

Maharashtra Gene Bank Project for Conservation, Management and Revival of Local Bio-resources

Salient Achievements

Realizing the need to work around diverse bio-resources which naturally occur in different agro-climatic zones of Maharashtra and the significance of the sustained availability of this diversity to the communities, the work around native, domesticated and diverse bio-resources such as indigenous breeds of domesticated livestock, wild relatives and local cultivars of diverse crops and forestry species has been identified as an important programme component of Maharashtra Gene Bank Project.

The ultimate goal is to ensure sustained availability of these bio-resources for food and nutrition security, livelihood and economic gains to the communities while also building resilience against the growing threat of climate change.

Objectives

- ▶ To design and undertake detailed participatory appraisals for diverse crops, trees and livestock genetic resources that exists in diverse agro-climatic zones in the state.
- ▶ To plan and introduce activities for *in-situ* and *ex-situ* conservation, domestication revival and management of selected local crops, regionally important breeds of cow, goat and local poultry and NTFP (Non Timber Forest Produce)
- ▶ To plan and initiate activities for habitat conservation on common and private lands including eco-restoration process along with soil and water conservation measures and better land use planning
- ▶ To plan and initiate activities for building motivation of local communities to participate & manage the program

Diversity in Rice germplasm



Dangi cattle



Diversity in NTFPs



Conservation of indigenous crop and wild edible plants diversity

Focused crops

Local cultivars of Rice, Millets (foxtail, finger, proso and barnyard millet), Beans, Cow Pea, Maize, Sorghum, Wild Vegetables and Tuber crops

Approach

- ▶ Documentation of crop diversity and associated knowledge in diverse agro-climatic zones
- ▶ Germplasm collection, characterization, evaluation and participatory seed production
- ▶ *In-situ* conservation with active involvement of local community
- ▶ Community level processes including networking, establishing community seed banks and participatory events

Salient achievements

- ▶ Documented crop specific diversity status, specific traits, wild edible plants and traditional knowledge.
- ▶ Developed inventory of landrace wise crop diversity and collected seed samples of focused crops (665 accessions)

- ▶ 473 crop landraces stored in Gene Bank at Urulikanchan with 5°C temperature and 33% relative humidity as an *ex-situ* conservation of plant genetic resources.
- ▶ 175 wild edible plants have been identified and 75 recipes documented, 10 wild edible plants are being promoted for cultivation.
- ▶ Purification and morphological characterization of 241 landraces through 31 *in-situ* conservation centres
- ▶ Applications for registration of 53 landraces of Rice, Maize and Sorghum submitted to Protection of Plant Varieties and Farmers Right Authority, New Delhi; deposited 105 crop germplasm samples to NBPGR, New Delhi and received IC numbers for 44 rice landraces.
- ▶ Promotion of cultivation of traditional varieties of vegetables through nutrition garden and worthy landraces, 8538 families participated
- ▶ Community level seed production (56.5 MT of 6 crops, 49 landraces) and availability of good quality seeds through community seed banks (5)
- ▶ Promotion of selected landraces of Rice like Kalbhat, Ambemohor, Raibhog, Valay through market linkages under brand "Farming Monk"
- ▶ Community mobilization and awareness through village level seed exhibitions, wild food recipe competitions, school events and awareness programmes (337 events)
- ▶ Nutritional evaluation of 108 selected landraces of Rice, Sorghum, Maize, Finger Millet, Little Millet.
- ▶ Promoted different crop cultivation practices Like SRI method in Rice, ridge and furrow method in millet crops, line sowing practice in Maize and organic input production techniques
- ▶ Genetic diversity analysis through application of molecular tools for 48 Rice and 16 Maize cultivars
- ▶ Documentation: 13 research papers and 38 articles/case studies, 21 seed keepers, 5 videos.



Gene bank at Urulikanchan



Rice in-situ conservation center



Participatory seed selection

Conservation of Indigenous Livestock Breeds

Focused breeds

Local breeds and strains of Cattle (Dangi, Lal kandhari and Gaolao), Goats (Sangamneri and Berari) and Satpudi local poultry

Approach

- ▶ Conservation of important indigenous livestock breeds by involving community
- ▶ Blending traditional and scientific knowledge in sustainable conservation program
- ▶ Scientific and technical assistance to the livestock breeders

Salient achievements

- ▶ Documented native livestock diversity and their management practices through socio-economic survey
- ▶ Under *in-situ* breed conservation program 8416 AI performed through 12 cattle breeding centres and 2631 new calves born, 2340 goat breeding services through 23 elite bucks, 1680 kids born
- ▶ 2.73 lakhs semen doses of elite bulls of Dangi, Lalkandhari and Gaolao and 7042 doses of Sangamneri and Berari goat produced for further breeding program and preserved for *ex-situ* conservation.



Gaolao Cattle



Sangamneri Goat



Berari Goat



Lalkandhari Cattle

- ▶ Completed field studies on milk yield potential (617cows), phenotypic characterization (500 cattle), physical characterization of Satpudi poultry (5000 birds) and growth measurements of goat (722 kids).
- ▶ Established 1 hatchery and 10 mother units of Satpudi poultry for pure chick production and study the reproductive performance
- ▶ Genotyped Dangi, Lalkandhari and Gaolao breeds using High-Density Illumina bead chip
- ▶ Community awareness through 786 events like health camp, calf rally, goat rally, deworming, vaccination, awareness meet, exhibition etc.
- ▶ Documented traditional forage resources and nutritional analysis of 107 samples completed.
- ▶ Documentation: 4 research papers, 13 articles/case studies, 4 best practices and 18 extension material.

Conservation of Non-Timber Forest Produce (NTFP)

Focus

Region wise important NTFP species (Mahuva, Charoli, Hirda, Behada, Karaya, Bamboo, Bauhinia)

Approach

- ▶ Participatory *in-situ* and *ex-situ* conservation of important NTFP species
- ▶ Promoting sustainable harvesting of NTFP species by adopting non-destructive harvesting methods
- ▶ Identification of plus trees and standardizing nursery techniques for mass multiplication
- ▶ Plantation and domestication of important NTFP species on community and private lands
- ▶ Post-harvest management of NTFP

Salient achievements

- ▶ 7 NTFP species were prioritized based on the conservation perspective, rare and market values.
- ▶ Individual households survey of 1508 families engaged in NTFP collection processing and marketing
- ▶ Documented availability of produce, local harvesting methods, processing and marketing of NTFP's
- ▶ Identified candidate plus trees (158) for further multiplication and plantation
- ▶ 4.36 lakhs of seedlings of NTFP species were raised in nurseries by involving seven entrepreneurs and planted on common and private land
- ▶ Plantation of 114 plants of 38 Mahua candidate trees at BAIF Wagholi and NTFP species arboretum at BAIF Urulikanchan as an *ex-situ* conservation. Seeds of 84 selected candidate trees of Mahua, Behada, Hirda, Karaya and Charoli are conserved in Gene bank.
- ▶ 12 NTFP groups were formed and market linkage was developed between group and vendors for Mahua flower at Dhadgaon cluster.
- ▶ Value addition in Mahua (35 recipes) and established 3 Mahua Oil extraction units
- ▶ Organized 28 events like Mahua mela, vendors meet, NTFP exhibition, training on



NTFPs tree plantation



Training on non-destructive gum harvesting



NTFP species nursery

value addition non-destructive harvesting.

- ▶ Laboratory studies of seeds and flowers of Mahua candidate trees (212) for sugar, nutrient and oil content and genomic studies of 48 trees were completed.
- ▶ Documentation: 4 research papers, 9 articles/case studies and 2 best practice and 8 extension material.

Habitat Eco-restoration

Approach

- ▶ Conservation of natural habitats with active involvement of the local community
- ▶ Participatory eco-restoration of habitat through site specific measures
- ▶ Establishing models for *in-situ* conservation of biodiversity.

Salient achievements

- ▶ Introduced the process of conservation of natural habitats with active involvement of the local community at 4 sites in North Kokan and Satpuda region (46.5 ha)
- ▶ Soil and water conservation measures like cattle protection trench (359.39 m³), continuous contour trenches (2450 m running length) and stone bunds (58.5 m) were undertaken.
- ▶ Plantation of various forestry and NTFP species (Seedlings-0.81 lakhs; Seeds-194 Kg and Stumps-1.11 lakhs)
- ▶ Documented biological diversity (396 plant, 92 insect and 42 bird species).
- ▶ Community mobilization and school children awareness by organizing 19 events.



Live fencing



Community participation in Plantation programme



Cattle protection trenches

Programme coverage

Clusters	District	No. of Villages	Focused Themes
Akole	Ahmednagar	19	Crop, Dangi cattle, Sangamneri goat
Etapalli	Gadchiroli	23	Crops, NTFP, Berari goat
Kandhar	Nanded	9	Lal kandhari cattle
Dhadgaon	Nandurbar	15	Crop, NTFP, Satpudi poultry
Jawhar	Palghar	11	Crop, NTFP
Gangakhed	Parbhani	6	Lal kandhari cattle
Junner	Pune	6	Crop
Aarvi	Wardha	5	Gaolao cattle
Kudal	Sindhudurg	6	Crop



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