

Banni grassland: 2600 Sq. Km. Largest natural tropical grassland in Indian subcontinent. Bhuj taluka of Kachchh district.

48 hamlets/villages organized into 19 Panchayats. Population: 40,000 (2011 census).

### Arid Climate:

Average Annual Rainfall: 317mm. CV of 65%. Number of rainy days in a year: 13.

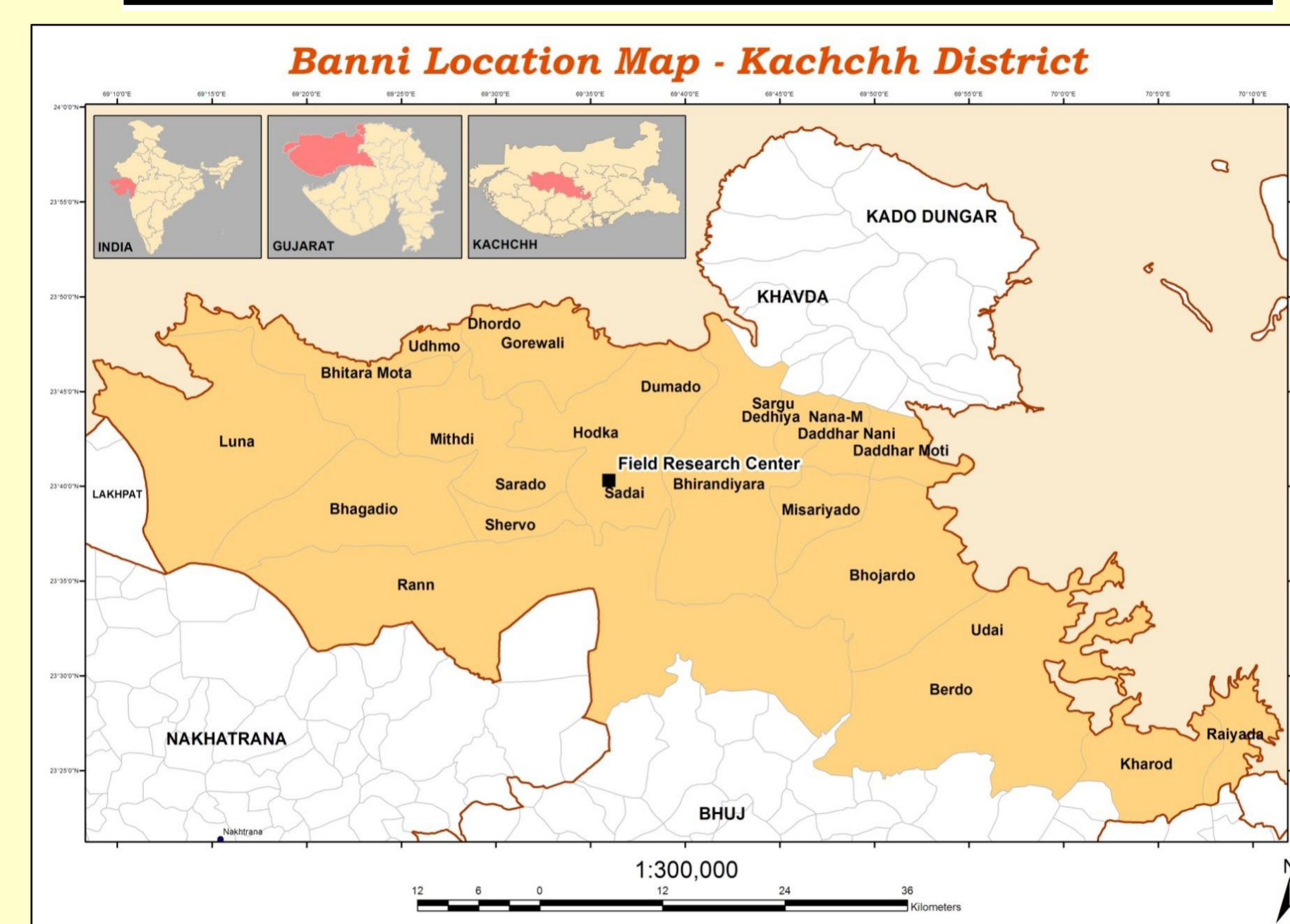
Maximum T: 48 to 50°C (May-June); Minimum: 5 to 8°C (December-January).

### Social Groups of Banni Grassland

Nomadic pastoralist communities, known as *Maldharies*, comprise 22 ethnic communities.

They are landless and depend upon Gauchars for their livestock rearing. Traditional breeding ground for Kankrej bullocks and Banni buffalo for draught and milch purpose respectively.

### Location of Banni Grassland



| Characteristics      | Banni Buffalo       | Kankrej Cow         |
|----------------------|---------------------|---------------------|
| Age at first calving | 3 to 3.5 years      | 3.5 to 4 years      |
| Calving interval     | 12 to 14 months     | 15 to 17 months     |
| Lactation yield      | 2500 to 2700 liters | 1700 to 1900 litres |
| Lactation length     | 290-295 days        | 290-300 days        |
| Fat content in milk  | 7-8%                | 3-4.5%              |

### Banni Buffalo



Recognized as 11<sup>th</sup> buffalo breed of the country by National Bureau of Animal Genetic Resources, Karnal.

Ability to free graze in the night to avoid harsh high temperatures of the day and little fodder in droughts

### Enterprises and livelihood security (Family as unit)

| Category | Primary occupation          | Secondary occupation 1            | Secondary occupation 2            | % Households |
|----------|-----------------------------|-----------------------------------|-----------------------------------|--------------|
| I        | Buffalo rearing             |                                   |                                   |              |
| IA       | > 40 animals                | Charcoal preparation              | Tourism/Embroidery                | 3            |
| IB       | 20-40 animals               | Charcoal preparation              | Embroidery/tourism                | 7            |
| IC       | 10-20 animals               | Charcoal preparation              | Embroidery/leather work           | 20           |
| ID       | 5-10 animals                | Charcoal preparation              | Embroidery/leather work           | 25           |
| IE       | <5 animals                  | Charcoal preparation              | Embroidery/leather work           | 15           |
| II       | Charcoal preparation        | Labour work (including migration) | Goat rearing/Embroidery           | 20           |
| III      | Sheep & goat rearing        | Charcoal preparation              | Labour work (including migration) | 3            |
| IV       | Handicrafts (leather)       | Charcoal preparation              | Embroidery                        | 3            |
| V        | Services                    | Charcoal preparation              | Embroidery                        | 2            |
| VI       | Other (retail, trade, etc.) |                                   |                                   | 2            |



### Nomadic Pastoralist Communities in Banni Grassland

| Social Group | Sub-groups   | Major Occupation  |
|--------------|--|---|
| Muslims      | Halepotra, Raysipotra, Mutwa, Jat, Hingorja, Node, Sumra, Juneja, Jiyenja, Theba, Saiyyad, Korad, Khaskeli, Bambha, Pathan, Sameja, Baloch, Munjavar | Livestock breeding and rearing ( <i>Banni</i> buffalo, <i>Kankrej</i> cow, <i>Patanwadi</i> & <i>Duma</i> sheep, <i>Kachchhi</i> goat and <i>Kachchhi</i> & <i>Tari</i> camel), <i>Sindhi</i> horse, Charcoal preparation, handicrafts (Embroidery) |
| Hindus       | Meghwals   | Livestock rearing ( <i>Banni</i> buffalo, <i>Kankrej</i> cow), Charcoal preparation, handicrafts (Leather work)   |
|              | Vadha Kolis  | Charcoal preparation, Honey & gum collection, labour work, handicrafts (Wood work)  |

Total of 280 Households in 14 villages were surveyed. Focused Group Discussions with key informants in each village.

Secondary data (1977 to 2012) used to estimate the growth & variability in population of different livestock species and factors affecting occupational shift. Historical data used to understand the factors that affected changes in livelihood structure.

### Historical Timeline of Pastoralism in Banni Grassland

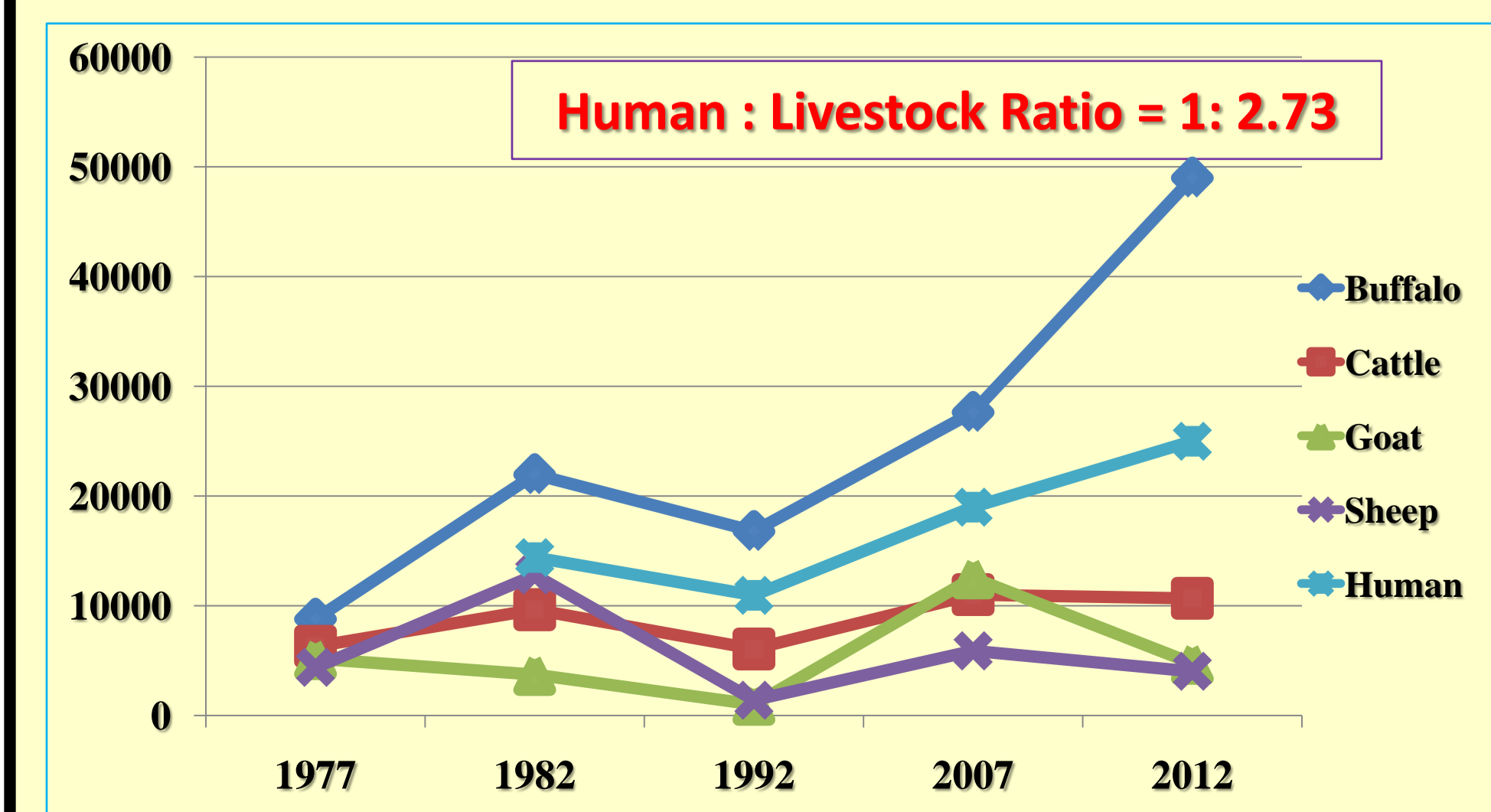
| Period/year                | Event  | Period/year                                     | Event  |
|----------------------------|--|---|--|
| Before 500 years           | •Camel herding pastoral nomads arrived from adjoining areas of Sindh, Baluchistan, Afghanistan and central Asian regions   | May 1955  | •Grassland declared a Protected/Reserve Forest<br>•Transfer of land from revenue to forest department has not been complete                      |
| Mughal period              | •Better access to common resources and no taxes  | After formation of Gujarat State (1960 onwards) | Gauchar standards were no longer practiced.  |
| Colonial period            | Commons and forests were enclosed and taken over by state  | <i>Prosopis juliflora</i>                       |  |
| Post 1857                  | Large scale conversion of waste to agriculture in Kutch region   | 1960's  | Planted by forest department to fight salinity ingress and barrenness  |
| 1870-1920                  | •Heavy grazing and animal produce taxes<br>•Sheep, goat and camels were classified as useless<br>•Wandering without license was declared a crime<br>•Animal registration and branding made compulsory  | 1980's  | Ban on tree's harvest. Covered <10% of Banni.  |
| Saurashtra State (1947-56) | •Land to the tiller and Gauchar to Maldhari was declared. Resettling maldharies was one of the priorities of first FYP.<br>•It was mandatory to maintain gauchar (40 acres/100 animals ratio) record for village panchayat.<br>•All taxes on livestock were abolished. | Late 1990's                                     | Juliflora covered 40% of Banni.  |
|                            |  | 2004  | Ban was lifted   |
|                            |  | 2008  | Re-imposed the ban   |
|                            |  | 2009 onwards                                    | Juliflora cutting is controlled by Gujarat State Forest Development Corporation (GSFDC) Ltd through contracting. Permission to cut with license. |

### Growth & Variability in Population of Human and Different Livestock Species

| Species | % Growth       |                |                |                | Overall growth (1977 to 2012) | CAGR (1977 to 2012) (%) p.a. | Instability Index (1977 to 2012) |
|---------|----------------|----------------|----------------|----------------|-------------------------------|------------------------------|----------------------------------|
|         | (1977 to 1982) | (1982 to 1992) | (1992 to 2007) | (2007 to 2012) |                               |                              |                                  |
| Buffalo | 149.82         | -23.60         | 64.68          | 77.30          | 457.31                        | 5.89                         | 31.29                            |
| Cattle  | 53.14          | -37.09         | 81.47          | -2.95          | 69.67                         | 1.78                         | 22.87                            |
| Goat    | -27.97         | -73.00         | 1146.22        | -62.14         | -8.25                         | -0.29                        | 89.48                            |
| Sheep   | 192.10         | -89.06         | 321.16         | -31.74         | -8.15                         | -0.28                        | 77.67                            |
| Human   | 18.09          | -23.91         | 73.53          | 31.58          | 162.05                        | 2.02                         | 42.63                            |

### Present Livestock Composition

| Species | Total Population | Percent Composition |
|---------|------------------|---------------------|
| Buffalo | 48982            | 71.58               |
| Cow     | 10681            | 15.61               |
| Goat    | 4746             | 6.94                |
| Sheep   | 4022             | 5.88                |
| Total   | 68431            | 100.00              |



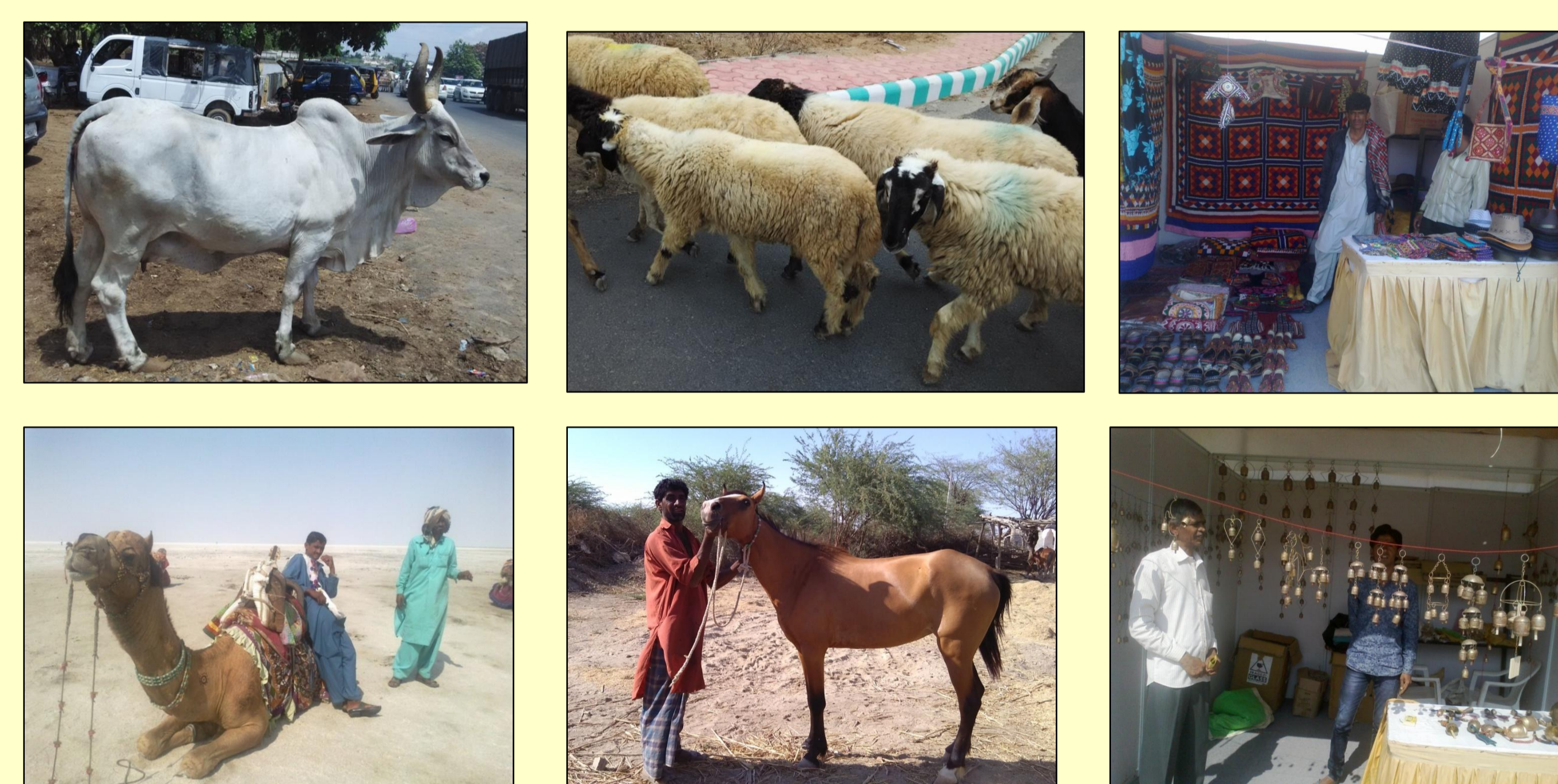
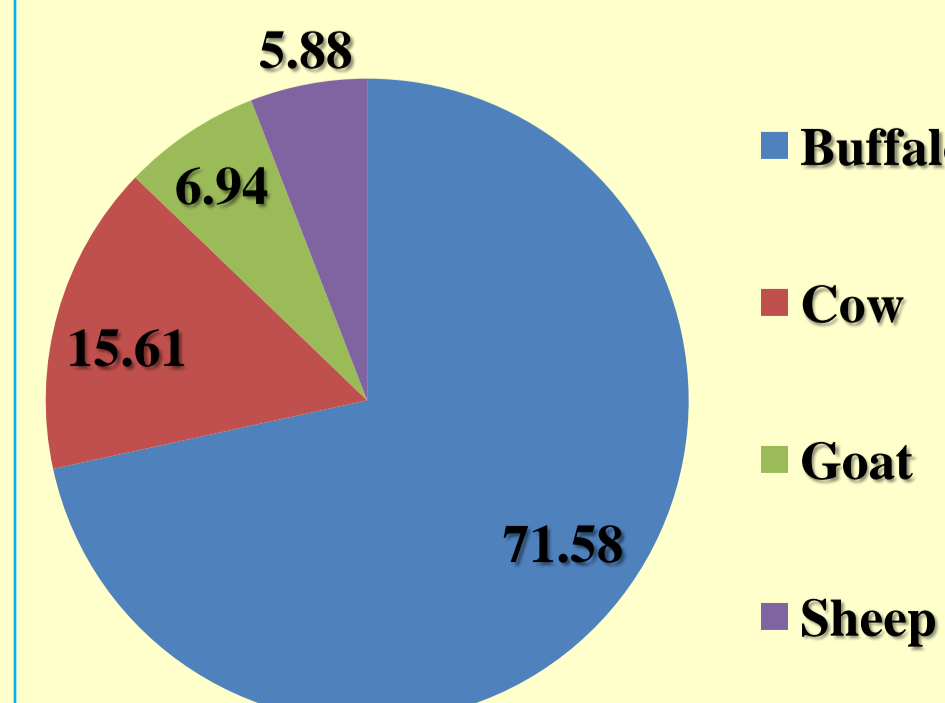
### Occupational Shift (Kankrej cattle to Banni buffaloes)

Push factors:

- Decrease in demand for Kankrej bullocks
- Negative impact of *P. juliflora* on cows

Pull Factors:

- Establishment of milk collection/ processing centres
- Higher productivity/ animal & high fat content
- Better road connectivity
- Supply of Narmada canal water for drinking purpose



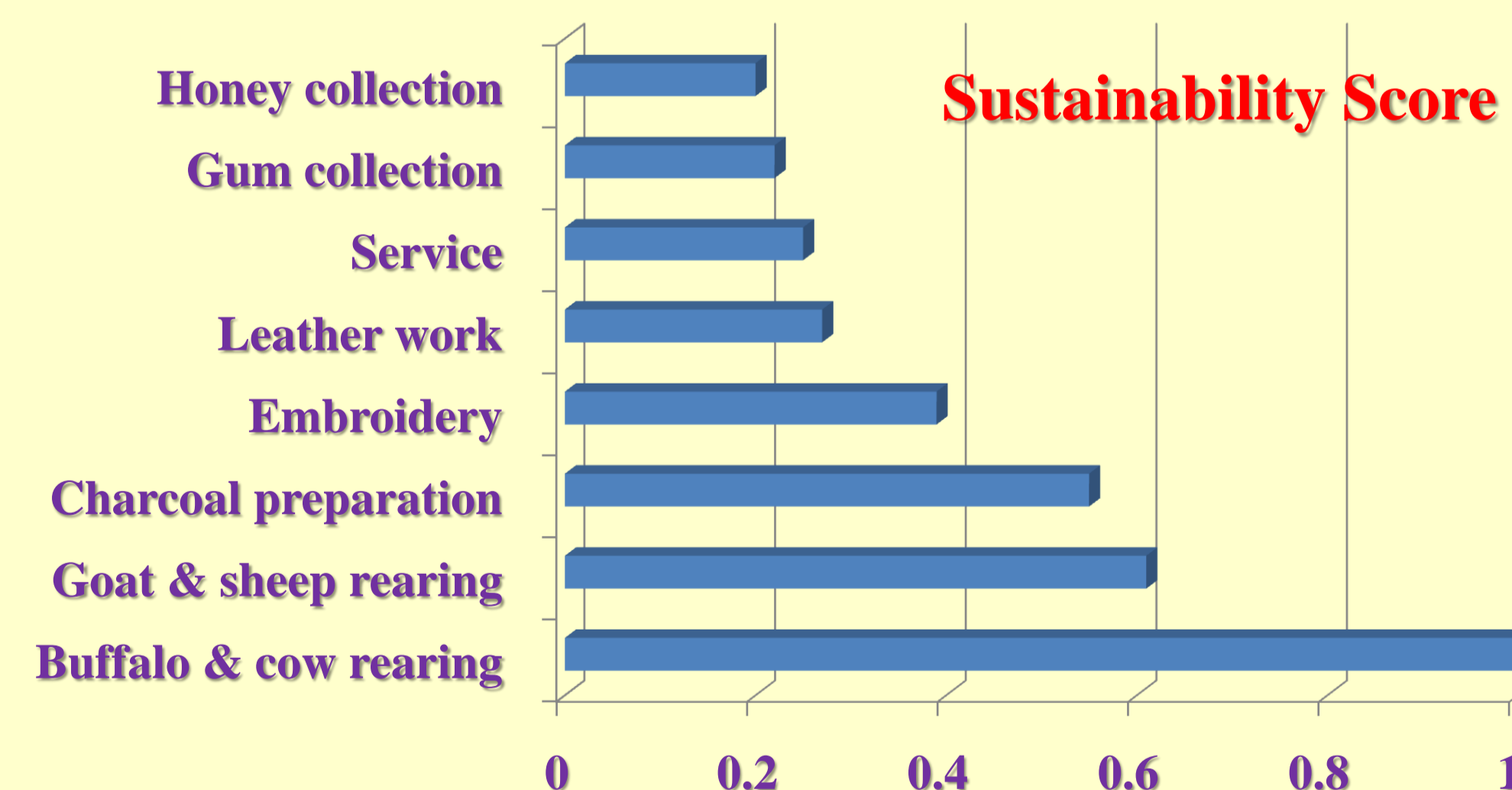
### Sustainability of Different Enterprises

| Sl. No. | Sustainability component  | Buffalo & cow rearing | Goat & sheep rearing | Charcoal preparation | Embroidery | Leather work | Honey collection | Gum collection | Service |
|---------|---------------------------|-----------------------|----------------------|----------------------|------------|--------------|------------------|----------------|---------|
| 1       | Ecological parameters     | 83.23                 | 85.94                | 43.13                | 30.83      | 32.71        | 23.33            | 16.35          | 33.33   |
| 2       | Economic parameters       | 64.79                 | 17.19                | 45.42                | 4.58       | 5.63         | 1.25             | 0.83           | 3.75    |
| 3       | Socio-cultural parameters | 74.90                 | 32.71                | 33.54                | 51.35      | 21.15        | 20.31            | 32.50          | 18.13   |
|         | Sustainability            | 74.31                 | 45.28                | 40.69                | 28.92      | 19.83        | 14.97            | 16.56          | 18.40   |

### Factors Contributing to Annual Income

| Sl. No. | Independent variables   | t value |
|---------|---|---------|
| 1       | Number of working adults in family                                  | 4.09**  |
| 2       | Ownership of buffaloes/cows   | 2.22**  |
| 3       | Number of buffaloes/cows owned                                      | 2.10**  |
| 4       | Contribution of non-agricultural enterprises (charcoal preparation) | 3.21**  |
| 5       | Annual rainfall @   | 2.28*   |
| 6       | Presence of Milk Collection Center in village                       | 2.40*   |
| 7       | Distance of Milk Collection Center from village                     | 2.56*   |
| 8       | Contribution of handicrafts #                                       | 0.98    |

\*\*Significant at 1% probability. \*Significant at 5% probability.



### Highlights

- Buffalo rearing and charcoal preparation are the major primary occupations for 70 and 20% households respectively (normal rainfall years). Households dependant on charcoal preparation as primary occupation increases to 35% (moderate/ severe drought years),
- Atleast 3 livelihood options contribute for annual income of households. Contribution of primary occupation to annual income ranges from 38 to 78%. Contribution of secondary occupation(s) to annual income ranges from 0.30 to 31%.
- Presence of Milk Collection Center in the village enhanced the incomes of pastoralists by Rs. 15000 to 45000/milching buffalo/lactation.
- Buffalo rearing is the most sustainable livelihood option in the Banni grasslands. Goat and sheep rearing was found to be more sustainable than charcoal production (though employing 20% at present).

### R&D Gaps/Interventions

- ❖ Removal/management of *Prosopis juliflora*
- ❖ Rejuvenation of native grass & tree species

### Policy Gaps/Interventions

- ❖ Recognizing Community Rights of Maldharies over Banni. ("The scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006").
- ❖ Road connectivity and establishment of milk collection centers in interior parts.