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ATHENA INFONOMICS

CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems

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# STRATEGY PAPER ON THE DECISION SUPPORT TOOL FRAMEWORK

Prepared by

ATHENA INFONOMICS

# INTEGRATED RURAL URBAN WATER MANAGEMENT

# FOR

# CLIMATE BASED ADAPTATIONS IN INDIAN CITIES

# (IAdapt)

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## Strategy paper on the Decision Support Tool Framework

### Athena Infonomics

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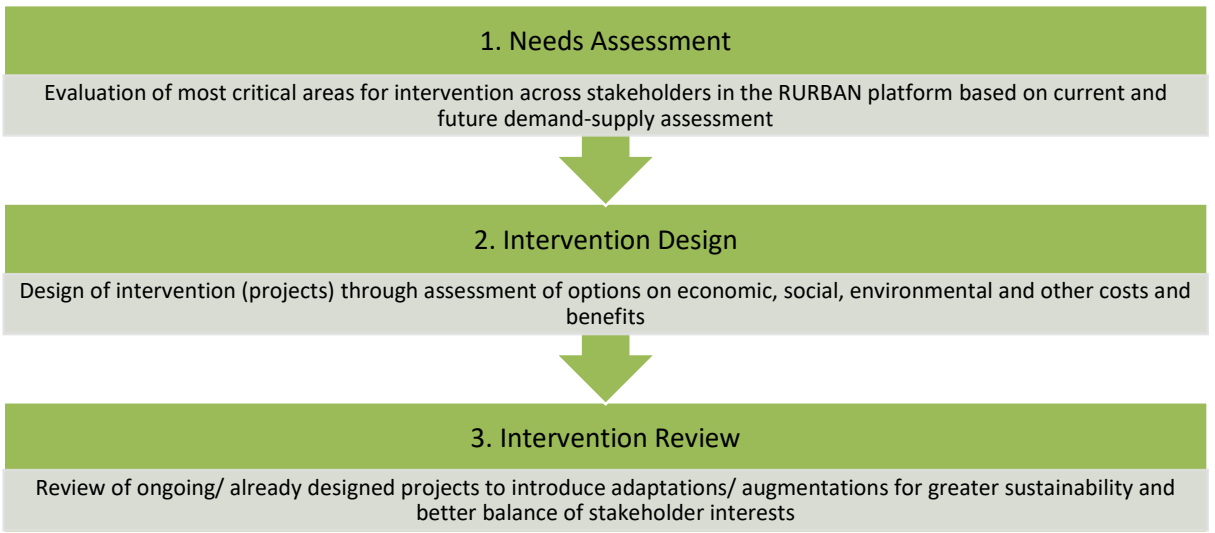
## The need of a decision support tool

Cities face water insecurity due to a changing climate and rapid urbanization. The cumulative impacts of urbanization and climate change factors can include flooding, water shortages and drought, within city boundaries and in their surrounding catchments, as well as a range of short-term and long-term consequences on human health, physical assets, economic development, and social systems. In this context, the IAdapt project proposes to work in two Indian cities - Solapur in Maharashtra State, and Vijayawada in Andhra Pradesh and their surrounding catchments – which face issues related to droughts, floods and water conflicts. The focus of the research will be to build an enabling ecosystem to empower the project cities to transition away from traditional approaches of water management (which considers water supply, wastewater and storm water as separate entities to be planned, implemented and operated with little reference to one another) to an 'Integrated Approach' based on the principles of IWRM and IUWM.

The enabling ecosystem proposed by the project aims to develop a multi stakeholder platform (RURBAN platform) to bring together rural and urban stakeholders to enable greater exchange of information and promote collaborative action and planning for improved water management, develop a scientific decision support tool and a participatory catchment management plan accompanied by capacity building of stakeholders on various aspects of water management, climate change, scientific decision making and project financing. To bring about a paradigm shift towards scientific and climate informed decision-making processes institutionalized with local bodies, a decision support tool (DST) is essential. The decision support tool aims to simulate the performance of the enabling ecosystem by empowering the catchment managers with simple rules for decision making and project prioritisation.

## DST possibilities

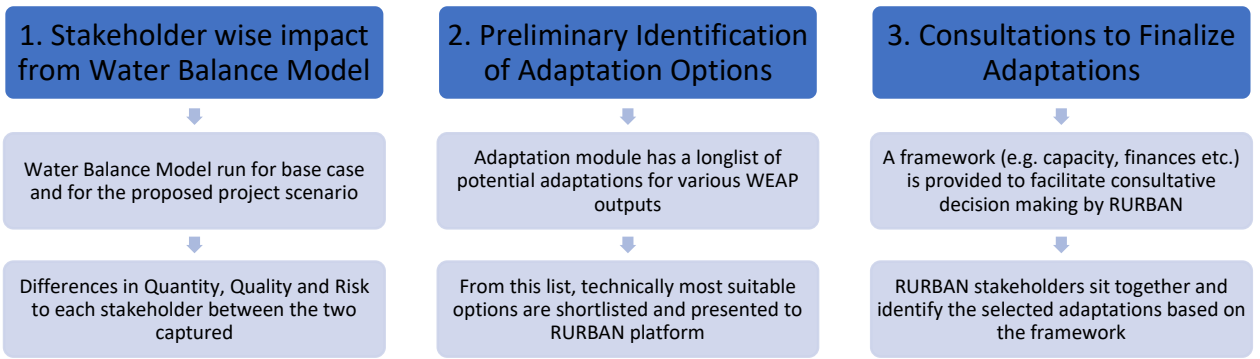
There are several potential entry points for a DST in such a scenario. These are outlined below,



Since the Catchment Management Plan (CMP) evaluates the critical areas for interventions across stakeholders and designs interventions/projects through an assessment of economic, social, environmental and financial benefits, the DST found its niche in reviewing proposed interventions/projects to introduce adaptation/augmentations for greater sustainability.

Since interventions or projects in the urban and rural space originate from either local bodies or State departments with very little direct linkage to proposed interventions of the CMP, the DST will seek to highlight deficiencies of the proposed water resource projects in current conditions and future change pressures (climate induced and others) and present potential adaptation options and strategies to optimize the performance of the project such that they are integrated in the concept of Integrated water management. The climate-based decision support tool will primarily act as a collaborative platform that allows all relevant stakeholders to understand the impacts of climate change on their water system and to develop appropriate adaptive measures in response.

While the DST will enable the effective use of local data to simulate different flow streams and articulate the relationship between the various components of the urban-rural water system to present a range of structural and non-structural adaptation pathways and measure corresponding costs, the actual choice of the solutions will be derived through a consultative process to ensure high levels of ownership towards the proposed solutions across stakeholder groups. The consultative process is illustrated below,




## The DST model

The DST model consists of the following components,

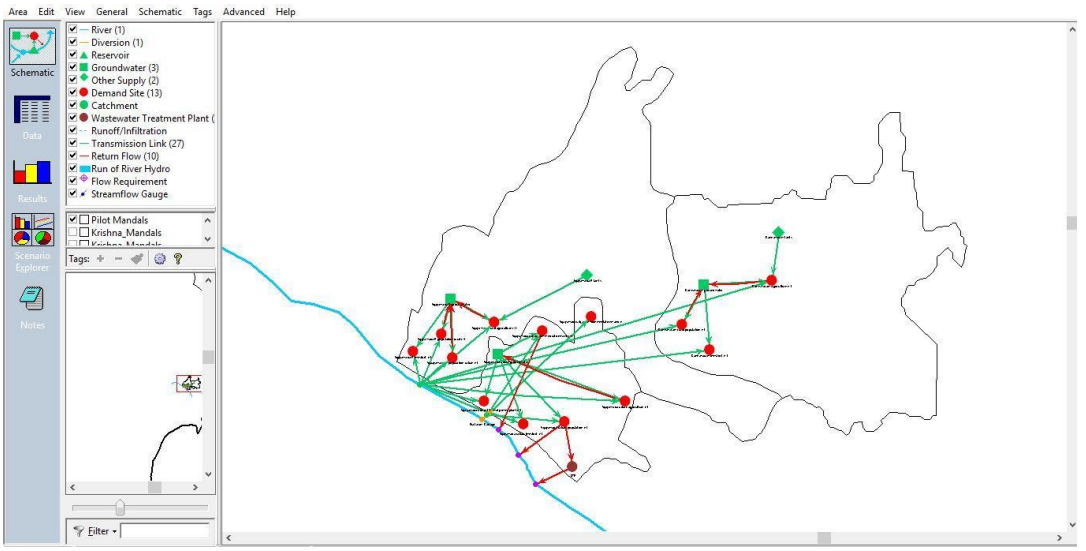
a. Water Evaluation and Planning Tool (WEAP)
b. Adaptation Module

The Water Evaluation and Planning System (WEAP) developed by the Stockholm Environment Institute's U.S. Centre, was selected as the DST application because of its following characteristics,

i) Unique approach for conducting integrated water resources planning assessments

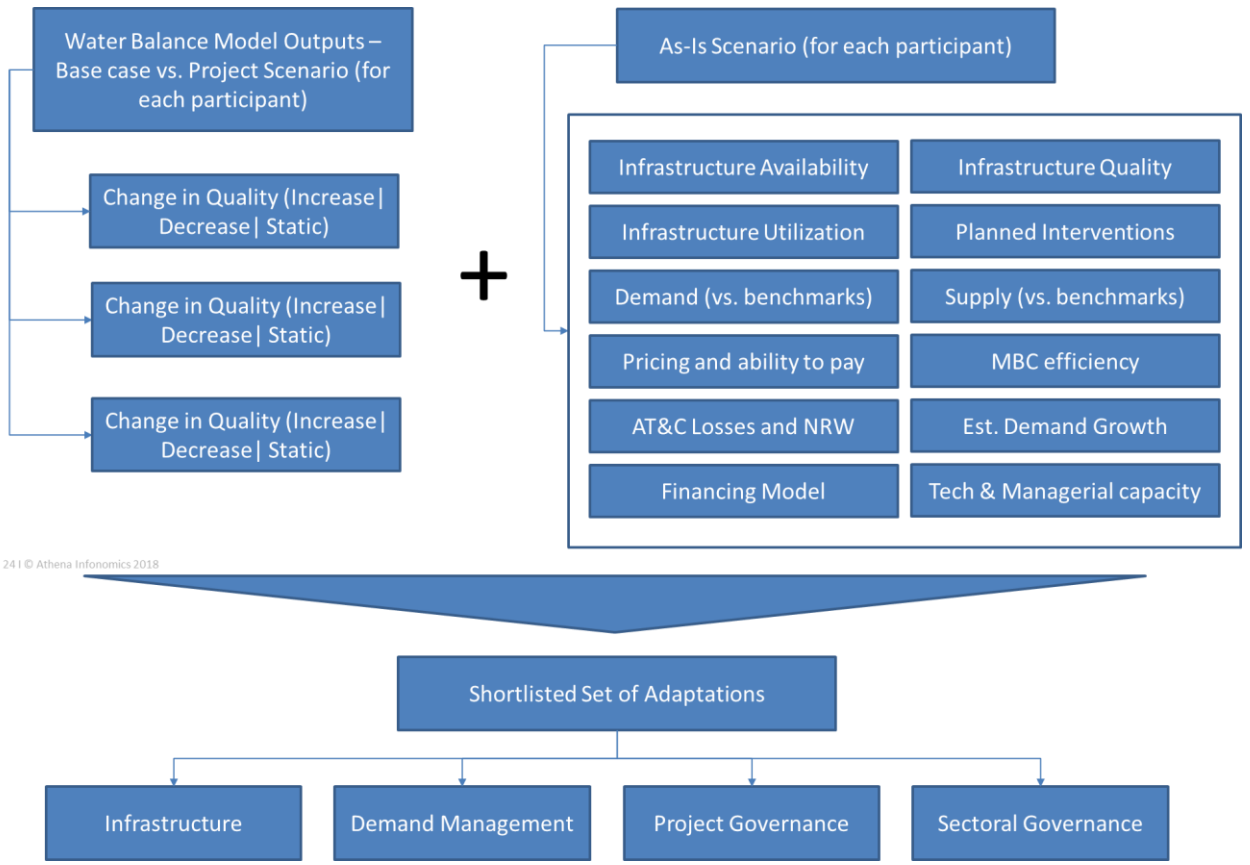
ii) it is a generic, integrated water resource planning software tool that provides a comprehensive, flexible and user-friendly framework for development of water balances, scenario generation, planning and policy analyses;
iii) it can be applied to municipal (water supply, wastewater, storm water) and agricultural (horticulture, agriculture, livestock) systems, a single watershed or complex trans-boundary river basin systems;
iv) Transparent structure facilitates engagement of diverse stakeholders in an open process;
v) A database maintains water demand and supply information to drive mass balance model on a link-node architecture;
vi) It can simulate a broad range of natural and engineered components of these systems, including rainfall runoff, baseflow and groundwater recharge from precipitation; sectorial demand analyses; water conservation; water allocation priorities, reservoir operations; hydropower generation; pollution tracking and water quality; vulnerability assessments; and ecosystem requirements;
vii) Geographical drag-and-drop GIS based interface with flexible model outputs as maps, charts and tables;
viii) it has also an internal financial analysis module that allows the user to investigate cost-benefit implications for various management alternatives under different future scenarios. Since the model is analytical and physical based, it makes possible to better represent some salient features of the hydrological cycle, i.e. surface-groundwater interaction, returned water, transfers etc.

The development of water balance through WEAP requires a certain set of climate and hydrological data, as well as data on water supply and water demand to map the existing water resources and users within the basin and to allocate the abstraction and discharge of water. A first draft water balance model has been developed for Vijayawada's study area. Depicted below is the schematic of the WEAP model. Demand nodes (indicated in red) include urban and rural household water demand, livestock water demand, agriculture water demand and industry water demand. Supply nodes (indicated in green) and their transmission links to the demand nodes include river head flow, barrage diversion, ground water withdrawal, rural water supply and irrigation tank. Existing sewerage treatment plants have also been mapped.



Here, we will take the demand and supply side inputs, and project the overall water balance, which will basically reflect the allocation of the available grades of water (supply) among the various users (demand). The proposed project data points will then be added to the existing water balance model and the impacts it has on meeting the water demand, water quality will be analysed after which mitigation measures will be curated and proposed for integration into the interventions themselves. This will be done through a lookup module, which will compile all potential responses to a variety of projects, along with rules for selection of the most appropriate subset for a model output, based on a combination of suitability factors

***Illustration of process of shortlisting adaptation interventions***




A set of 40 broad adaptations has been drawn up across four areas

1. Infrastructure: Infrastructure oriented adaptations fall into four categories – changing infrastructure specifications of a proposed project, upgradation and retrofitting of existing infrastructure, increasing utilization of existing infrastructure and creation of new infrastructure (in that order of preference). Infrastructure interventions will be sensitive to the nature of the issue and will span the value chain (bulk sourcing, transmission, distribution and treatment)
2. Demand management: Adaptations around demand management are primarily directed at two user groups – rural (Agriculture) and urban households. These adaptations are in the areas of

decreasing demand through IEC/BCC campaigns, through supporting low water footprint products and technologies, through pricing nudges, through support for accelerating structural change (e.g. cropping patterns, industries) and by reallocating grades of supply across demand nodes

3. Project Governance: Project adaptations are usually the easiest to implement since the DST is applied at the formative stage of project interventions. Such adaptations range from expanding project stakeholder groups and sharing information, to more structural changes on project scope and financing. It should be remembered that such adaptations are not necessarily focused on increasing project costs. In many cases where there are positive externalities from the project, a share of these can be monetized and help support project viability
4. Sectoral Governance: These include adaptations which are out of scope of the project, since they go beyond the project mandate, and/or require resources which cannot be raised within the project

While the above areas provide an idea of the nature of adaptations, even within an area, there is considerable variation in the level of cost and effort required to implement an adaptation. Hence, it is important that the DST is able to rank these adaptations in an ascending order of implementation cost, so that the most cost-effective alternatives for a particular WEAP scenario are shortlisted. Such a mapping has been done, and the summary of relevant alternatives for each kind of issue (quality, quantity and risk) is provided below

**Scenario: Quality Reduction**

**Ascending order of typical cost of intervention**

| Theme | Intervention |
|---|---|
| Infrastructure | Change infrastructure specification |
| Infrastructure | Improve utilization of treatment infrastructure |
| Demand Management | IEC/BCC campaigns for demand reduction |
| Infrastructure | Repair/ retrofit existing treatment infrastructure |
| Sectoral Governance | Supply limits (caps and floors) |
| Demand Management | Support to low water footprint technologies and products |
| Demand Management | Pricing nudges |
| Demand Management | Support to tactical agricultural demand reduction (pumps, meters) |
| Demand Management | Reallocate demand/ supply (across grades for consumers) |
| Infrastructure | Construct treatment infrastructure |
| Sectoral Governance | Modify land use (master plan, construction approvals) |
| Demand Management | Support to structural agricultural changes (new cropping patterns) |

**Scenario: Quantity Reduction**

**Ascending order of typical cost of intervention**

| Theme | Intervention |
|---|---|
| Infrastructure | Change infrastructure specification |

| | |
|---|---|
| Infrastructure | Improve utilization of supply infrastructure |
| Infrastructure | Improve utilization of transmission infrastructure |
| Infrastructure | Improve utilization of distribution infrastructure |
| Demand Management | IEC/BCC campaigns for demand reduction |
| Infrastructure | Repair/ retrofit existing supply infrastructure |
| Infrastructure | Repair/ retrofit existing transmission infrastructure |
| Infrastructure | Repair/ retrofit existing distribution infrastructure |
| Sectoral Governance | Supply limits (caps and floors) |
| Sectoral Governance | Improve compliance monitoring (PPT) |
| Sectoral Governance | Change pricing policies/ rules |
| Sectoral Governance | Preference of allotment/ drawal |
| Demand Management | Support to low water footprint technologies and products |
| Demand Management | Pricing nudges |
| Demand Management | Support to tactical agricultural demand reduction (pumps, meters) |
| Sectoral Governance | Improve MBC |
| Demand Management | Reallocate demand/ supply (grades) |
| Infrastructure | Construct supply infrastructure |
| Infrastructure | Construct transmission infrastructure |
| Infrastructure | Construct distribution infrastructure |
| Sectoral Governance | Modify land use (master plan, construction approvals) |
| Demand Management | Support to structural agricultural changes (new crops) |

**Scenario: Increase in Risk**

**Ascending order of typical cost of intervention**

| Theme | Intervention |
|---|---|
| Sectoral Governance | Empower existing forums (PPT) |
| Project Governance | Bridge information asymmetries between stakeholders |
| Sectoral Governance | New forums for collective decision making |
| Project Governance | Expand project decision making to include more stakeholders |
| Project Governance | Include specific safeguard clauses in the project |
| Sectoral Governance | Preference of allotment/ drawal |
| Sectoral Governance | Transparency and disclosure |
| Sectoral Governance | Allocate additional funding/ create financial buffers |
| Project Governance | Create financial buffer for catering to future risks |
| Sectoral Governance | Modify land use (master plan, construction approvals) |

**Others**

**Ascending order of typical cost of intervention**

| Theme | Intervention |
|---|---|
| Project Governance | Change project timelines to better coordinate other initiatives |
| Sectoral Governance | Improve provider capacity |

| | |
|---|---|
| Sectoral Governance | Commission specific research |
| Sectoral Governance | Change procurement processes |
| Project Governance | Share project revenues with other stakeholders (for financially viable projects) |
| Sectoral Governance | Compliance incentives and disincentives |
| Project Governance | Augment project financing with inputs from other stakeholders (for financially unviable projects) |

As per the framework above, in addition to the outputs of the water balance (WEAP) model, the adaptation shortlisting also takes into consideration stakeholder specific elements. These go into identifying most suitable alternatives (e.g. infrastructure retrofitting and capacity utilization are usually preferable alternatives to development of greenfield infrastructure, but these presume availability of infrastructure; project governance changes are usually easier to implement compared to sectoral governance improvement, but these require the proposed project to be in a certain stage of planning etc.). These inputs will be taken from each of the RURBAN stakeholders, at least those who are impacted by the project (positively or negatively) as per the WEAP model through a simple to administer questionnaire, or alternatively through secondary data since most of this information is usually in public domain. Based on this, a shortlist will be placed in front of the RURBAN platform. The logic for the shortlisting is provided in the subsequent table

Once the shortlisted intervention possibilities are identified, they are laid out to specific invitees from the RURBAN platform who are impacted (positively or negatively) through the intervention. Thsee stakeholders can then consultatively identify most appropriate interventions based on a combination of implementation costs and benefits. To support them in doing so, some key elements of such a cost-benefit assessment approach will be laid out including factors such as

- Financial costs and resource availability taking into consideration lifecycle costs of the intervention alternatives and sources of meeting such funding (internal and potential external sources) in light of the financial capacity of stakeholders
- Technical capability
- People and process maturity
- Gestation time vs. intervention timelines

If in course of the consultations, the benefits of the interventions are felt to outweigh the costs, appropriate representations may be made to higher levels of decision making (State and Central) to provide resources and support for the interventions.

# Illustration of the adaptation module for the Vijayawada 24X7 Project

Intervention Outline

The Vijayawada Municipal Corporation intends to move forward in the near future towards implementation of 24x7 supplies in the VMC area. On its implementation, every consumer will get water at full pressure 24 hours a day, seven days a week. Some of the actions as part of the implementation of 24x7 water supply in Vijayawada municipal area are listed below:

- Increase Storage capacities for transformation from intermittent to continuous system.
- Introduce Water Audit to measure the total inflows and outflows of the system in order to obtain information about the health of the water supply system in terms of its various components.
- Introduce Retail metering of supply at consumer end is necessary for demand management in the system.
- Leakage detection and plugging to be carried out on priority basis in a 24x7 schemes in order to prevent loss of water.

Based on the project plans and envisaged outcomes, the Water Balance model has been constructed, and compared with the reference scenario across stakeholder groups. The current model accounts only for quantity variations[1] . We present two levels of WEAP model outputs – two based on external scenarios (reference, high population growth[2]) and one comparing the project impact with the reference scenario. This helps identify the quantum and incidence points of impact on water allocation across the RURBAN stakeholders

***Total Unmet Demand (Million Cubic Metre) from 2021-2041 across Stakeholder Groups***

| **Stakeholder \| Scenario** | **Reference** | **High Pop Growth** | **24X7** |
|---|---|---|---|
| Gannavaram agriculture | 58.5 | 58.6 | 58.0 |
| Gannavaram industries | 0.0 | 0.0 | 0.0 |
| Gannavaram livestock | 1.0 | 1.0 | 0.9 |
| Gannavaram rural population | 15.9 | 15.9 | 15.9 |
| Vijaayawada R population urban | 121.0 | 121.0 | 120.9 |
| Vijayawada R livestock | 5.2 | 5.5 | 5.1 |
| Vijayawada R population rural | 3.8 | 3.8 | 3.8 |
| Vijayawada rural agriculture | 48.0 | 48.1 | 47.6 |
| Vijayawada rural industries | 0.8 | 0.8 | 0.8 |
| Vijayawada urban agriculture | 5.7 | 5.7 | 5.6 |
| Vijayawada urban commercial demand | 1.9 | 1.9 | 1.8 |
| Vijayawada urban environmental demand | 0.4 | 0.4 | 0.4 |
| Vijayawada urban industries | 2.1 | 2.1 | 1.9 |
| Vijayawada urban livestock | 1.0 | 1.0 | 1.0 |
| Vijayawada urban population | 1562.6 | 2848.6 | 1335.4 |

[1] Risk and quality variations will be incorporated in the next Semester

[22] In Vijayawada Municipal Corporation area

| | | | |
|---|---|---|---|
| Vijayawada urban thermal power plant | 135.9 | 137.6 | 133.9 |
| **Sum** | 1963.7 | 3252.1 | 1733.2 |

***Change in Unmet Demand from Reference Scenario (Positive indicates unmet demand is reducing)***

| **Stakeholder \| Scenario** | **High Population Growth** | **24X7 Water Project (VMC)** |
|---|---|---|
| Gannavaram agriculture | -0.1% | 0.9% |
| Gannavaram industries | 0.0% | 0.0% |
| Gannavaram livestock | -3.9% | 2.2% |
| Gannavaram rural population | 0.0% | 0.0% |
| Vijaayawada R population urban | 0.0% | 0.0% |
| Vijayawada R livestock | -4.3% | 2.2% |
| Vijayawada R population rural | 0.0% | 0.0% |
| Vijayawada rural agriculture | -0.1% | 0.9% |
| Vijayawada rural industries | 0.0% | 0.0% |
| Vijayawada urban agriculture | -1.2% | 1.4% |
| Vijayawada urban commercial demand | -1.2% | 1.5% |
| Vijayawada urban environmental demand | -2.1% | 1.0% |
| Vijayawada urban industries | -1.1% | 10.5% |
| Vijayawada urban livestock | -4.1% | 2.1% |
| Vijayawada urban population | -82.3% | 14.5% |
| Vijayawada urban thermal power plant | -1.3% | 1.5% |
| **Sum** | -65.6% | 11.7% |

The high population growth scenario affects the Vijayawada urban population the most, but also involves supply reductions (through substitution) for eight other stakeholders, four of who are outside the VMC jurisdiction. Similarly, the 24X7 project, through savings in water losses improves the supply available for eight other stakeholders, four of who are again outside the VMC jurisdiction. This shows that any project proposals from one stakeholder could potentially have impact on the other RURBAN members. In this case, the 24X7 project, by reducing losses results in positive externalities for several RURBAN members. These positive externalities can be ideally captured into the project design by eliciting co-contributions from some of the RURBAN stakeholders, especially those with a greater ability to pay (industries and thermal power plant)

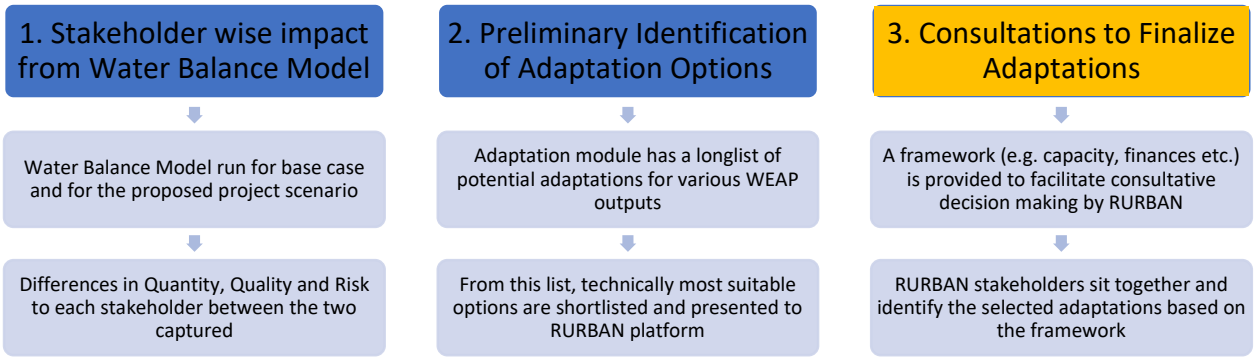
Based on the shortlisting logic, this helps identify the following potential interventions which could be placed in front of a subset of the RURBAN group, consisting of the impacted stakeholders

***Preliminary set of potential adaptations/ responses to the 24*7 Project***

| No. | Intervention | Logic | Notes |
|---|---|---|---|
| 1 | Infrastructure - Augment treatment infrastructure to repurpose used water | The 24*7 project increases available supply to city population and creates an increased quantity of used water, which could be repurposed by other user groups | Based on an assessment of the capacity, utilization and quality of the existing STP, a decision on augmenting the existing STP or expansion can be taken. It is understood that an STP expansion is anyway planned. If so, potential customers (e.g. thermal power plant) could augment project viability through an offtake commitment for treated water from the STP |
| 2 | Project Specific - Bridge information asymmetries between stakeholders (annual drawal schedule) | The project, through its metering component gives sharper visibility on demand on a daily/ spatial basis which can be used for better planning of seasonal demand | A transparency portal capturing actual drawal, consumption and treatment volumes on a daily basis can be integrated into the project scope at marginal cost, and potentially opened up to public access |
| 3 | Demand Management - Commission specific research on drivers of usage | The project, through its metering and pricing components, can enable research on drivers of consumption behavior | Several external research grants are available to support such studies on understanding the relationship between service delivery, pricing and customer demand. These avenues could be leveraged to fund the research, which could also potentially shape water policy at a city level |
| 4 | Sectoral Governance - Preference of drawal and allotment to make room for drawal credits to improve project viability | The 24*7 project, through reduction of losses reduces drawal at source, effectively increasing drawal potential for other user groups, which can be monetized | No system of drawal rights across user groups currently exists. This could potentially be an area for policy focus (long term implementation) |
| 5 | Project specific - Augment project financing with inputs from other stakeholders (for financially unviable projects) | The project reduces the quantum of unmet demand for eight other stakeholder groups. This benefit can be monetized and used as project support financing, especially from industrial users and the thermal power plant | Project feasibility assessments are done internally and the identified positive externalities are not priced in. Pricing these externalities in shows the true economic value of the project. In conjunction with option (1) above, the water savings from the 24X7 project can be directly, or post treatment be transferred to the other stakeholders for a negotiated fee |

**Next Steps**

The stakeholder wise impact from WEAP, leading to the preliminary adaptation option list has been summarized in the previous sections. The next step will be to have a round of consultations with the RURBAN stakeholders to finalize the adaptation set




In these consultations, the following inputs from the RURBAN stakeholders, especially the subset of nine stakeholders who stand to be impacted by the proposed project according to the WEAP model will be sought

- Infrastructure capacity and utilization,
- Availability of technical, financial and managerial resources to implement the recommended adaptations,
- Ongoing/ planned interventions which could aid or hamper the proposed adaptations
- Estimated time to implement the proposed adaptations
- Room in the project (from VMC) to include project specific adaptations

Based on this, the final set of adaptations will be presented, along with a comparison of pre and post adaptation endowments, along with a high-level action plan for implementation of these adaptations. If and where such adaptations require financial convergence, the same will also be covered in the action plan.

*Annexure - Logic for Shortlisting Interventions (Adaptations) based on WEAP Outputs and Stakeholder specific factors*

| # | Theme | Intervention | Quality | Quantity | Variability | Notes |
|---|---|---|---|---|---|---|
| 1 | Infrastructure | Construct supply infrastructure | | Low | | If there are no nearby supply points, and if treatment is not possible for partial reuse |
| 2 | Infrastructure | Construct transmission infrastructure | | Low | | If there is nearby supply of a matching grade, or slightly lower grade, and existing treatment infrastructure is fully used |
| 3 | Infrastructure | Construct distribution infrastructure | | | | If supply is high and penetration (end customer) is low and utilization of existing distribution infrastructure is high |
| 4 | Infrastructure | Construct treatment infrastructure | Low | | | If availability is low, of lower grade is high and treatment infra is fully used or unavailable |
| 5 | Infrastructure | Improve utilization of supply infrastructure | | Low | | If supply is available but drawal is lesser than full capacity |
| 6 | Infrastructure | Improve utilization of transmission infrastructure | | Low | | If supply is available but drawal is lesser than full transmission capacity |
| 7 | Infrastructure | Improve utilization of distribution infrastructure | | Low | | If supply is high and penetration (end customer) is low |
| 8 | Infrastructure | Improve utilization of treatment infrastructure | Low | | | If there is nearby supply of matching or lower grade water |
| 9 | Infrastructure | Repair/ retrofit existing supply infrastructure | | Low | | If demand is high and expected to increase and existing supply infrastructure quality is low |
| 10 | Infrastructure | Repair/ retrofit existing transmission infrastructure | | Low | | If transmission losses are high and quantity is low |

| | | | | | | |
|---|---|---|---|---|---|---|
| 11 | Infrastructure | Repair/ retrofit existing distribution infrastructure | | Low | | If distribution losses are high and quantity is low |
| 12 | Infrastructure | Repair/ retrofit existing treatment infrastructure | Low | | | If there is availability of lower grade water and there is a quality gap with demand |
| 13 | Infrastructure | Change infrastructure specification | Low | Low | | If jurisdictions near a project jurisdiction have quality or quantity gaps, infra can be expanded to cater to multiple user groups |
| 14 | Sectoral Governance | New forums for collective decision making | | | High | If there are no suitable existing forums |
| 15 | Sectoral Governance | Empower existing forums (PPT) | | | High | |
| 16 | Sectoral Governance | Modify land use (master plan, construction approvals) | Low | Low | High | |
| 17 | Sectoral Governance | Improve MBC | | Low | | If existing MBC efficiency is low |
| 18 | Sectoral Governance | Improve compliance monitoring (PPT) | | Low | | If existing MBC efficiency is low and NRW is high |
| 19 | Sectoral Governance | Transparency and disclosure | | | High | If impact of any project is on multiple stakeholders |
| 20 | Sectoral Governance | Change pricing policies/ rules | | Low | | If current pricing is low and WTP/ ability to pay is high, even within some sections |
| 21 | Sectoral Governance | Preference of allotment/ drawal | | Low | High | Rules in case of extreme events and availability fluctuations |
| 22 | Sectoral Governance | Compliance incentives and disincentives | | | | Linked to 14, 15, 17, 18 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 23 | Sectoral Governance | Supply limits (caps and floors) | Low | Low | | For units within a single jurisdiction where quality and quantity are both low |
| 24 | Sectoral Governance | Improve provider capacity | | | | If losses are high, cost coverage is low or service quality is poor |
| 25 | Sectoral Governance | Commission specific research | | | | If project has behavioral research avenues (bundled) or if risk on a particular group is felt to be high but not substantiated |
| 26 | Sectoral Governance | Change procurement processes | | | | Linked to 1-13 |
| 27 | Sectoral Governance | Allocate additional funding/ create financial buffers | | | High | When risk is high and contingent claims by other stakeholders may arise, and when the project does not have resources for this |
| 28 | Project Governance | Expand project decision making to include more stakeholders | | | High | Same as 14,15 - applied to a project context |
| 29 | Project Governance | Bridge information assymmeteries between stakeholders | | | High | Same as 19 - applied to a project context |
| 30 | Project Governance | Augment project financing with inputs from other stakeholders | | | | When positive externalities are distributed to other RURBAN members, especially those with paying power |
| 31 | Project Governance | Share project revenues with other stakeholders | | | | When negative externalities are distributed to other RURBAN members, and when the project is well financed |
| 32 | Project Governance | Change project timelines to better coordinate other initiatives | | | | When related initiatives are planned by other members |

| | | | | | | |
|---|---|---|---|---|---|---|
| 33 | Project Governance | Create financial buffer for catering to future risks | | | High | Same as 27, applied to a project context |
| 34 | Project Governance | Include specific safeguard clauses in the project | | | High | Same as 33, built into project agreement |
| 35 | Demand Management | IEC/BCC campaigns for demand reduction | Low | Low | | Short term |
| 36 | Demand Management | Support to low water footprint technologies and products | Low | Low | | Mid term |
| 37 | Demand Management | Pricing nudges | Low | Low | | Short term |
| 38 | Demand Management | Support to structural agricultural changes (new crops) | Low | Low | | Long term |
| 39 | Demand Management | Support to tactical agricultural demand reduction (pumps, meters) | Low | Low | | Mid term |
| 40 | Demand Management | Reallocate demand/ supply (grades) | Low | Low | | Mid term |