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WORKSHOP 4 - Citizenship and social participation in management water landscapes

Switzerland - Water, cultural diversity and solidarity

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**The Traditional Snow Harvesting Water Landscape of Ladakh (Indian Himalaya) and its
Adaptation to Climate Change and Modernity**

As defined in the Council of Europe Landscape Convention (2000, Article 1) ‘Landscape’ means *an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. Landscape is a reflection of identity and diversity, a living natural and cultural heritage which evolves through time as a result of being acted upon by natural forces and human beings.* The term “water landscape” designates the perception and use of water in its different manifestations. Viewed from an ecological perspective (Falkenmark 1992), the term water encompasses the whole water cycle, the precipitation in form of rain, hail and snow, the “blue” surface water of rivers and lakes and the “green water” residing in the vegetation.

In this article we explore how natural water is perceived and used by an agro-pastoralist community in the Indian Himalaya, in Ladakh and transformed into a water-landscape providing sustenance, self-identity and a perfect ecological adaptation to a cold mountain desert environment. Traditional knowledge and practices such as seasonal patterns of dwelling at different altitudes to make an optimal use of the scarce resources and constructing water canals and reservoirs with the local materials from nature and the skills of the water using community are successful adaptations to the “oecological space”

(Evans-Pritchard 1940) having proven their viability by being maintained by the communities themselves over hundreds of years. In response to a shift in the seasonality of the useful water for farming due to global climate change a Ladakhi engineer, Norphel Chewang, invented a modern adaptation of the traditional irrigation technology which strengthens the autonomy, skills and water rights of the oasis farmers. Encouraged and supported by the local government of Ladakh, the Ladakh Autonomous Hill Development Council, this innovation strengthens citizenship and contributes to embellish the landscape of Ladakh.

Water in Ladakh

Since the Indian government has opened a motorable road forty years ago the spectacular natural beauty of the barren mountain desert landscape of Ladakh at the western fringe of the Tibetan plateau attracts thousands of tourists from all over the world every year to enjoy breath taking views of glaciers, large rivers without vegetation at their sides, sand dunes and vertical gorges in adventures jeep drives through an ever changing landscape with its plays of light and shadow. At night the “moonland” of Ladakh, as it has been called, is illuminated by infinite many stars shining bright in the thin air of the high-altitude oases’ villages situated between 3,000 to 6,000 meters above sea level.

Ladakh played over centuries an important historic, cultural and religious role as autonomous kingdom and crossroad between its four large neighbouring Asian civilizations. Petroglyphs on major paths and river crossings in Ladakh suggest that the area has been initially peopled in the Bronze Age by diverse people from Iran, post Harappan India and Tibet and became from the period of the Kushan Empire onwards a major passage for caravans from Kashmir and the Ganges valley, from Tibet and China as well as from Central Asia and Russia. On their two to three months trekking journey across the Himalaya, the caravans met in the upper Indus valley, in the bazaar town of Leh in Ladakh, to exchange precious goods, religious ideas, art and music. As repository of more than thirty of the world’s most renown medieval Buddhist monasteries, numerous royal castles and watch towers built on steep rock elevations along the sandy upper Indus river valley and its tributaries, Ladakh is a custodian of a unique historic and cultural wealth of architecture, art and religious knowledge in a natural environment untouched by industrial development. The living tradition of Tibetan Buddhism is expressed in religious ceremonies, dances and music in the monasteries as well as in the daily routine of the people and is displayed in bright colours of red, yellow, blue, green and white prayer flags and white stupas spectacularly positioned on cliffs, village tops or at dangerous mountain passes and river crossings which further embellish the desert landscape dotted by the emerald green village oases.

The Ladakhi know the water sources of their desert landscape very well as this knowledge enabled them to embody their historical role as guides of the horse, yak, sheep and goat caravans traversing the three mountain chains surrounding their upper Indus Valley. With less than two inch of precipitation falling as snow in winter on high mountain peaks life in Ladakh depends on seasonal streams coming from melting glaciers and on the skill to harvest it and grow crops in the short summer period. We describe the water landscape of the Ladakhi people living in Leh District, a vast desert area of 45’000 km² with 113 village-oases which enabled Ladakh to unfold for two thousand years its important role as caravan crossroad at the southern artery of the Silk route.

The Water Landscape of Ladakh

Situated on the sand banks of the side valleys of the Indus, the Ladakhi oases with their cultivated terraces, fruit tree plantations and pastures are fed by seasonal springs and snow melt water. The

architecture of their monasteries, inscriptions on the prayer walls and the ruins of medieval castles in midst of the cascade of white washed family houses overlooking the terraced fields reveal that the villages are several hundred years old.

One of the keys to understanding their durability lies in the ecological knowledge of the Ladakhi especially on water. The villagers know a construction technique on how to build kilometre long irrigation canals to bring the snow melt water from the high mountain pasture areas down to where crops can be grown. In contrast to cement works which crack in the cold winter temperatures of minus thirty degrees, their traditional construction technique is durable. It consists in digging shallow canals fortified with stone boulders, willow branches, gravel and sand which they manure with goat dung and in which they plant millet and grass. Watered gently for three to five years the roots tighten the construction which also gains strength from the mineral silt deposits of the glacier water. To build the terraces on which crops can be grown, similar techniques are used but it takes some nine years to transform the sandy ground with manure into a soil on which crops can be grown. The extent of the cultivable land depends on the topography and the amount of water which can be tapped from the snow fields or is discharged by seasonal springs.

From the spring(s) to the end of the village the water course is beautiful and meticulously clean. Wild rose bushes, a willow tree and a white shrine at the source followed by a water powered prayer mill are religious symbols used in rituals performed by the villagers and the village monks for water and fertility. The water powers small water mills to grind the cereals and reaches a storage tank built with the same technique before it flows through the village where it is collected as drinking and household water and finally reaches the terraced fields where it waters every plant as the land has been carefully patterned into small chessboard squares for irrigation. Animal dung, night soil, ashes and soil are used to manure the fields in spring and no waste water enters the stream before the low end of the village.

Guided by the moon calendar of monk-astrologers and sun observation the families follow a common agricultural pattern. Starting after the month's long New Year festivities in February with a religious ceremony in the village monastery and the circumambulation of the prayer walls from the top to the lowest part of the grown village perimeter, the communal maintenance and repair work of the irrigation system is done, followed by a balloting of the water rights for the season given to two families on a twelve-day rotational base. The agricultural system comprises a complex pattern of farming at different altitude levels to make an optimum use of the scarce water and short growing season, seasonal animal herding on glacier near pastures and foraging fodder, firewood and shrubs for the four winter months with temperatures below freezing, during which the families visit relatives and friends in neighbouring villages, attend religious festivals and exchange or sell their agricultural products, sun dried apricots and cheese, walnuts and barley at regional markets. Every day starts with a donation of water, the most precious good, poured in silver, copper and brass cups on altars in the village monastery and in the families' temples. The water system is built, operated, maintained and owned by the villagers with their farming tools.

The knowledge about water and rules keeping the environment perfectly clean is emphasized in numerous religious ceremonies performed by the village monks at household and village level throughout the agricultural season. It is contained in a deep religious water symbolism rooted in Shamanistic and Buddhist concepts of purity and the human experience of life on earth. When water becomes scarce additional ceremonies are held at the village spring with precious offerings to the water spirits.

Citizenship in Coping with Climate Change and Modernity

Tourism brought numerous water problems to Ladakh as the foreigners don't know and respect the Ladakhi rules of cleanliness any hygiene and plastic waste clogs the irrigation system where tourist hotels and lodges have been built. Many development organizations have flocked into Ladakh bringing technical novelties which don't meet the test of time such as iron pipes and cement construction, chemical fertilizer rapidly washed out in the light soils and micro hydro-turbines to generate electricity in the traditional water mills transforming these village constructions into modern ruins.

Norphel Chewang, a Ladakhi engineer with great cultural knowledge and esteem for the traditional way of living and values of the Ladakhi became aware not only of the lack of ecological and socio-cultural adaptation of modern water equipment and engineering but witnessed also change in the seasonal discharge pattern of glacier melting. Climate change alters the timing when the winter snow melts and displaces the arrival of the natural water to the oases for several weeks. The changes of the climate pattern threaten to disrupt severely the agricultural livelihood in Ladakh. Measuring and recording the changes observed, he invented a method on how to store the excess water running down unused at the wrong period by pumping it uphill to barren land where it freezes in thin layers in the night and develops slowly into a thick artificial glacier. The emplacement is selected in such a way, that the spring sun melts the glacier at the required time for planting. The traditional construction technique of the Ladakhi farmers has been replicated to construct storage basins for the ice at the exactly defined emplacement on the mountain slope and canals are built in the traditional way leading the stored ice as water to the villages. The invention has been so successful that it has been replicated in more than thirty villages of Ladakh. More water enables the farmers to add new terraces and grow new valuable cash crops for the tourist such as a choice of vegetables, which can also be sold sundried as trekking soup for a good additional income.

Citizenship in coping with external change is based on participatory appraisal, the demand and the skills of the Ladakhi villagers. As the artificial ice storage and the new terraces are built outside the traditional irrigation perimeter but with the same technique and by the same people who are their owners and beneficiaries, the traditional water management system is not disrupted. Thus, the water landscape of Ladakh is maintained but adapted in an ecologically and socio-culturally sustainable way.

The Water Landscape of Ladakh viewed through the Lens of landscape Anthropology

Landscape anthropology defines the term "landscape" as a process (Hirsch 1995), a human praxis creating meaningful places and constituting social practices (Bourdieu 1977). Societies adapt to the constraints of the environment through culture (Sahlins 1976). By "dwelling" in a physical surrounding, people "embody" their environment (Merleau-Ponty 1945, Ingold 2000) and construct a landscape (Berger and Luckmann 1967, Grieder 1994). Landscape is the outcome of the physical and symbolic implication of people with their surroundings.

The Ladakhi farmers create their water landscape through their environmental knowledge about where the water sources of which quality and quantity are situated in their cold mountain desert. They adapted their mode of dwelling to the ecological resources of water, topography, soil and climate. This knowledge is reinforced by religious authorities in water related ceremonies and passed from one generation to the next. Their water landscape contains their technical knowledge of construction, farming and herding, tool making as well as their village-based system of sharing the work and the

benefit of irrigation. The religious symbolism of their water landscape has a central place in their folksongs expressing their self-identity. Here some examples:

A love song sung alone on the pasture land: *“On the height of Taru my home, up there on the heights a glacier is forming. When the glacier forms on the height it will give birth to a turquoise lake and from the lake flows out bubbling dancing water. It shows how blessed is Taru with good fortune. Thus, is the stream of Taru, my home. Flowing impetuously, foaming and roaming. But, my love, if you pass by, for you it will run gently and slow”*.

A threshing song sung while threshing in groups with the livestock: *“Please go around and around the centre. Slowly, slowly around and around and thresh. Come in my bag. From China come in my bag. From India come in my bag. From Mongolia come in my bag. From Kazakhstan come in my bag”*.

And a travelling song: *“The sun rose from east the warm sun of the east. On this auspicious day, I the boy, left home on tour...when I reached the top of Khardong pass, I could see the thousand houses of Chuchot. When I reached the top of Sasser La, the horse began to neigh. And I understood the horse’s feelings, for it recalled the good grass of Chuchot”*.

Conclusion

To develop culturally meaningful and viable solutions to the modern problem of climate change, local government has encouraged the innovation of artificial glaciering, which is constructed, operated and managed by the Ladakhi farmers based on their traditional knowledge and maintains the traditional water landscape of Ladakh. As the ecological water landscape in Ladakh undergoes change independently of the activities and views of the people, the farmers adapt to the ecological changes by communicating meaning, adapting their daily routines and increasing their village water to the joy of all thanks to the local invention of artificial glaciering.

For Bruno Latour (1993) landscape is a “quasi-object”: something constructed, a cultural product but having an independent existence with its own rhythm and purpose.

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Photo 1 - Phyang village and its irrigated fields in Ladakh
(photo C. Wacker)



Photo 1b



Photo 2 - Tagmachik village and its oases (photo C. Wacker)



Photo 3 - Towards the pasture land of Tagmachik (photo C. Wacker)

Photo 4 - Preparing the land and first watering in spring, Saspol village Ladakh (photo C. Wacker)



Photo 5 - Ploughing the terraced prepared, Leh Ladakh (photo C. Wacker)



Photo 6 - The village water tank of Tagmachig, Ladakh (photo C. Wacker)



Photo 7 - Bringing glacier water in the irrigation canal to the fields near Stakna, Ladakh (C.Wacker)



Photo 8 - The terrace landscape of Changspa, Ladakh (photo C. Wacker)



Photo 9 - Sharing the task of watering in Saspol, Ladakh (photo C. Wacker)



Photo 10 - Bringing manure to the fields in spring, Saboo village Ladakh (photo C. Wacker)



Photo 11 - Lamayuru village and its irrigated fields in Ladakh (photo C. Wacker)

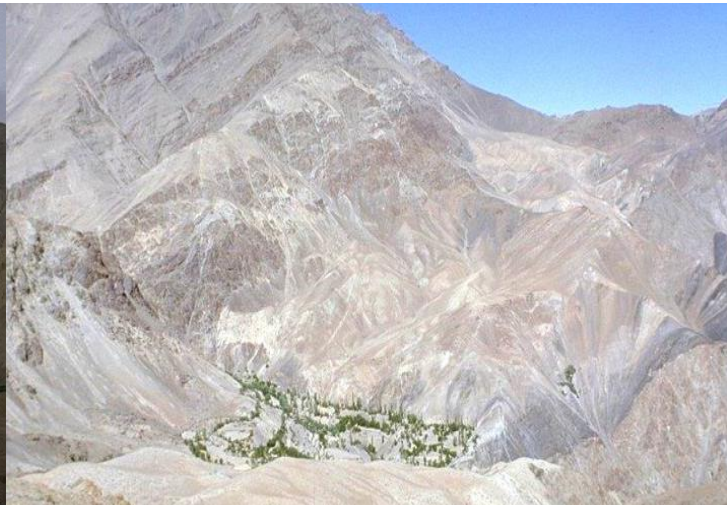


Photo 12 - Creating land by bringing glacier water to the terraces in Tagmachig, Ladakh (photo C. Wacker)



Photo 12b

*Photo 13 - Recalling the water rights with the official register at the village pond in Saboo village, Ladakh
(photo C. Wacker)*

