

Cross-Learning from the Himalica Project in the Kangchenjunga Landscape

15–16 October 2017, Taplejung, Nepal

Organised by

International Centre for Integrated Mountain Development (ICIMOD)
Environment Conservation and Development Forum (ECDF)



About ICIMOD

The International Centre for Integrated Mountain Development, ICIMOD, is a regional knowledge development and learning centre serving the eight regional member countries of the Hindu Kush Himalaya – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan – and based in Kathmandu, Nepal. Globalisation and climate change have an increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people. ICIMOD aims to assist mountain people to understand these changes, adapt to them, and make the most of new opportunities, while addressing upstream-downstream issues. We support regional transboundary programmes through partnership with regional partner institutions, facilitate the exchange of experience, and serve as a regional knowledge hub. We strengthen networking among regional and global centres of excellence. Overall, we are working to develop an economically and environmentally sound mountain ecosystem to improve the living standards of mountain populations and to sustain vital ecosystem services for the billions of people living downstream – now, and for the future.



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Background

The 'Support to Rural Livelihoods and Climate Change Adaptation in the Himalayas (Himalica)' Project has been implemented by ICIMOD in collaboration with partner organizations across the Himalayas (Bangladesh, Bhutan, Myanmar, Nepal and Pakistan) and funded by the European Union (EU). Himalica is a demand-driven project and focuses on developing national and regional capabilities to adapt policies impacting on mountain rural livelihoods, conducting collaborative action research in relation to mountain livelihoods and ecosystems, and piloting activities in a collaborative and integrated manner to strengthen the resilience of mountain men and women. In Taplejung, Nepal, the pilot as well as action research activities have been implemented to address some of the issues identified by Kangchenjunga Landscape Conservation and Development Project (KLCDI) in large cardamom-alder agroforestry system. It uses 'climate-resilient value chain development approach' as an entry point to build the resilience of farming systems for transformative change. The approach is guided by a 'social-ecological system' perspective that acknowledges the symbiotic 'nature-people' relationship in the mountains.

The Himalica programme is coming to an end in December 2017 and we believe that it is an opportune time to share the learning generated by the piloting and action research activities with stakeholders. The regional workshop for cross learning from the Himalica project in the Kangchenjunga Landscape was organized for this purpose.

The main objective of the regional workshop was to bring all relevant stakeholders from Nepal, India and Bhutan onto one platform for sharing stories, lessons and experiences on building community resilience and improving rural livelihoods in the context of climate change adaptation in the Himalayas and enhance cross country learning and scaling up to other districts in Nepal, India and Bhutan. However, no one from Bhutan could join.



Workshop Proceedings

The regional workshop was organized over a two-day period from 15–16 October 2017 in Taplejung, Nepal. On day one the key activities of the workshop included: thematic presentations and discussion on large cardamom related topics; video screening on climate- resilient practices on large cardamom farming followed by farmers' panel discussion; visit to the marketplace and information centre. All sessions included interactive discussions for more clarification and understanding. Day two was dedicated to field visit to demo farms, common facility centre, home stays, and the Taplejung Himalica gift shop; and review and reflection session followed by closing and discussion of a way forward.

Opening Session

Surendra Raj Joshi, Himalica programme coordinator, ICIMOD, welcomed all the participants to the workshop. Dr Joshi explained that ICIMOD, a regional intergovernmental organization, works for mountains and people in eight countries of the Hindu Kush Himalayas (Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan). He then stated that the EU-funded Himalica project is ongoing in five countries of the region, including in Udayapur and Taplejung districts in Nepal. He shared the key achievements of Himalica interventions in the region, and shared the overall approach and process followed for project implementation. He also stressed that farmers in Taplejung are over-dependent on large cardamom but the market price and production are unreliable. Therefore, managing risks and building resilience through livelihood diversification and capacity building of local stakeholders including farmers are key areas considered for Himalica pilot project. He then asked how we can upscale best climate-resilient practices of large cardamom, and also how to take those best practices to policy level, which would need to be discussed further during the two-day workshop.

Chitra Kumari Limbu, Member, Inter-Party Women Network, emphasized that market forces are outside the control of the farmers, so the private sector and government have a vital role in promoting domestic market for large cardamom in Nepal. She also lauded Himalica for doing exemplary work in this direction and thanked the organizers for inviting her to the workshop.

Narhari Bhandari, Local Development Officer, Taplejung, thanked ICIMOD and ECDF for organizing the workshop in Taplejung. Mr. Bhandari said that Taplejung is the biggest producer of large cardamom in Nepal but its price has been declining day by day. He suggested having a serious discussion on various issues related to large cardamom along with lessons learnt from Himalica pilot project and find ways for up-scaling. He also recommended the government to address the issue of market price in the international market through bilateral talks.

Ghanashyam Sharma, Programme Manager, the Mountain Institute, India, reminded everyone that the workshop was going to be very important for understanding issues facing agrobiodiversity in general and large cardamom in particular. He also noted that Sikkim, India and Taplejung, Nepal can learn much from each other and wished good luck to everyone present at the workshop.

Bam Bahadur Bhattarai, Deputy Mayor, Phungling Municipality, Taplejung, called on all to be greedy to learn and generous to share experiences and knowledge during the two-day workshop. Mr. Bhattarai commended ICIMOD and ECDF for facilitating the development of a five-year agricultural development strategy for Phungling Municipality. The strategy emphasizes the promotion of agro-tourism and institutionalizing good practices for raising the living standards of large cardamom farmers. He further stressed that large cardamom farmers from Taplejung are struggling to learn more about new methods and modern ways of doing things and minimizing risks associated with climate change, diseases and pests and also market forces.

Pradeep Basnet, Nepal Tourism Board, Government of Nepal, expressed his wish that the workshop participants would discuss potential ways of promoting agro-tourism in the Kangchenjunga Landscape. He said that the government of Nepal has accorded top priority to the tourism sector, which surely contributes to the lives and livelihoods of local farmers in Taplejung. He then called for a discussion on how various stakeholders can work together to implement innovative agro-tourism ideas like spice garden tourism in Taplejung.

Kishor Chandra Gautam, Regional Director, Forest Directorate, Eastern Region, Government of Nepal, noted that there are three things in Taplejung that can be harnessed to make the district prosperous. These are water resources, agriculture, and tourism. He further explained that large cardamom is the main source of income for farmers in Taplejung. However, sustainable production and price stability are questionable. Mr. Gautam called on all to come up with some sort of solutions to stabilize large cardamom prices and make cardamom production sustainable.

Hasta Bista, Regional Director, Agriculture Directorate, Eastern Region, Government of Nepal, recalled that large cardamom was first introduced in Taplejung via Sikkim around 1865, but large-scale cultivation started in 1955. He mentioned that cardamom development centre, Ilam has been instrumental in spreading large cardamom farming in eastern Nepal. Large cardamom at present is growing in more than 40 districts, benefiting some 70,000 households. About 12 million dollars' worth of large cardamom is exported annually. The Government of Nepal is providing subsidies on saplings and fertilizers to farmers. The government is also promoting distribution of saplings from seeds and encouraging farmers to transfer cardamom stands after 15 years to another plot. At last Mr. Bista urged the government to talk bilaterally with India and other players to seek stability in large cardamom prices and wished the workshop success.

Pem Narayan Kandel, Joint Secretary, Ministry of Forests and Soil Conservation, Government of Nepal, explained that without understanding the local context and issues against the backdrop of climate change and other drivers of change, development will not be sustainable. He said that the 2030 SDGs agenda calls for sustainable mountain development, protection and conservation of mountain ecosystems, and improvement in rural livelihoods. He added that Himalica has identified relevant issues in the Kangchenjunga landscape, especially those related to large cardamom and climate change. Mr. Kandel stressed that the workshop was highly relevant and timely, and suggested that market price volatility be addressed bilaterally among countries working on large cardamom in the region. He also suggested documenting good stories and lessons from Himalica and integrating them into policies for wider up-scaling. He mentioned the need to produce value-added products and promote domestic consumption through marketing campaign and awareness raising. At last he said that the future of Taplejung is indeed bright due to opportunities offered by the abundance of natural resources.

Ghanendra Maden, Chief District Coordination Committee, Taplejung, also the chief guest at the workshop, opened the regional workshop and welcomed all the participants to Taplejung. He lauded Himalica for introducing a package of practices on large cardamom, conducting ecosystem services assessments, and introducing the concept of spice garden tourism in Taplejung. These practices are going to be important for resilience building and livelihood improvement of rural people in Taplejung. He stated that marketing and control of pests and diseases of large cardamom are important issues to be addressed for building resilience together. At last he wished the workshop success and everyone a good stay in Taplejung.

Kumar Siwa, Chairperson of the Environment Conservation and Development Forum, Taplejung, thanked all the workshop participants on behalf of the organizers. He then requested a greater level of participation from all and apologized for any inconveniences caused inadvertently.

Mobile Apps and Map Launches

Mr. Ghanendra Maden, chief guest at the workshop, also launched a mobile app and a map for promoting the Kanchenjunga spice garden tourism in Taplejung that was initiated in collaboration with the Trekking Agencies' Association of Nepal (TAAN), Wolfmatrix Pvt Ltd, and the ICIMOD Himalica programme. The mobile app and the map can be downloaded from www.spicegardentourism.com

Experience Sharing on the Himalica Project on Large Cardamom for Cross-Learning and Up-Scaling

Key Highlights of the EU-funded Support to Rural Livelihoods and Climate Change Adaptation Programme in the Himalayas by Surendra Raj Joshi, Himalica Programme Coordinator, ICIMOD:

- Himalica works in five countries – Nepal, Bhutan, Myanmar, Bangladesh, and Pakistan – with two key objectives: a) institutional strengthening and capacity building, and b) poverty reduction through income/livelihood diversification. The programme has five components: a) action research b) pilots c) knowledge management and communication d) policy support, and e) capacity building.

- Himalica pilot project on large cardamom value chain started in Taplejung in July 2015; its main thrust is resilience building and livelihood diversification in the context of climate change and outmigration.
- Himalica has moved beyond income generation toward resilience: climate-resilient technologies and practices; market and production risk management; micro-planning; improved natural resource management at the landscape level.
- Pilot project on large cardamom value chain development in Taplejung increased (almost doubled) yields by adopting a climate-resilient package of practices; promoted cardamom-based value-added products under the Himalica brand in domestic markets, cardamom-based products from fibre, intercropping kiwi, shitake mushroom with cardamom, cultivation of off-season vegetables in poly houses; promoted bee pollination in large cardamom farms, and spice garden tourism with homestay.
- Enhanced gender equality through gender analysis and women empowerment activities
- Strategies for out-scaling and up-scaling good practices and innovations are – landscape journey, strategic planning on agriculture development for Phungling municipality, community-led micro-planning, joint monitoring, regional exchange, exposure visits, evidence-based assessments, regional documentation, advisory committees, etc.

Climate-Resilient Practices for Promoting Sustainable Productivity of Large Cardamom by Harish Chilwal, Himalica Coordinator, ECDF, Taplejung

- 65% of households in Taplejung, except those in Olangchung Gola, are involved in large cardamom cultivation.
- Large cardamom is cultivated in 4500 hectares, producing 2490 metric tonnes per year in Taplejung.
- Large cardamom is used as a spice in biryani, pulau and meat, herbal tea, taste enhancer, cosmetics, cooling agent, Ayurveda, etc.
- Himalica pilot project on large cardamom value chain is benefitting 288 households in Phungling, Furumbu and Sikaicha areas, mobilizing 12 farmers' groups and one cooperative spread over areas situated at 900–2100 masl.
- Climate-resilient practices on large cardamom – related to soil/nutrients, water, energy, gender, knowledge, and weather have been piloted and promoted in Taplejung. It has contributed to increase in production to 23 kg/ropani from 13 kg.



- There are 12 demo plots in the pilot villages; 65% of total households have improved animal sheds; 22% households are involved in vermicomposting; 10% households are intercropping legumes in large cardamom farms; 86% of households are involved in testing new varieties of large cardamom; 99% of households have their own irrigation systems in place.
- Initiated livelihood diversification activities to minimize risks; established a common facility centre where women are involved mainly in production of value-added products.
- 12 students, including 5 girls, received training from the Council of Technical Education for Vocational Training (CTEVT).
- Cardamom drier designed by Pakhribas was found to be most efficient in terms of firewood use and time saving.
- Supported Phungling Municipality to develop a five-year agricultural development strategy plan.
- Lobbied to influence policies on monoculture, support drought, hailstorm, promote wire house for cardamom plants; rationalize insurance policy; reduce taxes on cardamom equipment, and provide adequate technical support to farmers.

Supporting Large Cardamom Farming and Marketing Using ICT Interventions by Sibjan Chaulagain, Managing Director, ICT for Agri. Pvt. Ltd. (IFAT), Kathmandu, Nepal

- Initiated a SMS service targeting 225 farmers in Taplejung under the Himalica pilot project
- The SMS service included information on market price, weather, and agriculture advisory services for sustainable production of large cardamom. Farmers can call cardamom experts in case of problems.
- Findings of the evaluation survey in three pilot areas of Taplejung are: a) most farmers are interested in daily market prices of large cardamom and call experts for SMS info service; b) most farmers are willing to pay for the SMS service even after the Himalica project ends.
- Newly elected local government of Phungling Municipality wants to support the continuation of the SMS service.
- A Memorandum of Understanding (MoU) has been signed with FLCEN to upscale the SMS info service piloted under the Himalica project to deliver market prices to farmers, entrepreneurs and traders across Nepal on a daily basis for a year. This will open up opportunities to provide training to farmers on grading their large cardamom.

ICT- Assisted Spice Garden Tourism in Taplejung by Bachchu Shrestha of TAAN and Suman Humagain of Wolfmatrix Pvt Ltd, Kathmandu, Nepal

- One hundred and fifteen thousand people visit Pathivara every year, but not many visit the Kangchenjunga Conservation Area.
- The key objective is to reduce farmers' livelihoods dependency on large cardamom by promoting spice garden tourism in Taplejung. This can be done by linking large cardamom activities to tourism. For this, capacity building of farming households on agro-tourism services such as homestays in their cardamom gardens is crucial.
- ICT service using android mobile apps, maps, brochures, digital media will be deployed to promote spice garden tourism in Taplejung.
- Capacity building trainings in English language, cooking and baking, mobile apps, and homestay management have been provided to farming households interested to take this up as a business.
- A total of 28 local trekking guides from Taplejung are trained in agro-tourism, including in the use of mobile apps.
- Flyers for Gumba Danda and Sattal Danda homestays will be produced and shared soon.
- Partnership with Nepal Tourism Board, private sector, the local government is the way forward for community-based agro-tourism in Taplejung.
- A website <www.spicegarden tourism.com> has been developed to promote the spice garden tourism in Taplejung. The website has blogs, content management system, analytics, homestay contacts, and promotes the following main destinations: spice garden tourism in Phungling, Sikaicha and Furumbu areas, Suketar, Siddi Danda, Sattal Danda, Gumba Danda, Pathivara, Tinjure-Milke-Jaljala and Kangchenjunga Conservation Area as well as activities such as local cultures, cuisines, homestays, cardamom activities, and local lifestyles.
- The website also provides information on how to reach Taplejung via different routes and means, including inquiries, chats, etc.



Market Potential of Large Cardamom Based Value-Added Products by Rabin Amatya, CEO-SABAH-Nepal

SABAH – SAARC Business Association of Home-based Workers – is an NGO and also a technical partner of the Himalica programme.

- SABAH mobilizes homeworkers into clusters, CFCs (common facility centre as a community owned business centre) and TFCs (trade facility centre) and provides business development support, brand building and market linkages.
- The status of large cardamom is not positive: market prices are declining and farmers are perhaps cheated by the middlemen.
- Nepal exports large cardamom pods to India and UAE.
- Farmers trained in post harvesting and grading and also in value-added products should be linked to buyers (e.g., hotels, coffee/tea houses).
- Kangchenjunga Himalica Agriculture Industry (KHAI), a registered company of local entrepreneurs, now operates CFC and Taplejung Himalica gift shop.
- Small value additions at each step of large cardamom value chain and product diversification (from pods to herbal tea, spice, wallets, and bags) followed with consumer awareness and education.
- SABAH-Nepal in collaboration with the Himalica programme of ICIMOD has launched a marketing campaign called 'cardamania' to promote different cardamom-based products.
- The Himalica brand can be an umbrella brand for products from Sikkim (India), Nepal, Pakistan, and Myanmar,
- The Nepal government is planning to export cardamom pods to international markets under the brand 'Everest Big Cardamom'.

Questions, Comments and Suggestions

After five thematic presentations on different topics, participants raised a number of questions and provided comments and suggestions.

Chief, Cardamom Development Centre, Ilam: Padam Prasad Adhikari

The Government of Nepal is exporting large cardamom pods under the collective trademark 'Everest Big Cardamom' and on the other hand the ICIMOD Himalica programme in collaboration with its partners is promoting cardamom-based products under the Himalica brand. This needs further discussion and clarification.

To clarify the point raised by Mr. Adhikari, the Chief Executive Officer of SABAH Nepal said, "The government's trademark 'Everest Big Cardamom' is mainly for export, but the Himalica brand is a strategy to promote value-added large cardamom products in domestic markets."

Regional Director, Forest Directorate, Eastern Region, Government of Nepal: Kishor Gautam

Large cardamom harvesting and the annual pilgrimage to Pathivara temple take place around the same time, so this provides a great opportunity to sell value-added large cardamom products to pilgrims. We can sell value-added products such as cardamom herbal tea, cardamom coffee, cardamom biryani masala, and cardamom iced tea, as gift items from Taplejung to guest visitors. The idea is already being translated into practice and promoted by Himalica in collaboration with SABAH Nepal and KHAJ, a company of local entrepreneurs in Taplejung.

District Forest Officer, Taplejung: Bishnu Lal Ghimire

The total area covered by large cardamom cultivation is 4500 hectares in Taplejung. It would be good to have a breakdown to see how much of the land is public and how much is private.

Joint Secretary, Ministry of Forest and Soil Conservation, Government of Nepal: Pem Narayan Kandel

The presentations were comprehensive and the lessons useful, but the question is how to go forward after the Himalica pilot project ends. Who will shoulder the responsibility of addressing the issue of continuity and sustainability? As per new state structuring rules in Nepal, the local governments are empowered with several rights and responsibilities. It is therefore high time for local governments of Taplejung to play a proactive role and up-scale the promising practices to other places beyond the Himalica pilot sites in Taplejung.

Senior Veterinary Officer, Taplejung: Bodhnath Adhikari

There should be systematic analysis on how to promote large cardamom and other products such as milk, yak, chhurpi and blanket, linking them with spice garden tourism in Taplejung. Livestock – dairy farm practices / products – can be integrated with spice garden tourism to diversify options for rural livelihoods and harness local potential available in Taplejung.

Chief, National Spice Crop Development Programme, Khumaltar, Nepal: Rajendra Adhikari

Mr. Adhikari suggested that we can take Himalica's package of climate-resilient practices to 40-plus large cardamom growing districts in Nepal through coordination with the Department of Agriculture, Ministry of Agriculture Development, Government of Nepal.

Programme Manager, the Mountain Institute India: Ghanashyam Sharma

If Taplejung goes organic like Sikkim, the large cardamom market value will surely improve. If we grow large cardamom in the same plot for 15 years, it will not be productive, as the level of soil acidity goes up and productivity goes down. So we need to clear the plot and grow other crops for 2–3 years. After this we can plant new large cardamom in that plot again. Research findings suggest that such a practice can significantly help in ensuring sustainable productivity of large cardamom.

Member, Cardamom Entrepreneurs Association of East Sikkim, India: Abhimanyu Dhakal

Worldwide, the supply of large cardamom is increasing, so price has gone down. There is a need to study supply and demand scenario including geopolitical, social drivers to understand market price trends of large cardamom.

Regional Director, Agriculture Directorate, Eastern Region, Government of Nepal: Hasta Bista - Chair's summary:

The overall session was summarized by the chair as stated below.

In total five thematic papers were presented related to sustainable productivity of large cardamom in general and climate-resilient practices, spice garden tourism, mobile apps for agriculture and agro-tourism, value-added products and entrepreneurship in particular.

The presentations covered the work of Himalica implemented in five countries in collaboration with local partners. The presentations also reflected the status of large cardamom in Taplejung in terms of area of cultivation as well as production. Over 65% of farming households in Taplejung depend on large cardamom for their livelihood. Farmers have started to use new practices such as application of manures (vermicomposting, jholmal), cowshed improvement, planting varieties according to altitude, water management, intercropping with legumes, and integration of other livelihood options like kiwi cultivation, shitake mushroom, vegetables and beekeeping in large cardamom farms. Crop insurance in the case of large cardamom is not very successful as it is based on the cost of production. How to continue the SMS service for farmers once Himalica ends is an important question. It is, however, great to know that farmers are willing to pay for the ICT service. The local governments can also help in this aspect, and this requires more consultation. Multi-sector coordination is vital for promoting the concept of spice garden tourism in Taplejung. As state restructuring proceeds in Nepal, the role of local governments is becoming more crucial and how the local planning process addresses the new concept of spice garden tourism will be key.

Experience Sharing on Ecosystem Services for Cross-Learning**Experiences on Ecosystem Services from Taplejung by Programme Coordinator, KLDCl, ICIMOD: Nakul Chettri**

- ICIMOD conducted a study covering 250 households in three pilot sites in Taplejung. Different participatory rural appraisal (PRA) tools complemented by remote sensing and GIS (land cover/use change) mapping methods were used in the study.
- The objective was to assess the state, dynamics, and value of major ecosystems and their services (provisioning, supporting, regulating, and cultural) and their linkages to human wellbeing.
- Findings indicate that all people depend most on agricultural ecosystem, followed by forest ecosystem and freshwater ecosystem.
- Majority of farmers have shifted from traditional crop cultivation practices to more profitable cardamom-based agro-forestry practices.
- The study finding shows that people benefit more from provisioning services of the three ecosystems.
- Land use for agriculture is growing and forest cover declining, so water availability is decreasing.
- Both nature and religion based ecotourism are significant due to the presence of Pathivara Temple and the trekking route to Mount Kangchenjunga.
- ICIMOD will publish the ecosystem services assessment report of Taplejung soon.
- Wider implications of the Ecosystem Services Assessments studies – peer and cross-learning (tourism; regional dialogue); scale up and go beyond boundaries, socioecological system for sustainability, capitalize on agreed regional cooperation framework; go beyond boundaries to contribute to global agreements such as Aichi targets, and SDGs, cooperate on science-policy-practice in Bhutan, Myanmar, India, Nepal, and Pakistan

Experiences on Bees and Pollination Services by Agriculture and Beekeeping Specialist, ICIMOD: Uma Partap

- Bees have many uses – not only for honey, but also for pollination services.
- Bees pollinate crops and natural flora, provide honey and other products, contribute to household income and employment generation, and create social relationships benefitting beekeepers and honey consumers.

- Estimated value of pollination services is 2.3 billion USD in the Hindu Kush Himalayan region, not including Afghanistan, Tripura and Myanmar.
- Causes of decline of bee pollinators: habitat loss (deforestation, land use change), pesticides, pests and diseases, introduction of exotic bees (*Apis mellifera*), honey hunting practices, climate change.
- Impact of pollinator decline: decrease in crop yield and quality; farmers adopting different strategies for pollination management (e.g., beekeeping in Himachal Pradesh, India; human pollinators/manual pollination in China).
- Due to introduction of bee pollinators, productivity increased by 43% in apple orchards in Himachal Pradesh; large cardamom productivity increased by 44% in Sikkim.
- 23,000 colonies being rented for apple farming in Himachal Pradesh, India at USD 12-15 per colony per season.
- Farmers are using both *Apis cerana* (native) and *Apis mellifera* (imported) for apple pollination. *Apis cerana* is a better pollinator, well adapted to local conditions, can cope with climate change, and has many advantages over *Apis mellifera*.
- Recommendations: invest in pollination research, education and interventions – not only for honey but also in pollination, as honey is a by-product of pollination; encourage mountain beekeepers to rear *Apis cerana* rather than *Apis mellifera*.

Questions, Comments and Suggestions

Chief, National Spice Crop Development Programme, Khumaltar, Nepal: Rajendra Adhikari

Pollination is a product and honey a by-product, or is it the other way around? *Apis cerana* does well in highlands and *Apis mellifera* in hot, humid, low-lying areas. Is it really true?

Bees visit plants to collect food, so pollination is the primary service bees provide, hence honey is merely a by-product. For 20 years ICIMOD has been saying farmers should keep *Apis mellifera* in low-lying areas and *Apis cerana* in the mid hills or mountain areas. But I am very happy to say that the Nepal government has finally formulated policy for the same. Renting out colonies for pollination services can be an income generation option for beekeepers, as in Himachal Pradesh. In Himachal there is an agreement between highland and lowland beekeepers to allow lowlanders to take their bee colonies to higher altitudes during summer season and for highlanders to take their colonies to lowland during winter season.

How many flowers does the bee visit per minute – how many bee colonies are needed to pollinate one hectare of cardamom plot?

Depending on the type of flower or crop, a bee generally visits 5–20 flowers per minute. Bumblebees are primary pollinators of large cardamom; however, as natural pollinators (bumblebees) are declining, *Apis cerana* or *Apis mellifera* can also be used to supplement pollinators in cardamom farms.

How does increased purchasing power affect food security negatively?

Mono-cropping cash crops is risky in mountain areas, hence diversification is a good idea. When the Darjeeling hills suffered from a 104-day bandha, shopkeepers and the rich with higher purchasing power were more affected than small-scale farmers. If you produce your own food, you are more food secure, as purchasing power alone cannot guarantee food security.

Regional Director, Forest Directorate, Eastern Region, Government of Nepal: Kishor Gautam – Chair's summary

Nakul's presentation shed light on land use-forest cover change trends due to human activity since prehistoric times and its impacts on agriculture and environment. He also touched on the assessment studies done in three types of ecosystems and their linkages (relative dependency or importance) with human wellbeing in Taplejung. What these trends (less water availability, more agricultural land and less forest cover) hold for the future is not easy to say, however, monoculture is not good. Findings of the ecosystem services assessment conducted in Taplejung should be published soon, as they have wider implications for conservation of ecosystems going beyond boundaries. He said economic development that doesn't take ecosystems into account is not good and the assessments and the regional cooperation framework can contribute to global processes such as Aichi targets and SDGs.

Uma talked about the importance of beekeeping not only for honey but also for pollination. Pollination has increased the quantity and quality of crop/fruit yields. One part in three of any food item is due to pollination services, so its contribution to food security is not insignificant. Forest degradation, monoculture and exotic bee species pose challenges. In Himachal Pradesh, beekeepers rent out bee colonies to apple farmers for pollination services, so more research and education is needed to upscale bee pollination services.

Experience Sharing from Sikkim India and Udayapur, Nepal

Experience Sharing from Sikkim, India

Abhimanyu Dhakal, a member of Cardamom Entrepreneurs Association of East Sikkim, India, showed a video produced by Doordarshan India and then proceeded to present on Shoten group's Sikkim journey and work:

- Farmers can minimize/spread their risks posed by monoculture by also growing ground apple, shitake mushroom.
- There are often problems with logistics and market linkages for products from hills and mountains.
- Our team identified 20 crops, including new and traditional, based on a SWOT analysis and ended up selecting only two: yacon and shitake mushroom.
- Demo plots established to raise awareness among consumers and link them with farmers.
- Our team agrees to buy back all shitake and yacon from farmers and also provide technical support.
- Backward integration with farmers and forward integration with markets. Yacon is processed as fruit and juice for established markets in Europe and North America. It is diabetic friendly and has medicinal properties – tourists who visit Gangtok like it. But there are also opportunities to export it to Japan and Korea. Internal markets are big hotels and restaurants.
- The biggest challenge is consumer education; including yacon on breakfast menu at conferences and meetings is one way to raise consumer awareness.
- Shoten group has a processing plant and packages yacon to increase its shelf life. If we can brand it as purely organic and market it online, we can move it quickly, so opportunities are many. Establish trustworthy relations with farmers and cut middlemen out, so it becomes a win-win.
- The government can support and encourage youth to go into commercial farming.
- In 3–4 years alone, we have reached out to 45 yacon farmers and 170 shitake farmers, but we want to reach 500 farmers by the end of 2017. Before, we were doing farmer outreach out of our own pocket, but now we have established a Farm to Fork Foundation for fund raising and monitoring.
- We are also trying to reach out to farmers in Bhutan and in Taplejung, Ilam and Jhapa in Nepal.

Experience Sharing from Udayapur, Nepal

Kishor Gautam, Regional Director, Forest Directorate, Eastern Nepal presented on “Engaging Women in Ecosystem Management: Udayapur experience”:

- Men and women have been accorded equal rights under the new constitution; there has to be one woman representative per ward either as chairperson or vice-chair.
- Women are represented well in community forestry users groups.
- Women's participation in meetings, capacity building trainings, elections, exposure visits, etc. is growing.
- Collective efforts of women within an ecosystem lead to better outcomes.

Summary by **Nakul Chettri** – session's facilitator: Seeing is believing; exposure visits are a must. Sustainability requires capacity building and trainings and institutionalization of achievements.

Farmers' Panel Discussion for Cross-Learning

An eight-minute-long video entitled “The Large Cardamom Revival – Moving towards Sustainable Production of Large Cardamom in Eastern Nepal” was screened before the farmers' panel discussion at the regional workshop. The video presents climate-resilient practices on large cardamom piloted by demo farmers for sustainable production and livelihood improvement and community resilience building. The video featured four individual demo farmers and their challenges and experiences in piloting climate-smart practices on large cardamom in

Taplejung. The four demo farmers participated also took part in the farmers' panel discussion. They were: (1) Ms. Runa Bhattarai from Furumbu pilot site, (2) Mr. Dambar Karki from Furumbu pilot site, (3) Ms. Ambika Sauden from Sikaicha pilot site, and (4) Mr. Harka Gurung from Phungling pilot site.

Key Highlights of the Farmers' Panel Discussion

After the video screening, participants were requested to have interactive discussion with the demo farmers who were called on to the dais. Key points from the interactive panel discussion are as follows:

- There was no knowledge of when, how and how much manure to use on large cardamom before but now farmers have and use such knowledge, resulting in healthy plant growth, huge tillers and flowering.
- Traditionally, large cardamom plantations ('bagaan') were not managed properly; they only harvested large cardamom capsules from the bagaan but didn't provide any input in return, but now Himalica has taught farmers to prepare vermicomposting, and cow urine based 'Jholmal' and use these as bio-fertilizer as well as bio-pesticide.
- Large cardamom can be grown in marginal lands and also in sloping areas. Large cardamom needs water mostly after monsoon is over, especially in winter.
- Because of climate change, natural rivulets, springs and water ponds are drying up so irrigating cardamom farms with water from plastic-lined pond through a sprinkler system can work wonders.
- Putting manure in small water pits and covering with mulch helps surrounding cardamom plants to get nutrients.
- Replacing old cardamom plants with new varieties such as Seremna can enhance cardamom yield and productivity.
- To test soil moisture or dryness and get an idea on how long sprinkler irrigation should be used, take soil in your hand, and if it feels like cow-dung, there is no need to irrigate, but if you drop it and it breaks on the ground, then irrigate it.
- People are using polythene pipes to divert water from water sources such as upstream rivulets, ponds, etc. to their fields, so conflicts are also rising.
- Earlier, farmers didn't understand the importance of urine, or of vermi-compost. Vermicomposting has more nitrogen than cow dung and is highly effective if applied in small amounts, and farmers can also sell vermin-compost as fertilizer.
- Large cardamom pods should not be packaged right after drying in bhatti (dryer) as there is steam inside and the pods may rot inside over time. Dry the pods for 12–14 days in a hot place, and grade them according to three different sizes before packing. Also do not package pods when there is monsoon mist/fog around as moisture in the package can cause cardamom pods to rot.
- Now women are also involved in large cardamom farming unlike in the past; they do mulching, apply manure and carry out weeding and irrigation.
- Large cardamom farming is easier and more rewarding than rice and maize cultivation, so even if the price goes down to 20,000 NPR, farmers will continue with large cardamom farming. But they will reduce their dependency on large cardamom by integrating other livelihood options like intercropping with kiwi, vegetables, shitake, satuwa and fodder grass for livestock, etc.

Chief, National Spice Crop Development Programme, Khumaltar, Nepal: Rajendra Adhikari – Chair's summary

The video was too short to cover all pertinent issues, nonetheless some of these have been more or less covered during the discussion. Four demo/lead farmers brought here by Himalica shared first-hand experiences based on the learnings from piloting practices in their own farms. The session was very lively and interactive. Most aspects of climate-resilient practices on large cardamom are already discussed. Apart from these, land selection for cardamom farming must be right and cardamom varieties chosen must be best suited to the local condition (soil/climate/elevation).

It was good to know from the discussion that alder tree provides good shade for large cardamom, however, old alder trees (>15 years) are not good for large cardamom plantations. Up-scaling the knowledge and experiences shared by the demo farmers to other farmers outside the pilot villages is a challenge. On behalf of all participants, we thank demo farmers for sharing their first-hand knowledge on the usefulness of climate-resilient practices in large cardamom.

Marketplace and Interaction

Key Highlights of the Marketplace

A total of seven thematic posters (<http://lib.icimod.org/record/32813>, 32814, 32815, 32816, 32817, 32818, 32819) reflecting different aspects of cardamom value chain development and agro-tourism, ecosystem services, and eight different publications related to sustainable productivity of large cardamom including ecosystem services, value-added products like cardamom herbal tea, cardamom biryani masala, cardamom iced tea/coffee, cardamom pods prepared by local entrepreneurs, cardamom fibre weaving machine, fibre products like bags, wallets, tea mats, beehive, beekeeping tools and a cardamom based organic model farm were displayed in the marketplace. All participants visited the marketplace to observe those key elements of resilience building in general and climate-resilient practices and technologies in particular. This was a good tool to interact with demo farmers and project field staff engaged in these practices and technologies directly in the fields.



Field Visits and Interaction

Besides technical presentations, farmers' panel discussion and marketplace observation, a field visit was organized to one of Himalica's demo sites on second day. Participants got an excellent opportunity to see things on the ground and have face-to-face interaction with farmers for in-depth understanding. The workshop participants visited one of the Himalica pilot sites in Sattal Danda and observed a range of climate-smart technologies as well as options for strengthening the market chain of large cardamom in Taplejung. The participants also observed the spice garden tourism trail and homestay site that are promoted as spice garden tourism in Taplejung. In addition, they visited the Common Facility Centre and Market Outlet initiated by local entrepreneurs and supported by the Himalica project. On the way back, they dropped in at the Taplejung Himalica gift shop where the products of local entrepreneurs are kept for sale.

Visit to demo farm

Field visit was organized on second day from 9:00 am to 12:30 pm for all interested participants. Mr. Harka Gurung, a demo farmer, welcomed all participants and briefed them about the overall climate-resilient package of practices demonstrated in his farm. He guided the participants to go around the demo farm and showed the following practices and technologies:

- Livestock shed improvement as part of waste management and for contributing in low carbon emission.
- Bio-composting and vermi-composting and its application in large cardamom farm.
- Use of Jholmal as bio-fertilizer and bio-pesticide. Mr. Gurung has been practicing this using a combination of livestock urine and foliage of various plants.
- Mulching: This is a helpful practice for conserving soil moisture; gradual decaying of mulching material also enriched organic matter in the soil.
- Use of manure: Use of manure in large cardamom gardens is not a common practice. This practice has positive results in terms of plant growth and flowering, and ultimately increased yield almost by double i.e. from 13 kg to 23 kg/ropani.
- Creedal pit in cardamom field: Small water retention ponds were made in a large cardamom field, which was found to be useful for maintaining soil moisture and make water (moisture) available in dry season. In addition, we also observed a plastic pond, which is useful for irrigation during the dry period.
- Practice of micro-irrigation: We observed the use of sprinklers in the large cardamom farm. It is an efficient way of using the limited source of water.
- Practice of reviving old garden: Usually the large cardamom plants get elevated after years of plantation. The elevated plants need to be reinstalled at the original level of the farm. We saw the rejuvenated old farm.

- Cultivation of vegetables as crop diversification: This was observed to be a good Project for reducing farmers' total dependency on large cardamom. Mr. Gurung is using a poly-house for good harvest of tomatoes and cauliflowers.
- Beekeeping: Large cardamom is a cross-pollinated crop, so beekeeping has a direct relationship with the production and productivity of large cardamom. Farmers have been able to generate extra income by selling honey. This has reduced their total dependency on large cardamom.
- Multi-cropping (kiwi-cardamom): Multi-cropping kiwi with large cardamom is a new practice. This practice helped farmers to diversify their livelihood options.
- Shitake mushroom: Mr. Gurung started growing shitake mushroom last year with technical support from Himalica. He thinks this could be another good source of income if we can identify the market.
- Raising nursery for new saplings: This is another source of income for Mr. Gurung, who is producing saplings from rhizomes. He has also maintained a nursery of new cultivar 'Seremna' brought from Sikkim, India.
- Improved dryer: Use of the improved cardamom dryer designed by Agriculture Research Centre Pakhribas was found to be fuel efficient and time saving.
- Biological methods: Farmers use light traps and also plant titepati in large cardamom farms to control harmful insects.

Visit to Common Facility Centre and Market Outlet (Kanchenjunga Himalica Koseli Ghar)

Mr. Bhim Gurung, coordinator of KHAL and group of women entrepreneurs, welcomed all participants to the CFC, where they are involved in post-harvest processing, and production of value-added products with packaging and labelling.

- Himalica, in collaboration with SABAH Nepal, mobilized large cardamom producers to form a company of local entrepreneurs (KHAL) who manages CFC. The members of KHAL were provided support for business development, post harvesting, processing, grading, branding and market linkages.
- We saw that local producers are trained in post harvesting, processing and grading and also in value-added products. They are now trying to link their value-added products like cardamom herbal tea, cardamom biryani masala, cardamom taste enhancer, cardamom iced tea/coffee, cardamom juice, local spices to buyers (e.g., hotels, coffee/tea houses).
- KHAL also operates Kanchenjunga Himalica Koseli Ghar under the Himalica project in Phungling, with expected turnover of NPR 76 lakh in a year.
- Participants realized that small value additions at each step of the large cardamom value chain and zroduct diversification (from pods to herbal tea, spice, wallets, and bags) followed by consumer awareness and education are vital for market promotion and for minimizing the risk of price fluctuation in the international market.
- It is interesting to see that most members of KHAL are women producers.



Discussing cardamom plantation



Weaving bags from cardamom fibres



Taplejung Himalica gift shop



Cardamom herbal tea and spice at common facility centre

Key Learning and Way Forward

Key Learning and Feedback from Groups

During the two-day event, participants got involved in various learning sessions such as technical presentations and discussions; farmers' panel discussion and interaction; visit to the marketplace and interaction with demo farmers and project field staff; field visit to demo farm, common facility centre and market outlet. To consolidate the overall learning, workshop participants were divided into four groups (government and local government; I/NGO; men farmers; and women farmers), and each group shared their key learning and provided suggestions for a way forward. The four groups assessed the key lessons from different perspectives.

Things they liked most

- Integrated farming system promoted
- Agro-tourism concept put into practice
- Demonstration of environment friendly and climate smart technologies
- Risk minimization through enterprise development and value-added cardamom products with market promotion
- Promotion of simple, low-cost and locally available technologies and practices
- Biodiversity conservation through promoting agro-forestry system
- Efficient and effective drying, processing methods
- Better coordination and interrelationship between stakeholders
- Use of ICT services for information sharing and dissemination
- Local employment through mobilization of local resources and skills



Government officials discussing on key learnings



Women farmers' group discussing on key learnings from the workshop

Over 10 positive aspects of the Himalica project were identified through the group work. This also indicates that all stakeholders have more or less a similar understanding about the positive aspects of the Himalica project.

Things could have been done differently (improved)

- Little importance accorded to biodiversity
- Short project duration
- Late implementation of activities
- Waste management problem seen on the spice garden trail
- Workshop presentations were not farmer-friendly

Participants identified only five things that they did not like. Most of the responses were related to management aspects of the Himalica pilot and to the regional workshop. It is interesting to note that all three groups except government/local government realized that the project duration was not long enough to achieve expected results.

Challenges for out and up-scaling good practices of Himalica

- Allocation of adequate budget for agricultural development and promotion of agro-tourism
- Coordination with all relevant government line agencies and other stakeholders
- Unstable cardamom market price and its lack of consumption at local level
- The role of local governments taking lead in up-scaling good practices
- Sustainability and continuity of Himalica's work
- High production cost
- Local authority not clear about its policy role
- Providing security/safety to visitors on foot trail
- Problems with quality of cardamom
- Road condition for spice garden tourism

The group identified ten challenges. Women farmers in particular saw ground-level problems such as road condition and safety measures as key challenges in up-scaling, whereas other stakeholders like government and NGOs saw coordination, unstable market price, the role of local governments and availability of budget as their challenges in up-scaling good practices of Himalica.

Future steps for up-scaling

- Allocation of adequate budget for agro-tourism
- Implementing institution and local governments should work together for continuity of good practices.
- Conduct more research on large cardamom cultivation
- Immediate up-scaling of improved dryer, value-added products of large cardamom, irrigation systems and ICT services
- Up-scaling the practices of integrated farming system to similar areas
- Promotion of spice garden tourism
- Promotion of organic farming
- Awareness raising on storage methods and its importance
- Initiate rotation cropping system on large cardamom
- Enterprise registration and support

Some suggestions were directly related to the ground level, such as implementation of activities like enterprise registration and promotion of organic farming, whereas other suggestions covered broader aspects like adequate budget allocation, coordination and linkages between stakeholders, etc. This suggests that further consultations may be required among different stakeholders to come up with key steps and strategies for up-scaling.

Points to be discussed further

- Taking the package of practices from 288 households to say, 25,000 households if government is willing to support

- How can the agriculture office help small farmers with small landholdings? For example, pocket block approach
- It is difficult for agri-entrepreneurs to register their company with the word 'cardamom' as this does not figure on the government's approved list.
- Plantation of Paulownia needs further study and discussion
- Need to discuss how the government's agricultural modernization programme can help to give continuity to the Himalica good practices in Taplejung after 2017.

Out of the five points suggested, three are from government and local governments and the other two from INGO/ NGO and men farmer groups respectively. Women farmers group did not have any point for further discussion. The government/local government group identified three very important areas which need further discussion for up-scaling and giving continuity to Himalica interventions in other areas.

Closing Session

Pem Narayan Kandel, Joint Secretary, Ministry of Forest and Soil Conservation, Government of Nepal, chaired the session. This was a very important session as it summarized the workshop followed by individual reflections from workshop participants for documentation and cross-learning. The chief guest Ghanendra Maden, Chief of District Coordination Committee, Taplejung, and the special guest David Molden, Director General of ICIMOD, also shared their learning with key directives for future actions. Lastly, the session chair shared his thoughts and gave concluding remarks, highlighting the issue of up-scaling for continuity and sustainability of learnings from Himalica.

Summarization of two-day workshop

Ghanashyam Sharma, Programme Manager, The Mountain Institute-India, summarized the salient points of the two-day workshop as follows:

- Large cardamom productivity and market price are declining, farmers have to adapt to the changing context due to climate and other changes.
- The Himalica pilot project in Taplejung was conceived to address those challenges and enhance production and productivity of large cardamom through managing risks and vulnerabilities. Himalica helped build community resilience by piloting a climate-resilient package of practices on large cardamom with livelihood diversification and value chain interventions.
- The Himalica pilot project helped to find solutions through integrated farming and livelihood diversification using simple, low-cost and locally available technologies/practices mobilizing farmers' institutions and relevant stakeholders at the local level. It has been successful in community mobilization through encouraging farmers' groups and cooperative; gender equality has been given due emphasis; however, how to give continuity and sustainability to Himalica after it ends is the big challenge.
- Himalica has built capacities of local farmers, they know more about large cardamom than scientists do. We from Sikkim learnt a lot and will take the knowledge back home to share with farmers.
- Continuity of good practices is a must including the ICT-based information services on weather, advisory services and market.
- Spice garden tourism trail is a good concept; this should also link to people from the plains. We also need to work on solid waste management and plastic use policies to translate the tourism concept into practice.
- NABARD, Agricultural and Rural Development Bank in Sikkim, is interested to publish the Himalica-promoted package of practices but there are issues...so we ask ICIMOD to publish this book and distribute to farmers in Sikkim.



Ghanashyam Sharma summarizing the key messages of the two day workshop

Key reflections from participants

Ugyen Palden from North Sikkim said visiting Taplejung felt like visiting his own village in Sikkim. He found Nepal rich in agro-biodiversity, agro-resources, and cultural resources. Himalica has achieved a lot and made impact in such a short time, it has succeeded in not only enhancing income but also building capacity, educating, and reaching out to 288 households, and they in turn can reach out to many more farmers. Large cardamom is being revived in his village of Dzongu, but he learnt a lot here, and will take the climate-resilient package of practices on large cardamom to Sikkim to share with other farmers. Taplejung has homestays, spice garden tourism, many bio-cultural resources, it is truly an amazing place.

Khageshwori from Hee Gaun, Sikkim thanked the organizers for including women in the workshop. She said she started out with a large cardamom nursery and supplies seeds and saplings all over Sikkim and to Northeast India, mainly Nagaland and Assam. She said that she found Taplejung farmers to be more hardworking and learned a lot from them.

Kishor Chandra Gautam, Regional Director of forest directorate, Eastern Region, Nepal – said Himalica is coming to an end and has reached out to 288 households so far. It needs to reach thousands more in other districts of Nepal. ECDF should look for alternative resources to continue the good work in future once Himalica gets phased out. The local government may help in strategy planning and policy related work. District level forest and agricultural offices can continue to extend technical assistance and expand Himalica – introduce its package of practices to other areas. Large cardamom is the identity of Taplejung and spice garden tourism will also become part of its identity in the future, so let's hope Himalica's achievements get recognition both at national and regional levels.

Luna Bhattarai, Demo Farmer from Taplejung, said she feels like Himalica is leaving too soon, and wished it could be extended by two more years. She said she learnt about bee pollination, improved dryer, intercropping with kiwi and various products that can be made at home such as pickles, and thanked Himalica.

Closing Remarks

Mohan Bahadur, Chief District Officer, Taplejung: The regional workshop was professionally executed and useful. It is good to hear that Sikkimese participants want to put into practice the knowledge acquired in Taplejung. Farmers confirmed that Himalica has helped them immensely, and are a little afraid that Himalica is leaving too soon, so it is time to think of alternatives.

Ghanendra Maden, Chief of District Coordination Committee, Taplejung, said the two-day workshop was fruitful; and the field visit an eye opener as he got to see first-hand Himalica's achievements and impact on the ground. He said the production of cardamom herbal tea, cardamom masala, pickles, cardamom fibre products like wallets and bags for domestic and international markets should be continued and moved up the value chain. He conceded that a sharp drop in cardamom price was worrisome, and suggested that different value-added products be produced for sale from all parts of cardamom plants (and not just the pods). He requested ICIMOD to prolong the Himalica project in Taplejung, and if that is not possible, to extend support in other ways.



Ugyen Palden from North Sikkim reflecting on his learnings at closing session



Mohan Bahadur GC speaking at closing session



Ghanendra Maden speaking at closing session

David Molden, Director General - ICIMOD, thanked the participants for coming to the workshop and making it a success. ICIMOD's mandate, he said, is to help mountain people adapt to climate change, support their livelihoods, and promote knowledge and options to deal with climate change, so these options were tested and replicated in Taplejung. He said we have to look at climate-resilient practices, water, energy, jholmal, soil and nutrients, and have good partnership with local partners like ECDF in Taplejung. He admitted it was good to see the beneficiaries following a market-oriented approach and expanding local market with value-added products such as cardamom herbal tea, biryani masala, kiwi, shitake mushroom, homestays and honey. Taplejung is part of the Kangchenjunga landscape shared by Nepal, Bhutan and India. ICIMOD's KLCDI's objective is to understand issues of conservation and development and see what opportunities are there and test them out. As for the question of what happens to the issue of sustainability once the project leaves, he said the government, NGOs, private sector, and farmers' groups need to think about sustainability since at a certain point ICIMOD will have to step back. Then the government authorities, private sector, farmers' groups must give continuity to climate-resilient practices and approaches piloted under the Himalica project. The ultimate litmus test of their success is if they can come to Taplejung three years from now and still see many of the Himalica activities continuing. KLCDI can step in once Himalica folds. Under Himalica, women leadership development has been a success. Dr. Molden said he was happy to see the local government and ministry and other district level authorities represented at the meeting.



David Molden giving the closing remarks

Kumar Siwa, Chair, ECDF said they've shared Himalica lessons and practices, and also learnt from friends from Sikkim. Himalica is ending soon, after 30 months. This is to be expected as everything must come to an end. He said respecting farmers and their profession and helping them develop agro-based enterprises is the need of the hour. ECDF has conducted lots of training involving farmers, and worked with SABAH-Nepal to reuse wasted cardamom parts to make bags, purses, and wallets. He suggested that local authorities should step in once Himalica pulls out.



Kumar Siwa speaking at closing session

Pem Narayan Kandel, Joint Secretary, MoFSC, said that the Himalica project has been a success because it identified the right issues, the right partners and the right sites for implementation. Likewise, the regional workshop went very well, as they learnt a lot from experts, farmers, the field visit, and the participants provided good feedback and suggestions. He asked: what is the way forward or who will take the responsibility for sustainability and continuity, for out- and up-scaling? Perhaps the government, private sector, the local government, and farmers' group should step up once Himalica ends. ICIMOD's KLCDI can find a way to support the efforts. Nepal's three layers of government – central, provincial (yet to be formed), and local – should also take ownership. The foremost responsibility can lie with the local government. Himalica will document the proceedings with recommendations. There is a need to make an action plan, considering post-Himalica scenario, and go forward in a concerted manner.



Pem Narayan Kandel delivering the concluding remarks

Vote of Thanks

Nakul Chettri said that Himalica has many partners like private sector players, district line agencies, local governments, donors, ECDF and farmers' groups, all of whom have played their part in bringing Himalica this far. He said the local government should work with relevant ministries and district level authorities, with SABAH-Nepal and ECDF, and continue some of its activities even after Himalica ends. He thanked all the participants from India and Nepal for contributing proactively to the learning process during the two-day workshop and for making it a success.

Recommendations for the Up-Scaling and Way Forward

The following recommendations – specific and overall – are based on the concluding remarks as well as feedback and suggestions provided by the participants during the workshop deliberations. These can be instrumental in helping up-scale Himalica-supported successful interventions in the future.

Specific Recommendations

- Discourage monoculture of large cardamom cultivation and encourage multi-cropping by integrating kiwi, shitake mushroom, beekeeping, vegetables and livestock – dairy practices linking them to spice garden tourism and agro-forestry farming system. The main aim is to reduce farmers' dependency on large cardamom by diversifying livelihood options and harness local potential available in Taplejung.
- Do not grow large cardamom in the same plot for 15 years or more. Soil acidity will go up and productivity down. Better to clear large cardamom from old plantations ("bagaan") and grow other crops for 2–3 years and plant new large cardamom varieties such as Seremna in that plot to enhance productivity.
- Promote and diversify large cardamom-based value-added products for domestic consumption by linking them to spice garden tourism and targeting pilgrims/tourists who visit Pathivara. Promote these products under the Himalica brand in domestic markets. Support to farmers' groups and companies like KHAJ should be continued in post harvesting, processing, grading, packaging and branding and they should be linked to buyers (e.g., hotels, coffee/tea houses).
- Promote spice garden tourism assisted through mobile apps in and around model farms of large cardamom. Partnership with NTB, private sector, the local government for community-based agro tourism is the way forward. Waste management problem, including plastic and polybags, has been seen on the spice garden trail. It should be addressed if spice garden tourism is to take off.
- The Nepal government should address large cardamom market price volatility and market fluctuation with India and other countries bilaterally.
- Support farmers if they suffer loss of crops from drought, hailstorm; rationalize insurance policy; reduce taxes on large cardamom processing equipment; ensure adequate technical support and timely extension services to the farmers.
- ICT-based information services on weather, agro-advisory services and market should be continued. The local government may want to support the continuation of the SMS info service piloted under the Himalica project after it folds, but this needs further discussion and consultation.
- Taplejung should learn from Sikkim and think about going organic.
- Capitalize on the ecosystem service assessments and the regional cooperation framework to contribute to global processes such as Aichi targets and SDGs. Invest in research, education and interventions to upscale beekeeping not only for honey production but also for pollination services.
- Concerted effort is needed to make women's participation meaningful, which can lead to gender equality and more sustainable outcomes.
- NABARD (Agricultural and Rural Development Bank) in Sikkim is interested to publish the Himalica-produced package of practices for distribution to cardamom growers in Sikkim; however, there are some issues that need to be resolved. ICIMOD can look into it and provide guidance.

Overall Recommendations

The local governments, NGOs, private sector organizations, and farmers' groups need to think about sustainability/continuity of Himalica good works. They should come together and look for alternative resources to continue the good work of Himalica, including up-scaling. The local government can work out a strategy and arrange resources. District-level forest and agricultural offices can continue to extend technical assistance and take Himalica-introduced package of practices to other areas. Out and upscale Himalica's package of climate-resilient practices – from 288 households in Taplejung to other districts in Nepal and the region – through coordination with local governments, relevant government line agencies, non-government organizations, private sector organizations, farmers' organizations, ICIMOD and other donors. More specifically, ICIMOD and its local partner organizations can work out an action plan with the Department of Agriculture, Ministry of Agriculture Development, and Ministry of Forest and Soil Conservation, Government of Nepal for out and up-scaling climate-resilient practices on large cardamom throughout Nepal. ICIMOD's KLCDI can find a way to support these efforts. Nepal's three layers of government – central, provincial (yet to be formed), and local – should also take ownership. The foremost responsibility lies with the local government. This suggests that we need to develop an action plan, considering post-Himalica scenario.

Annex 1: Programme schedule and agenda

Day 1 Sunday, 15 October, 2017	
Time	Activity
09:00 – 10:30	Opening and Introduction Facilitator: Anu Kumari Lama, ICIMOD Chair: Kumar Siwa; Chairperson, ECDF <ul style="list-style-type: none"> • Welcome, Introduction to the Programme (Surendra Joshi, ICIMOD) • Good wishes from special guests <ul style="list-style-type: none"> – Ghanashyam Sharma, TMI – Chitra Kumari Limbu, Member Inter-party women network – Pradeep Basnet, Representative, NTB – Nar Hari Bhandari, Local Development Officer – Mohan Bahadur G.C., Chief District Officer, – Hasta Bista, Regional Director of Agriculture Directorate, Eastern Region, Nepal – Pem Narayan Kandel, Joint Secretary, Ministry of Forest and Soil Conservation (GoN) – Ghanendra Maden, District Coordination Committee Chairperson/Chief Guest (launch Kangchenjunga Spice Garden Tourism Trail App and Map) • Remarks from the chair at the session end
10:30 – 11:00	Tea/Coffee break and Group Photo
11:00 – 12:30	Experience Sharing for Cross-Learning Facilitator: Sanjeev Bhuchar & Harish Chilwal Chair: Hasta Bista, Regional Director, Agriculture Eastern Region, Nepal <ul style="list-style-type: none"> • Himalica programme - process, regional learning (Surendra Joshi, ICIMOD) • Himalica experiences on climate smart practices for large cardamom (Harish Chilwal, ECDF) • Supporting large cardamom farming and marketing using ICT intervention (Sibjan Chaulagain, ICT for Agri. Pvt. Ltd) • Supporting livelihood diversification through ICT-assisted Spice Garden Tourism (Bachchu, TAAN/ Suman, Wolfmatrix) • Market potential of cardamom based value-added products (Robin Amatya, SABA Nepal) • Questions & Answers session • Concluding remarks from the Chair
12:30 – 13:30	Lunch Break
13:30 – 14:30	Experience Sharing on Ecosystem Services Facilitator: Sanjeev Bhuchar & Harish Chilwal Chair: Kishor Chandra Gautam <ul style="list-style-type: none"> • Ecosystem services for livelihoods: Findings of ESA (Nakul Chettri, ICIMOD) • Pollination services and the role of bees (Uma Pratap, ICIMOD) • Question & Answer • Concluding remarks from Chair
14:30 – 15:15	Cardamom Farmers' Panel Facilitators: Min Bahadur Gurung & Anu Lama, ICIMOD Chair: Rajendra Adhikari <ul style="list-style-type: none"> • Himalica Taplejung video screening • Clarification and discussions • Concluding remarks from the Chair

15:15 – 16:00	Experience-Sharing by Participants
15 minutes per presentation	Facilitator: Nakul Chettri
15 minutes discussions	<ul style="list-style-type: none"> • Shoten Group Sikkim Journey and work (Abhimanyu Dhakal) • Engaging Women in Ecosystem Management: Experiences from Udayapur, Nepal” (Kishor Chandra Gautam) • Question and Answer
16:00 – 17:00	Market Place Observation and Interaction
	Facilitators: Ujol Sherchan, ICIMOD, Harish Chilwal, ECDF
	<ul style="list-style-type: none"> • Poster exhibition • Display of publications & other knowledge products • Demonstration of cardamom fibre weaving machine • Display of bee log hives • Display of diverse products (value-added cardamom products, cardamom fibre products, mushroom, Kiwi, honey, dairy products and other local products)
	Tea/coffee served during the session
19:00 – 21:00	Reception dinner hosted by ECDF
Day 2, Monday, 16 October, 2017	
03:30 – 12:00	Field Visits
	Facilitators: Harish Chilwal, ECDF & Min Gurung, ICIMOD
	<ul style="list-style-type: none"> • Visit to Himalica pilot sites to observe climate smart technologies/practices and understand spice garden tourism Trail • Visit to Common Facility Centre and Market Outlet initiated by local entrepreneurs (KHA) & supported by SABA Nepal • Interactions with group members
12:00 – 13:30	Travel back to hotel and Lunch break
13:30 – 15:30	Key Learning and Way Forward
	Facilitators: Surendra Joshi & Uma Pratap, ICIMOD
	<ul style="list-style-type: none"> • Feedback and clarifications on field activities • Key take-Home messages from Taplejung • Way forward: Considerations for scaling up messages from Taplejung
15:30 – 16:00	CLOSING SESSION
	Facilitator: Anu Lama & Sanjeev Bhuchar, ICIMOD
	Chair: Pem Narayan Kandel
	<ul style="list-style-type: none"> • Summarization of workshop findings (Ghanashyam Sharma, TMI) • Key reflections from the participants (Bhutan, India, Nepal) • Concluding remarks (Mohan Bahadur, Chief District Officer, Taplejung) • Concluding remarks (Ghanendra Maden, chief of district coordination committee, Taplejung) • Concluding remarks (David Molden, DG ICIMOD) • Concluding remarks (Kumar Siwa, Chairperson, ECDF) • Closing remarks by the Chair, Pem Narayan Kandel, Joint Secretary, Ministry of Forest and Soil Conservation, Government of Nepal. • Vote of thanks (Nakul Chettri, ICIMOD)
18:00 – 21:00	Closing dinner hosted by ICIMOD

Annex 2: List of Participants

Pem Narayan Kandel

Ministry of Forest and Soil Conservation, Nepal

Hasta Bista

Regional Agriculture Directorate, Biratnagar, Morang, Nepal

Kishore Gautam

Forest Directorate Eastern Region, Nepal

Rajendra Adhikari

National Spice Crop Development Programme, Nepal

Sujan Dhungel

Ministry of Agriculture Development, Nepal

Govinda Timilsina

NCARP, Pakhribas, Nepal

Cardamom Development Centre, Ilam

Keshab Datta Joshi

CEAPRED, Nepal

Sibjan Chaulagain

ICT for Agri. Pvt. Ltd.

Abhimanyu Dhakal

Cardamom Entrepreneur Association of East Sikkim, India

Ghyanashyam Sharma

The Mountain Institute, Sikkim, India

Ugen Palzo Lepcha

Farmer, Sikkim India

Tenzing Gyatsho Bhutia

Entrepreneur, Sikkim, India

Denzum Bhutia

Sikkim, India

Khageswori Chettri

Sikkim, India

Bachchu Narayan Shrestha

Spice Garden Tourism, TAAN, Nepal

Pradeep Basnet

Representative, Nepal Tourism Board

Karna Lama

General Secretary, TAAN Nepal

Suman Humagain

Wolfmatrix, Nepal

Rabin Amatya

SABAH Nepal

Deepak Nepal

Vice-chairperson, Federation of Cardamom

Entrepreneur Association, Jhapa

Ghanendra Maden

Chief, District Coordination Committee (DCC),

Taplejung, Nepal

Bam Bahadur Bhattarai

Deputy Major, Phungling Municipality, Taplejung, Nepal

Narahari Bhandari

Local Development Officer, District Coordination

Coordinator (DCC), Taplejung, Nepal

Naresh Ghimire

Senior Agriculture Development Officer, District

Agriculture Development Office, Taplejung, Nepal

Bishnu Lal Ghimire

District Forest Officer, District Forest Office, Taplejung

Bodh Nath Adhikari

Senior Veterinary Officer, District Livestock Development

Office, Taplejung

Nirja Bhattarai

Act. Industry Officer, District Cottage Industry Office,

Taplejung

Yogmaya Rizal

Act. Women & Child Development Officer, Women &

Child Development Office, Taplejung

Taranath Ghimire

Chairperson, Taplejung Chambers of Commerce and

Industry, Taplejung

Narendra Niraula

Agri-business Specialist, UNNATI, Taplejung

Balmani Baral

Chairperson, District Cardamom Trader Association,
Taplejung

Kumar Siwa

Chairperson, ECDF

Dipendra Subedi

Field supervisor

Asmita Sanba

ECDF Member

Maiya Devi Thapa

ECDF Member

Chandra P. Bhattarai

Focal Person Himalica, ECDF

Harish Chandra Chilwal

Himalica Project Coordinator, ECDF

Chandra Kalikote

Himalica Field supervisor, ECDF

Manisha Bhattarai

Himalica Field supervisor, ECDF

Dipal Bhandari

Himalica Field supervisor, ECDF

Harka Gurung

Demo farmer

Dambar Karki

Demo farmer

Ambika Sauden

Demo farmer

Runa Bhattarai

Demo farmer

David Molden

ICIMOD

Surendra Raj Joshi

ICIMOD

Ajaz Ali

ICIMOD

Uma Partap

ICIMOD

Anu K. Lama

ICIMOD

Sanjeev Bhuchar

ICIMOD

Nakul Chettri

ICIMOD

Ujol Sherchan

ICIMOD

Min Bahadur Gurung

ICIMOD

Annex 3: Key Achievements and Take-home Messages

Moving towards resilience of rural mountain communities in Taplejung, Nepal

From 2013 to 2017, ICIMOD and partners have been implementing the 'Support to Rural Livelihoods and Climate Change Adaptation in the Himalayas (Himalica)' programme. Himalica is a demand-driven programme financed by the European Union (EU) and implemented across the Himalayas (Bangladesh, Bhutan, Myanmar, Nepal and Pakistan). It focuses on developing national and regional capacity to adapt policies that impact rural mountain livelihoods, conducting collaborative action research on mountain livelihoods and ecosystems, and piloting activities in a collaborative and integrated manner to strengthen the resilience of mountain men and women.

Key achievements and take-home messages

Ecosystems management is the cornerstone for resilient livelihoods

Ecosystem services assessments conducted by Himalica, using Cascading Ecosystem Assessment Framework, show that agro-ecosystem, forest ecosystem and fresh water ecosystems are important for the sustenance of rural livelihood in Taplejung. The agro-ecosystem provides bundles of provisioning and other ecosystem services. Local communities consider it the most important ecosystem. For a resilient system to supply ecosystem services, participatory natural resource management planning that involves all local stakeholders is essential. Valuation of ecosystems and their services allows stakeholders to mainstream ecosystem services management in their local plans. Moreover, support for local level ecosystem management can be provided in the form of community-based incentives and for diversification of livelihood so that ecological reserves are not reduced.



Climate-resilient practices yield promising results

Himalica is promoting climate-resilient measures to improve large cardamom production systems and adapt to climate change (long dry spells, erratic rain, increasing pest and disease infestations). Weather-smart practices, soil/nutrient-smart practices, water-smart practices, energy-smart practices and knowledge-smart practices are part of the overall package of practices, with gender smartness as a cross-cutting element. These practices have been demonstrated in 12 demonstration farms managed by farmers' groups, and published in printed form and also as open access Resource Manuals for farmers and practitioners. After Himalica pilot interventions, more than 400 households in Taplejung have adopted at least one element of the package. For example, 266 households are using sprinkler irrigation, 256 households have applied farmyard manure, and 188 households Jholmal. The outcomes emerging are positive. Dry cardamom capsule yield was reported to increase by about 75% (from 32 kg/ropani to 56 kg/ropani) in the demonstration farms. A few farmers earned more (5000 NPR/40 kg) due to better quality cardamom capsules after improved grading and drying practices. By applying climate-resilient practices, the provisioning for increased production is achieved and good ecosystem health is maintained.



Livelihood diversification is essential for managing risks and resilience building

Most farmers in Taplejung sell large cardamom capsules to local traders and face challenges due to production and price fluctuations. To overcome these challenges and to provide diverse livelihood options, Himalica has partnered with SABAH Nepal for building capacities of women and men entrepreneurs to make value-added products from cardamom capsules, such as cardamom powder, cardamom black tea and cardamom tea mix, and cardamom fibre products. A few producers have been trained and organized into groups and linked with other market actors. KHAL has been registered in Taplejung district and they have set up an equipped production centre for grading, processing and developing products of cardamom. The value-added products are being marketed under the brand name and tag 'HIMALICA-Green Products from the Mountains'. With SABAH's support, cardamom is also promoted as the 'Queen of Spices'.

Along with value-added cardamom products, many farmers in Taplejung are also trained technically and supported financially to diversify their farms and livelihoods by incorporating ecologically-friendly options like kiwi farming, shitake mushroom cultivation, off-season vegetable cultivation, inter-cropping legumes, cardamom nursery raising and beekeeping. To capitalize on the agro-tourism potential of Taplejung landscape, the project is partnering with Nepal Tourism Board, the Trekking Agencies Association of Nepal (TAAN) and Wolfmatrix to develop ICT-assisted Cardamom Spice Garden Tourism.

ICT-based services empower cardamom farmers

Large cardamom producers in Taplejung are able to access real time market price information, agriculture extension information and weather information through mobile text messaging. A total of 220 registered farmers/users from Phungling, Sikaicha, Furumbu are receiving SMS almost daily in Nepali. They find the service useful as it helps them better plan for production and sale, and reduces their reliance on local traders for cardamom price information. The farmers are also consulting cardamom experts through interactive messaging and bi-weekly 'Call the Expert' services offered in collaboration with research scientists from the Cardamom Development Centre, Fikkal, Ilam and National Agriculture Research Council (NARC), Pakhribas, Dhankuta. A survey with 120 farmers showed that the majority of large cardamom producers would like to continue the service after Himalica ends. Most of them (92%) are ready to pay 30–50 NPR/month for SMS-based information and advisories, especially for price and climate-resilient practices. The Nepal Cardamom Entrepreneurs Association intends to extend this service in all their district chapters in Nepal.

Partners in this collaborative effort

ECDF, SABAH Nepal, TAAN, Wolfmatrix, Resource Himalaya, Nepal Cardamom Entrepreneurs Association



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