



# HANKU

## Assessing the effects of land-use change on agrobiodiversity



Khet lands



Carrying fodder from forest



Buckwheat diversity block



Buffalo



Amaranth diversity block

Hanku is located in Jumla, a Himalayan district in the north-west of Nepal. Jumla ranges in altitude from 2000 to 6400 MASL, while Hanku reaches altitudes of up to 4600 MASL. We worked with communities from nine wards in Hanku, belonging mainly to three major ethnic groups: Dalit, Brahmin and Chettri. We used household surveys, focus group discussions, participatory mapping and community assessment to assess diversity, land-use change and resilience. The data were combined with information on agrobiodiversity of high altitude crops from the UNEP/GEF funded Local Crop Project.

### AGROBIODIVERSITY

The Himalayan environment, with a steep rise in elevation and a patchwork of ethnic and cultural diversity, creates unique selection pressures on crops. Cold tolerance is a severe obstacle to diversity, yet farming communities have been maintaining crop diversity of rice (6 varieties), amaranth (4 varieties), barley (2 varieties), buckwheat (3 varieties), finger millet (4 varieties) and common bean (13 varieties). Farmers cultivate cold-tolerant crops such as proso millet, foxtail millet and buckwheat. Local breeds of cow, ox and hen are among the major livestock. Cows are mostly used for milk and manure whereas ox are used for draught power and manure. A few households also raise goats, sheep and horses. A diverse range of wild foods, fruits and vegetables is gathered from forests; one example of this is a wild plant called "ghodamarcha", commonly used to prepare tea due to its medicinal properties.

### LAND-USE CHANGE

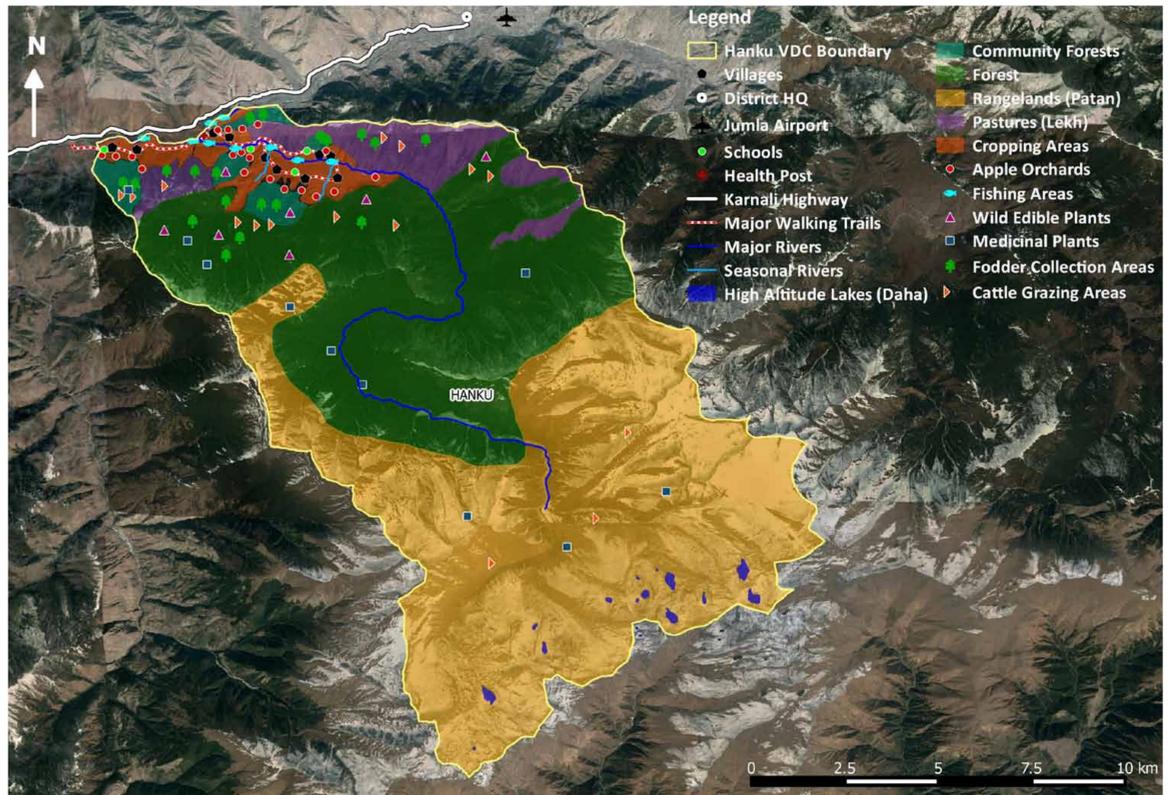
Most areas of Hanku are covered by forest and grassland/pastureland. A number of small high-altitude lakes are considered sacred and have high cultural and religious importance. After forest and pasture, agriculture is another major land use system here. A broad distinction of agricultural land is made between *Khet*, *Bari* and *Lekh*, based on altitudinal variation, topography, and irrigation availability:

- *Khet* – irrigated and rainfed lands for rice cultivation
- *Bari* – rainfed uplands
- *Lekh* – high-altitude lands, far from villages.

The commercial cultivation of apples and beans is changing the agricultural pattern of lands in Hanku. More than 60% of households grow apples, and over 90% grow beans. Apple cultivation is an added source of income for many farmers. The commercial cultivation of local beans has replaced some minor and neglected crops, such as proso millet. Being an organic district, animal manure is the principal source of nutrients in the soil.

### RESILIENCE TO ENVIRONMENTAL CHANGE

Hail is one of the major climatic hazards that have been affecting major crops. Farmers have reported frequent occurrences of hail for the past 3-4 years during the months of October (which affects rice and other crops at the time of maturity) and April (which does not affect crops). There is also a severe problem of drought. Local varieties that are more resilient to an unpredictable climate are conserved and used by the community. Some improved varieties of cold-tolerant rice are also grown to tackle the problems of hailstone damage and disease susceptibility. Over-exploitation of the forest has led to a steady decrease in forest area. Farmers have been establishing community forests for more sustainable use. The community has recognised the need for sustainable management of pastures to prevent over grazing. Farmers have also been unsystematically establishing apple orchards in common lands (pasture), which are in need of immediate management.



### FARMERS' PERCEPTION OF ECOSYSTEM SERVICES PROVIDED BY DIFFERENT LAND USES

**Forests, Community Forests**  
Forests provide fodder and fuelwood. *Community forests* have been established to prevent over exploitation. Forests are an important source of wild foods, medicinal plants and wild plants used for the preparation of organic biopesticides

**Crop Fields, Fruit Orchard**  
Diverse crops such as cold-tolerant rice, beans, buckwheat, millets, maize, barley and amaranth, among others, are cultivated.

**Rangelands, Pastures**  
Parts of rangelands are used for pastures during cropping season. After harvest, cows and buffaloes are brought to graze crop fields. Rangelands also provide wild foods, medicinal plants and forage.

**Perennial River, Seasonal River, Spring**  
Springs are the source of water for human consumption while agricultural lands are irrigated by water from rivers.

**Villages, High Altitude Lakes (daha), Temples**  
Settlements, temples and high-altitude lakes have cultural importance to community. The lakes are considered sacred.

**ECOSYSTEM SERVICES**

- Water for human consumption
- Water for agriculture
- Soil fertility
- Cultural importance
- Pollination
- Wildlife habitat
- Soil erosion reduction
- Pest and disease regulation
- Drought mitigation
- Flood mitigation



Rice harvest



Fishing at Tila River



Processing rice



Apple nurseries and ponds for snow-harvesting



Participatory mapping