Project Update: July 2016

The project team members are working hard in the Dharchula-Munsiari landscape for collection of data regarding various issues related to harvest trade and conservation of caterpillar fungus. During harvesting period (May to June, 2016) of caterpillar fungus, the team has travelled in the alpine meadows to document harvesting process and understand environmental and conservation awareness of the harvesters. We have also conducted questionnaire surveys to understand the socio-economic impact of the harvesting and trade of the species among harvesters of the landscape. During the stay in pristine habitat of caterpillar fungus (alpine meadows) and through communication with stakeholders of study area, the team has collected good amount of data on project objectives.

Figure: 1. Harvesters are searching for caterpillar fungus

During the field visits, the project team has observed that most of the harvesting areas are located on the north-facing slopes of the mountains. The harvesters recline on the ground over the high-altitude expanses, attentively scanning the terrain (Fig. 1). It is a difficult task requiring attention and tolerance for harvesting. Indeed, the height and thickness of caterpillar fungus are so small almost like stalk of the apple that it cannot be easily seen. During spring the ground is covered with short vegetation stumps as brownish as the small caterpillar fungus. But mountain people work hard since it is considered particularly strenuous, the enterprise is highly profitable. We found that when the caterpillar is first dug out of the ground it is covered in dirt (Fig. 2A). From what we saw the best way to remove this layer is with a toothbrush. During cleaning process careful consideration must be taken not to damage or break the caterpillar fungus. After drying in low sun, species is ready to trade (Fig. 2B) and people store it on dray place to save from moisture.

A **B**

Figure: 1. Caterpillar fungus: Uprooted from the ground (A) and cleaned and dried which is ready to sell (B)

Anthropogenic pressure in the meadows

The caterpillar fungus and its associated habitats are facing many ecological and anthropogenic threats. During the field surveys, we observed huge pressure of different human activities on natural resources of the alpine meadows. Goats, cows, mules and horses of the harvesters were gazing in the pristine pastures (Fig. 3). The associated habitats of caterpillar fungus (alpine meadows) of the landscape (Fig. 4) support a high degree of endemism and habitats for rare, endangered and threatened Himalayan species such as Snow Leopard *(Panthera uncia),* Blue Sheep *(Pseudois nayaur),* Aconite *(Aconitum heterophyllum),* Brahmakamal *(Saussurea obvallata)* and *Costus (Saussurea costus).*

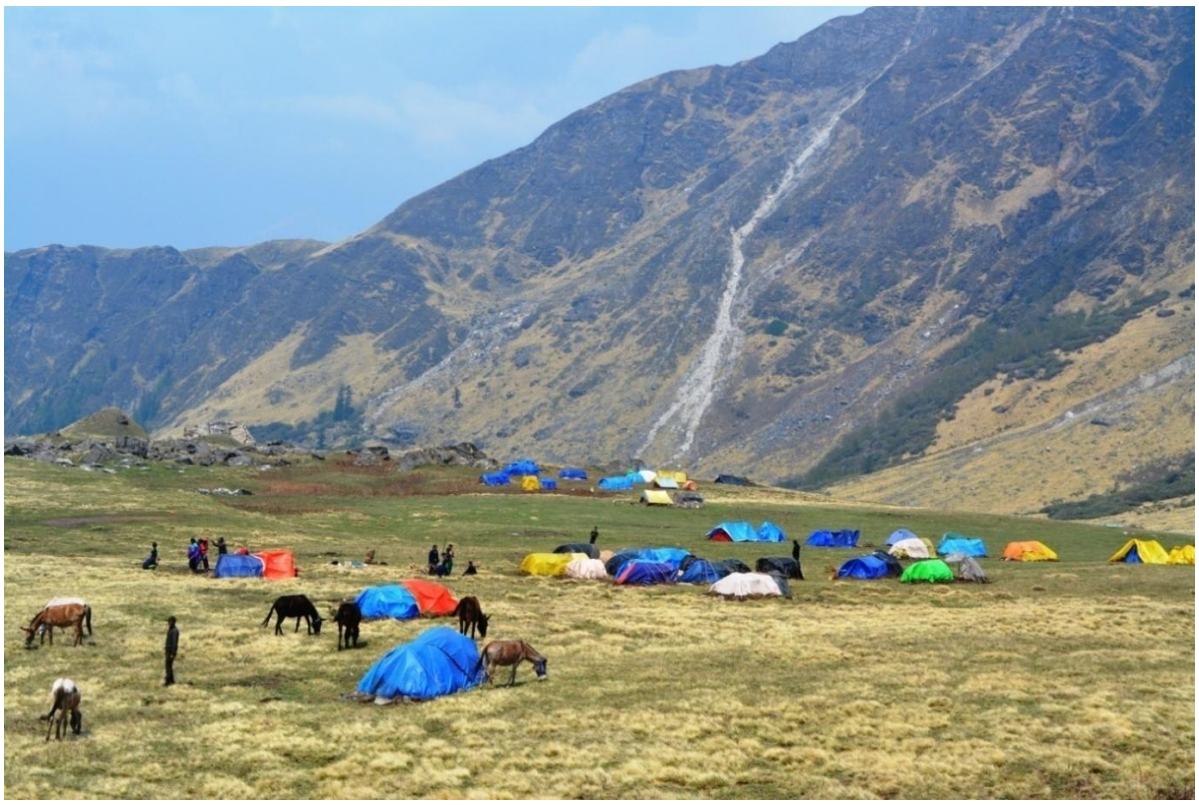

Figure: 3. Tents and livestock of harvesters in the alpine meadow during harvesting period

During collection period, the team has observed threats like over grazing, chopping of trees for fire-wood, increased human population in alpine pastures etc. probably have a negative impact on caterpillar fungus and environment. Ground-dwelling birds, charismatic mega-fauna and vegetation composition might be also affected by harvesters' activities. The team has also noticed degradable and non-degradable garbage in the surrounding of the base camps of harvesters. There was not any kind of management system to mitigate or reduce generated garbage during stay of harvesters in the meadows. Drinking waters sources seem polluted. In the evening, harvesters gathered and played different games like cricket, cards and ludo. During the games people shouted and cheered with each other loudly which creates huge noise level in the silent valleys. This sound could be problematic for the local wildlife.

Figure: 4. Habitat of caterpillar fungus and other Himalayan mega fauna

Opportunity and challenges for the community

The villagers who harvest caterpillar fungus in Dharchula-Munsiari landscape belong to the marginal community, traditionally shepherds, porters and traders. Agriculture is almost impossible and only a few crops can be grown in the rocky landscape, among them some cash crops like potato and apple were later adopted by the people as a source of income. The few means of money-yielding practices have forced the people to depend mostly on pastoralism and collection of NTFPs, among them medicinal herbs, for their livelihood. Woollen handlooms and beverage production are the traditional cottage industries. Investigation for soci-economic contributions of caterpillar fungus among mountain dweller illustrate that stream of cash income to harvester from this gold rush has caused a far-reaching revolution in social and economic conditions in the last 12-15 years. Just a couple of years after initiating harvesting of caterpillar fungus, the households' income from its trading

during the month of June, July and August has increased tremendously. Now people spend this money for their children's education, family healthcare and daily needs for whole year. Furthermore, they do not have to rely completely on agriculture which again subjected to rainfall and wildlife demolition. Thus, the income derived through the collection and trade of this precious caterpillar fungus has led to an enhanced empowerment of marginal communities, often living in extremely remote locations, who used to secure their survival only through pastoral and agricultural activities. Thus, the caterpillar fungus boom is facilitating the integration of rural upper Himalayan households into regional, national and international economic cycles by providing the necessary product and cash in exchange for sharing in this commodity trade.

As the climate and the terrain are tough in the collection areas, the harvesters face many problems such as common cold (many fall prey to pneumonia), headache, stomach problems, and sunburn and skin diseases due to exposure to high solar radiation. Some get injured from hidden stones and sometimes they slip while moving. In past, few cases were reported where people got seriously injured or died while slipping on a glacier. Food is always short and people eat minimum which lead to insufficient nutrition and related physical problems. During interview in different villages, harvesters appeared worry about decreasing production of caterpillar fungus and increasing conflict among community year by year. They were seemingly aware of the fact that over exploitation is leading to depletion of the species and huge human pressure during collection season affecting pristine habitat, they are driven by poverty to continue doing the same. They were concerned about the consequences if this natural resource disappears in near future.

The lure of easy money has resulted into aggregation of huge ecological threats for the species in the landscape and leading to a sharp decline of caterpillar fungus from its natural habitat. To address these issues, there is also need of long-term field studies on conservation challenges and impacts of anthropogenic pressure on the species as well as its habitat. In conclusion, despite the challenges, people enjoy their stay at the meadows and spend good times with their family and friends. We feel that there is a need for extensive outreach programmes to spread awareness about the environmental causes among the harvesters. They seem to be open to these ideas, but are very less aware of them, which is causing the pollution and other issues that we observed during our stay at the harvesting sites. The team is chalking out future plans to address these issues through suggestive environmental management and extensive outreach programmes among harvesters (September, 2016 onwards).

Conference

The team has collected good amount of data from the field regarding harvesting process, trade and socioeconomic survey among harvesters of caterpillar fungus. Recently I talked on outcomes from the project assignment regarding trade, harvest and sustainability of the caterpillar fungus in the Himalayas at Conservation Asia-2016 conference in Singapore. This conference was organised by the Society for Conservation Biology, the Association for Tropical Biology and Conservation and National University of Singapore. The RSG was also partner for this conference.

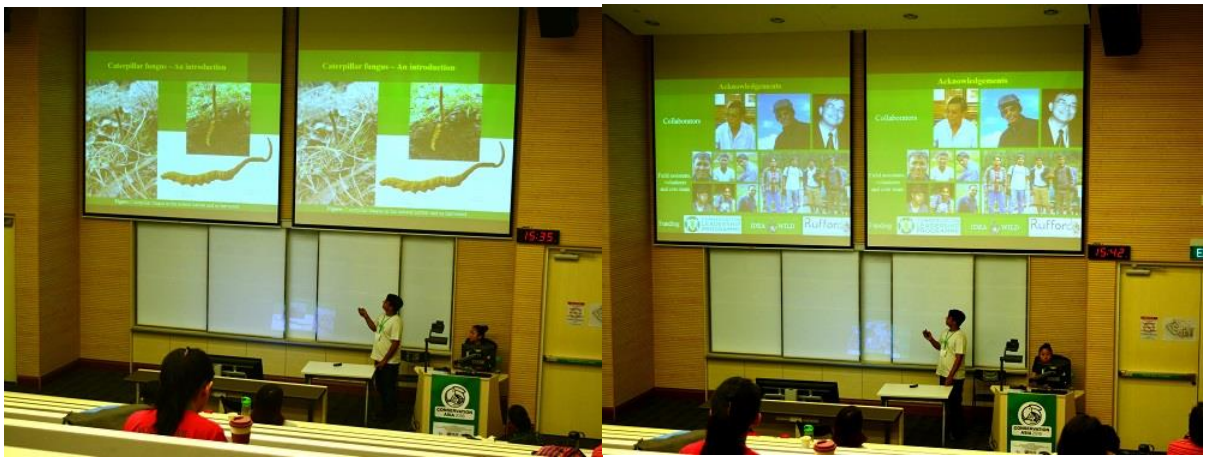

Figure 5. Conservation Asia-2016 Conference in Singapore.