

Participatory Rural Appraisal(PRA) conducted in the coastal villages of Malvan and Devgad Talukas, Sindhudurg District, Maharashtra to prepare the Biodiversity Action Plan

TERI

(The Energy and Resources Institute)

Overview of the project

- Total no. of villages: 136
 - **Malvan: 78 (31 Gram Panchayats)**
 - **Devgad 58 (46 Gram Panchayats)**
- Project work began on March 15, 2013
- Malvan: 78 villages
- Devgad: 20 villages
- Total of 98 villages

Team structure for PRA exercise

- Typical team composition
 - **TERI's sectoral experts as leaders – 2**
 - **Field assistants – 1**
 - **Local contact/ facilitator – 1**
- At a given time there were 6 teams working parallel on the field
- The teams spent on an average more than 3 days in every village but not consecutively due to field constraints.

Methodology



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**Meeting with Gram Panchayat
Members**



Focused group Discussion with Villagers



Resource Mapping by Villagers



Transect walk

Other meetings



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- Meetings with government officials (eg. Fishery Department, Agriculture Department)
- Krushi Vidyapith Research Station
- SFRUTI (Konkan Nisarg Manch)*
- Meetings with private industries (eg. food processing units, production units, etc.)
- Interviews with SHGs at Sindhu Saras 2013.

*<http://konimsfurti.org/sindhudurg-district.html>

Other meetings



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Visit to Sindhu Saras- Kudal



Visit to KONBAC Bamboo, Kudal

General highlights



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- **Climate and rainfall pattern:** irregular rainfall and increasing temperatures
- **Resource utilization** (organic): use of organic objects during festivities
- **Plastic recycling:** Rice and wheat in exchange of scrap plastic
- **Open defecation:** Still relevant in coastal villages
- **Monkey menace:** Major problem for agriculture
- **Poaching of protected fishes** and endangered fishes: Black-tip Reef Shark and Whale Shark
- **Organic vs. chemical fertilizers, pesticides:** Decreasing cattle numbers in villages; adulteration in market organic fertilizers.

APPROACH

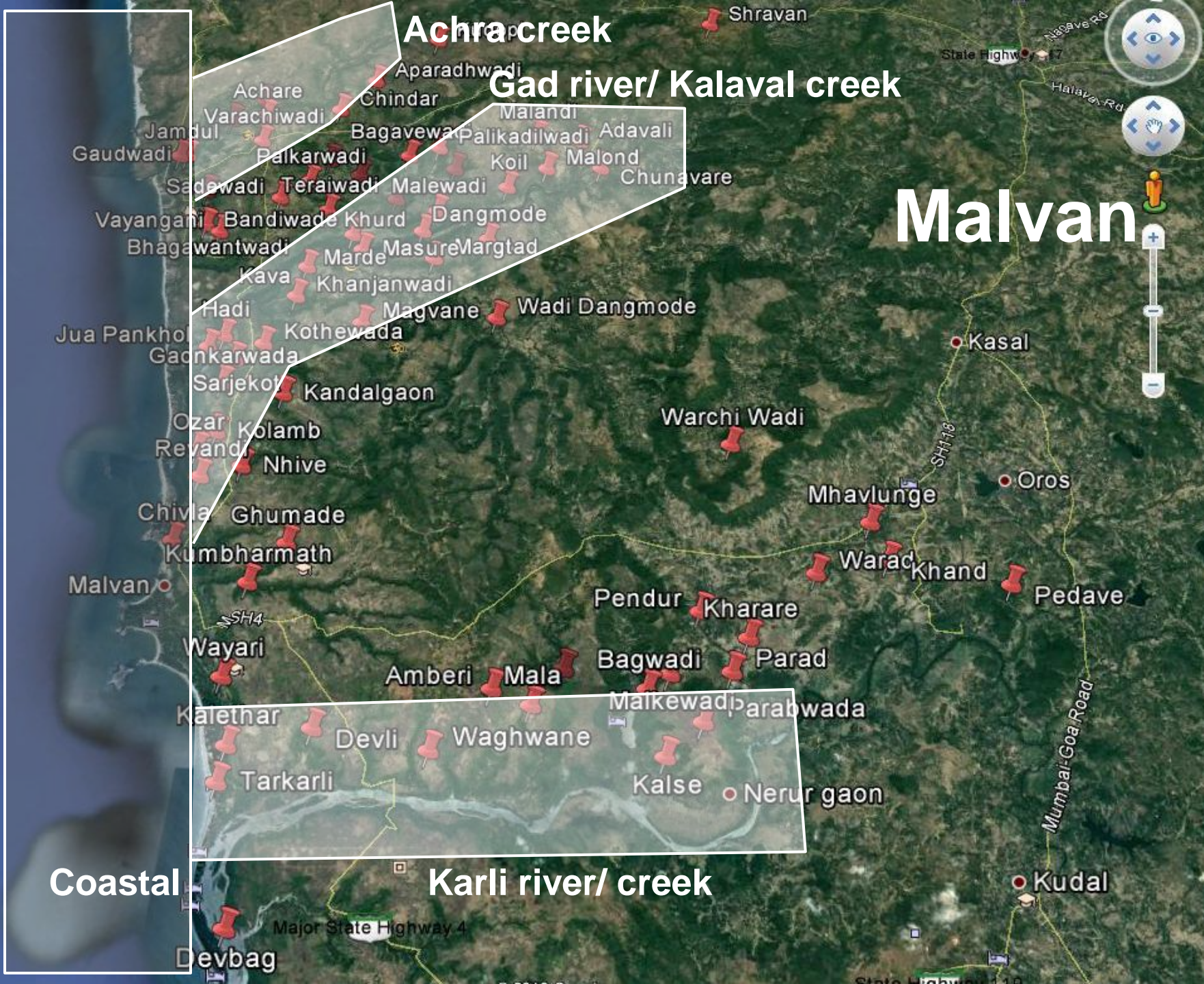
Achra creek

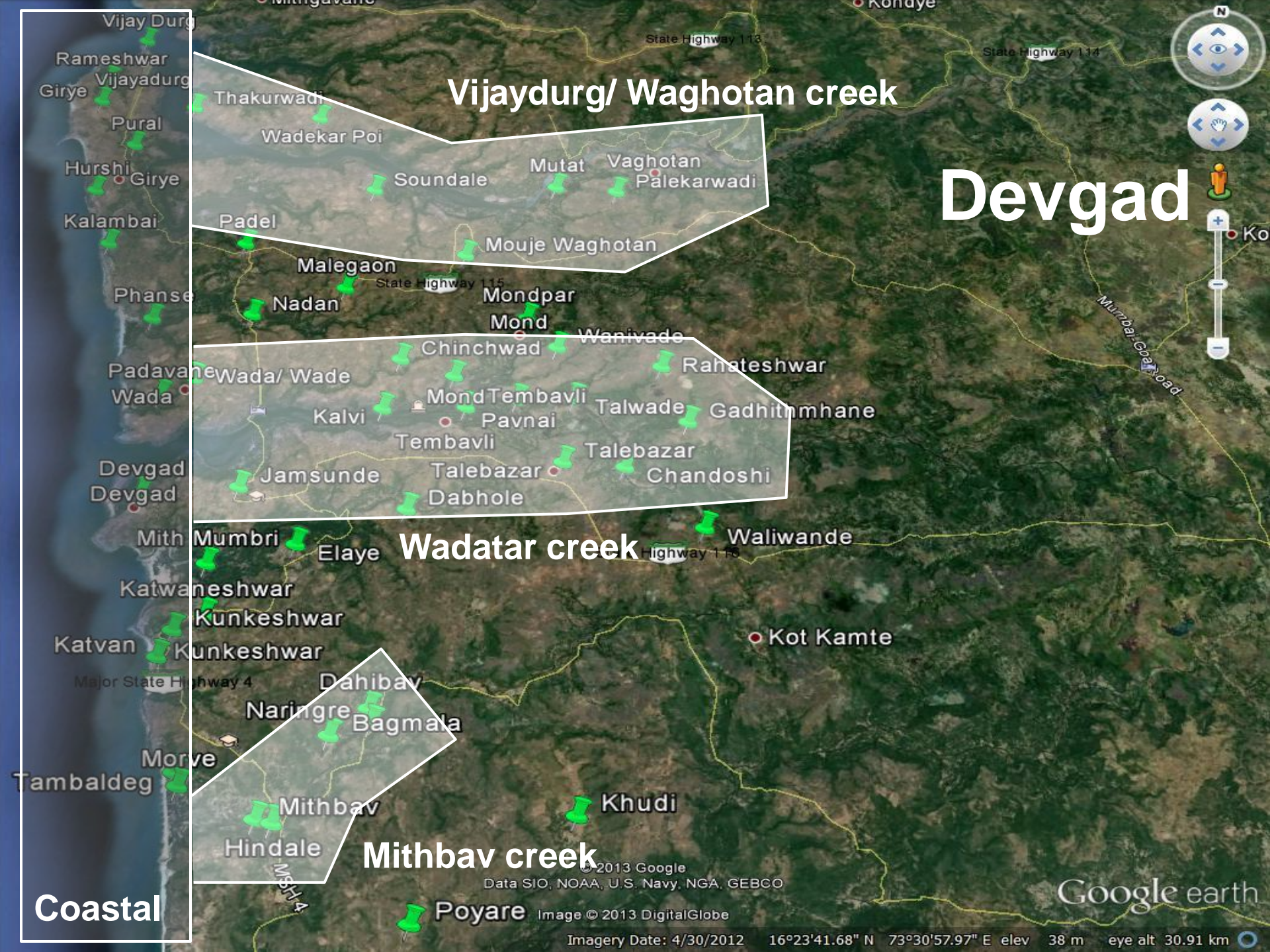
Gad river/ Kalaval creek

Malvan

Coastal

Karli river/ creek





Vijaydurg/ Waghota creek

Devgad

Wadatar creek

Mithbav creek

Coastal

© 2013 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth

Imagery Date: 4/30/2012 16°23'41.68" N 73°30'57.97" E elev 38 m eye alt 30.91 km

Identification of villages with uniqueness



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- **Malvan**
 - **Dhamapur:** large wetland and reserved forest
 - **Juva Pankhol:** island ecology
 - **Jamdul:** island ecology
 - **Tondavali:** fast developing tourism destination; reserved Casuarina forest
 - **Malkewadi:** sugarcane cultivation
 - **Aprajwadi:** ephemeral spring
 - Kalse: agro-tourism
 - **Revandi:** sacred grove
 - **Achra:** Mangrove ecosystems, nesting sites of White-bellied sea eagles (4)

Identification of villages with uniqueness



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Dhamapur: Large Lake and developing tourism destination



Sarjekot: Rosting site of Brahmani Kites

Identification of villages with uniqueness



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Vermi-Composting Unit at Hadi

Identification of villages with uniqueness



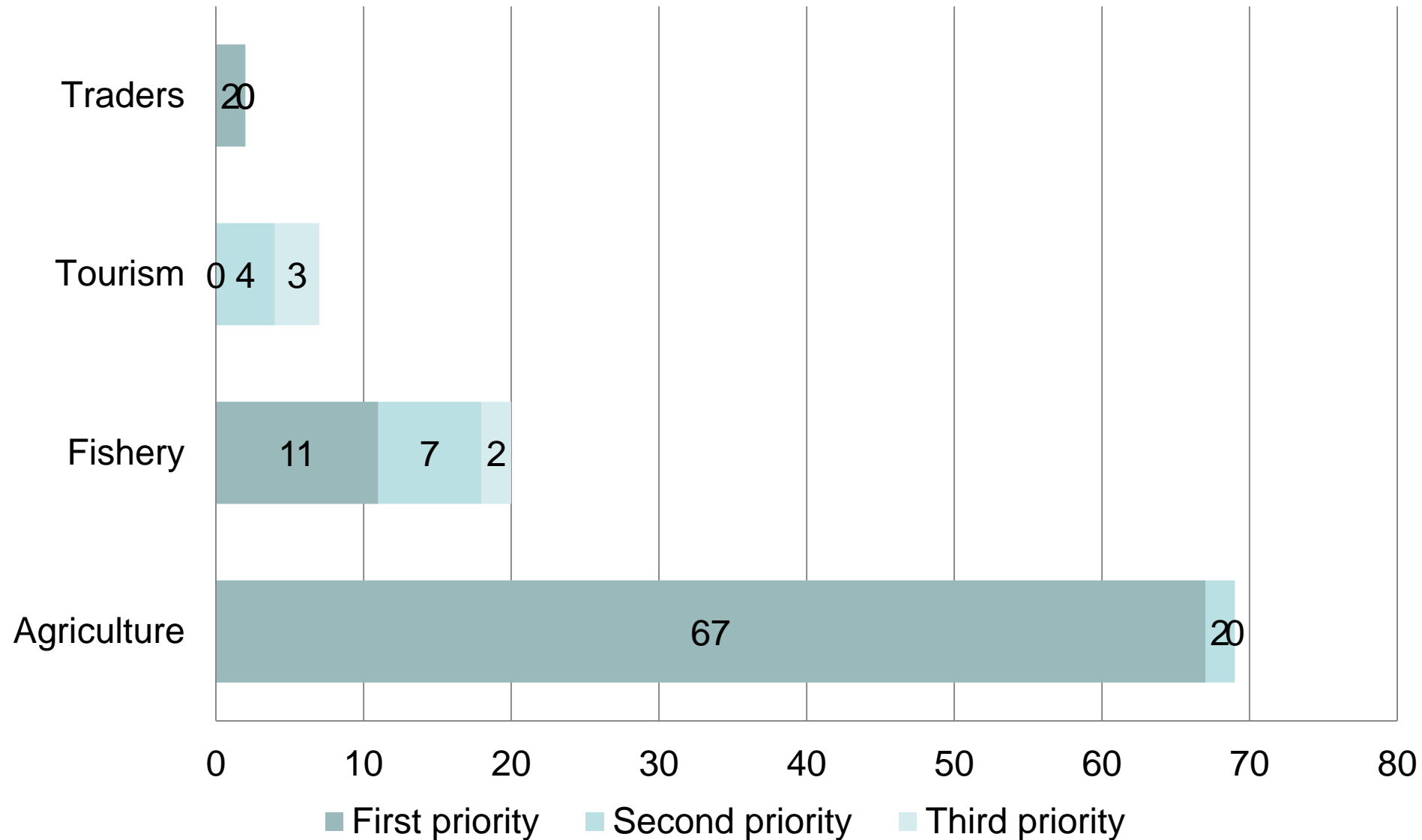
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- Devgad
 - **Wadatar** and adjoining islands: bird and fruit-bat colony
 - **Wada:** Vimleshwar temple with a bat colony
 - **Talebazar:** lake providing water to surrounding villages

Major occupations in Malvan for 78 villages



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Malvan – Major clusters for 78 villages



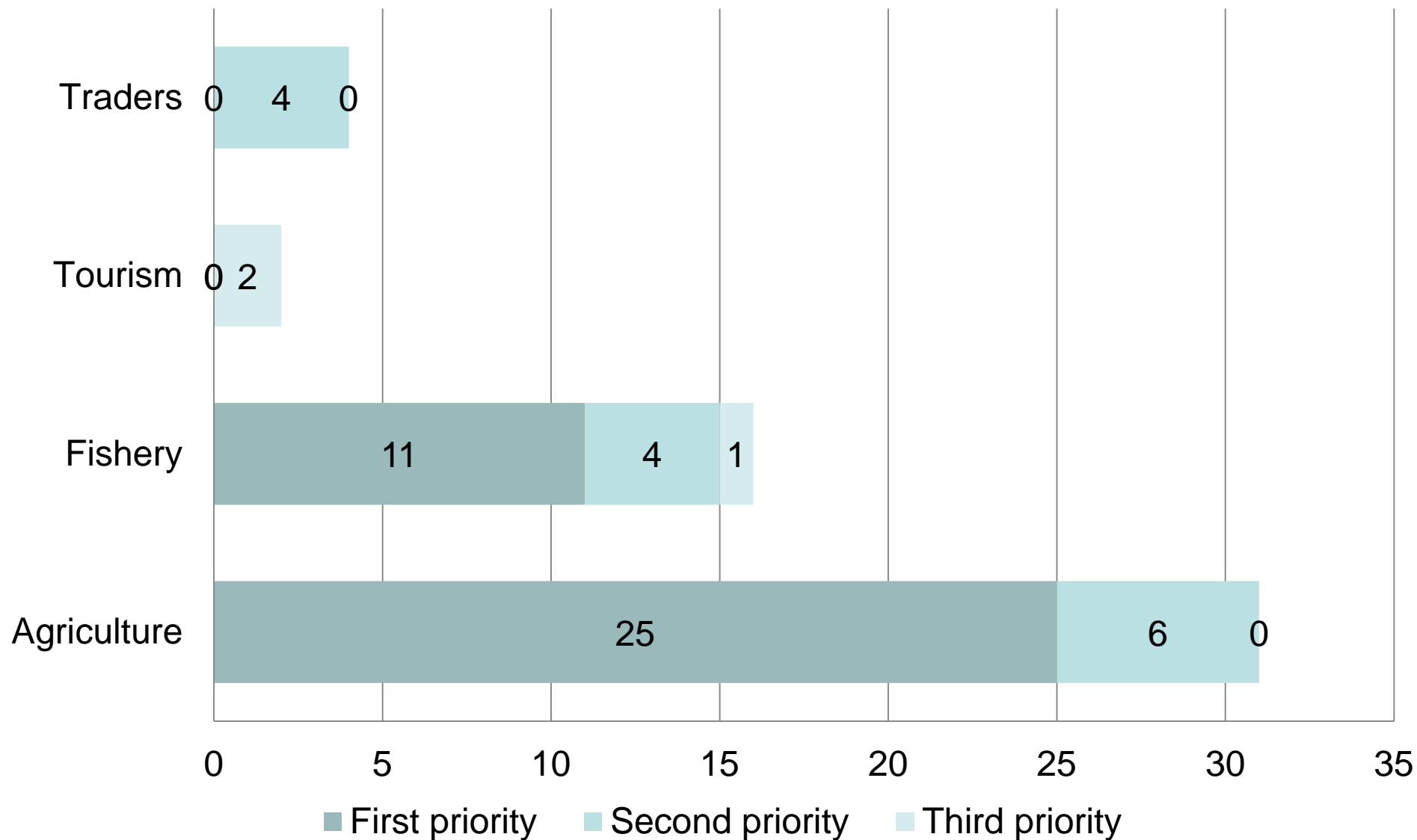
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Major fishery villages (11)	Agriculture with fishery as secondary occu. (5)	Major tourism villages (6)	Villages with major markets (2)
Devbag	Dhamapur	Devbag	Malvan
Tarkarli	Kalse	Tarkarli	Achra
Sarjekot	Syyed Juva	Tondavali	
Tondavali	Kavawadi	Sarjekot	
Wyari Bhootnath	Revandi	Wyari Bhootnath	
Wayangani		Kolamb	
Kolamb		Achra	
Ozar			
Achare			
Jamdul			
Pirawadi			

Major occupations in Devgad for 36 villages



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Devgad – Major clusters for 36 villages



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Major fishery villages (11)	Agriculture with fishery as secondary occu. (7)	Major tourism villages (5)	Villages with major markets
Devgad	Gadhitamhane	Devgad	Devgad
Kunkeshwar	Katvan	Kunkeshwar	Jamsande
Katvaneshwar	Mond	Vijaydurg	Talebazar
Mithmumbri	Munage	Wadatar	Shirgaon
Vijaydurg	Phanse	Jamsunde	
Tambaldeg	Rahateshwar		
Padvane	Jamsunde		
Mithbav			
Wadatar			
Morave			
Virwadi			

Fishery - overview

- Malvan: 11 villages (out of 78)
 - Rampani: 7 villages
 - Gillnet: 8 villages
 - Purse-seine (mini): 2 villages
 - Hook-and-line, cast-net: 11 villages
- Devgad: 11 villages (out of 36)
 - Rampani: 6 villages
 - Gillnet: 4 villages
 - Purse-seine (mini): -
 - Hook-and-line, cast-net: 11 villages

Fishery - overview



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- Mechanized but traditional: fibre boats with outboard motor used for gillnet, hook-and-line, cast-net
- Fishing season: Year round (except June 10 to Aug 15)
- Fishing time per day (weather permitting)
 - **Rampani: 3 to 6 hours**
 - **Gillnet: 3 to 6 hours**
 - **Trawler: 12 to 36 hours**
- Mesh size range: 0.5 sq. inch to 4 sq. inches

Fishery



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Salting of Fishes at Malvan



Prawn Cultivation Unit, Devli

Fishery



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Trap Method for Fishing in Wadatar Creek



Fishery Market at Malvan



Auctioning of Fishes at

Fishery



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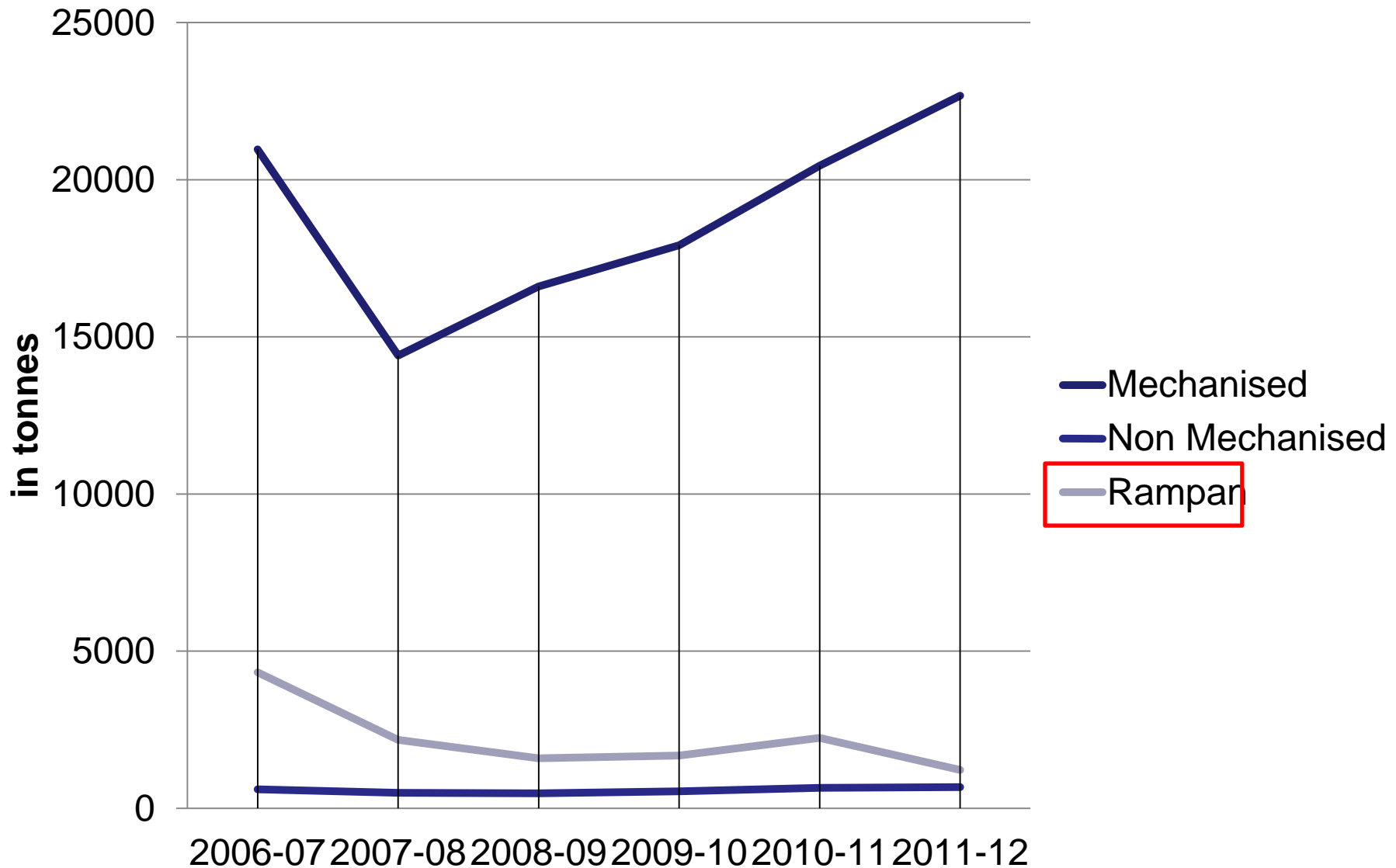


Auctioning of Fishes at Malvan Market



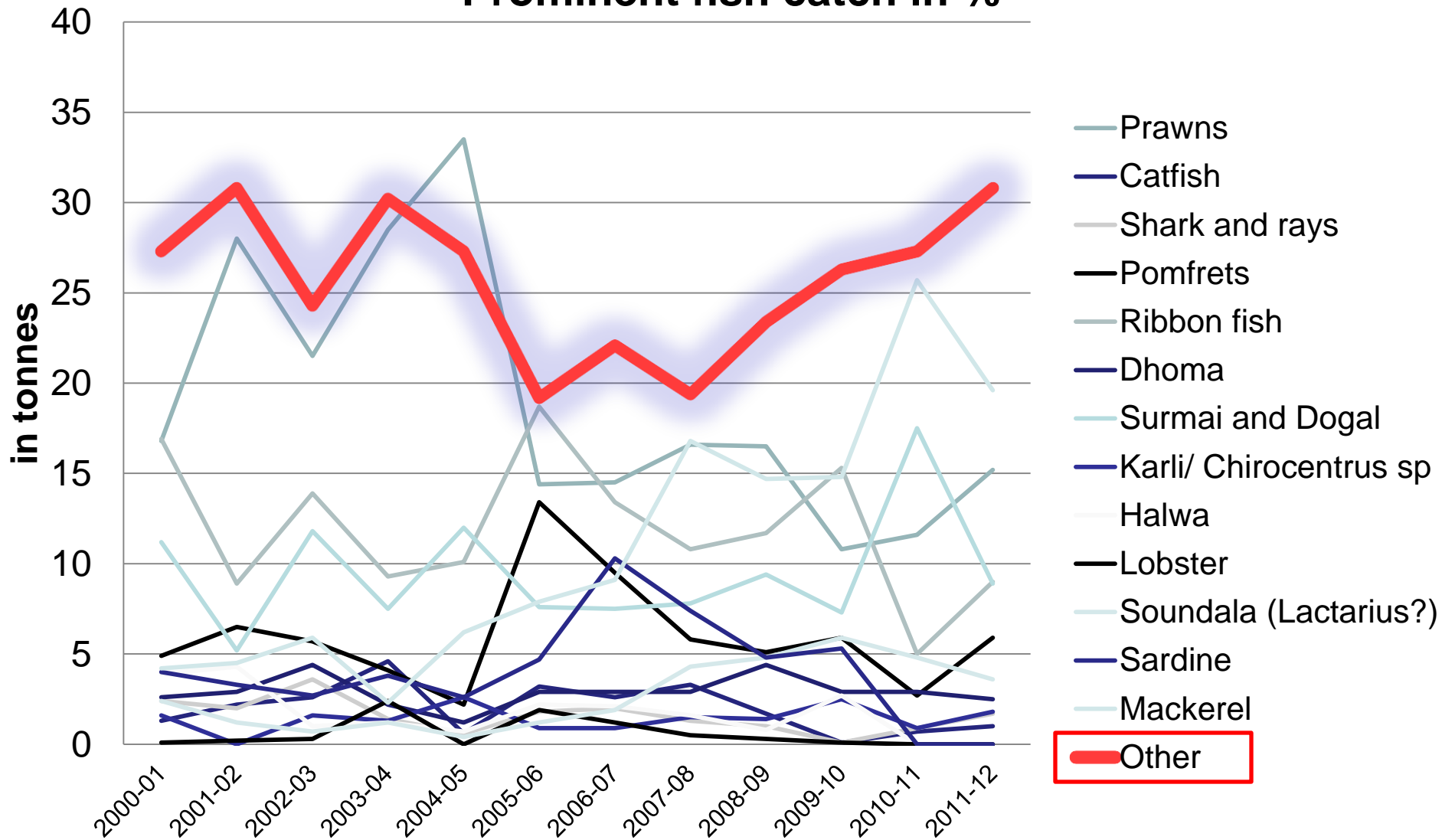
Fish Drying

Fishery production trend for past 5 years



Fishery - overview

Prominent fish catch in %



Fishery - observations



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- Decrease in fish catch as well as local decline in number of species e.g. Indian salmon (Rawas), Jew fish (Ghol) etc.
- Lack of basic infrastructure in terms of fully equipped jetty with cold storage facility, and market linkages.
- Fishermen understand the impact of purse seine net, bottom trawling, yet follow it in the hopes of a higher catch.
- High potential for Edible Oyster, Clam, Mussel culture.
- Increase in number of days at sea by trawlers (3 days maximum).

Fishermen views

- Severe competition amongst mechanized and non-mechanized traditional fishermen.
- Traditional fishermen want to preserve the traditional fishery practices but struggling due to increased mechanised vessels.
- Cage culture of high value brackish water fish such as Indian whiting (Sula), Mangrove red snapper(Tamboshi), if possible.
- Assigning the definite creek area per family to avoid conflict of interests. (as per FGD).

Fishery - impacts



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- Purse seine, trawler fishing ranked major culprits for decline in catch as per FGD's.
- Poaching of protected and endangered fishes such as Whale shark documented during study period.
- Immense demand for fish from Hotel industry during monsoon resulting in intensive fishing in creek water affecting fish breeding.
- Fishing during prohibited fishing season in monsoon.
- Mesh size regulations are not being followed.
- Small mesh size nets (nylon) causing significant mortality of sea snakes and turtles.
- Anthropogenic impacts at most places previously known for turtle breeding sites e.g. Kolamb beach.

Fishery - Impacts



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Poaching of Whale Shark at Malvan Jetty

Fishery - EPAs

Fishing and aquaculture	Villages
Mussel/ Clam/ Edible oyster/ shrimp/ crab culture at specific locations	Tondavali, Achra, Wadatar, Kava, Mithbav, Tambaldeg, Virwadi, Kunkeshwar, Mond, Chinchwad
Training and breeding of ornamental fishes (freshwater as well as marine)	Tondavali, Tarkarli
Fish processing centre for low-value fish	Sarjelkot, Kolamb, Achra, Devgad, Vijaydurg, Kunkeshwar
Formation and training for management of traditional fishing committee	Sarjekot, Tarkarli, Kunkeshwar

Fishery - EPAs

Green interventions	Villages
Ice factory and cold storage units	Kolamb, Wyari Bhootnath, Achra
Solar drying	Achra, Devgad, Vijaydurg, Kolamb, Kunkeshwar
Capacity building	
Awareness pertaining to endangered fishes, Rules and Acts, fish net mesh size	Malvan, Achra, Devgad, Vijaydurg
Capacity building of coast guards with respect to patrolling for illegal fishing, net-mesh size, poaching of protected species	Major fish landing centres

Agriculture - overview



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Malvan:

- 70 out of 73 villages
- Mostly traditional due to small and fragmented land holdings
- Marginal mechanization with on an average 2-3 power tillers per village

Devgad:

- 31 out of 36 villages
- Mostly traditional
- Less mechanization with on an average 2-3 power tillers per village

Agriculture - overview



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- Season: Mostly in Monsoons and in few villages during summers.
- Main Crops :
 - **Rice and Finger Millet [Nachni (During Monsoons)]**
 - **Horse Gram [Kulith (Post Monsoon)]**
 - **Other crops: Black Lentil (Udid), Groundnut, Wal, Pavata**
 - **Newly introduced Crops: Sunflower, Sugarcane (in few villages eg. Bandivade Budruk; Kalse).**
- Horticulture : Mango & Cashew
- Other fruit: Coconut, Betel nut, Kokum, Jackfruit, Jaam

Agriculture: Newly Introduced crops and technologies



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Sugarcane in Kalse and Masure



Sunflower in Bandiwade Budruk



Polyhouse for flowers in Kumbharmath



Jatropha plantation in Bandiwade Budruk

Agriculture - Observations

- Small, fragmented and mostly joint ownership land holding.
- Mostly rain fed crops due to water scarcity from Sept - May.
- Marginal agro- produce only sufficient for self consumption.
- Menace by Grey Langur & Bonnet Macaque.
- Rice production increased over the period due to shift from local breeds to hybrid seed varieties.
- Fertilizer & pesticide use dependant mostly on economic status of farmer.
- Decreasing cattle population over the period due to:
 - **Water scarcity**
 - **fodder unavailability**
 - **cattle diseases**

Agriculture - impacts

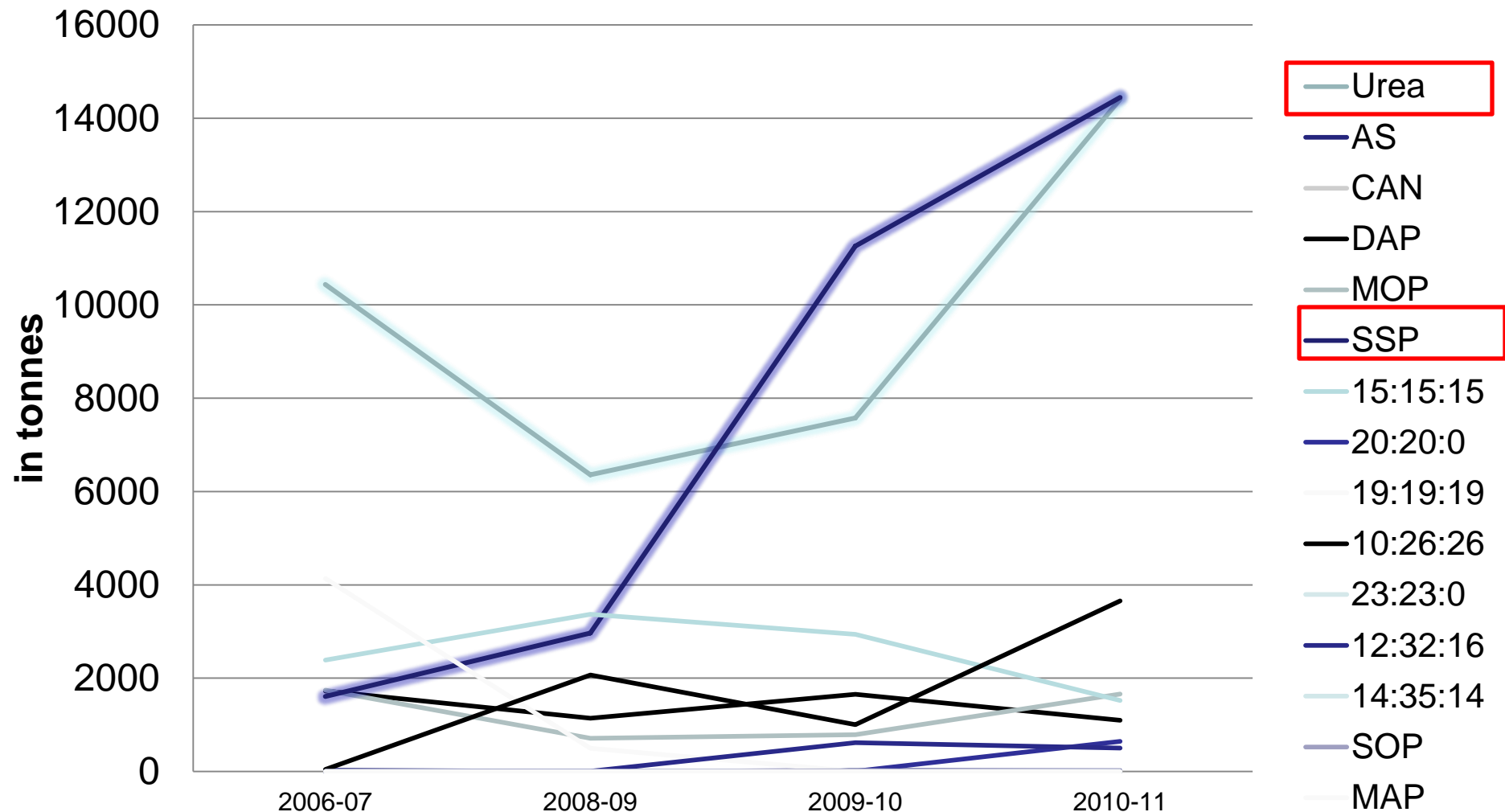


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- Issue of salt water intrusion and increase in khazan land in few villages
- Farmers unaware of soil nutrient profile, leading to higher use in fertilizers
- General increase in use of fertilizers and pesticides



Trend of Consumption of fertilizer in Sindhudurg district (2006-2011)

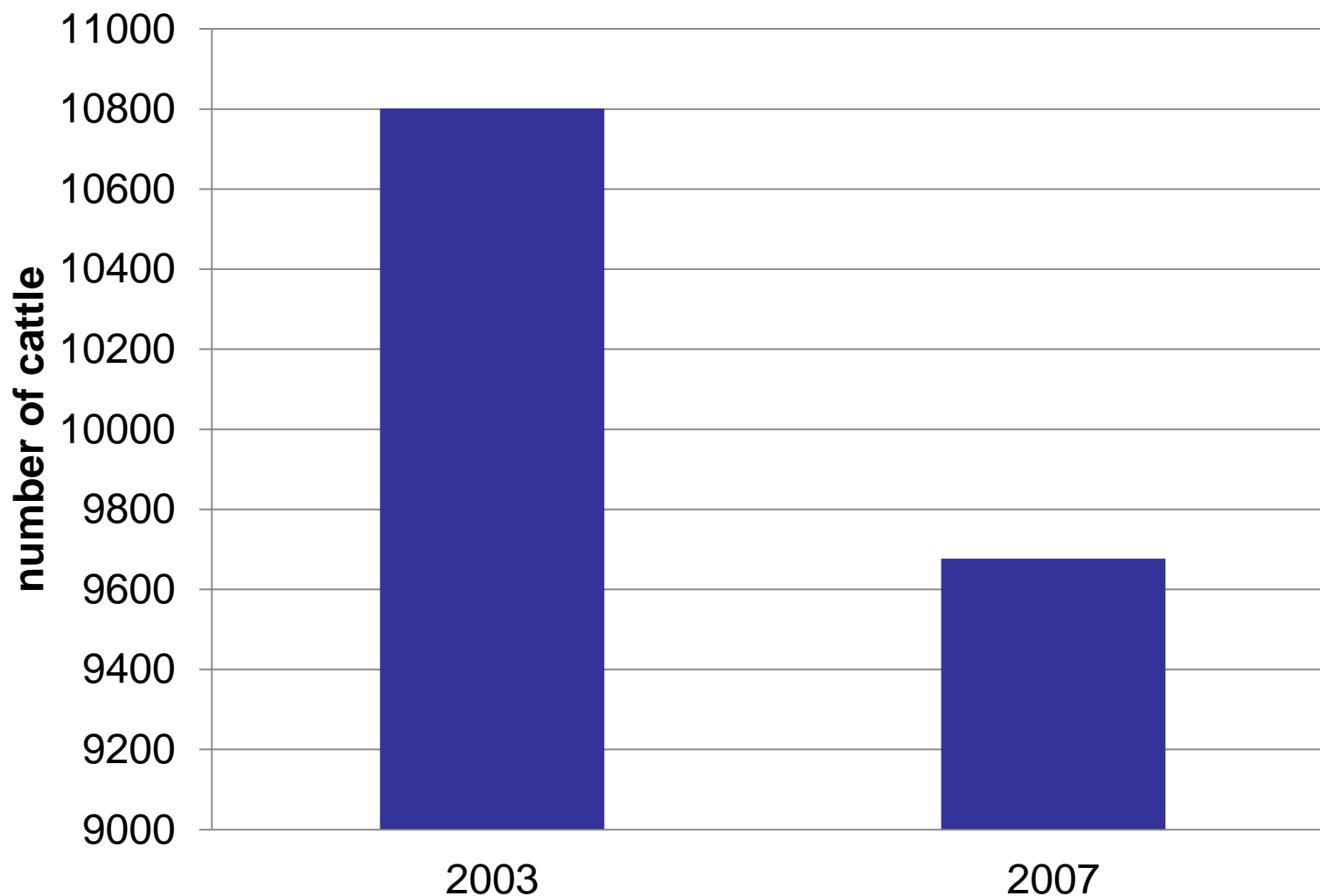


DAP : Diammonium Phosphate, MOP : Muriate of Potash, SSP : Single Super Phosphate, CAN : Calcium Ammonium Nitrate, AS : Ammonium Sulphate, SOP : Sulphate of Potash.

Trend of Cattle Population in Sindhudurg (2003 & 2007)



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Agriculture – Observations & Impacts



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- Pure organic farming trend is minimal & is mostly integrated with chemical fertilizers.
- Fertilizer & pesticide use is higher for horticulture varieties of crops (e.g. Mango and Cashew).
- Farmers do not know the composition or specifics of pesticides.
- Farmers are willing for organic farming subject to easy availability and proven usefulness of bio-pesticides and microbial fertilizers.

Agriculture - Issues



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Khazan Land, Nhive



Monkey Menace

Agriculture - Issues



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Land affected due to fertilizers and salt water intrusion at Tondavali

Role of SHGs



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- About 30-40% of SHGs are functional.
- Major items produced include snacks, traditional brooms, dried fish & pickles.
- Produce sold locally within village or at Malvan.
- About 5-10% SHGs participate in fairs such as Konkan Saras and Sindhu Saras.
- Training received by about 40-50% of SHGs however lack of market linkages as well as raw material availability are major constraints.



Local Arts



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Broom making from Coconut



Decoration from Banana plant

Local Arts



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Jhap making from Coconut Leaves



Boat Making from Undil Wood

Additional Employment Avenues



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Shepherd in Tondavali

Agriculture - EPA



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- **Agriculture and related occupations**
 - Watershed management
 - Adoption of composting & mulching methods
 - Salt-tolerant rice cultivation/ khazan land rice cultivation
 - Apiculture
 - Plantation and forward linkages for economically important plants such as marigold, sunflower
 - Summer irrigation via drip irrigation or sprinkler.
 - Tree plantation of economically/ medicinally/ other important plants: Avla, Neem, Adulsa, Bamboo
- **Market**
 - Market linkages for organic vegetables grown by farmers
 - Establishment of organic farming club
 - Market linkages for selling of the product currently produced (eg. local snacks, clothes, fruit products, *kerni* broom of coconut, coconut leaf shelter).

- **Capacity building**

- Establishment of farmers' club (eg. NABARD farmers' club)
- Establishment of organic farming information centre
- Training for food processing: traditional snacks, dried vegetables and fruits
- Training and promoting traditional food products (eg. Kokum, Jaam)
- Training for articles made of bamboo, jewelry items, clothes
- Training in management and resource utilization related to agriculture
- Training in eco-friendly packaging

Tourism - overview



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- **Malvan: 7 villages**
 - Beach
 - Scuba diving
 - Snorkeling
 - Boating & house boats
 - Corals & Dolphins
 - Fort
 - Agro-tourism (new)
- **Devgad: 4 villages**
 - Beach
 - Boating
 - Fort
 - Dolphin-watch
- Homestays, Bed & Breakfast, Cottages
- Peak season: November – January & April – May

Tourism - observations



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- Tourism industry blooming at few villages.
- No solid waste disposal mechanism. FGD revealed that dry and wet waste is directly burnt.
- Participation of local communities is minimal due to lack of skill. Only a few SHGs are employed to cook food by some hotels.
- No linkage between local fisherman and hotel industry directly.
- No control over collection of shells and other marine fauna. (e.g. Shell island near Tondavali)
- No preference for locals in tourism related activities e.g. Scuba diving, Snorkeling.
- Villages along creek have strong desire to venture into backwater tourism.
- Mangrove boardwalk: Stakeholders need to be defined, as well as the benefit sharing need to be worked out to avoid conflict of interests.
- Agro-tourism is newly emerging in few villages and some villages willing to start in near future; however there is a need proper orientation and training. e.g. Kalse (Malvan)

Tourism - EPA

Tourism operators:

- Sewage management via soak pits
- Biogas – use of organic waste
- Solar water heaters, lighting system.
- Involvement of local communities (SHGs, youth) in the tourism business – e.g.. providing food, tour guide, technical expert.
- Tying up with traditional fishermen
 - **Involving tourists in traditional fishing**

Capacity building:

- Training of local youth for nature trail, scuba diving, snorkeling, and boating activities.
- Training of local youth in hospitality.

Government/ policy level:

- Developing tourism packages – weekend package, 3 day package, holiday-special package
- Rent-a-car scheme to discourage personal vehicles during peak season of tourism.
- Solar car and charging stations (linked with rent-a-car scheme).
- Solar technology: solar heater, solar lantern, solar home lighting systems
- Developing bird-watching destinations
- Mangrove boardwalk