

IADAPT

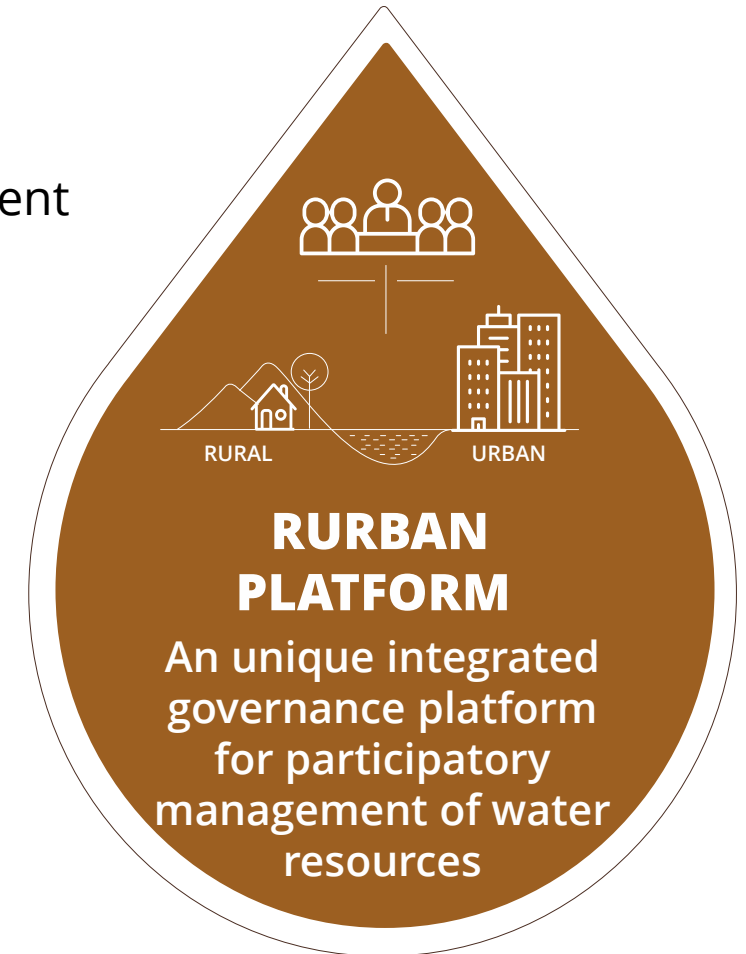
Integrated rural urban water management for climate-based adaptations in Indian cities

Decision Support Tool

Under the chairpersonship of the Deputy Commissioner, SMC and
Deputy CEO, Zila Parishad, Solapur, Maharashtra

ATHENA
INFONOMICS

1. **Water governance** and its importance
2. **Current Decision Making** in Integrated Water Resources Management
3. **Catchment Management Plan** Methodology
4. **Best Practices** in 'Decision Support Tool'
5. **Construct of Decision Support Tool (DST)**
6. Illustration of DST with project
7. **Operationalisation** of DST through RURBAN platform
8. **Next Steps**



Funding Agency



Canadian Government Corporation
investing in research and innovation
in the developing world

Implementing Partners

The logo for Athena Infonomics, with "ATHENA" in dark blue and "INFONOMICS" in orange.

Implementation Partner
for Vijayawada

The logo for ICLEI (International Council for Local Environmental Initiatives), featuring the acronym "I.C.L.E.I" in green with dots, and the text "Local Governments for Sustainability" below it.

Implementation Partner
for Solapur



Hydrological and climatic
research activities

The logo for the International Water Management Institute (IWMI), with "IWMI" in large blue letters and "International Water Management Institute" in smaller blue text below it.

Publication and
dissemination activities



1

Water Governance



Water governance **transcends traditional administrative boundaries** and hence must be looked from the catchment perspective.



Water transcends boundaries.

The natural resource traverses beyond administrative boundaries and is defined by its micro catchment, hence making it necessary to go beyond administrative jurisdictions.



Water is catchment sensitive.

There are geographical disparities. The mismatch has an impact on other geographies.



Stakeholder diversity.

Decision making involves multiple stakeholders i.e., a single catchment might have 20 odd departments and decision makers, making it more complex.



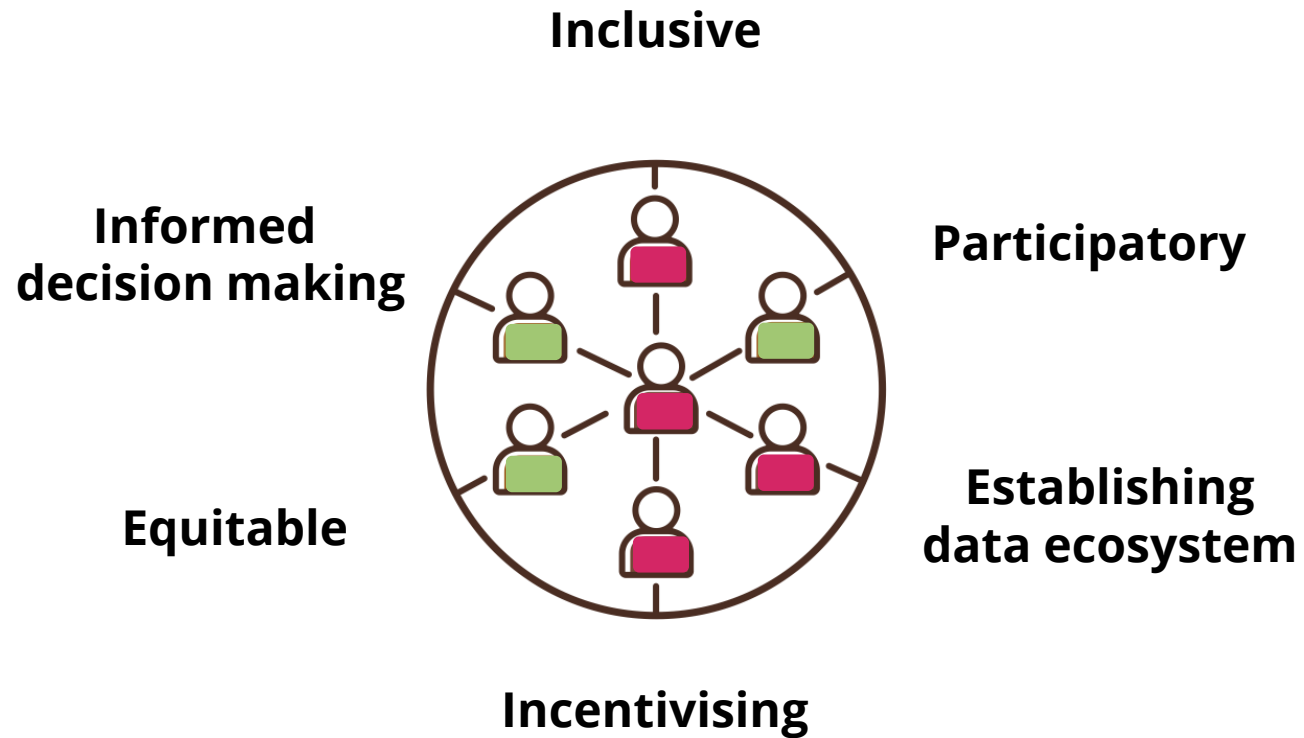
Water allocation.

It is done according to priority and availability, subject to distance from source location.



Quantity vs management.

The primary concern is not necessarily with the amount of water but of judicial management of the resources



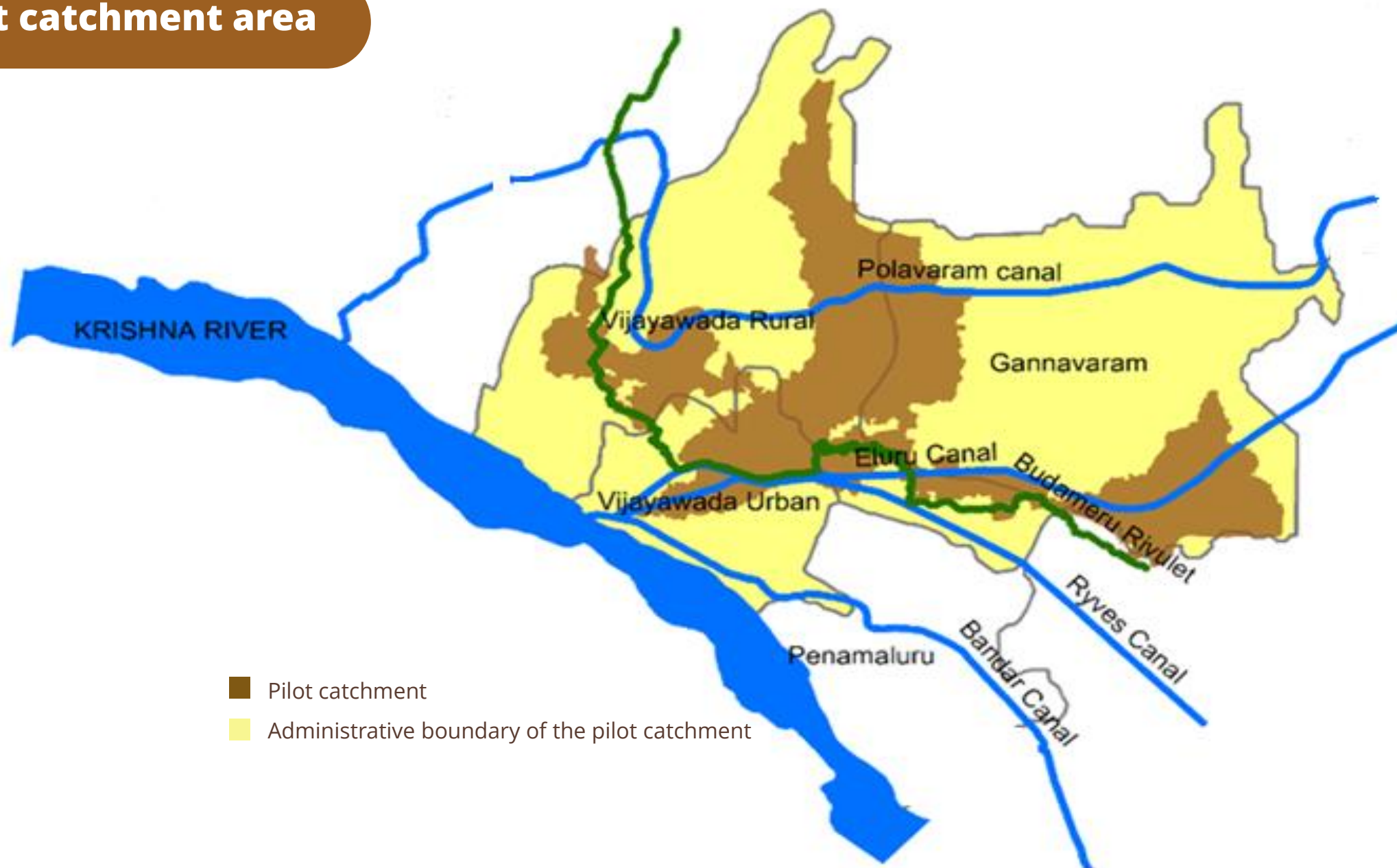
2

Current Decision making In IWRM

Case Study - Vijayawada



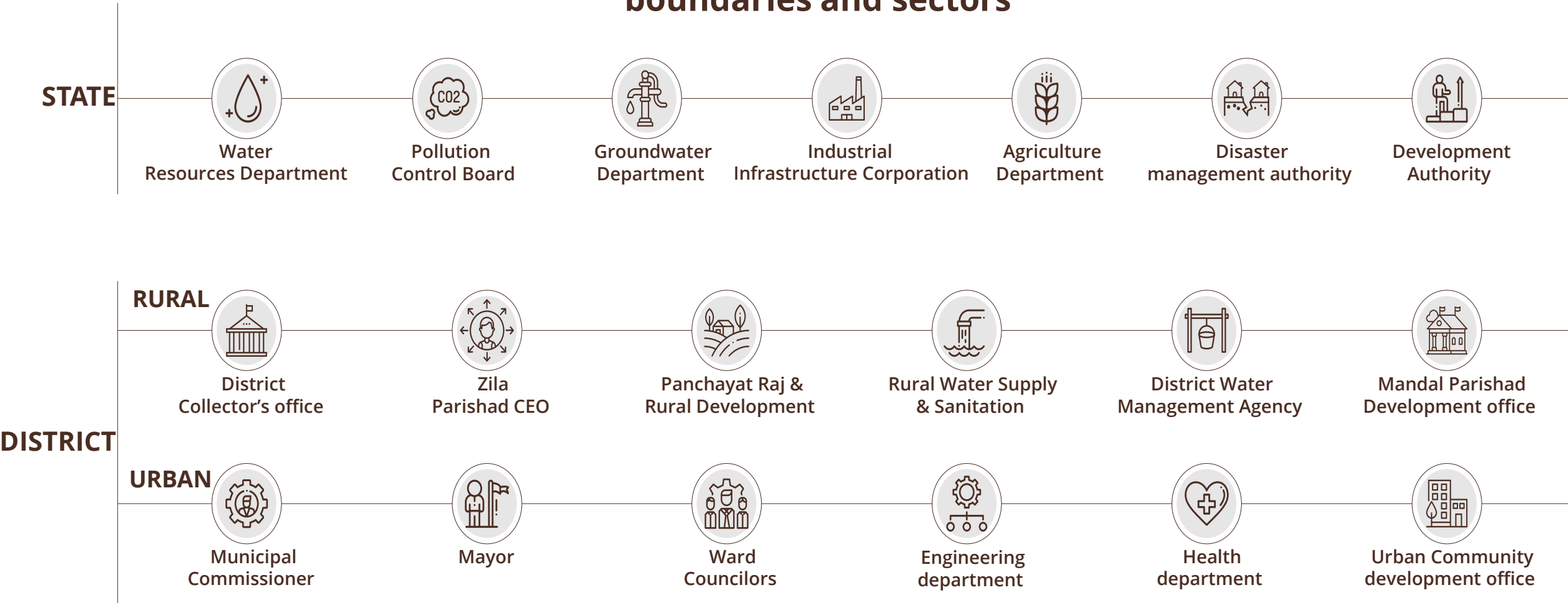
Pilot catchment area



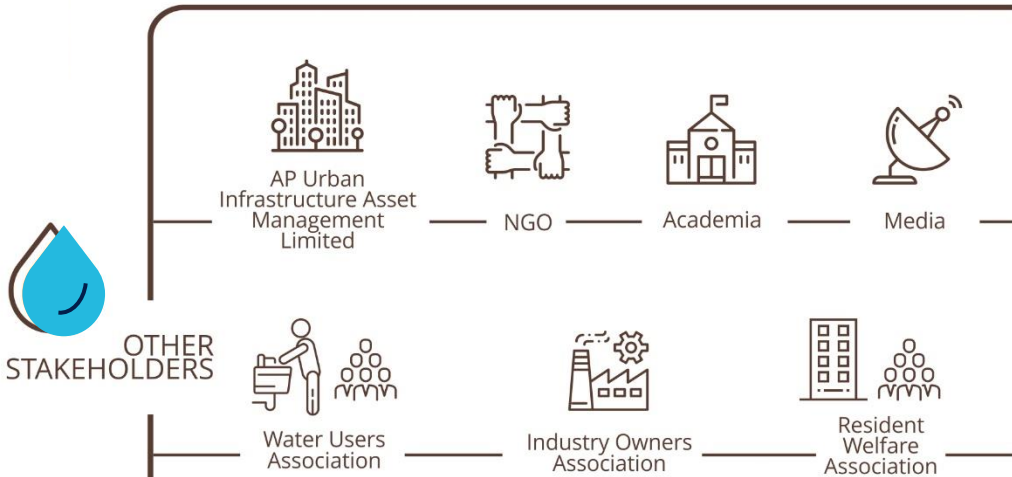
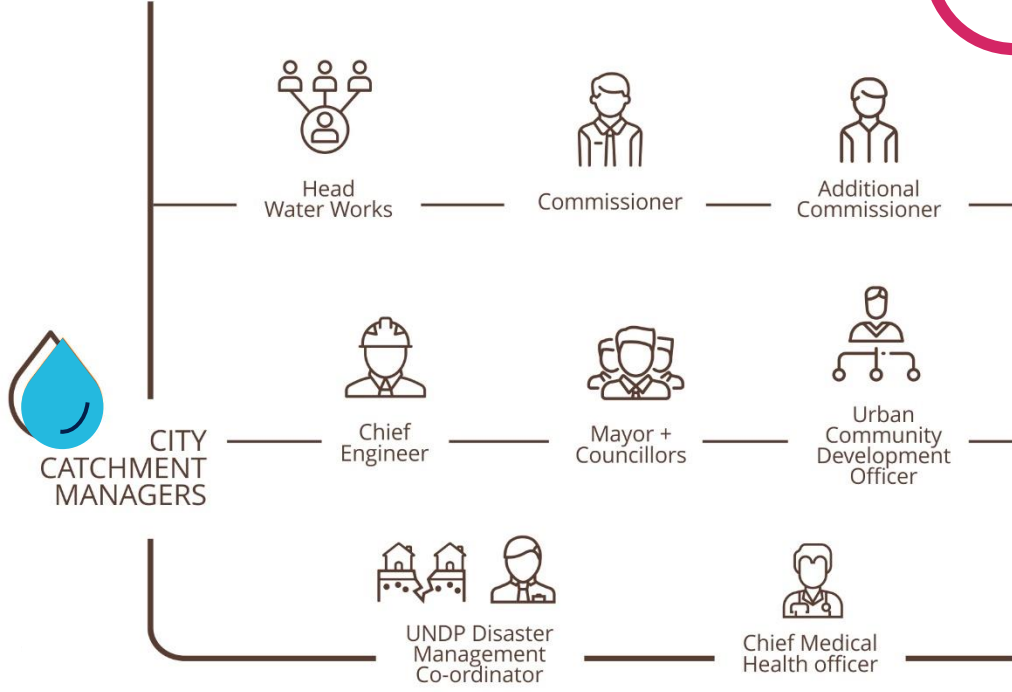
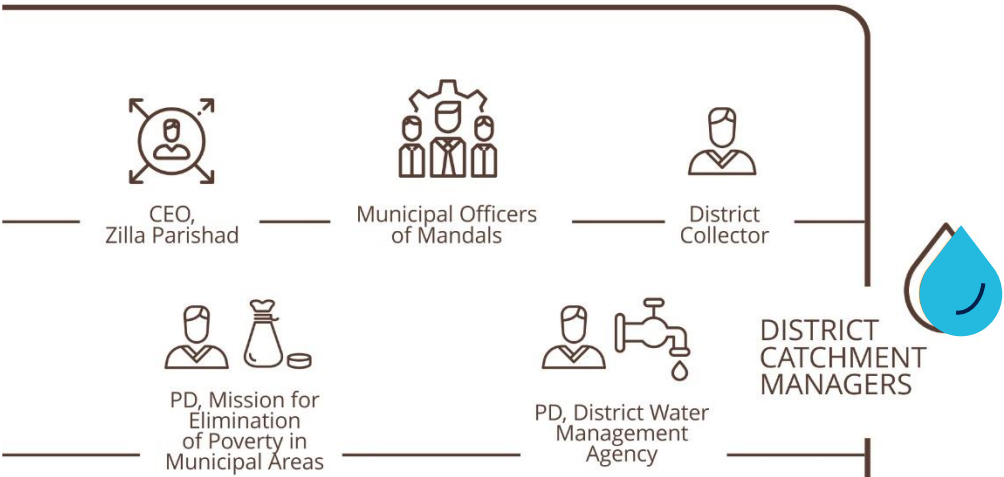
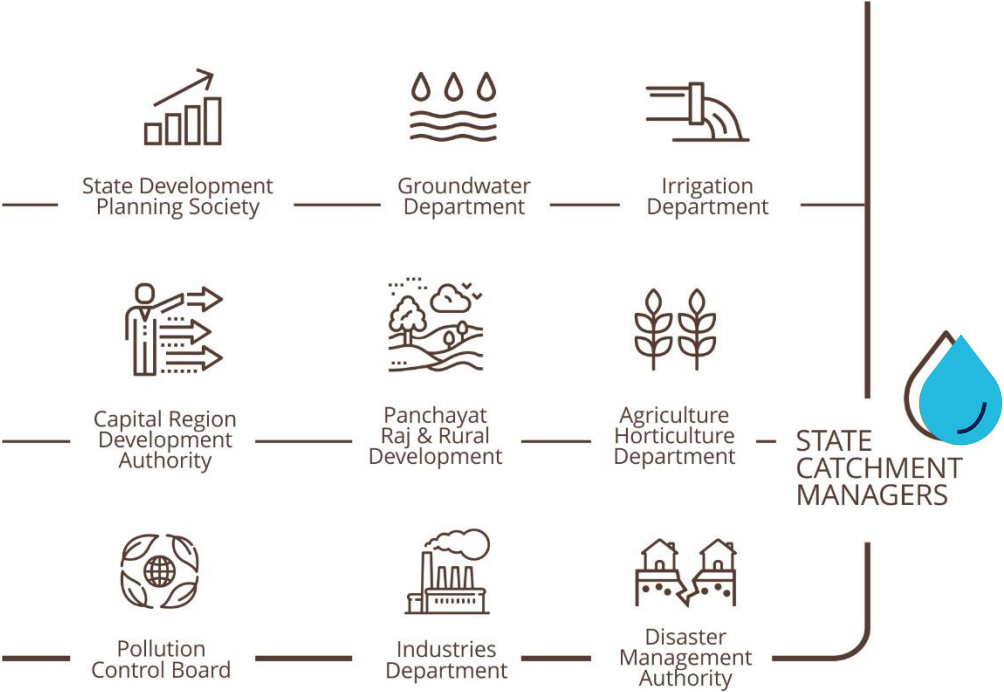
- Pilot catchment
- Administrative boundary of the pilot catchment

Pilot Catchment (284 sq. km)											
VIJAYAWADA URBAN											
Ward Nos.											
1	5	6	20	42	45	46	47	53	54	56	58
VIJAYAWADA RURAL											
Done Atkuru		Nunna				Phiryadi Nainavaram			Ambapuram		
GANNAVARAM											
Surampalle		Ramachandrapuram				Vedurupavuluru			Jekkulanekkulam		

Water resources in a catchment are managed by various institutions and stakeholders across boundaries and sectors

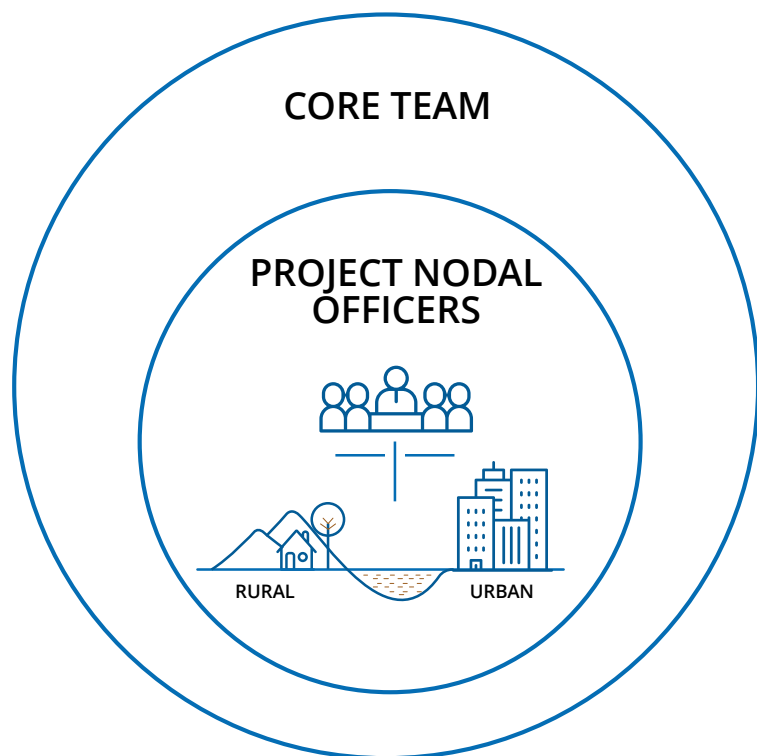


STAKEHOLDERS OF WATER MANAGEMENT IN VIJAYAWADA





RURBAN PLATFORM MEMBERS



The RURBAN platform as an integrated governance mechanism with rural and urban stakeholders.

The multi-stakeholder RURBAN platform is designed to bring together rural and urban stakeholders, to enable greater exchange of information, promote collaborative actions, and formulate and design plans for improved water management in the micro-catchment.

The main responsibilities of the RURBAN platform are:

- Provide guidance to actions identified and planned at the micro-catchment level through the IAdapt project
- Provide essential support to implement water sector related actions at different levels (e.g. community, city level)



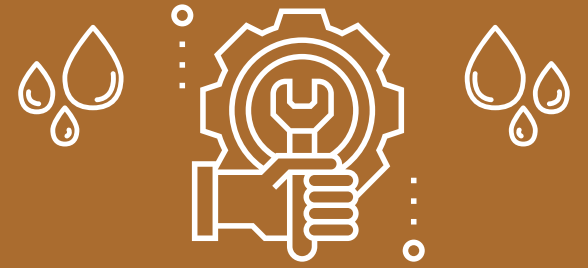
District RRBAN Steering Committee by institutionalized by the Krishna District Collector on 10th October 2019, through a government order.

It comprises of the following members:

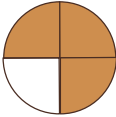
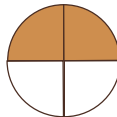
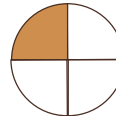
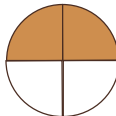
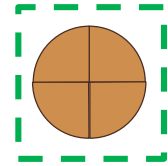
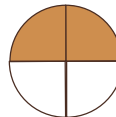
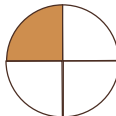
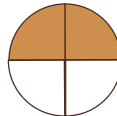
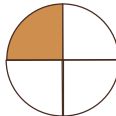

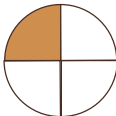
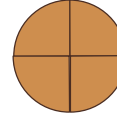
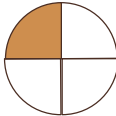
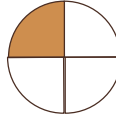
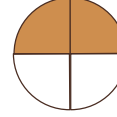
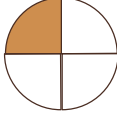
- a. Commissioner, Vijayawada Municipal Corporation
- b. Joint Collector, Krishna
- c. CEO, Zilla Parishad
- d. Chief Engineer, Vijayawada Municipal Corporation
- e. Superintending Engineer, Rural Water Supply and Sanitation
- a. Engineer in Chief, Water Resources Department
- b. District Panchayat Officer, Krishna
- c. General Manager, DIC
- d. Joint Director, Agriculture

3


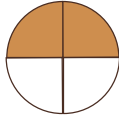
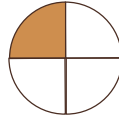
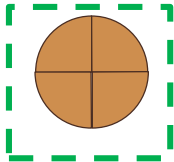

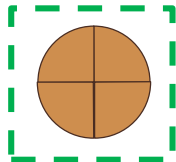
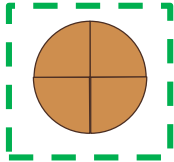
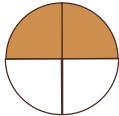
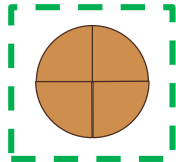
Decision Support Tool

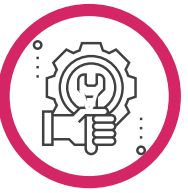


Types of Decision Support Tool (DST)...1

COUNTRY	ARCHITECTURE OF THE TOOL	DECISION TAKEN	PROCESS OWNER	STAKEHOLDER COVERAGE	APPLICABILITY TO ENTIRE WATER CYCLE	BACKED BY REGULATION
Greece	MS Excel	Capacity building	Tool developer		 Water reuse only	 Academic engagement
Vietnam	Self developed tools	Stakeholders opinion in water management plans	Government			
Botswana	Hydrologic model	Hand over to the decision makers	Government			
Syria		None	Tool developer			
India	GIS and time series tool	None	Tool developer			

Types of Decision Support Tool (DST)...2

LOCATION	ARCHITECTURE OF THE TOOL	DECISION TAKEN	PROCESS OWNER	STAKEHOLDER COVERAGE	APPLICABILITY TO ENTIRE WATER CYCLE	BACKED BY REGULATION
India	MS Excel	Cost Curve – Financial and Technical aspects	Tool developer			
Japan	Hydrological model	Stakeholders opinion in ground water management	Government			
Mediterranean	Water Demand Management tool – Technical and Non-technical	Decision Makers	Government			



Involvement of stakeholders

- Government organisations, water users, RWAs, SHGs, academic institutions



Identification of process owner

- Jointly owned by governments and users with representation



Level and complexity of decision making

- Parameters and components incorporated during the assessment



Scalability of model

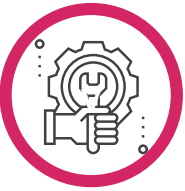
- Character of replicability and application to all sectors in water cycle



Link to project evaluation

- The function of the DST after building the model, and backing by regulations

DST CONSTRUCT AND PARAMETERS CONSIDERED



WATER SCENARIO
PLANNING



ADAPTATION
ASSESSMENT



URBAN REVIEW
MEETING



IMPLEMENTATION OF
ADAPTATION STRATEGIES

Supply Parameters

- Water Flow
- Canals
- Barrage
- Groundwater
- Tanks

Transmission links

- Population
- Agriculture
- Livestock
- Commercial base
- Industrial activity

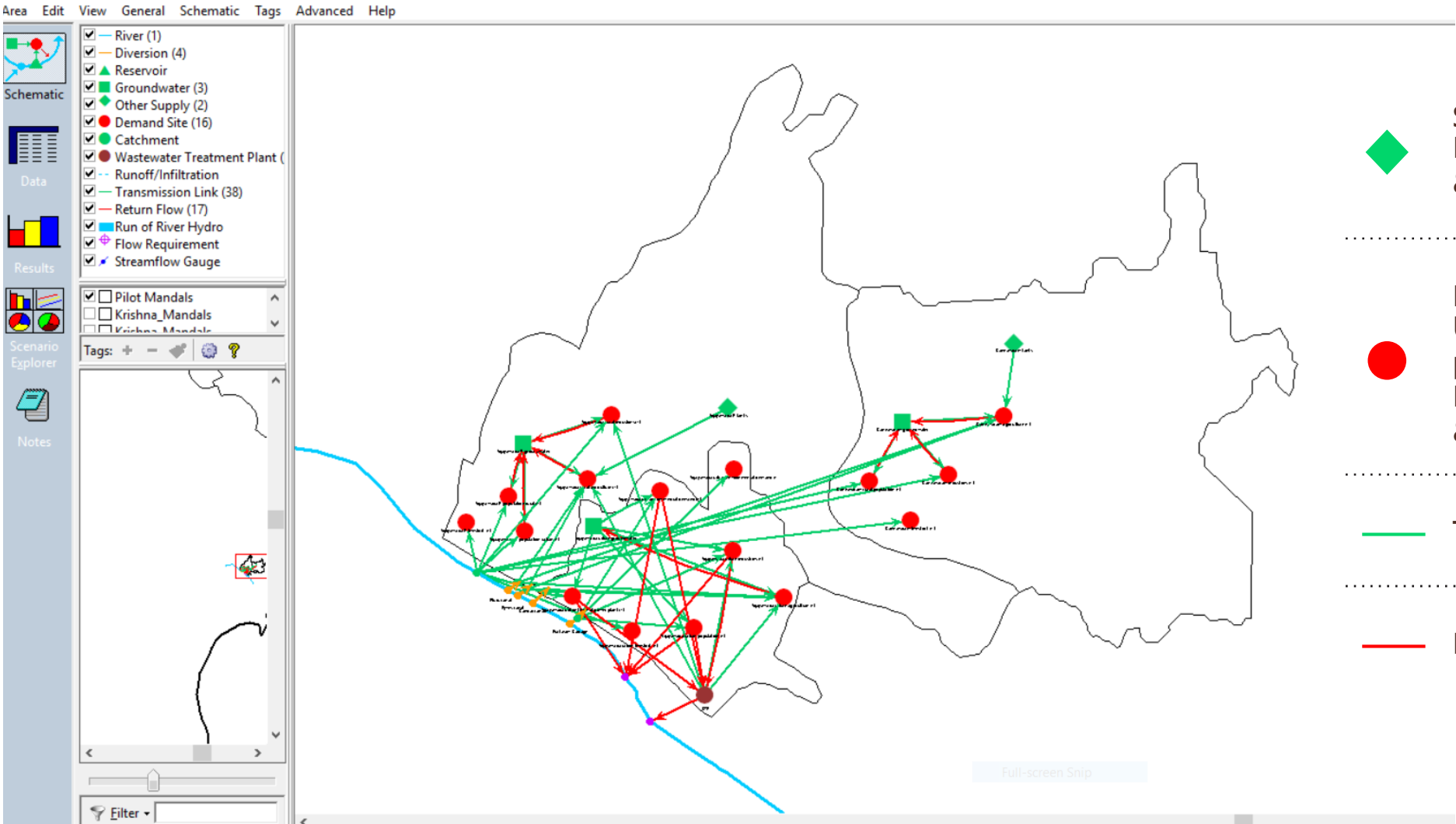
Quality and Quantity Parameters

- BOD
- Temperature
- DO
- Boron concentration
- pH

MAPPING WATER DEMAND AND SUPPLY ON WEAP

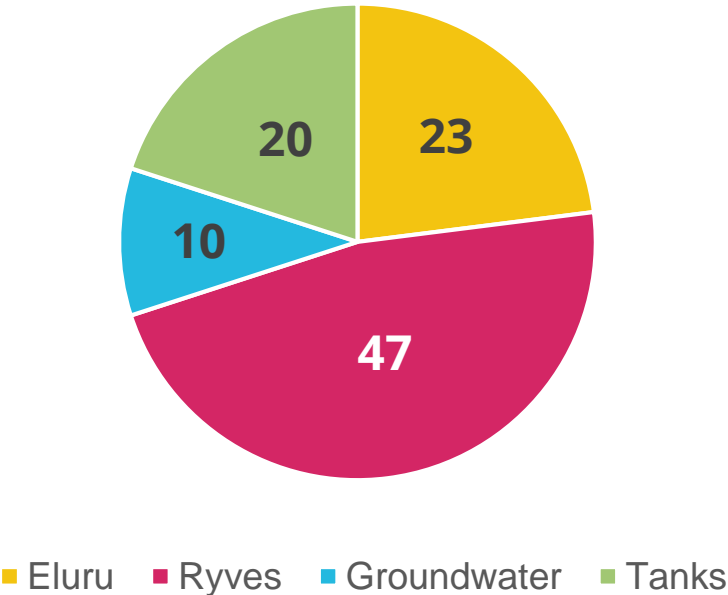


Using the Water Evaluation and Planning tool (WEAP), demand and supply nodes are mapped to identify water allocation across stakeholders (demand nodes)

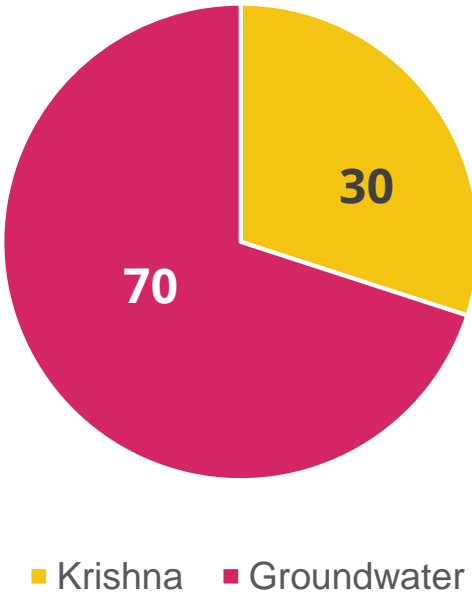


MAPPING WATER DEMAND AND SUPPLY ON WEAP

Vijayawada Agriculture Demand

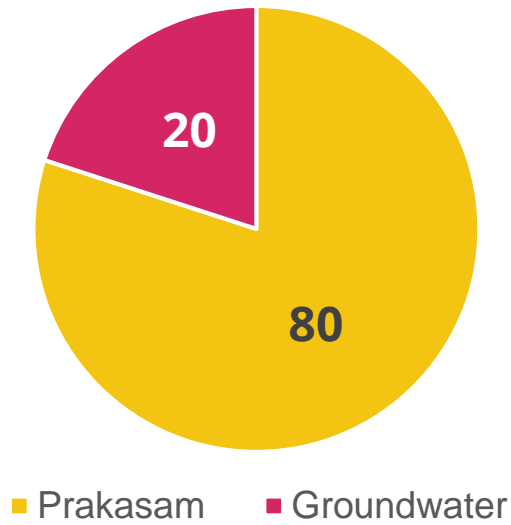


Vijayawada Industrial Demand

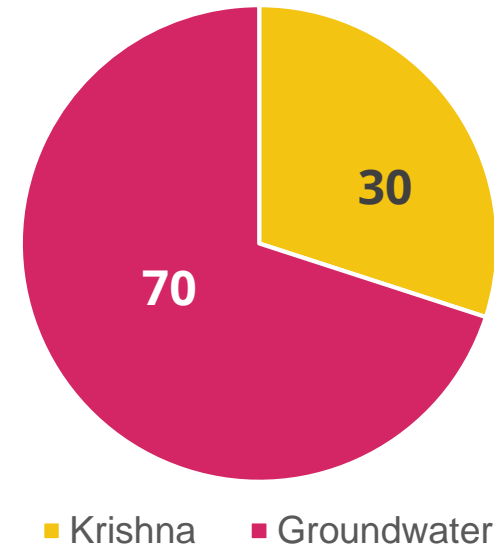


MAPPING WATER DEMAND AND SUPPLY ON WEAP

Urban Population Demand

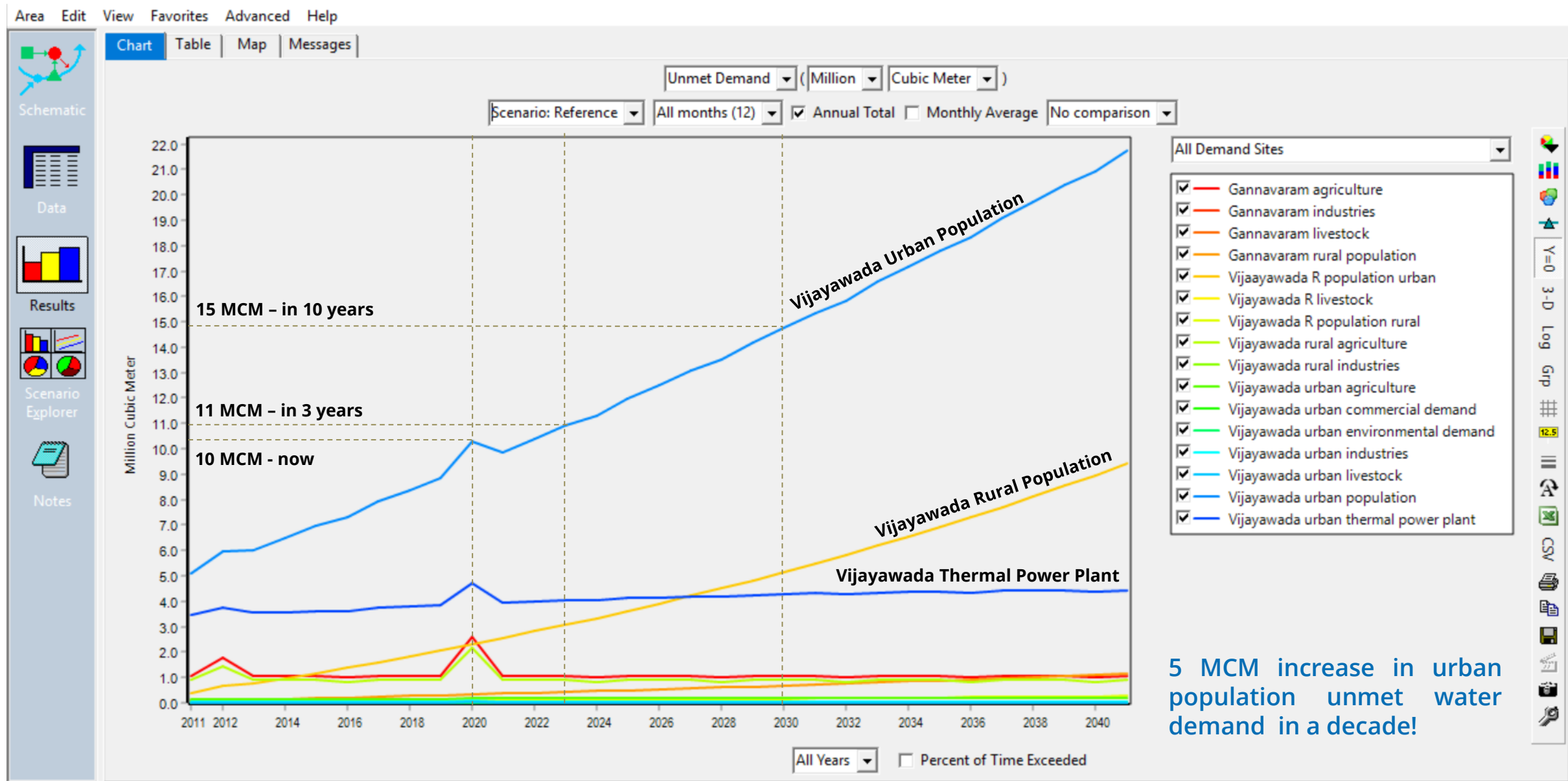


Rural Population Demand

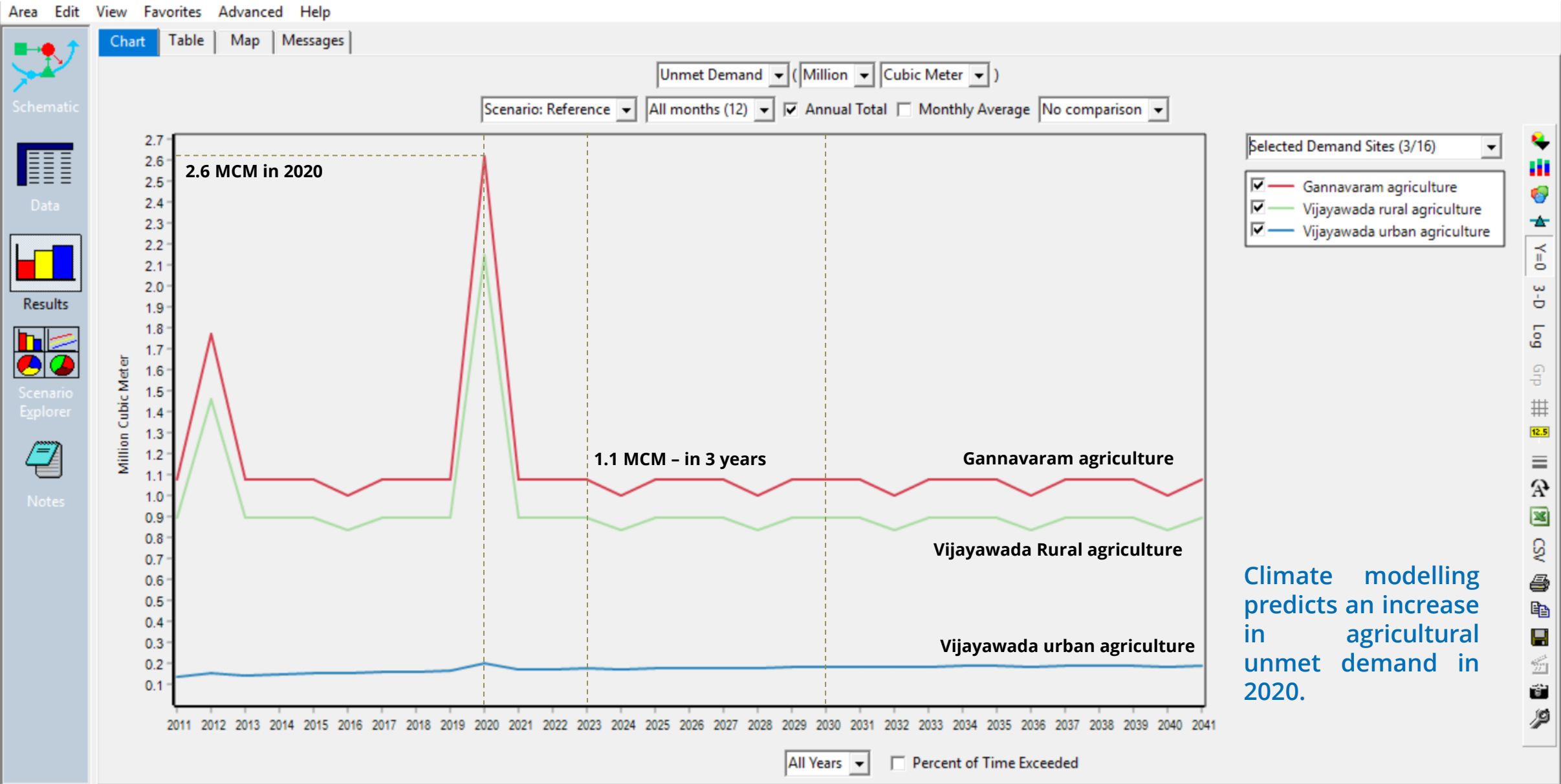


These give an additional indication of where the water source is coming from and how for decision making the water allocation can be looked at.

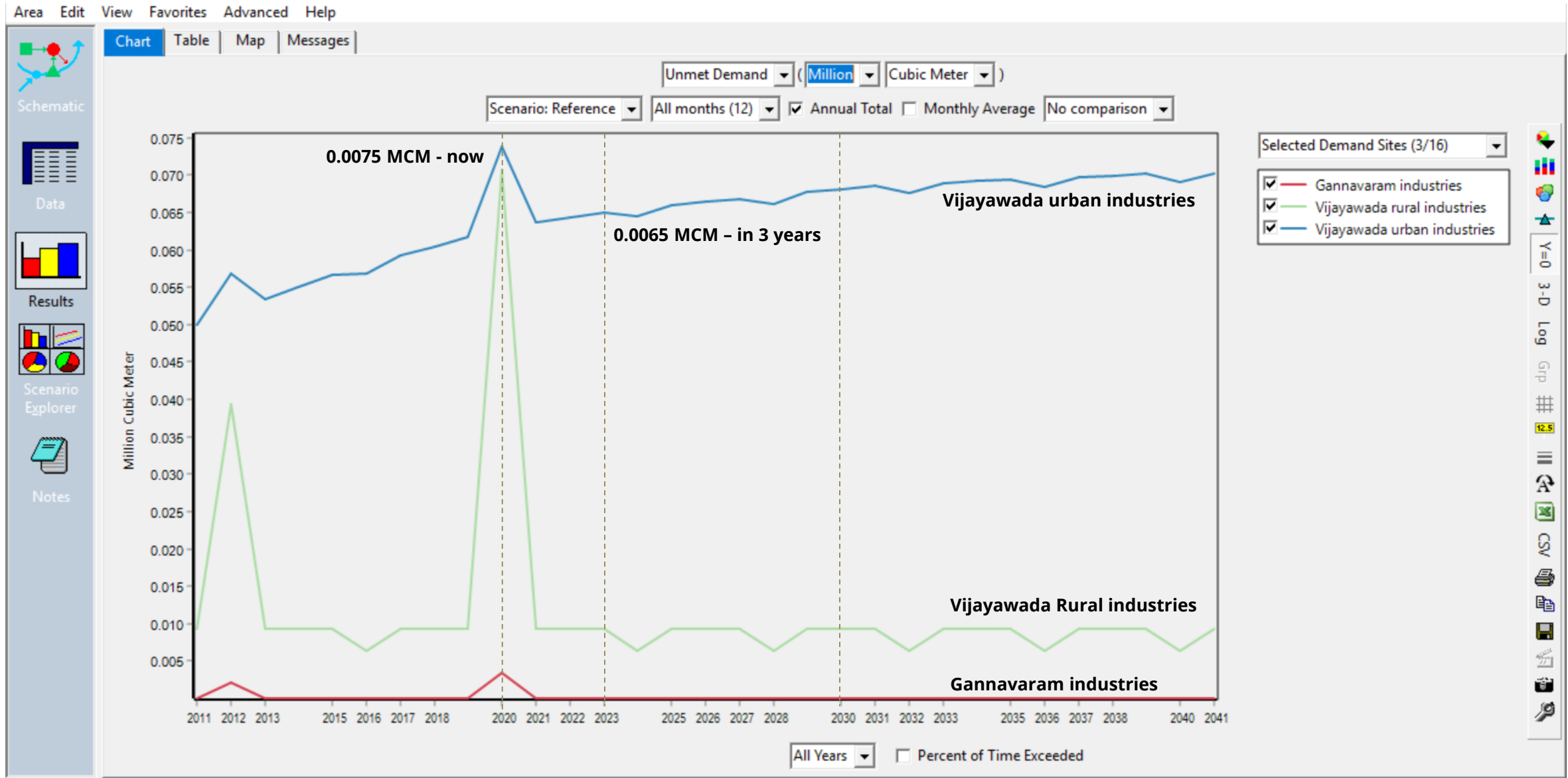
ASSESSING DEMAND SUPPLY GAP ACROSS STAKEHOLDERS – BAU



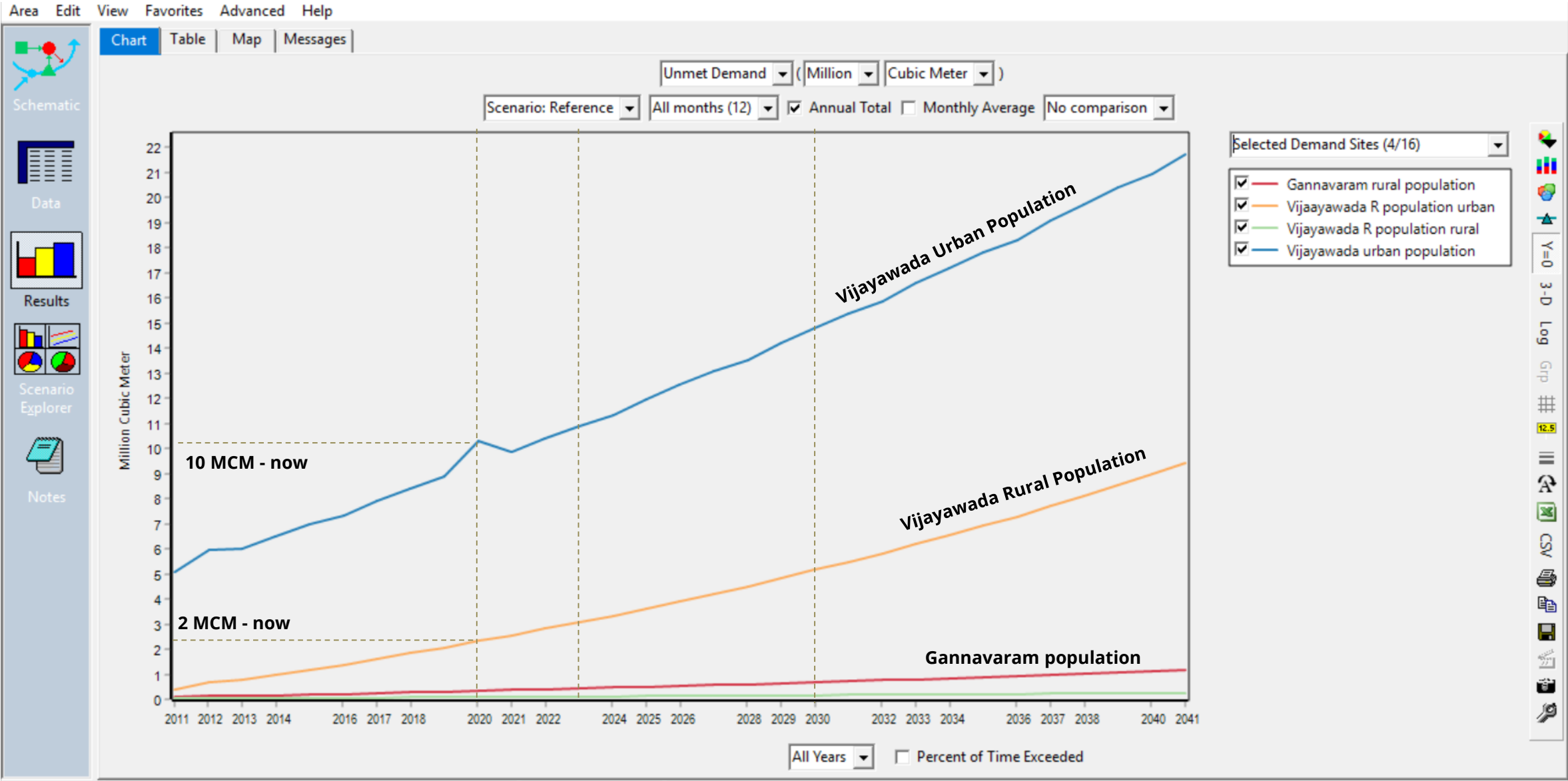
CURRENT AGRICULTURAL UNMET DEMAND UNTIL 2041



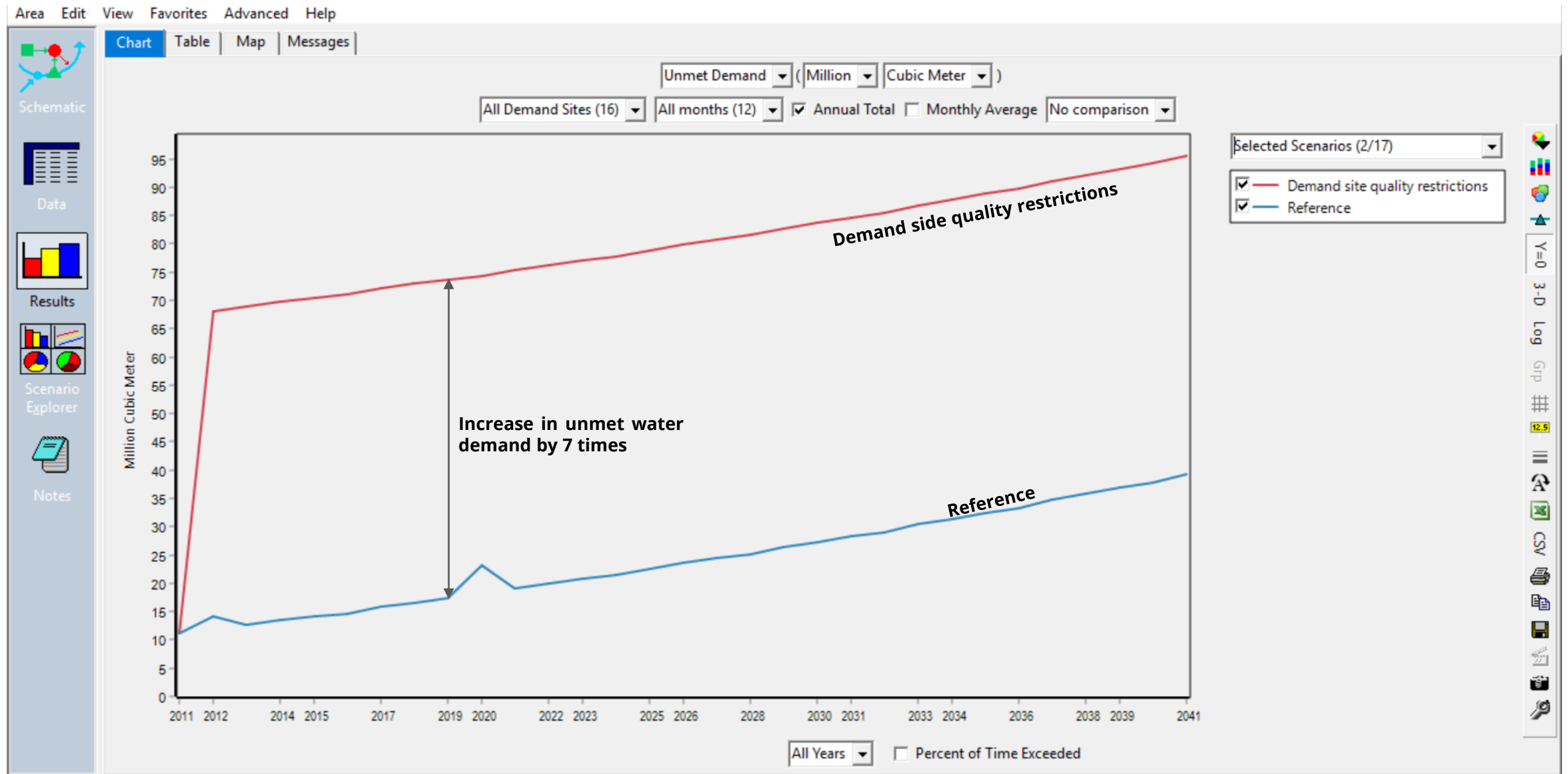
CURRENT INDUSTRIAL UNMET DEMAND UNTIL 2041



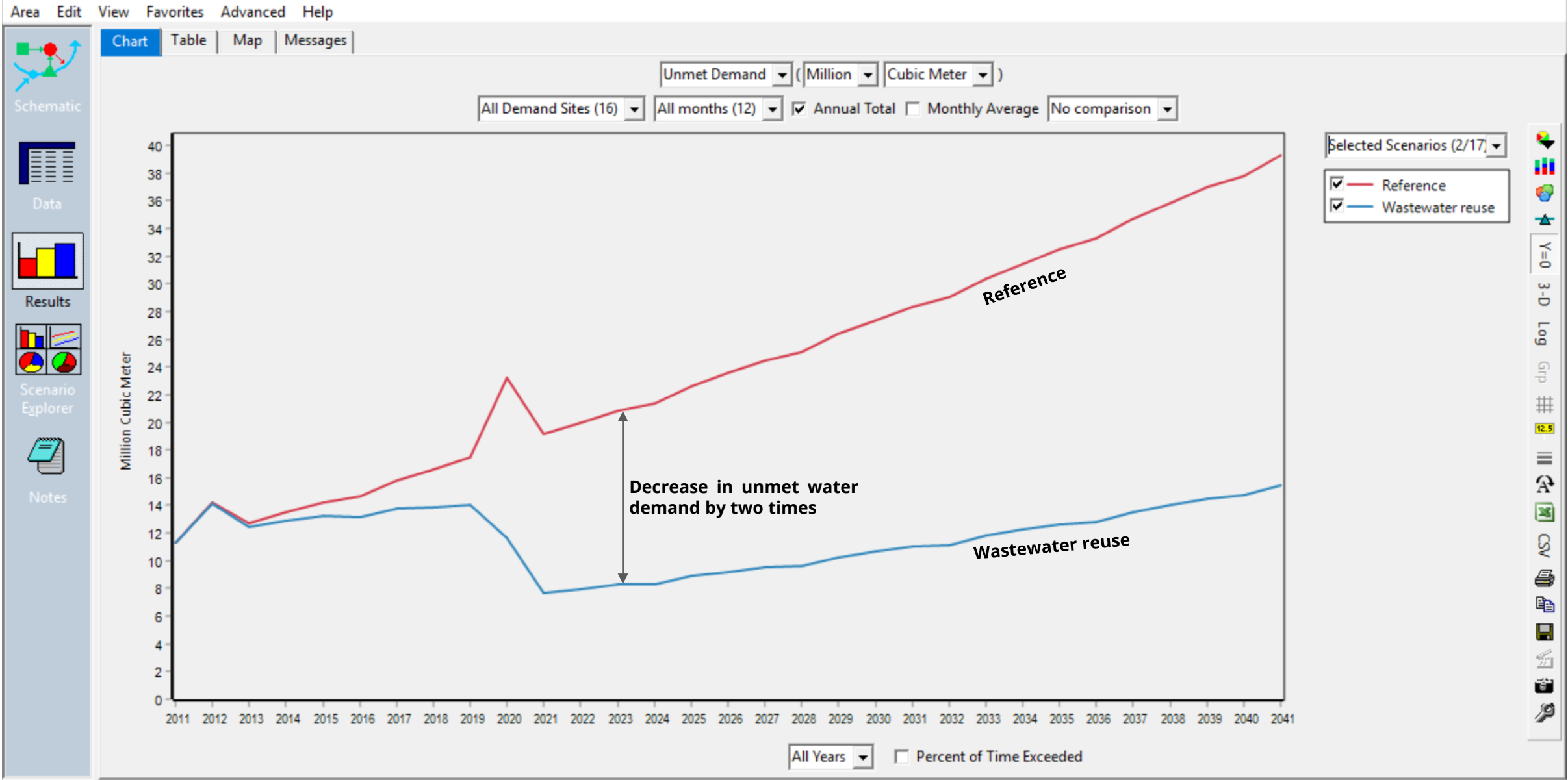
CURRENT POPULATION UNMET DEMAND UNTIL 2041



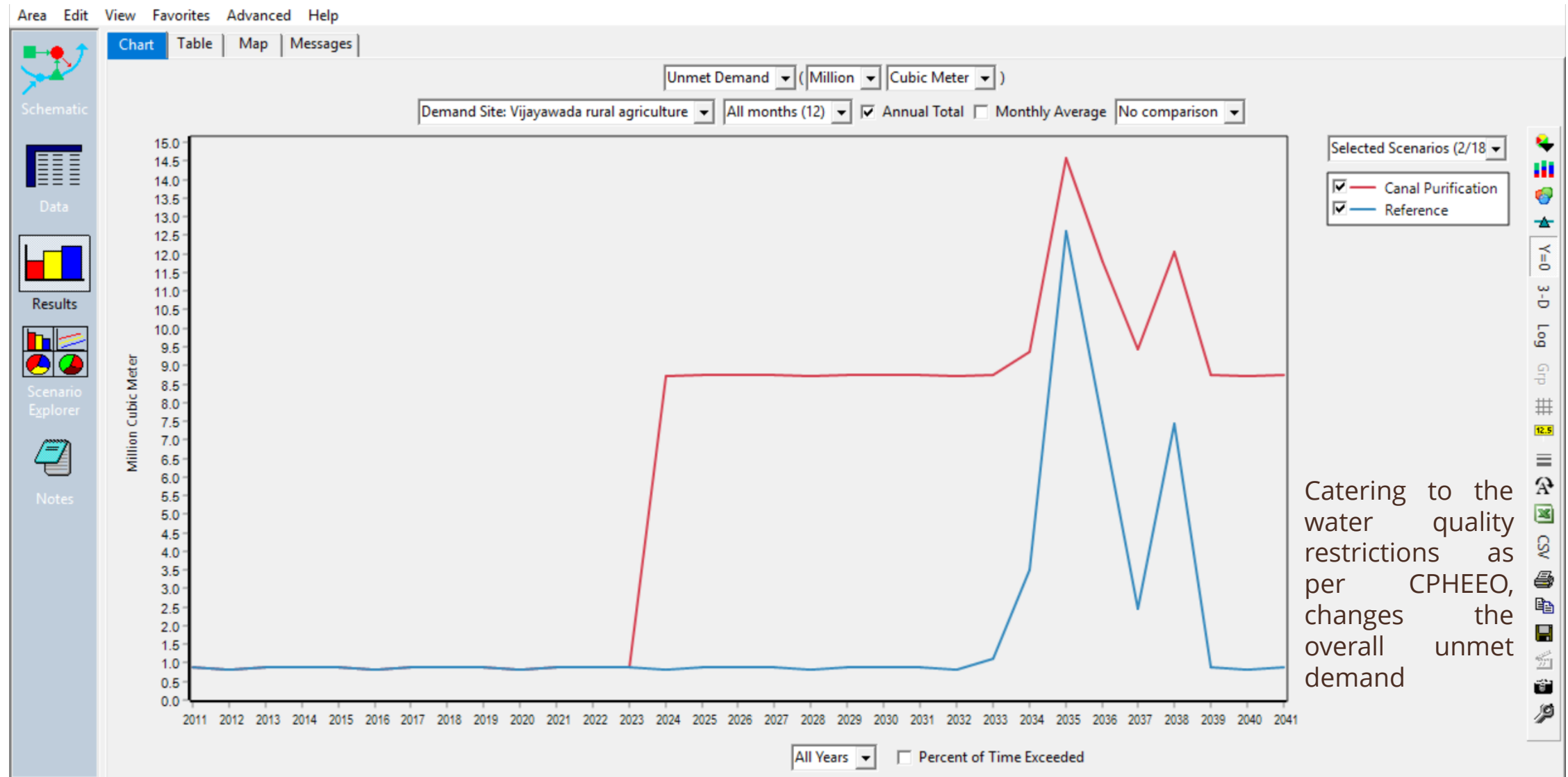
ASSESSING DEMAND SUPPLY GAP AFTER WATER QUALITY RESTRICTIONS



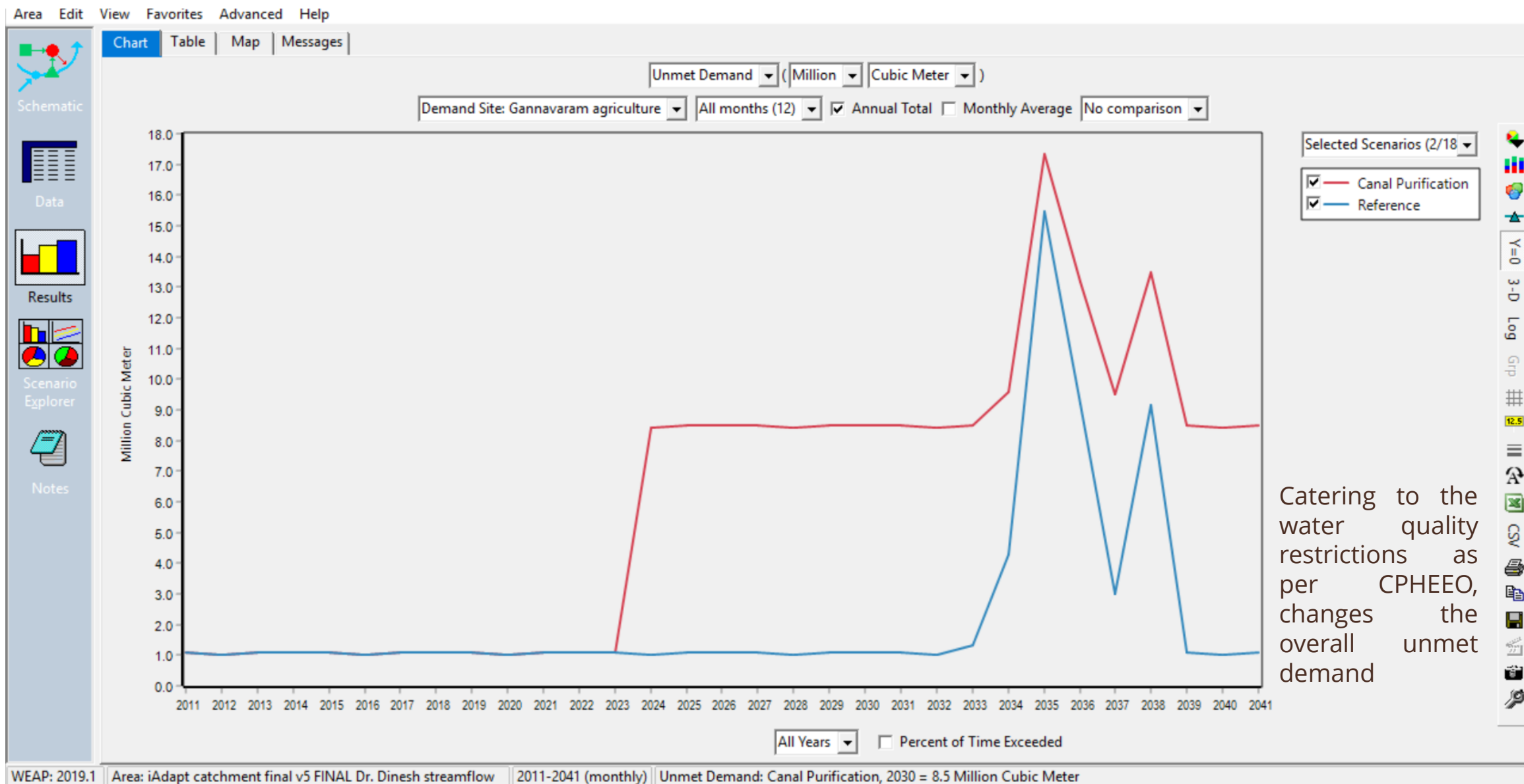
REVISED WATER BALANCE BASED ON WASTE WATER REUSE INVESTMENT SCENARIO



Impact of DPR on Vijayawada Rural Agriculture



Impact of DPR on Gannavaram Agriculture





A set of potential adaptation strategies is assessed to identify those adaptations that are most relevant to the particular quality/ quantity/ risk outcomes for impacted stakeholders in an investment scenario.

INFRASTRUCTURE

DEMAND MANAGEMENT

PROJECT GOVERNANCE

QUANTITY/ QUALITY



Triggers for DST evaluation of proposed DPR

INFRASTRUCTURE



Is the proposed capacity sufficient to cater to the current demand?

DEMAND MANAGEMENT



Does this project significantly alter the behavior of users for water resource dependency?

(will users move from groundwater to canals, if the project offers that opportunity?)

PROJECT GOVERNANCE



Is transmission infrastructure to the demand points considered?

Is there a necessity for downstream investment?

QUANTITY/ QUALITY



Is the size significant enough to impact the quantity and quality of water?

The evaluation of DPR through the DST highlights performance gaps in deciding utility of the proposed project and may lead to possible downstream stakeholder risk and impact project sustainability

The adaptation module generates the following “technically relevant” adaptations in the context of the Canal Rejuvenation Project

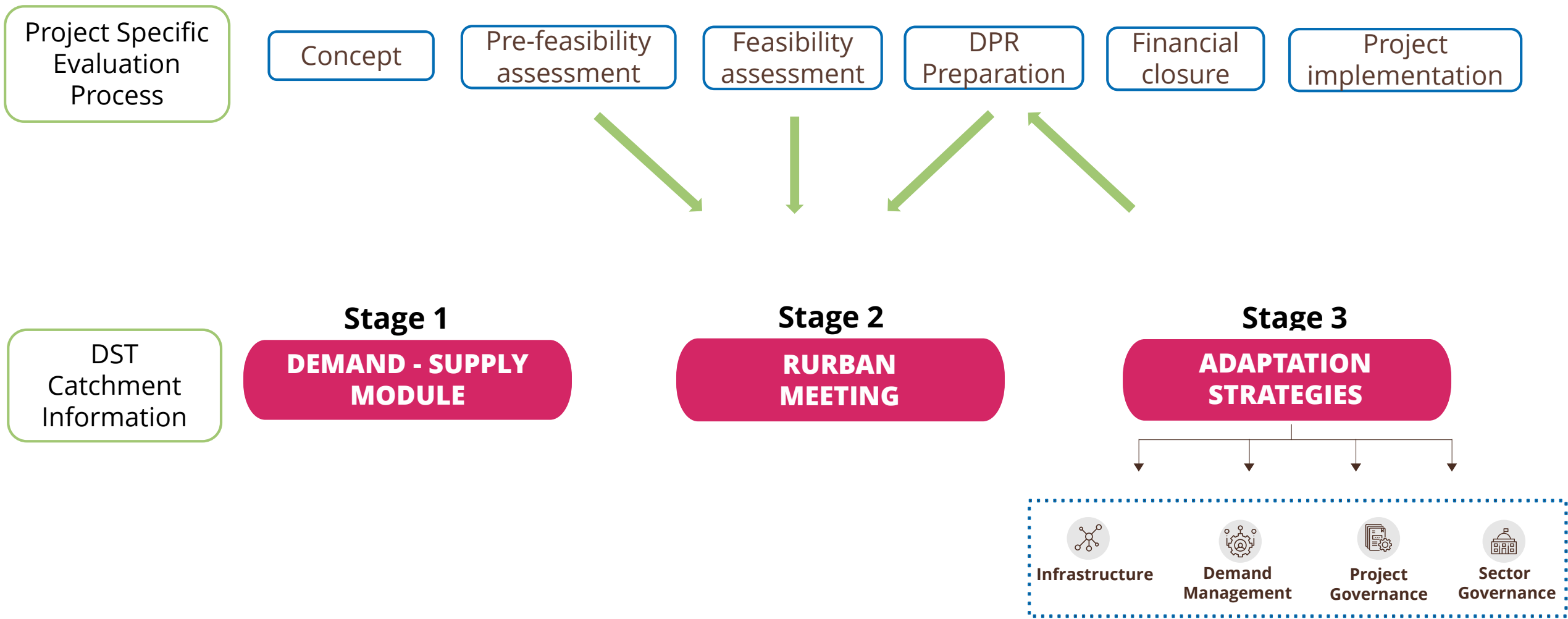
No.	Adaptation Group	Adaptation (complexity)	Logic
1	Infrastructure	Improve utilization of transmission infrastructure (2)	The project improves water quality downstream of the canals, and hence greater drawal by downstream users (in lieu of groundwater extraction) is recommended – by either improving or creating transmission infrastructure
		Repair/ retrofit transmission infrastructure (3)	
		Construct transmission infrastructure (5)	
2	Project Governance	Bridge information asymmetries between stakeholders (1)	Project impacts other RURBAN members
		Augment project financing with inputs from other stakeholders (3)	The project benefits accrue to more than the proposer (VMC), hence it makes sense to pool funding from other beneficiaries, or from the State Govt.
3	Sectoral Governance	Allocate additional funding (3)	

4

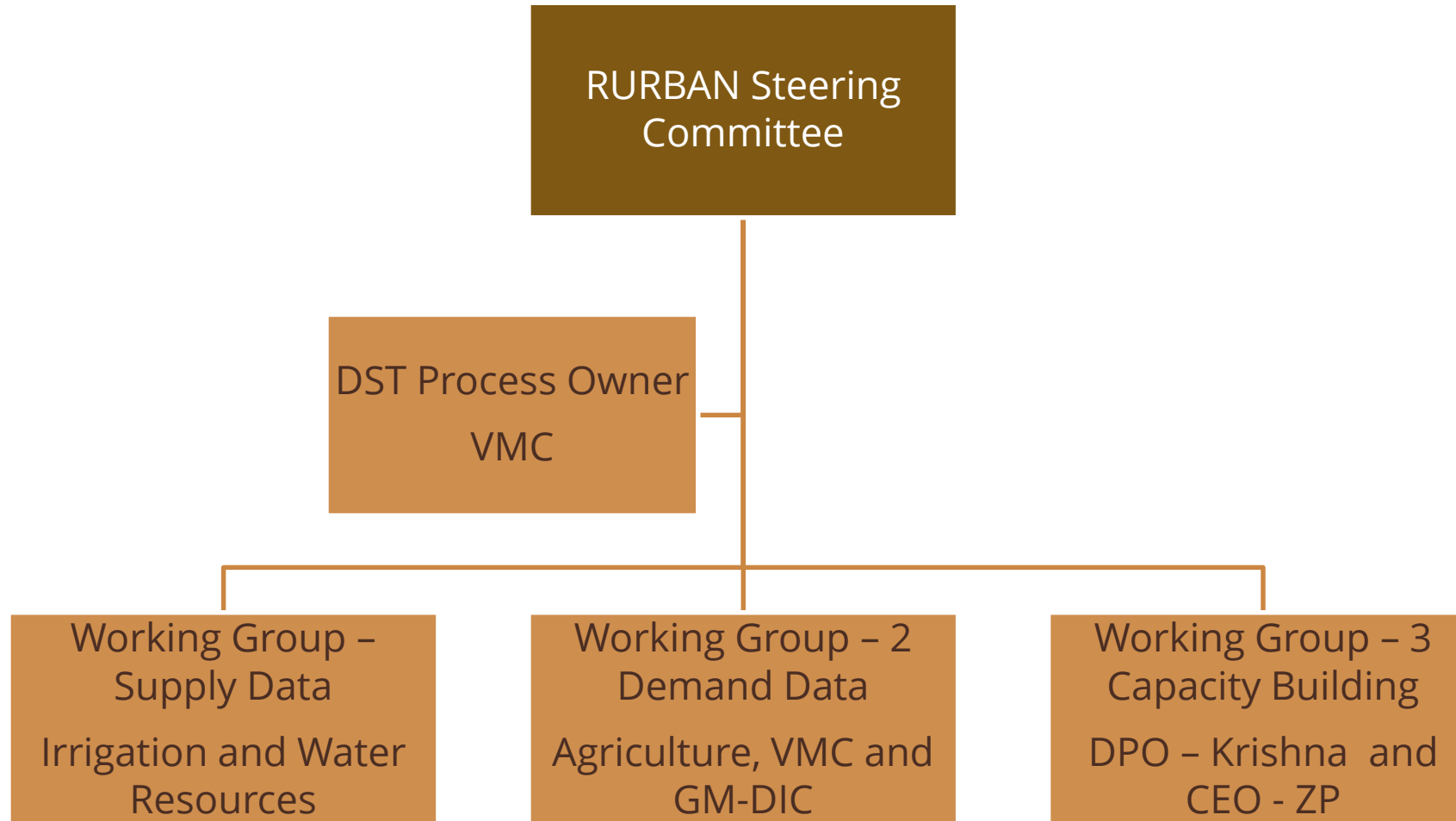
Operationalization of DST



DST AS AN INDEPENDENT QA PROCESS FOR PROJECT EVALUATION



Presented at RURBAN platform for participatory consultative decision making to identify most appropriate interventions based on implementation costs and benefits



5

**Next
steps**



- 1. Working group to get equipped with the CMP and DST**
- 2. Data sharing and collation between RURBAN platforms to update the CMP**
- 3. DST institutionalization to make it mandatory for all water related projects**



Thank You

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