

Annual Progress report

Year: 2019-2020



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Contents

1. Vision.....	4
2. Mission.....	4
3. Values:.....	4
4. Breed Conservation:	5
5. Building Dairy Based Livelihoods – Goat milk.....	13
6. Building Dairy Based Livelihoods – Camel milk.....	17
7. Camel Milk – Rajasthan.....	18
8. Sheep-wool based livelihood interventions.....	19
9. Restoration of Grassland and Biodiversity in Banni region	21
10. Case Study.....	27

2019-20 – At a Glance

Home in the City: resource mapping, action plans and implementation by Wards 2 and 3 of Bhuj; Joint Sahjeevan/Bhuj Nagar Palika proposal based on this learning submitted to Gujarat Biodiversity Board to form Biodiversity Management Committees at Nagar Palika level

Management plans developed with CFMCs for removal of *Prosopis* from 2500 ha covering 47 Banni villages; significant removal of *Prosopis* from Banni grasslands

RAMBLE website revamped to reflect past 7 years' work; ABF support enables resumption of Indrajith Thacker fellowships; 5 new Residential Fellows;

Fakirani Jat and Rabari Gram Sabhas of Lakhpatt, Bachau and Abdasa file 4 CFR claims under FRA

NBAGR recognizes Nari Cattle, Poda Thurpu cattle and Kacchhi Donkey as distinct breeds, based on applications filed by Sahjeevan

Annual Camel Mela; Banni Pashu Mela;

Khamir collaboration on using sheep wool in apparel; Desi Oon wool products exhibition, Delhi, 2019; Collaboration with Hunnarshala to test sheep wool as building insulation; with SPRERI and Kutch University to explore potential of using sheep wool as bio-fertilizer

Sarhad installs second BMC in Rapar and 10,000 litre facility to process camel milk in Bhuj; Gujarat Co-operative Milk Marketing Federation Limited announces "Amul Camel Milk" launch in select Gujarat markets (Gandhinagar, Ahmedabad, Kutch), in 500 ml PET bottles; Aadvik Food Pvt. Ltd. initiates pilot procurement of goat milk in Surendranagar

Sahjeevan / CfP initiates a partnership with Access Livelihood Services, Hyderabad, to facilitate pastoralist dairy by-products entrepreneurship

Research collaboration with University of Leeds to understand impacts of sedentarization among pastoral communities;

Collaboration with Agrocel to construct waterscape structures in 6 Banni villages

Inception of Salim Mama Course with KSKV Kachchh University to educate Maldhari youth about pastoral systems, breeds, ecology, economy etc.

Sahjeevan's Case Study, "Conservation of Camel Breeds of Kachchh" selected as Joint Runner-Up for 'Azim Premji Stories of Changes Awards', 2019-2020

Sahjeevan CfP nominated as Ministry of Tribal Affairs Expert Committee Member to improve recognition and vesting process of community rights under FRA with special focus on (i) Habitat Rights of PVTGs and (ii) Seasonal Resource Access to Nomadic and Pastoralist Communities

1. Vision

We contribute in the creation of a society which conserves the natural habitat and ecosystem which integrates culture, tradition, humanity and gender equality.

2. Mission

We exist to help the community to prepare demonstrations at grass root which helps in strengthening their traditional occupation by conserving the natural habitat and ecosystem which comprises gender equality, humanity, traditional knowledge and the use of simple techniques.

3. Values:

Collective:

- To work with a person or a community in such a way that natural habitat and ecosystem sustain and which affects a major part of the community.
- We believe in building a new strength at organizational level by comprehending the potential of supporting organizations.

Decentralization:

- We believe that instead of single authority of power, ownership, responsibility, decision making and leadership, it should be at community level.

Sustainability:

- We do sustainable work with the leadership of community which balances natural habitat and ecosystem.

Gender equality:

- We believe in equal power of decision making between men and women to conserve the lifestyle based on natural habitat and settlement.

Value the traditional knowledge:

- We believe in promotion of indigenous knowledge based on community's intellection, experience and culture which is balancing the natural habitat and settlement. We also believe in this to be recognized and valued worldwide.

Humanity:

- We believe in promoting the lifestyle which is based on the values which maintain the harmony between nature and humankind, such values are equality between each class and cast, sensitivity, honesty and supporting nature.

4. Breed Conservation:

4.1 Collaboration for Breed conservation

Sahjeevan has begun the work in south saurashtra since a year; saurashtra is geographically spread in 4 districts (Jamnagar, Rajkot, Junagadh and Devbhumi Dwarika). Kahami goat, Halari Donkey and Panchali sheep has the native tract of this area. Around more than 3000 migratory families are distributed in these four districts. For the conservation of native breeds and mobilisation of pastoral communities, Sahjeevan has decided to develop a strategy paper develop working strategy and methods for this region.

Sahjeevan is now working actively with pastoralists in Upleta, part of Saurashtra, to explore ways by which these populations may be revived. This includes working with the respective communities to build breeding associations, similar to the BPUMS and KUUMS in Kutch, and to then work with these associations, towards strengthening livelihoods that are built around these breeds. The most promising avenue thus far appears to be with the Kahami goat, a breed that produces significantly higher milk than other goats in the region. This milk is currently used to produce mahwa which is sold locally. Based on our work in other parts of Saurashtra, mentioned earlier, Sahjeevan will initiate an exploration linked to both the procurement of goat milk (by agencies such as Amul and Aadvik) as well as the marketing of mahwa (in collaboration with ALC).

Through the collective efforts by Sahjeevan, AAU, Department of Animal Husbandry and Ramrahim Kachhchhi-Sindhi horse was registered as 7th horse breed of India in 2017. Then after Ramrahim Kachhchhi-sindhi ashwa cooperative had submitted a proposal to Department of AH-Gandhinagar for conservation of this unique Horse. Department had approved Rs. 11.70 lakh under national livestock mission scheme, with condition that Sahjeevan will implement this project. Sahjeevan decided that this project will be implemented with partnership of the Ram Rahim Cooperative. Beginning of implementation of this project sahjeevan faced some challenges with horse breeders. There are few groups within the horse breeders, due to lack of proper understanding cooperative found difficulties to convince to the horse breeders. Although, project commenced in May-2019.

Based on a series of meetings with the breeders of Kahami goat (number of units now left over 6700) and Halari Donkey (number of donkeys now available in No: 1500), technical conservation plan, budget and proposal have been developed with a financial layout of Halari Donkey 15.57 Lakh. The said plan has been submitted to the Department of Animal Husbandry-Gandhinagar for support under the National Livestock mission. The department has approved and forwarded to State Level Economic Committee (SLEC) for its approval.

Conservation and management plan of Kachchhi Camel – 7000 was prepared along with technical plan and financial layout of Rs. 16.40 Lakh, this plan was submitted to Department of Animal Husbandry-Gandhinagar. The department has approved it and forwarded to SLEC for its necessary consideration. Population survey of Bhagri goat – 12000 (new goat breed identified very recently) has been carried out, and likewise a brochure on Bhagri goat has been published during This year.

Population survey of Halari donkey and Kahami goat has been carried out with 465 households in Jamnagar, Rajkot, Devbhumi Dwarka and Junagadh district. There is a total of 340 Bhagari goats.

Based on the characteristics and its milk yielding potential the region has promising potential. The said region has now been delineated for taking forward the work for Pastoral Dairy Production system.

Baseline survey of 901 mobile households has been carried out during this period. Health care of livestock is the very critical requirement for pastoral families. Sahjeevan has made efforts to organize mass level vaccination camps in saurashtra. Total 36973 sheep and goats have been covered under de-worming and other preventive treatments.

Under the activity of collaboration with central and state governments and NGO's, meeting with director of Animal Husbandry Department-Gandhinagar was organized to discuss conservation and management plan and proposals under state and central schemes. Sahjeevan had approached to Junagadh Agricultural University for collaboration on characterisation and registration of Bhagri goat of Jamnagar district. In this regard official meeting had been called by Director of Research JAU. JAU has agreed and decided to work on this project in collaboration with Sahjeevan. A team of scientist of JAU has been formed, JAU will develop a proposal and they will raise financial resources for this work. JAU will carry out phenotypical and molecular characterisation while Sahjeevan will provide field assistance to mobilize breeders for data collection.

Under collaboration with state and central government agencies, a meeting with director of Animal Husbandry and other officials of department was held at Hodko village during 12th Banni Pashumela. Director of AH had given time for the meeting with Kahami goat and Halari donkey breeders. Various issues which facing by pastoralists presented before director.

4.2 Developing Strategy Paper of Saurashtra Region:

It was decided that comprehensive strategic paper of Upleta center will be developed. Several meetings and FGDs conducted with the various pastoral groups.

A training cum awareness camp on preventive health care was organized on date of 9th September-2019 at Shethvadala center. Veterinary officers of Jamjodhpur district conducted sessions on how preventive healthcare and livestock management system. Same type of training cum awareness camp was held on date of 27th September-2019 at Kharchiya village. Total 73 members attend this awareness camp.

4.3 Training and capacity building:

Under this head, in collaboration with women and child health division of district panchayat a workshop was organized at Jamjodhpur. It was aimed to create awareness among migratory families to ho to access and get benefit various government schemes. Around 182 participants from Jamjodhpur and Upleta block were attend this workshop and most of them women. Government officials were made presentations on and open discussion was also held in question-and-answer form. A regional level workshop was held at Lalpur of Jamnagar district. Various villages of Jamnagar district 102 mobile pastoralists attend this workshop. In was aimed to how to form breeder's association or pastoral institution of Saurashtra. They discussed on membership, memorandum, and name of institution, rules and norms also discussed. In the conclusion the workshop 7-member committee of Lalpur block has been formed.

4.4 Mobilisation and Interactions with the Pastoral groups:

Sahjeevan undertaken a process to developing strategy paper for Upleta Center. Sahjeevan, held meetings and interactions with the Maldharis in Jamnagar and Rajkot districts. At some of locations pastoralists were very worried about the destruction of grazing patches by mining industries and wind mills.

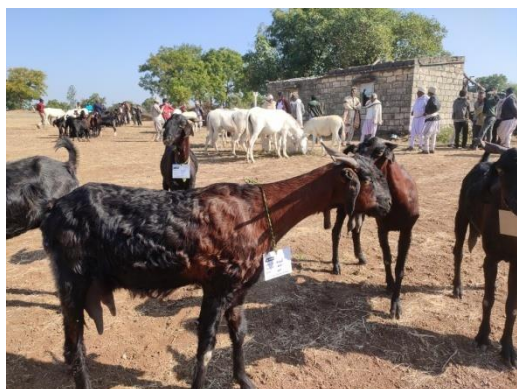


As part of developing strategy paper, team has carried out process of mapping pastoral migration routes through the FGDs. It is captured information of different groups, their season wise migration routes, stays, selling of milk, wool and meat markets, relation with farmers, fodder and water availabilities, breeding period, health aspect etc.

We interacted two groups of Bharwad and one group of Bhopa Rabari pastoralists. It was interesting to know that around 3000 families of Bhopa Rabari are traveling in Saurashtra. Originally, they belong from western Kachchh but they left Kachchh permanently around 200 year ago. Bhopa Rabari mostly keep Panchali sheeps, do to use camel as pack animal. They having their homes in Devbhumi Dwarika distict but very hardy they do go back to home entire cycle of year. Most of the time of year they roam in Gir forest, Junagadh and Jamnagar district. Sahjeevan along with Bharwad community will do mobilization process towards their pastoral institutions.

Kahami got animals brought in this event. Around 350 pastoralists from various districts were assembled in this event.

It was collaborative event with Department of Animal Husbandry-Regional joint director Dr. . was the chief guest in this event, other officials from the district animal husbandry department were also participated. Case Price with certifficket to first three winners was distributed.



4.7 National breed conference - indigenous breeds

Sahjeevan-Center for Pastoralism had planned to organized a stakeholder consultation on Streamlining Pastoralism in India in at new Delhi, In



collaboration with the Ministry of Animal Husbandry dairying and fisheries, GoI. This event planned to held on 12-13 March at India International Center (IIC) new Delhi. Revitalizing Rainfed Agricultural Network (RRAN), South Asia Pastoral Alliance (SAPA), Rainfed Livestock Network (RLN), etc were co-organizers. It was expected around 60-

70 Participates across the India, mostly representatives of various pastoral groups, civil society organizations and government officials from the ministry of animal husbandry and Indian council of agricultural Agricultural (ICAR). All the things and preparations had done. however, due to the recent circumstances of Covide-19 and to take preventive measures, Sahjeevan decided to postpone this event. This event will be organized once the situation will come favourable.

4.8 Institution Building

Upleta center comprises of 4 districts namely; Devbhumi Dwarika; Jamnagar; Junagadh; and Rajkot. Mobile Pastoralists Bharwad, Bhopa Rabari and Sorathiya Rabari are spread across these four districts. There are around 1.15 Lakh families belongs with these communities, however

only around 3000 families out of them follows nomadic pastoralism and 5000-8000 follows stationery pastoralism with sheep and goats. Over the years rest population has sifted and adopted other occupations like Agricultural, skill-based occupations and jobs. In the light of this situation Sahjeevan is primarily working with nomadic pastoralist and stationery sheep-goat herders at some level.

Institution building of pastoral communities is the one of important theme at Upleta centre. Sahjeevan has carried out following activities in this reporting period:

- Village level meetings:
Village level meetings is the very typical tool to interact with the beneficiaries, while the working with pastoralists is the different case, most of nomadic families stays away to village. Team generally interact with the families and pastoral groups in the grazing and forest areas. In this year 78 village level Meetings conducted with various pastoral groups.
- Block (Cluster) Level Meetings
- Pastoral Gathering: A workshop on pastoral institution and livelihood had held on date of 30th June-2019 at Vavdi village of Jamjodhpur district, aim to discuss institution building process and livelihood opportunities and selection of working committee members from each district. Around 135 Pastoralist with very few women were attend this workshop from Dwarika and Jamnagar District.





A meeting at Bhojabedi village was conducted on 27th June 2019. 31 Pastoralists were attend that meeting. That meeting was discussed livelihood alternatives, goat milk, Mawa selling etc. Formation of Breeders association also discussed.

4.9 Rehabilitating the Habitat

There is now an ongoing process for the participatory mapping of the Gulf of Kachchh, which is the Kharai camels' pastoral and breeding grounds. Six cluster level maps have been prepared to identify the Kharai camel's grazing lands. These are for the Mohadi cluster, Pipar cluster, Aasariya Vaandh cluster, Jangi cluster, Bhadreshwar cluster and Tundavaandh cluster. After conducting a meeting with camel breeders and village panchayats, maps of three further areas were created, namely Jodiya of Jodiya Taluka, Baed of Jamnagar Taluka and Chudesar village of Salayataluka to similarly understand work related to pursuing FRA claims in Saurashtra region.

Since 2019, Sahjeevan has also been actively participating in a multi-country, multi-university research initiative entitled 'TAPESTRY' on sustainability for mangrove systems. TAPESTRY stands for 'Transformation as Praxis: Exploring Socially Just and Transdisciplinary Pathways to Sustainability in Marginal Environments'. Its objective is to examine how transformation may arise from below in marginal environments with high levels of uncertainty. It focuses on vulnerable coastal areas of Mumbai, the Sundarbans and Kachchh, where hybrid alliances and innovative practices are reimagining sustainable development and inspiring societal transformation. As a part of this, biodiversity in the Kachchh mangroves is being studied jointly by Sahjeevan and a team from the University of Kyoto, Japan.

Sometimes protection brings its own ironies. Forest officials do not allow the pastoralists' Kharai herds to graze in the Marine National Park and Sanctuary, Saurashtra and Kachchh in the belief that their grazing

contributes to the destruction that has been going on. The reality is that the camels only eat the upper parts of the plants, which actually helps in new growth, and their itinerant grazing implies that they don't stop at any place for sustained grazing. Furthermore, the stamping down of mangrove seeds by the animals' hooves buries them deeper, preventing them from being washed out with the tide and improving their chances of sprouting. Given that the pastoralists are currently treated as trespassers in their own traditional grazing grounds, Sahjeevan has tried to find working solutions for the problem. In collaboration with the village panchayats and the police department, legal resident documents and certificates of all the Kharai camel breeders were submitted towards the end of 2018 to the district collector's office. Based on this, Kharai camel breeders are to be provided a distinct identity card, which will grant them permission to access the otherwise restricted grazing lands. This process is underway.

5. Building Dairy Based Livelihoods – Goat milk

5.1 Goat Milk: Gujarat (Kutch & Saurashtra)

Surendranagar District, a semi-arid region with modest sources of freshwater, shortage of rangeland forage and crop residues, presence of large number of livestock and the lack of any other alternative feed sources particularly for landless pastoralists, migration is an inevitable source of survival for the Maldhari - Rabari & Bharwad community pastoralists who inhabit these regions. Their destinations are principally the irrigated areas of north and south Gujarat. The communities get back to their villages immediately after the onset of monsoon.

The village level meetings (07 in Sayla and 08 in Chotila block) were conducted during the year primarily with such migratory households owning goat herds. The discussions during the meeting were focused on the issues and challenges being faced by the community during migration, the initiative on goat milk related procurement process vis-à-vis their role for engaging with it. The families back from migration did express their goat health related concern. For the same, an effort was made to devise a plan for including the families who have returned back from migration.

The goat milk potential assessment exercise did facilitate an understanding of CLUSTERS (geographically contiguous village locations having goat herding communities - covering 5-8 villages) in both the blocks. Cluster level meetings were organized to bring about awareness on precautions to be followed to reduce down the mortality rate owing to the likely disease incidence. The traditional extensive system followed by community for managing small ruminants, need to avoid risks of diseases to maintain herd numbers. The shortage of water and forage leads to malnutrition among herds and sometimes are the principle causes of heavy mortality. Besides, the intermingling of animals during grazing too

facilitates spread of infectious diseases such as peste-des-petis, contiguous caprine pleuropneumonia, goat pox, helminthiasis etc.;

The meetings and discussions at the village and cluster level helped to draw upon an action plan for health cum vaccination camp. The information shared during such interface witnessed exceptionally high community participation at the health / vaccination camps.

5.2 Facilitating dedicated infrastructure and liaison with AMUL & Others

A meeting was organized in the month of September first week with MD - Surendranagar District Milk Union Ltd. - Sursagar Dairy). The meeting had also the participation of both block and cluster level representatives from the goat herding community. The format of institutional structure likely to evolve in order to facilitate the supply side related operation associated with procurement was discussed. An approximate quantity of goat milk that has potential from the respective blocks too was shared. The MD has shown his inclination in principle however it would require an approval from the chairman – Surendranagar District Milk Union Ltd. Convenience of the chairman to dialogue and discuss on this agenda will be sought shortly. Meanwhile, Adhvik Food Pvt. Ltd. and yet another company ABC farm – Pune have expressed their interest to procure goat milk, however given the lean availability of goat milk during monsoon season, the next set of procurement may commence after the month of October 2019. Aadhvik foods has committed to procure 3000 litres of goat milk in the next month. Meanwhile, while the liaison with District Milk union Ltd. is being carried out it was felt imperative to also explore the possible entrepreneurial options and look for harnessing the local entrepreneurial ecosystem as well. In the process, a four member team from Access livelihood Services Ltd.; visit the area to explore the possible options. A detailed discussion followed both at the village and block level. Visit to few of the existing entrepreneurs engaged with making “Mawa” out of goat and cow milk in the region was made. The objective was to explore possible strategic action towards creating an enabling environment for entrepreneurship around pastoral dairy products.

Aadhvik has also been instrumental in the initial exploration of different ways to expand and diversifying its product range. Initially it was converting all milk it procured into powder as a means of extending its shelf life. It then began selling high end chocolates and other products – all available on Amazon. Amul replicated some of these ideas, and included camel milk chocolate in its new range of dark chocolates. It also attempted to market liquid milk in 500 ml packing. However, the soluble milk had a shelf life of only a couple of days. This didn't deter Amul, which went on to set up equipment for Ultra-High Temperature processing (UHT) and Tetra Pak retail packaging towards the end of 2019, which gave camel milk a game-changing 6-month shelf life. It has recently introduced camel milk ice cream, already a proven success in experiments in Rajasthan. Amul has the potential to procure a much larger volume and

is attempting to market liquid camel milk across Gujarat and eventually in other parts of the country. Already, today, as a result of all this, some 170 breeders are selling their milk for an average daily collection of 2000 litres. Households with an average herd size of 40 camels are earning in the region of Rs. 20,000 a month. A number of youths who had taken city jobs as assistants to truck drivers have returned to rebuild family herd assets, seeing this as a reliable, remunerative investment with greater dignity than the jobs they had taken. The next objective is to be procuring milk from 270 households in the district.

5.3 Capacity building of the Goat herding community

Average herd size of 55 goats maintained by the pastoral community in the block needs an effective control of animal diseases as a strategy to aim at supporting and enhancing goat based livelihoods. The large networks of veterinary institutions run by the state government for surveillance, control and diagnostics was considered as a critical platform. Realizing such a need establishment of relationship with the District level Animal Husbandry department was carried out with repeated follow up. Deputy Director – Animal Husbandry offered platform to Sahjeevan so as to plan health / vaccination camps. Operationally, the respective block level department officials were made responsible to coordinate and conduct the health / vaccination camp. The group contact conducted with 903 households later to the health camp at each of the camp site proved to be beneficial for the goat herders. Various state governments scheme to support veterinary care and services including the importance of herd registration with Panchayat were discussed at length with the Maldharis.

5.4 Formation of Institutions and inputs on Pastoral Goat Production System

Cluster level and Village level platforms serve as a dynamic means to discuss upon the pastoral goat production system. Intertwined with the information on management practices associated with goat production system, formation of institutions too formed a central theme of discussion. 06 cluster level meetings and village level meetings were conducted in this year to form coordination committees. The committee is expected to play an anchor role. It will disseminate information regarding the need for creation of pastoral institution, and also seek suggestion on its form and structure. A

fter due deliberation with the community, the committee is expected to meet in the month of November to finalize its governance structure and suggest names of representatives. Based on the information harnessed from the documentation on status of goat herding communities along with an assessment on the milk potential etc.; a presentation was offered to the Access Livelihoods Services Ltd.; team. The overview along with few cases offered insights related to the potential and also the future strategy on creation of an entrepreneurial ecosystem in the region. An elaborate

knowledge sharing workshop is being planned in the next year with potential entrepreneurs to help evolve an action plan.

5.5 Goat Milk Rajasthan

The scoping study conducted in the state of Rajasthan to understand the milk potential, production system, determinants of herd size, feed management, cost and returns and its role in livelihood security provided the following salient insights from the region of Sumerpur & Bali Tehsil (District Pali), Pindwara (Sirohi District):

- a. The region has three distinct goat production systems, viz., large-scale commercial farms, small units under semi-intensive and intensive system, and small to medium sized flocks under the extensive system raised on CPRs.
- b. Based on a rank-based quotient (RBQ), access to Common Property Resources (CPR) was perceived to be the most important constraint to goat pastoral practice rearing followed by losses due to diseases and parasites in goats and a realization of the low price of goat milk.
- c. The herd size and average grazing hours per day proved to be factors behind existence of economies of scale. The imputed value of family labour and feed resources from CPRs were found to be the major component of the total expenditure which accounted for 51 to 78% of the total cost across different flocks. Most of the cases family labour was used for grazing of 30-40 goats on an average.
- d. The male: female ratio in flocks was as high as 1:35. Majority of the medium and large flock owners in the tehsils maintained a breeding buck of the same breed (Sirohi) which helped in maintaining purity of the breed.
- e. The practice of migration of goat and sheep in search of feeding resources to fulfil their feed requirement was largely prevalent. The families with goats migrated to nearby hillocks few went to as far as up to 500 km during summers. During migration, farmers sold their surplus and weak adult animals and kids to minimize the transit losses.
- f. During winters, the goats survived on tree leaves of Khejri (*Prosopis cineraria*), Neem (*Azadirachta indica*), Ardu (*Ailanthus excelsa*), Babool (*Acacia nilotica*), Siras (*Albizia procera*) and Heens (*Capparis horrida*).

With the above background the availability of average milk potential of 9000 to 11,000 litres per day of goat milk makes it all the more imperative for intervention in the region. The work of Sahjeevan for creating an enabling ecosystem for goat milk economy will be partnership based in the state of Rajasthan. Presently discussion with local organization active in the region with significant presence in goat production system is ongoing.

6. Building Dairy Based Livelihoods – Camel milk

During the Year 3, 89,236 litres of milk was collected from two BMC (Bulk Milk Chillers) installed by Sarhad Dairy (Kutch District Milk Union Ltd.) in Kutch. An average of 152 households participated in the process of milk supplies. There was a decrease in demand of camel milk from Amul, hence Sarhad Dairy had put a ceiling on the quantity of milk to be procured from the two BMCs (Nakhatrana and Rapar). This led to decrease in the number of Maldharis participating in the milk supplies. Liaison with Sarhad Dairy and Amul is being carried out regularly to ensure a sustained and regular supply of the quantity of milk procurement. The 10 youths trained as part of cadre development strategy at the three-day orientation cum training on clean camel milk production at National Research Centre on Camel, Bikaner have been provided with pedagogical tools (pictorial representation on the process to be followed) on clean milk production. The youths served as resource person to offer an orientation to the camel herders at Nakhatrana and Rapar blocks. Two such training programs were organized during this year at two locations wherein a total of 31 camel herders participated. Officials from Sarhad Dairy too were present in the orientation program.

6.1 Strengthening Existing Institutions of the Camel Herders / Breeders (KUUMS)

Four meetings of the camel dairy milk cooperative societies were organized during this year. The meeting dealt upon issues such as increasing the membership of the Maldharis supplying milk, issues with respect to timely payment to the producers, audit of the society accounts, and maintenance of time for the milk supply at BMC. The effort was to streamline the functions and governance structure of the existing dairy Cooperative society.

The functionaries of the Camel Breeders Association too convened a general body meeting to identify the key challenges being faced during the milk collection and also regularly connect with Sarhad Dairy towards regular milk collection. It is expected at the body of KUUMS will meet regularly with the officials every quarter to discuss and sort out issues related to either milk quality, quantity and also its sustained supply.

A process to select youths for the program has commenced during the year. It is expected that an orientation to the youth herders will be carried in the next the year on areas viz.; natural resource management; human health; to address the pastoralists' poor access to modern health services; camel herd management & leadership and governance to strengthen an informal pastoral governance system.

Documentation work related to development of manual and pedagogical tools for providing training to the camel herders on disease management, clean milk production, herd management along with the various forms of

pastoral dairy products has commenced during this year. The manual in vernacular language will serve as a guide to either the Business Development service providers including the youths trained at National Research Centre, Bikaner. A workshop will be conducted with the District Animal Husbandry Department once this will be completed.

6.2 Capacity building of the camel herding community

Managing and treating camels in the traditional management system is critical to maintain the herd health. Infectious and Non-infectious diseases related to various body parts such as skin, head and neck, nose and lungs including the stomach and intestine are very common. Also, veterinary services are rare in camel herding areas. The district animal husbandry department provided the necessary support to provide vaccination for the infectious diseases and also to disseminate relevant information to the herders towards preventive care and early diagnosis. During the Year, 31 health camps were organized covering 6035 camels from 151 households across accessible centres spread over two blocks viz.; Nakhatrana and Rapar.

7. Camel Milk – Rajasthan

Continuous follow up with Rajasthan Cooperative Dairy Federation (RCDF) is being carried out to gauge for their willingness including their readiness as part of the commitment to invest on the establishment of physical infrastructure for camel milk procurement at one location. The potential assessment report undertaken in the state of Rajasthan has identified Jaisalmer (Pokharan) Bhilwara, Jodhpur and Pali as the potential centres to begin the camel milk procurement. URMUL has been actively involved in Jaisalmer region to mobilize the camel herding communities. It is expected that a partnership-based process to engage with local organization will commence in the next Year.

7.1 THE MARKETING OF A MILK BI-PRODUCT

As part of the partnership with Access Liveihood Services, Hyderabad a four member team comprising dairy technologist, Marketing & Sociologists participated in a joint discussion across the program area during this year. The team had interesting observations and also were offered suggestion on the potential traditionally made products such as ghee, flavoured mawa (elaichi, Kesar, jaggery-based); Flavoured ghee; ready to eat flavored paneer (black pepper, cumin, chili, other spices unique to the community and/or region); Personal Care: Goat milk-based soaps; Therapeutics, based on medical evidence and other functional foods. As part of the overall objective to strengthen the ecosystem of entrepreneurial activity related to pastoralist dairy bi-products the pan-

india survey is likely to commence shortly. This pan india survey will provide both demand and supply side related details and help us to identify potential or existing entrepreneurs working in or willing to work in the pastoralist milk bi-product space.

Sahjeevan has also signed an MOU with Hunnarshala Foundation, for the building of a production cum training cum research centre in Lakhpat, western Kutch. The decision to locate this centre in Lakhpat is based on the fact that both camel and goat and sheep herders are part of the area, and this will present opportunities for undertaking a variety of entrepreneurial initiatives linked to pastoral production. We expect the centre to be functional by the middle of next year. During this year various locations in the region were identified and later the necessary process to seek the land permission from the government has been initiated. The land will be jointly owned by camel breeders association and goat and sheep herder association. Meeting with the Camel Breeders Association (KUUMS) to collect the community contribution as part of the payments to be made to the treasury against standard government rate has already been initiated. The production center will be used to pilot the production of marketable niche products, such as camel cheese, organic cow milk, organic goat cheese, organic buffalo and goat mawa and so on. These will then be test marketed in areas with a high density of tourists, as well as on online portals, to explore customer interest in such products. Such production and marketing is primarily aimed at generating data and information that much larger cooperative or private players may use in up- scaling their own marketing of such produce.

8. Sheep-wool based livelihood interventions

8.1 Sheep Wool (Textile): Partnership with Khamir

The objective of the pilot in the textiles sphere is to generate / identify suitable technologies to soften indigenous sheep wool and also to create high end apparels to engage with market and other designers. For the same, during this year attempts have been made to engage with sheep herders, hand spinners, dyers and weavers. New design developments with sheep wool too have commenced. Preparations are now on to organize a Desi wool exhibition at Delhi for effective branding and positioning sheep wool as natural fiber in the Design world. Dialogues too have been initiated with artisans and weavers with requisite expertise in treating and using sheep wool to produce ethnic textiles. The artisans of Kharad weaving, Namda, Carpet weaving and artistic handloom weaving have been included on board in the initiative. Both Namda and Kharad weaving are languishing crafts and presently have very few practicing artisans. Their association with wool value chain is likely to offer new avenues towards revival of the age old craft practices. Interestingly, a young weavers' group "Kallori" group has joined the process by

integrating with Dastkar nature bazaar, Bangalore and National Institute of Design (NID, Ahmedabad). The group intends to innovate with both wool as fiber and yarn. Delhi based designers – Amit and Richard, have been roped in to create innovative wool based textile products, which will be showcased at the exhibition. Weaving Studio, established as part of the project during this year, has been actively pursuing design sampling task. Wool research association Thane has been associated with to explore the potential of softening it both as fibers as well as yarn.

8.1.1 Sheep Wool (SPRERI - Sardar Patel Renewable Energy Research Institute, Anand & Kutch University):

Scientists from SPRERI will undertake lab-based testing of wool as bio-fertilizer, to understand the speed of decomposition and the content levels of Nitrogen, Phosphorous and micro-nutrients available in sheep wool. The necessary process has been established to procure the sheep wool and undertake the lab tests.

Kutch university field based research is based on the premise that the protein content in sheep wool (33%) can be degraded organically in a field pit filled with different layers of dry plant waste, cow dung and cow urine. The natural composting process has begun in the month of July 2019 and would require a minimum period of five months. Simultaneously, the compositing process too has is being carried out in a controlled condition with the contents in a galvanize iron box. The mixture in controlled condition has been put in the month of September 19. Both the mixtures are being regularly sprinkled with normal water after every 15 days followed by proper mixing. The observation revealed that the gas emission have started from natural pit which is an indirect evidence of beginning of composting process and has recorded a high bacterial activity.

Both the pilots of sheep wool as potential fertilizer will provide evidence to help disseminate the critical information for potential commercial production and thereby integrate the sheep herders as part of the supply chain for sustainable sheep wool based livelihoods.

8.2 Sheep Wool (Insulation) – Hunnarshal foundation

Hunnarshala foundation is attempting to understand the use of sheep wool for Insulation in Buildings. In the process various aspect such as cleaning processes, Various material properties viz.; thermal conductivity, thermal resistivity, hygroscopic properties, sound absorption coefficient, etc.along with its physical properties such as staple length, fibre diameter, crimp, etc. A visit to Avikanagar, tonk, jaipur, Bikaner and delhi was conducted to understand various aspect such as demand pattern of sheep wool, products being manufactured, processes being followed including the market price being realized for the felt. RuTag – IIT Delhi too has been contacted to understand the various technical aspects such

as acoustics, thermal and textile related which will help preparation of sample with requisite thermal properties. Professor from MIT, USA too has offered its support to understand the thermal properties of wool. The characterization process will be critical to arrive at finds to test sheep wool as a building insulator against heat.

Early onset of monsoon during the year and incessant rain for extended time period has delayed the *Prosopis Julifloa* removal plans. However, now since the rain has stopped, there will be fair amount of time available for the drying of the beds.

9. Restoration of Grassland and Biodiversity in Banni region

Under ABF- Restoration of Banni Grassland and conservation of threatened biodiversity program since last more than one year; various activities like meetings and consultations with breeders' association (BPUMS- Banni Pashu Ucherak Maldhari Sangathan), community forest management committees (CFMCs), and selected youth under Salim mama course; removal of *Prosopis* and illegal agricultural plots for grassland restoration; pre and post implementation monitoring of vegetation and biodiversity including collection of soil samples; and fellowship or research funds to monitor the targeted species like Spiny-tailed Lizard (locally called Sandho), Chinkara (Haran) and Houbara Bustard (Tilor).

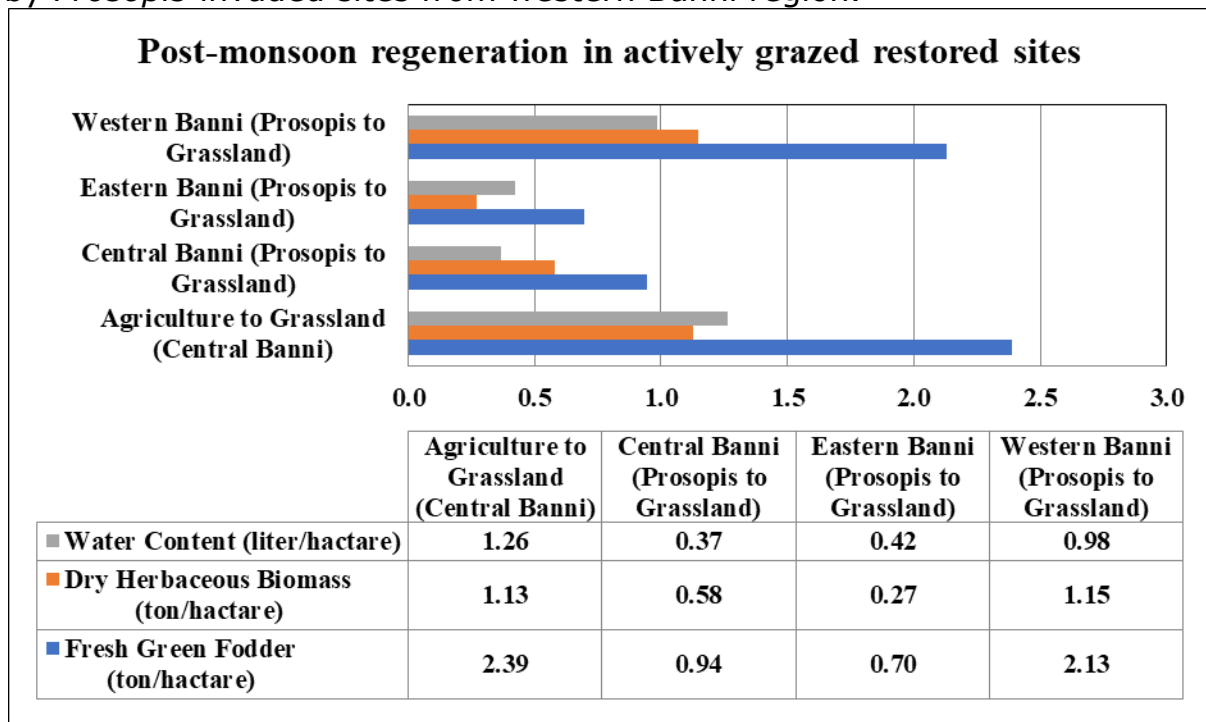
With above main activities, SETU team engaged with CFMCs to maintain the all required documentation at panchayat level under FRA, 2006 and same also communicated with respective Govt. Depts. Like Forest and Revenue. In addition, as part of participatory resource mapping exercises with CFMCs, each village panchayat also developed a management plan for restoration and conservation of grassland ecosystems and associate's biodiversity.

A total of more than 20 villages/CFMCs are completed their necessary gram sabhas for sanctioning their management plan with necessary action plans to restore their grassland and waterscape works. In addition, all these villages are also developed their technical proposal on restoration of grassland with help of technical team and collected all baseline data on standing biomass of woody vegetation- *Prosopis juliflora* for necessary documentation at CFMC level. After detail plan of action, each CFMC also developed their rules and regulation for each develop site and for same, they also started to construct a sign board on respective site/s.

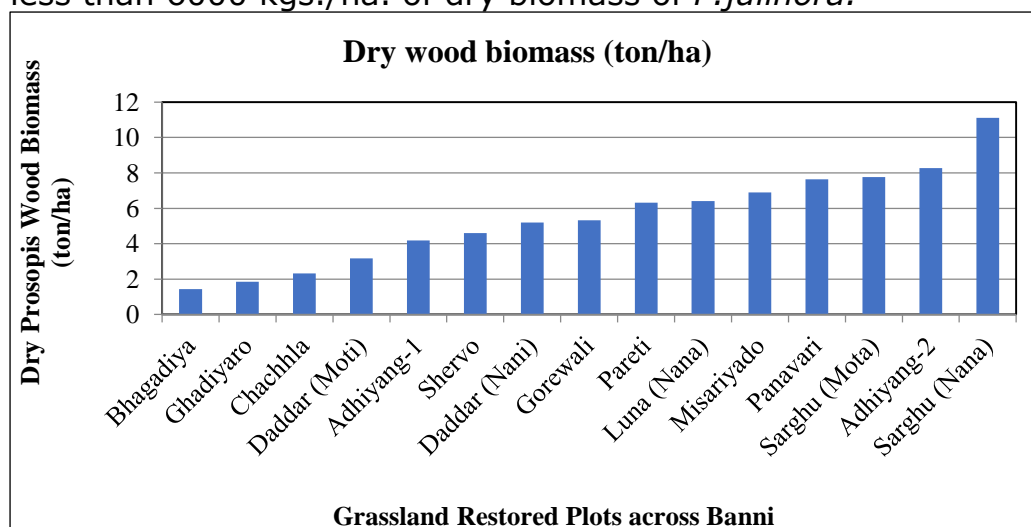
A total of 13 villages are started the grassland restoration activities in their *Prosopis* dominated landscape (approx. 2375 ha.) and for this they

also completed a baseline data collection of standing biomasses. All the selected landscapes for this activity are also marked with GPS points and photographs taken from all sides to document the landscape level changes in coming years.

From all restoration landscapes, CFMC sampled in post-monsoon to collect regeneration data and following graph share for comparison, with highest fresh green fodder recorded from agricultural encroached sites followed by *Prosopis* invaded sites from western Banni region.



While, dry wood biomass of *Prosopis juliflora* is calculated from all restored sites, and maximum biomass is recorded from Nana Sargu village (more than 11000kgs./ha.) followed by Adhiyang (8200) and Panawari (7600) landscapes. Other all restored sites are recorded with less than 6000 kgs./ha. of dry biomass of *P.juliflora*.



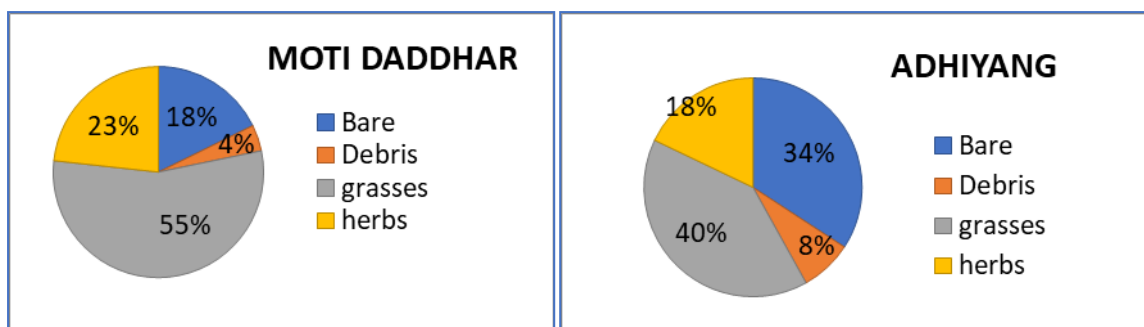
Hence, restoration and conservation of natural resources inputs are being offered to establish the linkages of such activity associated with livelihood. The above interface facilitates mobilization of the community for the necessary contribution.

CFMCs are panchayat level bodies that take responsibility for managing grasslands and other natural resources that fall under the purview of the panchayat. Such management takes place based on a management plan that each CFMC generates. In turn, the development of these plans requires substantial investment of time by the community. The actual implementation of the plan will also require investments of time and energy as communities work to systematically remove *Prosopis* (trees and seedlings), as well as work to convince members of the community to voluntarily give up lands they have encroached upon.

In addition, along with restoration of grassland in selected CFMCs, RAMBLE team also shared all baseline data on woody biomass of *Prosopis juliflora*, green biomass and available grasses-composition, and distribution of selected wildlife in their landscape for long-term participatory conservation and monitoring program.

Sr. No.	1	2	3	4	5	6	7	8	9	10	11	12
Villages	Chhchhala	Bhagadia	Sherva	Thikariyado	Gorewali	Pannawari	Nava Sargu	Mota Sargu	Misariyado	Sarada Mota	Mithadi	Zimri wandh
Key Areas for Spiny-tailed Lizard (<i>Sandha</i>)												
	-	-	-	Yes	Yes	Yes	Yes	Yes	Yes	-	-	-
Key Areas for Chinkara (<i>Haran</i>)												
	Yes	Yes	Yes	-	-	-	-	-	Yes	Yes	Yes	-
Key Areas for Hubara bustard (<i>Tilor</i>)												
	Yes	-	-	-	-	-	Yes	Yes	-	Yes	-	Yes
Key Areas for Desert and Indian Fox (<i>Lonkadi</i>)												
	-	-	Yes	-	-	-	Yes	Yes	-	Yes	-	-

In addition, village wise calculation of available biomass of herbs and grasses with debris also calculated for long-term monitoring of restored sites with respective CFMC and village panchayat.



As we know, under this program, Banni Grassland Restoration and conservation of threatened biodiversity is main proposed outcomes; and last year with total of 13 villages started the grassland restoration activities in their *Prosopis* dominated landscape (approx. 2375 ha.) and for this they also completed a baseline data collection of standing biomasses. All the selected landscapes for this activity are also marked with GPS points and photographs taken from all sides to document the landscape level changes in coming years.

Before starting the removal of *Prosopis juliflora*- Ganda Bavar from above selected sites, technical team of RAMBLE collected data on four corner GPS and marked on revenue map/ GOOGLE image of respective CFMC with help of villagers. In addition, to calculate the standing woody biomass, a total of ten plots of 10 x 10 meters² were also laid down and collected the data on numbers of mature trees, average height and girth. With woody vegetation, RAMBLE team also developed a brief note on available biodiversity in and around the proposed grassland restoration site/s and suggested a future broader strategy for development of grazing as well as biomass resources. In addition, RAMBLE team also sampled grasses and herbs from a certain 50x50 cm area in the 1 m² grid, which then carried to lab for the fresh weight and the dry weight analysis. Comparison of pre-monsoon and post-monsoon variation from baseline to the treatment plots is going on for all plots, which certainly will be completed in the upcoming Years.

As part of conservation of Spiny-tailed Lizard, only herbivores reptile recorded from Banni, and with several surveys, our team observed several hunting burrows. With enthusiasm and positive conservation approach, they developed a short video and viral in social media platform, within few minutes, this video also shared with forest officials and they called us to discuss more on this hunting in Banni region. In addition, one of the villager's group from Banni also called us and inquired on locations in Banni where this hunting is reported and discussed their views on how to stop this illegal poaching in Banni.

With above background and since this species is threatened and protected under Wildlife Protection Act, 1972, forest officials are continues call us for necessary documentation with ground proofing or GPS points; but with

our all faith on conservation of this species, few leaders of Banni are not supported this and make a different story to dilute this illegal poaching in Banni.

After several days of evidences of this poaching, no regulated measured taken from both the stakeholder's forest and village panchayat to protect this species; and wrongly make a pressure on our team to withdraw from this report.

This is big lesson we learned from our experiences with entire process, and developed a strategy for future to handle this type of illegal hunting or poaching with proper legal way and participatory with local people.

9.1 The Salim Mama Course on Pastoral Ecosystems – Banni Grasslands

Background – The Banni is the largest tropical grasslands in Asia, 25,00 sq.km. Over the years their mismanagement has reduced its biodiversity and regenerative capacity. About 7000 pastoral families reside in the Banni. They have applied for Community Forest Rights under Forest Rights Act to ensure they have the powers to restore, manage and use the grasslands. Sahjeevan is assisting the Breeders Association, BPUMS, who in turn are helping the Community Forest Management Committees (CFMCs) in each village, prepare management plans, restore and manage the grasslands.

The objective of the course is to help students understand the connections between pastoralism and their ecosystems and develop their skills so that they feel equipped to strengthen their ecologies and regenerate it's strong features that support sustainability but have been lost over time.

Target Participants - Any individual in the age group between 18 and 25 may participate in the course, although it is primarily targeting youth of Banni and MSc (Environmental Science) students of Kutch University (KU). The hope is that over a two year period, each CMFC will send 2-3 youth to participate in the course, and that over time these will become the key functionaries of their respective CMFCs. MSc students can participate in the course, and work on relevant topics for their dissertations.

Course structure and Duration: The course is expected to last six months, and will be offered twice a year. The students will meet every fortnight for two days in the office of the BPUMS. A total of 24 (40-50 days) such sessions will be conducted. The students will have field training wherein the faculty will work with them in the grasslands. The students will use the ongoing implementation of the grassland restoration by CFMC's as an opportunity to learn planning, implementation,

monitoring and research. They will also be taken for learning exposures outside the Banni. That pastoral and MSc students learning together will provide cross-cultural learning opportunities.

Course Faculty and Management – The course will be managed by Sahjeevan with support from the Earth Science Department of KU. The Staff of Sahjeevan, Centre for Pastoralism (CfP) and Faculty of Earth Science Department will be the key faculty of the course. Sahjeevan will invite pastoral Bhagia's (knowledge bearers), conservation biologists, sociologists and legal experts as Guest Faculty.

Course Curriculum - The course will be taught through multiple prisms, including ecology, politics, history, culture and economics, reflecting the fact that pastoral lives and livelihoods fall at the interface of each of these thematic.

Pastoralism, Pastoral Societies, their Economies and Culture – this will help develop an appreciation of the history of pastoralism; its practice across varied ecosystems in the world and India; the key tenets of pastoralism and practice including commons, movement and sharing. The course will analyse the changing political ecology that has shaped their lifestyles and adaptations, especially in the context of changing usufruct rights (customary, modern legislation and forest rights act) on the commons its management and productivity. It will look at the contributions of pastoralism to the nation, particularly sustainable economy. Special emphasis will be made on the science and economics of their practice that ensures sustainability. The course will juxtapose mainstream practice to highlight difference in pastoral systems, societal values and constructs, especially with reference to the practice of animal husbandry economy and judicious use of natural resources. The course will understand how culture manifests their beliefs and values. It will use poetry, music, language, craft and spirituality to decode the essential beliefs and contribution to society.

Grassland Ecosystems and Pastoral Adaptations - The course will introduce the idea of ecosystems, and what are the essential characteristics of grasslands particularly the Banni. It will develop the scientific bases of categorisation of grassland landscapes. An appreciation of how flora and fauna have adapted to extreme conditions, especially climate and saline soils. Their food-web of Banni will be articulated. They will analyse how pastoralists understand the patterns of climate and biomass production of Banni to develop resilience, breeds, and norms of practice. They will understand the changes in recent history, especially climatic, macro-economic, political and vegetation that have influenced adaptation and change and the ecology.

The course will also develop the necessary skills amongst the youth for them to organise the pastoral communities to develop consensus on action, develop scientific maps of their grasslands, develop, implement and monitor projects for regeneration of the grasslands and wetlands.

Course Outcomes – we expect that the six months will provide the students an opportunity to become aware and committed to an environmental agenda. Develop an appreciation of the fundamental pastoral tenets that work with the environment and therefore help shape pastoralism as a sustainable profession and lifestyle. They will feel equipped to become change agents to restore the ecology of Banni, as well as see themselves as empowered to advance pastoralism as a legitimate, aspirational mode of building a sustainable livelihood, relevant to the Banni. The experience of being immersed in a pastoralist-grassland dynamic will, hopefully, build an awareness and understanding that will shape the nature of work undertaken by these students here, as well as in their research going forward.

10. Case Study

10.1 Local Community Participation- Becharbhai Vasta Rabari

Becharbhai, a resident of Piyava village in chotila block of Surendranagar district is a proud owner of 51 goats along with three cows and, one buffalo. Beyond the livestock asset base to feed his family of four members (wife and two sons) he owns 3 bighas of un-irrigated land. The land offers modest harvest from one season crop viz.; cotton & sorghum. Enthused by the prospect of goat milk market connect, Becharbhai offered his voluntary services for organizing all operations associated with pilot goat milk collection – a maiden initiative with operational systems and processes including the physical infrastructure yet to be established. Series of operations viz.; putting in place a procurement route, maintain alternate time interval for milking in order to provide for minimum time for the raw milk to remain exposed, aggregation, registering volume of collection, maintain record with names of the suppliers for payment, ensuring its safe delivery until it reaches the lone refrigerated van - were all managed by Becharbhai for a cluster of 8 villages. Later, he also thrust himself into the task of organizing the first health camp conducted in Chotila block with support of state animal husbandry department. The exquisite articulation skills possessed by him to converse upon the significance of vaccination to address the high mortality rate among goat proved to be instrumental to facilitate community participation. Becharbhai's outstanding rapport with the goat herding households eased out the mammoth task to identify space for the conduct of health camp. He was also proactive to coordinate with the staff members of Sahjeevan to ensure the success of the first such initiative. 40 households from three adjoining villages (Piyava, Mewasa and Suwai) with 3080 Goats participated in first camp on 9th July 2019. Informed mobilization of community, sharing relevant information related to the significance of health camp, identification and treatment of goats inflicted with disease,

coordination with block level veterinarian at the health camp site and last but not the least securing presence of goat owning Maldharis to attend the information dissemination by the officials from animal husbandry department on various government support available for small ruminants veterinary care and services - was all performed single handedly by Becharbhai. Not yet, Becharbhai also shouldered the responsibility to register all the goat herders with respective village panchayat. Local community lead and the passion demonstrated by Becharbhai have stirred few other young Maldhari goat herders to join this movement which will go a long way in seeking an identity - "GOAT MILK from Maldharis of Saurashtra".