

**Report on
Training of Stakeholders
on adaptation to change including Climate Change
22-24 June 2014
Khagrachari, Chittagong Hill Tracts**



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Inaugural Session

Under the collaborative program of AF-ICIMOD, the training was organized for Government Officials, Journalists and School and College teachers of Khagrachari on 'Adaptation to change including climate change issues' during 22-24 June 2014 at the conference room of Parjatan in Khagrachari town. There were 17 participants in the training. Though it was expected that there would be around 25 participants, many organizations could not nominate their officers because of their heavy involvement in closing of financial year and their own training program. Many School and College teachers could not join because they had half-yearly exam of their schools and colleges.

The inaugural program started with a welcome speech by the Executive Director of Arannayk foundation Mr. Farid Uddin Ahmed where he briefly introduced both the organizations – Arannayk Foundation and ICIMOD, resource persons and facilitators.

Later on Mr. Ahmed described the collaboration program of AF-ICIMOD in detail. He started with a brief introduction of each of the organization. While introducing Arannayk Foundation Mr. Ahmed gave a brief idea of 'Tropical forest conservation act, 1998' on the basis of which a debt cancellation agreement was signed in 2000 for establishment of an organization to manage the fund and mobilize tropical forest conservation. He then mentioned the process of establishment of AF in 2003. He briefly explained the grant making procedure, implemented and ongoing projects; staffs background along with a short introduction to the 7 board of directors, its partnership with GIZ, World Bank and ICIMOD.

Mr. Ahmed then introduced 'The International Centre for Integrated Mountain Development (ICIMOD)' to the participants. He said that ICIMOD is a regional intergovernmental learning and knowledge sharing centre serving the eight regional member countries of the Hindu Kush Himalayas – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan. He also shared the aims of ICIMOD which is to assist mountain people to understand these changes, adaptation, and make the most of new opportunities, while addressing upstream-downstream issues.

The introductory session ended with a description of the objectives of collaboration between ICIMOD and the Arannayk Foundation. He also elaborated expected outcome of the training along with the outcomes of the previous trainings under the same collaboration program.

Technical sessions (TS):

The technical sessions started with a guided presentation followed by either discussions or group works.

TS-1: Overview of changes in Chittagong Hill Tracts (CHT)

The session was conducted by Mr. Farid Uddin Ahmed. He started the session with a PowerPoint presentation where an overview of Changes in CHT was given. The changes included bio-physical changes, socio-economic changes, cultural and climatic changes. He narrated hill specificities such as inaccessibility, fragility, marginality, diversity, niche, local communities, uniqueness and opportunities. The changes due to population pressure on natural resources like water, land and forest resources were briefly discussed. Though population is considered as a problem Mr. Ahmed urged to utilize it as a valuable resource for conservation and overall development.



Photo-1: Mr. Farid Uddin Ahmed conducting the first technical session

Mr. Ahmed informed the participants about various varieties of fruits developed in Bangladesh and their potential in CHT. He shared the issue of intellectual property right - IPR (the rights given to persons over the development of varieties) and sui-generis system of documentation. In his presentation he mentioned CHT as a treasure of wealth having different plants and animals with traditional use. He considered all those important for future which is likely to solve many health and food production problems. Through his presentation, he made people aware about plant genetic resources specific to CHT.

The participants were then requested to identify changes over decades in CHT on land use, livelihood pattern, social context, climate (rainfall and temperature), forest resources & biodiversity. The participants were divided into three groups. Each group had in-depth interactions and thorough discussion and came up with key changes in Khagrachari.

Group work: Identifying the major changes in Khagrachari

Group work- 1:

The participants of the group observed that Jhum cultivation has increased over time in Khagrachari. Simultaneously there is increased mono culture, commercial cultivation of cash crop like tobacco, increased private plantation, sedimentation in water bodies, decline in soil fertility, etc. The groups also mentioned that there are some adaption measures such as introduction of modern technologies and access to communication because of infrastructure development.

The identified that livelihood in Khagrachari has improved because of local development. Many people are employed in different jobs and others in business. They also described how the changes in customs, food habit and dressing style etc. have impacted on the overall livelihood changes of the locals.



Photo-2: Representative of one of the groups presenting their findings

All of the groups mentioned that in Khagrachari as well as other hill districts, women empowerment is more pronounced. They also mentioned that there is drastic improvement in educational level but few of them also mentioned that the local dialect changed due to exposure to other languages. The groups also pointed out that social bonding is less now. Impact on climate change has been observed by all the groups. The impact included increase in temperature during summer and erratic rainfall during rainy season. Those changes have created impact on crop yield, flood and landslides, drying out of water bodies along with increased environmental pollution.

While mentioning about the changes in the Wildlife and biodiversity the participants pointed out that there is invasion of exotic species in forest land which included rubber, teak, acacia and eucalyptus. Those species are competing with various native species. They also mentioned that

there is a tendency of monoculture. Finally all the groups noted that there is soil degradation and loss of biodiversity all over the area.

At the end of the group-work presentation Dr. Md. Mohiuddin and Mr. Farid Uddin Ahmed gave their feedback on the changes they have observed over time. Since both of them have been working in and around the area for several decades they could explain the changes with practical examples. They mention about increased trend of lease hold forestry, intrusion of more diseases and deterioration of social values over time in Khagrachari. Though day by day more advanced technologies are being introduced to develop the livelihood but Mr. Ahmed gave his preference to live with the traditional system based on the forest resources. To justify his statement he gave example of average life expectancy with people who lived in nature Satyoma. They have fresh food sources and have a huge life expectancy.

TS-2: An overview of Climate Change

The second technical session was on the 'Overview of Climate Change'. The session was led by Mr. Abdul Mannan. He mentioned the major drivers of changes and compared the Climatic and Non Climatic drivers with examples. Some Consequences were shown through pictorial comparisons. The concept and trend of change was addressed as well. The PowerPoint presentation included some videos on green house gases, carbon emission and carbon footprint through animations to explain the idea.



Photo-3: Mr. Mannan conducting the session on Climate Change

At the end of the session Mr. Farid Uddin Ahmed elaborated the topics like car pool, usage of local products, electronic devices etc. which were related to carbon emission and Climate Change. He mentioned that though Bangladesh is contributing very little (The CO₂ emission of Bangladesh is 0.18%) but considering emission per unit area, it is significant. His own

experiences of paying fees for carbon footprint in Columbia and Mexico helped the participants understand better.

He also shared the findings of his very recent exposure Visit to Nepal where he saw various technologies that could be used to adapt the Climate Change in Bangladesh as well and in some cases might contribute to mitigate it as well. The shared the details of the technologies through photographs. The technologies include the following:

- Rainwater harvesting
- Shitake Mushroom cultivation on wood
- Sloping agricultural land technology (SALT)
- Acid tolerant Ipil Ipil (*Leucarna diversifolia*)
- Kiwi fruit cultivation strategy
- Fish culture using the water from hills
- Storage of crops
- Bio-briquette
- Hydropower generation
- Solar drying and filtering water
- Cultivation in bag
- Stall feeding of goats

Video and photo presentation of different sites:

Since it was not possible to take the participants to the field due to consistent heavy rainfall at Khagrachari the participants were shown some videos and photos of selected sites where forests are conserved for water and livelihood. The videos of Proshika and ANONDO helped the participants learn the activities carried out by Arannayk Foundation at Khagrachari.

After presentations of videos on community based conservation of forests and restoration of degraded forests by the communities, a plenary session was organized to find out the best practices and suggestions for improvement.

The participants identified the need for alternative livelihood for poor household for effective conservation as the important lesson. They also recognized that for water, conservation of natural forests is more important than plantation. Their general concept of planting trees in hilly area was challenged with a video where there was no water flow even after having an excellent plantation but there was sustained flow of water from a natural forest where there were apparently no valuable trees. They also recognized that ecosystem service of forests is more valuable than only wood. The participants recognized that there is weakness in promotional campaign of Arannayk's activities. The journalists and school teachers said that they never knew about gravitational flow system of water which could help in supplying water to people of hilly areas. Agroforestry technologies adopted by Anando were highly appreciated. They also realized the importance of quality planting materials in case of fruit trees for having return within shortest period.

After that photos of previous field visit at Pagoda (locally known as Keyang) based forest conservation at 'Nirbanpur Bonbihar' of 'Kutukchari' at Rangamati were shared. The participants got an idea of how the religious leader established a conservation area. The idea and mechanism of GFS at the Keyang was also explained through videos. Mr. Ahmed explained how even after planting a huge area with various native tree species the people in and around the area is still totally dependent on the natural forest. He clearly mentioned how the water from the nearby natural hilly forest is being transported through pipelines to the reservoir through GFS and then the water is being purified and supplied to almost 500 households of the Kutukchari area. For better understanding he compared the system with fire fighting by fire brigade.

This water supply helped the locals to fight against disease as well. Since the water is less contaminated, they hardly get sick with water borne diseases. They started homestead vegetable cultivation and improved livelihood after getting the consistent water supply through the GFS. Mr. Ahmed compared the natural forest and planted forest in many ways. The Keyang (Pagoda) was situated in a hill top and encircled by more than 50 hills over 100 ha of land. All the hills are covered with trees. Hills around Keyang had plantation of more than 100 local species while other hills were covered with natural vegetations. Still the water supplied to the area only came from the natural forest.

Mr. Ahmed mentioned if we are need to restore degraded areas through afforestation it must be kept untouched for ensuring proper growth of the natural vegetation. As an example, he mentioned that Lawachara National Park, Srimangal was once degraded but the area was planted and protected for long. As there were limited interference gradually a rich vegetation cover was developed. Mr. Ahmed encouraged the participants to plant in the degraded land and that too with site specific native tree species.

TS-3: Impact of Changes on Ecosystem and Biodiversity

The third session of the training was on 'Impact of Changes on Ecosystem and Biodiversity' conducted by Prof. Dr. Mohammed Kamal Hossain. He shared his experience of CHT in general and Rangamati in particular on changes in forest cover and ecosystem. His presentation highlighted deforestation and loss of important indigenous trees, shrubs and herbs from the Rangamati, changes in ecosystem and its impact on the biodiversity.

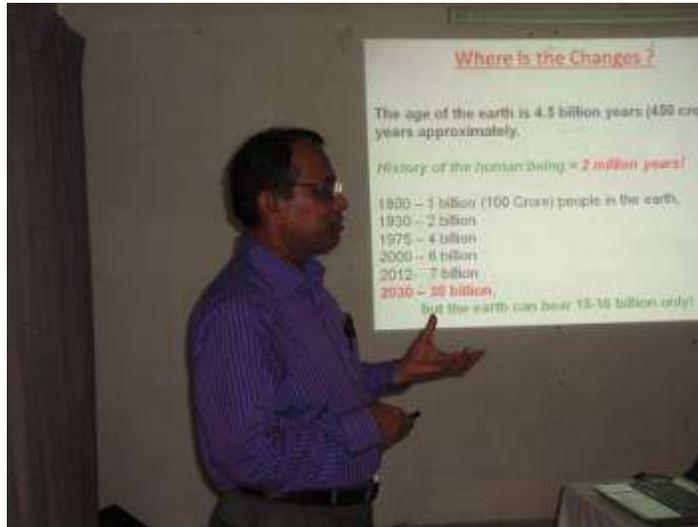


Photo-4: Prof. Dr. Mohammed Kamal Hossain conducting the session

Issues like energy flow and food chains in an ecosystem, cycles in ecosystem, zonation process, and ecosystems of Bangladesh were presented through statistics. He clearly mentioned that CHT has been the storehouse of biodiversity but due to over-exploitation and improper use, serious deforestation has taken place resulting in forest degradation and soil erosion.

Discussion

The discussion was conducted by Mr. Farid Uddin Ahmed. The discussion started with an introduction to Ecosystem service and Payment for ecosystem services - PES. He also gave example of Nepal's Dulikhel where 1900 families are contributing 160-250 NPR each for the water they get from the forest managed by the community. The amount is saved and utilized in many purposes. Till now around 25,000,000 NPR has been saved in their fund to utilize the water properly to each family. Community people are building schools, roads, giving salary and bonus to up hill school teachers (science and math) from that money and also give loan to extreme poor and poor for improving their livelihood. It was addressed as a great lesson for Bangladesh as Nepal's community forestry is one of the best examples in the world.

He also talked about Ecosystem Based Management – EBM. Then he shared the concept of REDD+ with special emphasis on Free Prior Inform Consent - FPIC. He showed a video which depicted how REDD+ is likely to give benefit to the indigenous communities for their conservation of natural forests. He urged all participants to prepare the communities for REDD+. The example of Green building at Dubai was shared where minimum light is used and mostly solar technology is used. He also mentioned about innovation of a membrane to absorb CO₂ in near future. He especially mentioned about a new solar technology recently developed by NASA where a small solar panel would be generating electricity to suffice the need of a house in USA (including heating) and four in India and 10 houses in Bangladesh. It might solve total power problem and national grid supply of electricity. At present FedEx's main office in USA is being run by such technology as a pilot study. He said that with commercialization of such technology, developing countries will not be able to ask for compensation from developed nation in future for environmental pollution.

Mr. Ahmed specially mentioned the suggestions of Raja Debashish Roy, Chakma Raja where he mentioned REDD+ as one of the last solutions that can help make the authority of the community stronger over the natural resources of CHT.

The new emerging trend of Social Business in Bangladesh was discussed as well. He gave an example of health service within an attaché. It was developed by Japan and being used under social business for health check up at an affordable price. The data is directly transferred to Japan's server and processed immediately along with a prescription for the patient. The record is documented in a website as well. All of these are expected to be done at a very nominal fee in Bangladesh. He encouraged the participants to think out of the box to help the society as well as improve their own living.

Finally at the end of the discussion he requested the participants to practice the Change in attitude, being more devoted to the nature so that the nature doesn't payback for human's activities which harmed it.

TS-4: Impacts of Climate Change on Livelihoods

The session was conducted by Dr. Md. Mohiuddin. Through PowerPoint presentation he showed link between livelihood and different capitals. He quoted Brammer (1986) and mentioned his classification of CHTs' land and broadly compared the present situation, livelihood shifts and various newly adapted livelihoods. He cited example of 1200 Tobacco chimneys in CHT, using most fertile land for producing tobacco but at the cost of natural forests and wildlife habitat. He provided practical examples of changes in livelihood due to bio-physical changes in CHT.



Photo-4: Dr. Md. Mohiuddin conducting the session

TS-5: Gender & Climate Change

The session was conducted by Ms. Farhana Khan Pushpa where she clarified Gender as the distinct social roles assigned to men and women. She mentioned it as not a special focus on women, but rather, an understanding on how discrimination against women and gender roles interact to shape men and women’s every aspect of living. The importance of ‘Gender Analysis’ from the context of climate change was explained in the session.

At the end of all the technical sessions Mr. Farid Uddin Ahmed addressed the major topics regarding changes including Climate Change along with the adaptation plans using the following table:

Land type	Livelihood	Awareness raising	Research
<ul style="list-style-type: none"> -Natural forests -Reserve forest -Degraded forest (USF/common land) VCF -Jhum land -Water bodies and Jhiri/chara -Fruit orchard, rubber -Private forest/plantation 	<ul style="list-style-type: none"> -Jhum -Fruit orchard -Tobacco cultivation -Cattle fattening – goat/pig rearing -Poultry rearing (chicken, koel) -Marketing of products like: Bamboo/shoot, Rattan/cane -Ecotourism, wildlife -Promotion of traditional food - Promotion of traditional weaving - Marketing of Ginger, turmeric, taro/ aroid, pineapple - Marketing of skin of buffaloes 	<ul style="list-style-type: none"> -Mobile health -Book-text book -Android 	<ul style="list-style-type: none"> -Drought resistant varieties -various medicinal plants. Example: Baruna leaf, <i>Xantho xylum</i> -Easy and economic ways of Rainwater harvesting -Improved fish culture -Scaling up of Mushroom -Marketing of ICS: bio-briquette -Improved ways of processing and storage -New fruit varieties -Establishment of gene bank

Mr. Ahmed explained each of the points mentioned in the table from the context of Khagrachari. He pointed out that Jhum cannot be stopped since it is related to the culture of the society but as the proper Jhum cultivation is not anymore followed locals must maintain the previous structure of Jhum. The appropriate plantation rules and usage of fertilizers and insecticides needs to be learned. Another alarming fact regarding Tobacco cultivation has emerged at Khagrachari nowadays. It is leading to temporary improvement of the livelihood but the soil’s fertility gets destroyed if it’s continued. Thus massive tobacco cultivation must be stopped.

Mr. Ahmed emphasized on the sector of awareness. Especially, from the primary school level, to inform them the importance of forest, wildlife. According to him for changing the CHT proper

information and awareness is needed. He shared the updated of ICIMOD who has recently taken a program to improve the tourism of CHT.

He also highlighted the need of high-quality research on drought tolerant crop varieties, medicinal plants, utilizing the remaining hills to sustain its fertility along with wildlife. He established an interlink between all these and the locals livelihood improvement, tourism improvement stating that if the biodiversity remains enriched more tourism will take place at Khagrachari leading to an improved livelihood along with more livelihood options for the local hill people.

Feedback of the participants:

The participants raised the following point at the end of the previous session:

- FD should stop planting exotic trees including Teak.
- Plantation of trees in homestead and in degraded areas needed.
- Natural forests should be conserved to check soil erosion and ensure water seepage.
- Watershed must be conserved for reducing siltation of rivers
- More awareness raising is needed for Climate Change and adaptation
- Since Arannayk Foundation is working from the grass-root level to high officials, its project sites should be increased.
- More pilot projects needed as demonstration
- Conservation without alternative livelihood support to forest dependent communities will not work.

Concluding session:

Mr. Farid Uddin Ahmed began the concluding session thanking the participants for attending the training despite of their busy official schedule on the month of June. He then talked about the total training briefly.

He emphasized on establishing a Gene bank/germplasm centre for widening scope for research as well as for economic development of the CHT. He suggested for documentation of existing biodiversity and have their DNA fingerprinting to establish sui generis. The importance of protected area and production area both were informed. Adopting innovative technologies that would be combating Climate Change impact in near future were highly encouraged.

Finally Mr. Ahmed handed over the certificates of participation to all the participants. The participants thanked AF-ICIMOD for organizing such obliging training.

Training of Stakeholders on Adaptation to Climate Change Issues in Chittagong Hill Tracts

22-24 June 2014, Khagrachari

List of Participants



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1. Identifying the major changes in Khagrachari

There were three groups. Each group has given their group name

GROUP – 1 (Gomoti)		
1	Land Use	<ul style="list-style-type: none"> • Plain land people have brought their cultural, social and economic values with them when they come here for job, agriculture and other purposes • Deforestation has cause soil to erode more and thus the water reservoirs are filled up • Hills are encroached and used for various private and commercial purposes • Fertility of land has decreased
2	Livelihood Pattern	<ul style="list-style-type: none"> • The hilly people, especially women, have become socially and economically independent thanks to various factors such as high education rate, help from different government and NGOs • Household income has increased • There has been a change of food habit due to reasons such as mixture of culture, health consciousness etc. • Modernization of life is seen • Change in culture
3	Social Context	<ul style="list-style-type: none"> • Rate of education has risen • Increase in mutual interaction of different cultured people • Increased demand and consciousness in preserving one's culture • Increased awareness and communication among people • Increase in anti-social activity and political instability
4	Climate	<ul style="list-style-type: none"> • Decreased rainfall • Rise in temperature • Erratic monsoon rainfall • Drying up of streams and rivers • Increase in pollution
5	Bio-Diversity	<ul style="list-style-type: none"> • Scarcity of natural resources • Increase of alien species in forest and in plantation • Decreased number of wild animals and birds • Increased use of forest resource based industry (rubber,teak, incense etc.
GROUP – 2 (Maini)		
1	Land Use	<ul style="list-style-type: none"> • Whereas mixed culture was popular before, it is getting replaced by monoculture • Traditional shifting cultivation technique is getting replaced by modern cultivation technology e.g. Use of tractor, chemical based fertilizer etc. • Increase in tobacco cultivation • Increase in individual plantation
2	Livelihood Pattern	<ul style="list-style-type: none"> • Before most of the people relied only on agriculture but now people are taking up different ways to earn their living such as working for NGOs, working as teachers, entrepreneurship, small cottage industry etc. • People are building concrete houses rather than building houses of wood, bamboo, leaves, hay, mud etc.

		<ul style="list-style-type: none"> • Relying more on chemical based medicine than in natural herb based traditional medicines • Increase in education
3	Social Context	<ul style="list-style-type: none"> • Decrease in social values and norms • Decrease in traditional hierarchy management system such as decrease in number and influence of headman, Karbari, etc. • Increased trend of mono families • Change in dressing trend, food habit, entertainment etc.
4	Climate	<ul style="list-style-type: none"> • Erratic Rainfall • Increase in temperature • Drying up of water reservoirs • Seasonal variation has changed drastically
GROUP – 3 (Chengi)		
1	Land Use	<ul style="list-style-type: none"> • Commercialized cultivation of Arum, Turmeric, Ginger, Pineapple etc. has become popular and thus decreased the trend of shifting cultivation • Instead of natural variety, hybrid and high yielding varieties are used in agriculture • Change in slope of hills • Increased use of pesticide, insecticide, herbicide and fertilizer in agriculture • Hills are cut to establish roads and human settlement • Increased surplus agricultural produces
2	Livelihood Pattern	<ul style="list-style-type: none"> • Used of modernized cultivation techniques • Surplus produces has helped the people to not only fulfill household demand but also to sell the produces in the market • Increased produces are now supplied to the bigger cities • Entrepreneurship and business mindset has been created among the natives • Change is house building pattern, food habit, dressing, job trend etc.
3	Social Context	<ul style="list-style-type: none"> • Higher education rate observed • Involvement of women in education, socio-economic development etc. has increased notably • Social degradation is observed thanks to alcohol and other addictions
4	Climate	<ul style="list-style-type: none"> • Increased Temperature • Decreased rainfall