



TIBETAN FARMERS FACE CLIMATE CHANGE

Number 4 in a series of 10 briefings on climate and Tibet

The staple of Tibetan life is highland barley. All six million Tibetans depend on this high-altitude crop, not only the farmers but also the nomads, who traditionally barter animal products for the farmers' barley.

Only a tiny part of the great plateau –an area as big as western Europe–is suitable for farming, due to the intense winter cold, the rugged terrain and the concentration of rainfall in summer. Only in valley pockets is there water nearby that can be directed onto fields, on slopes not too steep for farming.

As climate changes, Tibetan farmers seldom have the option of simply moving up or downstream, or up slope. The terrain of Tibet is too steep, too exposed to gales and blizzards and, in most areas, too dry. In the land surrounded by mountains, as Tibetans call their homeland, it is the mountain tops that are forever snowbound, while the valleys are often dry. Although China calls Tibet, where China's great rivers rise, "China's Number One Water Tower", the reality is that most of Tibet is semi-arid. It is amazing that a stable, sustainable civilisation exists at all, at average altitudes of 4000 to 6000 meters, the highest inhabited portion of the planet.

Climate change threatens the livelihoods of the Tibetan farmers, although the farmers did nothing to cause climate change. The entire Tibetan Plateau –two and a half million square kilometres– is desiccating. It is warming and drying, with especially sharp drops in mid summer monsoon rains. To some extent, this is compensated for by increased spring and autumn rain, but it's not that simple.

On the plateau, the growing season is short. Crops need to be sown as soon as possible after winter, so they can grow fast and be harvested before the cold returns, as early as September. But the monsoon rains, the only substantial rain, arrives only in summer. For thousands of years Tibetan farmers have dug irrigation channels and lined them with stone, to get glacier-melt water in springtime onto fields. Farmer's crops are finely attuned to the other source of water: in the frozen earth which thaws in spring just at the time that the roots of crops reach down to tap this storehouse of precious water.

Australian agricultural scientists investigating Tibetan farms reported in 2009 that: "the cash incomes of adults from rural households in Tibet average less than US\$1 per day, such that even households that provide all their own food have little extra money to buy non-food necessities, including inputs to develop agricultural enterprises. The average size of farms in Tibet's crop-dominated zone was found to be just under one hectare, and practically all arable land is already being farmed."

Now the balance has been lost. The spring thaw is earlier and earlier, permafrost is melting away before growing plants can access the water. This affects not only crops but also the native vegetation of Tibet, especially in wetlands and other low-lying areas, now rapidly drying out and dying off. The desiccation death of the many wetlands turns carbon sinks into carbon emissions, adding to the global burden of carbon dioxide and methane into the atmosphere. The loss of wetlands in turn threatens migratory birds used to Tibetan stopovers.

The big crunch will come in a few decades from now, as the melting glaciers disappear. Tibetan rivers which are now boosted by the accelerating glacier and spring snow field melting, will experience a sharp reversal, a sudden drop in flow as glaciers and snowcaps will no longer regulate runoff and ensure year-round release of water downstream.

Chinese scientists have put a monetary value on the services provided to the planet by Tibetan farmers

in Tibet Autonomous Region (TAR), which is half the area where Tibetans live. The actual monetary value of the crops is only 45% of the total. A bigger sum, 2.07 billion yuan, or 46.7% of the total, comes from Tibetan farmers sequestration of carbon in their growing crops, and exhalation of oxygen to the atmosphere. Nutrient recycling and water conservation are also quantified, in this 2008 research report by two Chinese and one Tibetan scientist. Altogether, the work of Tibetan farmers of TAR provides environmental services to the planet worth 2.4 billion yuan each year. If all Tibetan farmers are included, that figure could be at least doubled.

Yet degradation of farmland due to climate change is accelerating, on top of other causes of degradation originating in China's disastrous insistence on growing wheat in Tibet, a crop more familiar to Chinese settlers but unsuited to the tough conditions in Tibet.

The Chinese style of intensive peasant farming of small plots using highly labour intensive methods is not suitable in the frigid climate of Tibet. There are few Chinese style farms, other than some large scale state farms, and small scale greenhouse vegetable growers on urban outskirts, who often exhaust the soil.

Tibetan farmers need new methods, new hybrid seeds, new ways of improving productivity for a fast drying climate and rapidly increasing immigrant population. They need to be allowed, trained and encouraged to set up their own self-managing water user groups and farmers' associations, rather than being instructed from above by officials.

There is much the world could teach China about best practice methods of working in partnership with farmers to ensure co-operative partnerships based on mutual respect.