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Common property resources in drylands of India

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ABSTRACT

Common property resources are areas of land or water being used by a community or a group of communities. These have special significance to peoples and communities who depend on them for their livelihood. The commons in all arid districts of India include village pastures, community forests, wasteland, common threshing grounds, waste dumps, watershed drainage, village baoris¹, talabs², nadis³ and ponds, and tanks, rivers, rivulets, wetlands, riverbeds, community conserved areas, protected areas, Dhaam⁴ or Dhooni⁵, culturable wastelands, barren & un-culturable land, etc. The area under commons often ranged from 9 to 28% of total village area. Appropriation of the commons by the state for building essential infrastructure such as schools, clinics, veterinary hospitals, housing for government functionaries, SEZ and industrial corridors, etc. is a cause of serious concern. Presently the ownership rights over CPRs are not clear and there are many who claim ownership, some at State level but also like local bodies. The 12th plan of the Planning Commission of India recognized and highlighted the need for favourable land tenure arrangements, institutional design and programme architecture in order to achieve effective governance and management of the commons. The revitalization of CPRs is crucial for protecting livelihoods, as well as for biodiversity conservation and for the improvement in arid microclimatic conditions. Dialogue continues on the status of common property resources, the available legal framework and some policy related issues for its conservation through strengthening of local institutions and capacity building for stakeholders.

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Common property resources; community; agriculture; appropriation

Introduction

The resources for community use or for the common human welfare of the village or a region are known as common property resources (CPRs). These resources usually include waterbodies, grazing lands, so on and have special significance for the livelihood of the rural population. These are not necessarily possessed by any individual. OECD (1997) termed CPRs as natural resources owned and managed collectively by a community or society rather than by individuals. The 'tragedy of the commons' (Hardin 1968) is a problem that occurs when individuals over-exploit shared or CPRs to such an extent that demands exceeds supply and the resource ultimately becomes unavailable or degraded to the point where it is no longer useable. In this context 'shared' means that an individual cannot claim ownership on any part of the resource, but rather has the right to use a portion of it for his/her own benefit (Ponse 2009). The critics argue that Hardin's tragedy of commons is applicable only to open access resources where no property is assigned rights, and not to the commons, that is, CPRs (Ciracy-Wantrup and Bishop 1975; Runge 1981; Bromley and Cernea 1989). CPRs contribute and allow considerable access to all users, but not all the sections of the rural

community are equally attracted by these potentials and opportunities (IGFRI 2015). Right to grazing lands and pastures, right to collect fuel wood, non-timber forest produce, and fodder from forest patches, rights to irrigation and drinking water are some of the examples of commons regime (Kadekodi 2004). The CPRs have remained a strong support-base as well as an important source of livelihood for the sustainability of rural communities, but exploitative use and lack of maintenance of these resources have serious implications for their long-term sustainability. Therefore, the situation is extremely grave in resource poor areas like semi-arid and arid regions of the world.

Study area

The hot arid zone of western Rajasthan in India occupy a total geographical area of 208,751 km² of which 61.9% is concentrated in 12 western districts of Rajasthan state. The region extends from 24°37'00" to 30°10'48" north latitudes and between 69° 29'00" and 76°05'33" east longitudes (Figure 1). This hot arid region is characterized by low and high erratic rainfall, high evaporation loss and extremes of diurnal and seasonal temperatures. The average annual rainfall varies from 456 mm in

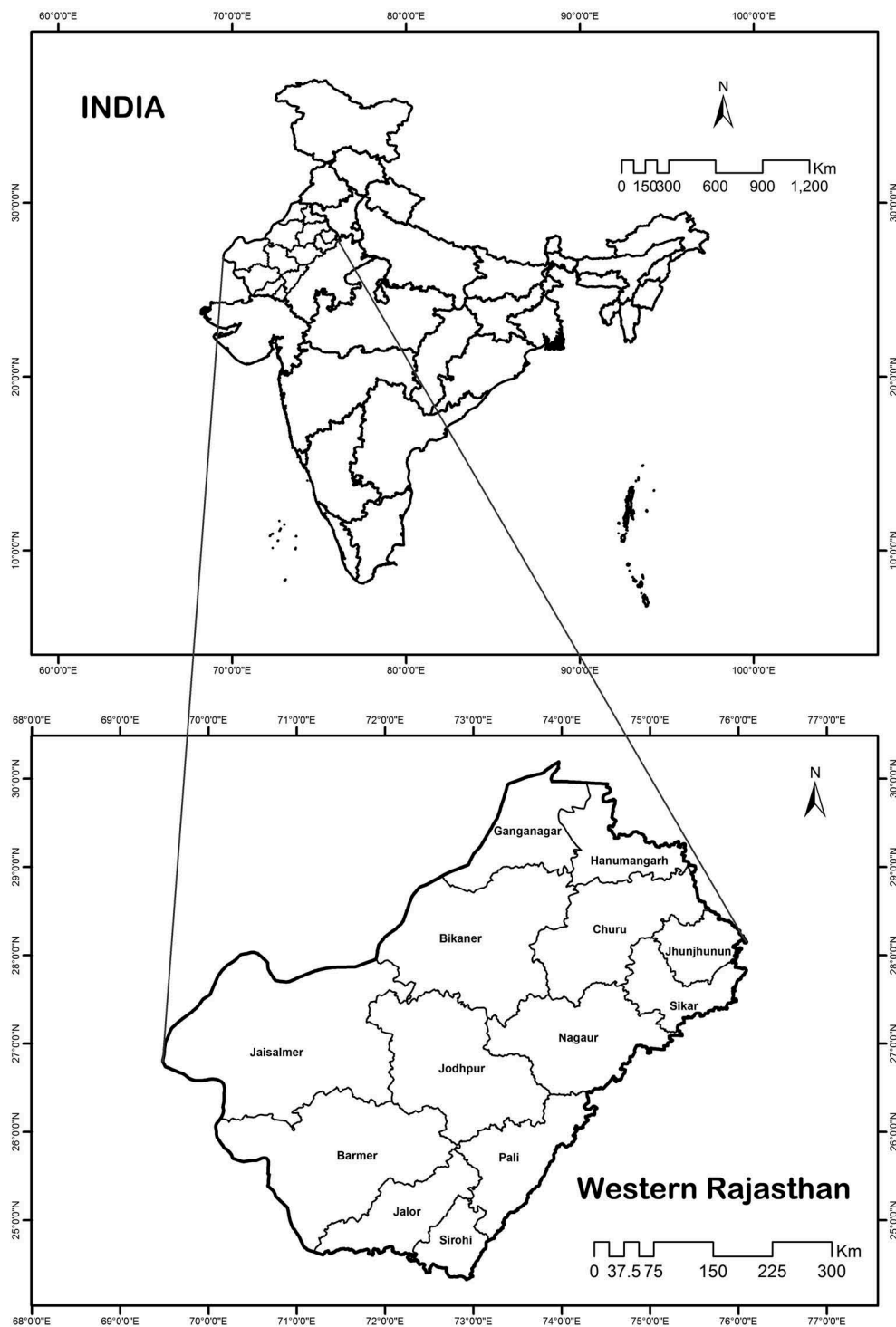


Figure 1. Study area.

northeast to less than 100 mm in western most part of Jaisalmer district. The coefficient of variability of annual rainfall varies from 40% to 70%. Mean aridity index is 78%. Probability of occurrence of drought varies from 50% to 60%. Mean moisture index varies from -59.5 in Sikar to -88.9 in Jaisalmer. The mean maximum expected wind velocity is about 30–40 kmph. Mean relative humidity during July and August ranges between 75% and 80% and during winter from 46% to 56% (Narain et al. 2006).

Vegetation is quite sparse with limited number of xerophytic plants and thorny bushes. The drainage, except the ephemeral Luni river system, is mostly internal. Ground water is deep, scarce and over exploited. Ground water in 45% area is saline to very saline and in 40% moderately brackish. As per 2011 census the region has 27.12 million human populations. The density of population varies from 17 in Jaisalmer to 361 in Jhunjhunun district (Anon 2011a, 2011b). Rural poor ratio varies from 3.3% in Jaisalmer and 3.6% in Jhunjhunun districts to 35.4% in Bikaner district.

This region harbours a total domestic livestock population of nearly 30.18 million heads – an increase of 14.63 million heads (94.72%) over the 1956 census figures. The desert region has about 52.3% of the State's livestock. The density of livestock population varies from 83 in Jaisalmer to 274 Sikar. As per 2011 census, the region has 27.12 million human population. Density of western part of Rajasthan is very thin and average density is only 174 which is much less than the state average of 201 in 2011 census. Population density of Jaisalmer in 2011 is 17 persons/km⁻² whereas it is 346 for Sikar.

CPRs of Thar Desert

The majority of area Thar Desert of western Rajasthan consists of a dry undulating mass of loose sand, thereby, leading to shifting sand dunes. The sandy plains have many sand dunes with several low interdunal depressions (swales) where salts accumulate. Trees are few and far between (Bhandari 2005). Despite this the region is known for its rich and unique biodiversity as well as for its ancient culture and traditions. The people and the biological resources of this region survive in a very fragile ecosystem under highly hostile environment (Tod 1920). The majority of the country's natural resources were freely available to the rural communities during the pre-British period in India (Muhnot Nainsi 1610–1670) and various checks and balances were in place at the village level to govern use and preserve resources. The community management system became less effective with the gradual extension of state control over these CPRs, resulting in fewer benefits to the rural communities. In spite of this, CPRs still have an important role to play in the life and economy of the rural population, particularly for the inhabitants of this environmentally hostile area. According to Gaur (2014), the 'commons' in all arid areas encompassed village pastures (including *Gauchars* or *Charagah*¹ and *Orans* or *Dev-vans*), community forests, wasteland, common threshing grounds, waste dumps, watershed drainage (aagor and *pachor*, i.e. catchment and overflow area), village *baoris*², *talabs*³, *nadis*⁴ and ponds, and tanks, rivers, rivulets, wetlands, riverbeds, community conserved areas, protected areas, *Dhaam*⁵ or *Dhooni*⁶, culturable wastelands, barren and un-culturable land, culturable

wastelands, so on, and the area under commons ranged from 9% to 28% of total village area.

So, the communities were prompted to evolve local strategies to live in harmony with its hostile arid environment while maintaining symbiotic relationship with the CPRs (Gaur et al. 2004). The community grazing lands (*orans* and *gauchars*) have remained repositories for ancient system of gene pool conservation. *Orans*, as such, were fashioned by any individual or the communities to fulfil the needs of the human beings and livestock. These *orans* have been part and parcel of the lifestyle of the desert communities and provide vital support for livelihood and green cover. These were worshipped as *devbhumi* or *dev van*. Thus, human intervention was limited in the *orans*, so these used to preserve the endemic, endangered or threatened species, medicinal plants and wild ecotypes.

With the passage of time and changes in the demand and supply system, perception of inhabitants has also been transformed (Gupta and Bakshi 2008). A study was carried out to map community grazing lands at 1:50,000 scale using IRS LISS III satellite data of 2005–2006 and same were compared with the data of Department of Economic and Statistics (DES) (Table 1 and Figure 2). A variation of 1.74% was observed in area of community grazing lands. Satellite data provided real-time situation whereas another anthropogenic activities like encroachment, mining, so on, may have not been considered in the DES data. Mining areas was delineated separately in the IRS mapping.

Communities had constructed structures for water harvesting in these community grazing lands. Structurally, a dam of loose boulders, *talab* (pond) or earthen bunds at upstream, and masonry check dams were constructed to arrest runoff. Basically, these bunds and check dams were useful in checking soil erosion. The improved percolation on high slopes, in the absence of vegetation, allows the recharge of groundwater and provides surface water for agriculture or livestock. The availability of soil moisture supports plant growth and effectively supports fauna, and livelihood needs of the local communities depending upon animal rearing.

Table 1. Percentage area under community grazing lands.

District	IRS LISS-III data, 2005–2006 (% area)	DES Data (%) (2006–2007)	District	IRS LISS-III data, 2005–2006 (% area)	DES Data (%) (2006–2007)
Barmer	3.49	7.19	Jalor	3.16	4.49
Bikaner	2.19	1.71	Jhunjhunun	1.03	6.70
Churu	0.97	2.73	Jodhpur	4.46	5.42
Ganganagar	0.00	0.01	Nagaur	3.47	4.14
Hanumangarh	0.27	0.41	Pali	3.60	7.37
Jaisalmer	2.30	2.71	Sikar	1.04	5.25
			Grand Total	2.17	3.91

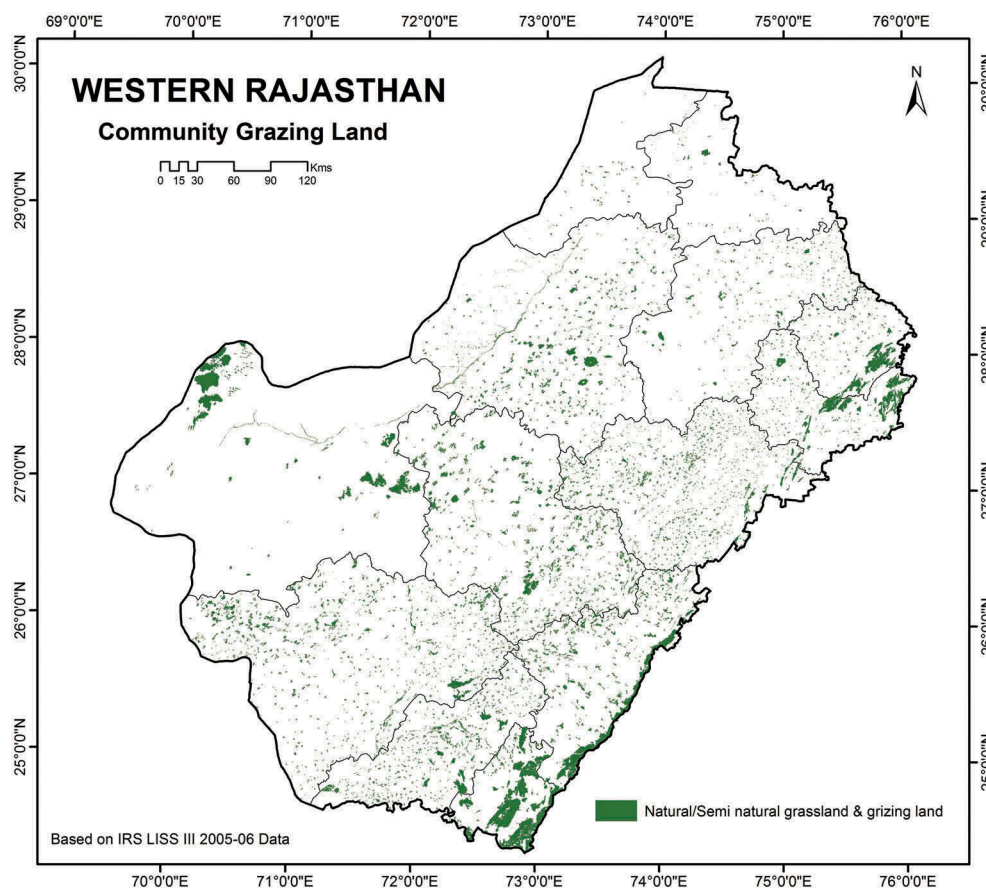


Figure 2. Extent of community grazing lands in western Rajasthan, India.

Status of CPRs in western Rajasthan

Scientists and other people are concerned about the state of health of CPRs. Hoskin and Stamp (1967) gave an account of decline of commons due to population pressure and open access to grazing lands in medieval England. According to Darling (1984), population pressure, rising land values, extension of irrigated areas, and alienation of land all led to the collapse of the communal land management in Punjab. Jodha (1985) also describes the declining state of commons in Rajasthan due to population pressure and commercialization. Chakravarty-Kaul (1996) provides a detailed account of changes in all such commons due to legislation, canal irrigation systems, population growth and market factors. Gaur (2014) gave an account of declining trend in *orans* (*dev bhumi*) in the western arid districts of Rajasthan (Ganganagar, Bikaner, Jodhpur, and Jaisalmer) due to introduction of canal irrigation and weakening influence of community groups over the

control of CPRs. Gaur (2015) stated that area under grasslands and grazing lands in 1976 was 1442.74 km² in Jodhpur district which was reduced to 984 km² in 2005–2006 and further to 341.15 km² in 2012–2013 (based on Cartosat LISS IV+Mx data). So, a decline of about 47% area under grass and grazing lands during a span of 35–40 years was observed. Mining and expansion of agricultural activities have caused severe encroachments onto grasslands and other grazing land. Physiographically, changes in grazing lands in western Rajasthan are depicted as follows (Table 2).

According to Gaur (2014), the process of colonization was initiated in the Indira Gandhi Canal Project in the districts of Ganganagar, Bikaner, Jodhpur and Jaisalmer for resettlement. As a result, common property lands were acquired by the government and allotted to inhabitants and resettlers for agricultural activities. Thus, land use of large areas of community lands were transformed into agricultural lands. As such, common lands in Rajasthan fall into three categories:

Table 2. Changes in common property lands in western Rajasthan.

Physiographic units	Districts	Area under CPRs (%)	
		1960–1961	2014–2015
Arid western plain	Barmer, Bikaner, Churu, Jaisalmer and Jodhpur	68.43	48.50
Transitional plains of Luni basin	Jalor and Pali	48.95	41.19
Transitional plains of inland drainage	Jhunjhunun, Nagaur and Sikar	32.78	26.47
Northwestern canal irrigated plains	Ganganagar and Hanumangarh	36.24	15.03
Western Rajasthan (CPRs): 8,551,765 ha (41.07%)			

- village community pasture (*Charagah*, pasture and *oran* land) entrusted to panchayats;
- revenue wastelands under revenue authorities; and
- forests under the Forest Department.

Under Rajasthan Tenancy Act, 1955, 'Pasture land' is defined as land used for the grazing of the cattle of the village or recorded as such in settlement records. Individual rights cannot accrue in such lands, prior to 2011, limited allotment powers were vested in the District Officer by which they could allot or set apart *charagah* for agriculture or non-agricultural purposes. These powers no longer exist.

The maximum decline has been in the arid zone of the western part of the state (Table 2) and in the tribal dominated districts in the south. The 'common lands' are the only open space left in the village that are often encroached upon by nearby inhabitants for expansion of agriculture/settlement. Land is excised from the 'commons' for building essential infrastructure such as educational and health institutions, housing for government functionaries and resettlement purpose, mining, manufacturing, solar and wind energy projects, so on, usually by the state government. So, the pasture lands, which have already been entered in land records as state property, are the first lands to be assigned to new and varied purposes.

The most apparent changes have been in the decline in the number and diversity of plant species, particularly woody plants in community grazing and catchment areas. The picture is also grim for grasses and shrubs. Main reason for the decline in productivity may be due to the population growth. While human population has grown considerably in a span of 70 years, there have been equally significant changes in the livestock population that has remained entirely dependent upon the CPRs for pasturage. The botanical composition of the CPRs had consequently evolved in response to the grazing pressure from cattle. However, CPRs are being used by buffaloes

for grazing and wallowing, especially during the dry season of the year when green grass is unavailable. The CPRs were not the main grazing ground of small ruminants in the past but their population has increased substantially in recent times. Hence, traditional type of livestock composition has shifted with its penchant for cattle rearing. Presently, the perceived value of the CPRs is much diminished and the community is unwilling to invest resources and energy into its management due to changed priorities. The traditional sources of water, sourced from the CPRs, have become insignificant as water has been made available at household level. Broadly, water sources such as *talab*, *baories* and *nadis* have been ignored, and interest in their management at community level has declined.

Year	% area of CPRs to TGA of western Rajasthan	% decline (at the base year of 1974–1975)
1974–1975	56.28	-
1978–1979	50.12	10.94
1990–1991	44.33	21.23
2010–2011	40.28	28.44
2013–2014	35.68	36.61

Source: Various yearly district-wise publications of Directorate of Economics and Statistics, Government of Rajasthan.

Agriculture across this entire arid tract has seen a complete transformation over the last 25–30 years moving from a subsistence type of production to a commodified, resource intensive type. Large marginal and sandy areas that were uncultivated have been brought into cultivation. Community grazing lands have been converted to cultivable lands. The area under fallow has reduced, as grazing pressure from expanding herds intensifies (Figure 3). The basic shift has been to a modern technology-intensive agriculture focusing on water-intensive crops giving high grain yields. Crops with high residual fodder value have generally gone out of favour. Farmers prefer cash crops like onions, mustard, groundnut, cumin, so on, which leave very little or no space for grazing lands for livestock.

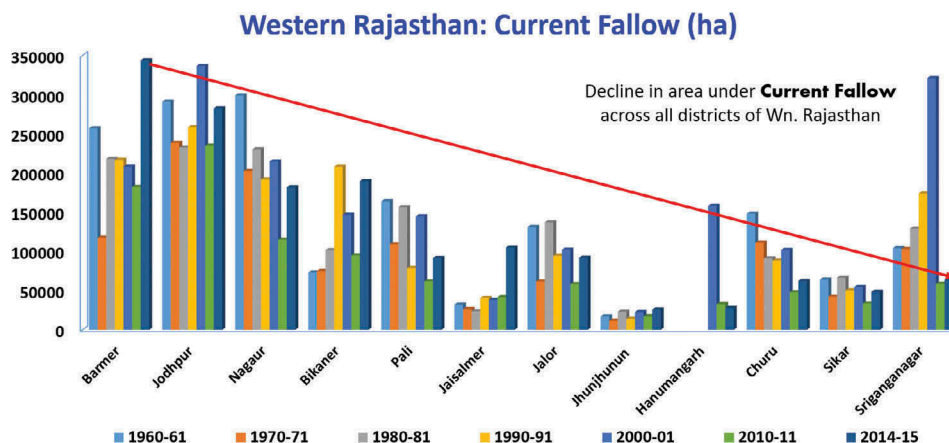


Figure 3. Area under current fallow in western Rajasthan.

Broadly, the CPRs are existing as well as operating today in something of an institutional vacuum and the jurisdiction of agency(s) over these CPRs is not well defined. Earlier the responsibility of managing the CPRs was with the traditional village institution. Village Panchayats that have succeeded them have not shown any interest pertaining to the management and use of CPRs.

It has often been observed that local populations have been excluded from the management of their own resources by the larger agencies/departments. Depending upon the requirement, the Forest Department is empowered to enclose these areas for plantation or declare these as a reserve. It brings two causes of concerns to the fore: (i) triggering complete isolation of local peoples and (ii) further worsening of natural resources. Considerable areas of lands, comprising of CPR lands, have been reassigned for cultivation or infrastructure development benefitting a few people, mostly entrepreneurs coming from outside the local community. In this process, local communities are dispossessed from accessing the local CPRs, although often enough grazing continues surreptitiously. They have gone from being custodians to trespassers in the space of few years. This chain of events over the past decades has contributed to the mismanagement, dispossession and alienation that forever severs the relationship between CPRs and the village communities.

Conservation and biodiversity values of CPRs

The biodiversity levels in the majority of CPRs are often much higher than the areas around them and some are the repositories of rich biodiversity. The status and biotic composition of the CPRs is influenced by the changes in local rainfall and seasonality. Rural livelihood was sustained by the various species within the CPRs. These provided traditional non-timber forest products and subsistence goods to the people; nesting, roosting and foraging sites to the pest-controlling cavity nesting birds and other wild animals; sites for beehives, thus enhancing the availability of honey; etc. These are also used to develop seedling orchards and seed production areas of ethno-silvicultural species, thus sustaining essential ecological processes and life support systems.

Grazing of livestock on the village CPRs was done in rotation and in certain seasons only, whereas permission for the collection of minor forest produce for domestic purpose and for non-commercial purposes was site specific and for a certain period only. These products sustained essential ecological processes and provided an invaluable supplement to village livelihoods as well as a much-needed poverty alleviation mechanism during times of natural vulnerabilities (drought, poor harvest, etc.).

Therefore, the revival of CPRs is essential for protecting rural livelihood support system and biodiversity conservation, as well. Any initiative to restore CPRs can be justified on the grounds:

- CPRs have traditionally been repositories of rich bio-genetic diversity preserving the endemic, endangered or threatened species, medicinal plants and variety of wild ecotypes. As part of management of CPRs, there is a need to re-plant traditional indigenous species because ecologically valuable species perform key functions in the ecosystem thereby supporting and enhancing biodiversity.
- Community-based conservation is largely concerned with the functioning of governance systems that regulate and monitor extraction and distribution of benefits of these CPRs (Turner 2007).
- The 'CPRs system' helps in restoring rural biodiversity conservation that has in the past been managed by local communities. This links biological conservation with cultural integrity to initiate long-term conservation strategies.
- Well-maintained CPRs can improve in the micro-climatic conditions. Losses of rainwater due to runoff can increase ground water availability, which in turn recharges wells and provides additional water for irrigation.

Policy issues

The Indian Forest Act of 1878 of British period was the first act implemented in India (Peabody 2001). The Cattle Trespassers Act of 1871 is the Act applicable to regulate grazing in public and forest lands. The government of India implemented the Forest Conservation Act in 1980. Since then, several amendments have also been incorporated at the Central and the State levels to ensure proper management and utilization of forests. Further, different jurisdictions of government agencies and the categories of land use largely determine which CPRs are *de facto* or *de jure*. The laws carry provisions for custodianship of these lands.

Pasture land: These include pastures and grazing lands and are allocated to local Panchayat bodies based on livestock population, under the Rajasthan Land Revenue Act. It has been clearly defined in this Act that encroachment on pastures is prohibited under section 291. In spite of this, majority of encroachments has been on made pasture and grazing lands. Causes for encroachments: (i) easier access, (ii) general quality of the land and (iii) the chance of getting the land allotted or regularized through government policies.

Forest lands: The Forest Conservation Act (1980) prohibits conversion of forest lands for non-forestry and commercial activities, like conversion to agriculture through encroachments, allotments and diversion, so on. The Forest Rights Act (2005) recognizes the livelihood usage of forest lands, even for individual uses. The village level Forest Rights Committee of Joint Forest Management Committee has the power of verification of livelihood use of forests by an individual.

Oran/dev bhumi and gochar: The *oran/dev bhumi* and *gochar* have traditionally been an important source of fodder for livestock and fuel for domestic purpose. Legally, the *oran* is part of land use category, *area not available for cultivation*, but due to its importance both socially and for fodder needs, this category is viewed as a separate and independent category in the land use classification system in India.

There is a need to further strengthen existing Acts to deal with the present situation of CPRs. There is an also a need for a National Grazing Policy to ensure sustainable use of pastureland/grasslands. Presently there is no clarity about the ownership rights over pastureland. Jodha (1994) stated that the traditional management systems for common grazing resources (involving usage regulations, encroachment of user obligations and investment for conservation and development) have practically disappeared.

The Government of Rajasthan was the first to formulate The Draft Rajasthan Common Land Policy (2010), following it up by developing Operational Guidelines on the Implementation of Grazing Land Development under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). The 12th plan of the Planning Commission of India had also recognized the importance of the commons, creating a working group on Natural Resources Management and Rainfed Farming and a subgroup on 'Institutions and Commons' for the 12th plan preparation.

The directions of the Supreme Court, and the policy and programmatic level decisions of the central government, a model common lands bill at the national level could provide a way forward, enabling direction to state governments. One approach could include tethering the MGNREGA with a 'commons regime', such that the institutional dimensions currently found wanting alongside the financial investment through MGNREGA could be filled. The right to employment and right over resources combined together can have a significant impact in creating durable assets, both as biophysical resources and as institutional regimes (Nagendra et al. 2013).

Further, there is a need to streamline for proper planning for grassland development. Limited ownership may be allowed by forming Village Pasture Development Cooperatives on the lines of milk producer's cooperatives. There is an immediate need to provide institutional arrangements to promote

participation of local bodies in managing CPRs. Studies by a group of CAZRI scientists have indicated that new generation of traditional pastoralist communities are not keen to continue in this profession. It will further bring pressure on the CPRs. Therefore, a variety of encouragements need to be provided so that they continue with traditional practices.

The implementation of Dharia Committee report (Anonymous 1995) on the use of commons and wastelands is also needed after a proper revision in the present context. As it suggested to make the Zila Parishads (District Councils of elected representatives) and Gram Panchayats (Village Councils of elected representatives) the nodal agencies to implement the CPR-wastelands programmes. It also stressed to create a central (as well as state level) Land Use Authority, to prepare long-term (15–20 years) plans and to enhance the role of National Bank for Agriculture and Rural Development (NABARD) to take up these programmes. Synergy of micro-watershed approach and the decentralized Panchayati Raj institutions, the CPR's can be conserved, protected and optimally utilized for support and livelihood of village communities.

Conclusion

Croplands are under pressure to meet demand of food grains for the teeming population. Therefore, cultivated area has to be increased by bringing areas into production that are currently under non-agriculture use. Sustainable development in arid areas can only be achieved through optimum utilization of its CPRs. There is a tremendous scope for enhancing carrying capacity and productivity of CPRs. Socio-economic and environmental constraints need to be tackled through providing and implementing a favourable policy environment. Systematic and evidence-based analysis to define agreed and effective rules and procedures to use and manage CPRs will assist in its development. The present study reveals that the management of CPRs in the arid and semi-arid region of western Rajasthan is significantly influenced by the various socio-economic, bio-physical and external factors. However, these CPRs embrace wide possibility of again becoming the key for sustainable socio-economy of the user community in the dryland. The factors influencing the management of CPRs vary from village to village. As outlined in the previous section 'Policy Issues', there is scope for coping with the 'tragedy to commons' scenario in the arid zone through following concerted efforts exists.

- Awareness generation among the local peoples and institution.
- Recognizing and acknowledging the significance to traditional practices and indigenous expertise

pertaining to sustainable management of common natural resources.

- Strengthening of local institutions (PRIs and community groups) through capacity building programmes.
- Decentralized policies and programme formulation at micro-level.
- Essential policy amendments through participatory approach.
- Ensuring active, effective, massive involvement of women in local institutions dealing with CPRs, and
- There is a need to frame, implement and evaluate CPR management programmes in the light of area specific needs, socio-economic, cultural, bio-physical and external variables so that sustainable management of the CPRs could be ensured along with maintaining harmony between humans and nature (Topal 2015).

Notes

1. Charagah (meadow or grazing lands): A place specifically earmarked for the grazing purpose.
2. Baori: these are step-wells, usually used for fetching water for drinking and domestic purposes. These are quite deep.
3. Talabs: these are village ponds and their source of water is monsoon rains only. Water stored in these is used by human as well as livestock for drinking purposes.
4. Nadi: these are again village ponds. Size varies. Water of these is used by human as well as livestock for drinking purposes.
5. Dhaam: A holy place which is used by saints for stay purpose.
6. Dhooni: A holy place, where another saint had lived here and is named after a respected late saint, which is used by saints for stay and sacred activities.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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