Water Stewardship Plan

Utilities - Water Management, JSW Steel Vijayanagar Works

In Accordance with Technical Standard - Water Management

Document Name	Water Stewardship Plan	**Revision Date**	20.01.2024
Document Owner	JSW - VIJAYANAGAR - Utilities	**Revision**	1/1

Document Issue and Revision History		
Date	**Revision No.**	**Change Summary**
20.01.2024	01	Action Outside Plant Boundaries

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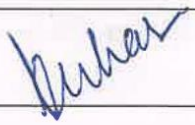
Signature			
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This document shall be subject to annual review by the Head of Department.

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1. Introduction

JSW Steel Limited; Vijayanagar Works recognizes the need for responsible and safe management of Water from point of generation till the point of take over. We aim to adopt the principles of water prevention, minimization and recovery through reusing & recycling. Our commitment is to minimize the water usage while conserving this earth's precious natural resource. This is also reflected in our Environmental policy prepared aligning to Group's Water Resource Management Policy (JSW/SUST/POL/04).

2. Scope

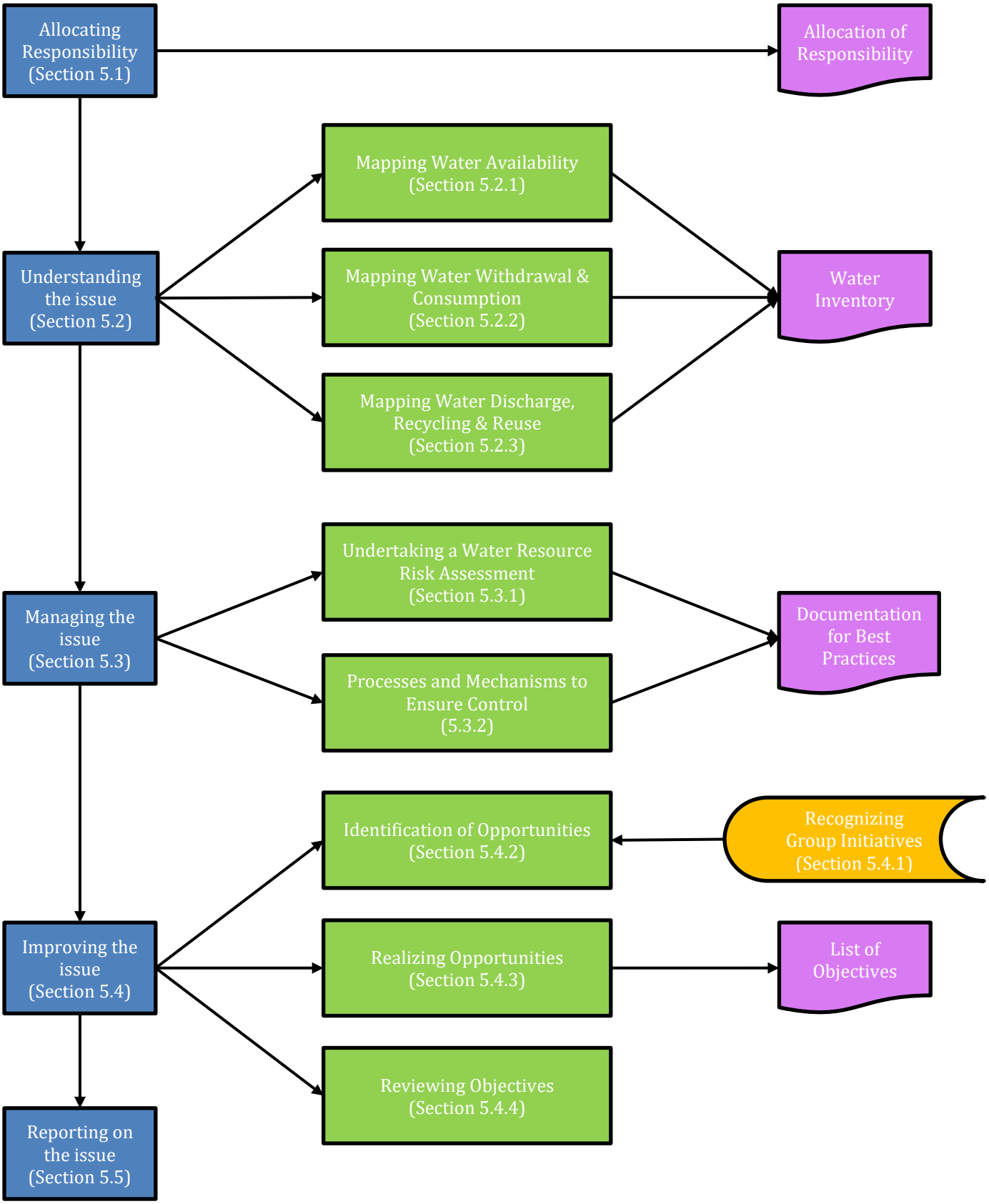
This plan has been developed by JSW Steel Vijayanagar Works to minimize water usages and to reuse the blow down water & treated STP water, endeavor to achieve water source security for the plant operations.

3. Objective

The Water Stewardship Plan is being prepared in line with the JSW's Sustainability Framework and in particular supports our Environmental Policy aligned to our Group Water Resource Management Policy JSW/SUST/POL/04, Technical Standard for water Management: JSW/SUST/TSTD/04 which outline the requirements that need to be planned and established in relation to water identification, characterization, inventory, prevention, minimization and treatment leading to environmentally sound management of water. The aim is to improve water performance including Reprocess, Reuse and Recycle on sustainable basis through process mapping, optimization of Control parameters and treatment of Industrial and domestic Effluents

This Water Stewardship Plan is developed in line with JSW Technical Standard in Water Resource Management which follows the six stage approach, as per TS and below figure for Water Resource Management, each of which contains a set of criteria that shall help site to achieve Water Stewardship targets.

Water consumption will be minimized at the source as well as within the processes, as far as practicable. Recycle from blow down water will be adopted by making necessary modifications in systems, controls, and consequent processes.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4. Aim of Water Management Plan

It is aimed at the experts in business and the management to facilitate the integration of water management into decision making for operating sites and also new projects. This Water Stewardship Plan applies to all JSW Steel company employees and contractors and is likely applicable to the entire lifecycle (including planning, assessment, exploration, evaluation, design, development, operation and closure) of a Project/ Company.

Table 1: ***Water Requirement – Stage Wise***

Description	**12MTPA (present)**	**18.5MTPA**	**24MTPA**	**Remarks**
For Power Plants, MGD	20	20	26	
For Steel Plant, MGD	20	31	38	
Ancillaries and losses , MGD	14	24	37	
Total Requirement in MGD	**54**	**75**	**101**	
TB Dam Water Pumping in MGD	26	26	26	
Almatti Water Pumping in MGD	32	40	40	10MGD implementation by 2024
Total availability in MGD	**58**	**66**	**66**	
Surplus/Deficit in MGD	**4**	**-7**	**-35**	

Table 2: ***Water Consumption***

Month	Water Consumption Manufacturing processes Including Power plant in M3	Manufacturing Processes Consumption in M3 As per CFO	Domestic Purpose In M3	Domestic Purpose as per CFO M3
Apr-23	4480566	5050800	100703	108000
May-23	4687018	5219160	96207	111600
Jun-23	4533208	5050800	93862	108000
Jul-23	4442612	5219160	94897	111600
Aug-23	4619452	5219160	84609	111600
Sep-23	4569362	5050800	84020	108000
Oct-23	4513249	5219160	80679	111600
Nov-23	3935419	5050800	90246	108000
Dec-23	4082787	5219160	97733	111600

Apart from water consumption, other quantities and qualitative aspects have also been taken into consideration

- Typical quantitative targets include:
  a. Absolute reduction of water withdrawals
  b. Reduction in consumptive volumes

- Typical qualitative targets include:
  a. Supply of treated water to internal stakeholders.
  b. Treated parameters are validated by Third party lab as per ISO/IEC 17025:2017.

5. Regulations, Standards and Permit/Consent Requirements

Section	Applicable Items
Memorandum of Understanding	Agreement with Irrigation Department.
Standards	JSW Technical Standards
Best Management Practices	▪ Across JSW Group Companies
System for review of regulatory compliances	▪ ISO-14001:2015 ▪ Climate Action Group ▪ Executive Committee ▪ Cluster of Excellence ▪ Board's Sustainability and Reporting Committee

6. Water Inventory

The Unit's water needs are sourced from TB Dam and Almatti Dam. These encompass various uses such as industrial processes, power generation, oxygen production, residential areas, and other domestic purposes. The permitted withdrawal limit from TB Dam stands at 32.8 MGD, while from Almatti Dam, it is 40 MGD, sanctioned by KNNL & KBJNL. Currently, the plant maintains a flow rate below 1,70,000 m3/day by implementing diverse water conservation measures throughout its water-intensive facilities.

A notable aspect of our operations is our judicious utilization of water resources. Despite the considerable outflow from TB Dam and Almatti Dam, our operations only account for a minimal fraction, utilizing merely 0.86% of the total outflow for FY-24 from both of these sources.

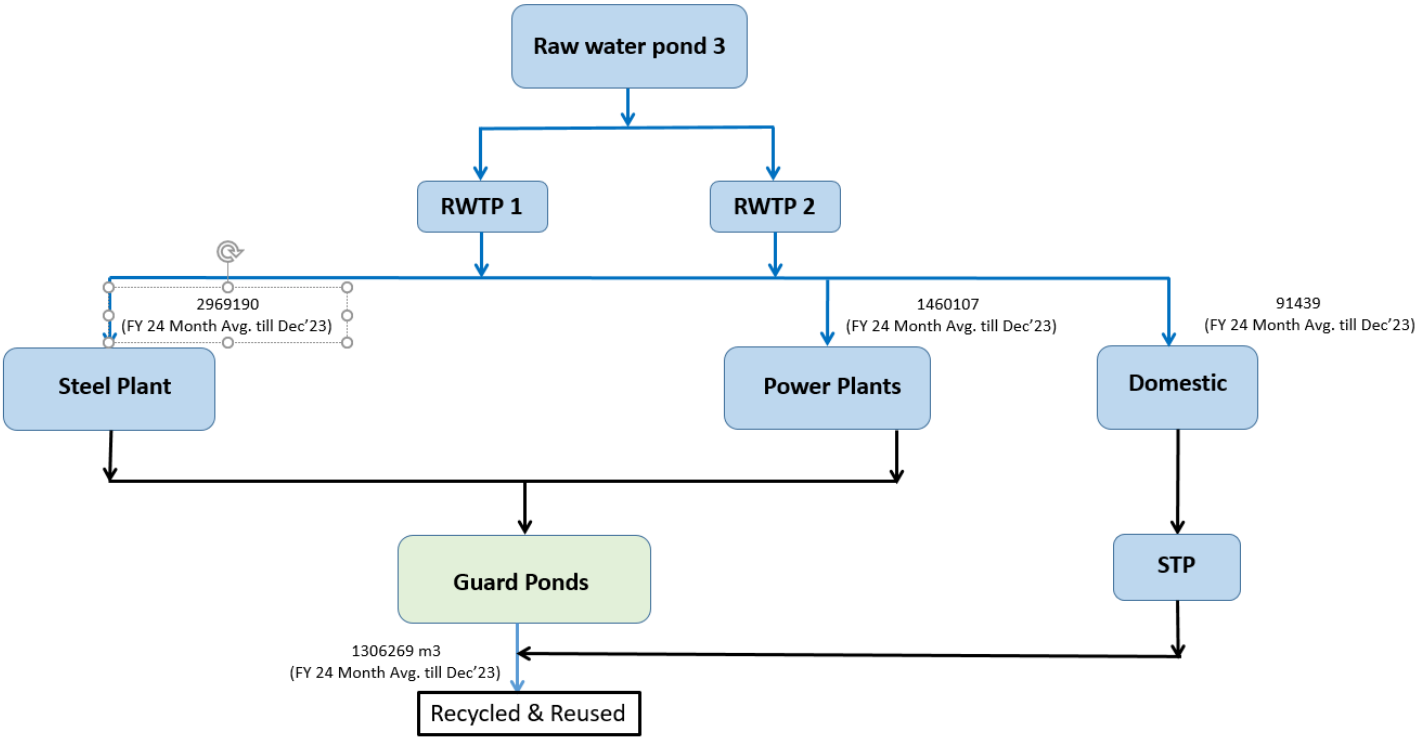
This prudent approach underscores our dedication to sustainable water usage practices. Our ongoing efforts include water conservation initiatives and the implementation of water recycling and reuse strategies to reduce our overall water demand.

6.1. Key Water Consumption Sections

Table 3: ***Section wise consumption of water (M3)***

SWC AS PER SUSTANIBILITY						
SHOPS	Planned Monthly Avg.FY-24			Actual Monthly Avg (Apr'23 to Dec'23)		
	Total Prod (T)	Total WC (m3)	SWC	Total Prod (T)	Total WC (m3)	SWC (m3/tons)
CO-3	120758	97833	0.81	122838	94969	0.77
CO-4	152300	123094	0.81	152939	123290	0.81
CO-5	95140	120828	1.27	78130	97532	1.25
PP-1	313083	24563	0.08	285942	25017	0.09
PP-2	228583	8151	0.04	207488	5737	0.03
PP-3	488542	60139	0.12	401304	33807	0.08
SP-1	177917	5327	0.03	181324	3178	0.02
SP-2	131150	12463	0.10	160106	16744	0.10
SP-3	329583	30073	0.09	311360	22816	0.07
SP-4	172083	12225	0.07	156245	10537	0.07
DRI	79657	109927	1.38	68398	86373	1.26
CX-1&2	124515	129395	1.04	117169	115685	0.99
BF-1 &2	297371	160577	0.54	292888	148393	0.51
BF-3	262528	218164	0.83	269202	192389	0.71
BF-4	282715	240050	0.85	284112	226453	0.80
SMS-1*	304534	186832	0.61	300826	166898	0.55
SMS-2*	553046	398695	0.72	547862	409127	0.75
SMS-3*	121448	127053	1.05	125623	115194	0.92
HSM-1	297018	82095	0.28	295176	79793	0.27
HSM-2	433340	164614	0.38	418873	185903	0.44
WRM & BRM	86130	37897	0.44	89859	39153	0.44
BRM-2	807111	10091	0.01	83228	8430	0.10
WRM-2	49073	23231	0.47	47054	5100	0.11
RMHS-1 & 2		21061			23829	
LCPs		5709			2946	
MGP		924			1908	
Drinking water supplied to plant		96316			91392	
	979028	2449350	2.50	974310	2332593	2.39
Note* Total production of Cast Steel (SMS-1,2&3) in tcs						

6.2. Water Balance Diagram



6.3. Water Conveyance and Treatment System

The water received at the inlet of the plant have associated infrastructure for bringing this water into the plant, treating it and then further Blowdown water being used for Secondary processes.

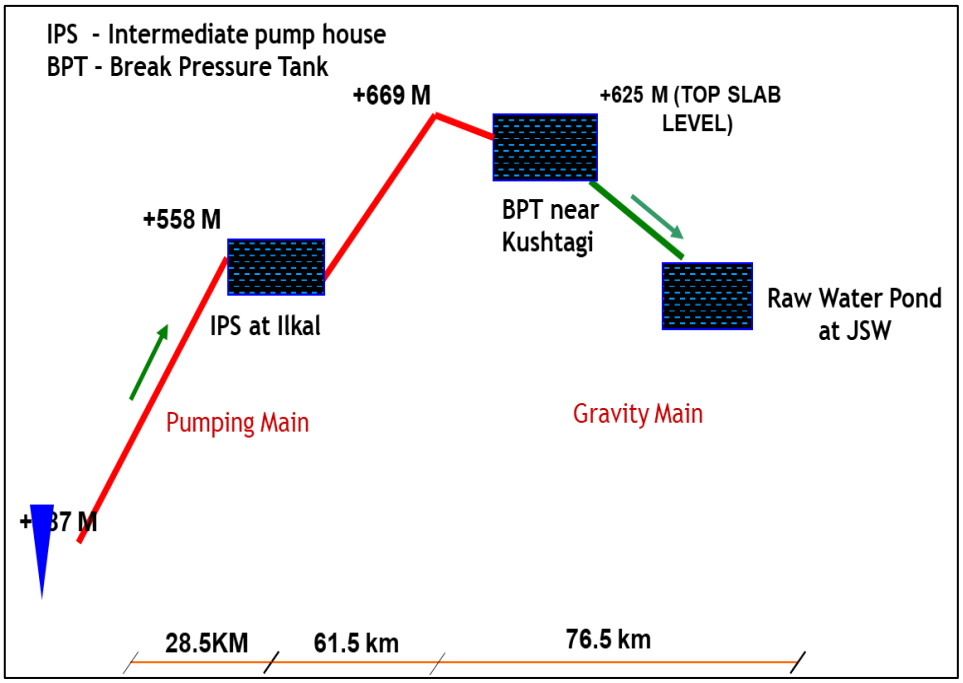
The key components of a water system would be:

1. Raw Water Transmission: Pipelines & pumping system to transfer water from TB & Almatti Dam to Reservoirs.
2. Water Treatment: Pre-treatment; Treatment based on end use.
3. Treated Water Storage: Sumps & Pumps, Over Head Tanks and reservoirs.

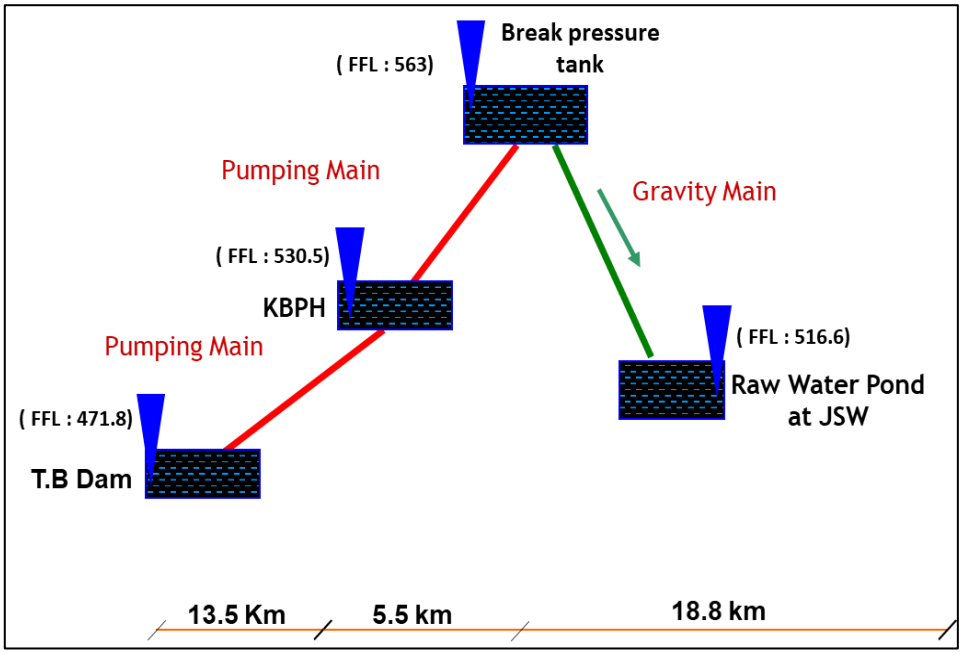
6.4. Infrastructure for water conveyance and treatment

Adequate infrastructure available for water conveyance and treatment. This includes pumping station, pipelines, water treatment plant, treated water tanks, intermediate storage tanks, water metering facilities, water treatment plant automation etc.

Pumping Systems from Source to JSW



Almatti Dam
Total Pipeline Distance: 166.5Km



TB Dam
Total Pipeline Distance: 37.8Km

Raw water Ponds: -1,2 & 3

Pond 1:
Gross capacity: 52, 45,115 m³

Pond 2:
Gross capacity: 527000 m³

Pond 3:
Gross capacity: 3, 39,00,000m³

6.5. Water Treatment Plants:

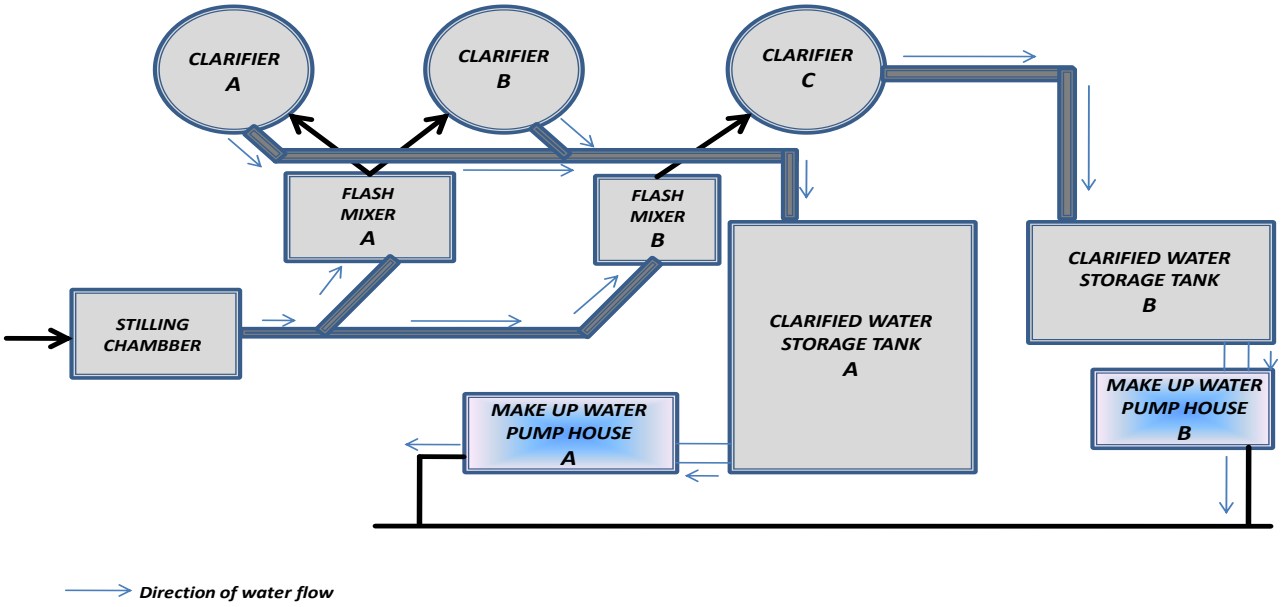
Raw water Treatment Plant-1

Raw water Treatment Plant-2

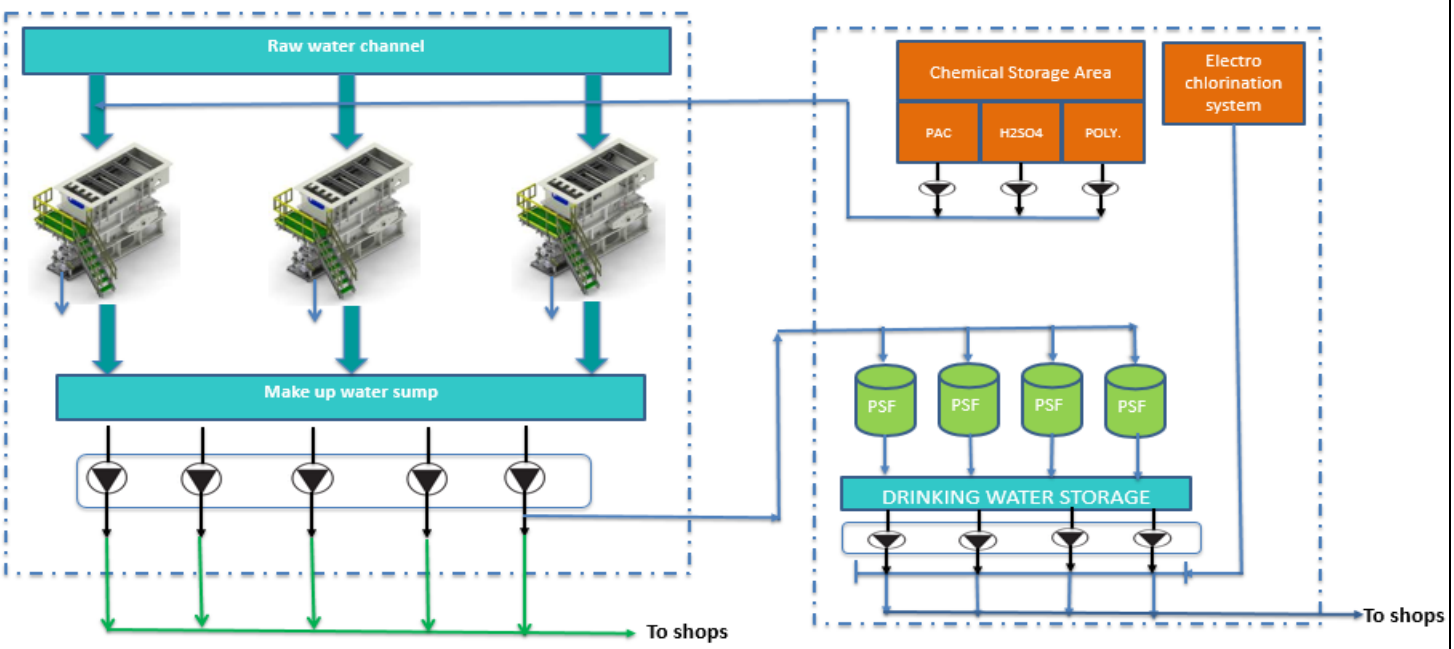
- **Water Source**: Pumped from TB & Almatti dams.
- **Storage**: Stored in Raw Water Ponds (plant reservoirs).
- **Treatment**:
  - Water supplied for treatment in the raw water to maintain pH & turbidity parameters.
  - Transfer to clarifier for settling
- **Chemical Treatment**: Poly Aluminum Chloride and polyelectrolyte added to control water parameters.
- **Treated Water Handling**: Treated water transferred to the Makeup Water tank.
- **Distribution**: Pumping to all user departments, townships, etc.

- This process ensures a controlled and treated water supply sourced from dams, subjected to necessary treatments, and then distributed for various uses within the plant and associated areas. The specific steps, including chemical treatments and settling processes, highlight the emphasis on maintaining water quality before its final distribution.

Water Treatment Plants: (Flow Charts Diagrams)



RAW WATER TREATMENT PLANT-1



DAF and Pumping System

Drinking & Chemical Handling System

RAW WATER TREATMENT PLANT-2

7. Water Risk Assessment

7.1. Area of Influence of Site

- **Sources:**
  - **a.** Tungabhadra Dam, Karnataka 583225, India. Latitude: 15.26456, Longitude: 76.33717
  - **b.** Almatti Dam, Karnataka 586201, India. Latitude: 16.17925, Longitude: 76.14978

- **Storage Ponds:**
  - **a.** Raw Water Pond 1, Bellary, Karnataka 583123. Latitude: 15.16707, Longitude: 76.64846
  - **b.** Raw Water Pond 2, Bellary, Karnataka 583123. Latitude: 15.16289, Longitude: 76.65745
  - **c.** Raw Water Pond 3, Gonahal, Karnataka 583223. Latitude: 15.23082, Longitude: 76.61813

- **List of Pipeline Villages:**

Villages	Districts
Amaravati	Bagalkot District
Budukunte	Koppal District
Dannur	Gulbarga District
Dotihal	Koppal District
Gorebal	Raichur District
Guggalamari	Bagalkot District
Gunnal	Bagalkot District
Haavaragi	Bagalkot District
Hirekodagali	Bagalkot District
Hiresulikere Tanda	Koppal District
Hirevankalakunta	Koppal District
Hullalli	Bagalkot District
Hunugund	Bagalkot District
Indaragi	Koppal District
Ingalagi	Bagalkot District
Jeerakunte	Koppal District
Kadekuppa	Koppal District
Kandakur	Koppal District
Kolihal	Koppal District
Kukanapalli	Koppal District
Kurubanal	Koppal District
Kushtagi	Koppal District
Kyadigoppa	Koppal District
Marol	Bagalkot District
Mataladinni	Koppal District

Myadaneri	Koppal District
Naduvinakoppa	Koppal District
Putgamari	Koppal District
Shahpur	Koppal District
Uppaladinni	Koppal District
Vanaballari	Koppal District
Vanageri	Koppal District

7.2. Generic Water Situation Assessment

Research report published by International water management institute on India's water future to 2025-2050 under business as usual scenario is summarized below. The overall future scenario indicated increase in water stress across India.

Table 1: ***India's water future to 2025-2050 under business as usual scenario***

	2025		2050		Traffic light (Red/Yellow/green)
Population (million)	1389		**1583**		
Urban population	37%		**51%**		
Increase in per capita income	5.5 % annually for next 50 years				
Domestic withdrawal/person/year (m3)	46		**62**		Increase in per capita requirement
Industrial withdrawal/person/year (m3)	66		**102**		Increase in per capita requirement
Water demand	Total in BCM	% from ground water	Total in BCM	% from ground water	
Irrigation	675	**45**	637	**51**	Increased demand & dependency on ground water
Industrial	92	30	161	30	No change
Domestic	66	**45**	101	**50**	Increased demand & dependency on ground water
Food consumption per capita (in kg/yr)					

Grains	166	152	
Rice	74	**79**	Increase in water demand
Wheat	58	58	
Maze	8	4	
Other coarse cereals	15	9	
Pulses	12	12	
Vegetables	102	**114**	Increase in water demand
Fruits	49	**67**	Increase in water demand
Sugar	28	**33**	Increase in water demand
Crop area (million hectare)			
Net sown area	142	142	
Net irrigated area	74	81	
Net groundwater area	43	50	
Net canal and tank area	31	31	
Gross irrigated area (million hectare) - (GIA)	111	117	
Gross crop area (GCA) in million hectare	208	210	
Grain crop area - % of GCA	58	57	
Grain irrigated area - % of GIA	49	52	
Irrigation efficiency (%)			
Surface water	35-50	42-60	Improvement in efficiency will reduce the water demand
Ground water	70	75	

JSW Steel Vijayanagar water source details and future projection of usage:

Water assessment had been done through CII study conducted in the Year - 2022 focusing upon the Conservation of water & Water Neutrality followed by Water Positivity.

Table 2: ***Business Plan***

Description	FY 23 Achieved	FY 24 Projected	FY 25 Projected	FY 30 Projected
Projected Production capacity in MTPA	11.47	11.74	16.9	24.1
Target Water intensity in m3/TCS (To be considered for Business plan)	2.40	2.50	2.34	1.75
Projected Water Consumption Million m3	27.47	29.39	39.54	42.2

7.3. Water Risk Scenario Analysis

JSW Steel, Vijayanagar conducted water stress scenario analysis using Aqueduct tool developed by WRI to evaluate future water related risks (both transition and physical risks) considering 3 scenarios suggested by IPCC with reference to baseline scenario (current condition). Water stress is projected to increase from Medium – High level to Extremely high (>80%) for water source in Hospet (Tungabhadra Dam) and High (40-80%) for all three scenarios for the water source in Hungund (Almatti Dam) considered in the analysis.

Scenarios:
Following three scenarios are considered for water risk analysis using Aqueduct water risk atlas.

Optimistic:
The "optimistic" scenario (SSP2 RCP4.5) represents a world with stable economic development and carbon emissions peaking and declining by 2040, with emissions constrained to stabilize at ~650 ppm CO2 and temperatures to 1.1–2.6°C by 2100.

Business as usual:
The "business as usual" scenario (SSP2 RCP8.5) represents a world with stable economic development and steadily rising global carbon emissions, with CO2 concentrations reaching ~1370 ppm by 2100 and global mean temperatures increasing by 2.6–4.8°C relative to 1986–2005 levels.

Pessimistic:
The "pessimistic" scenario (SSP3 RCP8.5) represents a fragmented world with uneven economic development, higher population growth, lower GDP growth, and a lower rate of urbanization, all of which potentially affect water usage; and steadily rising global carbon emissions, with CO2 concentrations reaching ~1370 ppm by 2100 and global mean temperatures increasing by 2.6–4.8°C relative to 1986–2005 levels.

a. Water Stress:
Water stress measures the ratio of total water withdrawals to available renewable surface and groundwater supplies. Water withdrawals include domestic, industrial, irrigation, and livestock consumptive and non-consumptive uses. Available renewable water supplies include the impact of upstream consumptive water users and large dams on downstream water availability. Higher values of water stress indicate more competition among users.

Table 3: ***Water Stress Analysis – Baseline scenario***

Location name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Baseline Water Stress
Tungabhadra Dam	15.26456	76.33717	Krishna	Tungabhadra / Hagari / Varada	Medium – High (20 to >40%)
Almatti Dam	16.17925	76.14978	Krishna	Krishna / Malprabha / Varna	Medium – High (20 to >40%)

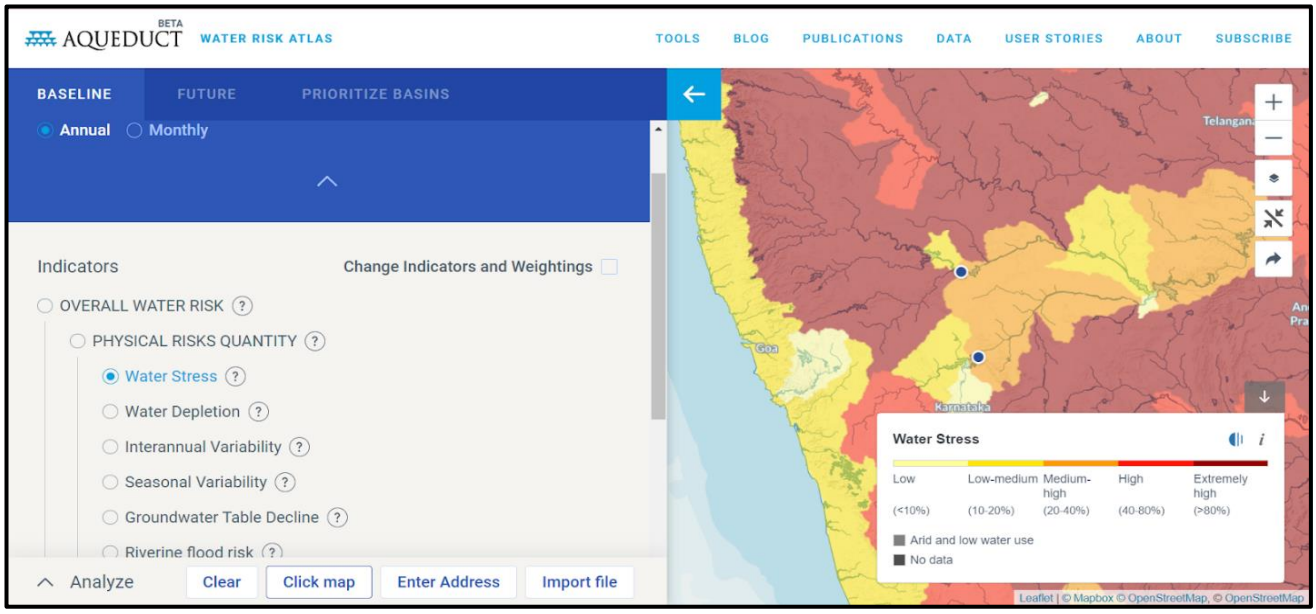


Table 4: ***Water Stress Analysis - Future Scenario***

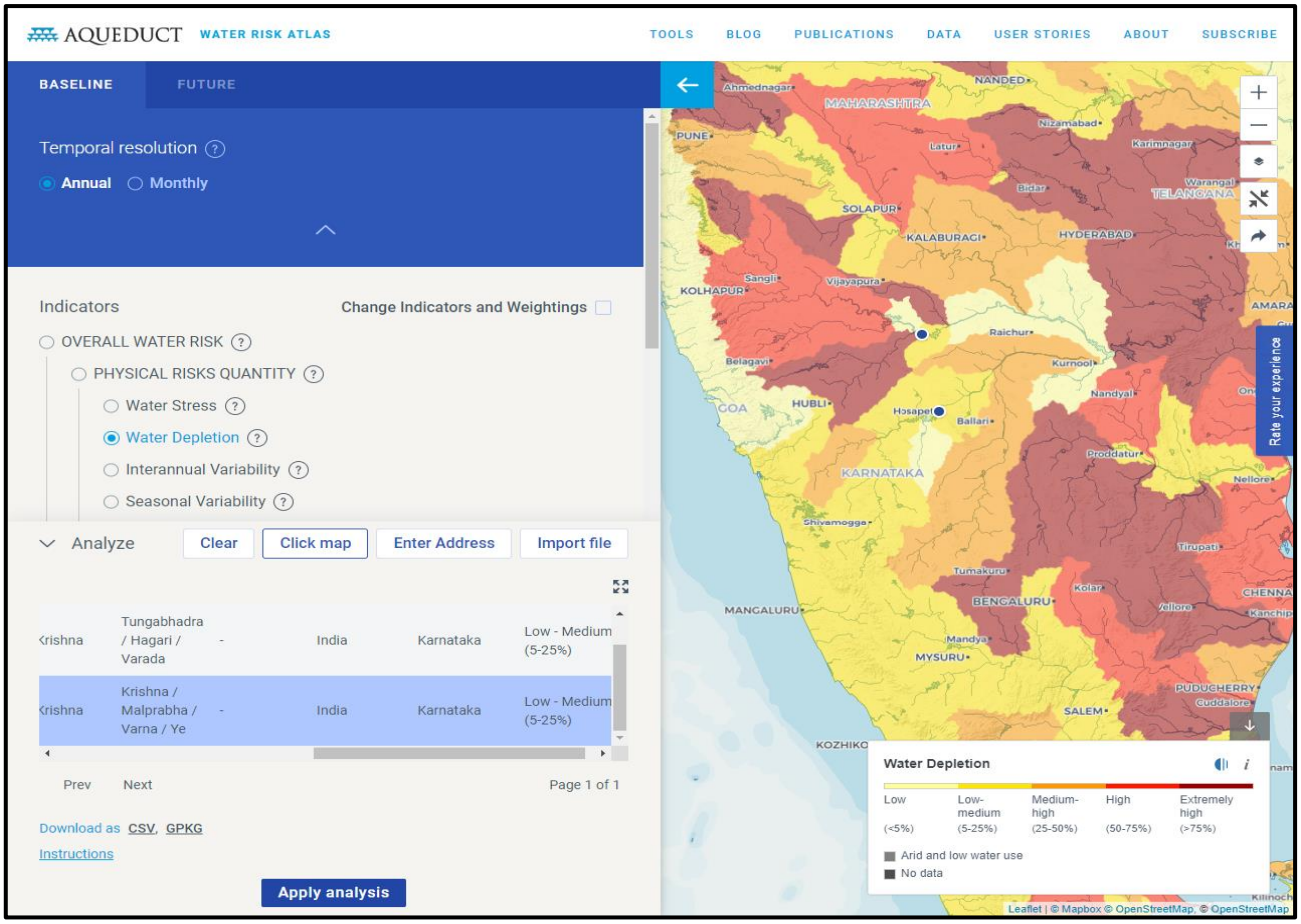
Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Optimistic		Business as usual		Pessimistic	
					2030	2040	2030	2040	2030	2040
Tunga-bhadra Dam	15.26456	76.33717	Krishna	Tungabhadra/ Hagari/ Varada	Extremely high (>80%)	Extremely high (>80%)	Extremely high (>80%)	Extremely high (>80%)	Extreme ly high (>80%)	Extremely high (>80%)
Almatti Dam	16.17925	76.14978	Krishna	Krishna / Malprabha / Varna	High (40-80%)	High (40-80%)	High (40-80%)	High (40-80%)	High (40-80%)	High (40-80%)

b. Water depletion:

Baseline water depletion measures the ratio of total water consumption to available renewable water supplies. Total water consumption includes domestic, industrial, irrigation, and livestock consumptive uses. Available renewable water supplies include the impact of upstream consumptive water users and large dams on downstream water availability. Higher values indicate larger impact on the local water supply and decreased water availability for downstream users. Baseline water depletion is similar to baseline water stress; however, instead of looking at total water demand (consumptive plus nonconsumptive), baseline water depletion is calculated using consumptive withdrawal only

Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Depletion
Tungabhadra Dam	15.26456	76.33717	Krishna	Tungabhadra/ Hagari/ Varada	Low - Medium (5-25%)
Almatti Dam	16.17925	76.14978	Krishna	Krishna / Malprabha / Varna	Low - Medium (5-25%)

Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Optimistic		Business as usual		Pessimistic	
					2030	2050	2030	2050	2030	2050
Tungabhadra Dam	15.26456	76.33717	Krishna	Tungabhadra/ Hagari/ Varada	Low - Medium (5-25%)	Low - Medium (5-25%)	Low - Medium (5-25%)	Low - Medium (5-25%)	Low - Medium (5-25%)	Low - Medium (5-25%)
Almatti Dam	16.17925	76.14978	Krishna	Krishna / Malprabha / Varna	Low - Medium (5-25%)	Low - Medium (5-25%)	Low - Medium (5-25%)	Low - Medium (5-25%)	Low - Medium (5-25%)	Low - Medium (5-25%)

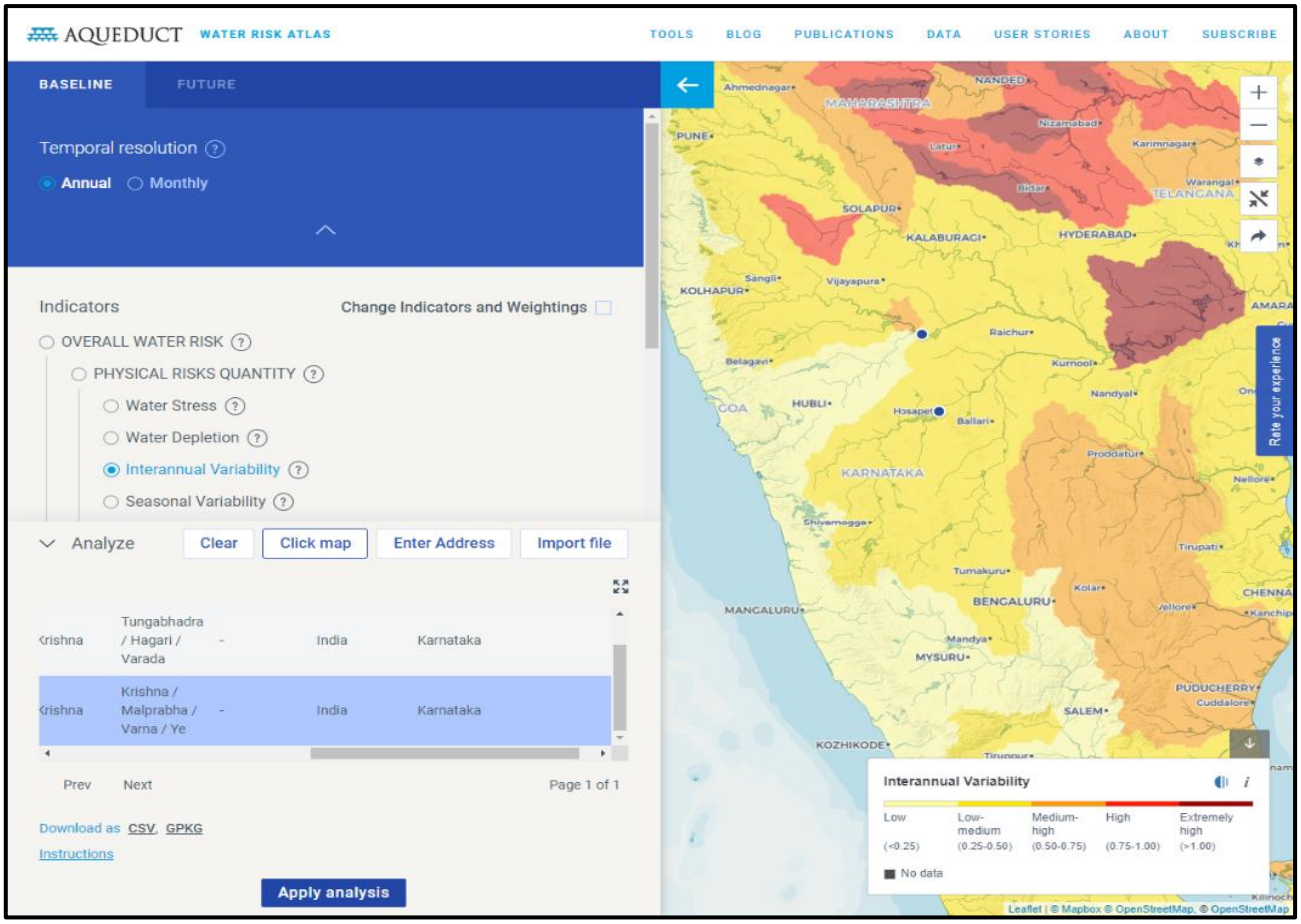


c. Interannual Variability:

Interannual variability measures the average between year variability of available water supply, including both renewable surface and groundwater supplies. Higher values indicate wider variations in available supply from year to year.

Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Interannual Variability
Tungabhadra Dam	15.2646	76.3372	Krishna	Tungabhadra/ Hagari/ Varada	Low - Medium (0.25-0.50)
Almatti Dam	16.1793	76.1498	Krishna	Krishna / Malprabha / Varna	Low - Medium (0.25-0.50)

Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Optimistic		Business as usual		Pessimistic	
					2030	2050	2030	2050	2030	2050
Tungabhadra Dam	15.2646	76.3372	Krishna	Tungabhadra/ Hagari/ Varada	Low - Medium (0.25-0.50)	Low - Medium (0.25-0.50)	Low - Medium (0.25-0.50)	Low - Medium (0.25-0.50)	Low - Medium (0.25-0.50)	Low - Medium (0.25-0.50)
Almatti Dam	16.1793	76.1498	Krishna	Krishna / Malprabha / Varna	Medium - High (0.50-0.75)	Low - Medium (0.25-0.50)	Medium - High (0.50-0.75)	Medium - High (0.50-0.75)	Medium - High (0.50-0.75)	Low - Medium (0.25-0.50)

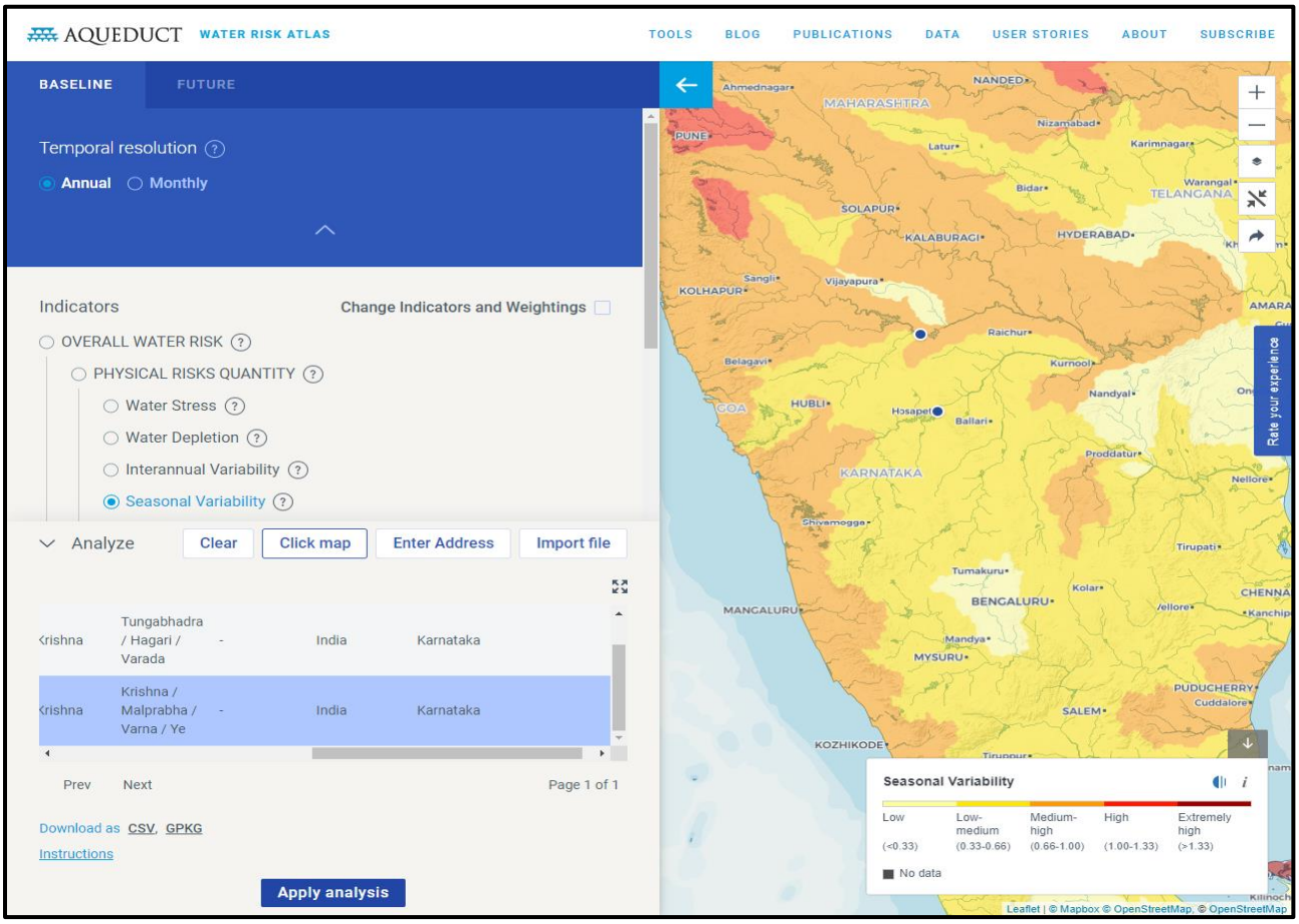


d. Seasonal Variability:

Seasonal variability measures the average within-year variability of available water supply, including both renewable surface and groundwater supplies. Higher values indicate wider variations of available supply within a year.

Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Seasonal Variability
Tungabhadra Dam	15.2646	76.3372	Krishna	Tungabhadra/ Hagari/ Varada	Low - Medium (0.33-0.66)
Almatti Dam	16.1793	76.1498	Krishna	Krishna / Malprabha / Varna	Medium - High (0.66-1.00)

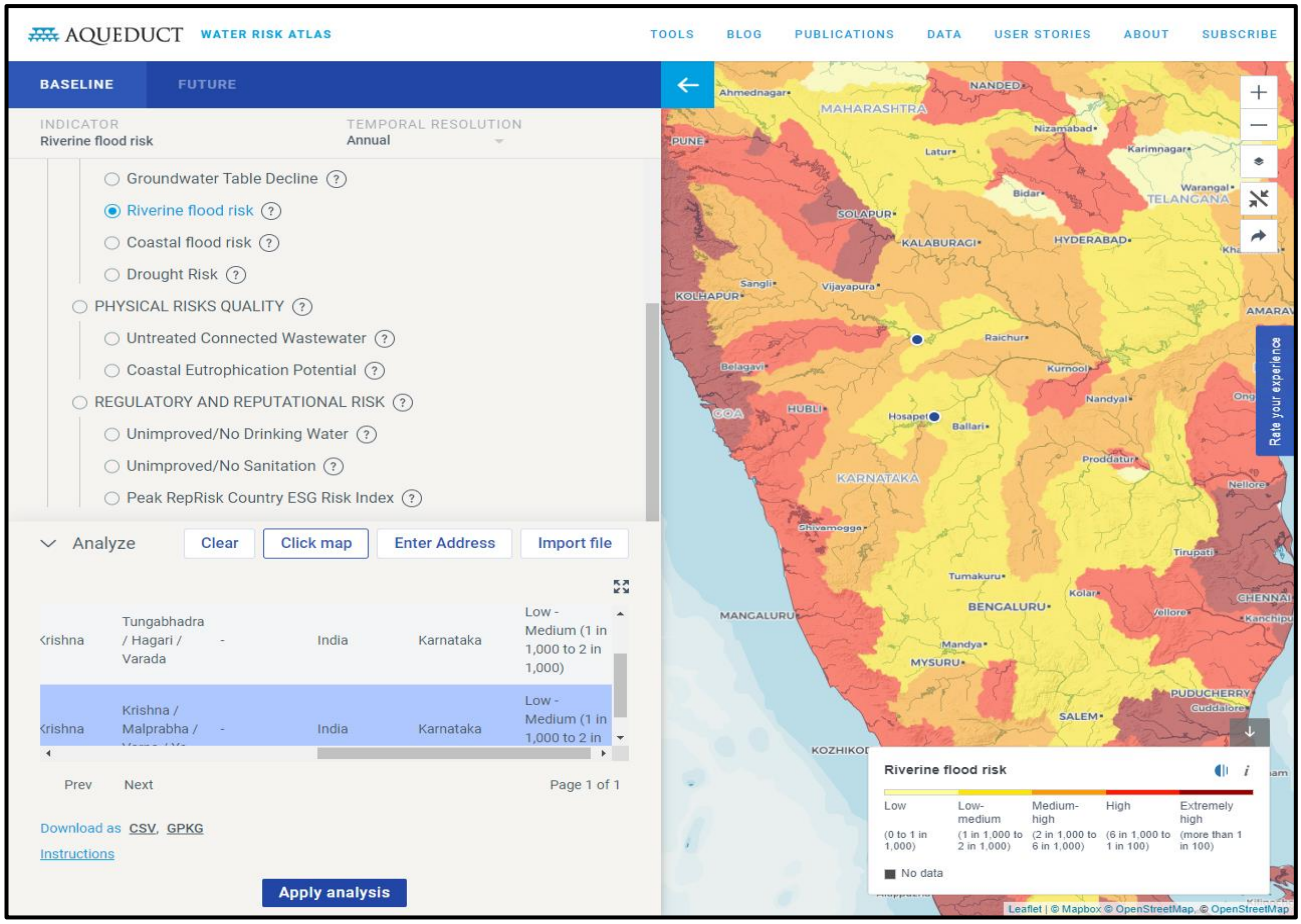
Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Optimistic		Business as usual		Pessimistic	
					2030	2050	2030	2050	2030	2050
Tungabhadra Dam	15.2646	76.3372	Krishna	Tungabhadra/ Hagari/ Varada	Low - Medium (0.33-0.66)	Low - Medium (0.33-0.66)	Low - Medium (0.33-0.66)	Low - Medium (0.33-0.66)	Low - Medium (0.33-0.66)	Low - Medium (0.33-0.66)
Almatti Dam	16.1793	76.1498	Krishna	Krishna / Malprabha / Varna	Medium - High (0.66-1.00)	Medium - High (0.66-1.00)	Medium - High (0.66-1.00)	Medium - High (0.66-1.00)	Medium - High (0.66-1.00)	Medium - High (0.66-1.00)



e. Riverine Flood Risk:

Riverine flood risk measures the percentage of population expected to be affected by Riverine flooding in an average year, accounting for existing flood-protection standards. Flood risk is assessed using hazard (inundation caused by river overflow), exposure (population in flood zone), and vulnerability. The existing level of flood protection is also incorporated into the risk calculation. It is important to note that this indicator represents flood risk not in terms of maximum possible impact but rather as average annual impact. The impacts from infrequent, extreme flood years are averaged with more common, less newsworthy flood years to produce the "expected annual affected population." Higher values indicate that a greater proportion of the population is expected to be impacted by Riverine floods on average.

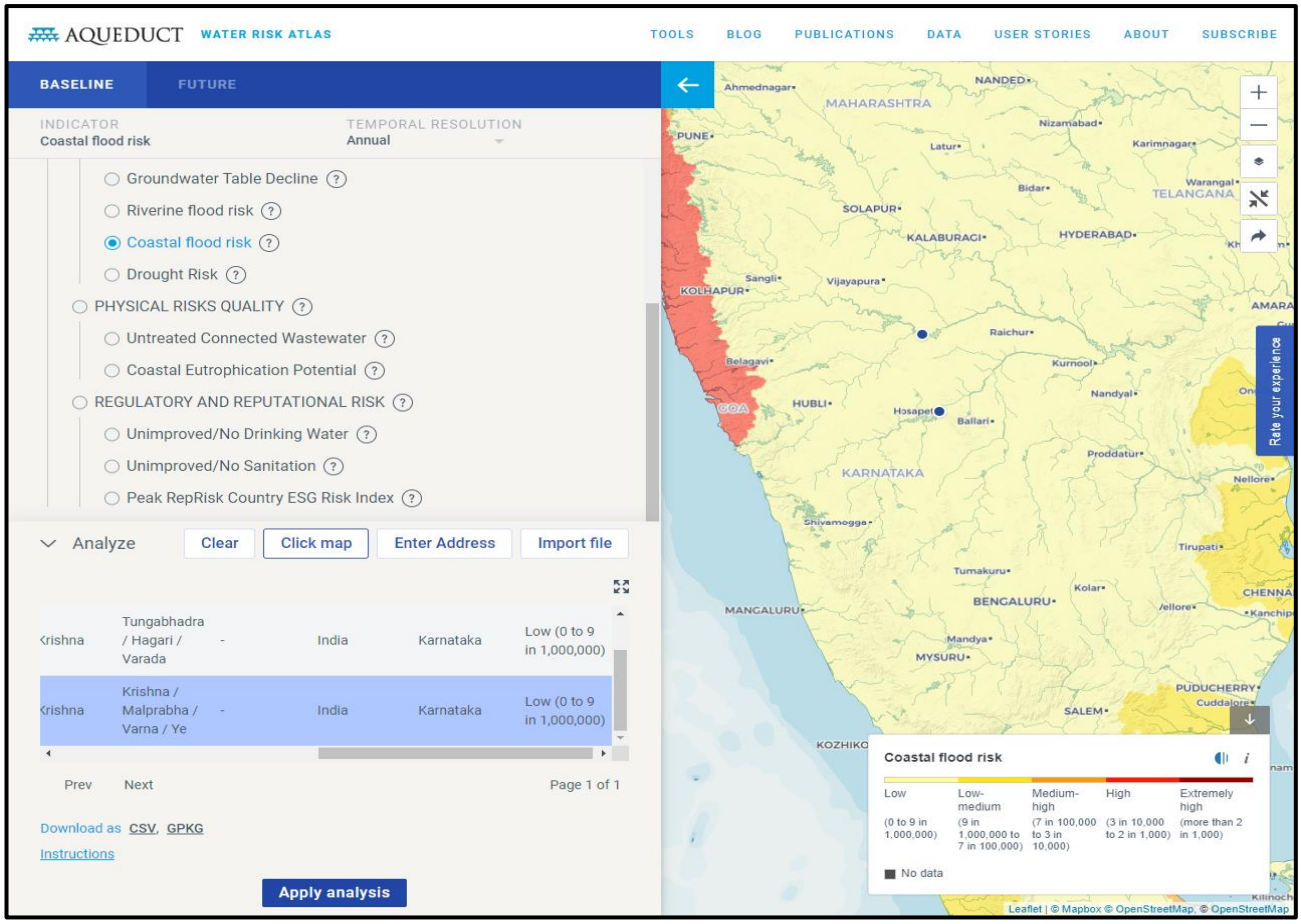
Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Riverine Flood Risk Stress
Tungabhadra Dam	15.26456	76.33717	Krishna	Tungabhadra/ Hagari/ Varada	Low - Medium (1 in 1,000 to 2 in 1,000)
Almatti Dam	16.17925	76.14978	Krishna	Krishna / Malprabha / Varna	Low - Medium (1 in 1,000 to 2 in 1,000)



f. Coastal Flood Risk:

Coastal flood risk measures the percentage of the population expected to be affected by coastal flooding in an average year, accounting for existing flood protection standards. Flood risk is assessed using hazard (inundation caused by storm surge), exposure (population in flood zone), and vulnerability.17 The existing level of flood protection is also incorporated into the risk calculation. It is important to note that this indicator represents flood risk not in terms of maximum possible impact but rather as average annual impact. The impacts from infrequent, extreme flood years are averaged with more common, less newsworthy flood years to produce the "expected annual affected population." Higher values indicate that a greater proportion of the population is expected to be impacted by coastal floods on average.

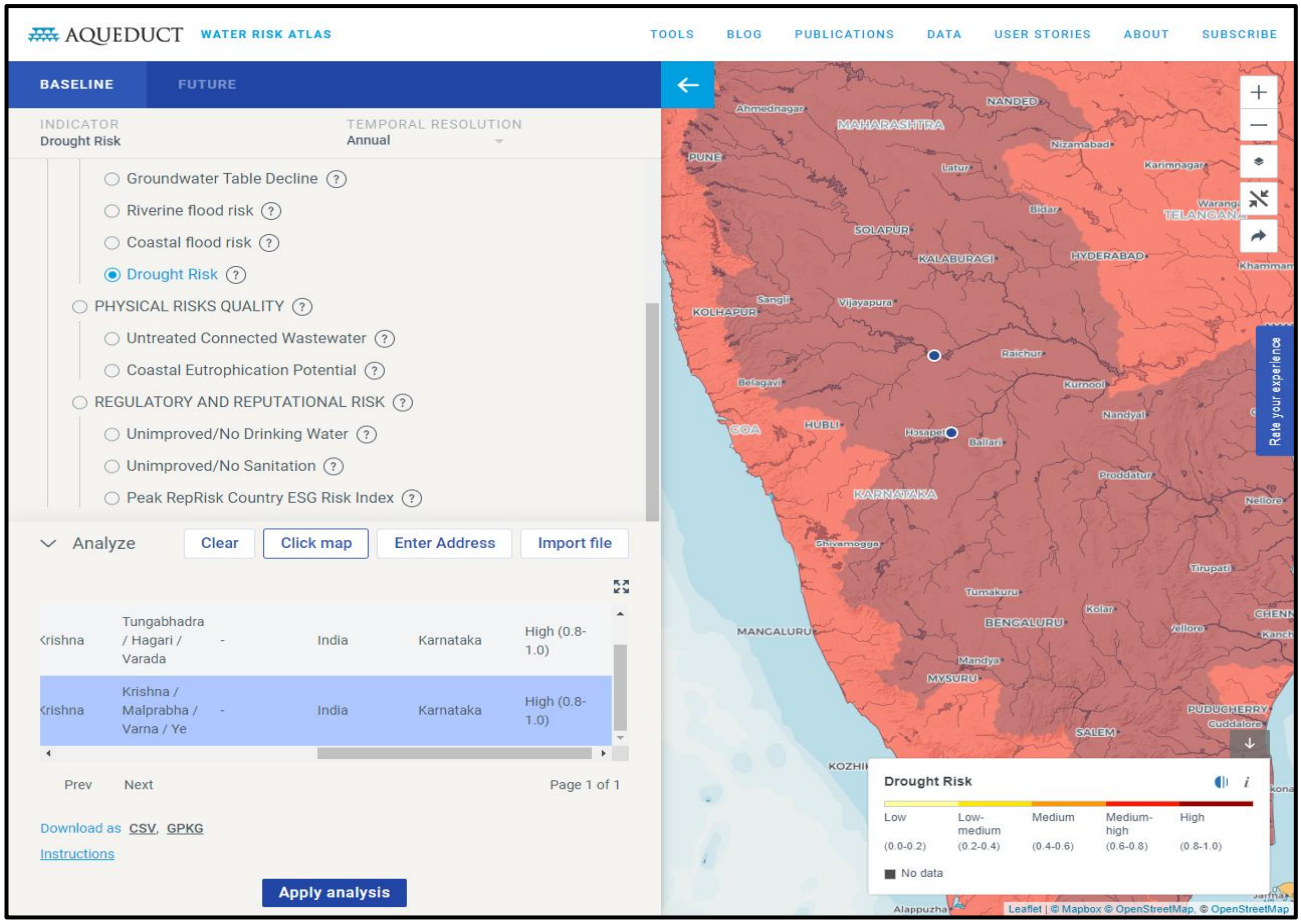
Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Coastal Flood Risk
Tungabhadra Dam	15.26456	76.33717	Krishna	Tungabhadra/ Hagari/ Varada	Low (0 to 9 in 1,000,000)
Almatti Dam	16.17925	76.14978	Krishna	Krishna / Malprabha / Varna	Low (0 to 9 in 1,000,000)



g. Drought Risk:

Drought risk measures where droughts are likely to occur, the population and assets exposed, and the vulnerability of the population and assets to adverse effects. Higher values indicate higher risk of drought.

Location Name	Latitude	Longitude	Major Basin Name	Minor Basin Name	Drought Flood Risk
Tungabhadra Dam	15.26456	76.33717	Krishna	Tungabhadra/ Hagari/ Varada	High (0.8-1.0)
Almatti Dam	16.17925	76.14978	Krishna	Krishna / Malprabha / Varna	High (0.8-1.0)



7.4. Water Risk Scenario Analysis (RS Criteria 12.3)

Considering the future scenarios proposed by IPCC and Business Plan indicated in table 5 following are the risk matrix.

Risk Matrix

Risk	Severity (A)	Likelihood (B)	Risk score(C) (C=A*B)	Action plan	Risk indicator	Impact
Unavailability of water for plant operation may result in to loss of production & profitability	High (3)	Low (1)	High Risk (3)	In-house water conservation initiatives – Water consumption road map.	1. Average rainfall in catchment area. 2. Overall water risk analysis using Aqueduct study	Plant
Unavailability/ Scarcity of water to local communities	High (3)	Low (1)	High Risk (3)	CSR initiatives Water stewardship initiatives	1. Average rainfall in catchment area. 2. Plantation of native species	Society

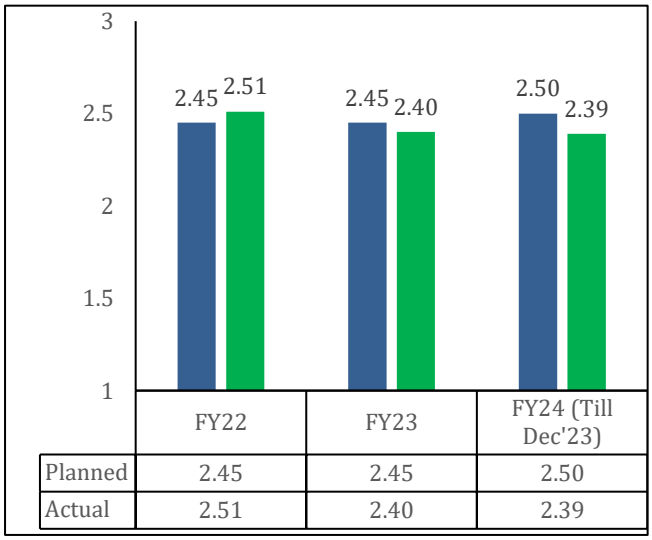
					requiring less water.	
Risk due to flood	High (3)	Low (1)	High Risk (3)	Effectiveness of storm water system. Climate change adaptation plan to be developed	Rainfall	Plant / Society
Risk due to draught	High (3)	Medium (2)	High Risk (6)	CSR initiatives Water stewardship initiatives Increase reuse of process water	Ground water level Reduction in rainfall	Plant / Society
Risk of Population growth may put additional pressure on water availability	Low (1)	Low (1)	1 (With in the risk appetite-No action required	-	-	Plant / Society
Risk on poor water quality – Impact on water treatment cost - Impact on local community for WASH requirement	Low (1)	Low (1)	1 (With in the risk appetite-No action required	-	-	Plant / Society
Inadvertent effluent release or pollution of freshwater source	Low (1)	Low (1)	1 (With in the risk appetite-No action required	-We have achieved ZLD	Reroute to ETP/guard pond	Plant / Society

Variability in water supply due to seasonal variations may impact community, farmers and our own operations	Low (1)	Low (1)	1 (With in the risk appetite-No action required	-		Plant/ Society

7.5. Site water stewardship strategy and Plans

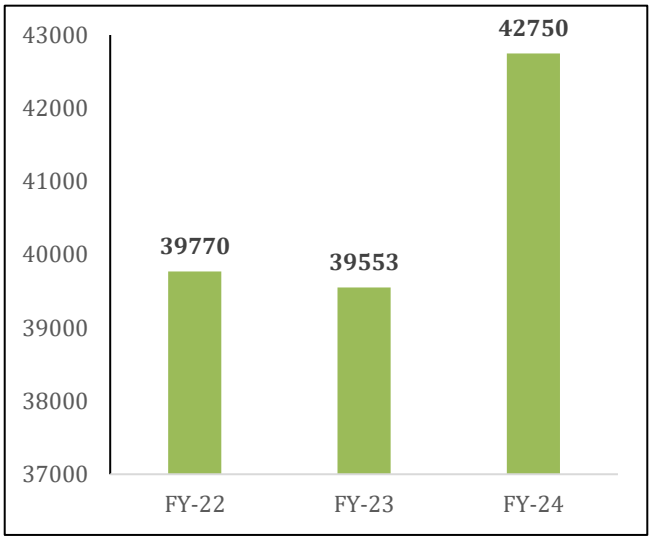
As water is an indispensable resource for our operations, we ensure efficient and judicious use of our resources as far as practicable. Several initiatives are taken to promote the optimal usage of Water from source till discharge of effluent. These initiatives have resulted in a substantial reduction in the consumption of water over the period of years.

Specific Water Consumption (m3/TCS)



	FY22	FY23	FY24 (Till Dec'23)
Planned	2.45	2.45	2.50
Actual	2.51	2.40	2.39

Blow down water Utilization (m3/day)



S No	Shops	Water Consumption Year Avg.(m3/day) FY-23	Target Water Consumption(m3/day)	Savings (m3/day)
1	**CO-3**	3171	3200	**29**
2	**PP-2**	122	180	**58**
3	**PP-3**	864	1320	**456**
4	**SP-1**	61	120	**59**
5	**SP-3**	1468	1600	**132**
6	**SP-4**	617	630	**13**
7	**BF-2**	1828	2150	**322**
8	**BF-3**	7083	7200	**117**
9	**SMS-3**	3252	3800	**548**
10	**WRM-2**	78	180	**102**
11	**BRM-2**	243	300	**57**
12	**CRM-1**	1309	1400	**91**
Savings (m3/day)				**1984**

At our unit management of water has always been a priority as the forefront of Responsible Stewardship. Following are the strategies and action plans of water management driven by our Environment Policy and Water Policy

7.5.1. Action Inside Plant Boundaries

- The efficient use of process blow down water has led to a reduction in the consumption of fresh water. Process effluents generated by different Iron, Steel, and Mills complexes are gathered and retained in three separate Guard Ponds for the settling process. The water from these Guard Ponds is then reused in various secondary processes, including the BF Slag Granulation Process, OBP-2 Process, yard spraying for dust suppression at RMHS, and horticulture/greenery activities.

- Various water conservation measures have reduced fresh water consumption by **1900 m3/day** in process units. This reflects a commitment to sustainability, addressing water scarcity, and minimizing Water consumption through proactive, collaborative efforts.

- RO Plants have been set up at various sites within the JSW Vijayanagar Steel Complex to enable the efficient reuse and recycling of process effluents. A noticeable decrease in fresh water consumption has been noted following the deployment of these RO Plants.

- The sewage water is treated through the Sewage Treatment Plant (STP), and the resulting treated water is utilized as both the input for Reverse Osmosis (RO) feed and for horticultural purposes

7.5.2. Action Outside Plant Boundaries

Project 1: Rain Water Harvesting and Artificial Recharge by CSR

Project 2: Plantation Initiatives by CSR

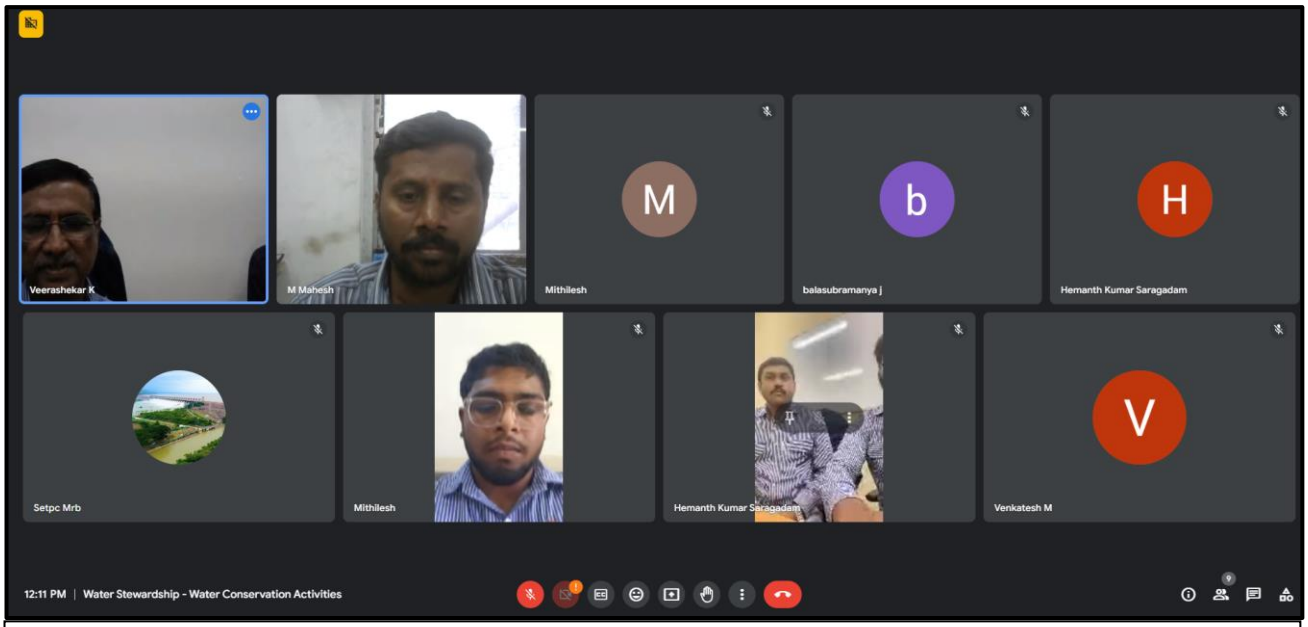
Project 3: Constructions of Recharge Wells by CSR

Project 4: Community Engagement Initiatives by CSR

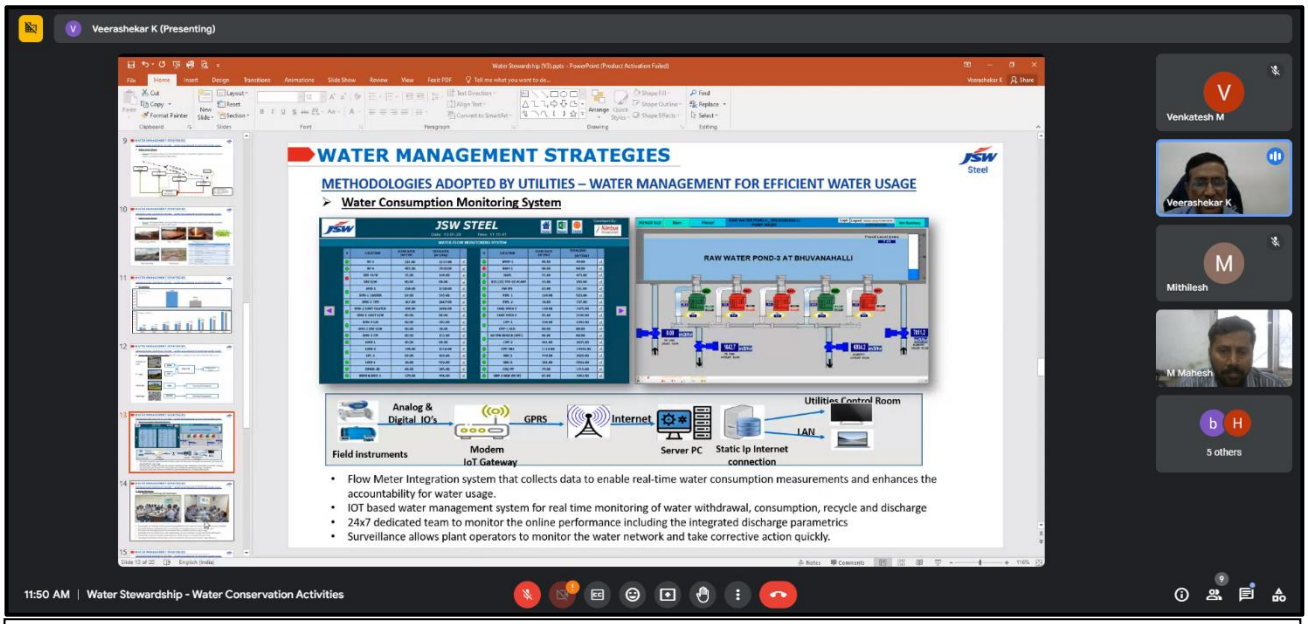
Collaboration with stakeholders and commercial users in our watershed to craft a water stewardship plan.

This joint effort will focus on:

- Sharing and adopting best practices in water management.
- Discussing common challenges and finding solutions.
- Devising a strategy to achieve water-neutral or positive status.
- Implementing rainwater harvesting initiatives within our watershed for sustainable water practices.



Interaction on Water Conservation with Stakeholders - BMM, KBJNL, BTPS & KNNL.



Sharing best practices of JSW VJNR Water Management with Stakeholders.

Interaction with Stakeholders on Water Conservation

Physical meet with Executive Directive BTPS, Kudithini

8. Water Risk Mitigation Plan

8.1. Internal Mitigation Plan

Sr. No.	Risk	Mitigation /Reduction Plan
01	Water Source for Industrial purposes	• Treatment of Raw Water to reduce turbidity and optimize water quality (pH) for optimized usage. • Recycling of blow down water. • Operation of the cooling tower at increased number of cycles. • Flow Meter Integration system that collects data to enable real-time water consumption measurements and enhances the accountability for water usage. • Weekly and Monthly Review Meetings with Internal Stakeholders • Maintaining a storage reservoir with a capacity of 3, 96, 72,115 m3 which shall fulfill the Plant Operational requirement as per present water consumption for 140 days (12MTPA).
02	Water Source for Domestic purposes	• Daily checking of all parameters i.e. pH, Turbidity. • Infrastructure Maintenance • Daily monitoring of water consumption Calibration of meters on yearly basis. Campaign of optimum use of water in township. • Community Education.

8.2. External Mitigation Plan

Sr. No.	Risk	Identification	Mitigation plan/ Reduction
1	Physical		
	Quantity	During summer season quantity of Dam water declines	Internal water audit, Maximizing the COC & reuse of process water.
	Quality	Increase in turbidity of water during monsoon season	Chemical dosing modification based on Standard operating procedure.
2	Regulatory	Agreement With Irrigation Department for withdrawal of Water.	Strictly following directions of Irrigation department guidelines. Submission of withdrawal quantity from sources monthly to WRD (KNNL&KBJNL).
3	Financial	There is no financial risk	NA

9. Water Neutral or Water Positive Status/ Ambition

Water neutrality implies balancing the demand and supply of water through a deliberate intervention by the water user. We are working in line with the approach of 'water neutrality' through voluntary initiatives whereby applicable to seek quantitative balance of water used by both reducing our water usage and investing in projects which increase supplies of clean freshwater. With the implemented water management initiatives at site clubbed with our future plan of action, we are optimistic to achieve the target of water neutrality in upcoming years.

10. Monitoring, Verification and Record Keeping of Water Stewardship Plan

JSW Steel measures the quantity of water consumed for different sections on continuous basis and maintain all the records. Water consumption is communicated to the shops Shift In charges, Section Head & HOD on daily basis by Utilities department. On the basis of historical data, SWC Targets are set for respective department. The water consumption data is also logged into SoFi for convenience in monitoring and tracking.

Water Flow Monitoring Details			
Plant	Monitoring Method	Number of Meters	Monitoring Frequency
RWTP-1	DCS	67	24/7 (Scada)
	Log Sheet	147	Every 24 Hours

Water Quality Parameters like pH & Turbidity are checked on hourly basis and controlled as per requirement.

Water analysis is carried out by third party every alternate month. For this recognized lab as per ISO 9001–2015/NABL Accredited is engaged.

Parameters for Analysis of Raw, Make Up & Drinking Water Sample				
Water Sample	**Analysis**	**Test Parameters**	**Frequency**	**Responsibility**
Raw- water & Makeup Water (RWTP-1 & RWTP-2)	Chemical	pH	Every hour	Utilities
		Turbidity		
	Chemical	pH	Alternate Month	Met Chem Laboratories
		Turbidity		
		Color		
		Total Dissolved Solids		
		Phenolphthalein Alkalinity as CaCO3		
		Total Hardness as CaCO3		
		Calcium as ca		
		Magnesium as Mg		
		Total Suspended Solids		
		Nitrates as NO3		
		Iron as Fe		
		Chlorides Cl		
		Sulphates as SO4		
		Fluoride as F		
		Conductivity in Micro mhos		
Drinking Water (RWTP-1 & RWTP-2)	Chemical	pH	Every hour	Utilities
		Turbidity		
	Chemical	pH	Alternate Month	Met Chem Laboratories
		Turbidity		
		Color		
		Total Dissolved Solids		
		Phenolphthalein Alkalinity as CaCO3		
		Total Hardness as CaCO3		
		Calcium as ca		

		Magnesium as Mg		
		Total Suspended Solids		
		Nitrates as NO3		
		Iron as Fe		
		Chlorides Cl		
		Sulphates as SO4		
		Fluoride as F		
		Conductivity in Micro mhos		
		Coliform -MPN		
		E-Coli		

11. Roles & responsibilities

Implementation including review and documentation		**Responsibilities**
1	Review of regulatory requirements	Head – Environment & Sustainability
2	EHS audits of third party vendor	
3	Preparation and submission of statutory returns to the regulatory agency	
4	Application for permits to the regulatory agency and timely renewal and/or extension permits	
5	Discussion with stakeholders and users to identify water management opportunities	Head- Utility Head – CSR Head – Civil
6	Data collection for water management by the site or by a third part EHS consultant	Head – Utility
7	Planning for procurement of goods and services required to implement water management systems and preparing budget	
8	Setting targets for water management	
9	Overseeing design and construction water management systems through an internal team or third party vendor	
10	Review design and construction details of the of water management systems	

11	Overseeing operation and maintenance of water management systems through an internal team or third party vendor	Head – Utility
Availing third party service		
1	Select a third party vendor for conducting data collection if the site does not have expertise	Head – Utility
2	Select a third party vendor for design and construction of water management systems if the site does not have expertise.	
3	Select a third party vendor for operation and maintenance of water management systems.	Head – Utility
4	Identification of analytical laboratory	Head - laboratory
5	Identification of hazardous and non-hazardous waste disposal vendor	Head – Environment & Sustainability
6	Identification of EHS consultant and evaluation to undertake facility/site EHS compliance audit and risk assessment for water management systems and third party vendors	
Monitoring		
1	Preparing environmental monitoring plan	Head – Environment & Sustainability
2	Oversight of environmental monitoring	
Reporting		
1	Report the status to stakeholders as required	Head – Environment & Sustainability
Training		
1	Identification of training need in consultation with various department heads	Head – Utility Head – HRD

12. Stakeholder Engagement Plan

Sr. No.	List of Stakeholders	Engagement Medium	Engagement Aspect	Frequency
1	Employees/ Internal Stakeholders	Power point presentation, Oral Communication, E-mail, Flyers, Posters	-Water scarcity, -Water consumption, -Water conservation through Reduce, Reuse & Recycle. -Optimization of water supply through metering in water line.	Monthly
2	Investors	Sustainability report	-Reduction in specific water consumption -Good practices of water conservation.	Yearly
3	Irrigation Department	Water consumption Quantity & Water charge	-Availability of surface water- -Surface water quantity monitoring -Submission of water charge	Monthly by irrigation department
4	External stakeholders	BMM Hospet BTPS, Kudithini KBJNL,KNNL	- Water conservation through Reduce, Reuse & Recycle. - Water conservation technologies	Quarterly

13. Emergency Preparedness and Response

There might be a few reasons of anticipated water crisis. We have EPP to tackle with all types of water crisis.

- Water supply line has a chance of water leakage in Underground water line. In that case we have a plan to restore the water supply after attending the leakage. We have an SOP for this work.
- Maintaining on-site water storage capacity. Our Unit has reservoirs that is sufficient to sustain the plant operation for 140 days at 12MTPA.

14. Awareness and Training

JSW Steel is conducting the training and awareness program on water management system to new joiners on following topics.

01	Responsibilities/Functions of Utilities – Water Management
02	Water Pumping System from Sources
03	Raw Water Treatment Process
04	Make up & Guard Pond Water network
05	O&M of Pipelines & Equipments

Rewards & Recognitions

01	• World Water Day celebrations – Rewarding Best performance shops & individuals. • World steel association workshop.