

River Basin Rejuvenation Programme

(Decentralized Community Driven and Government Supported River Basin Reform)

River Rejuvenation as a Adaptation and Mitigation for Climate Change

**“National Workshop on
"Rejuvenation of Rivers/Streams
through Watershed Development Approach"
at Bharat Mandapam, New Delhi.
29-9-2026**

1) How should Rivers / Streams with Declining flow Be identified.

- a) Ground water level depletion, GSDA Categorization of Watersheds as Critical and Over-Exploited .
- b) Water tankers Supplying Drinking Water.
- c) Shortage of Fodder and Reduced Milk Production
- d) Heavy migration from villages to urban Areas.
- e) Degraded Agriculture and Forest Lands.

2) What criteria Should be Used for river Stream selection.

- a) Flow in river during Monsoon Period.
- b) Reduced Sub surface flows.
- c) Dried up springs which feed the Streams and River.
- d) Ground water level very low. Aquifer Recharge not very good due to Geology of area or due to Heavy erosion and low Percolation
- e) Due to Chemical farming the Microbes and Earthworms that Make the soil perforated and act as sponge are destroyed leading soil to act as solid and does not allow water to recharge the Aquifers.

3) How Much of catchment area Treated.

Area extending upto Micro-Watershed or watershed be Undertaken for Treatment.

4) Watershed Interventions Most imp.

- a) Identification of 2nd order to 4th Order streams , demarcate them on the ground and remove encroachments by Widening & Deepening them to Increase their water carrying Capacity and their storage capacity.
- b) Treat The Catchment Area of Origin and Convert that area into **Forest Water Conservation sanctuary**. Construct Loose boulder Dams ,Soil Check dams, Deep CCT, Trench cum Mounds (TCM), forest lakes as watering holes, increase Grass Cover and Plant Native species of Trees

5) What institutional mechanism is required?

Meeting With Local Communities to Understand the Water Stress Situation, to Co-Create Water Budget and Coordinate with the Committee Created For River Rejuvenation work with Collector as Chairman



1) At The District Administration Level a Nodal Officer Designated as River Rejuvenation Officer to be Nominated. This Officer will Network and coordinate the Activities of Various Departments Like Water Resources, Soil and water Conservation, Rural Development , Land Revenue Forest, Social Forestry, Ground water survey , Agriculture, Horticulture, MRSac In case of Maharashtra etc. They will Provide inputs for Preparing a detailed Project Report

2) Involving Civil Society Members Experts who Have been Working for Decades in Jal Jungle Jameen Kheti and Janwar fields.

3) Involving the Large skilled Manpower Trained by Jal Saakshartaa Vibhaag at Yashda Maharashtra.

4) Chala jaanuya Nadila a flagship Programme Of Maharashtra Govt Has Done studies on 108 Rivers and created current Status Report on these Rivers which includes Suggestions by Communities and Government Officers for works to be Implemented to rejuvenate these Rivers

6) How should GIS, remote sensing and hydrological modelling be used?

- a) GIS and Remote Sensing Historical data can be Used as Baseline to study the Current Hydrological status of river Basin, Aquifer status, Land Use Pattern cropping Pattern , Forest Cover etc. Most Important Action required is to Identify and Demarcate water bodies , lakes which have been encroached upon Partially or fully and Rejuvenate them.
- b) This Data can Be Used for monitoring the impact of ongoing and progress of Implementation of Water Conservation structures.
- c) Historical Rainfall pattern and drought situation in the River basin can help in Evolving Predictive Forecasting of Droughts and Floods in the Region.
- d) It is However Very Important to Do the Ground truthing of the Technical data with the Indigenous traditional Knowledge and Wisdom of Local communities who have for Centuries managed their water Resources sustainably.

7) What outcomes should determine the success of a pilot?



8) How can communities protect and maintain the created assets?

Nadi sansad to Ensure Sanatan Aviralta, Nirmalta and Swatantrata of River A Paradigm shift from Rights to responsibilities Model.

1) Identify and nominate 5 Volunteers in each village of River Basin who are committed and dedicated to Ensure water Security in the River basin. These Volunteers Act as **Custodians and Trustees** of The river and water conservation structures constructed.

2) The **River Trustees** from All villages of River basin will form a **Nadi Sansad**.

Functions and Responsibilities of Nadi Sansad

a) To Ensure **Aviralta, Nirmalta** of River , with the Understanding that River Nurtures both Nature and Humans and they have Right on Water. They shall ensure Ecological Flow of Water which will ensure Ground Water Recharge .

B) Ensuring Equitable Distribution of water from Origin to Confluence, Avoiding Over Exploitation on the entire Course of River.

C) Maintaing, Ecological, Hydrological , Biological and chemical Integrity of River.

D) Motivating the River Basin Population to Undertake Rooftop Rain water recharge of wells and Borewells.

E) Aligning of Cropping Pattern with availability of water in the River Basin.

F)River Health and Human health is Interdependent ,healthy River Healthy civilization.

Continued-----

G) Measuring Entire Length of River and installing Markers at Every 500 Mts , Every Km. showing Distance at any point from origin on One face and upto Confluence on another. Entire Community will Know the Length of River. The communities will inculcate a River Basin Overview.

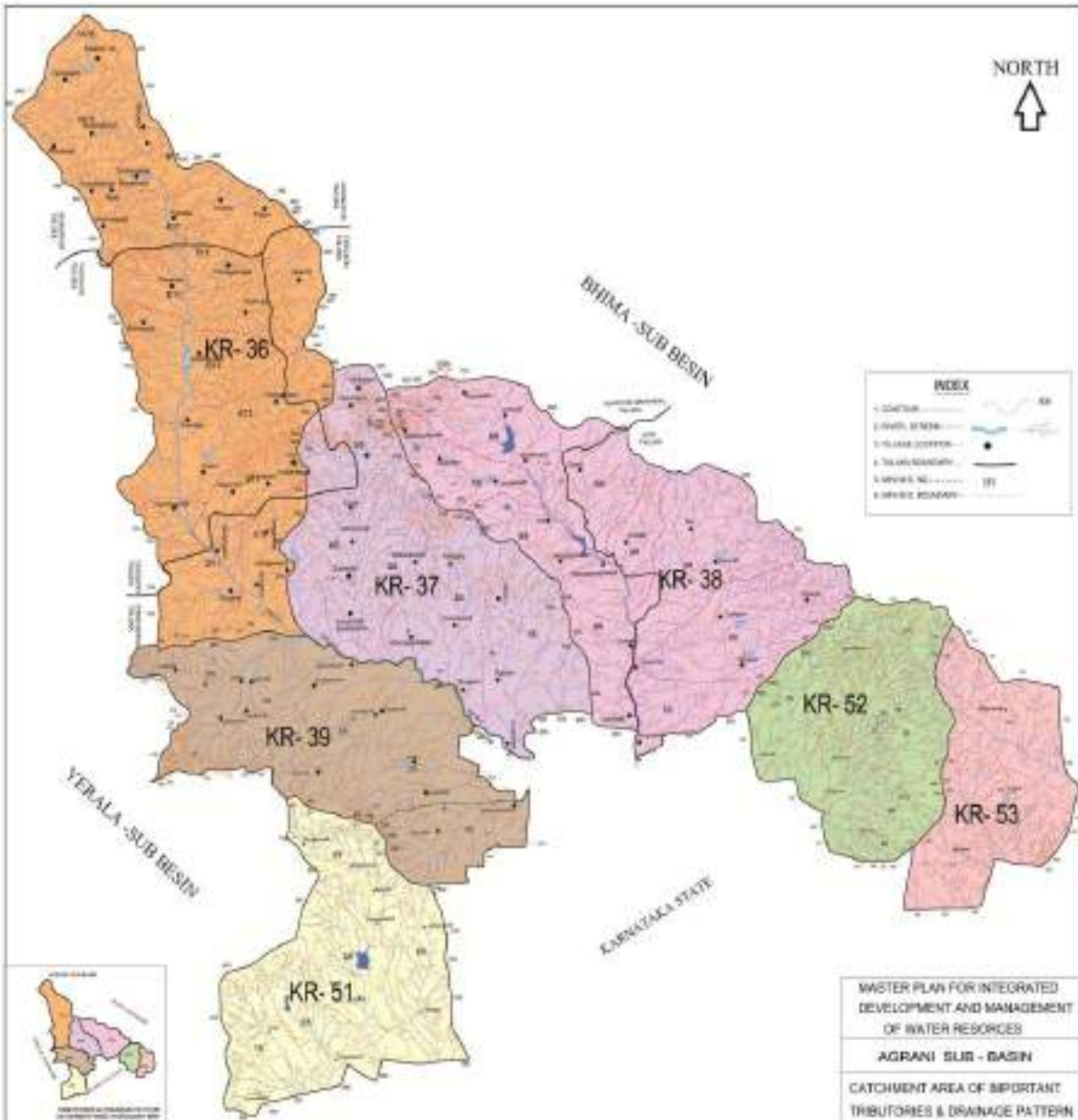
H) 2 River Custodians will take responsibility of 1 KM on One bank and 2 Custodians will Take responsibility on another Bank. They will ensure plantation on river Banks , check Encroachments Prevent Pollution and disincentivise over exploitation. This will ensure Mapping of Bio Diversity and updating Bio Diversity Register of River Basin Villages. Involving college Students , Research students of University who will take part in Undertaking such activities and be part of River Rejuvenation initiative .

I) These River Custodians Nadi Sansad members will Liase with

- 1) Sant (Domain experts),**
- 2) Shasan (Govt ,Administration ,**
- 3) Samaaj (River basin communities**
- 4) and Mahajan**

Mandatory recommendations

- 1) River Basin, Sub River Basin , Watershed and Micro watershed Boundaries to be Held Sacrosanct.
- 2) Administrative Boundaries of District, Talukas and Villages will Play a secondary Role, i.e administratively Supportive Role.
- 3) At Village Level Awareness to be Created of River basin Approach by Involving Communities with the Basin Map.



The 2013 drought in Maharashtra is remembered as one of the worst environmental and agrarian crises in over 40 years, since 1972 severely gripping the semi-arid eastern belt of the Sangli district

- The drought was most severe in the eastern and north-eastern talukas of Sangli, primarily: **Jath (Jat), Kavathe Mahankal, Khanapur, Tasgaon (Agrani River Basin Taluka's)**
- **GSDA had Categorized This River Basin as Dark Zone. Ground water was Over Exploited**
- These areas fall into a rain-shadow region and Receive Return Monsoon Rains.

Water Tanker Supply Operations

Jath, Kavathe Mahankal, Khanapur, and Tasgaon, thousands of villages and hamlets (*wadis*) completely ran out of groundwater. The state deployed fleet networks of government and private water tankers daily to fill village community tanks and household plastic containers.



Cattle Camps (*Chara Chavanis*)

To prevent mass livestock deaths and the distress sale of animals, large-scale cattle fodder camps (*chara chavanis*). The famous [Mann Deshi Cattle Camp](#) operating in **Jath, Kavathe Mahankal, Khanapur, and Tasgaon** housed thousands of animals collectively under temporary green shade nets, providing them with targeted daily allocations of fodder and water.



Relationship of Forests with Water Scarcity

Sr. No	Particulars	Total Area in Sq. Km
1	Sangli Dist Geographical Area	8572
2	Total Dist Forest Area	510
A	Forest Department Area	399
B	Reserve Forest Dept Area	103
C	Private Forest Area	8
3	% of Forest area of Sangli	5.95%
4	Out of 510 SQ.Km of Dist Forest Agrani River Basin has 94 Sq.Kms (i.e 23.55%)	94
5	Agrani River Basin Forest is 23.55% of Sangli Dist Forest	23.55%

Agrani River Basin (Forest Area) Watershed Wise

Sr. No	Water Shed No	No Of Villages	Total Area in
1	KR-36	15	5,017.12
2	KR-37	7	567.46
3	KR-38	12	1,555.25
4	KR-39	9	1,561.27
5	KR-51	2	320.33
6	KR-52	3	378.49
7	KR-53	-	
Total		48	9400

अग्रणी नदी खोऱ्याचे एकूण क्षेत्र 133800 हेक्टर

अग्रणी नदी खोऱ्याचे एकूण वन क्षेत्र 9400 हेक्टर

म्हणजेच अग्रणी नदी खोऱ्यात फक्त 7 % वन क्षेत्र आहे.

[illegible]

Dist	Forest Area % of Total Area	No of Tankers
Beed	1.64	939
Ahilya Nagar	1.58	822
Jalana	0.49	667
Solapur	0.32	315
Dharashiv	0.62	220

No Tankers in District of : Gadchiroli, Chandrapur, Bhandhara, Kolhapur, Nandurbar As forest Area 20% to 33 %

Vision To Create a Forest Conservation Sanctuary at The Ridge , Origin Of River

Concept of the Forest Water Conservation Sanctuary

A **Forest Water Conservation Sanctuary** is conceived as a specially protected and ecologically restored zone around the **origin and upper catchment of a river**, where forest restoration, soil conservation, water conservation and ecological regeneration are undertaken in an integrated manner.

The sanctuary would demonstrate the **forest–water relationship** and function as a natural water-retention and recharge system.

Forest degradation → increased runoff → soil erosion → stream siltation → reduced infiltration and storage → declining groundwater recharge → reduced lean-season flow → vegetation stress → further forest degradation.

The Forest Water Conservation Sanctuary seeks to reverse this cycle.

The principal objective of the Forest Water Conservation Sanctuary is to secure and ecologically restore the vulnerable high-altitude and upper-catchment zones where rivers originate.

The major objectives are to:

1. Restore and strengthen native forest vegetation.
2. Reduce soil erosion and arrest the loss of fertile topsoil.
3. Slow down torrential rainwater runoff.
4. Increase infiltration and groundwater recharge, thereby reducing the evaporation loss.
5. Revive springs and strengthen primary tributaries.
6. Improve soil moisture and ecological conditions within the catchment.
7. Regulate downstream water flow.
8. Reduce sedimentation of streams, dams and reservoirs.
9. Create habitat and watering opportunities for wildlife.
10. Establish conditions for sustained **base flow during the non-monsoon period.**
11. Promote ecological continuity from the river origin to downstream areas.
12. Demonstrate the relationship between **healthy forests and healthy rivers.**

Deep CCT Work to Arrest Soil Erosion & Water Conservation For Rejuvenation & Development of Forest Lands



Rejuvenation & Development of Forest Lands



Deep CCT Work to Arrest Soil Erosion & Water Conservation For Rejuvenation & Development of Forest Lands



Deep CCT Work At Village **Khalati Tal. Jath**



Deep CCT Work At Village **Khalati Tal. Jath**

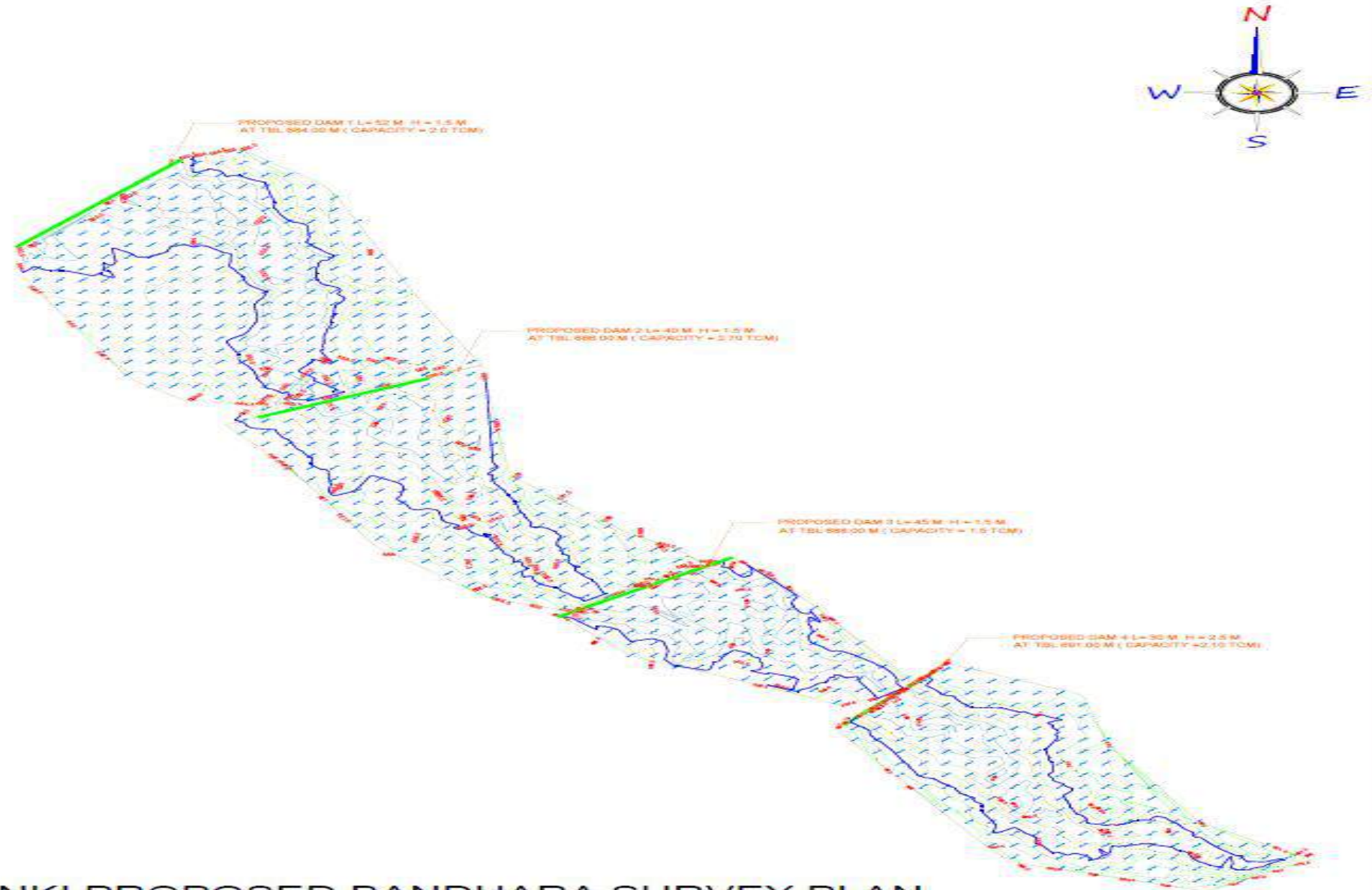


Deep CCT Work and Mati Nallah Bandhs Constructed on Forest Land at Vill Daflapur Tal Jath





Contour Survey of site with Markings of four Proposed Mati Nallah Bandh's to optimize the storage capacity of the structures



BELUNKI PROPOSED BANDHARA SURVEY PLAN

Google Locations of Mati Nallah Bandh's At Belunki Village – Taluka Jath, Sangli



Forest Lakes Work Completed.





Belunki Village Forest Lakes Filled up with rain Water on 22.09.2026



Belunki Village Forest Lakes Filled up with rain Water on 22.09.2026



Visit Of ShriLaxmi.A (Chief Conservator of Forest) At Belunki Lake Site 14.07.2026



**Plantation at the Hands of ShriLaxmi. A (Chief Conservator of Forest) At Belunki Lake Site
14.07.2026**



Latitude: 17.032873
Longitude: 75.111292
Elevation: 691.7+7.4 m
Accuracy: 3.0 m
Time: 14-07-2026 18:12
Note: बेल्की बरसात रोज जंगल



Latitude: 17.032751
Longitude: 75.111156
Elevation: 687.12+9.1 m
Accuracy: 3.0 m
Time: 14-07-2026 18:54
Note: बेल्की बरसात रोज जंगल

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**After Construction Of Check Dam Widening
and Deepening of Stream Undertaken
12.08.2017**



**Dam Gets Filled Up After good
Rains on 20/10/2018**



Bandhara Cement Check Dam on Mahankali River a Tributary of Agrani River



2020/09/22 09:24

Bandhara Cement Check Dam on Mahankali River a Tributary of Agrani River



CM Shri. Devendra Fadnavis visit to Agrani River in 2014



Concrete Jacketing of 30 Cms on All sides done to stop Leakage

दि. 30.08.2019



दि. 02.09.2019



दि. 07.09.2019



बंधारा काम पूर्ण झाले नंतर ओढा पत्रातील गाळ काढताना.

दिं. 09.09.2019



दिं. 09.09.2019



हातपंप पाण्यात बुडाला आहे.

दि.
01.10.2019



दि.
21.10.2019



Google Locations of Mati Nallah Bandh's At Belunki Village – Taluka Jath, Sangli



Forest Lakes Work Completed.





Belunki Village Forest Lakes Filled up with rain Water on 22.09.2026



Belunki Village Forest Lakes Filled up with rain Water on 22.09.2026



Belunki Village Forest Lakes Filled up with rain Water on 22.09.2026



Village Ranjani Kavthe Mahankal Taluka .



कामा पूर्वी



कामा नंतर

Streams Filled Up with Rain Water at Village Ranjani Tal Kavthe Mahankal 01.08.2025



कामापूर्वी रांजणी ता.कवठे महाकाळ जि.सांगली. दिं. 12.06.2025



कामानंतर रांजणी ता.कवठे महाकाळ जि.सांगली. दिं. 02.08.2025



कामापूर्वी रांजणी ता.कवठे महाकाळ जि.सांगली. दिं. 12.06.2025



कामानंतर रांजणी ता.कवठे महाकाळ जि.सांगली. दिं. 02.08.2025



Ranjani Village Tal Kavthe Mahankal 06.08.2025



अग्रणी नदी खोऱ्यात झालेल्या जल संधारण कामामुळे बोअरवेल मधून आपोआप पाणी येत आहे.



Ranjani, Maharashtra, India 
Xxf6+wf, Ranjani, Maharashtra 416411, India
Lat 16.975378° Long 74.962242°
19/09/2025 02:27 PM GMT +05:30

GPS Map Camera



Natural Capital Accounting and Valuation of Ecosystem Services to assess the **Efficacy of Agrani River Rejuvenation**

TV Ramachandra, Paras Negi & Tulika Mondal

"When Water Flows, Equality Grows"
जेव्हा पाणी वाहते, तेव्हा समानता वाढत

IISc-EIACP, Energy & Wetlands Research Group (EWRG)

Centre for Ecological Sciences, CES TE-15

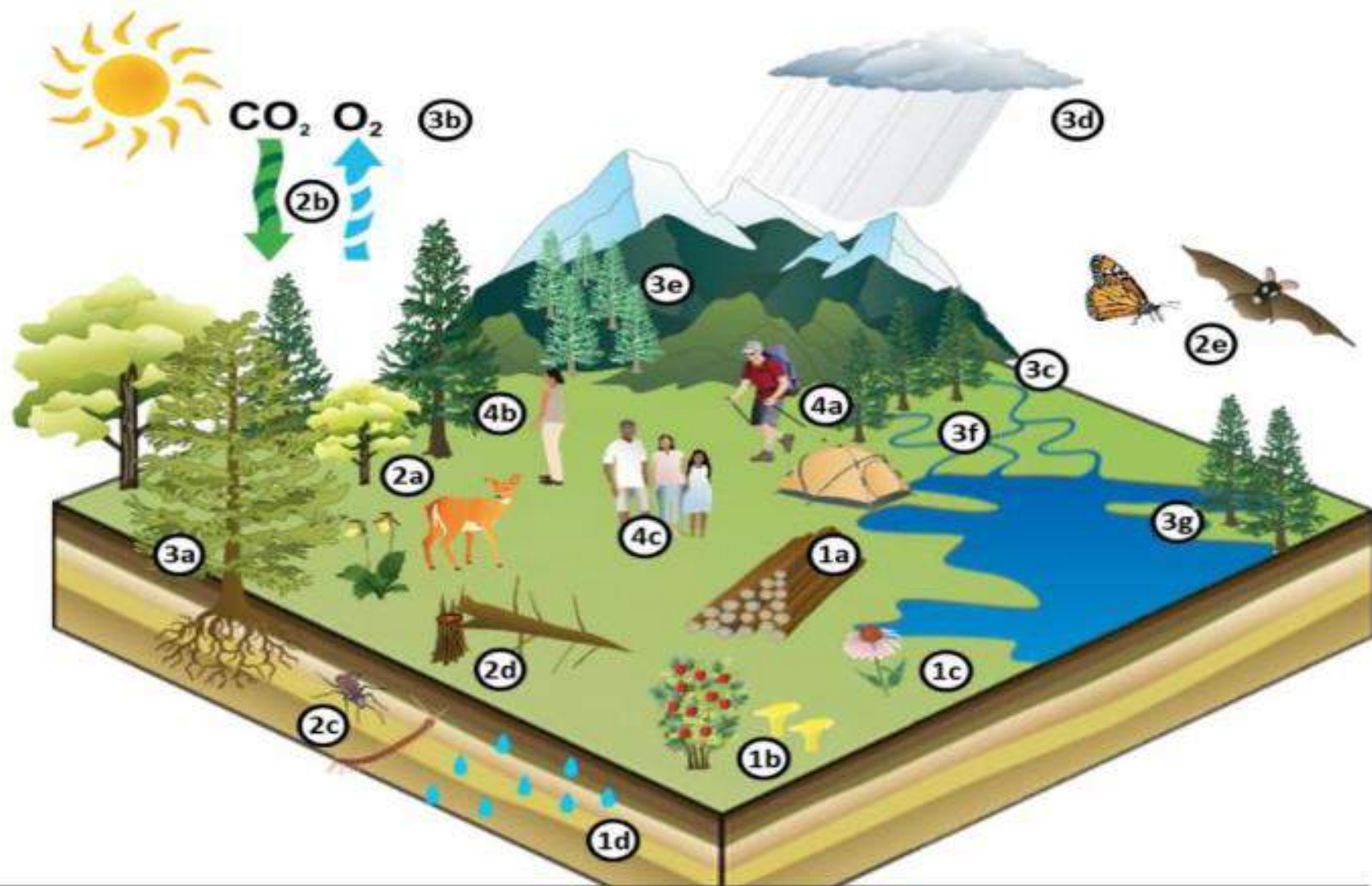
Indian Institute of Science (IISc), Bangalore-560012, INDIA

<https://wgbis.ces.iisc.ac.in>

Email: envis.ces@iisc.ac.in, tvr@iisc.ac.in | Telephone: 080-22933099 / 22933503 / 23608661

ECOSYSTEM SERVICES – SUPPORTING THE LIVELIHOOD OF ALL BIOTA





Ecosystem services of forests

1. Provisioning Services

- Timber/Fibre (construction, energy)
- Food (deer, fruits, herbs, seeds, honey)
- Chemical and medicinal products
- Water

2. Regulating Services

- Habitats for fauna and flora (biodiversity)
- Photosynthesis/Primary production
- Soil formation
- Nutrient cycling
- Pollination, seed dispersal

3. Regulating Services

- Carbon storage (above/below ground)
- Purification of air
- Purification of water
- Climate regulation
- Protection against erosion/avalanches
- Flood mitigation
- Protection against coastal erosion and storms

4. Cultural Services

- Recreation/Aesthetics
- Spirituality
- Education

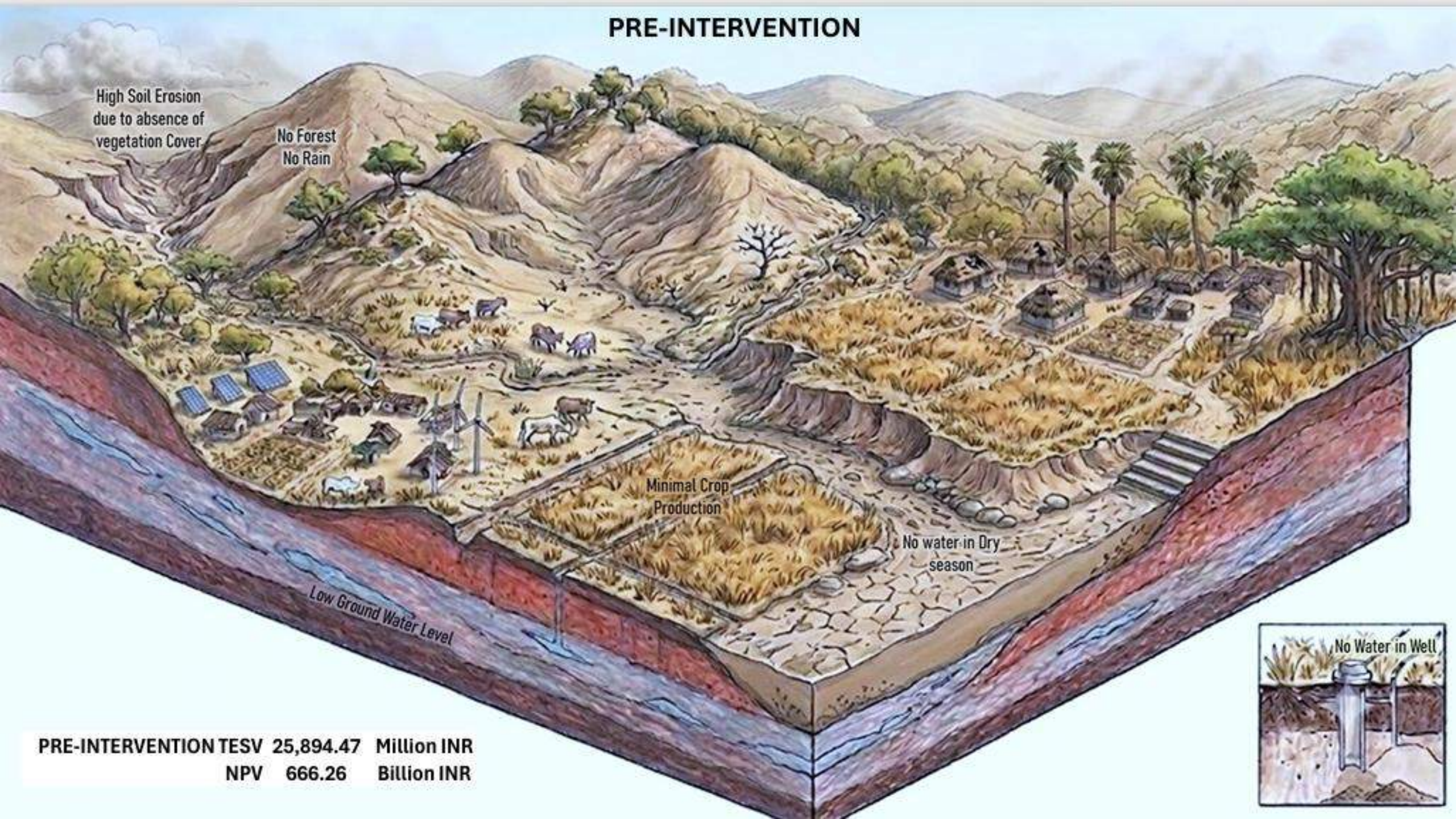
Current Economic Metrics (GDP) does not account for contributions from the NATURE or degradation costs of ecosystems (with the implementation of the developmental projects). We need GREEN GDP for a strong and healthy Nation

Figure 4. Categorized ecosystem services provided by forests (source: Holzwarth et al., 2020)

Research Highlights

- ❖ Agrani basin covering 1,909 sq. km Maharashtra and Karnataka, supporting 4.2 lakh people across 166 villages.
- ❖ Severe water scarcity that limited cultivation to only 10% of land.
- ❖ Through Nature-based solutions - Shifted focus toward high-value cash crops and expanded acreage.
- ❖ Implementation of 61 rainwater harvesting structures, riverbank stone pitching, bamboo plantations, and native species afforestation.
- ❖ Ecosystem Services:
 - ❖ Provisioning: Increased by ₹56,851/ha/year.
 - ❖ Regulating: Increased by ₹31,067/ha/year.
 - ❖ Cultural: Showed the highest relative growth rate.
- ❖ Annual Total Ecosystem Supply Value surged from ₹25,894M to ₹37,530M.
- ❖ Achieved a 45% increase in Net Present Value (NPV) of agricultural land assets (to ₹2.28M/ha).
- ❖ Incremental benefits (₹1,164 Cr) outweigh annualized intervention costs (₹59.72 Cr) by 792:1.

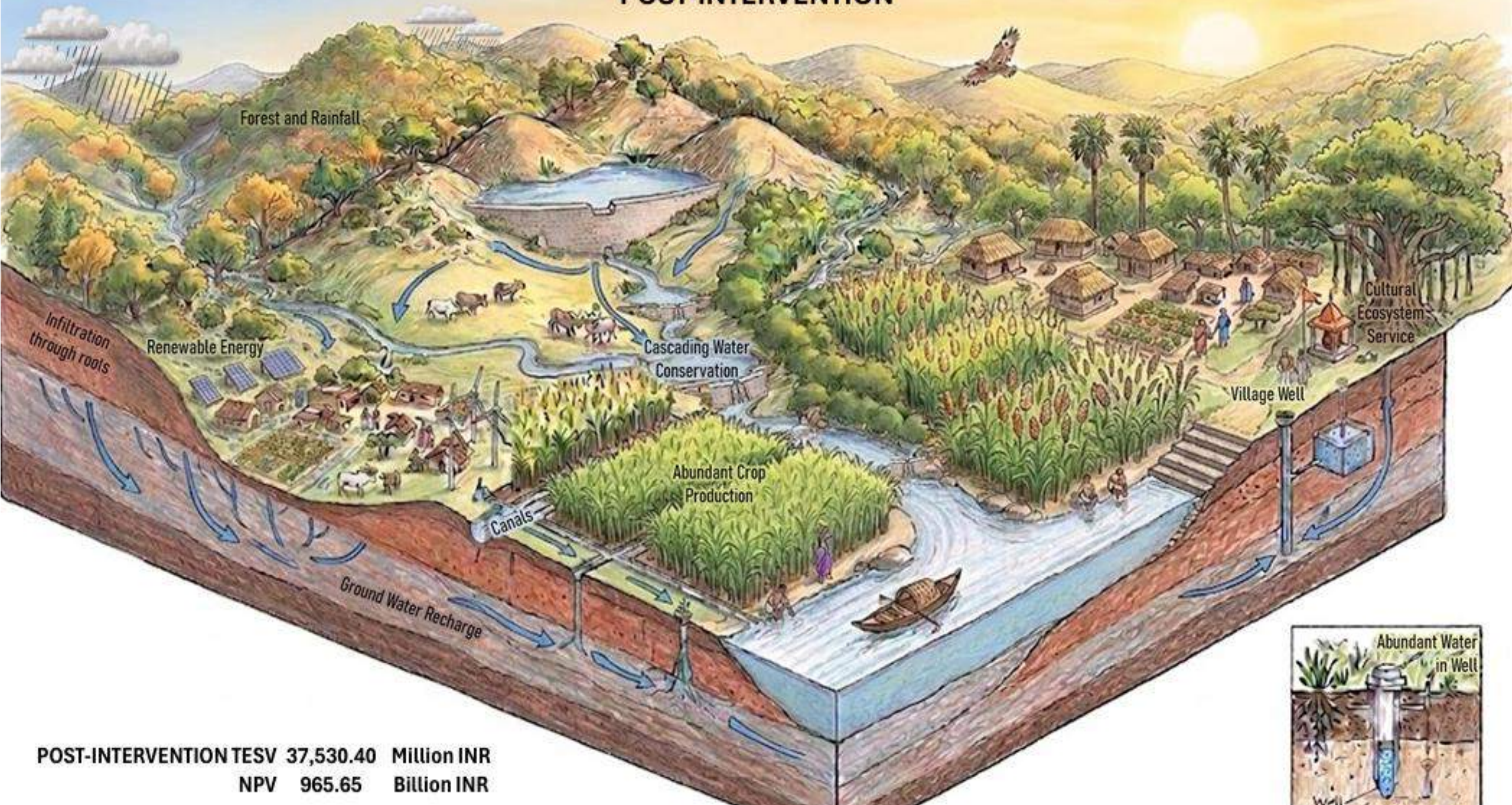
PRE-INTERVENTION



PRE-INTERVENTION TSV 25,894.47 Million INR
NPV 666.26 Billion INR



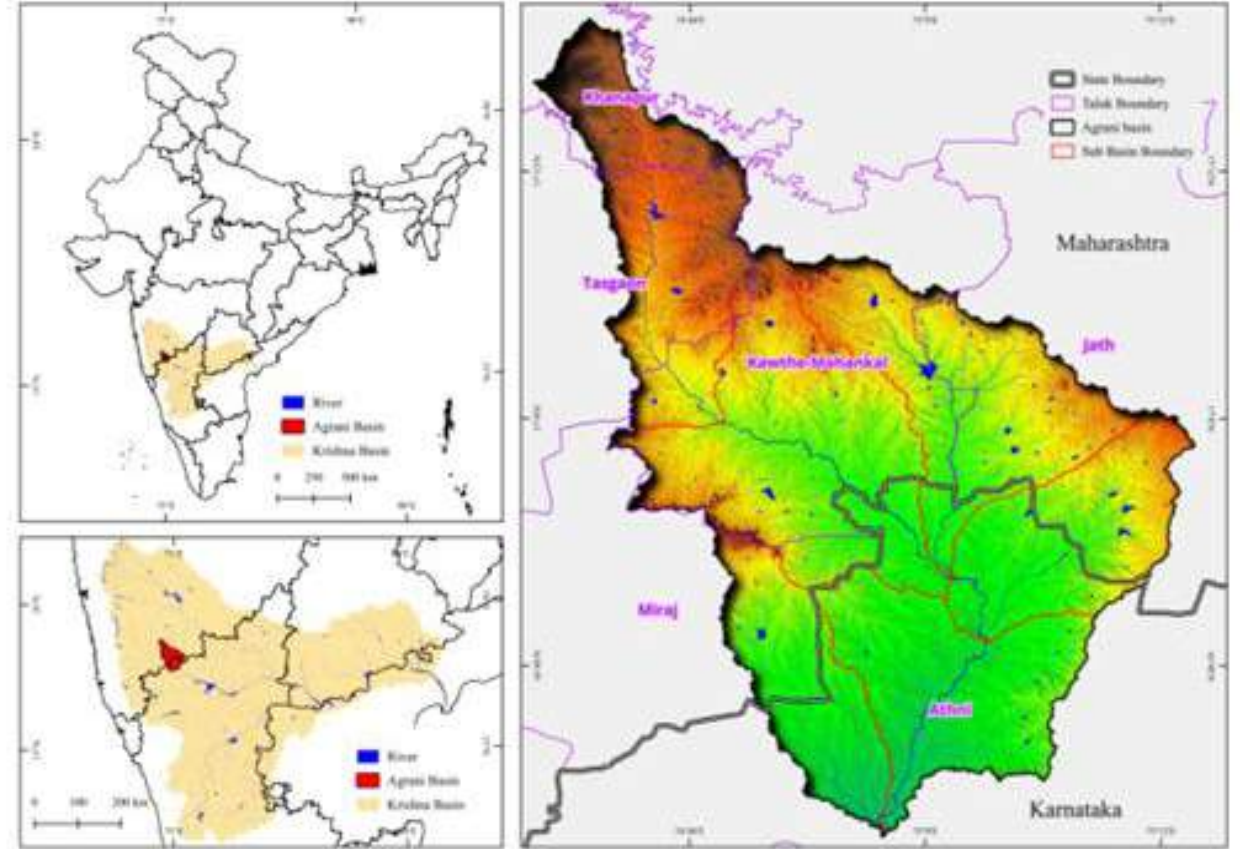
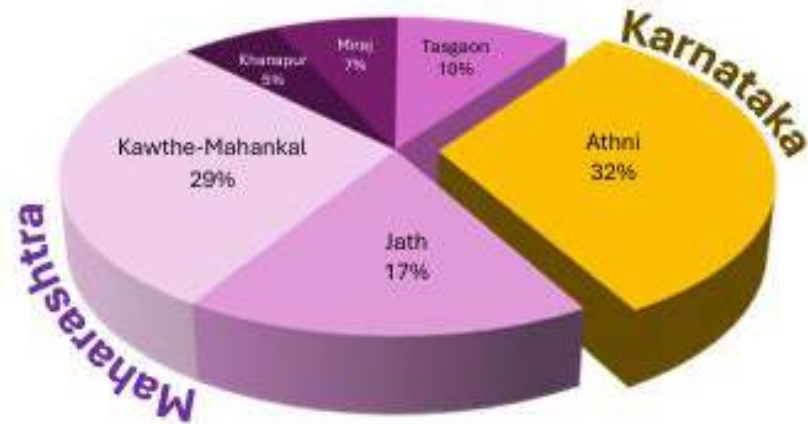
POST-INTERVENTION



POST-INTERVENTION TESV 37,530.40 Million INR
NPV 965.65 Billion INR

Agrani River

Location	Latitude: 16°39'24" N to 17°28'00" N Longitude: 74°20'00" E to 75°23'00" E
Basin Code	K-2 Sub-basin (within the Krishna Basin)
Total Basin Area	1909.34 km ² (varies by study) 1293.88 km ² Maharashtra, 615.46 km ² Karnataka 1338 (according to JalBiradari)
Villages Covered	166 Villages 120 Maharashtra, 46 Karnataka
Administrative Boundary	Sangli District, Maharashtra: Khanapur, Tasgaon, Miraj, Kavathe Mahankal, and Jath Taluk Belgavi District, Karnataka: Athni Taluk



STATE	District	TEHSIL	Total Area sq. km	Area in basin sq. km	% area in basin	No of Village
Karnataka	Belagavi	Athni	1988.13	615.46	30.96	46
Maharashtra	Sangli	Jath	2240.84	325.40	14.52	20
Maharashtra	Sangli	Kawthe-Mahankal	736.91	554.52	75.25	49
Maharashtra	Sangli	Khanapur	1163.17	87.75	7.54	18
Maharashtra	Sangli	Miraj	925.50	135.91	14.69	15
Maharashtra	Sangli	Tasgaon	782.81	190.30	24.31	18
TOTAL				1909.34		166

Data

Services	Data use	Source	Valuation method	
Provisioning Service	Crop production	Crop-wise area, yield, benefit to cost ration, the market price of the crop (Farm harvest price), net profit	Directorate of Economics and Statistics (DES), Government of Maharashtra	Residual value method
	Fodder production	Area under fodder crop, yield, local market price Green Grass productivity	Field Data (based on survey)	Residual value method
	Milk & Manure production	Number of cattle in lactation, milk production, dung production, local market price of milk and dung	Livestock census 2012 and 2019	Residual value method
	Fish Production	Production of Inland Fish, Area under water	District Fisheries Development, Government of Maharashtra	Residual value method
	Water Provisioning	land use, Surface water harvest from different water bodies, watershed area, catchment coefficient, cost of municipal water supply	Field data collection and literature reviews. Ministry of Fisheries, Animal Husbandry & Dairying.	Residual value method
Regulating Service	Groundwater recharge	Watershed area, average annual water level fluctuation, watersheds specific yield, cost of municipal water supply	Central Ground Water Board	Residual value method
	Carbon stock Carbon sequestration	Carbon stock in soil and vegetation in different land uses, area under land uses, Social cost of carbon (SCC)	Field data collection and literature reviews	Social cost of carbon
	Pollination	Crop production, area under different crops, the market price of the crop (Farm harvest price),	Directorate of Economics and Statistics (DES), Government of Maharashtra	Product function
	Soil Conservation	Watershed area, average annual soil retention, precipitation, land use, soil data, slope, cost of subsidised synthetic fertilizer	InVEST RUSLE model	Avoided cost method
Cultural services	Tourism & Recreational, Inspirational, Culture, Art Field Data	Ramachandra et al. 2025 (NCAVES)	Benefit transfer	

Natural Capital Accounting of Ecosystem Services of Agrani Catchment



Ecosystem Goods and Services

Valuation Method

Provisioning Services



Water
Non-Timber Forest Produce (NTFP)
Fuelwood
Fodder
Fish

Residual Method
&
Direct Market price

Provisioning
Services

Regulating Services



Carbon Stock
Carbon sequestration
Soil conservation
Ground water recharge
Nutrient cycling
Pollination service
Air filtration services
Habitat Protection

Social Cost of CO ₂
Replacement Cost & Avoided Cost
Market Price
Replacement Cost & Avoided Cost
Product Function Method
Abatement Cost
Avoided Cost of ex-situ conservation

Regulating
Services

Cultural Services



Ecotourism
Environment Education
Research

Revenue from Ecotourism
Funding for environmental education and Research

Cultural
Services

Agani Catchment

TESV or GEP (Gross Ecological Product)

Total Ecosystem Supply Value (TESV)

$$= \sum_{i=1}^3 (ES_i)$$

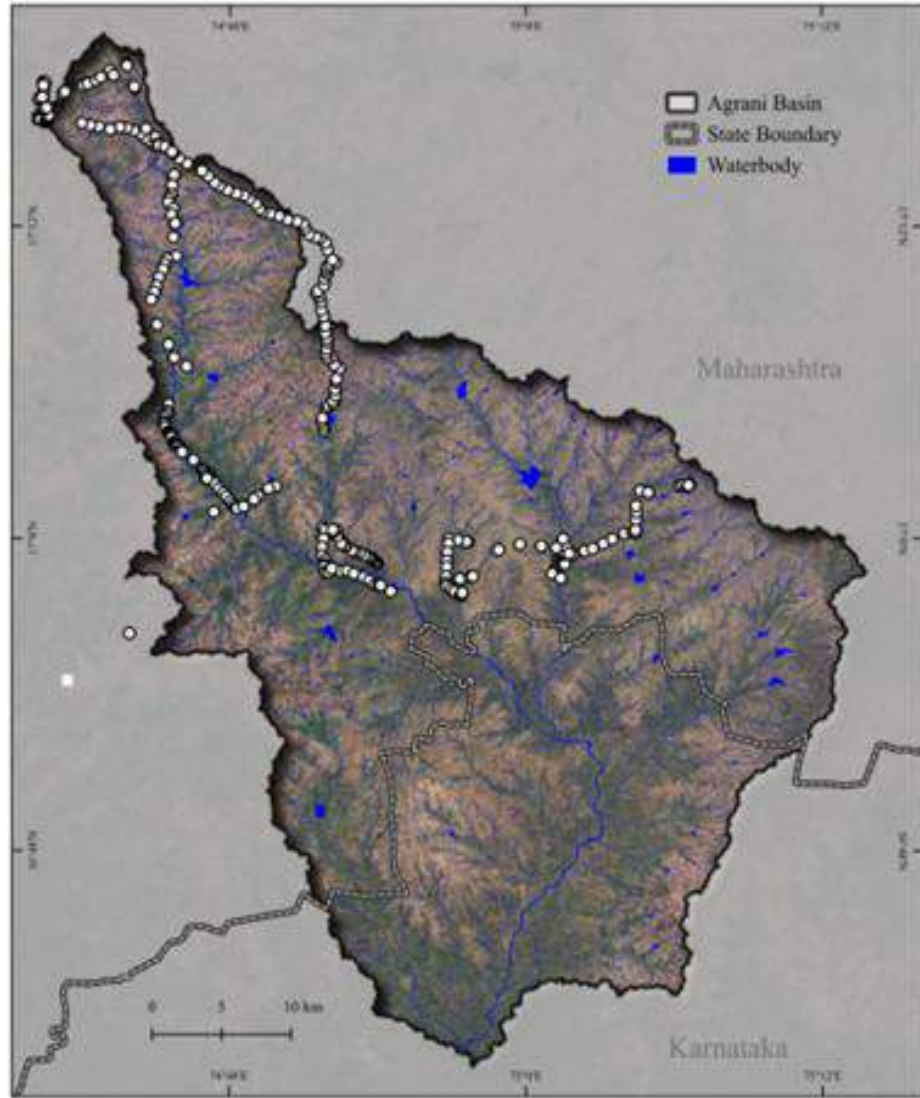
ES = Ecosystem Service
i= 1 (Provisioning),
2 (Regulating),
3 (Cultural)

$$\text{Net Present Value (NPV)} = \sum_{t=1}^T \frac{TESV_t}{(1+r)^t}$$

where, $TESV_t$ = net cash flow from the forest ecosystem in year t, T = discount period (50 years), r = discount rate (3%)

Forest Ecosystem Services

Field Data Collection – January 2026



Acknowledgement

We are grateful to local experts and Jal Biradari for actively participating in this exercise of valuation of Ecosystem Services of Agrani Basin, Maharashtra.

24th to 26th January 2026
Field Work

Narendra Chugh
Ankush Narayankar
Dr Suvarna More
Dr Ravindra Bora
Vadagbalkar Shrinivas Krishnaji
Swapnil Patil
Snehadeep
Sagar Patil

27th January 2026
Interactive Session in Walchand College of Engineering, Sangli

Narendra Chugh
Ankush Narayankar
Dr Ravindra Bora
Dr Madhukar Bachunkar Patil
Dr. Surendra Singh Rathore
Dr. D S Patil
Dr. A. D. Katdare
Dr. A. K. Kokane
Mr. C. H. Wagh
Mr. G. M. Bhosale
Dr. A. K. Mali
Mahi Patil

13th April 2026
Discussion meeting regarding valuation of Ecosystem Services

Meeting Link: <https://us02web.zoom.us/j/82010590457?pwd=Qn05HBvgbaHhNldk1Dn50p/YnVvGg.1>

Narendra Chugh
Ankush Narayankar
Dr Ravindra Bora
Dr Amay
Dr Amol Patil
Jay Samant
Vijay Paranjape
Dhananjay Shebale
Shailaja Deshpande
Ranjit More

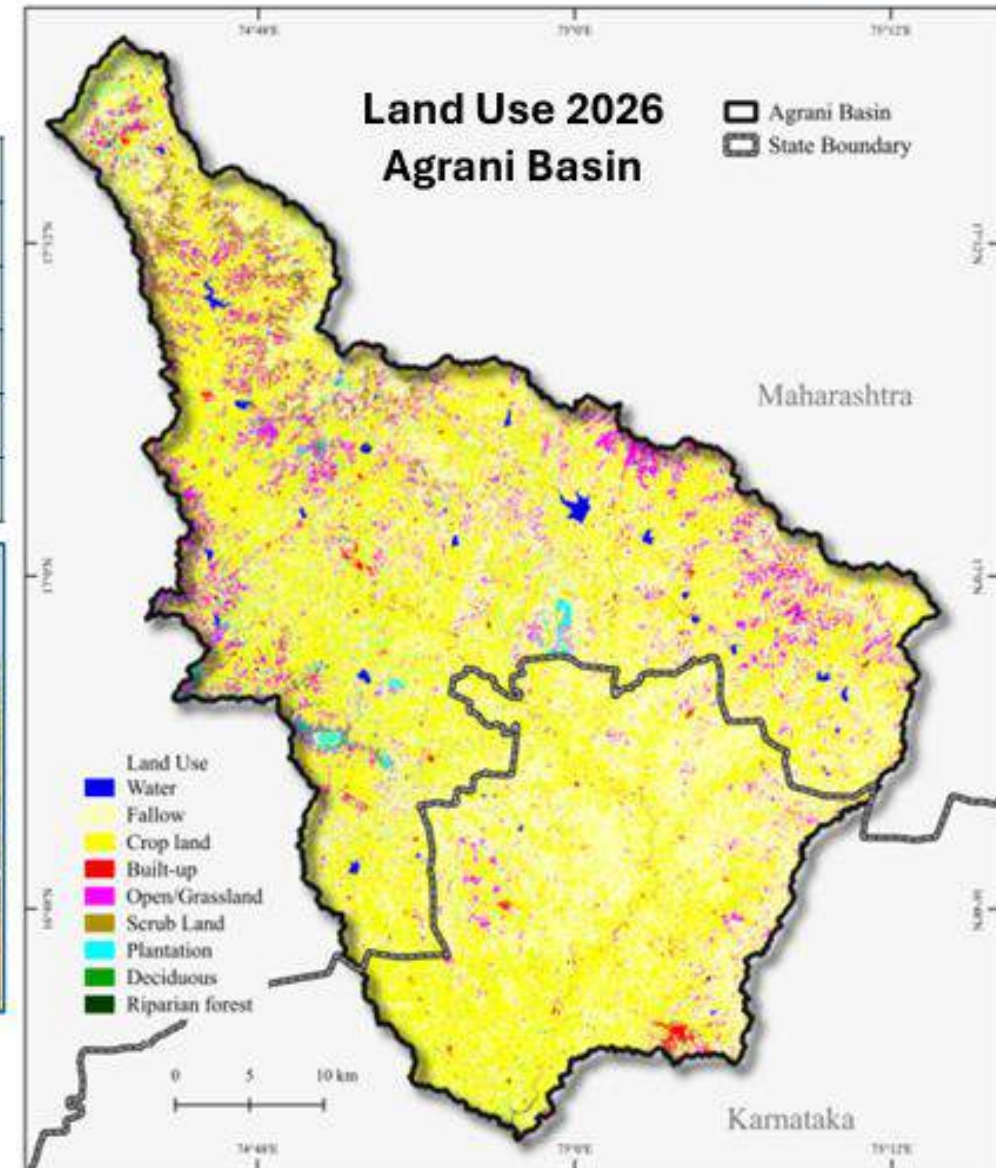


Extent of Forest – Land Use Assessment, 2026

using sentinel data of 10m spatial resolution through Supervised Non-parametric Classifier - Random Forest (Machine learning algorithm)

	Area in ha	%
Water	1218.47	0.63
Agriculture	1,65,912.77	86.4
Built-up	2317.97	1.21
Open Grassland	11,407.73	5.94
Scrub	5867.56	3.06
Plantation	642.71	0.33
Forest Deciduous	440.77	0.23
Riparian Vegetation	1081.6	0.56
Glyricidia Plantation	3135.45	1.63
TOTAL	1,92,025.02	100

Taluks	% area of taluk in basin
Khanapur	9.25
Tasgaon	24.31
Kavathe Mahankal	75.25
Jat	14.52
Miraj	14.69



Total Ecosystem Supply Value (TESV)

Tahsil/Block	Provisioning Service PRE-INTERVENTION Million INR							Regulating Service PRE-INTERVENTION Million INR					Cultural Service PRE-INTERVENTION
	Crop Production	Crop Fodder Production	Green Fodder Production	Fish Production	Milk Production	Manure Production	Water Provisioning	Ground Water Recharge	Carbon Stock	Crop Carbon Sequestration	Soil conservation	Pollination	
Khanapur	380.57	347.25	3.15	1.77	282.61	78.80	43.01	47.25	7,143.10	623.09	0.00	62.85	9.38
Tasgaon	889.09	806.56	9.22	7.95	1,285.92	338.43	95.52	267.08	11,642.87	1,361.47	0.03	154.67	21.16
Miraj	651.13	380.98	2.03	2.06	656.45	172.63	117.37	156.01	7,597.58	1,377.69	0.01	51.46	14.92
Kavathemahankal	641.92	1,511.89	17.44	16.88	2,902.84	797.69	115.76	639.96	31,927.59	2,015.30	0.18	47.86	33.29
Jat	428.81	1,050.69	13.71	11.13	748.92	277.02	62.07	350.53	17,691.89	1,152.29	0.02	57.60	20.97
Total	2,991.52	4,097.38	45.56	39.79	5,876.75	1,664.57	433.73	1,460.84	76,003.02	6,529.85	0.24	374.44	99.72
Total	Provisioning Service 15,149.30 Million INR/year							Regulating Service 10,645.46 Million INR/year					99.72
Per ha (131374 ha)	1,15,314.29 INR/ha/year							81,031.69 INR/ha/year					759.04 INR/ha/year
PRE-INTERVENTION TESV 25,894.47 Million INR NPV 666.26 Billion INR 5.07 NPV Million INR/ha													

Tahsil/Block	Provisioning Service POST-INTERVENTION Million INR							Regulating Service POST-INTERVENTION Million INR					Cultural Service POST-INTERVENTION
	Crop Production	Fodder Production	Green Fodder Production	Fish Production	Milk Production	Manure Production	Water Provisioning	Ground Water Recharge	Carbon Stock	Crop Carbon Sequestration	Soil conservation	Pollination	
Khanapur	379.27	88.30	6.31	3.09	367.04	100.37	59.78	129.82	9,681.84	578.37	0.01	36.66	7.65
Tasgaon	2,257.46	511.53	18.44	13.82	1,261.40	332.59	122.35	436.33	17,148.55	1,343.21	0.04	473.25	24.80
Miraj	1,551.59	285.03	4.06	3.58	1,202.78	322.07	137.60	248.31	11,529.67	1,310.00	0.01	268.71	23.77
Kavathemahankal	2,745.72	1,384.58	34.88	29.36	3,791.90	1,016.69	231.05	917.96	47,970.73	2,918.19	0.24	470.21	77.95
Jat	1,214.15	951.55	27.42	19.36	1,617.65	428.80	96.50	401.38	27,106.23	1,565.62	0.03	225.38	51.29
Total	8,148.19	3,220.99	91.12	69.21	8,240.77	2,200.52	647.28	2,133.80	1,13,437.02	7,715.39	0.33	1,474.22	185.47
Total	Provisioning Service 22,618.08 Million INR/year							Regulating Service 14,726.85 Million INR/year					185.47
Per ha (131374 ha)	1,72,165.60 INR/ha/year							1,12,098.64 INR/ha/year					1,411.74 INR/ha/year

जेव्हा पाणी वाहते, तेव्हा समानता वाढत

Benefit-Cost Ratio → 792:1

Annualized Cost
(8% interest rate for 50 years)

1.47 crores INR

*cost of the watershed improvement interventions (including construction of **61 check-dams**, etc.) collected from the field*



Annual Benefit

3753 crores INR

Total Ecosystem Supply Value Post-Intervention

Incremental Benefit per year

1164 crores INR

between pre and post intervention period



Pre-Intervention

Benefit-Cost Ratio

792:1

of the noble watershed initiative of sustaining water in the catchment and contributing to the marked improvements in the livelihood of the community



Post-Intervention