Local institutions for sustainable management of common property resources: Learning from Nubra valley in Leh district, India

Dorjey Angchok1,2, Ranjay K Singh2, Sonam Chorol1, Tsewang Tamchos1 & Anand Katiyar1
1 Defense Institute of High Altitude Research, Leh, Jammu & Kashmir -194 101, India;
2 ICAR-Central Soil Salinity Research Institute, Karnal 132001, Haryana, India
E-mail: achuk_iari@rediffmail.com

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In risk-prone high altitude areas like Ladakh many resources, including highland pasture lands, groves for fuel wood, and irrigation waters, are held in common. The common property regime helps local inhabitants access different eco-environments and thus reduces risk and vulnerability. There are norms and regulations for sustainable management of such common property resources. In this paper, we focus on local institutions for management of tsogs (forest groves) in the Nubra valley of Ladakh. The tsogs provide local people with their required fuel wood, pasture land for animals, as well as aesthetic beauty in this cold desert area. During the early 1980s these tsogs were an unregulated ‘open access resource’, and over the time due to various contextual factors there was over exploitation of these forest groves for commercial purposes, and their sustainability was threatened. To combat this problem, this open access resource was converted in to a common property resource, with institutional norms enacted for its sustainable use. We discuss the various types of norms and regulation patterns related to tsogs management including the various stakeholders included, and their respective rights and duties. The unique and effective way of peer monitoring/ self discipline among the appropriators was found to be the prevalent monitoring mechanism, devoid of any formal and tangible monitoring system. Similar systems can be developed and replicated in areas with similar geography and context.

Keywords: Common property, Leh, Nubra, Resource management, Tsogs

Common property resource (CPR) is a well-defined concept, in which there is a defined group of authorized users that manage and set institutional rules for use of and access to the resource in question where the resource system makes available to a group of users a flow of subtractable resource unit over time1,2. Prevalence of CPRs, especially in risk-prone areas is a common phenomenon and the institution for its management are a part of the changing cultural, religious, and social experiences of any community3. One cannot analyze resource management institutions without understanding the conceptualization of the nature and repertoire of responses that a community evolves to adjust to changes in environmental conditions and resources. The portfolio of activities, evolving according to specific social-ecological conditions, includes a combination of apparently rational and more abstract strategies for livelihoods, based on the types of resources governed by different property regimes on the one hand, and ethical and cultural norms on the other4.

In the context of the high altitude cold desert lands of Ladakh, the prevalence of CPR is a common phenomenon. Even privately own lands become common property resource areas for some specific uses during different periods5. The high frequency of CPRs assists people in accessing different econiches where they may not have private holdings of their own. In this way, the scale of resource extraction spreads over different geographic locations with different fertility and use patterns. In contrast, in a haste to develop the area, the agencies (Govt/NGOs) involved often ignore the existence of CPRs and their related management institutions, resulting in low level of desired development work and users satisfaction5.

In this connection a study was designed to understand the manner in which the local people of Leh manage their CPRs. Our specific objectives were: (i) to understand the local institutions governing the commons; and (ii) to understand the perspectives of stakeholders involved in extracting resources from the commons.
Research methodology

Leh district is situated roughly between 32°-36° North latitude and 75°-80° East longitude, and altitude of approximately 2300-5000 m above sea level. With an area of 45,100 Sq km it is the 2nd largest district in the country after Kutch (Gujarat), at 45652 Sq km. The district is bounded by Pakistan in the West, China in the North and eastern parts and Himachal Pradesh in the South east (Fig. 1). Topographically, the entire district is mountainous, and lies in the rain shadow of the Himalayans, and is often called as cold desert—where intensive sunlight, high evaporation rates, strong winds and fluctuating temperatures characterize the general climate. It is said that a man sitting in the sun with his feet in the shade can have sunstroke and frostbite at the same time. Major source of livelihood among the local population is agriculture where the growing season is only a few months (May to September) long every year. But over the centuries, people have developed a farming system uniquely adapted to this unique environment. Farming is small-scale; traditionally, each family owns a few acres of land, the principal crop is barley, the mainstay of traditional Ladakhi food. In the valleys there are orchards, and up on the high pastures, where not even barley grows, people husband yaks, cows or sheep. Even though with limited resources there prevails high level of social security, among the high altitude community due to prevalence of local institutions which provide assurances (both vertical and horizontal) to an individual household who may not possess self sufficient resource.

This study was designed to explore local institutional norms and structures, governing the tsogs resource. As the institution is already existing and functional and considering the type of study, an ex-post facto exploratory survey was used. The survey was conducted in the Nubra valley (Fig. 1) of Leh district, where three villages (De-skyit, Hunder and Sumoor – Fig. 2) were purposively selected due to the prevalence of tsogs as CPRs. From each of these villages 20 households were randomly selected from among those households who were members of the CPR institutions. Nubra valley consists of 28 villages and lies to the North of Leh, for details of the selected three villages see Table 1. The name Nubra derives from ldum-ra. ldum means vegetation, and ra means a place, thus a place full of vegetation. The charm of Nubra is pithily expressed in this following Ladakhi saying: Nubra lchaks-si dongbo; chha-la lhamo, bing-nga kags-po (Nubra is like a well, made of iron; easy to enter but difficult to come out of it). Along the river confluence lies the forest groves, locally called as tsogs consisting of shrubs, thorny bushes, trees and some annuals (Fig. 2). For villagers, it provides them with fodder, fuel wood and more importantly serves as grazing field for their domestic animals.

Before the survey, a pilot study was undertaken to gain background experience of the local communities and the resources available, helping the researchers to establish rapport with the local people. The study was carried collaboratively, involving local people at every step. Locals were encouraged and helped to share their knowledge about their resource management practices. In this connection, all the parameters on which local people were asked to provide scores were the outcome of interactions with them during the pilot study. Information on the organisational and functional aspect

![Fig. 1—Study location](image1)

![Fig. 2—Nubra valley](image2)
of the local institution in context of tsogs management along with the various stakeholders related to the tsogs and their relationship was collected through a combination of methods: community observation, personal interviews, focused group discussions (FGD) and participatory appraisals of natural resources. During interviewing, a household was taken as a unit instead of a single individual, since, on many occasions the key informant was aided by his/her other family members in providing information. Moreover these interviews actually served as semi-group discussions where members of different age groups, sex and orientation contributed to make the information more comprehensive. One FGD in each village was organized, apart from the personal interviews, which helped to cross check the information gathered during the household interviews. Typically in interviewing we focused on informal and open dialogues and group discussions, as well as using a semi structured set of questions. All the interviews included an initial visit to the village and a series of follow up meetings. Wherever possible the information was written down, and in many occasions where this was not feasible, the narratives were audio taped (Fig. 3) with their permission.

Results and discussion

This research findings and discussion on the management of tsogs through local institutions in three villages of (Table 1) Nubra valley are described below:

De-skyit village: De-skyit, also the tehsil headquarters, is situated 81 Km from Leh (district headquarter). The whole village is divided into 4 groups called schhu-cho based on the location of households (who shares a common irrigation channel), viz. (i) Gangtag (ii) Khangbatong (iii) Sper (iv) Tsaking. Traditionally, the Village Administrative Body (VAB) is headed by the goba (nominated on a rotational basis). Under him are four assistants called member and two other people called kutual. All these positions are held on rotational basis taking household as a unit. Only a Buddhist thal-pa can become goba. thal-pa are those households who contribute labour in the community work, like: help to the monastery, such as providing food and fuel wood; compulsory labour in the Government development programme, and during times of emergency, helping the army to carry loads to distant posts. The post of kutual is rotated only among the tongchen (the principal house). The khau-pa (a family of younger brother/sister separated from the principal house after marriage) are excluded of it.

As far as people can remember, around two decades back tsogs were an open-access resource. As well as local villagers, people and animals from neighbouring villages were also allowed to access them for fuel and fodder. Later, a few rich-resourceful people started selling truckloads of fuel wood to the neighboring town of Leh. They exploited the tsogs to that extent that signs of degradation of the vegetation were evident. As a result the people of De-skyit found it difficult to procure their own fuel and fodder from the tsogs, and the pasture was also degrading for grazing of their animals in the tsogs. The villagers then realised the consequences of such exploitation, and consequently rules and regulations were established regarding who could access the tsogs, and how and when they were to be used. The tsogs areas are divided into three categories (Fig. 4) based on ownership: (i) Individual household ownership; (ii) schhu-cho (group of households) ownership; and (iii) ownership by the whole village.

No clear boundary exists differentiating these categories, except for some bio-fencing made of

<table>
<thead>
<tr>
<th>Village</th>
<th>Total area (in hectares)</th>
<th>Total population</th>
<th>No. of households</th>
<th>Nearest town and distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>De-skyit</td>
<td>495.34</td>
<td>891</td>
<td>257</td>
<td>Leh (81 Km)</td>
</tr>
<tr>
<td>Hunder</td>
<td>414.00</td>
<td>937</td>
<td>210</td>
<td>Leh (76 Km)</td>
</tr>
<tr>
<td>Sumoor</td>
<td>324.15</td>
<td>498</td>
<td>96</td>
<td>Leh (80 Km)</td>
</tr>
</tbody>
</table>

Source: Census village directory, Evaluation and Statistics Office, Leh
seabuckthorn (*Hippophae* spp.) established by some individual households. In the area belonging to individual households, the owner has the right to erect bio-fencing around the area and has exclusive rights to use it (for example, to stall their animals). In the part owned by *schhu-cho*, only those households who are members of the respective *schhu-cho* have use rights. De-skyit is divided into four *schhu-cho*, and accordingly the *tsogs* is divided into four parts, the size of each in proportion to the number of households belonging in the *schhu-cho*. These parts are not clearly demarcated, and the boundaries are fuzzy. For grazing animals there is no restriction within these parts, and the whole *tsogs* is used as pasture (except for areas owned by individual households due to their bio-fencing). And last, the part owned by the whole village can be used by every household. In simple words, each of these four parts (owned by the 4 *schhu-cho*) is common property of the respective *schhu-cho*, and each is a subset of the common owned by the whole village.

The following are the bundle of rights for resource extraction from the *tsogs*:

(i) People and animals from neighbouring villages are prohibited to use the *tsogs*;
(ii) No physical boundary like bio-fencing or any other kind of fencing can be established by the *schhu-cho* in their respective parts;
(iii) Use of axes is prohibited in areas owned by the *schhu-cho* and the whole village;
(iv) Vehicles are not generally allowed to enter the *tsogs*;
(v) Vehicles are allowed only once in a year, when a truckload of fuel wood is given to the village *Gompa* (monastery), *Masjid* (mosque), and *maney chogs-pa* (annual religious gathering of the Buddhist people). During this occasion, the use of axes is allowed but only on dead and uprooted trees and shrubs;
(vi) Commercial sale of woods is prohibited. Villagers can use it only for their personal household use;
(vii) Rights of an individual cannot be traded with another (i.e. an individual cannot sell his share if he doesn’t need the share right);
(viii) Amount and time of collection of fuel wood is decided by the *goba*, in consultation with other members of the village. The time generally falls before the *losar* festival (New Year according to the Tibetan almanac); and (ix) One individual from each *schhu-cho* (i.e. four) are selected on a rotation basis to monitor the activities during the period of harvest after the *goba* has given his decision. For rest of the period, self-restraint and informal peer monitoring are practiced routinely.

**Hunder village:** Hunder is 76 km from Leh, and similar to De-skyit, the *tsogs* of Hunder village is also situated along the Shayok River (Fig. 2), and was also an open-access resource. When it was obvious that it was being exploited beyond its carrying capacity, in around 1996-97, people of Hunder felt the need to establish some norms to conserve it. In Hunder, however, the *tsogs* is owned by the whole village; there is no individual household or *schhu-cho* ownership, as there is in De-skyit.

**The bundle of rights for tsogs resource extraction in Hunder are:**

(i) Time and amount of harvest are decided by the *goba* (Muslims cannot become *goba* because they are not considered as *thal-pa* and moreover they were not the original inhabitants of this village.);
(ii) First, *gotak* (dry wood) in *ston* (autumn) is harvested. The amount of *gotak* permitted to be harvested is around ten *khuru* (the load that a normal man can carry) per household;
(iii) Then *bhum-ker* (wet wood) of seven *khuru* per household is allowed;
(iv) Ten *khuru* of *tsermang* (seabuckthorn) is allowed per household. *tsermang* is also used as a bio-fence, apart from using it as fuel;
(v) For the Muslim community one *khuru* each of *gotak*, *bhun-ker*, and *tsermang* is allowed per household;
(vi) One *khuru* of fuelwood per household per year is also carried to the monastery;
(vii) *Ana chogs-pa* (women’s alliance) of the village also get its share of one *khuru* per *ama* member;
(viii) In times of sorrow for example, in the case of a death, the affected household, on request to the *goba*, receives one tripper load of fuel wood; (ix) People accompanying grazing animals are not allowed to carry an axe. They can collect fuelwood and hay from the *tsogs* while their animals are grazing, but only by using a *matu* (wooden stick/cane). The whole village pools up their animals and then two to three persons (Fig. 3c), one from each part owned by the whole village.
household on a rotation basis, takes these animals to graze; (x) The *tsogs* is surrounded by Shayok River and its tributaries on the side facing the village, and there are only two opening gates in and out of the *tsogs*, passing through which people carry out their work. To monitor the amount of harvest being taken, a person is appointed at each gate on a rotation basis during the decided period of harvest. For rest of the period, self discipline/restraint and informal monitoring are practiced.

**Sumoor village:** Sumoor, situated opposite to the above two villages on the other side of the river, is 80 km from Leh. Sumoor means three canals (derived from *sum* ‘three’ and *yu-ra* ‘canal’). It lies North of De-skyit on the banks of Siachen river (Fig. 2) and is divided into four *s khu-cho* (named *saipa, scuba, labag* and *idora*). There are total of 130 *thal-pas* in the village (*th al* means the compulsory community work). The *goba* (village head) is selected randomly, through *rGyen* (lottery) system, in which the current *goba*’s name is excluded in the subsequent lottery. Similar to De-skyit and Hunder, there are four members and two *kutuals* to assist the *goba*. As in De-skyit and Hunder villages, the *tsogs* in Sumoor was also once an open-access resource, but today there exist rules and norms around who can access the *tsogs* resource.

The **bundle of rights for resource extractions from the Sumoor tsogs are:** (i) Wood from the *tsogs* can only be procured by a *thal-pa*; (ii) A person cannot sell/trade off his share of rights; (iii) The *goba* decides the time and quantity of wood that would be allowed of each household: on average, one *k h uru* (quantity an individual can carry) per day, per household for two days (i.e. two *k huru* per household) is allowed. In case someone wants to carry wood using a *dzo* (cow × yak), then in place of two *k huru*, one *dzo-k hur* (quantity that can be carried by a *dzo*) is allowed; (iv) Vehicles or *dzo* are not allowed to enter the *tsogs*. People have to carry the allowed quantity of wood up to edge of the *tsogs*, and from there the wood can be carried away according to one’s convenience; (v) On average, five *dzo-k hur* each of *khurhing* (dry shrubs and fallen twigs of trees) and *khal chu* (wet driftwood brought by the Shayok River from neighboring upland areas) is allowed to be collected by each household; (vi) Use of axe is allowed only for *khal chu*; (vii) Animals like *dzo*, donkey and sometime horses are allowed to carry *khal chu*; (viii) For *skit-duk* (*skit* means joy and *dug* means sorrow, *i.e.*, at times of joy or sorrow), on a formal request to the *goba*, the concerned family is allowed to collect fuel wood of the quantity decided by the *goba* on consultation with the *members*; (ix) The job of monitoring these activities is done by the *lora-pa* whose principal responsibility is to protect the field crops from stray animals. If someone is caught with a higher quantity of harvest than what had been decided by the *goba*, then he has to give that extra amount to some village associations (*e.g.*, *ama-chogs pa*, women’s alliance).

**Efficacy of the local institutions in relation to tsogs management**

The parameters (listed by the local people themselves) by which local people define the efficacy of the institutions in relation to the *tsogs* management are arranged in descending order of their importance (as perceived by local people) in deciding the efficacy of the institutions. These parameters were noted down by the researchers during the pilot study, and then during the main field work these parameters were put forward to the people to give their scores in relation to the importance of the particular parameter for them in defining the efficacy of the institutions: (i) Good health of the *tsogs*. (ii) Continuous flow of product from the *tsogs*. (iii) Restriction of outsiders. (iv) Equitable distribution of products. (v) Sanctions to defaulters. Local people accorded health of the *tsogs* as the most important parameter followed by the continuous flow of products, as the major parameters to judge the efficacy of the institution in managing the *tsogs* resource. The next important parameter was restriction of outsiders from using the *tsogs*, followed by equal distributions of products. The last listed, and least important, was levying sanctions on defaulters.

As mentioned earlier, in all of the three villages the main reason for the previously free-access resource being converted to CPR was the degradation of the *tsogs*, due to overexploitation (for other common features among these villages Table 2). This is again validated by the above listed top three parameters perceived by local people by which to judge the efficacy of the institutions. These villages have a strong social network and people are dependent on each other to carry out their daily work, due to which people don’t find any incentives in breaking the norms (because defaulter in one case will be reciprocated in the other cases due to their high interdependency). This is the reason that “equity in distribution” and “sanctions against defaulters” are seen as the least important.
Moreover, the characteristic of the resource itself and the monitoring system are such that there is very little scope for rules being violated.

Overall, people observe, there has been improvement in the efficacy of the institutions. People perceive the increased value of the tsogs resource as one of the major reasons behind this. The increase in value of the tsogs resource is due to the decrease in the traditional practice of sending animals to phu (vast stretches of grazing land in the vicinity of the glaciers at elevations of 15,000 to 18,000 feet and serve as pasture. Traditionally, from July to September some families spend time here, caring for their animals, gathering dung, and making butter and cheese for the winter) to graze for around three months during summer time when there is standing crops in the fields, because of which people have no choice but to use the tsogs as fulltime pasture for those animals, which otherwise would have been tended in the phu. The main reason being perceived by the local inhabitants for change in this practice is the scarcity of labour for animal tending in phu.

**Stakeholder analysis**

The stakeholders’ analysis was undertaken to identify the major stakeholders and to determine who benefits; who has right and responsibility over the tsogs; and what revenue they acquire from the tsogs. The stakeholders’ rights, responsibilities and revenues (3Rs) in relation to the tsogs are summarized in Table 3. The stakeholder analysis identified the
Roles played by local institutions | Roles descriptions
---|---
Regulating behaviour | The dates and quantities of different kinds of wood allowed for collection from the tsogs is decided by the goba.
Maintaining ecosystem productivity | The institutions help coordinate technological activities. (e.g. Use of axes is not allowed in collecting wood from the tsogs).
Maintaining the rate of resource use | The quantity of fuel wood to be extracted from the tsogs is decided by the goba in consultation with his members; his decision to a great extend is influenced by the present status of the tsogs.
Influencing resource allocation | Access to the tsogs for collection of wood is given to thalpa households only (those households who contribute labour in village level community work). *Ensuring access to scarce resources*: The appointment of monitoring agency and enactment of norms ensures access to the tsogs resource.
Helping reduce uncertainty | Having fixed times for harvesting different kinds of wood from the tsogs helps to avoid rule violations.
Imposing sanctions (coercion) on defaulters | The provision of different levels of sanction (social ostracism being the highest) acts as a deterrent for persons ignoring the established rules and regulations.

In the three study villages the rules regarding use of the tsogs were broadly concerned with: dates of harvesting, specific quotas of harvesting and use of harvesting technology. On the basis of our observations from the case studies of tsogs management through local institutions in Nubra valley, some of the resource management roles played by local institutions include regulating human behavior, maintaining ecosystem productivity and rate of resource use, influencing resources allocation, minimizing uncertainty and imposing sanctions on defaulters (Table 4). In sum, the local institutions help manage resources through scaled allocation of boundaries for access, technologies used, time of access, participants, and types of use.

### Conclusion and policy implications

Rules specifying the opening and closing dates of seasons are far less costly to monitor than rules that specify a quota for participant in regard to the quantity of appropriation activities. Anyone found extracting the resources before or after the official established season is unambiguously breaking the rules. Also reported by other authors, such monitoring systems are found in areas of low population density, where not enough labour is available for full time monitoring. Rules limiting harvesting technologies (such as use of axes) are also less costly to enforce compared with rules specifying a set quantity of a resource to be extracted. Regarding the evolution or the genesis of institutional norms, respondents did not had a clear cut remembrance of the exact line of action followed in creating this institution, though there was consensus that gradual discussion/meets (during village/community level socio-cultural occasions) over a period of time helped enact this institution. But it was for sure that top down approach was not used.

This case study reveals that to counteract the problem of resource overexploitation, a local institutions came into existence which was a people's community of people with equal opportunity for all to hold power positions and who share the same level of decision-making power.
driven bottom up approach. Throughout this study the researchers encountered peer monitoring/self discipline, a phenomenon found universally across the selected villages. Self discipline was identified as one of the major regulatory norms among local people, and one to which people paid heed, as clearly indicated by very few cases of norms being violated. On the basis of our observations we recommend that peer monitoring/self discipline is a successful norm if: The physical nature of the resource is such that any signs of violation are easily identifiable, and every member is aware of each other’s rights and duties; Individuals are committed to norms being followed, because of high moral and ethical grounds; Interdependence among the people is high, so that violation by an individual in one case might be reciprocated in another case; Work is pursued in groups, where peer groups in such situations can easily monitor each other’s behavior; Rules are simple, democratically formulated, considered legitimate and mutually agreed upon by the members; The boundary of the resource is small and clearly (visible) defined; The distance between the resource in question and the residence of the majority of shareholders is small, increasing the noticeability of rule violation; The resource is very significant in terms of sustaining the livelihood of the people, and; Boundaries of the group are clearly defined and shareholders know each other well, and noticeability of cheating on arrangements is very high.

The present case study illustrates the emergence of a local institution to combat overexploitation of a CPR (in this case the tsogs) and functioning of the institution in Nubra valley of Ladakh. The appropriators perceived that the enactment of the local institution has recovered the health status of the resource and helped them extract equitable and timely availability of the harvest. In the management of the resource all the stakeholders are involved and peer monitoring and self restrain were the major monitoring mechanism successfully being implemented due to the higher interdependency among appropriators and physical proximity to the resource. The learning from this case study provides a model of resource management which can be successfully replicated in other areas also where similar environment and context prevails.

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