

Building Adaptive Capacities of Small Inland Fishers for Climate Resilience and Livelihood Security, Madhya Pradesh



Towards Action And Learning
10 April 2019
Bhopal



Outline of Presentation

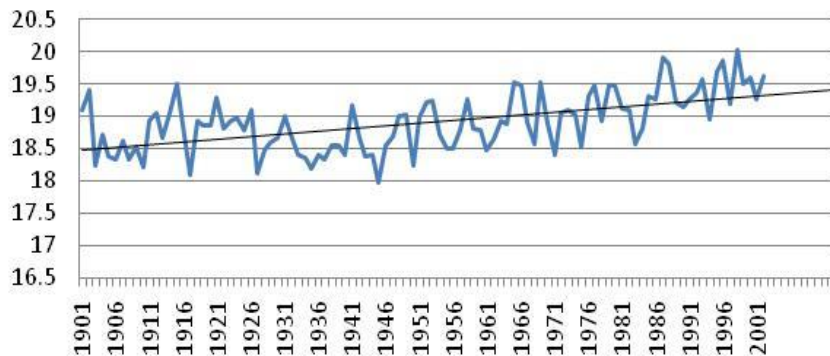


- Climate Story of the Project
- Adaptation Challenge
- Pond Selection (Regional and Village Level)
- Issues in Leasing of Pond
- Fishers Group
- Water Retention
- Fish Protection
- Skilling for Fisheries
- Protecting Fishers (Insurance)
- Fish Market and Business
- Ecological Issues (Fish Diversity and Habitat Development)

Project: The Climate Story

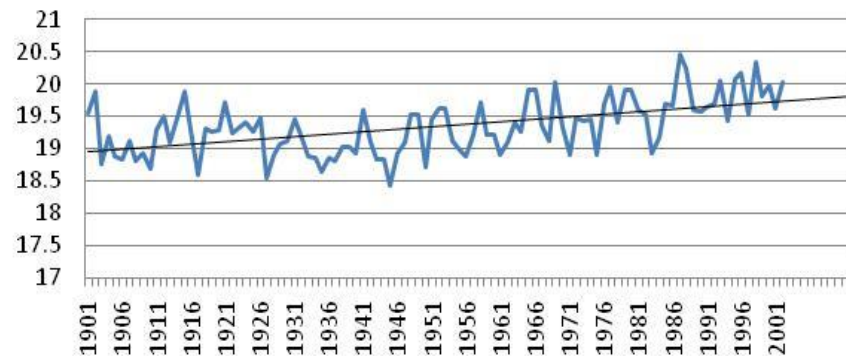


Mean Annual Minimum Temperature- Dhar (°C)



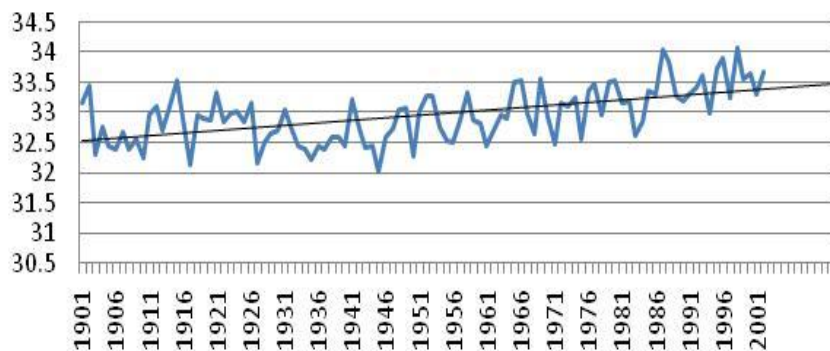
— Mean Minimum Temperature — Linear (Mean Minimum Temperature)

Mean Annual Minimum Temperature- Jhabua (°C)



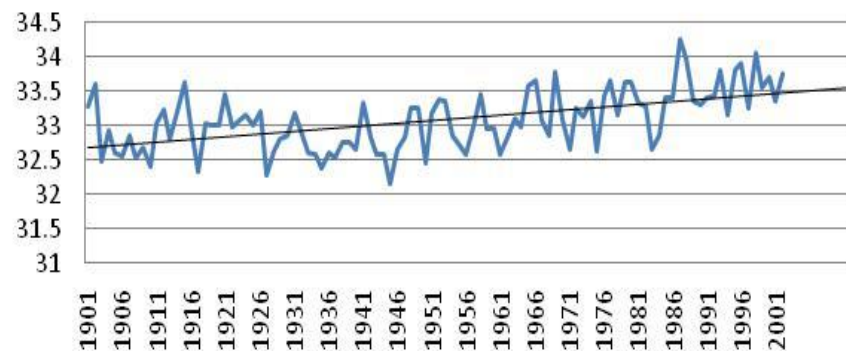
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Mean Maximum Annual Temperature- Dhar (°C)



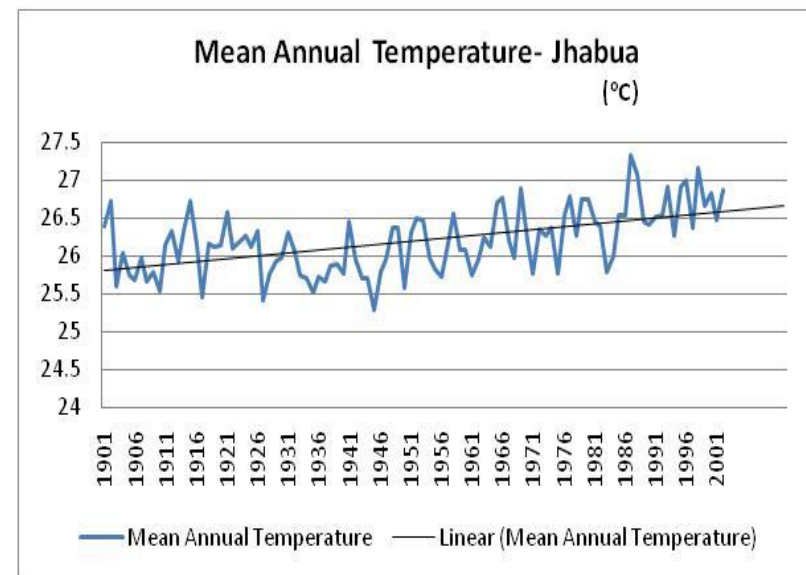
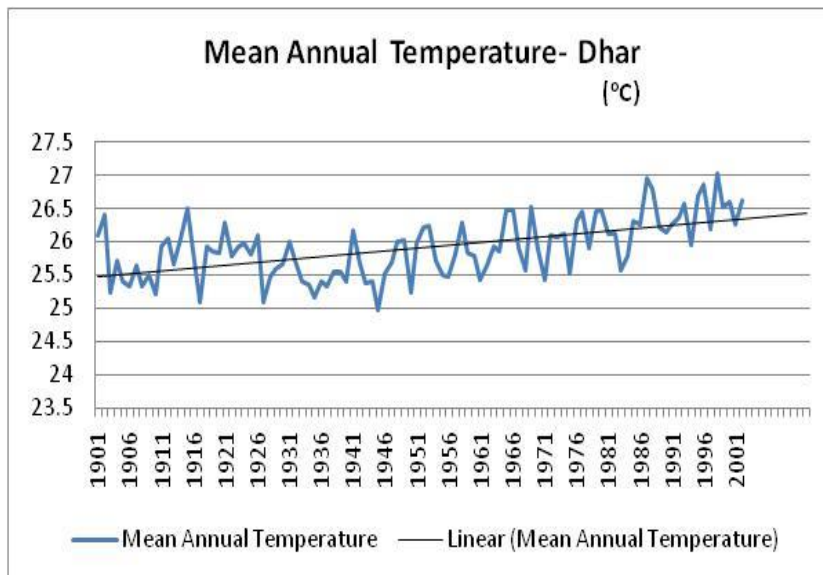
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Mean Maximum Temperature- Jhabua (°C)

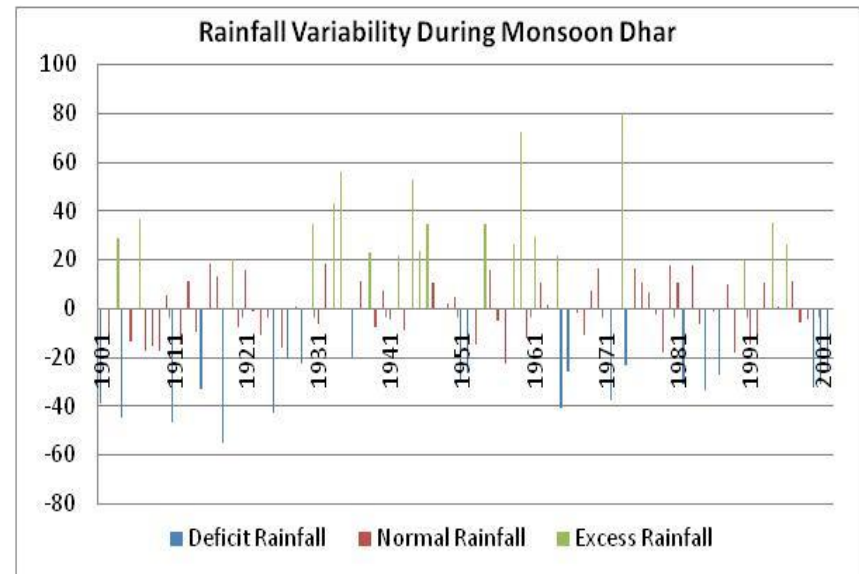
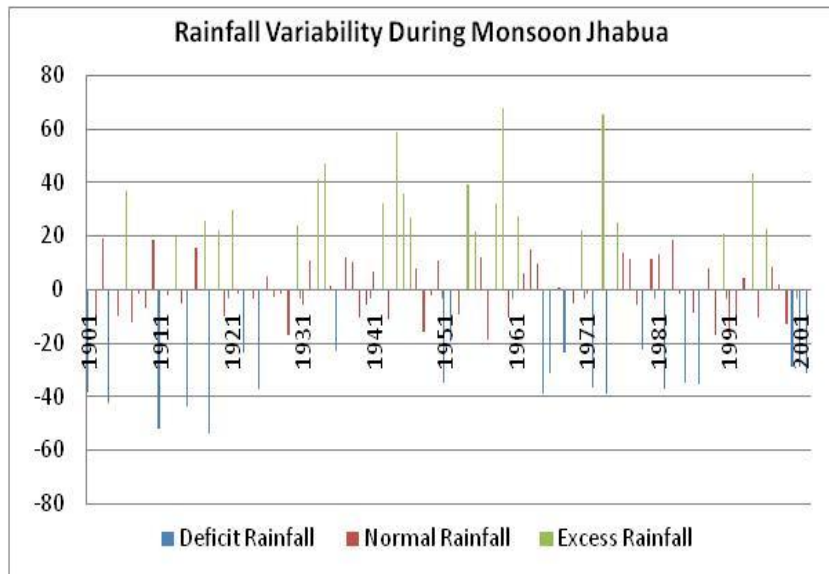


— Mean Maximum Temperature — Linear (Mean Maximum Temperature)

Project: The Climate Story



Project: The Climate Story



Project: The Climate Story



Micro Climatic Trends

- Days and Night are getting warmer
- Summers and Winters are getting warmer
- Delay in setting of monsoon
- Decrease in number of wet days
- Increase in number of extreme climatic events
- Post monsoon decreasing

Impact on Fisheries

- Growth retardation
- Shift/ shortening of breeding periods
- Decrease in fish spawning
- Drying/flooding of ponds leading to increase in fish mortality
- Shortening of production/ harvesting period
- Decrease in fish catch
decreased income from fish

Project: Adaptation Challenge



- Preventing risk of low water retention
- Reducing risk of reduced production
- Reducing risk of income loss
- Removal of silt load from ponds
- Catchment treatment of ponds
- Reducing rate of evaporation of water
- Multi-layered fisheries
- Weather based insurance for fishers

Pond Selection-Regional Level



Use of GIS based processes to identify priority areas for selection of ponds. Maps used included maps related to:

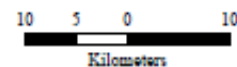
- Drainage Density
- Landforms
- Structural
- Geology
- Groundwater
- Soil
- Slope
- Perenniality

The maps were Referenced to

- Village Boundaries
- Land use
- Existing water bodies

COMPOSITE PRIORITY MAP FOR WATERBODIES SUSTAINANCE DISTRICT: DHAR, MADHYA PRADESH

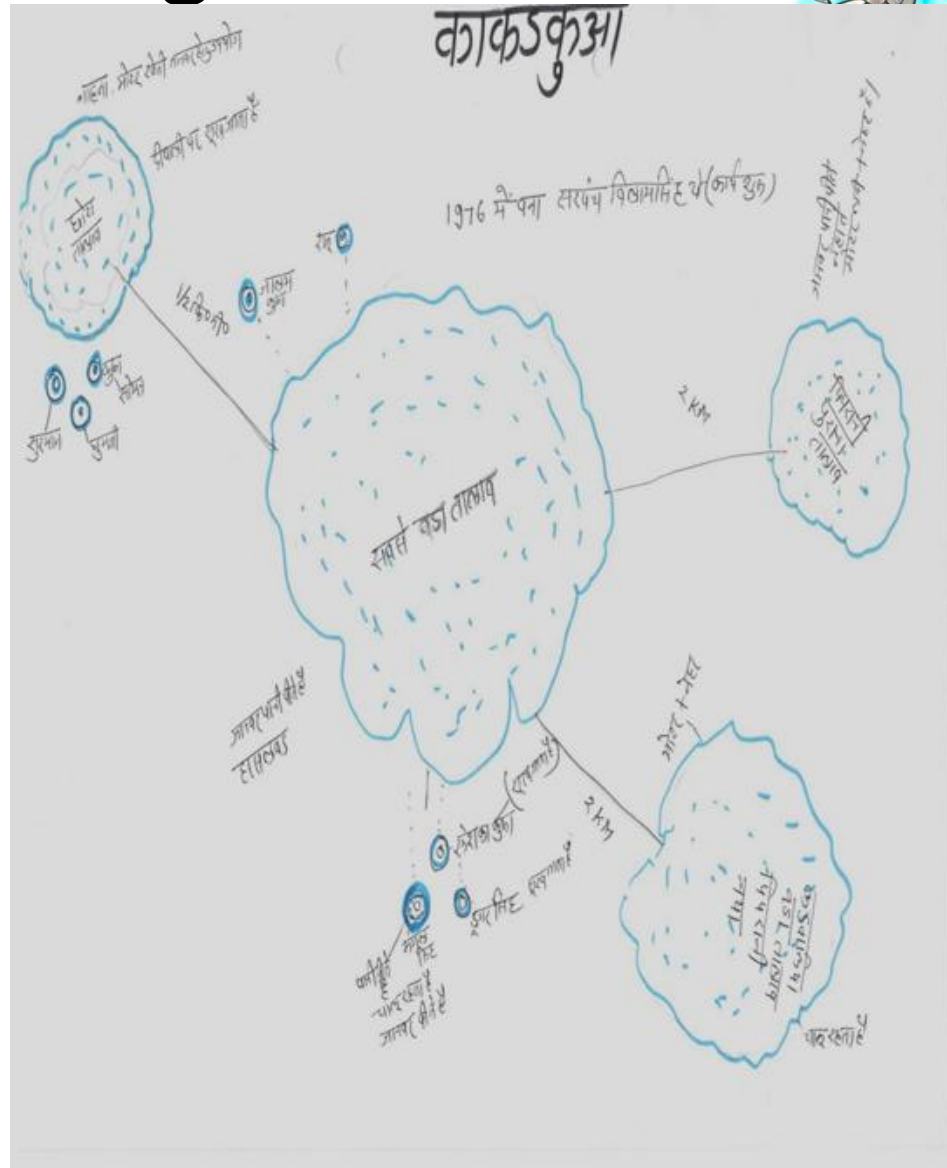
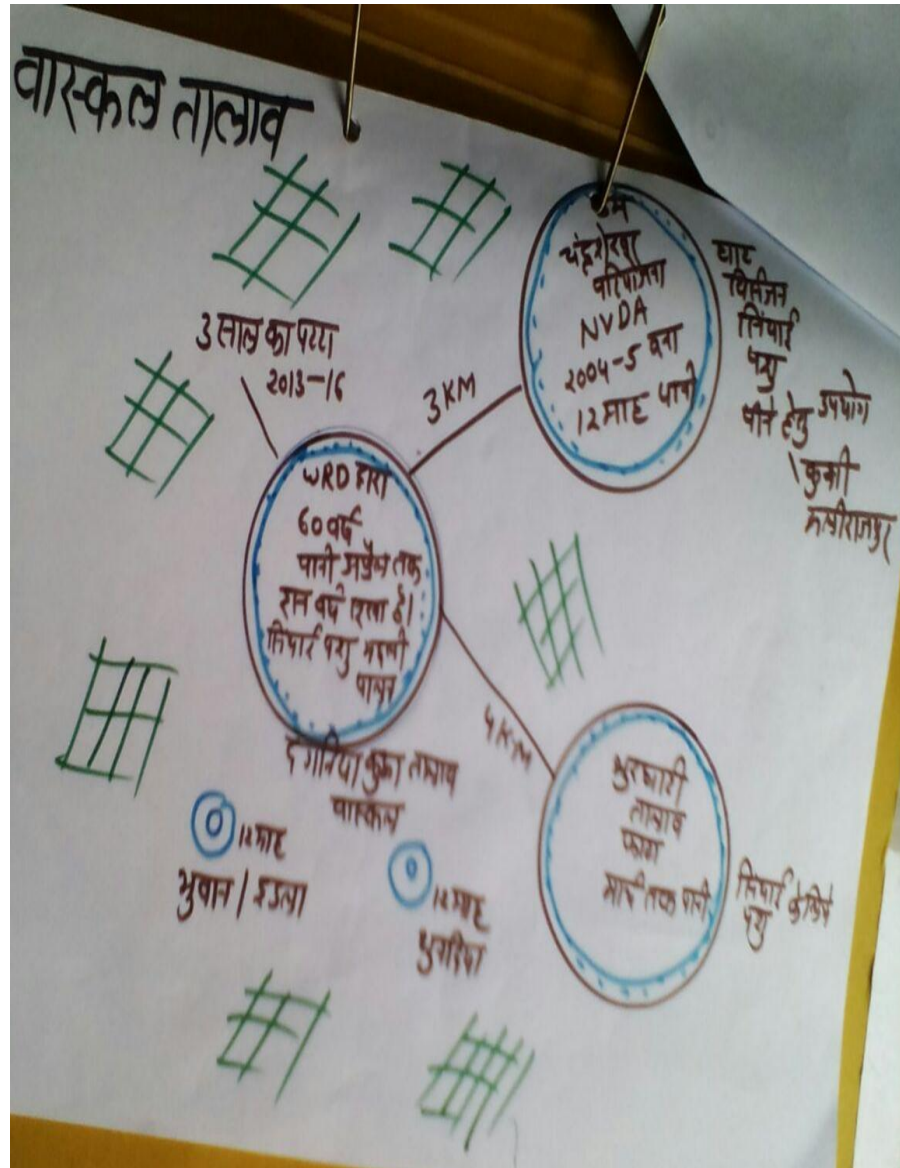
PROJECT: Building Adaptive Capacities of Small Inland
Fishermen Community for Climate Resilience
and Livelihood Security



LEGEND

-  District Boundary
-  Tehsils Boundary
-  Priority 1 (Very High)
-  Priority 2 (High)
-  Priority 3 (Moderately High)
-  Priority 4 (Low)
-  Priority 5 (Poor)
-  Dry Waterbodies
-  Partial Dry Waterbodies
-  Perennial Waterbodies
-  River
-  Canal
-  Lineaments
-  Dykes

Participatory processes for Pond Selection- Village Level



Issues in Leasing of Pond for fisheries



- Rural ponds are made for *nistari*, irrigation or as percolation tanks
- Fisheries in small ponds is not by design but incidental
- What is **10 ha**:
 - Is it the area of the plot/khasra where pond is located?
 - Is it water area of the pond?



- Drawings/DPR have not been transferred to Gram Panchayats
- In case of Irrigation Ponds maintenance amount have not been transferred
- Fees collected are not shared with Gram Panchayat
- Outside the Participatory Irrigation Management (PIM) framework
- Pond area nor FRL have been marked on any pond

Tribal Fishers: Fish Culture a Paradigm Shift



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Climate Adaptive Works for Water Retention and Fish Protection



Pond Modification

- Bund Side Clearance
- Bund Strengthening
- De-siltation
- Pitching
- Flush Bar Repair
- Wastewier Repair
- Fish Wall
- Fishermen's Platform
- Fish Collection Tank
- FTL Marking

Catchment Treatment

- Contour trench
- Earthen Check Dam
- Boulder Gully Check Dam
- Gabion Check
- Plantation in catchment

Climate Adaptive Practice to enhance Water Retention in ponds





**Preparatory activities
before the beginning of
the fishery cycle**



Fish Wall: Climate adaptive practice





Skilling for Fisheries



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Entrepreneurship Based Livelihood

- **Fisher:** person(s) who rear fish for commercial purposes
- **Breeder:** procures seeds and manages fish reproduction and sell spawn, fry or fingerling
- **Feed Producer:** produces fish feed for sale to fisher and breeder

Basic Skill Set

- **Technical Skills**
- **Managerial Skills**
- **Marketing Skills**
- **Sustainability Skills**



Skill Set for Fishers

Technical Skills

- Pond Preparation and Management
- Stocking of Fish Fry/Fingerlings
- Water Quality Testing
- Feed management (natural/supplementary; composite fishery)
- Growth Monitoring
- Harvesting Skills

Managerial Skills

- Resource Management (Human, Financial, Equipment)
- Financial Accounting
- Conflict Management
- Accessing Entitlements
- Linkages with Financial Institutions
- Business Management (When and How much to harvest)



Skill Set for Fishers

Marketing Skills

- Market Scoping
- Customer Differentiation
- Price Determination
- Sales Equipment

Sustainability Skills

- **Green Skills**
 - Water Budgeting
 - Habitat Development
 - Conserving Fish Diversity
- **Climate Adaptive Skills**
 - Measures for Water Retention
 - Measures for restricting fish loss during flooding
 - Measures for Controlling Water Temperature during summers
 - Composite Fisheries



Skill Set for Breeder

Technical Skills

- Maintaining Brood Stock
- Injecting Brooder and Breeding
- Egg Collection and Hatching
- Spawn Collection
- Spawn/Fry rearing
- Feed management

Managerial Skills

- Resource Management (Pools, Brooder, Human, Financial)
- Financial Accounting
- Breed Cycle Management (Which species, when and how much to breed)



Skill Set for Breeder

Marketing Skills

- Demand Assessment
- Price Determination
- Packaging Spawn/Fry
- Transporting Spawn/Fry

Sustainability Skills

- **Green Skills**
 - Water Conservation
 - Using seepage water for nursery
- **Climate Adaptive Skills**
 - Timing of breeding cycle
 - Temperature control of water
 - Maintaining Fish Diversity



Skill Set for Feed Producer

Technical Skills

- Identification of Feed Material
- Feed Making
- Pelletising and Drying

Managerial Skills

- Resource Management (raw material, equipment, human, financial)
- Financial Accounting
- Feed Storage



Skill Set for Feed Producer

Marketing Skills

- Demand Assessment
- Price Determination
- Packaging and Transporting

Sustainability Skills

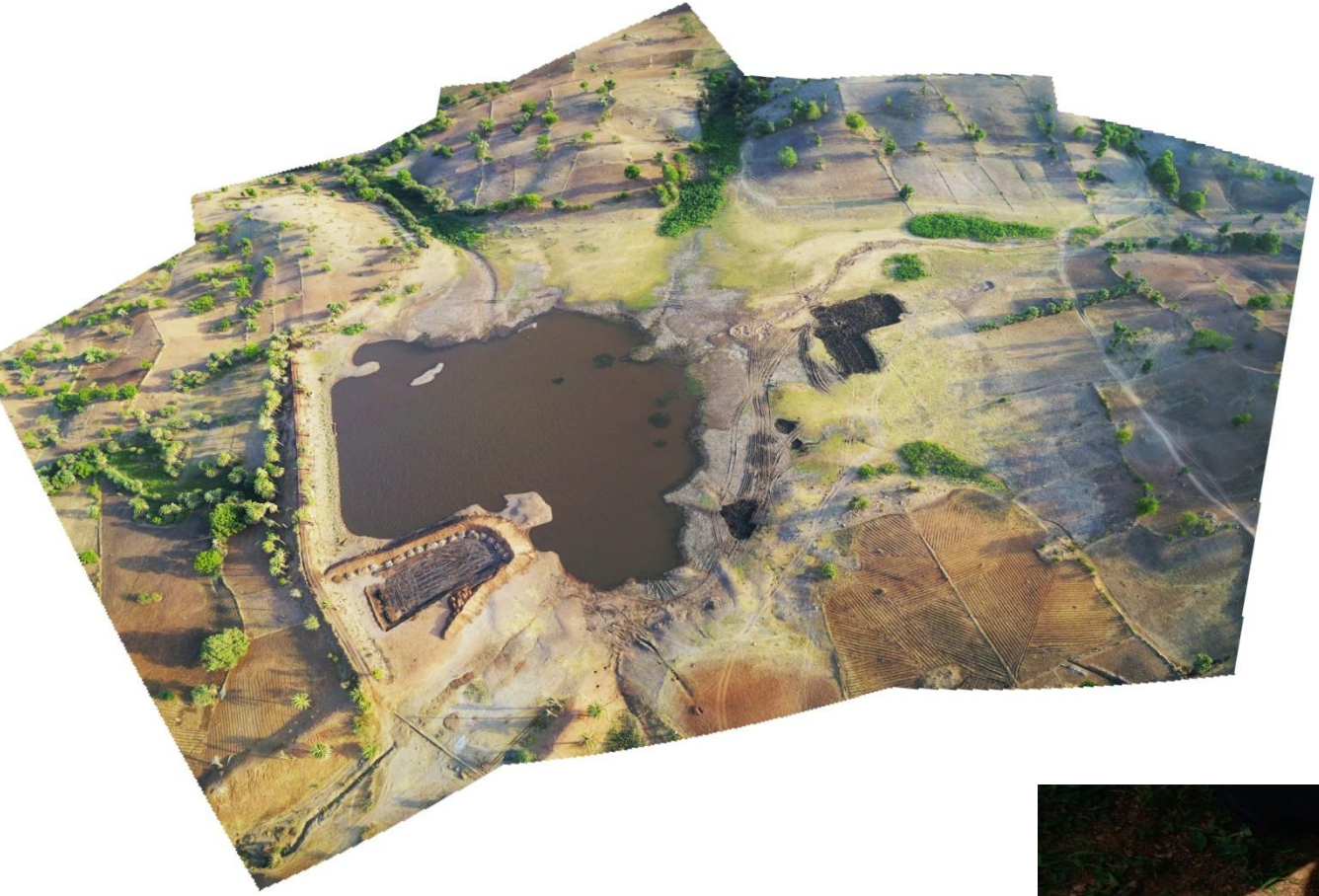
- **Green Skills**
 - Rational/responsible use of chemicals in feed
- **Climate Adaptive Skills**
 - Use of locally available raw material (maize, wheat, rice bran, ground nut husk)





FRP Hatchery Unit at Village Jawaniya- Make available fish locally and at low cost





**Nursery Ponds as
adaptive strategy as well
as additional income
earning opportunity**







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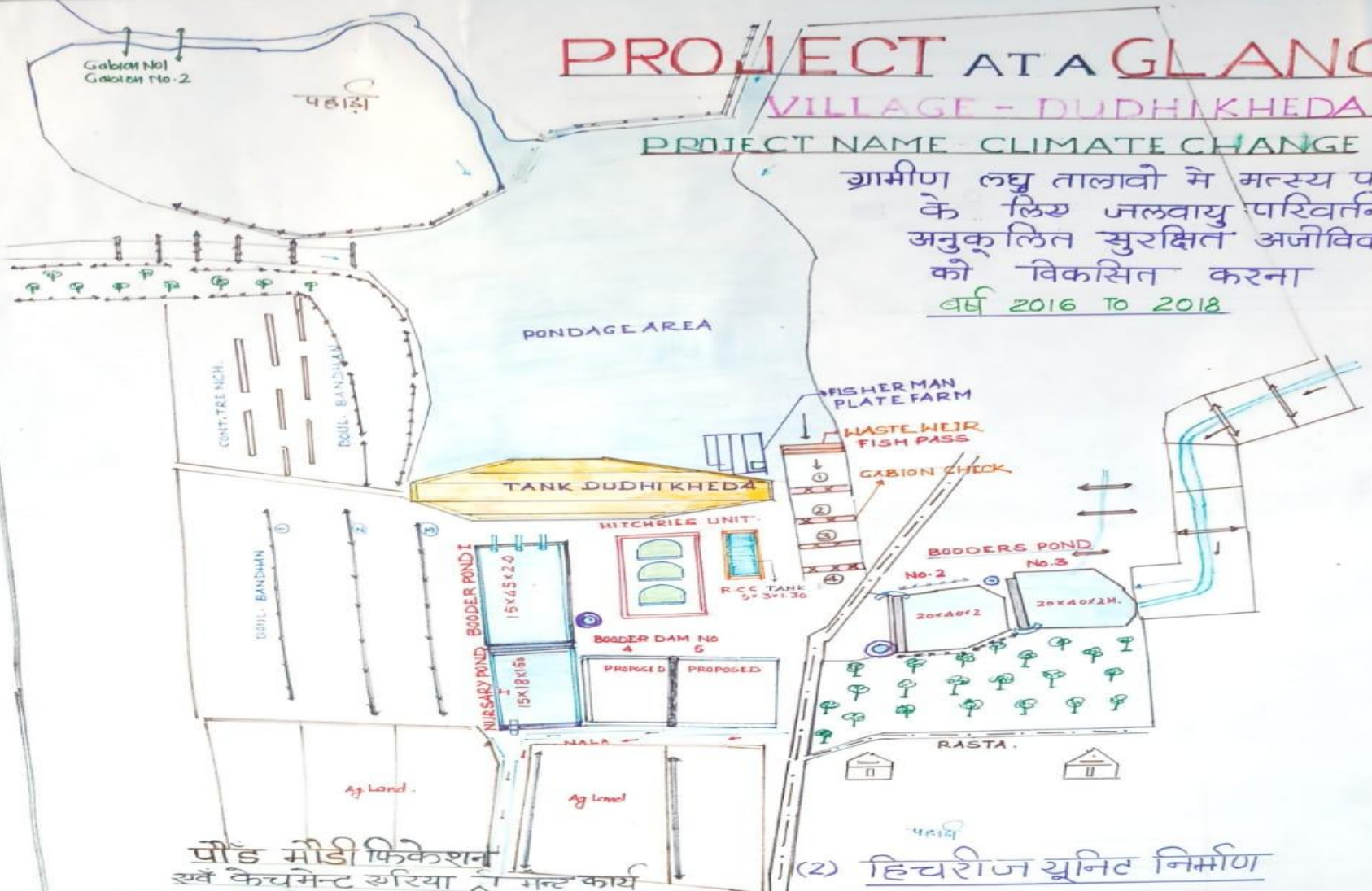


PROJECT AT A GLANCE

VILLAGE - DUDHIKHEDA

PROJECT NAME - CLIMATE CHANGE

ग्रामीण लघु तालावों में मत्स्य पालन के लिए जलवायु परिवर्तन से अनुकूलित सुरक्षित अजीविका को विकसित करना वर्ष 2016 TO 2018



पौंड मीडि फिकेशन
खे केचमेन्ट सुरिया मन्त कार्य

(1) वुन्ड स्ट्रेथनिंग	90M x 4.0
(2) डी सिलड्रेथन	3556 Cum.
(3) कन्ट्र ड्रेच निर्माण	535 RMT
(4) वॉल्डर बंधान निर्माण	1442 RMT
(5) गली कन्ट्रोल चेकस निर्माण	11
(6) गली कन्ट्रोल पिच अरुद्धन बंड	7
(7) गेपियन् चेकस निर्माण	6
(8) प्लानटेशन (पौधरोपण)	1580 Plant
(9) फिशरमेन प्लेट फार्म निर्माण	1 - 10x6 M
(10) फिश पास निर्माण	1 - 7x5 M

(2) हिचरीज यूनिट निर्माण

- (1) फिश नरसरी पौंड - 15x18 M. - 1
- (2) वूडरस पौण्ड निर्माण 15x45x2 - 1
- (3) वूडरस पौण्ड निर्माण - 20x40x2 - 2
- (4) रफ. आर. पी. पोस्टेवल - 1
हिचरीच सेट & प्लेट फार्म निर्माण
- (5) आर. सी. सी. वाटर टैंक - Cap - 25000 LT

- (1) वित्त पोषित - A.F.B
- (2) वित्त पोषित - नावार्ड
- (3) क्रियान्वयन एजेन्सी - ताल

Protecting Fishers- Weather Indexed Insurance



RAINFALL (Jun-Sep)

- **DEFICIT** (eg for 1 to 31 Aug)
 - Rainfall bet 60-30 mm in the month- Rs 333 per mm
 - Rainfall bet 30-20 mm in the month- Rs 1500 per mm
 - Rainfall less than 20 mm for the month- Rs 25000 per ha
- **EXCESS** (for 3 consecutive days in Aug)
 - Rainfall more than 150 mm – Rs 13 per mm
 - Rainfall more than bet 150-225 mm- Rs 516 per mm
 - Rainfall more than 320 mm- Rs 50,000



TEMPERATURE (Feb-Jun)

- Benchmark for sub phases (15 days) defined
- Aggregate of deviations from benchmark determine risk

HIGH

- Eg 1-16 March bench mark 34⁰C:
 - sum of upward temp deviation by 20⁰C Rs 400 per degree
 - sum of upward temp deviation 35⁰C Rs 2714 per degree
 - sum of upward temp deviation 42⁰C Rs 25000

LOW

- Eg 1 to 15 Feb bench mark 11⁰C
 - sum of downward temp deviation by 40⁰C Rs 142
 - sum of downward temp deviation by 82⁰C Rs 1117
 - sum of downward temp deviation by 99⁰C Rs 25000



DISEASE CONDUCTIVE DAYS(Sep-Nov)

- Aggregate of number of DCD during the period
 - DCD= Rainfall > 20 mm and RH > 70% during the day
 - If DCD are 10 Rs 1000
 - If DCD 15 Rs 4000
 - If DCD 20 Rs 25000



- Premium Rs 6068 per ha
- Max Policy Cover Rs 1,50,000 per hac
- Premium assessed high by the fishers
- Expectation that project will pay the premium
- Company need business of minimum 100 ha for pilot
- Weather Index Insurance be made part of PMKBY for fisheries

Fish Business and Fish Markets



Fish arriving from



Ponds

Dams & Reservoirs

River

Wholesale Market



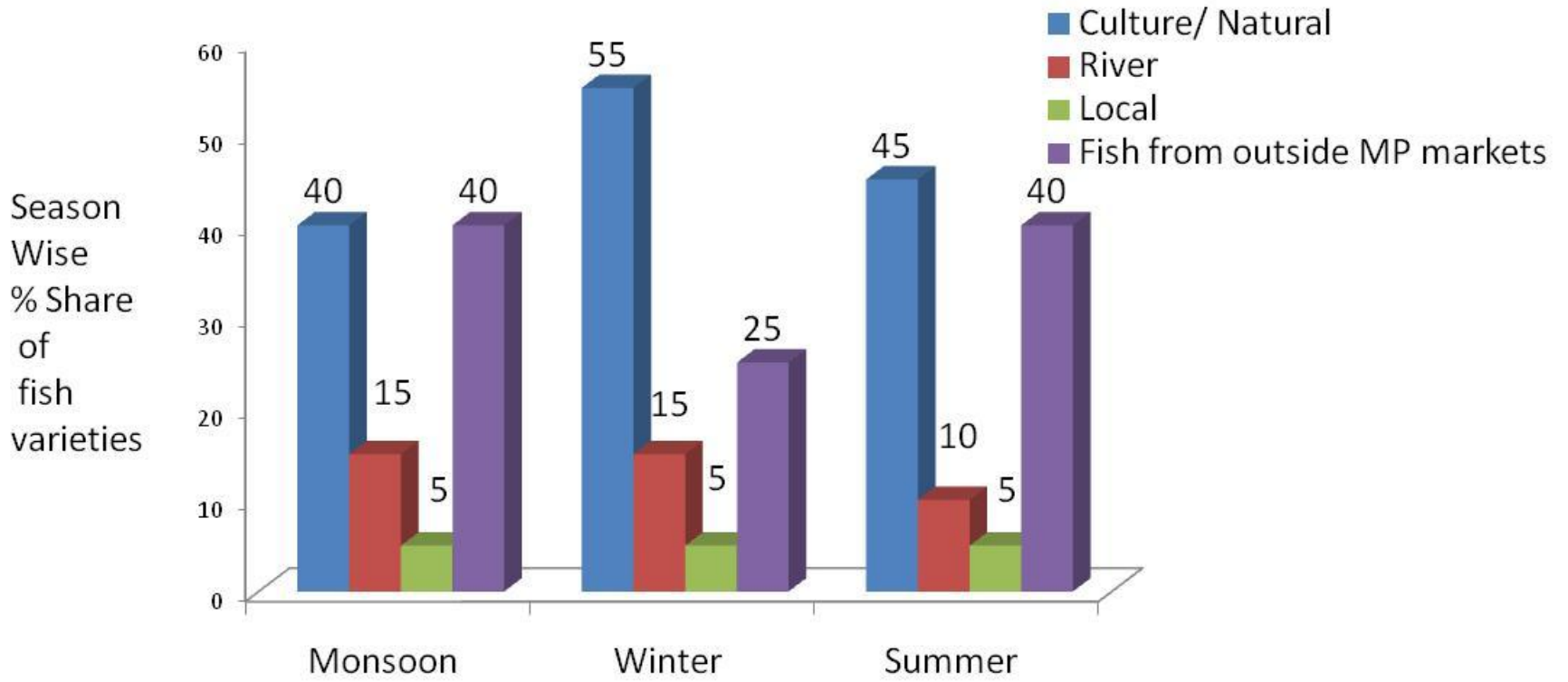
Fish brought by

Individual catcher
(Capture fishing)

Fishermen committee
(Culture Fishing)

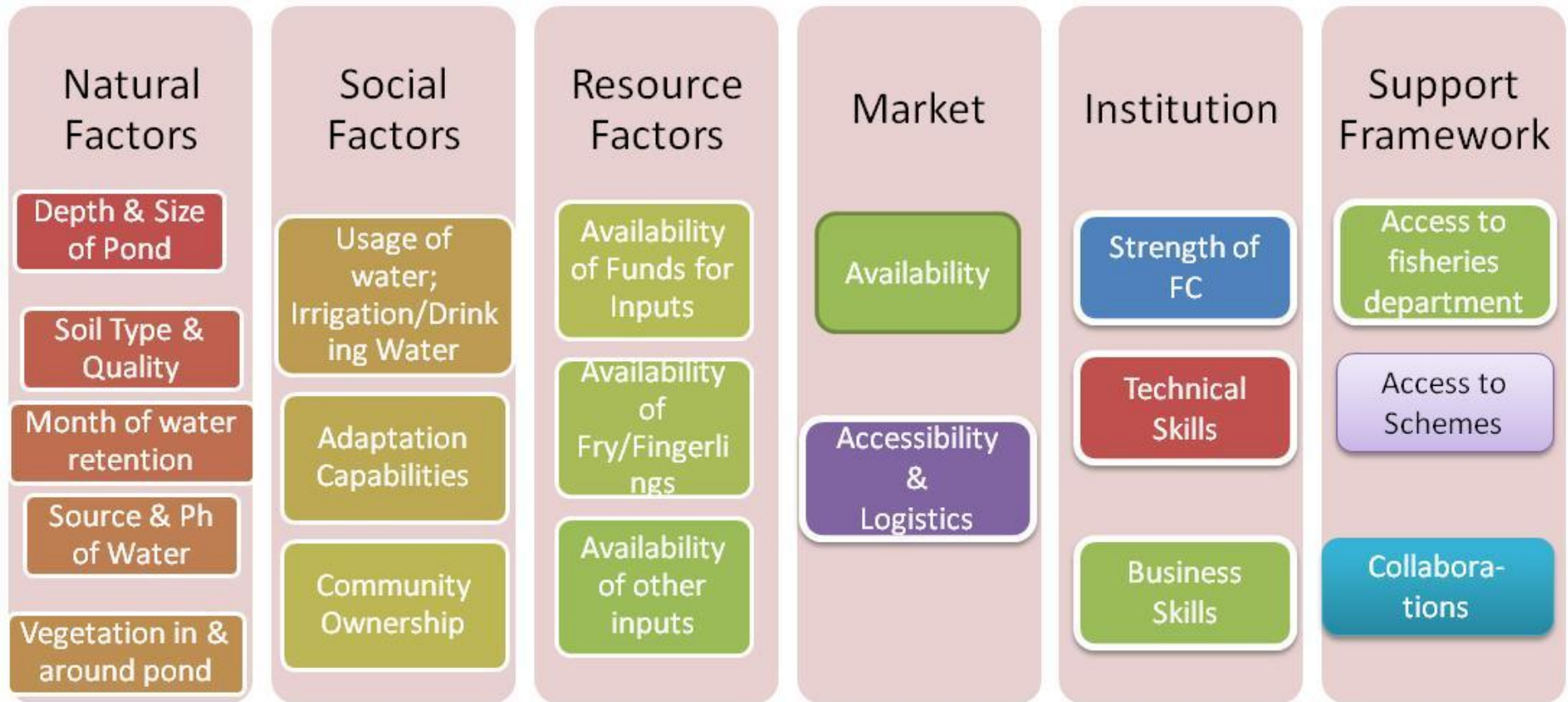
Local Trader
(Captured & Culture both)

Wholesale Trader
(Fish from out side MP)

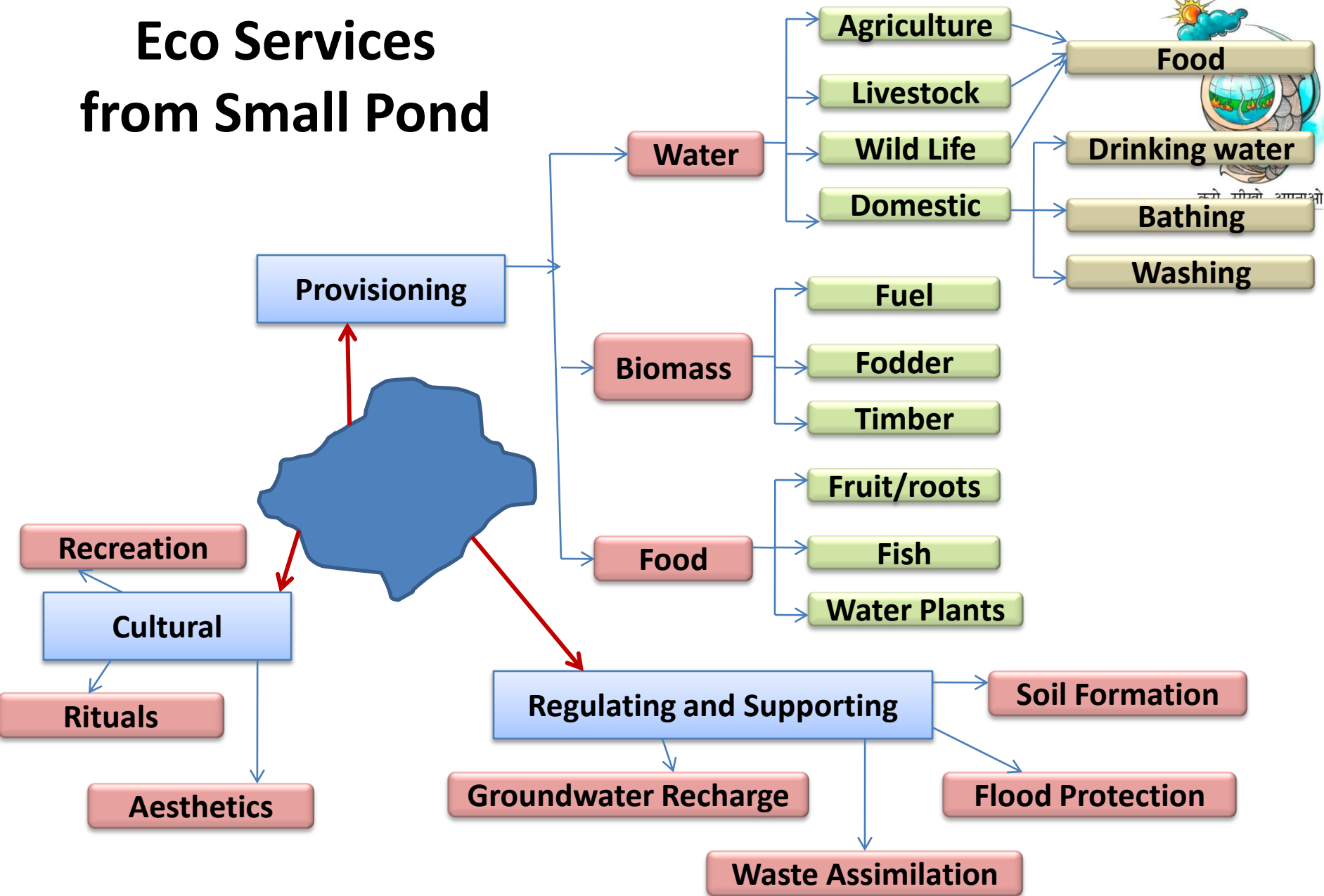




Important Factors Affecting Fish Business



Eco Services from Small Pond



Management Plan for Eco Services from Small Ponds



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Water Budgeting

- Seasonality of water availability
- Service provided by water

Maintenance Plan

- Pond maintenance (infrastructure)
- Catchment maintenance (physical works and anthropogenic encroachment)

Network of Ponds

- Planning for small ponds in the village/district
- Linkage with other ponds and water bodies
- Convergence in eco services from ponds

Sustainability Plan

- Planning for sustainability
- Resourcing for sustainability
- Role of Gram Panchayat

Pond Habitat Plan



Pond Profile

- Pond Morphology
- Bio Diversity of Pond
- Fish Diversity

Pond Restoration

- Protection (species, anthropogenic activities)
- Conservation (species low in abundance, control flow of silt and soil)
- Regeneration (in situ, brought from external sources)

Fish Practices

- Stocking density
- Harvesting practices



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