

Report of **Symposium on Banni Grassland**

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Symposium Sponsors

Gujarat State Forest Department, GoG, Gandhinagar

Gujarat Mineral Development Corporation, GoG, Gandhinagar

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Organized By



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Background

Banni region has a very fascinating history, geography, diversity of flora and fauna, highly nutritive grasses; rich cultural heritage of Maldhari (Cattle breeders) communities, unrivalled embroidery work and other handicrafts, soul-touching folk and Sufi music, earthquake resistant mud houses *Bhunga*, traditional fresh water reservoirs *Virda*, traditional knowledge of medicinal plants and animal breeding and last but not the least, drought tolerant highly productive livestock - the very base of survival of Maldharis. Banni is perhaps the only largest stretch (2617 km²) of grasslands in India, which was once the 'finest grassland' of Asia. It is located between Kachchh mainland and Greater Rann of Kachchh in the north western part of Gujarat State of India. The region is believed to have formed due to seismic activities and marine processes operating in the north along with fluvial deposition by the Indus and other rivers during the Vedic times. These virtues of Banni have always attracted scientists, sociologists, naturalists and tourists.

Livestock is the mainstay of inhabitants of Banni, constituting major bulk of their assets. Despite tough survival conditions, Banni buffaloes are the most productive cattle in India and are recently recognised by 'National bureau of Animal Genetic Resources' as 11th distinct breed of the nation. During princely rule, the Maharao of Kachchh declared Banni as a *Rakhal* (reserve grassland), where only milching cattle were allowed to graze. The grazing regulations slowly disappeared after the



independence and different species of livestock from other parts of the state and neighboring states gained free entry into the area. In 1955, an area of about 2700 km² of Banni was designated as 'Protected Forest' (PF) and brought under the purview of Indian Forest Conservation Act, (FCA) 1927, while the ownership remained with the Revenue Department.

In spite of all its significance, Banni grassland is now facing severe degradation. Unfortunately, Banni is gradually losing capacity to sustain human and livestock population. Main reasons for the degradation include increasing soil salinity, invasion of *Prosopis juliflora*, grazing pressures, water scarcity, climate change and desertification. The grassland belongs to all and responsibility of none. There is neither a declared grazing policy nor any systematic programme for grasslands in the state. Dependence of Maldhari communities and their livestock demands immediate protection, restoration and sustainable use of the grassland. It is imperative to recognize the ecological, economic and sociological role of Banni grassland and conserve it for the future generations.



Objectives of the Symposium

Gujarat Institute of Desert Ecology (**GUIDE**), Bhuj, ever since its establishment in May 1995, has been working steadfastly to address different ecological issues pertaining to arid and semi-arid regions of Gujarat in general and Kachchh in

particular. GUIDE's endeavor to apply ecological principles and scientific knowledge for the restoration of Banni grassland, leading to amelioration of hardships of the inhabitants, in collaboration with Gujarat State Forest Department, has prompted us to organize this symposium. The main objective of the symposium is to bring together research and academic institutions, government and non-government organizations, policy makers and various stakeholders dedicated to research, conservation and restoration of Banni grassland. We are also looking forward to establish a nationwide network of grassland ecologists and research organizations. In future, we expect a long-term integrated ecological research and development programme and formulation of grazing policy for grasslands of the state.

Themes of the Symposium

Scientists and Professors from various organizations like Central Arid Zone Research Institute (CAZRI), Arid Forest Research Institute (AFRI), Wildlife Institute of India (WII), Gujarat Institute of Desert Ecology (GUIDE), Gujarat Ecological Society (GES), Gujarat Environmental Education Research (GEER) Foundation, Center for Environmental Planning and Technology (CEPT), Sardar Dandhiwada Agricultural University, KSKV Kachchh University, M. S. University, Gujarat University; officials from various government departments like Gujarat State Forest Department (GSFD), Gujarat State Forest Development Corporation (GSFDC), Animal Husbandry and NGOs like Shajeevan, Khamir Craft Resource Centre and Shrujan have presented papers on various aspects under four major themes which are as below:

Session I: Introduction to Banni Grassland and Its Biodiversity

DEES, KSKV Kachchh University - Banni Grassland of Kachchh: A Geological And Geographical Perspective

GUIDE - Land Use Land Cover Classification of Banni Grassland

GUIDE - Status and Distribution of Plants in Banni Region of Bhuj Taluka, Kachchh District, Gujarat

CAZRI - Composition, Nutritive and Medicinal Values of Prominent Grasses of Arid Regions

GUIDE - Microbial Diversity in Banni Region of Kachchh: Exploring the Hidden Prospects

SDAU, Mundra - Observations on Seasonal Abundance and Diversity of Grass Hopper Fauna of *Banni* Grassland of Kachchh, Gujarat, India

GEER Foundation - Fauna of Chhari Dhandh Wetland and Its Environs

GUIDE - Faunal Diversity of Arid Banni Grasslands of Kachchh District, Gujarat

Shajeevan, Kachchh - Indigenous Technical Knowledge (ITK) of Maldharis on Animal Health Care in Banni Region, Kachchh, Gujarat

Shajeevan, Kachchh - Bio-Cultural Community Protocol of Maldharis of Banni

Highlights of Presentations

The presentation on floral diversity in Banni brought out a total of 192 plant species belonging to 50 families and 142 genera which include 35 species of trees and 37 species of grasses and highlighted that the perennial grass species has higher nutritive values in terms of palatability and protein values in comparison to annual grass species. Additionally several grass and herbaceous species have medicinal values and are being used by the local communities.



The faunal diversity in Banni is reasonably high as reflected by the documentation of 21 species of mammals, 187 species of avifauna, 13 species of herpetofauna and 17 species of grasshopper. Out of total recorded species of avifauna, 46.5% were wetland birds and 44.6% were terrestrial and 8.6% were semi-aquatic. Interestingly, 45 species of migratory birds were observed in Banni grasslands and interspersed wetlands. Due to high diversity of avifauna in Banni region, the Chhari-Dand wetland has been included as an “Important Bird Area (IBA)” by the Birdlife International and also declared as Conserve Reserve by the State Forest Department.

Along with wildlife, the domestic diversity of Banni has significant importance. The Kankrej breed cattle and Kundi breed buffalo are top native varieties of Banni.



Another enriching presentation was based on a pilot study initiated by GUIDE on microbial diversity in soils of Banni. The preliminary study has isolated 16 types of fungi and 45 types of bacteria which include thermophile, osmophile and halophile species. Interestingly, about 15 types of above bacteria

produces lovely colours and research is focusing on how to use these bacteria in eco-friendly dyeing industries. Some species of *Rhizobium* were also isolated which are helpful in enrichment of the soil nutrients.



Presentations on Indigenous Technological Knowledge (ITK) of the 'Maldhari' community revealed that 337 types of ITK available in Banni which could treat 39 types of animal diseases by using 35 plant species found in Banni grasslands. Following presentation on Bio-cultural Community Protocol (BCP) highlighted that the livelihood of 90% of the Maldhari community depends on the livestock rearing and livestock products.

Session II: Issues & Interaction with Maldharis of Banni

GES, Vadodara - Changes in Ground Cover Vegetation in Relation to Abiotic Components in Banni Grassland

GUIDE - *Prosopis Juliflora* Status and Distribution in Banni Grassland: Ecological and Socio - Economical Aspects

Highlights of Presentations

Various issues degrading the Banni are discussed in this session. Salinity has shown increase in the year 2010 as compared to 2003, especially along northern border of Banni in Dhordo and Nana Bhitara villages where species richness has declined, whereas species evenness has increased pointing at ill effects of salinity ingress. The increase of herbaceous species *Cressa cretica* in the areas indicates water logging and salinity enhancement. Aggressive invasion of *Prosopis juliflora* in the moderate to low saline areas, contributing to further grassland degradation is another important issue of concern.

Session III: Economical Aspects

SDAU, Dhandiwada - Status of Animal Genetic Resources of Kachchh

SANDARBH Studies, Ahmedabad - Pastoral Livelihoods of Banni: Case of Bullock Trade

GSFDC, Vadodara - Minor Forest Products of Banni Grassland

KHAMIR Craft Resource Centre, Kachchh - Leather Craft in Banni

GUIDE - Screening Of Pigmented Bacteria from Banni Region for Biocolor Production: Application Perspective in Textile and Handicrafts

Highlights of Presentations

This session dealt with various economic options available in Banni. Annually about 15,000 bullocks are traded out as well as within Banni with a turn-over of Rs. 10 crores, involving about 150 bull traders. As the farm sizes are decreasing and tractors fail to perform in clayey black cotton soil, farmers find bulls more suitable and cost efficient.

Banni has been a hub of embroidery and handicraft work in Kachchh, which opened to the outer world only since 1970s. Economically the art reached its peak in 1990s followed by sharp decline, due to the commercial approach such as reduction in cost, low wages, internal conflicts and use of inferior thread material. The market again recovered but due to the availability of other options of livelihood and less profit in embroidery profession artisans are gradually giving up the handicraft work.

Warm and welcoming nature of Maldharis of Banni makes it a potential Ecotourism spot. Resorts in Hodko and Dhordo have already made a special place with respect to tourism in Banni. Restoration of historical sites and make over of potential tourist destinations in contemporary yet with a traditional touch will certainly attract more tourists and contribute to the economy of Banni.

Session IV: Conservation, Restoration and Management

Wildlife Institute of India, Dehra Dun - Indian Grasslands-Management Perspective

CAZRI, Jodhpur - Terrain Considerations for Developing the Banni Grasslands

CAZRI, Regional Station, Kachchh - Improved Grass Resources and Their Management for Higher Productivity

CAZRI, Regional Station, Kachchh - Butterfly Pea (*Clitoria ternatea*) For Quality Forage-Yield under Arid Region of Kachchh

AFRI, Jodhpur - Silvi-Pastoral Studies Using *Cenchrus ciliaris* and *C. setigerus* in Combination to Different Top Feed Species to Enhance the Productivity of Degraded Forest Land

CAZRI, Jodhpur - Regeneration of Grass Cover in *Banni* Region: Technological Options and Policy Issues

CEPT, Ahmedabad - Sheep-Breeders and Banni Grasslands: Demographic Pointers and the Conservation Policy

GUIDE & NEERI, Nagpur - Exploration Of Rhizospheric Microbes of Prominent Vegetation in Banni Region: An Eco-Friendly Approach to Re-Sustain Waning Vegetation

EQMS India Private Limited, Delhi - Study of Morphological Diversity of Lichens at Extreme Ecological Niches: Role in Carbon Sequestration

Department of Life Sciences, HNG University, Patan & GUIDE - Evaluation Of Grassland Development Options In Banni Kachchh, To Suggest Management Strategies

CCF, Kachchh Circle, GSFD - Banni Working Plan – A Management Option

Highlights of Presentations

The session dealt with Banni grasslands as ecosystems, whose biological diversity-



grass species, domestic and wild herbivores, local as well as alien competitors interact with the chemistry of the soil underneath and the physics of the air above. These biodiversity–environment interactions provide the grassland ecosystem its functionality. Furthermore, the maldharis learned to derive benefits from these ecosystem functions, such that their livelihoods have become interconnected with ecosystem functionality. The presentations in this session implied that as long as the use of the grassland ecosystem goods and services enabled their renewability, livelihoods maintained their sustainability too. But the speakers also showed that the

Banni ecosystem is constantly experiences change—slow change through natural processes, but also fast—through human interventions. These can be political or policy changes, like grassland afforestation, and social ones—like nurturing aspiration for livelihood diversity. All these combined lead to the current state of grassland ecosystem most of which turned into shrubland and woodland ecosystem, and human communities still practicing pastoral livelihood but increasingly turn to other land-dependent livelihoods, mainly *Prosopis*-derived charcoal production and collection of minor forest produces. Thus, the Banni area is an arena of man-induced ecosystem transformation, leading to biodiversity change that result in ecosystem services' trade-offs, with major effects on human well-being.

Major Focus Points Require to be Addressed

The entire sessions was concluded by Sh. S. G. Mankad, IAS (*Retd.*), Chairman, GUIDE and the major highlights of the symposium is as below.



The presentations and follow-up discussions have brought out the current state of degradation in Banni due to climatic factors that is natural and man induced factors like spread of soil salinity and invasion of *Prosopis juliflora* which subsequently decreased the grassland productivity. The scientists and other participants have discussed on remedial

measures to improve the grassland productivity, improve the animal husbandry, socioeconomic enhancement through handicrafts, ecotourism, dairying, etc.

The working plan of GSFD presented by Sh. D. K. Sharma has highlighted various programmes under the working plan to improve the socio-economic situation of maldharis as well as the Panchayat as a whole by way of Joint Forest Management Programmes. He further stated that though the Working Plan was already ratified by relevant authorities, is still open for adaptations.

Under the present scenario, the following questions needs to be taken into priority consideration:

- a. Who are the beneficiaries and who are the losers of this ecosystem change? (From Grassland to Woodland).

- b. Is the current state of the Banni and its communities sustainable, and if not – how to induct sustainability?
- c. If no new management practices are in place – where will current state of degradation and changes in ecosystem will lead to?
- d. What is necessary to add in order to get sustainability of Banni grassland?

Immediate Actions Required – For Sustainable Banni

1. It is indispensable to jointly initiate a process leading to agreed Banni projections for sustainability. This calls for a multi disciplinary team consisting of representatives of stakeholders, local community leaders, government departments, non-governmental institutions and the scientific community to initiate ecosystem assessment process using the methodology developed by the Intergovernmental Panel on Climate Change (IPCC), succeeded by the Millennium Ecosystem Assessment (MA).
2. Comprehensive management plan for the Banni mainly to secure the sustained flow of a suite of ecosystem services, leading to an aspired, yet sustainable human well-being of their local users.
3. This assessment needs to be based on existing knowledge, data, and other information. It extracts available data and synthesizes only the management policy-relevant knowledge, thus enabling to describe the current state and trends of ecosystems, its biodiversity and their services, their drivers of change and their impact on the land users. The assessment then develops several Banni scenarios, based on alternative socio-political narratives, from which alternative plausible futures are derived.
4. It is important that both land users and authorities would feel ownerships of the assessment results, and this will be through their involvement in its manning and planning right from the outset. Thus, such approach needs to guarantee that the assessment products are scientifically credible, highlighting what is known, fully or partly agreed and not-contested, and what is only conjectured but remains uncertain.
5. The assessment would also be politically legitimate, through its planning process, and due to the final products being policy-relevant but policy non-prescriptive. Thus, the final decision on a working management plan for the Banni would be that of society and its leadership, on whose table the best available science is presented.
6. It was therefore also pleasing and comforting that the ecosystem assessment laid out above, would much benefit from including the Working Plan elements of the State Forest Department in its scenario building process and the suite of response-to-change options.