Research Paper

Unfolding the 'Raakhan Raan' a Livelihood Based Conservation Tradition of Tribals around Kalsubai Harishchandragad Wildlife Sanctuary

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Abstract

Degraded and overgrazed grasslands and meadows is a critical issue affecting productivity of open grazed animals. Traditional forest dwelling communities are known to conserve their surrounding biodiversity, mostly with cultural perspectives and this indirectly preserve the resources for future generations. Raakhan Raans are privately owned grass sanctuaries which are protected from open grazing and other disturbances like fires and harvested sustainably. This is the first study of this tradition unique to the Western Ghats. A survey was conducted in 13 hamlets belonging to 11 village panchayats in Akole taluka of Maharashtra. Fully structured interviews were conducted in all households of selected hamlets in a door-to-door manner. Using a detailed questionnaire we collected data on livestock, raakhan ran holdings and changes within last decade. The tradition is not unique to a particular community. It is a sustainable practice considering that grass is harvested after seed dispersal and some areas are left unharvested. The Raakhan Rans have been reducing over the last decade, though still maintained by large herders for fodder security. Special efforts are required to conserve the tradition and link it to the protection of grassland biodiversity and dependent livelihoods.

Introduction

Overgrazed grasslands and substandard fodder is a critical issue affecting productivity of open grazed animals (Kelkar, 2009). Overgrazing eliminates desirable plant species, decreases water infiltration into soil, increases soil erosion, reduces soil nutrients and alters the plant community composition to a less desirable state (Kgosikoma, Mojeremane and Harvie, 2013) that is poor quality fodder in the context of this study.

Ecosystem people are known to conserve their surrounding biodiversity, mostly with cultural considerations and this indirectly preserves the resources for future generations. *Devrais* or sacred groves are important community conservation practices responsible for preserving gene pools of numerous otherwise threatened flora in different parts of the world (Gadgil and Vartak, 1976). Similar to the *Devrais*, **Raakhan Raans (RR)** are privately owned grass reserves

which are protected from open grazing and other disturbances like fires. Protection enables complete undisturbed growth of grass species which are harvested systematically only after completion of their lifecycle. But unlike the *Devrais*, RR is a relatively recently evolved practice with clear livelihood motivation.

This study is an effort to dig into the conservation tradition which has not been documented earlier from anywhere in the Western Ghats (Pers. Comm. Dr. Madhav Gadgil).

Raakhan Raans (RR) are sections of privately owned pastures which are protected and managed for securing fodder to be used during months of scarcity viz. February-March to July. They are protected since the past few generations by the communities in the study area. Fodder is carefully harvested after completion of its lifecycle and dispersal of seeds. This ensures healthy regeneration of local grass diversity while securing fodder for the local cattle. This is an

ecologically sustainable practice as against the modern fodder harvesting practice which recommends harvesting fodder at flowering stage for maximum nutrition. But extensive harvest of wild grasses at flowering will hamper its regeneration and availability to eventually exhaust the local fodder resources. Contrary to this unsustainable modern day approach, the age-old Raakhan Raan tradition safeguards regeneration potential of the fodder species and at the same time provides fodder security to the cattle dependant local communities. **Raakhan Raan is thus protected reserve for grass species in areas around KHWLS.**

Alongwith grasses like *Dichanthium* sp., *Ischaemum* sp., *Heteropogon* sp., *Themeda* sp., they also support the non-graminous taxa (such as *Crotalaria* sp., *Commelina benghalensis*, *Smithia* sp.,) and diversity of avifauna, amphibians, reptiles and lesser mammals dependant on grassland habitat for food and shelter. Thus, it is very likely that Raakhan Raans play a significant role in conservation of indigenous, rare and lesser known biodiversity.

The specific article is the first investigation about this sustainable management tradition. However the study limits itself to socio-economic perspective of these special conservation areas.

Methodology

Study Area

The project area consists of 18 villages in western part of Akole Taluka of Ahmednagar district. These villages are situated on the ridge of Western Ghats and are characterized by :

- Undulating terrain, and heterogeneous landscape including basaltic mesas, grassy slopes, cliffs, dense forest patches and human settlements.
- Torrential rains with precipitation exceeding 3000mm per year in a few places
- Semi-evergreen and moist deciduous type of vegetation (Champion and Seth,1968).

Biodiversity : The villages selected and surveyed lie in the buffer area of Kalsubai Harishchandragad Wildlife Sancturary (KHWLS). KHWLS is the northernmost protected forest in Western Ghats of Maharashtra. It harbors endemic fauna like Yellow Bulbul, Malabar Parakeet, Malabar Pied Hornbill, Indian Giant Squirrel etc. The area also supports good population of Leopards (*Panthera pardus*) with relatively less human wildlife conflict (Sambare, 2016). Many rare and endemic medicinal plants, orchids,

Map 1: Villages of the study area (marked in blue) along with villages selected for door-to-door survey (marked with red dots)

tubers etc. have been recorded by local nature enthusiasts in the region. Surprisingly, alongside a broad spectrum of diversity of wild flora and fauna, this Protected Area (PA) also supports one of the largest populations of indigenous cattle breed – ‘Dangi’ (Sambare, 2016) (Photo 7) National Bureau of Animal Genetic Resources, Accession Number : INDIA_CATTLE_1104_DANGI_03004). KHWLS is thus an important conservation site for its wild as well as domesticated living diversity. But except a few documentations like by Kshirsagar et al. (2012), Waman (2005) and a Flora of Ahmednagar District Pradhan and Singh (1999) by the Botanical Survey of India, the bio-cultural diversity of KHWLS has been neglected.

Demographics : The study area is inhabited mostly by Mahadev Koli and Thakar (Scheduled Tribes) along with a small population of Scheduled Castes. Farming, livestock rearing, NTFP collection are their major livelihood activities. Seasonal migration in dry period is also common. local tribal communities, Mahadev Koli and Thakar, are amongst the last communities conserving the ‘Dangi’ cattle. Along with caring for a rare cattle breed, they also conserve forest and grasslands through traditions such as ‘Sacred Groves/Devrai’ and ‘Raakhan Raan’.

All the hamlets (72 hamlets from 26 village panchayats in KHWLS) were surveyed to collect baseline data. The hamlets were divided into strata based on two criteria :

1. Community constitution (ST/non ST)
2. Ecological Location : Hamlets were located in varying ‘Ecological Location’ like mountain top, mid-slopes and valleys which have diverse microclimates affecting floral and faunal composition of the area. Thus, ecological location would affect the fodder availability, diversity, major and minor wild herbivore species dependant on them, etc.

RR is a tradition which has clear livelihood implications. Consequently, its practice can be affected by occupational profile of the household (like whether or not the HH is involved in livestock rearing) and availability of resources (like whether they own sufficient land which can be set aside as RR) Therefore, this baseline survey also recorded landholdings and occupations of the HH.

Detailed questionnaire was developed to understand the tradition of Raakhan Raan primarily including the socio-economic and distribution aspects. The

questionnaire was designed to answer questions like

- What percentage of population is maintaining Raakhan Raans?
- Is there any relation between cattle rearing HH and RR conserving HH?
- What is the tenure status of RR and how much percentage of land is under RR?
- What is the temporal trend in RR practice and occupancy?
- Is RR a tradition limited to a certain community?

Trained enumerator collected information through questionnaires. When classified according to population demographics, it was found that **56** hamlets had mainly **Mahadev Koli (ST)**, **17** had **Thakar (ST)**, and **35** had **Scheduled Caste**.

Out of the studied hamlets, 41 belonged to Mountain tops, 24 to Mid-slopes and 7 to valleys. Hamlets were selected using **Stratified Random Sampling Method** to avoid over representation of a certain category and underrepresentation of other. Final door to door survey was conducted in 13 hamlets belonging to 11 village panchayats (Table 1). Structured interviews were conducted in all the households of selected hamlets in a door-to-door manner (100% households of each selected hamlet).

Detailed information was collected from households so as to explore the research questions. Data was also analyzed to look at relation between herd size (of cattle type) and RR. Cattle herds were classified into four size categories as follows : **Small** (1-5 animals), **medium** (6-15 animals), **large** (16-25 animals), **very large** (26 and above number of animals).

Results

In all 269 HH were surveyed from 13 hamlets to understand the tradition of Raakhan Raan. Eight HH (3% of total HH surveyed) belonged to SC category and 261 belonged to the ST category (97% of total HH surveyed). There were two Scheduled Tribes in the area, the dominant being Mahadev Koli which contributed as many as 199 HH in the study (76% of tribal or total population). Thakar community of Scheduled Tribes comprised of 62 HH in the current study (24% of tribal population).

Out of 269 HH 268 HH were involved in farming. A single household from Ratanwadi (Tirthachiwadi) was not farming. The number of HH involved in livestock rearing (including cattle, buffaloes and goats) was 264. HH without livestock were five and belonged to Ratanwadi (Tirthachiwadi) and Kumshet (Gavthan and Thakarwadi).

Table 1 : Classification of selected hamlets according to communities and their status

Sr	Village name	Hamlet	Total HH	Major Comm	Minor Comm	Occupation		Private land		Forest land		Landless HH
						Agri	Catt	Owner	Holding (Acres)	Occu-pier	Holding (Acres)	
1	Ambit	Payalichiwadi	16	Thk	M. Ko	16	16	15	49	1	2	0
2	Fopsandi	Fopsandi	17	M. Ko	SC	17	17	17	36	0	0	0
3	Janewadi	Bherushi	11	M. Ko	-	11	11	10	22	9	14	0
4	Koltembhe	Koltembhe	51	M. Ko	Thk	51	51	51	148	13	14	0
5	Kumshet	Gaothan	34	M. Ko	-	34	33	27	68	29	53	1
6	Kumshet	Mudhachiwadi	7	M. Ko	Thk	7	7	7	17	1	2	0
7	Kumshet	Thakarwadi	21	Thk	M. Ko	21	20	19	62	2	6	0
8	Murshet	Gavthan	18	M. Ko	Thk	18	18	18	37	0	0	0
9	Ratanwadi	Tirthachiwadi	23	M. Ko	SC	22	20	21	41	6	7	2
10	Satewadi	Jambhalewadi	15	M. Ko	-	15	15	15	35	0	0	0
11	Shingawadi	Shingawadi	22	Thk	SC	22	22	22	39	1	2	0
12	Tale	Tale	17	M. Ko	-	17	17	17	37	0	0	0
13	Vihir	Vihir	17	M. Ko	SC	17	17	17	43	0	0	0

HH: Households; Major Commu: Major community in the village; Minor Comm: Minor community in the village; Occupation: Agri: Agriculture; Catt: Cattle/Livestock; Communities: Thk: Thakar (ST); M.Ko: Mahadev Koli (ST); SC: Scheduled Castes

A total of 256 HH owned private land (95.2% of total surveyed households) and they together owned as much as 634 acres of land. Koltembhe village had a largest total private land holding of 148 Acres with an average private land holding of 2.9 Acres/family. Mudhachiwadi had the smallest total private land holding reaching to 17 acres and average land holding being 2.43 acres/family. Maximum average private land holding was observed in Ambit (Payalichiwadi) (3.27 acres/family) while least was observed in Shinganwadi (1.77 acres/family).

As many as 5 hamlets out of 13 did not have any land recorded as forest land under cultivation. 62 HH (23% from total surveyed HH) from 8 hamlets were cultivating on land recorded as forest lands. The average forest land holding was 1.61 Acres Forestland/HH. Only 3 HH from 2 different hamlets (1.1% of total surveyed households) did not have access to any land whatsoever.

Dynamics of Domesticated Animal Population

Graph 1 shows changes in agricultural assets (land holdings and reared animals) of the studied HH in the past decade. There has been minor increase in land holdings of the HH. But changes in category wise animal population are remarkable. The graph indicates clear increase in most reared animals except in

Graph 1 : Comparison of livestock population of past (before 10 years) and present

Dangi cows. Especially, buffaloes are seen to have doubled in the past decade with 92% increase in their number. Dangi Bulls also show increase by 63% since the past 10 years. Male buffaloes and goats have also increased by 36% and 30% respectively in the past decade.

The only category which has reduced in numbers in the past decade is the Dangi Cow. They have reduced by as much as 16% since the last decade. The main cause of this decrease may be non-salability of cows (people believe that cows should not be traded),

Table 2 : Villages and their participation in conservation

Sr. No.	Village Name	Hamlet	Ecological location	Community	Do they protect Sacred groves	RR Tradition
1	Aambit	Payalichi wadi	Valley	Thk	No	Yes
2	Fopsandi	Kondarwadi	Mid Slope	M.Ko SC	No	No
3	Janewadi	Bherushi	Mid Slope	M.Ko	Yes	Yes
4	Koltembhe	Gavthan	Top	M.Ko, Thk	No	Yes
5	Kumshet	Gavthan	Top	M.Ko	Yes	Yes
6	Kumshet	Mudachi wadi	Mid Slope	M.Ko, Thk	Yes	Yes
7	Kumshet	Thakarwadi	Top	Thk, M.Ko	No	Yes
8	Murshet	Gavthan	Top	M.Ko SC	No	Yes
9	Ratanwadi	Tirthachiwadi	Valley	M.Ko SC	No	No
10	Satewadi	Jambhlewadi	Top	M.Ko SC	No	No
11	Shinganwadi	Gavthan	Top	Thk SC	Yes	Yes
12	Tale	N/A	Top	M.Ko	Yes	No
13	Vihir	N/A	Mid Slope	M.Ko, SC	No	Yes

reduced livelihood dependence on cattle, increase in accessibility through which trade has taken up, migration to nearby cities or towns for short term alternative employment, etc.

The Raakhan Raans

Total of 56 out of 269 households practiced the tradition of Raakhan Raan. These households were distributed in nine out of 13 hamlets (five hamlets from the mountain tops, three from mid slopes and one from the valley) (Table 2) (Photo 3 and 4).

Sacred groves are known to provide benefits to local communities like better microclimates, ground-water tables, soil properties etc. It is very likely that people who practice one conservation practice (Sacred groves, in this case) and are used to the restrains which come with it, easily take up other conservation tradition (RR in this context) for clear benefits. The study tried to identify if there was any such relationship. But we found no significant relation between villages which protected the RR with village protecting the sacred groves.

The 56 HH which were instrumental in conserving RR, protected as much as 64.5 acres of land out of the 738 acres of total cultivated land in the area around the KHWLS and allowed grass species to flourish and reproduce without disturbances like grazing, fires, invasive species etc. Even though RR is a individual practice, the entire village sees to it that each RR is protected and livestock of any family does not stray in for grazing. Traditional management strategies are yet to be documented in details, but people say that RR are protected through community effort.

The study of tenures (ownerships) of RRs revealed that 97% of the Raakhan Raans are situated in private lands and 3% on forest lands. A total of 10% of land held by households is dedicated to conserve RR while agriculture is taken up on remaining 90% land.

Hamletwise distribution of RRs

As seen from Graph 2, Ratanwadi (Tirthachiwadi), Tale, Satewadi (Jambhlewadi), Fopsandi (Kondarwadi) did not have any RR. Rest all the hamlets had RRs in varying percentages.

Graph 3 shows changes in RR lands within the last decade. There is a 14% decrease in RR area in the past 10 years. Pressures like land use changes, local unemployment and forced migration, changing climate and its impact on cattle health, failure of village economies to provide the much needed cash for sustenance may have caused HH to discontinue animal rearing as a livelihood option. With cattle rearing losing its signifi-

Graph 2 : Village-wise distribution of HH practicing RR

Graph 3 : Change in RR area in the past 10 years.

cance, important conservation traditions like the RR are also losing their contexts.

Community wise contribution to the RR tradition

Community wise classification of the RR villages revealed that all four hamlets which had a population of Thakar community still practiced the tradition. Also 6 villages (out of 10) with Mahadev Koli community and 3 (out of 7) with Scheduled Caste population were observed to be following this RR practice.

Maximum number of HH protecting RR belonged to Mahadev Koli tribe followed by Thakars and lastly the Scheduled Caste HH. But considering percentage of households within communities, 29% of Thakar HH, 19% of Mahadev Koli and 12% of the SC households practiced this unique tradition.

The RR are protected from fires and open grazing through community regulations and mutual understanding. Open grazed lands are severely grazed (Photo 1) whereas grass density is better in raakhan rans (Photo 2 and 5, 6). Even though RR is an individual ownership entity, there are no physical barriers demarcating or excluding it from open grazing. It is through mutual understanding amongst communities

that RRs are protected. Detailed study needs to be undertaken to understand the different management/ protection strategies which communities employ for RR but it is very clear that the decision of the individual is being honoured by the entire community.

Most grasses complete their lifecycle in early winter and disperse seeds. The fodder in RR are harvested after completion of lifecycle to ensure healthy regeneration in the coming season. These areas with vigorous grass growth and high species diversity act as seed banks for this neglected diversity which provides vital support to the entire ecosystem. Depending on the soil characters grasses dry at varying rates. Harvesting at optimum moisture is essential to ensure optimum biomass recovery. Over-desiccation of fodder makes it brittle causing breakage and reducing biomass recovery. Therefore most HHs prefer harvesting Raakhan Raans in the month of November-December for optimum palatability and biomass recovery.

Size of RR

Most HH practicing the tradition preferred to protect as much as 1 acre of RR. The area conserved through this practice ranged between 0.5-3 acres. Average landholding was 1.015 acres per HH at the time of survey. Comparative study of RR landholding in the past decade shows that average land holdings have reduced from 1.36 Acres per family to 1.015 Acres per family. See Graph 4. On the background of increasing cattle population in the area reducing RR area may indicate increasing grazing pressure on surrounding forest areas.

RR and the cattle rearing livelihood

Amongst 269 interviewed HH, 238 HH were rearing animals (1 and 49 numbers). Thirty one HH did

Graph 4: Changes in area of RR/HH through past decade.

not have any animals. Amongst the 238 livestock rearing HH, 185 HH maintained larger livestock like cows, bulls, buffalos, etc.

Out of 56 HH who owned RR, 54 maintained livestock while only 2 families who were not into livestock rearing maintained RR. This finding indicates that motivation behind protecting RR is closely related to whether or not the family is currently involved in livestock rearing. A total of 99 rearing goats did not practice RR while only 23 HH rearing goats practiced RR. Goats are browsers; they feed on grass along with leaves and shoots of wild plants and do not require an assured supply of fodder like the cattle.

RR assures fodder security during months of scarcity. Larger herds which are more prone to starvation due to the sheer volume of their fodder requirement can be nurtured well with a resource like RR. It is evident from the study that large herd owners prefer protecting RR more than smaller herd owners. Graph 5 shows that 40% of the “very large” herd owners depended on RR.

Age of this tradition

Total of 61% of the HH were practicing this conservation tradition since 75 yrs/ 3 generations. 30% were conserving since last 50 years/2 generations. 5% HH had a conservation history of 100 years/ 4 generations. Similarly only 4% had newly begun to protect RR i.e since past 25 years/1 generation.

There were 235 HH involved in selling various animal produces like milk, milk products, dung, calves, etc. 55 RR HH out of the total 56 RR HH were found to earn income out of sale of various animal products. RR thus supports livestock based income

Graph 5: RR practice on the basis of herd size

X axis denotes herd size while Y axis represents % HH with RR

generation activity amongst the marginal tribal communities in the area.

Households in the study area reported cattle based income ranging from 1000 to 10000 annually. This was divided into 2 categories, 1000-4999.00 as low and 5000-10000 as high. Amongst the 56 RR HH in the studied sample, 37 RR HH (66%) earned annual income in the higher category. There were 24 Mahadev kolis, 13 Thakars amongst these higher earning HH.

Yield from RR

Initially, it was thought that RR were maintained and harvested for securing fodder alone. Survey revealed multiple applications to which these grasses were put. The grass harvested from RR provides sustenance to local cattle during the critical draught period. Besides, the grass is also used in annual maintenance of houses done before monsoon and for roughing operation in traditional rice farming. Fifty six HH reported using RR grasses as fodder, 38 for household maintenance and 31 HH used the harvested grass in farming operations. Depending on the nature of substratum, climatic exposure and protection level the yield from each RR varies considerably. Average yield per acre reported varies from 3 cartloads/acre to 20 cartloads/acre. Maximum harvest possible was found to be as much as 50 cartloads and least being 3 cartloads.

RR are not always harvested to 100% of its capacity. HH harvest the area as per their estimation of annual requirement. Only 20% RRs were completely harvested while 28% harvested only 3/4th, 36% harvested only half and 16% harvested 1/4th. Setting aside a part of unharvested RR may also be a management strategy to ensure sufficient seed numbers and soil health, but other factors such as household requirement for fodder might also play a role.

Conclusion

Fodder is an important resource for a agro-pastoral community like the ones in study area. Overgrazing and lack of suitable management strategies, have rendered community grazing areas non-productive in terms of quality and quantity. Sustainable fodder production, protection and harvesting assure long lasting resource. RR is an old practice which assures a prolonged supply of this resource.

Raakhan Raan are privately owned and traditionally conserved grassy patches in the study area. They covered a broad spectrum of landscapes and habitats. RR were located on flat lands, steep slopes, stream banks, near forested areas, in deep soils as well as in

shallow soil habitats. Almost 21% of households protect and preserve RR in the current scenario underlining their dependence on animal rearing as a livelihood activity. It also indicates the significance of sufficient quality and quantity fodder for sustaining this activity. Families who rear larger livestock like cattle and buffaloes opt more for protecting RRs. Furthermore, families with larger herds depend more on RR due to higher requirement of fodder every year.

R Rs are mostly found on privately owned lands. Local communities protect as much as 10% of the total private landholdings as RRs. Thus 10% of privately owned lands in the study area have been providing protection and support to many plant and animals species of grasslands habitats of Northern Western Ghats.

Improved transportation, migration for employment, change in approach towards livestock rearing, improved irrigation facilities, etc have led to reduction in RR holding HH and also area under RR per HH.

RR practice is not limited to any community as a whole. All the communities from the study area were found to protect RRs in varying proportions. RR was most common amongst Thakar communities (ST), followed by Mahadev Kolis (ST) and lastly SC. This practice is most related to livelihood and allied activities of the HH. Animal rearers and that too those who own larger animals (like cows, bulls and buffaloes) were found to be eagerly protecting RRs.

Considering today's scenario of animal husbandry as an enterprise, the enormous expenses incurred for procuring animal feed is the prime factor reducing its profitability. Reduced profitability increases incidences of malpractices and use of substandard raw material in any venture. RR practice can be a sustainable means to produce the major chunk of animal feed in a very localized and decentralized manner. Native fodder species growing in the RR will be hardy, drought and pest resistant. Production cost of these species will be negligible as no commercial seed material, fertilizer application will be necessary. It will be interesting to see how RR soils respond to land preparation and water conservation interventions also.

Besides supporting communities, RRs provide a safe and undisturbed habitat for grass species which have always been neglected from conservation perspective. The study area consists of hamlets located in buffer areas of KHWLS. Their location further increases significance of this practice by supporting greater and lesser wild herbivores.

For these multiple reasons, RR practice needs to be studied and replicated not only on individual scale

but must also be tried on community level.

Declaration

Authors take full responsibility of originality of the study conducted and article developed. They also declare no competing interests.

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Photo 1 : Dormant Grass in open grazed area of KHWS

Photo 2 : Dormant Grass of harvested Raakhan Raan

Photo 3 : Raakhan Raan on flat lands

Photo 4 : Raakhan Raan on slopes protecting soil from erosion

Photo 5 : Grass density in Raakhan Raan

Photo 6 : Grass harvested from Raakhan Raan

Photo 7 : Dangi cattle