Participatory Rural Appraisal (PRA) conducted in the coastal villages of Malvan and Devgad Talukas, Sindhudurg District, Maharashtra to prepare the Bio-diversity 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 constrains.
Methodology

Meeting with Gram Panchayat Members

Focused group Discussion with Villagers
Resource Mapping by Villagers

Transect walk
Other meetings

• 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

Visit to Sindhu Saras - Kudal

Visit to KONBAC Bamboo, Kudal
General highlights

- **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.
Malvan: Major occupations

Coastal

Malvan

Karli river/creek

Gad river/Kalaval creek

Achra creek

Achare
Varachiwadi
Palkarwadi
Jambul
Gaudwadi
Sadawadi
Teraiwadi
Malewadi
Vayangani
Bandiwade
Khurd
Dangmode
Bhagawani
Kava
Hadi
Gaoarkarwada
Sarjekol
Chivla
Ghumade
Kumbharnath
Wayari
Kalethar
Tarkarli
Devli
Waghwane
Kalse
Nerurgaon

Karli river/creek

Malkewadi
Parawada
Khand
Warad
Mhavlunge
Oros
Kudal
Pedave
Mumbai-Goa Road
State Highway 4
Major State Highway 4
State Highway 27
State Highway 172
State Highway 30
Kasal

Malvan

Kothevada
Magvane
Wadi Dangmode
Ko
Harare
Bagwadi
Parad
Devbag

Achra creek

Achar
Varachiwadi
Palkarwadi
Jambul
Gaudwadi
Sadawadi
Teraiwadi
Malewadi
Vayangani
Bandiwade
Khurd
Dangmode
Bhagawani
Kava
Hadi
Coastal

Devgad

Mithbav creek

Vijaydurg/ Waghrotan creek

Wadatar creek
Identification of villages with uniqueness

- **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

Dhamapur: Large Lake and developing tourism destination

Sarjekot: Rosting site of Brahmani Kites
Identification of villages with uniqueness

Vermi-Composting Unit at Hadi
Identification of villages with uniqueness

- **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

- **Agriculture**: 67 (20 first priority, 20 second priority, 20 third priority)
- **Fishery**: 11 (7 first priority, 2 second priority, 2 third priority)
- **Tourism**: (0, 4, 3)
Malvan – Major clusters for 78 villages

<table>
<thead>
<tr>
<th>Major fishery villages (11)</th>
<th>Agriculture with fishery as secondary occu. (5)</th>
<th>Major tourism villages (6)</th>
<th>Villages with major markets (2)</th>
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</thead>
<tbody>
<tr>
<td>Devbag</td>
<td>Dhamapur</td>
<td>Devbag</td>
<td>Malvan</td>
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<tr>
<td>Tarkarli</td>
<td>Kalse</td>
<td>Tarkarli</td>
<td>Achra</td>
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<td>Sarjekot</td>
<td>Syyed Juva</td>
<td>Tondavali</td>
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<td>Tondavali</td>
<td>Kavawadi</td>
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<td>Wyari Bhootnath</td>
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<td>Wayangani</td>
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<td>Pirawadi</td>
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</tbody>
</table>
Major occupations in Devgad for 36 villages

- **Agriculture**: 25 villages, 0 first priority, 6 second priority, 0 third priority
- **Fishery**: 16 villages, 11 first priority, 4 second priority, 1 third priority
- **Traders**: 4 villages
- **Tourism**: 2 villages

First priority, Second priority, Third priority
Devgad – Major clusters for 36 villages

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<td>Kunkeshwar</td>
<td>Katvan</td>
<td>Kunkeshwar</td>
<td>Jamsande</td>
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<td>Katvaneshwar</td>
<td>Mond</td>
<td>Vijaydurg</td>
<td>Talebazar</td>
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<td>Mithmumbri</td>
<td>Munage</td>
<td>Wadatar</td>
<td>Shirgaon</td>
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<td>Vijaydurg</td>
<td>Phanse</td>
<td>Jamsunde</td>
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<td>Tambaldeg</td>
<td>Rahateshwar</td>
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<td>Padvane</td>
<td>Jamsunde</td>
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<td>Mithbav</td>
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<td>Wadatar</td>
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<td>Morave</td>
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<td>Virwadi</td>
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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

- 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
Salting of Fishes at Malvan

Prawn Cultivation Unit, Devli
Fishery

Trap Method for Fishing in Wadatar Creek

Fishery Market at Malvan

Auctioning of Fishes at
Fishery

Auctioning of Fishes at Malvan Market

Fish Drying
Fishery production trend for past 5 years

- **Mechanised**
- **Non Mechanised**
- **Rampant**

**in tonnes**

- 0
- 25000

**Years**

- 2006-07
- 2007-08
- 2008-09
- 2009-10
- 2010-11
- 2011-12
Fishery - overview

Prominent fish catch in %

- Prawns
- Catfish
- Shark and rays
- Pomfrets
- Dhoma
- Surmai and Dogal
- Karli/ Chirocentrus sp
- Halwa
- Lobster
- Soundala (Lactarius?)
- Sardine
- Mackerel
- Other
Fishery - observations

• 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

- 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 beech.
Fishery - Impacts

Poaching of Whale Shark at Malvan Jetty
<table>
<thead>
<tr>
<th>Fishing and aquaculture</th>
<th>Villages</th>
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</thead>
<tbody>
<tr>
<td>Mussel/ Clam/ Edible oyster/ shrimp/ crab culture at specific locations</td>
<td>Tondavali, Achra, Wadatar, Kava, Mithbav, Tambaldeg, Virwadi, Kunkeshwar, Mond, Chinchwad</td>
</tr>
<tr>
<td>Training and breeding of ornamental fishes (freshwater as well as marine)</td>
<td>Tondavali, Tarkarli</td>
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<td>Fish processing centre for low-value fish</td>
<td>Sarjelkot, Kolamb, Achra, Devgad, Vijaydurg, Kunkeshwar</td>
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<td>Formation and training for management of traditional fishing committee</td>
<td>Sarjekot, Tarkarli, Kunkeshwar</td>
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<td>Ice factory and cold storage units</td>
<td>Kolamb, Wyari Bhootnath, Achra</td>
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<td>Solar drying</td>
<td>Achra, Devgad, Vijaydurg, Kolamb, Kunkeshwar</td>
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<th>Capacity building</th>
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<td>Awareness pertaining to endangered fishes, Rules and Acts, fish net mesh size</td>
<td>Malvan, Achra, Devgad, Vijaydurg</td>
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<tr>
<td>Capacity building of coast guards with respect to patrolling for illegal fishing, net-mesh size, poaching of protected species</td>
<td>Major fish landing centres</td>
</tr>
</tbody>
</table>
Agriculture - overview

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

- 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
- Horticulture: Mango & Cashew
- Other fruit: Coconut, Betel nut, Kokum, Jackfruit, Jaam
Agriculture: Newly Introduced crops and technologies

Sugarcane in Kalse and Masure

Sunflower in Bandiwide Budruk

Polyhouse for flowers in Kumbharmath

Jatropha plantation in Bandiwide 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

• 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)

Agriculture – Observations & Impacts

• 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

Khazan Land, Nhive

Monkey Menace
Land affected due to fertilizers and salt water intrusion at Tondavali
Role of SHGs

- 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

Broom making from Coconut

Decoration from Banana plant
Local Arts

Jhap making from Coconut Leaves

Boat Making from Undil Wood
Additional Employment Avenues

Shepherd in Tondavali
Agriculture - EPA

- **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

• 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

- 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 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 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.
Tourism - EPA

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