple, low cost and locally fabricated, but have the disadvantages of being non-portable, with higher distillation losses with respect to quality and quantity.

- FOR FARMERS AND SMALL SCALE DISTILLERS
- IT REDUCES EFFORTS AND COST
- INCREASE IN OIL YIELD BY ABOUT 30% DUE TO MODIFIED CONDENSSER SYSTEM
- DURATION OF DISTILLATION OPTIMIZED
- MAXIMUM YIELD DUE TO 100% CONDENSATION OF VAPOUR WITHOUT LOSS
Chemical seasoning of bamboo for handicrafts:

- **Chemical Seasoning of Round Bamboo for Handicrafts**
- An Initiative of FRI, Dehradun

Green bamboo may contain 50-150% of moisture. As wood, seasoning of bamboo is necessary before its utilization. Seasoning of round bamboo poses considerable problems in several species of bamboo. Many species of bamboo are less liable to surface cracking during drying. Some species of Bambusa tuldoides and Dendrocalamus strictus crack more than the others. Unlike timbers, drying under conditions cannot always prevent cracking in round bamboo, splitting, surface cracks, and cracking at the nodes and problems faced during air-drying even at slow rate of drying and mild weather. Due to these problems, artisans and these species of bamboo for novelty items like flower lamp holds etc.

Chemical seasoning of bamboo solves the problem of cracks and wrinkles in bamboo, besides protection. Chemical seasoning of round green bamboo has been done to avoid surface cracks, splitting, and fungal discoloration. Wood Products Division of FRI has developed methods of chemical seasoning, which are especially suitable for local wood, and can be easily adopted by rural artisans to improve the durability and utilization of the bamboo, resulting in higher yields and value addition from the products.

**Sap Displacement:**
- The sap of bamboo is replaced by preservative.

**Boucherie Process:**
- Preservative is pumped through the bamboo.

**Diffusion Process:**
- Culms are fully immersed in preservative.

**Hot and Cold Process:**
- Bamboo is kept in hot preservative for 2-3 hrs.

**Automized Boucherie Process:**
- For treatment of 24 bamboos developed and patented.

**Full Cell (Bethel) Process:**
- Preservative is forced into the bamboo under high pressure.
BASKETRY FROM RINGAL

Livelihood for Women through various types of baskets and Handicrafts from Ringal and Nirgal (*Arundinaria* spp. & *Calamus* spp.)
HANDICRAFTS FROM RINGAL
MUSHROOMS-CULTIVATION

Cordyceps sinensis
(Kirajari)

Disclaimer: Before putting the technology to commercial use, the mammalian safety must be ascertained.

Ganoderma lucidum
(Lal Khumbi)

Ganoderma lucidum, also known as Reishi, Ling chih, Ling zhi is an interesting shelf fungus that is important as a medicine in the Far East. In places such as China, Japan and Korea, G. lucidum is of particular interest because of its properties that includes nourishing, supplementing, toning and removing toxins, dispersing accumulation. It is indicated for neurasthenia, nervousness, dizziness, insomnia, high blood pressure, high cholesterol, chronic hepatitis, cancer, AIDS/ARC, nephritis, bronchial asthma, allergies, pneumonia, stomach disease, coronary heart disease, diabetes, angina, mushroom poisoning, fatigue, and for enhancing longevity. Ganoderma is often classed as an adaptogen (a substance that aids the body in resistance against a wide range of physical, biological and environmental stresses, with no harmful side-effects and no deleterious drug interactions). The mushroom, also called Lal Khumbi in hindi, has a long history of being used as an herbal remedy. More recently, it has been shown to be effective in scavenging hydroxyl radicals in blood plasma. It has been reported to be effective in scavenging diseases, cleansing toxin, regulating body functions, ensuring recovery of health and preserving youthfulness.

Cultivation of mushrooms is very easy and yields good returns, because of their ability to grow on agricultural wastes, as well as requiring less area for cultivation. Mushroom cultivation adds an important dimension to diversification of agriculture for higher returns. While the button mushroom (Agaricus bisporus) is the most commonly cultivated mushroom, other species such as Oyster (Pleurotus spp.) and paddy straw mushroom (Volvariella volvacea) are gaining a lot of popularity.

However, as the frontiers of food and medicine overlap, the demand for more and more medicinal mushrooms is on the rise.

MUSHROOMS - CULTIVATION FOR IMPROVED LIVELIHOODS
AN INITIATIVE OF FRI, DEHRADUN

Mushrooms are the bounty of nature and have been prized as delicacies since ages. About 2000 species of fungi have been documented to be used wereld by many tribes and societies. They possess excellent food value, being full of protein containing all-21 amino acids, besides being a rich source of vitamins and minerals. Mushroom protein is superior to vegetable proteins and is easily digestible. They constitute an important source of improvement in diets as a solution to malnutrition. Due to presence of starch, low calories, low fat and high protein content, they are a ‘source of diabetic patients’.

Oyster Mushroom (Dhingh) grown in Bamboo culms

The Forest Pathology Division of...
SUSTAINABLE INCOME GENERATION THROUGH MEDICINAL PLANTS PROPAGATION
AN INITIATIVE OF HFRI, SHIMLA

ORGANIC AND SUSTAINABLE FARMING OF MEDICINAL PLANTS
AN INITIATIVE OF FRI, DEHRADUN
NATURAL DYES have been associated with human life since time immemorial and extensively used in staining hides, decorating shells and feathers, cave paintings and coloring textile fibers. Traditionally, dyes were obtained from flowers, nuts, berries and other forms of vegetable and plant life, as well as from mineral and animal sources. Before the nineteenth century, only natural dyes were used for dyeing various articles. Since the advent of widely available, cheaper, bright and fast shade producing synthetic dyes, the use of natural dyes declined to a great extent. Due to growing global awareness about eco-friendly 'green' products including textiles, the demand for natural dyes is nowadays increasing. In India and other countries, coloration of textiles using natural dyes has been done mainly by craftsmen, khadi & village industries, small scale exporters having high monetary value textiles, small scale dyeing units, NGOs etc. However, in near future, the products with natural colours are projected to have an increased demand, not only for the safety of health and environment but also for their beauty and novelty, for which some efforts are needed, such as to find natural dyes having bright and fast shades at reasonable price.
# Fibre Extraction for Cottage Industries

**HEMP/SUN HEMP**

<table>
<thead>
<tr>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO- TEXTILES</td>
</tr>
<tr>
<td>PULP &amp; PAPER</td>
</tr>
<tr>
<td>COMPOSITES</td>
</tr>
<tr>
<td>BUILDING MATERIAL</td>
</tr>
<tr>
<td>ANIMAL BEDDING</td>
</tr>
<tr>
<td>EDIBLE OIL</td>
</tr>
<tr>
<td>PERSONAL CARE PRODUCTS</td>
</tr>
<tr>
<td>INDUSTRIAL FLUIDS</td>
</tr>
<tr>
<td>PESTICIDE, etc.</td>
</tr>
</tbody>
</table>
LIVELIHOOD THROUGH LOCALLY AVAILABLE FRUITS

Zanthoxylum armatum DC (TIMRU)
USES:
✓ Leaves are cooked as Vegetable
✓ To make Chutney
✓ flavouring the food dishes
✓ Aromatic essential Oil (Linalool -28.9 %)
✓ High Nutritive Value – Protein, Mineral matters and Vitamin C
Hippophae salicifolia D.Don
Common Name: SEABUCKTHORN

USES:
- Juice
- Marmalade
- Syrup
- Fruits are rich in Vitamin C
- Fatty oil is a source of Vitamin E
Myrica esculenta Buch. –Ham. Ex. D.Don.
Common Name: KAPHAL
Rhododendron arboreum Sm.
Common Name: BURANS
**Rubus ellipticus** Smith
Common Name: HISALU, HISRA

**USES:**
- For making Juice, Jam, Sauce and Syrup
- For treating diabetes, diarrhoea, dysentery, healing wound and as anti-fertility agent
LIVELIHOOD THROUGH FOREST NURSERIES

Ornamental Plants

Vermi Composting

Medicinal Plants

Seedlings of Multi Purpose Tree Species
GREEN EMPLOYMENT OPPORTUNITY
USES:
✓ For making furniture, baskets, etc. from lantana stems
GENETIC IMPROVEMENT

WORKING FOR
IMPROVEMENT OF
ACTIVE CONSTITUENTS IN
MEDICINAL PLANTS
SPECIES: for example
*Asparagus racemosus*,
*Acorus calamus*, etc.
Various models of Agroforestry in Hills and Plains can be established to produce wood for plywood and paper industries, medicinal plants, spices, etc. Successfully practiced for increasing forest cover.

**BENEFITS OF AGROFORESTRY SYSTEMS**

- **ENVIRONMENTAL**
- **ECOLOGICAL**
- **SOCIO-ECONOMIC**

**Soil Conservation**

**Crop Cultivation**

**Eucalyptus + Wheat cultivation**
Source of Plywood, Pulpwood and Round wood

Eucalyptus + Soyabean

Windbreaks

Apiculture
LIVELIHOOD FROM PINE FOREST

Briquettes from Pine Needles

Timber Production

Chilgoza Pine Seeds

Plywood Veneer Production

Resin
Making up for the lost opportunity of utilizing the Forest Resources through COMMUNITY INCOME
STRATEGIES FOR ACTION

- Facilitate access of resources & sustainable harvesting
- Promote development of local institutions (SHGs etc)
- Capacity building
- Product value addition
- Access to credit and finance (micro-credits)
- Promote and establish market linkages
Thank You