

Status assessment and planning for water security in Mokhada Block

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Content

- Objectives of the study
- Water status of Mokhada taluka
- Planning process
- Parameters for stress categorization
- Stress categorization at village level
- Habitations selected for study
- Intervention planning protocol design
- Case studies

Objectives of the study

An effort to evolve holistic approach towards regional resource planning

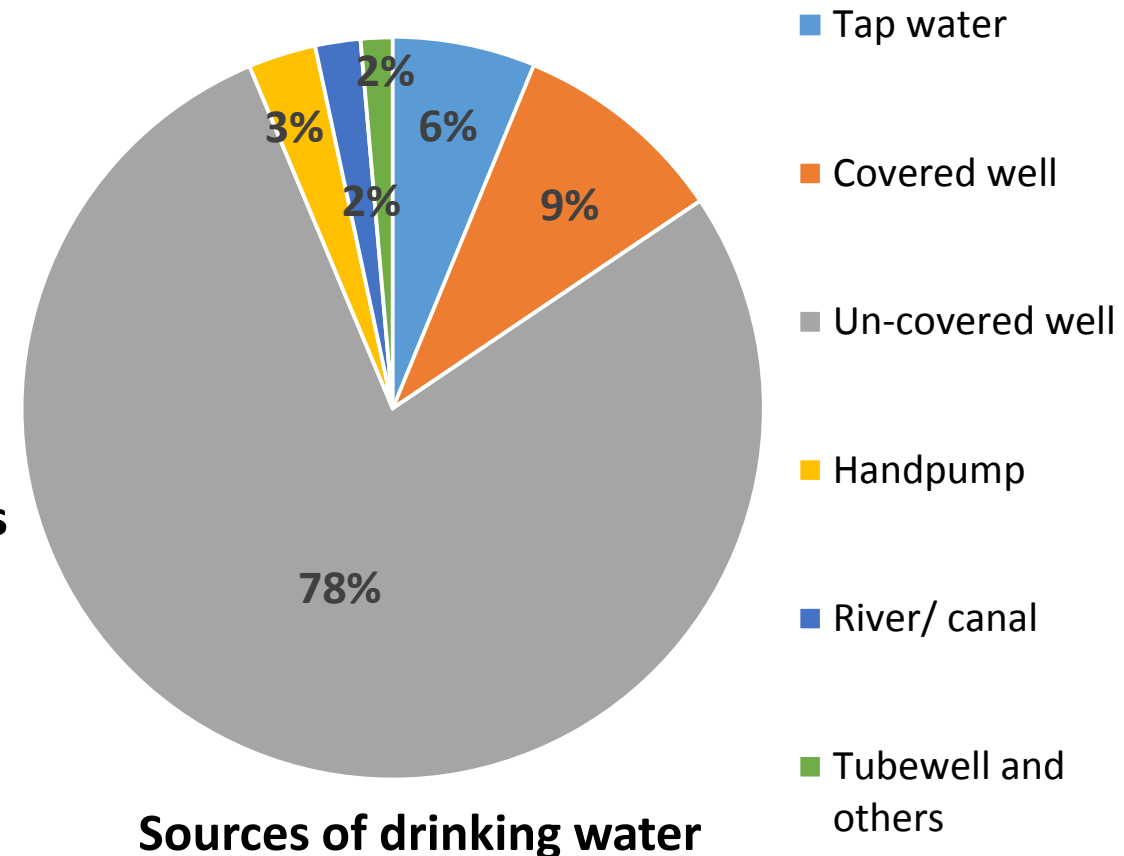
- Block as a planning unit
- Using water security as an anchor
- Can be extended towards other sectors such as energy, health, education etc.

Objectives of the present study

1. To get a taluka wide perspective of water security and identify stress/ challenges
2. To develop and design standard intervention protocols
3. Implement the protocol on pilot basis and study its impact thereafter.

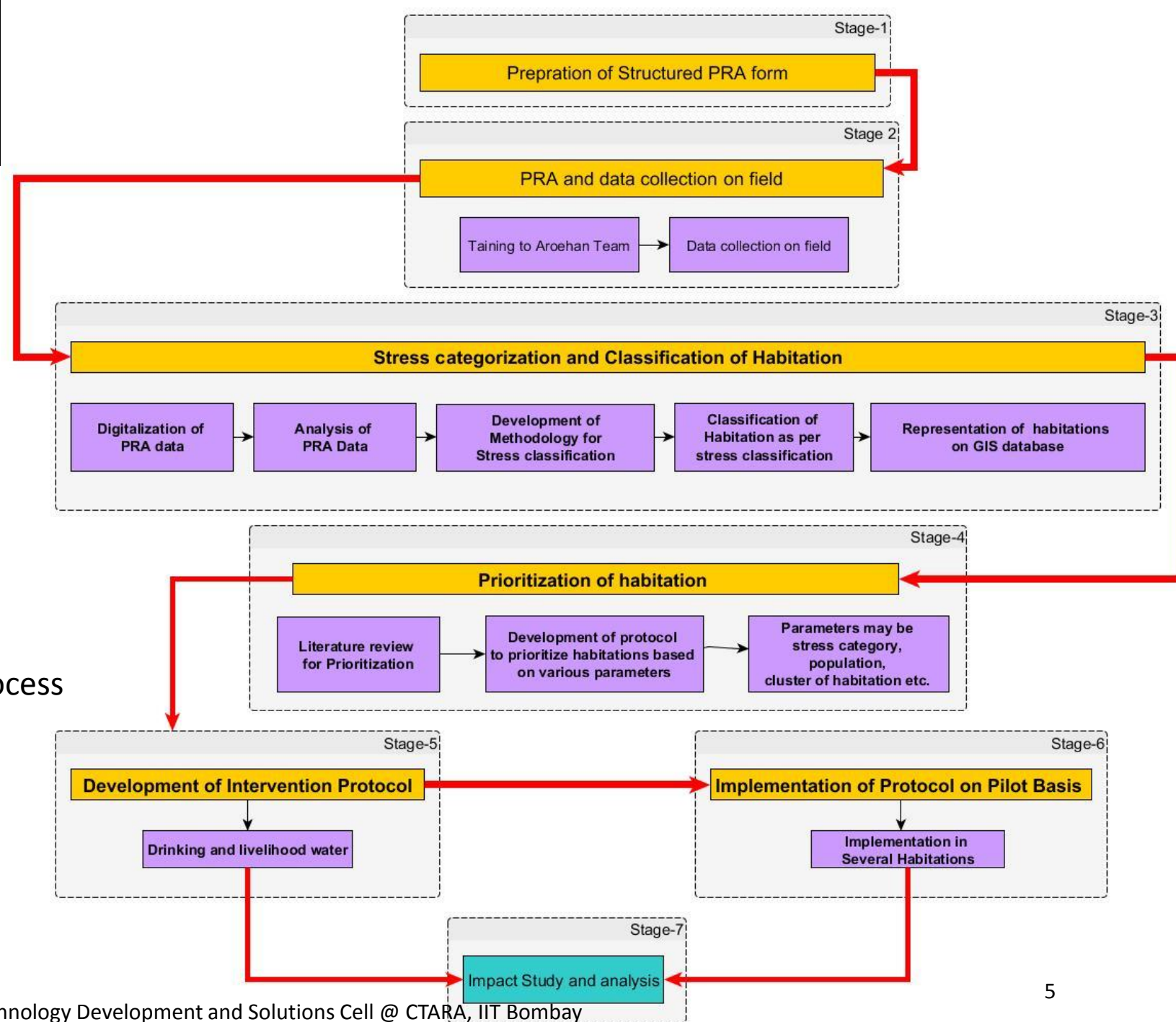
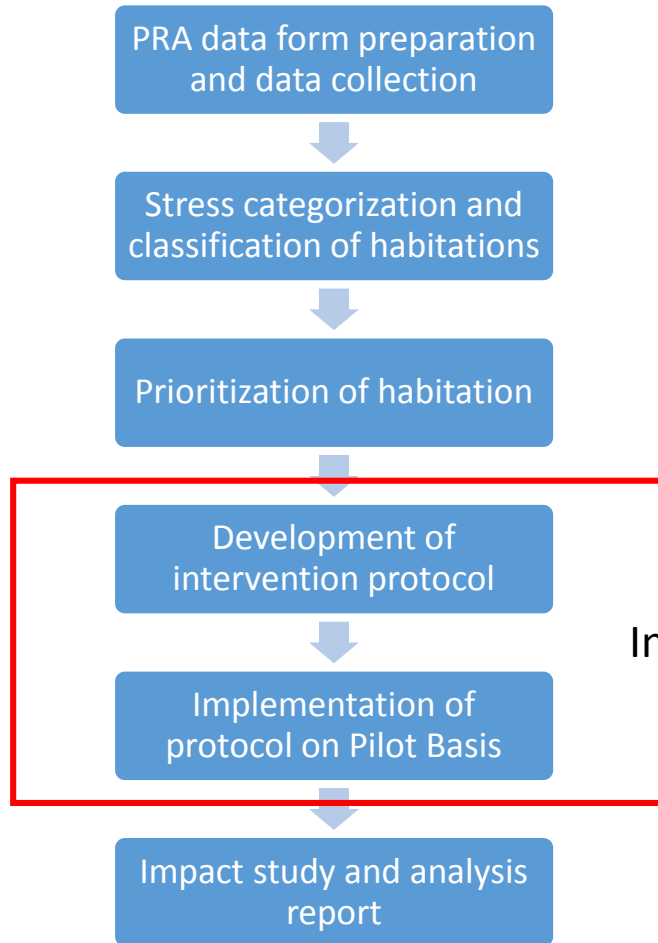
Water status of Mokhada taluka

- **Administrative details:** 27 Gram panchayats + 1 Nagar Panchayat, 59 villages and 236 habitations.
- **Geographical Area:** 494.83 km², mostly hilly
- **Population:** 83453 People (17789 HH)
- **Source of drinking water:** Ground water
- **Avg. Annual Rainfall:** 2300mm
- **High surface runoff and poor groundwater recharge**
- **Stage of ground water development ~5%, but habitations go dry after Feb.**



Ref: Census 2011, Thane District.
<http://maharain.gov.in/>

Planning process



Parameters for stress categorization

| Information from PRA | Principal features | Category |
|--|---------------------|----------|
| Availability | | |
| 12 month availability of water | Throughout the year | Low |
| Not available in April & May | 10 Month | Moderate |
| Available for few months after monsoon | Less than 10 months | High |
| Accessibility | | |
| Plain terrain, Pakka road | Good | Low |
| Moderate slope, Pakka road/ paulvat Plain terrain, paulvat | Fair | Moderate |
| Steep slope, Pakka road/pavulvat/ dangerous road Pain terrain, dangerous road Moderate slope, dangerous road | Tough | High |
| Quality | | |
| Good | Good | Low |
| Bad or Non-potable | Bad | Moderate |

Importance within parameters

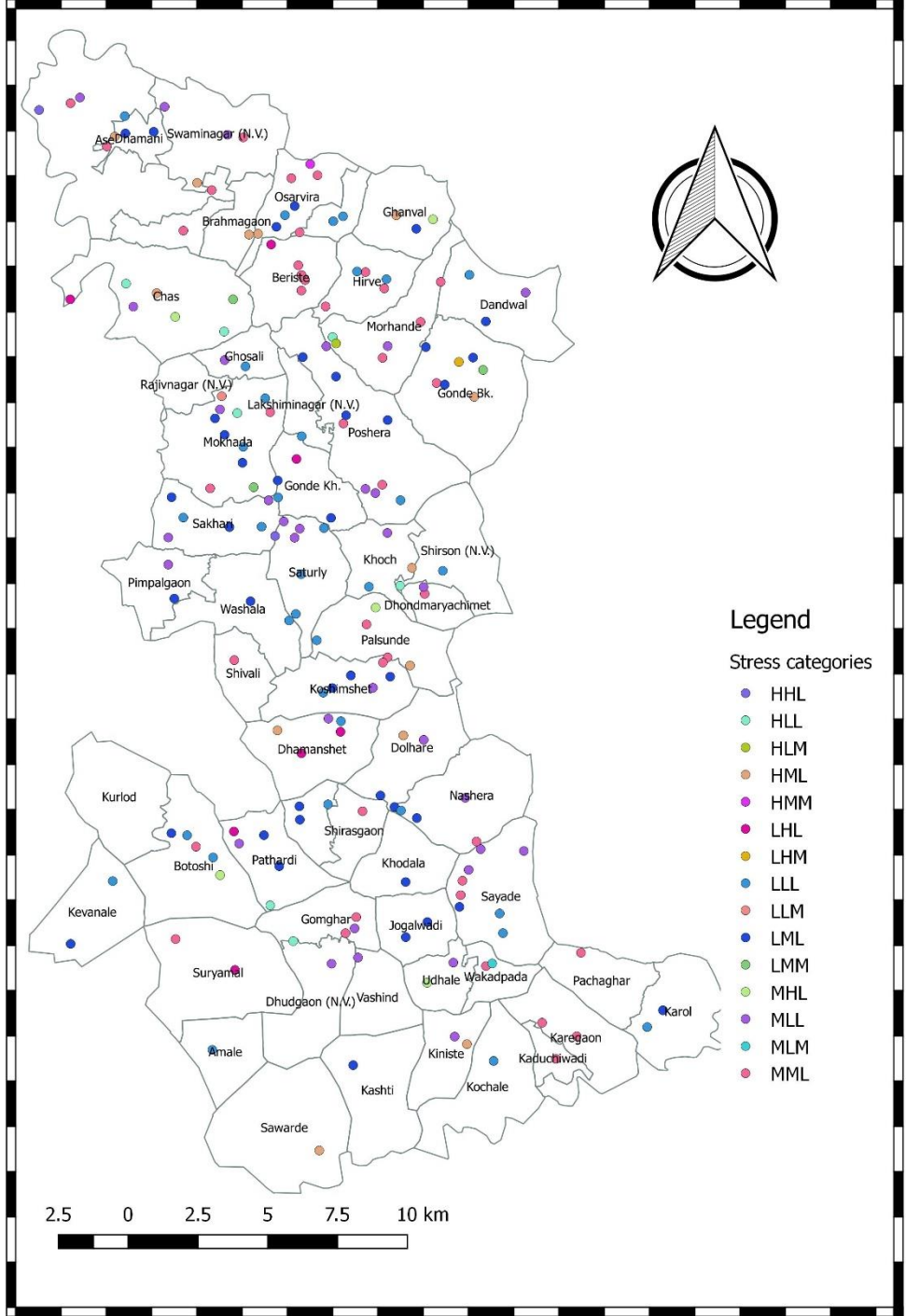
Availability > Accessibility >

Quality

Habitation level stress categories

Out of 18 identified stress categories, only **15 categories** were observed in Mokhada Taluka

| Sr. No | Availability | Accessibility | Quality | Category | Stress type |
|--------|--------------|---------------|---------|----------|-------------|
| 1 | L | L | L | LLL | No stress |
| 2 | M | L | L | MLL | Moderate |
| 3 | H | L | L | HLL | High |
| 4 | L | M | L | LML | Moderate |
| 5 | M | M | L | MML | Moderate |
| 6 | H | M | L | HML | High |
| 7 | L | H | L | LHL | High |
| 8 | M | H | L | MHL | High |
| 9 | H | H | L | HHL | High |
| 10 | L | L | M | LLM | Low |
| 11 | M | L | M | MLM | Moderate |
| 12 | H | L | M | HLM | High |
| 13 | L | M | M | LMM | Moderate |
| 14 | M | M | M | MMM | Moderate |
| 15 | H | M | M | HMM | High |
| 16 | L | H | M | LHM | High |
| 17 | M | H | M | MHM | High |
| 18 | H | H | M | HHM | High |



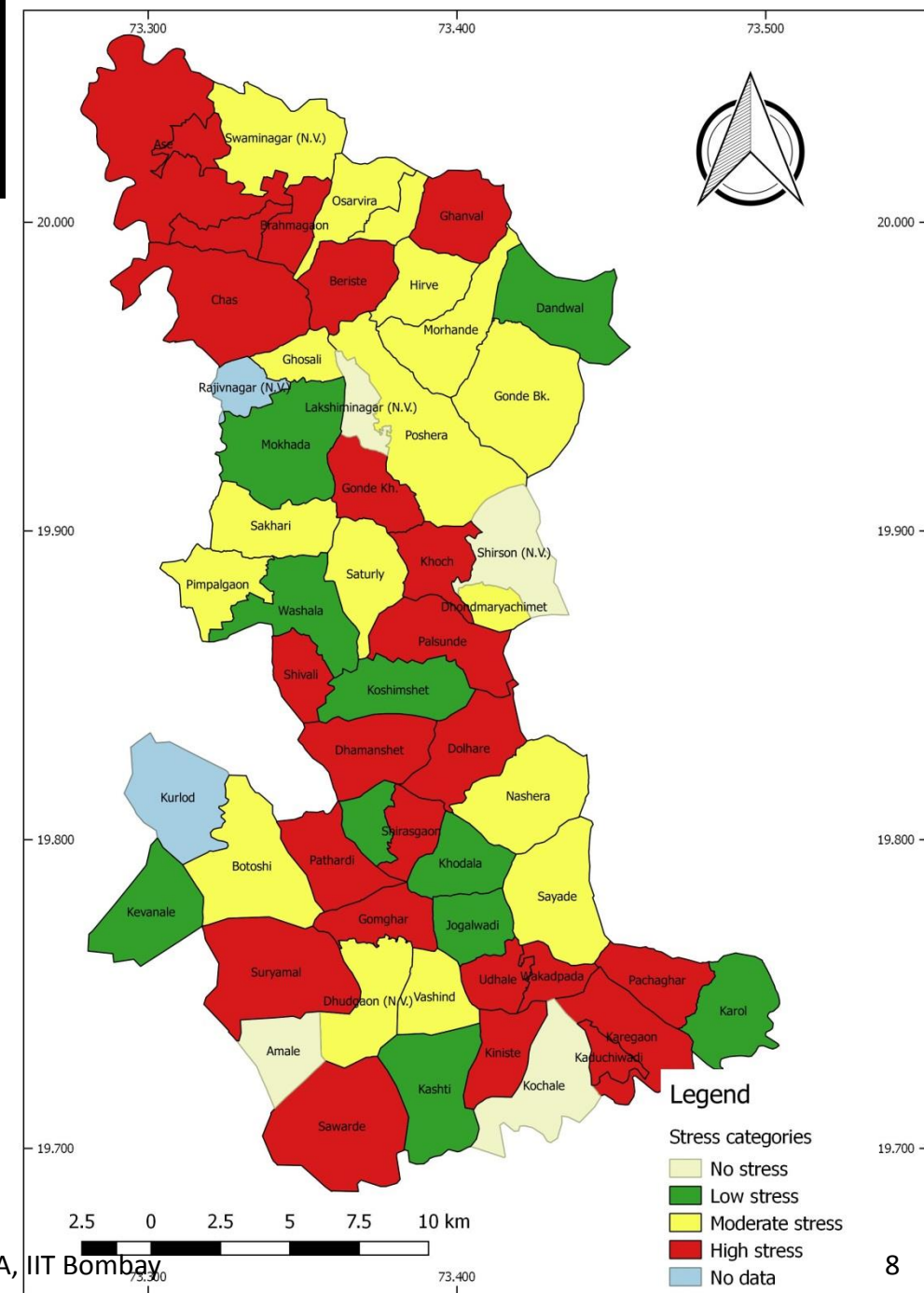
Stress categorization at village level

Parameter categorization

Habitation level stress categorization

Village level stress categorization

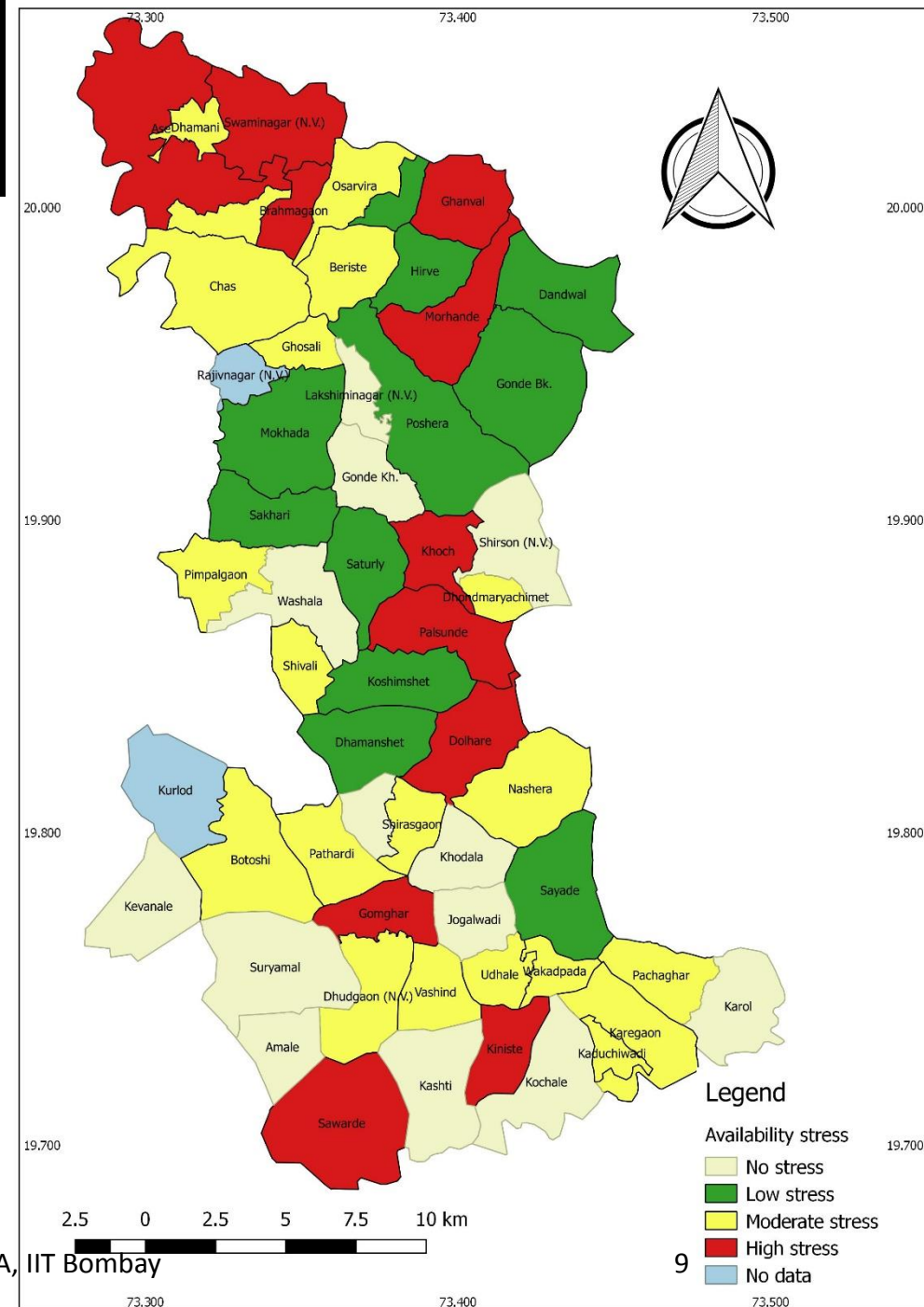
| Stress category | No. of villages |
|-----------------|-----------------|
| High stress | 24 |
| Moderate stress | 17 |
| Low stress | 12 |
| No stress | 4 |
| No data | 2 |



Stress categorization at village level

Availability stress

| Stress category | No. of villages |
|-----------------|-----------------|
| High stress | 11 |
| Moderate stress | 20 |
| Low stress | 11 |
| No stress | 15 |
| No data | 2 |

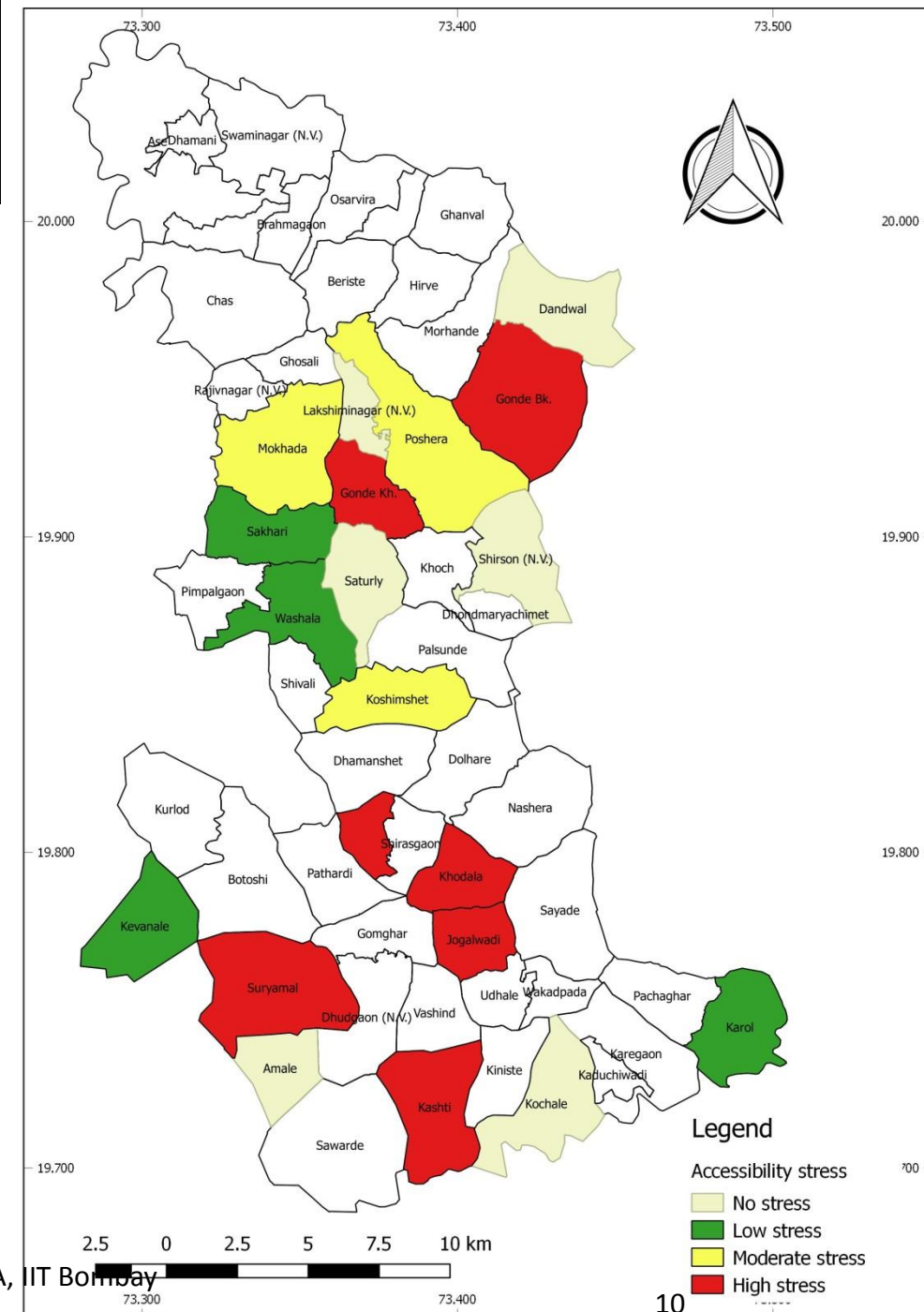


Stress categorization at village level

Accessibility Stress

(No or Very low stress of availability and quality)

| Stress category | No. of villages |
|-----------------|-----------------|
| High stress | 7 |
| Moderate stress | 3 |
| Low stress | 4 |

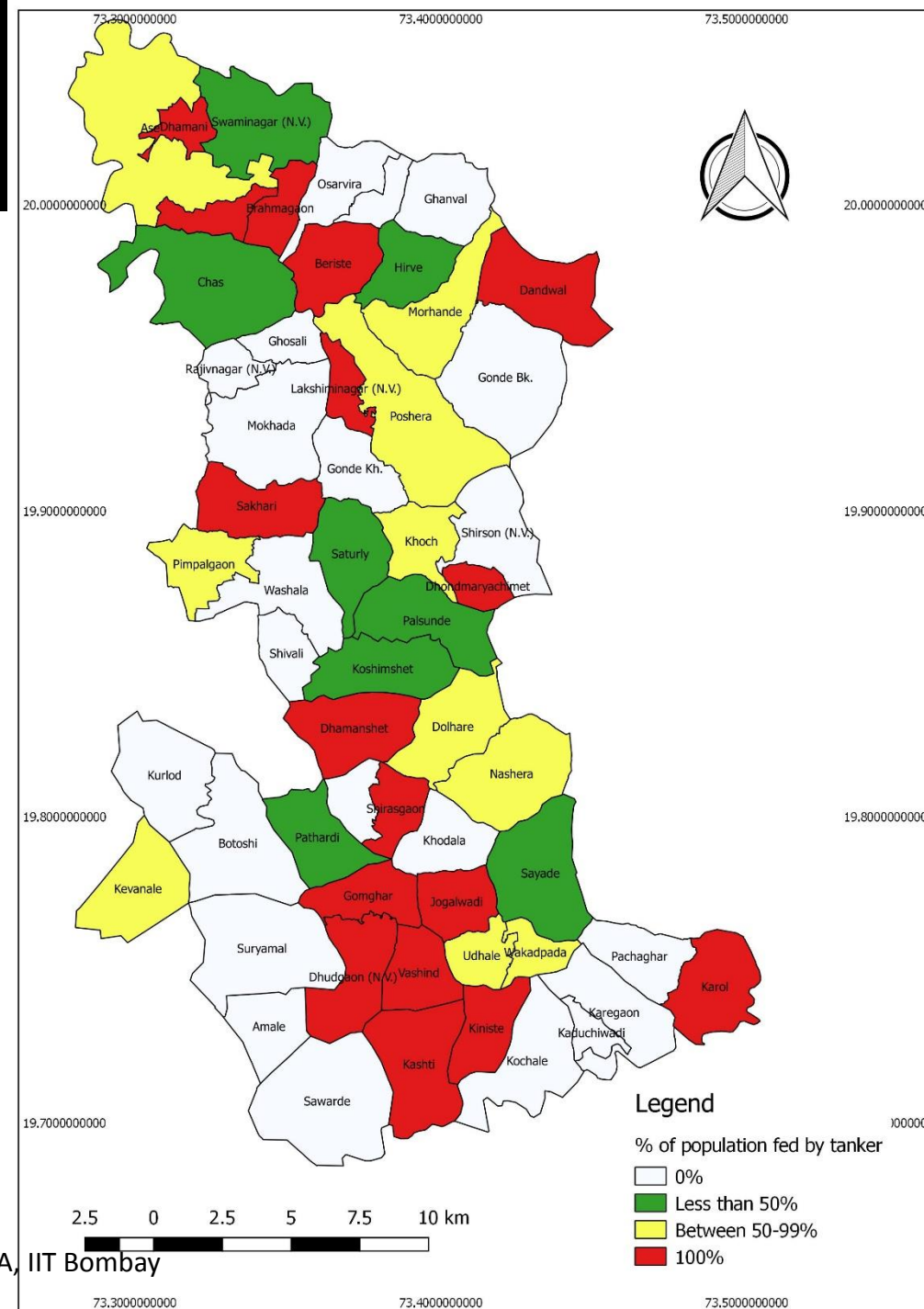


Stress categorization at village level

Tanker fed villages (for last two years)

| Stress category (% of population) | No. of villages |
|--------------------------------------|-----------------|
| 100% | 17 |
| 50-99% | 10 |
| Less than 50% | 10 |
| 0% | 22 |

Ref: Tanker fed list provided by RWS department, Mokhada



Stress categorization at village level

Expenditure by Government on NRDWP and JYS programs in last three years

| Expenditure | No of Villages |
|--------------------------|----------------|
| Significant expenditure* | 27 |
| Meager expenditure | 32 |

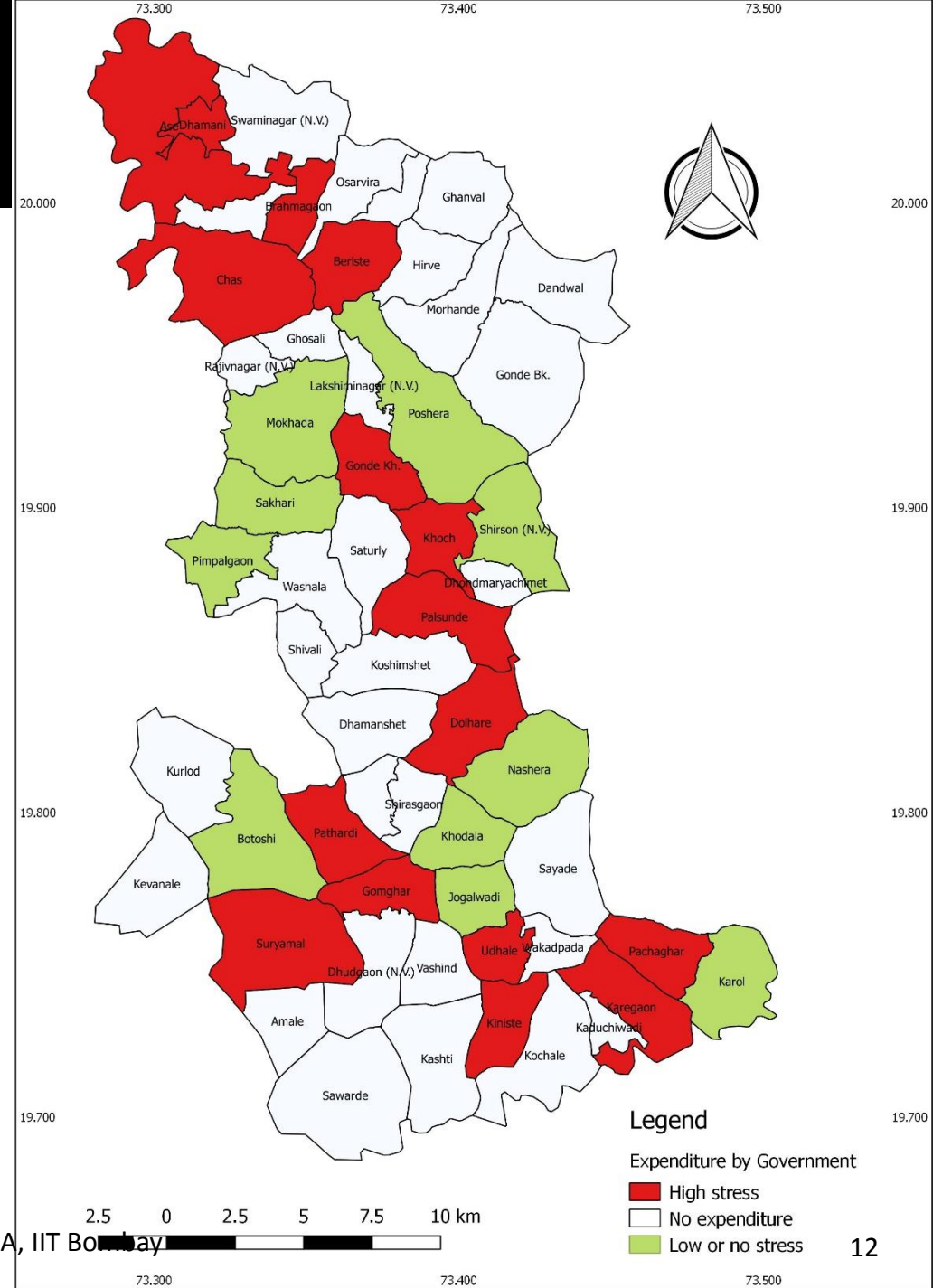
| Stress category | No. of villages |
|--------------------|-----------------|
| High stress | 17 |
| Not in high stress | 10 |

Inspite of spending lakhs of rupees by government, 17 villages are in high stress category.

* Significant expenditure means spending more than around 20 lakhs per village

Ref: NRDWP report of year 2013-2016.

Jalyukt Shivar report of year 2014-2015



Habitations selected for study

- Out of 3 Gram panchayat, **27 habitations are selected**
- All selected habitations have **high stress**, except habitations of Kevnale village
- Population benefited~ 10,600

| Gram Panchayat | Village Name | Habitation Name | Population | Stress Category |
|------------------|---------------|---------------------|------------|-----------------|
| Botoshi Pathardi | Pathardi | Dongar wadi | 475 | High stress |
| | | Pathardi 1 | 320 | |
| | | Pathardi 2 | 278 | |
| | | Pathardi- Patilpada | 320 | |
| | | Dhindewadi | 126 | |
| Suryamal | Kevnale | Bhavaniwadi | 324 | Low stress |
| | | Kevnale | 503 | |
| | Suryamal | Suryamal | 860 | High stress |
| Aase | Aase | Aase | 718 | High stress |
| | | Bhoirpada | 95 | |
| | | Bival pada | 197 | |
| | | Dapati 1 | 430 | |
| | | Dapati 2 | 275 | |
| | | Dhamodi | 203 | |
| | | Ikharicha pada | 256 | |
| | | Karoli | 397 | |
| | | Kolhedev | 337 | |
| | | Kudava | 370 | |
| | | Kunbhipada | 405 | |
| | | Rautpada | 262 | |
| | | Warghpada/Bhoirpada | 33 | |
| | Bramhangaon | Bramhangaon | 719 | High stress |
| | Dhamani | Dhamani | 262 | High stress |
| | Shastri nagar | Kundyacha pada | 694 | High stress |
| | Swami nagar | Bhowadi | 687 | High stress |
| | | Navlyahapada | 341 | |
| | | Swami nagar | 737 | |

Intervention planning protocol design

1. Status assessment of existing assets and its demarcation
2. Quantification of need for planning
3. Identification of existing assets for interventions
4. Intervention to reduce stress
5. Standard design and criteria for suitable location

Status assessment of existing assets and its demarcation

1. Verification of PRA data and stress categories.
 - i. Baseline data collection
 - Dimensions
 - Physical condition
 - Utility (drinking/domestic/irrigation)
 - Availability of water in term of months and distance of source from habitation or potential area
2. Demarcation/identification of existing built assets (well/CNB)
3. Demarcation of available perennial source (stream/river)

Quantification of need for planning

1. Current Requirement
 - i. Drinking water – Adequate quantity (40 lpcd) of water with acceptable quality is available within habitation.
 - ii. Livelihood water – Adequate quantity of water (depend on crop, livestock) is available
2. Gap Analysis
 - i. Drinking water –
 - Availability - Water is not available for few months from any existing source
 - Issue of accessibility - water is available but people have to fetch longer distance
 - Issue of quality - Visually found not fit for drinking
 - ii. Livelihood water
 - Availability - Water is not available for second crop or livestock
 - Accessibility - Water is available but difficulty in accessibility
3. Identification of possible interventions for sustainable approach
 - i. Suitable area treatment and drainage treatment measures

Identification of existing assets for interventions

1. In case reviving existing asset

- i. Verification of existing asset w.r.t. possible repair/ desilting/ nonstructural interventions to repair/ revive source structure or recharge structure
- ii. Availability for 12 months but accessibility/quality issue that is in resolvable condition
- iii. Availability for less than 12 months but intervention at asset level is possible by adding a new recharge structure

2. In case of building new asset

- i. Construction of new well
 - Suitable location criteria
- ii. Construction of new CNB
 - Suitable location criteria

Interventions to reduce stress

1. Drinking and domestic water

i. Availability

- Sustainability measures (for making water available for longer duration and for ground water recharge)
 - Repair of existing bund - if there are some minor leakages or partial damages
 - Construction of subsurface bund (SSB)
 - Construction of cement nala bund (CNB)
 - Construction of water harvesting structures
- Repair and revival of existing structure
 - Repairing/ Renovation of existing well
 - Deepening of well
 - Desilting

ii. Accessibility

- Construction of pathways
- Pumping of water from source to habitation

iii. Improving water quality

- Providing a protection net to avoid falling of leaves/ bird droppings in well
- In case of eutrophication, identifying the cause and resolving the issue at source
- In case of turbidity, improving quality by providing water filter, etc.

Interventions to reduce stress

2. Livelihood water

- i. Repairing of existing bund
- ii. Construction of new bund
- iii. Desilting of existing bund
- iv. Provision of community farm ponds

For drinking water, domestic water and water for irrigation and other livelihood purposes, the measures required for area and drainage treatment are:

A. Drainage Treatment

- i. Providing gabion/Loose Boulder structure
- ii. Cement Nala Bund
- iii. Small diversion canal

B. Area Treatment

- i. Contour Trench/ Bund
- ii. Old paddy field repair/Majagi
- iii. Farm bund

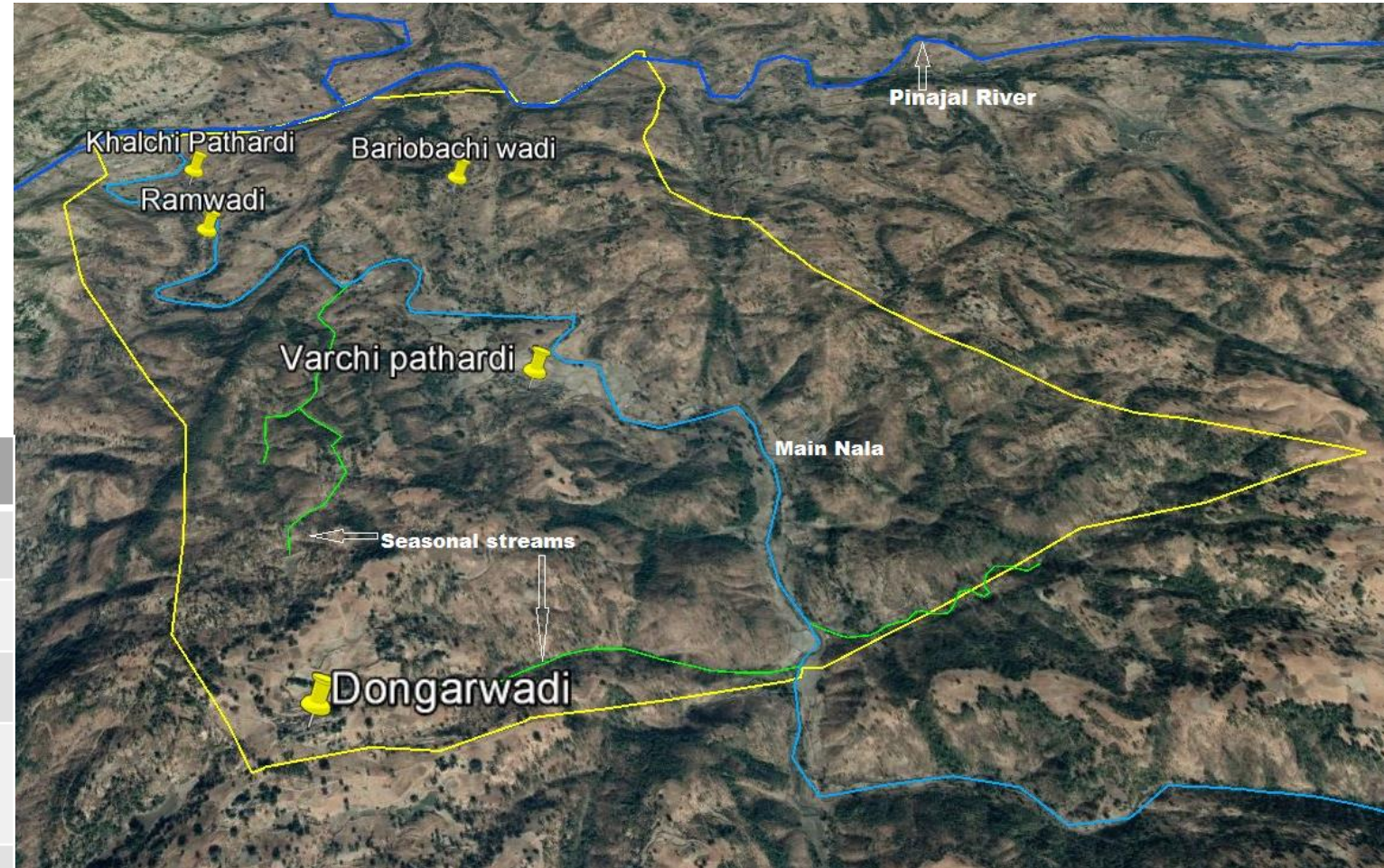
Kurlod Botoshi Model

- A water security planning exercise has been already done for Kurlod and Botoshi
- Kurlod and Botoshi are neighboring tribal villages in Mokhada block, Palghar district that face severe water scarcity, particularly from February till June
- Planning was done for **13 habitations** of Kurlod and Botoshi
- The project was executed in three phases, whereby,
 - Aim of phase I & II was to **increase water availability in the area for drinking and livelihood purposes,**
 - Phase III interventions were mainly **related to area treatment.**

Pathardi village Case study

- Consists of 5 habitations
- All habitations are along one seasonal nala
- Drinking water sources are based on ground water
- Potential agricultural area

| Habitation Name | Type of Stress |
|----------------------------|--------------------------|
| Patilpada/Khalchi Pathardi | Accessibility |
| Ramwadi/ Naviwadi | No stress |
| Bhairobachiwadi | Availability |
| Varchi Pathardi/ Pathardi | Availability and quality |
| Dongarwadi | Availability |



Patilpada habitation

- Drinking water stress can be reduced by providing pumping solution on well 1 and construct a new sub surface bund
- Storage structure
 - Water shortage due to broken and leaky bund



| | |
|----------------------------|------------|
| Potential agriculture area | ~ 15 acres |
| Currently irrigable area | < 1 acres |
| Could be irrigated | 2 acres |



Ramwadi/ Naviwadi habitation

- No agriculture area, habitations are in forest area
- One CNB used for domestic purpose



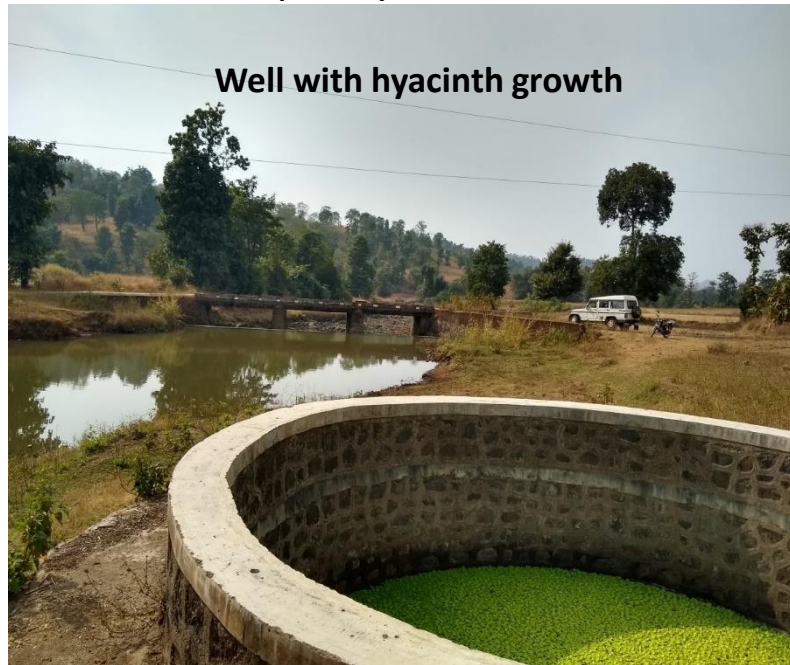
Bhairobachiwadi habitation

- Habitations are scattered at two location
- Habitation-A have stress of availability
 - Currently using Habitation-B source that is at 550 m away
- Solution can be pumping water from B to A
- Community farm pond can be option for irrigation



Varchi Pathardi/ Pathardi habitation

- Well 1 last till May but water quality issue though water used for drinking
- Well 2 also have quality issue



- Potential area and insufficient storage structure
 - 1-2 suitable location only
 - Community farm pond



Thank You...!!!

Questions, comments and suggestion

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