

Underutilized Crop Species for Resilient Agriculture, Food & Nutritional Security



Project Location

The agro biodiversity conservation project is proposed to be implemented in Mandla and Dindori districts in Madhya Pradesh



Rationale

- The two identified districts form a contiguous terrain and ecozone
- The 2 districts share almost similar cultural and agricultural backgrounds
- All the two selected districts have significant tribal population, practicing subsistence agriculture
- The regions have considerable forest cover, with good irrigation potential

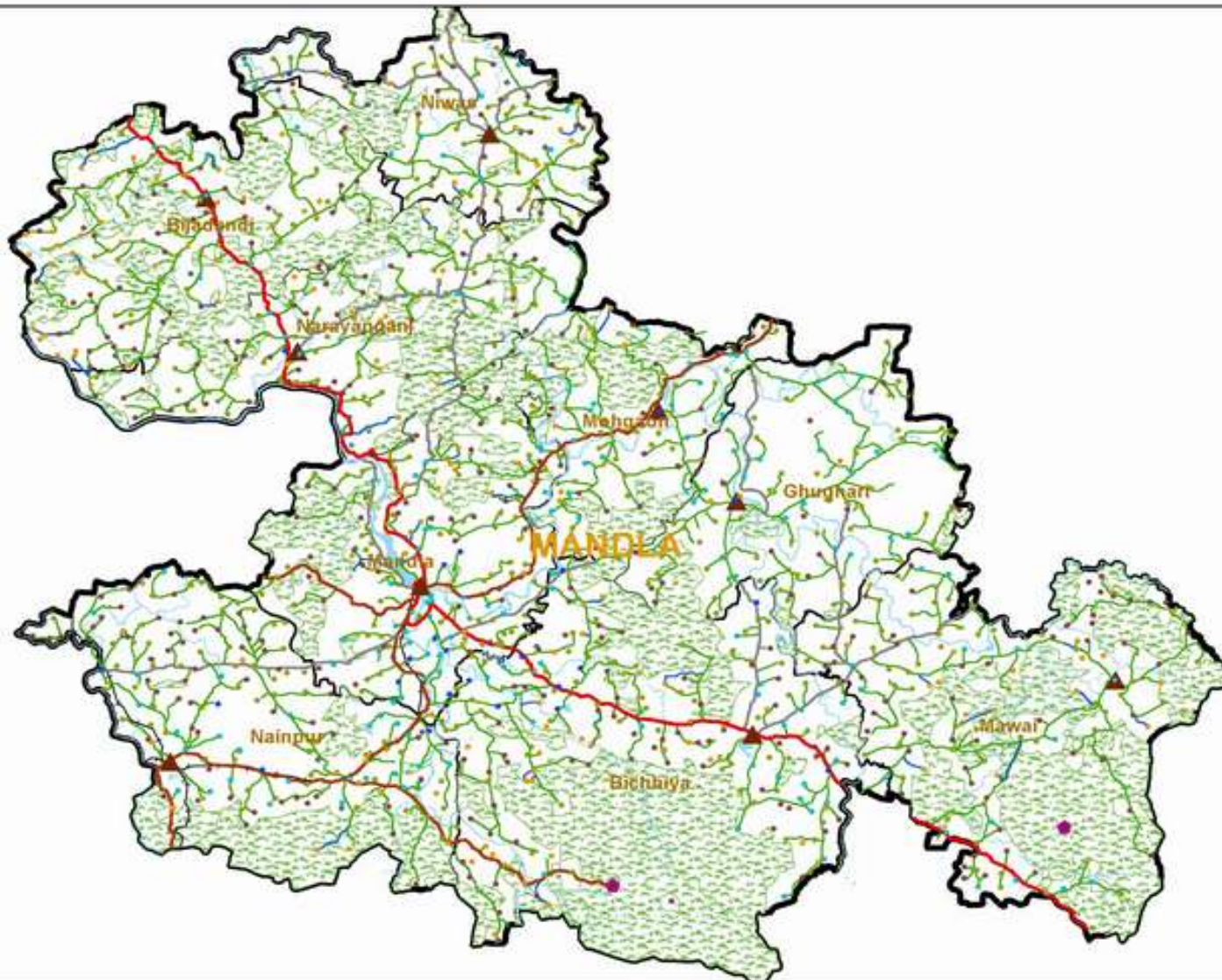
General Information

- Mandla & Dindori districts are prominent tribal dominated districts in Madhya Pradesh.
- Dindori district was carved out of Mandla Dist in 1998
- Mandla & Dindori have rich and varied biodiversity due to their diversified topography and variable climatic conditions.
- Baigachak area in Dindori Forest Division of Madhya Pradesh consists of 52 villages and is a rich source of bio diversity and indigenous knowledge
- The area is predominantly inhabited by one of the Primitive Tribal Groups (PTG's), i.e. Baiga, Gond, Dhoba and even Ahirs.

Mandla District

District : Mandla

Geo Plan



POPULATION

- 0
- 1 - 249
- 250 - 499
- 500 - 999
- 1000 - 1999
- 2000 +
- ▲ BLOCK_HQ
- ◆ 2

ROADS

- NH
- SH
- MDR
- PMGSY
- MMGSY
- RAILWAYS

■ WATER BODIES

■ Forest

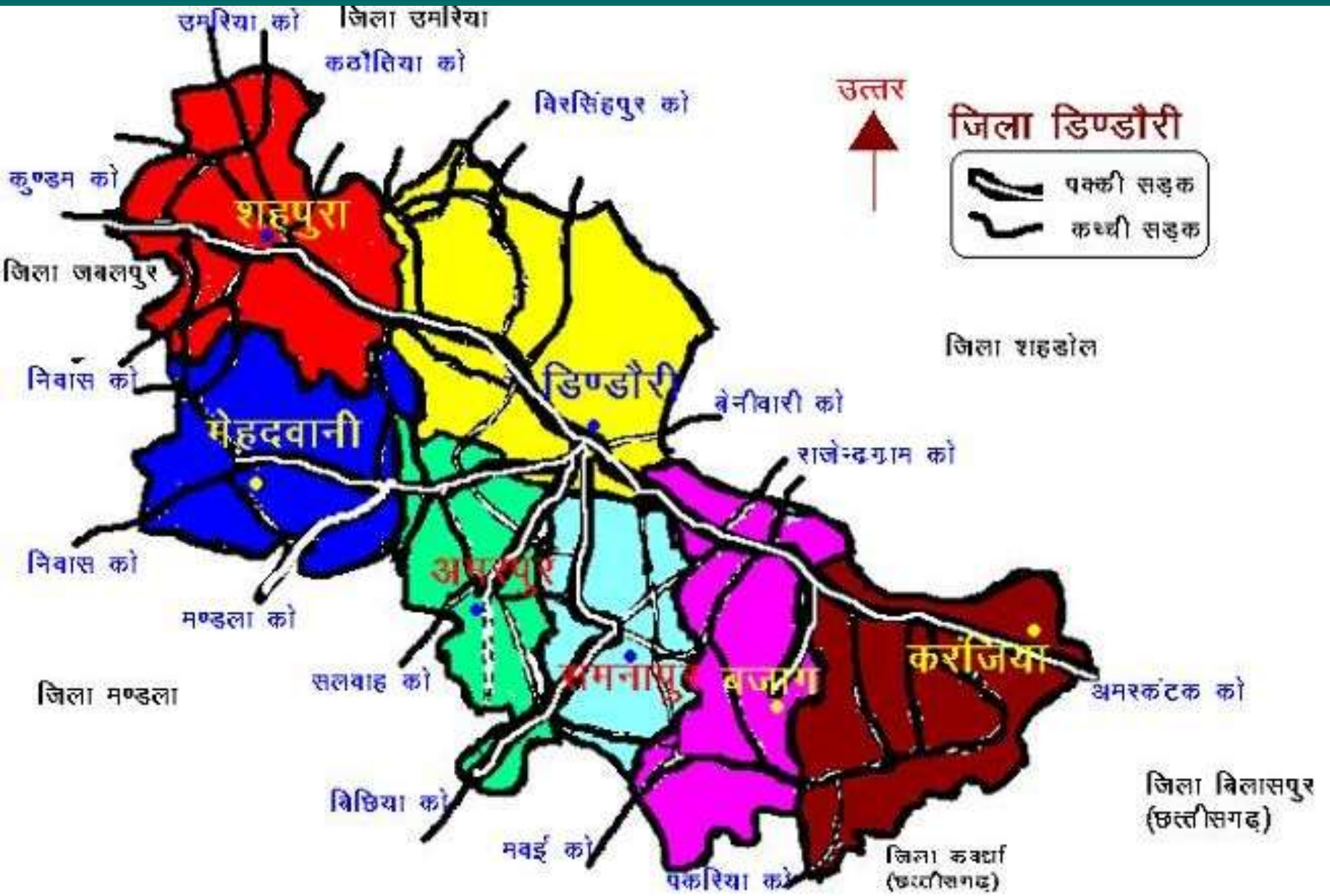
□ BLOCK BOUNDARY

□ DISTRICTY BOUNDARY

0 6,250 12,500 25,000 Kilometers



Dindori District



Project Area Profile

Physical Profile	Mandla	Dindori	Total
Total Geographical Area (Sq.km)	9655	6128	15783
No. of Sub Divisions	4	2	6
No. of Blocks	9	7	16
No. of Villages (Inhabited)	1216	902	2118
No. of Panchayats	495	364	859
Total Area Reported (Hectares)	965559	612816	1578375
Forest Land (% to Total)	61.4	39.2	52.8
Area Not Available for Cultivation (% to Total)	5.5	6.3	5.8
Permanent Pasture and Grazing Land (% to Total)			
Land under Miscellaneous Tree Crops (% to Total)		7.9	
Cultivable Wasteland (% to Total)	2.2	2.0	2.1
Current Fallow (% to Total)	6.5	10.8	8.2
Other Fallow (% to Total)	2.1	4.1	2.9
Net Sown Area (% to Total)	22.3	31.4	25.8
Total or Gross Cropped Area (% to Total)	29.3	43.8	34.9
Area Cultivated More than Once (% to Total)	8.4	12.4	9.9
Cropping Intensity [GCA/NSA]	131	136	134

Project Area Profile

Demographic Profile figures in 000's

Category	Mandla	Dindori	Total	Mandla	Dindori	Total
	Male	Male		Female	Female	
Population	448	292	740	446	289	735
Scheduled Caste	21	17	38	20	16	36
Scheduled Tribe	252	186	438	260	188	448
Literate	330	206	536	203	111	314

Category	Rural	Rural	Total	Urban	Urban	Total
Population	802	554	1356	92	27	119
Scheduled Caste	33	32	65	8	2	10
Scheduled Tribe	501	369	870	11	6	17
Literate	454	295	749	79	22	101

Project Area Profile

Demography Farmers figures in 000's

Physical Profile	Mandla	Dindori	Total
Cultivators / Farmers	204	322	526
Of the above, Small/Marginal Farmers	116	69	185
Agricultural Labourers	192	52	244
Total Households	272	116	388
Rural Households	197	111	308
BPL Households	123	84	207

Project Area Profile

Land Holding Pattern

Classification of Holding	Holding (No. Of farmers)			
	Mandla		Dindori	
	Nos.	% to Total	Nos.	% to Total
<= 1 Ha	78463	48.26	48923	41
>1 to <=2 Ha	37853	23.28	27259	23
>2 Ha	46283	28.46	44459	37
Total	162599	100.00	120641	100
Classification of Holding	Area			
	Ha.	% to Total	Ha.	% to Total
<= 1 Ha	35040	12.14	23212	9
>1 to <=2 Ha	54984	19.05	38769	14
>2 Ha	198621	68.81	207812	77
Total	288645	100.00	269793	100

Project Area Profile

Irrigation

Irrigation	Mandla	Dindori	Total
Total Area Available for Irrigation (NIA + Fallow) HECTARES	282867	342955	625822
Irrigation Potential Created (% to Total)	4.11	59.82	63.21
Net Irrigated Area (Total area irrigated at least once)	7.26	5.86	11.85
Area irrigated by Canals / Channels (% to Total)	5.65	0.93	5.59
Area irrigated by Wells (% to Total)	1.04	0.79	1.65
Area irrigated by Tanks (% to Total)	0.01	0.26	0.27
Area irrigated by Other Sources (% to Total)	0.56	3.88	4.34
Irrigation Potential Utilized (Gross Irrigated Area) (% to Total)	13.50	9.45	20.59

A peek into the past (1902)

Source : Imperial Gazetteer of India : 1908

Area in 000s Acres	Mandla	Dindori
Total Area	162.36	161.53
Cultivated	38.91	43.64
Irrigated	0.32	0
Cultivable Waste	46.78	43.13
Forests	57.98	60.28

Crop	Area in Year 1902 (000's Acres)	Yeild / Acre (Kg)
Kodo & Kutki	28.41	190.5
Wheat	10.49	281
Paddy	11.07	498.9
Oil seeds (Mustard & Niger)	9.28	71

Major Crops grown during last 10 Years

S.No	Parameter	Mandla	Dindori
1	Major Cereal Crops Kharif	Paddy, Maize	Paddy, Maize
2	Major Cereal Crops Rabi	Wheat	Wheat
3	Major Pulses Kharif	Urad (Black gram), Arhar (Pigeon pea)	Urad, Arhar
4	Major Pulses Rabi	Gram (Chick pea), Lentil, Peas	Gram, Lentil, Pea
5	Major Oilseeds Rabi	Linseed, Mustard, Niger	Niger, Linseed, Mustard

Indigenous Paddy varieties still cultivated

Indigenous paddy variety	Type of maturity
<i>Chapti</i>	Early variety and drought tolerant
<i>Lachhmi Bhog</i>	Early and drought tolerant
<i>Vishnu Bhog</i>	Medium period variety and drought tolerant
<i>Kamodh</i>	Medium period variety and drought tolerant
<i>Chingo</i>	Late variety and water logging tolerant
<i>Motisar</i>	Late variety and water logging tolerant
<i>Nag Kesar</i>	Late variety and water logging & drought tolerant
<i>Chhoti Lochai</i>	Early variety and drought tolerant
<i>Badi Lochai</i>	Early variety and water logging & drought tolerant
<i>Newari</i>	Medium late variety and drought tolerant
<i>Rai Buta</i>	Late variety and water logging & drought tolerant
<i>Pathar Chatti</i>	Early variety and drought tolerant
<i>Sathiya</i>	Early variety and drought tolerant
<i>Karanga</i>	Medium period variety
<i>Sukhdas</i>	Early variety and water logging & drought tolerant
<i>Lal Dhan</i>	Late variety and drought tolerant

Millets

Table 2. Classification of minor millets.

Crop	Number of			
	Species	Subspecies	Races	Subraces
Finger millet	1	2	6	10
Foxtail millet	2	2	3	10
Proso millet	1	1	5	-
Little millet	1	2	2	4
Barnyard millet	2	4	8	-
Kodo millet	1	-	3	-

Source : Collaboration of Genetic Resources

Summary proceedings of Workshop on Germplasm Exploration and Evaluation in Indi, 14 & 15 Nov 1998 ICRISAT Center, India

Several of these species & races were reported to have been present in the Mandla / Dindori Region

Minor Millet Varieties present in Mandla / Dindori

मण्डला जिले में पाये जाने वाले माइनर मिलेट्स



नान बाई कुटकी



सीताही कुटकी



भदेली कुटकी



डोंगर कुटकी



भुरया काँग कंगनी



मड़िया



कोदो



बड़े काँग कंगनी



बेंबर कुटकी



कुटकी निवास



रसैनी कुटकी



बडे मडिया



राली कुटकी



भदेली सांबा



लाक्षी कुटकी



नागदाई कुटकी



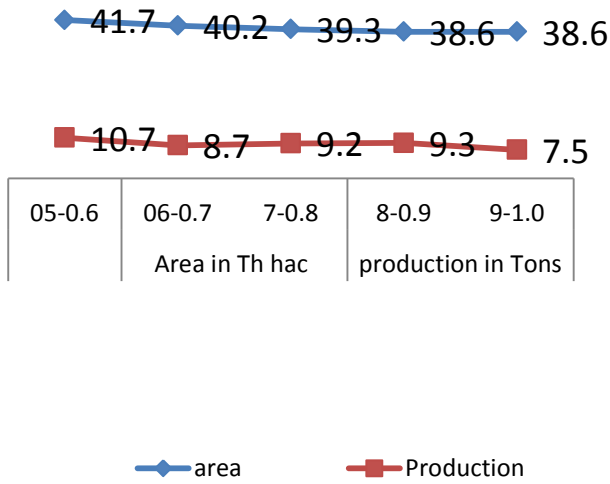
कतकी काँग



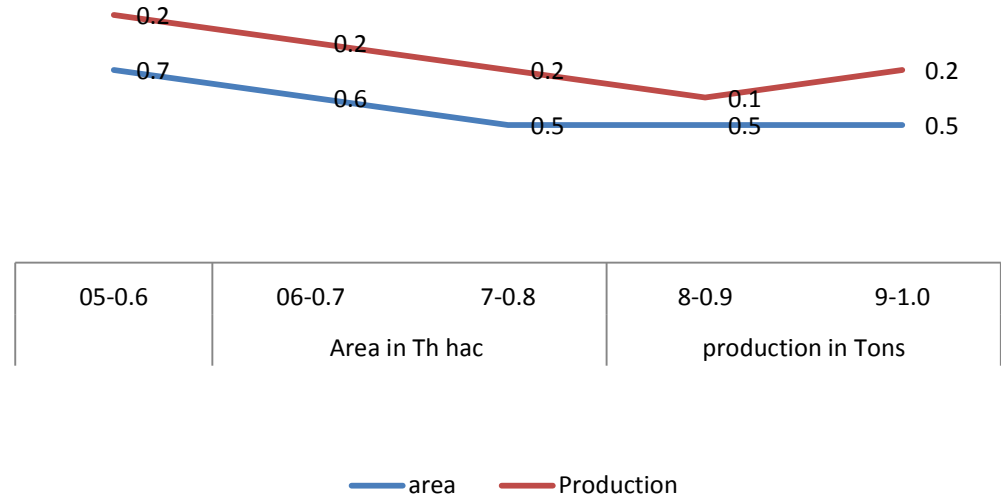
कुटकी

Trends in Millet Production (till 2010)

Trends of area & production of kodo in mandla district



Trends of area & production of ragi in mandla district



Some Facts related to NUS Crops

- Paddy is the most important crop in all the locations
- Apart from paddy, the traditional crops of these regions include wheat, maize, masoor (lentil), millets, niger
- Almost all farmers used to grow and maintain the traditional varieties of these crops, and some of them still grow them for their self consumption
- Millets like **Bajra & Jowar** have almost **disappeared** from the area, while millets like **Kangani and Sawaan** are grown sparingly in the regions.
- Till early 1900, Cotton was also known to be grown in the region (Source Imperial Gazetteer of India 1902)

Some Facts related to NUS Crops

- Before 1978, there were 6 landraces of ragi of which only 2 are left
- In Kodon, there were 4 landraces of which none are left. The presently cultivated Kodon varieties are the university developed varieties
- In Kutki there are 6 land races, which have been preserved by tribals.
- Another scented variety Jawaphul is believed to be extinct

Some Facts related to NUS Crops

- Kangani – 4 landraces now believed to be extinct in Mandla, but preserved in Seoni
- Sawaan – 2 land races preserved by tribals
- Niger – Original land races are extinct. Only University developed varieties are available
- Pea – 2 or 3 land races still present but not popular

Some Facts related to NUS Crops

- Arhar – 3 Landraces present, of which Baigani is still popular amongst tribals.
- Local Moong and urad land races are extinct.
Moong as a crop is almost extinct in the region since 1970
- Wheat – about 3 landraces now extinct

Some Facts related to NUS Crops

- In Paddy there were about 102 land races, of which only 45 races were left in 2012
- Of these 45 races, about 30 are upland varieties, which have been preserved due to their distinctive characters
- 2 scented paddy land races (Asamkothi & Chindikapur) have been multiplied and promoted by Agri Dept

Role of Agriculture Department & KVKs in Agro Biodiversity conservation

- The government agencies especially the agriculture department and the KVKs are working towards the conservation of the genetic resources.
- Several local landraces of crops have been taken up for multiplication .
- Germplasms of several landraces have been collected and preserved
- Government of Madhya Pradesh through its Nutricereal & Nutrifarm scheme aims to promote and incentivise the production of millets like Kodo, Kutki & Bajra.
- Regularly conduct programmes to encourage the farmers to display their local varieites & knowledge

Recommendations for enhancing agricultural biodiversity

- **Increased use of mixtures** (intercropping, multistorey, agro-forestry, crop-livestock systems)
- **Access to a wide range of good quality genetic material** (plant and animal)
 - Promote production of local germplasm and commercialization
 - Promote decentralized and participatory breeding
- **Improve use of genetic diversity as part of IPM strategies**
- **Monitor and identify underutilized species, support needs**
- **Develop sustainable management practices and post-harvest and marketing methods;**
- **Stimulate demand for diverse local products** (niche markets, labelling, registration)
- **Review and promote policies for development and use** e.g. biodiversity conservation and coping with climate change



Some glimpses of the region



Some Interventions By ASA



Some Interventions By ASA





FGDs in progress



*We need to conserve agro-biodiversity
because our present & future depends on it*

