RCUES
Ministry of Housing & Urban Affairs, Government of India

Urban Development & Housing Department

SERVICE LEVEL IMPROVEMENT PLAN OF WATER SUPPLY

MUNICIPAL CORPORATION GAYA

PREPARED BY

Regional Centre for Urban and Environmental Studies Lucknow

IN CONSULTATION WITH

Gaya Municipal Corporation

&

Bihar Urban Infrastructure Development Corporation Limited

CITY NAME – GAYA MUNICIPAL CORPORATION

WATER SUPPLY

1. Assess the Service Level Gap

The first step is to assess the existing situation and service levels gaps for Water Supply (AMRUT Guidelines; para 3 & 6). This will also include existing institutional framework for the sector. AMRUT is focused on improvement in service levels. The zone wise data shall be used in identifying the gaps. These zone-wise gaps will be added to arrive at city level service gaps. While assessing service level gap reply following questions not more than word indicated against each question.

Question: What kind of baseline information is available for water supply system of the city? Detail out the data, information, plans, reports etc related to sector. Is zone wise information available? (75 words)

Baseline information available for water supply system of the city is taken from the DPR prepared by Gaya Municipal Corporation prior to implementation of Water Supply Scheme in the City. In this DPR, all the information related to water Supply Scheme was taken from secondary data, plans, reports and primary survey data collected by Municipal Corporation Gaya which is verified by other line agencies involved in the preparation of DPR and implementation of project from time to time. In this process Gaya Municipal Corporation identified gaps in demand and supply of water supply services owing to the lack of proper infrastructure leading to poor service delivery to its citizens. Lack of funds to meet out the requirement paved the way for initiating a dialogue with the Asian Development Bank by the Urban Development and Housing Department, Govt of Bihar.

Before ADB took over the project only 39 tube wells with a capacity of 21.75 MLD along with 72 Km distribution network and one OHT with the capacity of 0.45 ML, seven GLSRs with a capacity of 17.293 ML were available. Gaya is an old religious city surrounded by hills hence using the natural elevation available seven GLSRs were installed at the hill tops and only one OHT was constructed.

ADB DPR derived the demand forecast for the years 2018-2048 based in the census data from 1921-2011. The demand water production for 2018 is 90 MLD and 2021 is 104 MLD and 2033 is 130 MLD and 2048 is 165 MLD. It was also recorded in the DPR that out of 39 tube wells 29 were to be refurbished whereas 2 tube wells were defunct and 8 have been recently drilled. The need for refurbishment of 29 tube wells is felt as the pumps used are of higher capacity because of which the sand flows through the pipes and clogs the tube wells. This brings down the yield and also damages the pumps which have to then pump turbid water. Not only are the expenses higher due to repair work but citizens also suffer from consumption of turbid water.

During the survey conducted by ADB it was observed that the low yield of 21.75 MLD from 39 tube wells was also because the pumping was intermittent and all the reservoirs were not exhaustively used for string the water. Hence it is now proposed that after the refurbishment of 29 tube wells the pumping hours have to be maintained for a minimum of 20 hrs and optimum utilization of all the reservoirs have to be done to produce a water production level of 64 MLD.

Currently the city has 8 reservoirs i.e 1 OHT and 7 GSLRs which are more than 50 years old. Hence it has been proposed in the DPR that all the reservoirs have to be rejuvenated to store the water. As per the guidelines of the Ministry 24x7 water supply with universal coverage has to be achieved and in line with this the reservoirs have to be in functional condition so that even when the pumping cannot happen the city gets its water supply without fail.

As per the study conducted by ADB under the water supply scheme it is found that the refurbishment and

repair work will only partially suffice the need till 2033 hence 24 new tube wells have been proposed which will give another 66 MLD. Additional 10 reservoirs (6 OHTs (10.95 ML and 4 GSLRs 15.58 ML) with a capacity of 26.53 ML are also proposed to store the additional water production projected. This will make the entire reservoir capacity to be 44.273 ML.

New pumping mains has been proposed under the project by ADB for around 34.5 Kms. For the purpose of efficient distribution system the entire town of Gaya has been divided into 30 District Metered Area (DMA/Zones) and at the entry point of each DMA one monitoring station will be established to know the pressure and quantity of water being supplied to the particular DMA. Apart from this two Critical Stations (farthest point and the most elevated point) will be established in the distribution chain of each DMA to analyze the water supply service and to gauge the health of the entire system. In order to keep a check on the NRW, Electromagnetic flow Meters are proposed to be setup at the tube wells and reservoirs to know the exact quantity of water being produced and supplied.

As per the survey the pumping system/machinery/panel boards available to the city of Gaya cannot be used for the refurbished capacity. Hence new pumping system/machinery/panel boards are proposed wherever required.

A distribution Network of 446 Km connecting 75000 households is being proposed under the ADB project. Smart Metering devices are also proposed to be installed along with the house service connection to record the meter reading without having to enter the house.

SCADA system is also proposed to monitor the entire pumping system and distribution at one place. In order to run the system efficiently by the GMC officials after the handing over, a capacity building exercise throughout the entire phase of construction and maintenance period will be organized. Also counselling sessions with civil society, elected representatives and citizens at large will also be organized throughout the entire project period to create awareness. Compensation will be given to people who are effected by the construction activity.

To create accountability of the entire system, the contractor will be bound by an agreement to access the capacity of the existing as well as the newly developed system and take over the system from the seventh month of commencement of the project and run it for the remaining project period and later on hand over to GMC. During the operation period all the GMC personnel involved in the O& M of the existing system will be working with the Contractor to learn on the job. A grievance redressal system will also be put in place by the contractor which will eventually be handed over to GMC.

Question: Have you collected census 2011 data? Are you aware of baseline survey data of MoUD? Have you correlated data from these and other sources? (75 words).

We have collected the Census 2011 data from Census of India website. Yes, we are aware of the baseline survey data of Ministry of Urban Development.
Yes, we had correlated the data from Census of India, MoUD Survey Data, DPRs, Primary and Secondary Data available in Municipal Corporation and other Parastatal Agencies that were involved in urban development schemes while preparing the Service Level Improvement Plan.

	Location of source of drinking water Population	Total number of house holds	Tap water from treated source
Total population (census 2011)	Total Population = 4,74,093	71,153	12,988
	Within the premises	58,124	10,354
	Near the premises	7,333	1,770
	Away	5,696	864

Departmental data as per UD & HD	69,615	31,409
Data as per the DPR prepared under ADB	72118	26969

What are existing service levels for water supply in the city? What is the coverage of water supply Connections? What is per capita supply of water? How much is the extent of metering? How much is non-revenue water? Provide information in table

TABLE: STATUS OF WATER SUPPLY SERVICE LEVELS

Sr. No.	Indicators	Present Status		MOUD Benchmark	Reliability	
		2015	2017		2015	2017
1	Coverage of water supply connections 26969/72118	**37.39%**	**37.39%**	**100%**	**C**	**C**
2	Per capita supply of water 21.75 MLD / 4,74,093 Population = 45.87 LPCD	**45.87 LPCD**	**45.87 LPCD**	**135 LPCD**	**C**	**C**
3	Extent of metering of water connections	**0 %**	**0%**	**100%**	**C**	**C**
4	Extent of non-revenue water	**100%**	**100%**	**20%**	**D**	**D**
5	Quality of water supplied	**90%**	**90%**	**100%**	**D**	**D**
6	Cost recovery in water supply services	**0 %**	**0%**	**100%**	**D**	**D**
7	Efficiency in collection of water supply related charges	**0%**	**0%**	**90%**	**D**	**D**
Note: Data not available regarding NRW, Cost recovery and efficiency in collection of water related charges.						

QUESTION: WHAT IS THE GAP IN THESE SERVICE LEVELS WITH REGARD TO BENCHMARKS PRESCRIBED BY MOUD? (75 WORDS).

S.No	GAP IN SERVICE LEVELS IS AS UNDER:	Year 2015	2017-Existing
1.	Gap in coverage of water supply	**62.61%**	**62.61%**
2.	Gap in Per capita water availability as per present population is about	**89.13 LPCD**	**89.13 LPCD**
3.	Gap in Metering is	**100%**	**100%**
4.	Gap in NRW include leakage and free water supply to social gathering festivals along with water supply through stand posts.	**80%**	**80%**
5.	Gap in Quality of supplied water as per PHE norms.	**10%**	**10%**
6.	Gap in Cost recovery with expenditure on electricity and power.	**100%**	**100%**

S.No	GAP IN SERVICE LEVELS IS AS UNDER:	Year 2015	2017-Existing
7.	Gap in efficiency of water charges	90%	90%

SOURCE OF WATER AND WATER TREATMENT SYSTEM.

Please provide information in 150 words on the above responding to (however not limited to) following questions.

Question: What is the existing source of water? Is it surface water source or underground water source? What is the capacity of these sources?

Existing source of water supply is underground water and capacity of the source(Total Nos of tube wells x Average discharge of each tube well) is 39 x 0.56 MLD= 21.75 MLD

Question: Is there any treatment provided to water from these sources? How much water is required to be treated daily? What is the treatment capacity installed in the city?

Currently no chlorination of underground water supply is done and the old system of treatment has been defunct for a long time. Currently 21.75 MLD water has to be treated but after the implementation of the project 130 MLD of water will be treated. ADB has proposed two types of chlorination system: one is liquid chlorinators and the other one is electro chlorinators.

Question: What per capita water supply in LPCD (liter per capita per day) comes out, if you divide total water supply by the total population?

Existing source of water is ground water and already treatment facility is available. Per capita water supply in LPCD is =(Total water supply/ total Population) 21.75 MLD / 4,74,093 Population = 45.87 LPCD

DISTRIBUTION ZONES

Please provide information in 150 words on the above responding to (however not limited to) following questions.

Question: City is divided in how many zones for water supply?

For the purpose of efficient distribution system the entire town of Gaya has been divided into 30 District Metered Area (DMA/Zones).

TABLE: ZONE WISE COVERAGE OF HOUSEHOLDS

Question: Provide details of total no of Households (HH) in each zone, no of HH with and without water tap connections in the Table

Zone No/DMA	Total No. of Households	Households with Water tap Connection			Households without water tap connections		
		2015	2017	Total	2015	2017	Remaining gap

Zone No/DMA	Total No. of Households	Households with Water tap Connection			Households without water tap connections		
		2015	2017	Total	2015	2017	Remaining gap
1	1180 HH	700 HH	0 HH	700 HH	480 HH	480 HH	480 HH
2	1968 HH	850 HH	0 HH	850 HH	1118 HH	1118 HH	1118 HH
3	2110 HH	750 HH	0 HH	750 HH	1360 HH	1360 HH	1360 HH
4	2477 HH	1126 HH	0 HH	1126 HH	1351 HH	1351 HH	1351 HH
5	1305 HH	70 HH	0 HH	70 HH	1235 HH	1235 HH	1235 HH
6	1716 HH	700 HH	0 HH	700 HH	1016 HH	1016 HH	1016 HH
7	1723 HH	650 HH	0 HH	650 HH	1073 HH	1073 HH	1073 HH
8	2595 HH	710 HH	0 HH	710 HH	1885 HH	1885 HH	1885 HH
9	2057 HH	800 HH	0 HH	800 HH	1257 HH	1257 HH	1257 HH
10	3956 HH	1300 HH	0 HH	1300 HH	2656 HH	2656 HH	2656 HH
11	3718 HH	1125 HH	0 HH	1125 HH	2593 HH	2593 HH	2593 HH
12	3247 HH	1380 HH	0 HH	1380 HH	1867 HH	1867 HH	1867 HH
13	2913 HH	800 HH	0 HH	800 HH	2113 HH	2113 HH	2113 HH
14	2612 HH	1335 HH	0 HH	1335 HH	1277 HH	1277 HH	1277 HH
15	2819 HH	885 HH	0 HH	885 HH	1934 HH	1934 HH	1934 HH
16	2567 HH	820 HH	0 HH	820 HH	1747 HH	1747 HH	1747 HH
17	3186 HH	1150 HH	0 HH	1150 HH	2036 HH	2036 HH	2036 HH
18	1456 HH	1100 HH	0 HH	1100 HH	356 HH	356 HH	356 HH
19	2503 HH	900 HH	0 HH	900 HH	1603 HH	1603 HH	1603 HH
20	3349 HH	1670 HH	0 HH	1670 HH	1679 HH	1679 HH	1679 HH
21	3059 HH	1190 HH	0 HH	1190 HH	1869 HH	1869 HH	1869 HH
22	3036 HH	1560 HH	0 HH	1560 HH	1476 HH	1476 HH	1476 HH
23	2348 HH	970 HH	0 HH	970 HH	1378 HH	1378 HH	1378 HH

Zone No/DMA	Total No. of Households	Households with Water tap Connection			Households without water tap connections		
		2015	2017	Total	2015	2017	Remaining gap
24	2250 HH	1058 HH	0 HH	1058 HH	1192 HH	1192 HH	1192 HH
25	2357 HH	1070 HH	0 HH	1070 HH	1287 HH	1287 HH	1287 HH
26	1982 HH	900 HH	0 HH	900 HH	1082 HH	1082 HH	1082 HH
27	1422 HH	550 HH	0 HH	550 HH	872 HH	872 HH	872 HH
28	1544 HH	65 HH	0 HH	65 HH	1479 HH	1479 HH	1479 HH
29	2098 HH	275 HH	0 HH	275 HH	1823 HH	1823 HH	1823 HH
30	2565 HH	710 HH	0 HH	710 HH	1855 HH	1855 HH	1855 HH
Total	72118 HH	26969 HH	0 HH	26969 HH	44949 HH	44949 HH	44949 HH

STORAGE OF WATER

Please provide information in 150 words on the above responding to (however not limited to) following questions.

Question: What is the total water storage capacity in the city? What is capacity of elevated and ground water reservoirs?

Storage capacity of in the city is as follows:-
Total Elevated reservoir Storage Capacity Existing –0.45 ML
Ground Level Reservoir Existing – 07 Capacity is 17.293 ML
Proposed capacity : 6 Elevated reservoir and Capacity is = 10 .95 ML
Proposed Ground Level Reservoir – 4 Capacity is – 15.58 ML

Question: In case of surface water, does city need to have ground level reservoirs to store raw treated water?

As per the existing situation, the city is using only ground water however a GLSR of capacity 4 ML has been proposed.

Question: Is water being supplied to consumers through direct pumping or through elevated reservoirs?

Water is being supplied to consumers through direct pumping as well as through elevated reservoir.

Question: Is storage capacity sufficient to meet the cities demand?

No, storage capacity is not sufficient to meet the demand of the city.

DISTRIBUTION NETWORK

Please provide information in 150 words on the above responding to (however not limited to) following questions.

Question: What is the total length of water supply distribution pipe line laid in the city?

The total length of water supply distribution pipeline laid in the city 72.45 KM in 17 DMAs however the city is divided into 30 DMAs.

Question: What is the total road length in the city? Is the pipe lines are laid in all streets? Is the objective of universal coverage of water supply pipe line is achieved?

The total road length in the city is 518.88 KM. Pipe lines are not laid in all the streets. The objective of universal coverage of water supply is not achieved as pipe line is not laid in all streets.

Question: What are the kinds of pipe materials used in distribution lines?

D.I., C.I. pipe materials are used in distribution lines.

Question: Provide zone wise details of street length with and without water distribution lines in the Table?

Table: Zone Wise length of distribution network

Zone No.	Total Street Length In KM	Street Length With Water Distribution Pipe Line In Km			Street Length Without Water Distribution Pipe Line(In Kms		
		2015	2017	Total	2015	2017	Remaining Gap
1	19.79 KM	2.8 KM	0 KM	2.8 KM	16.99 KM	16.99 KM	16.99 KM
2	10.72 KM	.75 KM	0 KM	.75 KM	9.97 KM	9.97 KM	9.97 KM
3	12.53 KM	3.08 KM	0 KM	3.08 KM	9.45 KM	9.45 KM	9.45 KM
4	16.01 KM	4.53 KM	0 KM	4.53 KM	11.48 KM	11.48 KM	11.48 KM
5	9.89 KM	0 KM	0 KM	0 KM	9.89 KM	9.89 KM	9.89 KM
6	21.64 KM	4.72 KM	0 KM	4.72 KM	16.92 KM	16.92 KM	16.92 KM
7	20.05 KM	4.11 KM	0 KM	4.11 KM	15.94 KM	15.94 KM	15.94 KM
8	14.78 KM	0 KM	0 KM	0 KM	14.78 KM	14.78 KM	14.78 KM
9	9.02 KM	0 KM	0 KM	0 KM	9.02 KM	9.02 KM	9.02 KM

Zone No.	Total Street Length In KM	Street Length With Water Distribution Pipe Line In Km			Street Length Without Water Distribution Pipe Line(In Kms		
		2015	2017	Total	2015	2017	Remaining Gap
10	14.87 KM	0 KM	0 KM	0 KM	14.87 KM	14.87 KM	14.87 KM
11	12.47 KM	0 KM	0 KM	0 KM	12.47 KM	12.47 KM	12.47 KM
12	9.7 KM	0 KM	0 KM	0 KM	9.7 KM	9.7 KM	9.7 KM
13	8.7 KM	0 KM	0 KM	0 KM	8.7 KM	8.7 KM	8.7 KM
14	10.98 KM	0 KM	0 KM	0 KM	10.98 KM	10.98 KM	10.98 KM
15	10.9 KM	1.62 KM	0 KM	1.62 KM	9.28 KM	9.28 KM	9.28 KM
16	22.12 KM	8.49 KM	0 KM	8.49 KM	13.63 KM	13.63 KM	13.63 KM
17	15.49 KM	1.24 KM	0 KM	1.24 KM	14.25 KM	14.25 KM	14.25 KM
18	39.48 KM	2.16 KM	0 KM	2.16 KM	37.32 KM	37.32 KM	37.32 KM
19	39.57 KM	13.80 KM	0 KM	13.80 KM	25.77 KM	25.77 KM	25.77 KM
20	32.32 KM	12.74 KM	0 KM	12.74 KM	19.58 KM	19.58 KM	19.58 KM
21	19.29 KM	1.31 KM	0 KM	1.31 KM	17.98 KM	17.98 KM	17.98 KM
22	14.06 KM	0 KM	0 KM	0 KM	14.06 KM	14.06 KM	14.06 KM
23	14.81 KM	0.25 KM	0 KM	0.25 KM	14.56 KM	14.56 KM	14.56 KM
24	12.89 KM	0 KM	0 KM	0 KM	12.89 KM	12.89 KM	12.89 KM
25	32.19 KM	4.21 KM	0 KM	4.21 KM	27.98 KM	27.98 KM	27.98 KM
26	15.93 KM	5.78 KM	0 KM	5.78 KM	10.15 KM	10.15 KM	10.15 KM
27	14.5 KM	0.85 KM	0 KM	0.85 KM	13.65 KM	13.65 KM	13.65 KM
28	21.12 KM	0 KM	0 KM	0 KM	21.12 KM	21.12 KM	21.12 KM
29	10.56 KM	0 KM	0 KM	0 KM	10.56 KM	10.56 KM	10.56 KM
30	12.5 KM	0 KM	0 KM	0 KM	12.5 KM	12.5 KM	12.5 KM
Total	518.88 KM	72.45 KM	0 KM	72.45 KM	446.48 KM	446.48 KM	446.48 KM

INSTITUTIONAL FRAMEWORK

Please provide information in 150 words on the above responding to (however not limited to) following questions.

Question: Define role and responsibilities in terms of O&M, policy planning, funding, service provision in table

Table: Functions, roles, and responsibilities

Planning and Design	Construction/ Implementation	O&M
BUIDCO through Consultant	Project Implementation Unit (PIU) Gaya	Municipal Corporation Gaya

Question: How city is planning to execute projects?

For the ease of executing the project in a smooth manner the ADB has prepared two DPRs. One DPR (Package 1) focuses on the refurbishment of the existing infrastructure, distribution system and construction of new reservoirs whereas the other DPR (Package 2) will focus on the creation of source and connected rising mains and two new reservoirs. Both the DPRs will be implemented simultaneously by two different agencies. For Package 1 construction period will be 42 months and operation and maintenance will be 54 months (the agency will have to maintain the existing system until their rejuvenation and thereafter the new system will be maintained by the agency). The work was awarded under Package 1 in the month of January 2018 and the work was commenced in March 2018.
The work was awarded under Package 2 in the month of July 2017 and the work was commenced in September 2017 and the completion of construction activity is February 2019. For Package 2 construction period will be 18 months and operation and maintenance will be 3 years.

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produce a water production level of 64 MLD.

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Question: Shall the implementation of project be done by Municipal Corporation or any parastatal body? Please refer para 8.1 of AMRUT guidelines.

Yes, implementation of the project will be done by BUIDCo with the support of Consultant in consultation with Urban Local Bodies.

2. Bridge the Gap

Once the gap between the existing Service Levels is computed, based on initiatives undertaken in different ongoing programs and projects, objectives will be developed to bridge the gaps to achieve universal coverage. (AMRUT Guidelines; para 6.2 & 6.3, Annexure-2; Table 2.1). Each of the identified objectives will be evolved from the outcome of assessment and meeting the opportunity to bridge the gap.

Question: List out initiatives undertaken in different ongoing programs and projects to address these gaps. For this provide details of ongoing projects being carried out for sector under different schemes with status and when the existing projects are scheduled to be completed? Provide information in Table

TABLE: STATUS OF ONGOING/ SANCTIONED PROJECTS

2015-16 & 2016-2017

S.No.	Name of Project	Scheme Name	Cost	Month of Completion	Status (as on dd /2017
1	Improvement of Water Supply System Package -1 Distribution Network – 447.78 KM, 06 Over Head tank- 10.95, 03 GD-11.88 ML, Household Connection with meter – 75,000, Raising Main-16.55 KM Refurbishment of Old Tub Well- 29	ADB	311.30 Cr	September,2021	0 %
2	Improvement of Water Supply System Package -2 Number of new Tub Well-24, 01 GD -3.7 ML -01 Clear water -4Ml, Raising main-17.051 KM	ADB	64.97 Cr	Feb 2019	5 %

Question: How much the existing system will able to address the existing gap in water supply system? Will completion of above will improve the coverage of network and collection efficiency? If yes, how much. (100 words).

The existing system is unable to address the existing gap in water supply system. After the completion of ADB project, there will be improved coverage of network in 447.78 KM along with Per-Capita of Water Supply 135 LPCD and Storage Capacity of OHT 10.95 ML, Groundwater reservoir of capacity 15.58 MLD along with refurbishment of 29 existing tube wells for enhancement of water sources for fulfillment of gaps as required in 2033.
In the DPR metering of water supply connections to 75000 Household is also proposed to improve the Collection Efficiency and curb NRW

Question: Does the city require additional infrastructure to improve the services? What kind of services will be required to fulfill the gap?

Yes, the city requires additional infrastructure to improve the services. The following kind of services will be required to fulfill the gap:

1. Better coverage of water supply system by increasing length of pipelines and creating awareness among people towards proper usage of municipal water.
2. Regularization of unauthorized water connections.
3. Reduction in NRW water by replacement of old &damaged pipelines.
4. Automation of tube wells
5. Metering of water supply.

Question: How does the city visualize taking the challenge to rejuvenate the projects by changing their orientation, away from expensive asset replacement programs, to focusing on optimum use of existing assets?

The vision of the city is to rejuvenate all its reservoirs to store the water. And As per the guidelines of the Ministry to provide 24x7 water supply with universal coverage the reservoirs will be made functional so that even when the pumping cannot happen the city gets its water supply without fail.

Since the refurbishment and repair work will only partially suffice the need till 2033 hence 24 new tube wells have been proposed which will give another 66 MLD. Additional 10 reservoirs are also proposed to store the additional water production projected.

For the purpose of efficient distribution system the entire town of Gaya has been divided into 30 District Metered Area (DMA/Zones) and at the entry point of each DMA one monitoring station will be established to know the pressure and quantity of water being supplied to the particular DMA. Apart from this two Critical Stations (farthest point and the most elevated point) will be established in the distribution chain of each DMA to analyze the water supply service and to gauge the health of the entire system. In order to keep a check on the NRW, Electromagnetic flow Meters are proposed to be setup at the tube wells and reservoirs to know the exact quantity of water being produced and supplied.

Smart Metering devices are also proposed to be installed along with the house service connection to record the meter reading without having to enter the house.

SCADA system is also proposed to monitor the entire pumping system and distribution at one place. In order to run the system efficiently by the GMC officials after the handing over, a capacity building exercise throughout the entire phase of construction and maintenance period will be organized. Also counselling sessions with civil society, elected representatives and citizens at large will also be organized throughout the entire project period to create awareness. Compensation will be given to people who are effected by the construction activity.

To create accountability of the entire system, the contractor will be bound by an agreement to access the capacity of the existing as well as the newly developed system and take over the system from the seventh month of commencement of the project and run it for the remaining project period and later on hand over to GMC. During the operation period all the GMC personnel involved in the O& M of the existing system will be working with the Contractor to learn on the job. A grievance redressal system will also be put in place by the contractor which will eventually be handed over to GMC.

Question: Has city conducted assessment of Non-Revenue Water? If yes, what is the NRW level? Is city planning to reduce NRW?

No, City has not conducted any assessment related to Non-Revenue Water but is planning to conduct a study on NRW for the purpose of reducing it.

Question: Based on assessment of existing infrastructure and ongoing / sanctioned projects, calculate existing gaps and estimated demand by 2021 for water supply pipe network, number of household to be provided with tap connections, and required enhancement in capacity of water source/ treatment plant (MLD). Gaps in water supply service levels be provided as per Table

Component	2015	2017	Total		2021 As per Design in 2042	
	Present	Ongoing	2015	2017	Demand	Gap
Source	21.75 MLD	55.80 MLD	21.75 MLD	77.55 MLD	103.92 MLD	26.37 MLD
Treatment capacity	21.75 MLD	55.80 MLD	21.75 MLD	77.55 MLD	103.92 MLD	26.37 MLD
Elevated Storage capacity	0.45 ML	10.95 ML	0.45 ML	11.4 ML	34.64 ML	23.24 ML
Ground Level Reservoir	17.293 ML	15.58 ML	17.293 ML	32.873 ML	Surplus	Surplus
Distribution network coverage	72.45 KM	446.48 KM	72.45 KM	518.88 KM	518.88 KM	0 KM

Note: - As per the DPR of Package one 29 old Tub Wells will be refurbished and the capacity of old tube wells will increase and hence there is no need for a fresh water source for fulfilling the gaps.

OBJECTIVES

Based on above, objectives will be developed to bridge the gaps to achieve universal coverage. While developing objectives following question shall be responded so as to arrive at appropriate objective.

Please provide List out objectives to meet the gap in not more than 100 words.

Question: Does each identified objectives will be evolved from the outcome of assessment?

Yes. The objective is to increase the coverage to un-served areas and to reduce NRW and enhance storage capacity.

1. Universal coverage of water connections by laying of water supply pipe lines in shortfall areas and legalization of unauthorized water connections.
2. To reduce NRW, provision of replacement of old pipe lines, leakage detection machines and automation of tube wells will be made**.**

Question: Does each objective meet the opportunity to bridge the gap?

Yes, each objective meets the opportunity to bridge the gap.

3. Examine Alternatives and Estimate Cost

The objective will lead to explore and examine viable alternatives options available to address these gaps. These will include out of box approaches. (AMRUT Guidelines; Para 6.4 & 6.8 & 6.9). This will also include review of smart solutions. The cost estimate with broad source of funding will be explored for each. While identifying the possible activities, also examine the ongoing scheme and its solutions including status of completion, coverage and improvement in O&M. Please provide information on the above responding to (however not limited to) following questions.

Question: What are the possible activities and source of funding for meeting out the objectives? (75 words)

ADB under the Multi Trans-Financing Facility has given 200 million dollars during March 2012 to Government of India for infrastructure development in the State of Bihar. And completion date will be 31 December 2021. The amount will be released in a phased manner depending on the requirement of the project.
ADB is providing 70 % of the project cost by way of loan to Government of India for a period of 9 years. Remaining 30 % of the project cost will be borne by the Government of Bihar.

Question: How can the activities be converged with other programme like JICA/ ADB funded projects in the city etc? (100 words)

ADB under the Multi Trans-Financing Facility has given 200 million dollars during March 2012 to Government of India for infrastructure development in the State of Bihar. And completion date will be 31 December 2021. The amount will be released in a phased manner depending on the requirement of the project.
ADB is providing 70 % of the project cost by way of loan to Government of India for a period of 9 years. Remaining 30 % of the project cost will be borne by the Government of Bihar.

Question: What are the options of completing the ongoing activities? (75 words)

DPR preparation, Bid processing and award of work has already taken place.

Question: How to address the bottlenecks in the existing project and lessons learnt during implementation of these projects? (75 words)

The project is in the preliminary stage of construction activity.

Question: What measures may be adopted to recover the O&M costs? (100 words)

The O&M cost shall be recovered by:

1. Increasing the coverage of water supply to un-served areas,
2. Regularization of unauthorized water connections.
3. By increasing user charges
4. By reducing NRW
5. Metering of Water Supply Connection

Question: Will metering system for billing introduced?

Yes, Metering System will be introduced.

Question: Whether reduction in O&M cost by addressing NRW levels be applied? (75 words)

Yes, Gaya Municipal Corporation will minimize NRW level to enhance O&M Cost by regularizing of unauthorized connections and replacement of old pipe lines with new ones. To enhance Efficiency of water charges collection metering system in water supply system and online billing, tracking system and spot billing machine will be introduced**.**

Question: Does each objective meet the opportunity to bridge the gap?

Yes, each objective meet the opportunity to bridge the gap.

THE ALTERNATIVE ACTIVITIES TO MEET THESE ACTIVITIES BE DEFINED AS PER TABLE

Table: Alternative Activities to Meet Objectives

Sr. No.	Objective	Activities	Financing Source
1	Universal Coverage	Laying of Water Supply line to achieve Universal Coverage of Water Supply	ADB
2	Per Capita of Water Supply	Installation of Tube-Well to Increase Water Production	ADB
3	Reduction of NRW	Metering Provision for	ADB

4. Citizen Engagement

ULBs will organize and conduct city level citizen consultation and receive feedback on the suggested alternatives and innovations. Each alternative will be discussed with citizens and activities to be taken up will be prioritized to meet the service level gaps. ULB will prioritize these activities and their scaling up based on the available resources. (AMRUT Guidelines; Para 6.6, 6.7 & 7.2). Please explain following questions in not more than 200 words detailing out the needs, aspirations and wishes of the local people.

Question: Has all stakeholders involved in the consultation?

Yes, all stakeholders are involved in the consultation process of formulation of Service Level Improvement Plan.

Question: Has ward/ zone level consultations held in the city?

Yes, ward/ zone level consultations are being held in the city.

Question: Has alternative proposed above are crowd sourced?

There were no alternatives proposed by the citizens and all the activities proposed under ADB project were accepted by all.

Question: What is feedback on the suggested alternatives and innovations?

Feedbacks are regularly taken each month both in monthly MIC meetings and at ward level meetings.

Question: Has alternative taken up for discussions are prioritized on the basis of consultations?

N.A.

Question: What methodology adopted for prioritizing the alternatives?

N.A

5. Prioritize Projects

Based on the citizen engagement, ULB will prioritize these activities and their scaling up based on the available resources to meet the respective objectives. While prioritizing projects, please reply following questions in not more than 200 words.

Question: What are sources of funds?

The source of funding of activities shall be:

1 ADB – 70% (Loan)

2. State Government Funds- 30%

Question: Has projects been converged with other program and schemes?

The project has been taken up under ADB.

Question: Has projects been prioritized based on "more with less" approach?

Yes, the projects are being prioritized based on "more with less" approach.

Question: Has the universal coverage approach indicated in AMRUT guidelines followed for prioritization of activities?

Yes, universal coverage approach indicated in AMRUT guidelines has been followed for prioritization of activities

6. Conditionalities

Describe in not more than 300 words the Conditionalities of each project in terms of availability of land, environmental obligation and clearances, required NOC, financial commitment, approval and permission needed to implement the project.

Before approving the DPR the ADB conducted an initial environmental examination to assess the project feasibility and its effect on environment as a standard practice. A resettlement study was also conducted in

the implementation area to know about the effected persons in the project area. Baseline survey is to be done by the contractor prior to the implementation of the project and also after completion.
NOCs were also obtained for all the lands required for the project prior to the tendering process.

7. Resilience

Required approvals will be sought from ULBs and competent authority and resilience factor would be built in to ensure environmentally sustainable water supply scheme. Describe in not more than 300 words regarding resilience built in the proposals.

Yes, resilience factor, disaster and environmental related factors would be built-in, to ensure environmentally sustainable water supply scheme**.**

8. Financial Plan

Once the activities are finalized and prioritized after consultations, investments both in terms of capital cost and O&M cost has to be estimated. (AMRUT Guidelines; para 6.5) Based on the investment requirements, different sources of finance have to be identified. Financial Plan for the complete life cycle of the prioritized development will be prepared. (AMRUT Guidelines; para 4, 6.6, 6.12, 6.13 & 6.14). The financial plan will include percentage share of different stakeholders (Centre, State and City) including financial convergence with various ongoing projects. While preparing finance plan please reply following questions in not more than 250 words

Question: How the proposed finance plan is structured for transforming and creating infrastructure projects?

The structured plan of the project has been developed in which a sharing of fund as follows is adopted: 70% of the project cost as loan from ADB and remaining 30% from State Govt .

Question: list of individual projects which is being financed by various stakeholders?

Gaya Water Supply Project Package -1 & Gaya Water Supply Project Package-2

Question: Has financial plan prepared for identified projects based on financial convergence and consultation with funding partners?

Yes, financial plan prepared for identified projects are based on financial convergence and consultation with funding partners i.e. GOI, ADB, state government and ULB.

Question: Is the proposed financial structure is sustainable? If so then whether project has been categorized based on financial considerations?

Yes, the proposed financial structure is sustainable and project has been categorized based on financial considerations.

Question: Have the financial assumptions been listed out?

Yes, financial assumptions have been listed out.

Question: Does financial plan for the complete life cycle of the prioritized development?

Yes, financial plan has been done for the complete life cycle of the prioritized development

Question: Does financial plan include percentage share of different stakeholders (Centre, State, ULBs)

Yes, financial plan include percentage share of different stakeholders (Centre, ADB, State and ULB)

Question: Does it include financial convergence with various ongoing projects.

Yes, it includes financial convergence with various ongoing projects

Question: Does it provide year-wise milestones and outcomes?

Yes, year-wise milestones and outcomes have been provided.

DETAILS IN FINANCIAL PLAN SHALL BE PROVIDED AS PER TABLE 8.1, 8.2, 8.3, 8.4 AND 8.5. THESE TABLES ARE BASED ON AMRUT GUIDELINES TABLES 2.1, 2.2, 2.3.1, 2.3.2, AND 2.5.

Table 8.1 Master Plan of Water Supply Projects for Mission period
(As per Table 2.1of AMRUT guidelines)

(Amount in Rs. Cr)

S.No.	Project Name	Priority number	Year in which to be implemented	Year In Which To Be Completed	Estimated Cost
1	Improvement of Water Supply System Package -1	1	March 2018	September,2021	311.78 Cr
2	Improvement of Water Supply System Package -2	2	September 2017	Feb 2019	62.03 Cr

MASTER SERVICE LEVELS IMPROVEMENTS DURING MISSION PERIOD

S.No	Project Name	Physical Components	Indicator	Change in Service Levels			Estimated Cost
				2015	2017	2020	
1,	Improvement of Water Supply System Package -1	Distribution Network – 447.78 KM, 06 Over Head tank- 10.95, 03 GD-11.88 ML,	Coverage	37.39%		100%	311.30 Cr
			Per Capita Of Water Supply	58.25 LPCD		135 LPCD	

S.No	Project Name	Physical Components	Indicator	Change in Service Levels			Estimated Cost
				2015	2017	2020	
		Household Connection with meter – 75,000, Raising Main- 16.55 KM Refurbishment of Old Tub Well- 29	NRW	100%		20%	
			Quality	90%		100%	
			Cost Recovery	0%		100%	
2.	Improvement of Water Supply System Package -2	Number of new Tub Well- 24, 01 GD -3.7 ML -01 Clear water -4Ml, Raising main- 17.051 KM	Coverage	37.39%		100%	64.97 Cr
			Per Capita Of Water Supply	58.25 LPCD		135 LPCD	
			NRW	100%		20%	
			Quality	90%		100%	
			Cost Recovery	0%		100%	

ANNUAL FUND SHARING PATTERN FOR WATER SUPPLY PROJECTS

(As per Table 2.3.1 of AMRUT guidelines)

(Amount in Rs. Cr)

Sr. No.	Name Of Project	Total Project Cost Approved By SHPSC	Share		
			ADB	Govt of Bihar	Total
1	Improvement of Water Supply System Package -1	11/01/2018	70%	30%	311.30 Cr
2	Improvement of Water Supply System Package -2	05/07/2017	70%	30%	64.97 Cr

ANNUAL FUND SHARING BREAK-UP FOR WATER SUPPLY PROJECTS

(As per Table 2.3.2 of AMRUT guidelines)

Sr. No.	Total Project Cost Approved By SHPSC	GOI	State			ULB			Convergence	Others (ADB)	Total
			14th FC	Others	Total	14th FC	Others	Total			
1	Improvement of Water Supply System Package - 1	-		93.39 Cr	93.39 Cr				-	217.91 Cr	311.30 Cr
2	Improvement of Water Supply System Package - 2			19.49 Cr	19.49 Cr					45.48 Cr	64.97 Cr
	Total			112.88 Cr	112.88 Cr					263.39 Cr	376.27 Cr

YEAR WISE PLAN FOR SERVICE LEVELS IMPROVEMENTS

(As per Table 2.5of AMRUT guidelines)

Proposed Projects	Project Cost	Indicator	2015	Annual Targets (Increment from the Baseline Value)					
				FY 2016		FY 2017	FY 2018	FY 2019	FY 2020
				H1	H2				
Improvement of Water Supply System Package -1	311.78 Cr	Coverage	37.39%				40%	50%	100%
		Per Capita Of Water Supply	58.25 LPCD				70 LPCD	100 LPCD	135 LPCD

Proposed Projects	Project Cost	Indicator	2015	Annual Targets (Increment from the Baseline Value)					
				FY 2016		FY 2017	FY 2018	FY 2019	FY 2020
				H1	H2				
		NRW	100%				80%	60%	20%
		Quality	90%				-	-	100%
		Cost Recovery	0%				-	-	100%
Improvement of Water Supply System Package -2	62.03 Cr	Coverage	37.39%				40%	50%	100%
		Per Capita Of Water Supply	58.25 LPCD				70 LPCD	100 LPCD	135 LPCD
		NRW	100%				80%	60%	20%
		Quality	90%				-	-	100%
		Cost Recovery	0%				-	-	100%

DATA COLLECTION , DISCUSSION AND VALIDATION BY	
Name of the officer deputed in ULB	
Designation	Municipal Commissioner /Executive Officer/ Chief Engineer/……
Signature	
Name of Parastatal Agency	Bihar Urban Infrastructure Development Corporation Limited
Officer of Parastatal Agency deputed for the task	Mr.Tanay Kumar Das National Team Leader Shah Technical Consultant Pvt. Ltd Design and Supervision Consultant BUIDCo-ADB Contact Number- 9477577134 Email id- dtanay@hotmail.com
Signature of Team Leader DSC / Project In-charge	

Signature of Project Director BUIDCo	
Date of Finalization	