



**USAID** | العراق  
من الشعب الامريكي

Governance Strengthening Project  
(GSP)

## **Kirkuk Water**

# **Service Delivery Improvement Plan (SDIP)**

*Prepared by*

**Kirkuk Water Directorate**

*In cooperation with*

**GSP/Taqadum**

*February 2015*

**Kirkuk-Iraq**



## **SDIP – for drinkable sector**

This Service Delivery Improvement Plan (SDIP) is aiming at revising the process of drinkable water sector, at the local level, and serve in evaluating the capabilities of the sector, including the inputs of financial and human resources and authorities, for it is basically directed to human services along and determining the obstacles and facilitating factors. The SDIP is a strategic work plan developed to address a variety of management issues. It is designed to improve Water service delivery in Kirkuk province and enable the Water Directorate to achieve its short-, medium- and long-term goals. The SDIP will enable the Directorate to develop a long-term vision to run itself and ensure that problems will be gradually under control. This plan will ensure planned use of resources to achieve these goals. SDIP also helps the Directorate of Water in Kirkuk to address issues related to its performance in delivering better services to citizens. This plan provides a structured network to reduce any insufficiency and also it provides emergency plans to response to any failure and unexpected and dangerous accident

### **Scope of Work**

#### **1-In General**

A-Critical and main issues to locally manage and provide water

B-General and brief perception of water issues at the province level.

C-The future prospective for managing drinkable water and taken procedures in the province.

D- Issues related to the management and provision of water and taken measures in the province.

E-Projects and plans adopted at the short, medium and long terms to meet future demands.

F- General background of drinkable water in the province.

G-Population growth and management of water resources

H-Amount of domestic production, in general, and available quantities for consumption, amount of daily consumed quantities and amount consumption at the city level.

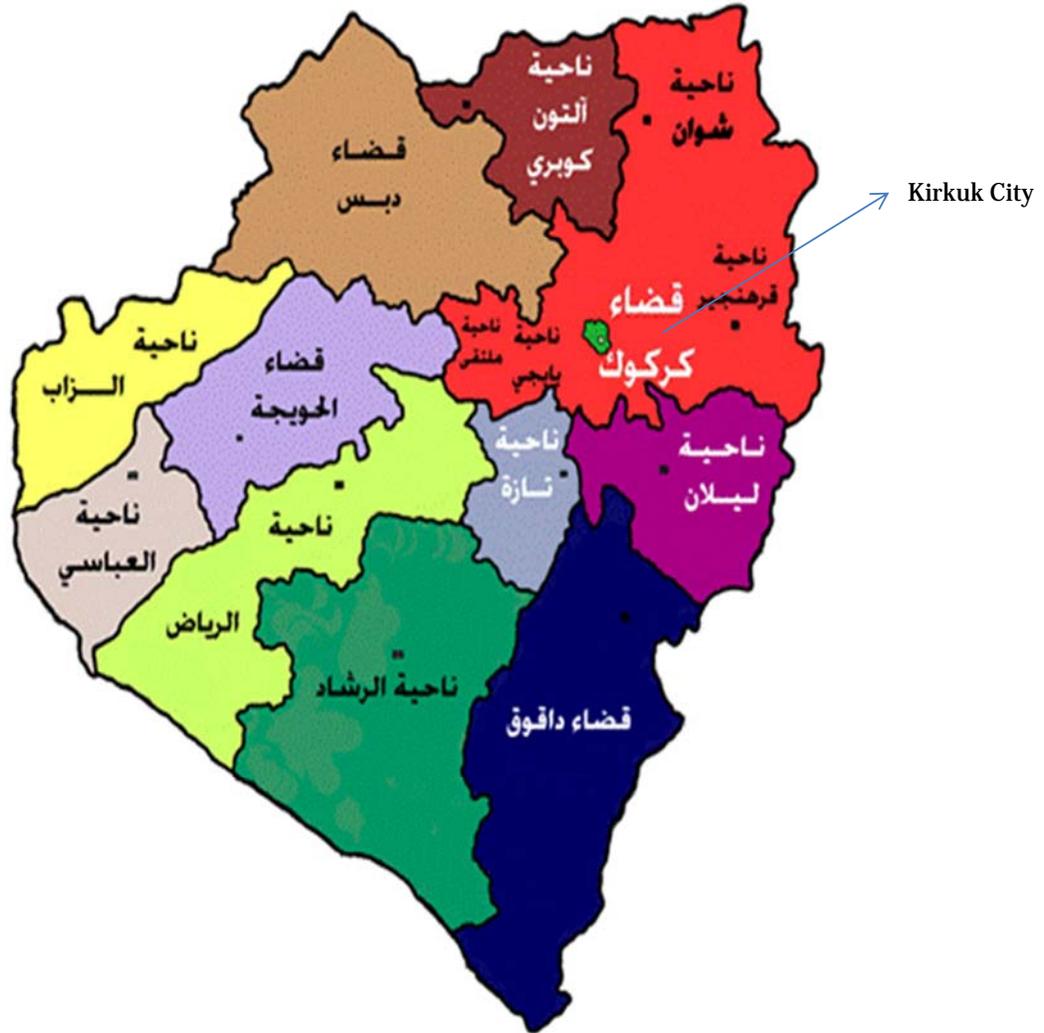
I-Main and critical issues facing the directorate of water in Kirkuk in providing drinkable water.

J-Available opportunities

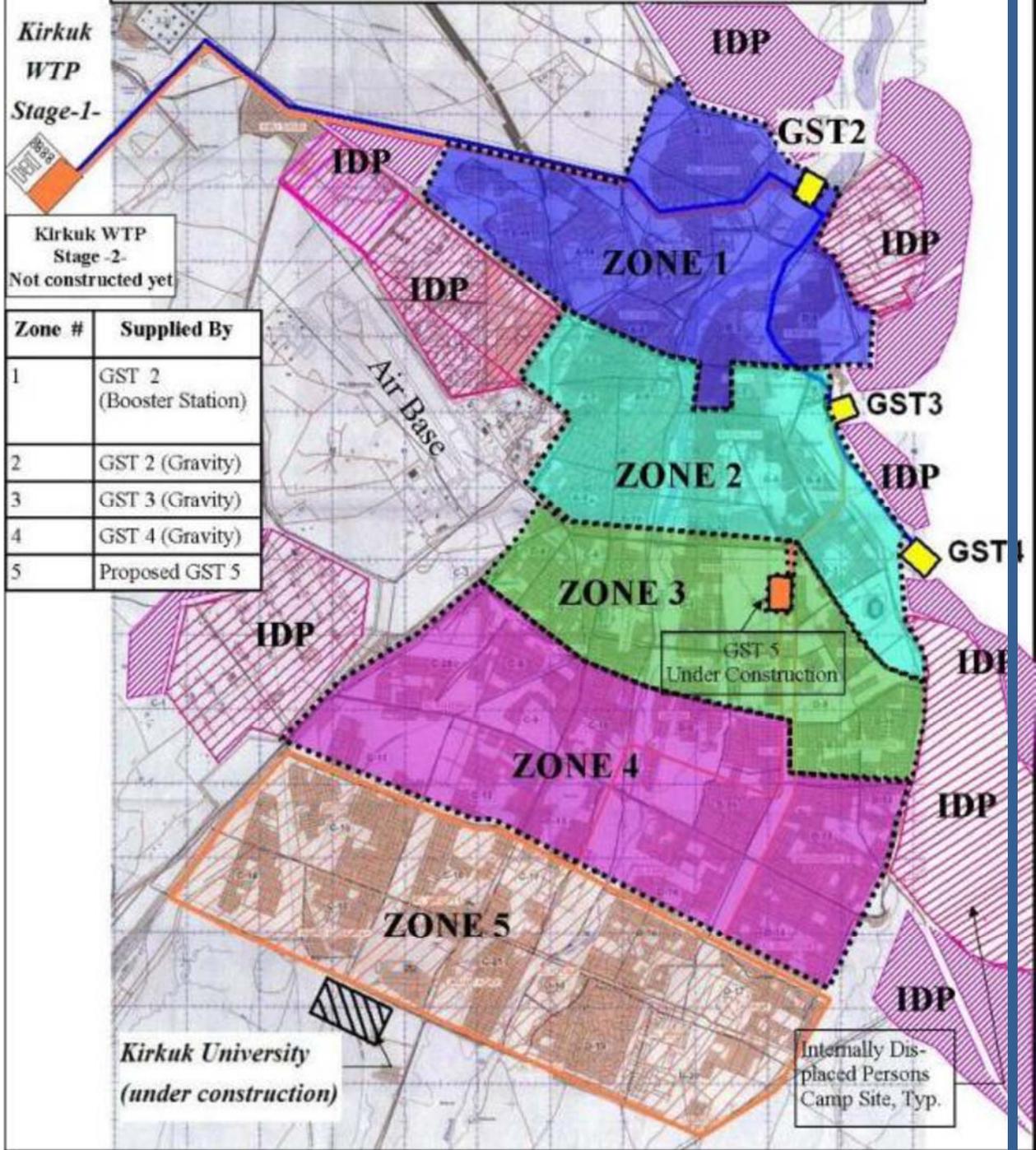
## **2- When developing the plan we should focus on the following**

- A- Necessary solution to provide drinkable water in Kirkuk province, due to the current situation.
- B- Required measures on the short and long terms
- C- Long term Strategic solutions to address water crisis
- D- Develop a work frame to manage water crisis in Kirkuk ,which includes
  - Identifying roles and responsibilities and providing effective legal and administrative frameworks to face current situations and allocate financial allocations to execute long term strategic projects
  - Classify obstacles, overlaps and treatment means.
  - Amount of required resources, providing these resources to achieve effective management of drinkable water in the province.
  - Increase general awareness , educate citizens to rationalize consumption of water and reduce wastes
  - Meet citizen needs along with citizens growth in both urban and rural areas

## Kirkuk City and Districts and Sub-Districts



# Kirkuk Water System Pressure Zone Delineation



## Evaluation of Drinkable Water System

Evaluation of drinkable water system is applied on water treatment plants , water compact units , pipelines ,networks ,sub pipelines and its distributions . The evaluation is aiming at the development of existing infrastructure or developed plans for new provision or improvement of water service .Since the quality of water depends on the type and length of the network , the evaluation should specify if citizens receive good quality of water and carrying out regular evaluations .

In order to evaluate the system we should take into consideration number of elements or selected elements ,as well as current risks and conditions, which have direct effect in the quality of water .

All elements used in the evaluation should be verified to insure the accuracy of the plan supported information , required data can be derived from water provision plan and field surveys and as-built drawings and data .If the system theoretically is able to meet the correct goals ,then the water provision plan becomes the tool which assist in meeting these goals , and the plan should be developed by following the specified steps , if it is not possible to the system to satisfy the correct goals , there will be a need to develop a new program to improve the service ,which may include the need to re-design ,plan and establish new projects and take additional actions .

### Challenges and problems facing Wasit Directorate of Water and significantly contributing in providing poor quality of services to citizens

Classification by sectors (by Priority)

- **Financial challenges**
  - 1- Reduced and delayed financial allocations spared for water sector
  - 2- Increase of projects expenditures due to maintenance purposes ,as a result of increase of operation hours to meet the demand for pure water.
  - 3- Poor payment of service charges by citizens ,which leads to poor revenues .
- **Infrastructure**
  - 1- Aging water networks , difficulties in carrying out surveys to existing water networks in the city to gather technical information and details on the as-is of these networks.
  - 2- Lack of power needed to operate water projects , drop of river's level and poor maintenance .
  - 3- Creation of new residential areas which require provision of water and establishment of new water treatment plants and water compact units .
- **Capacity building**
  - 1-The need to hold specialized training courses to develop the capacity of workers in water production field.
  - 2-Lack of the number of skilled trainers in pipelines , lay down of networks and maintenance works .

- 4- Provision of modern systems and equipment to operate the projects and carry out preventive maintenance .

#### **4. Stages of work on the service delivery improvement plan:**

Kirkuk Water Directorate and in cooperation with USAID GSP/Taqadum program completed the gap analysis model developed by Taqadum program to actively contribute to the gap analysis. The importance of gap analysis in the services provided to citizens is that:

1. The use of scientific method in the analysis of all elements that cause the gap in the indicators. of the services provided to citizens compared with the value of the standard.
2. Determine the priority of the elements influencing the gap in services through the power of their influence.
3. Put the proposed immediate and long-term solutions to address the elements the gap in order to minimize it.
4. The results of the analysis which represent proposed immediate and long-term solutions will be the input for the preparation of relevant service delivery improvement plan in the province.

The development of required solutions, conclusions and proposals to minimize the gap and improve delivered services is conducted through studying the challenges and difficulties in administrative units associated to Kirkuk province, develop immediate and long term solutions to address the elements causing the gap and the successful use of the model and performance approach within the introduced study to improve drinking water sector.

#### **Analysis of elements causing the gap in the service performance:**

The development of the plan is carried out through gathering all effecting elements with the service standard that are associated with the service standard (Financial, Technical, etc.) aspects, according to the plan, where after completing the analysis, weaknesses or deficiencies were identified in each element and the proportion of its influence in the gap, and thus the most influential elements causing the gap were chosen. Kirkuk water directorate identified these elements and developed immediate and long-term solutions that effectively contribute to the reduction of the value of the gap. In the next chapter, all performance indicators will be analyzed in comparison with standard via using elements analysis in detail, and finally to develop solutions for the elements of the most influential events in the gap. Annex No. 1 includes a guide to use gap analysis of the services provided to citizens which was applicable by Kirkuk Directorate of Water.

## 5. Gradual approach

The (SDIP) includes the following questions:

- Where are we now?
- Where do we want to be?
- How can we get there?
- How can we ensure success?

### "1-5 "Where are we now?"

To answer this question, it requires a comprehensive and objective review and a review of the current state of performance and practices of water departments in Kirkuk and should be measured through key performance indicators. The data related to "Where are we now?" Can be obtained by using the relevant technologies,

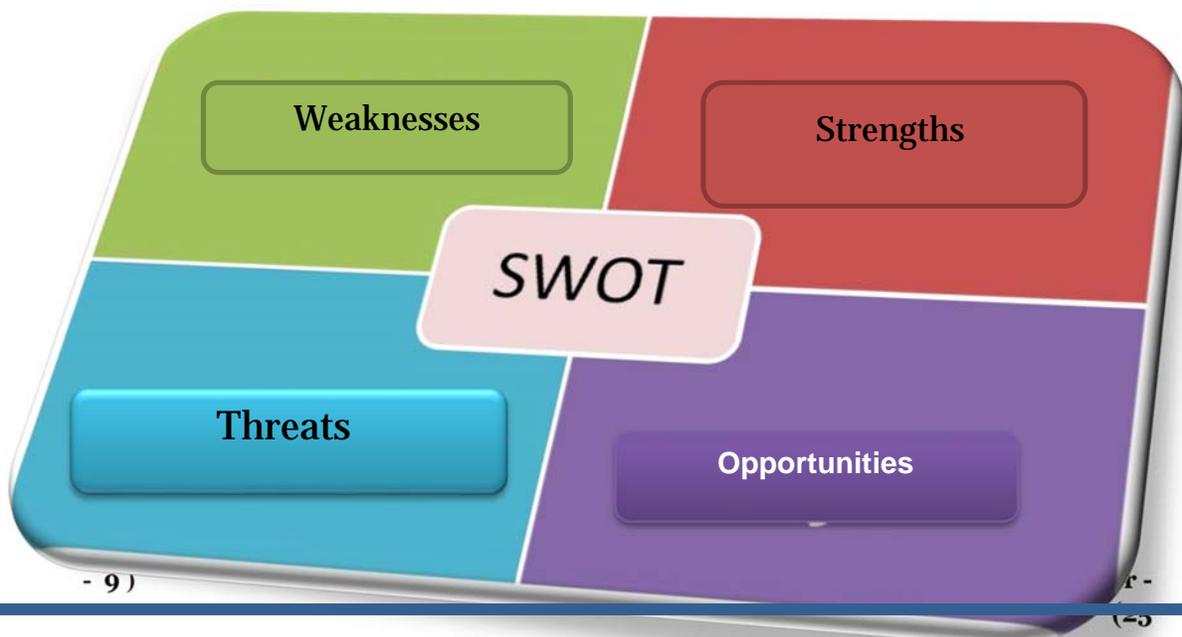
First: ((SWOT analysis by diagnosing strengths -weakness, -opportunities-threats.

Second: Key Performance indicators analysis - these two techniques help to understand and summarize the environment and the performance of the Directorate.

**The SWOT analysis helps to identify realistic short, medium and long-term goals in order to:**

- Correct weaknesses
- Enhance strengths
- Prevent threats
- Seize opportunities
- Achieve vision

**SWOT Analysis elements**



### **SWOT analysis includes the following elements:–**

- **Strengths:** Project strengths elements, which distinguishes it from other projects.
- **Weakness:** project weakness points
- **Opportunities:** Which comes out of the project and may increase the production?
- **Threats:** Which comes out of the project and may causes failure or delays to the project?

### **SWOT Analysis of Kirkuk directorate of water**

#### **Key performance indicators analysis**

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## **SWOT Analysis of Kirkuk directorate of water**

### **Strength**

- 1- According to attached schedules, there are many central water treatment plants, water compact units and small enterprises belonging to Kirkuk directorate of water, and currently there are a number of proposals and studies developed to establish central projects in the city center, districts and sub-districts.
- 2- Current water networks cover about (90%) of the actual need of the city center, districts and sub-districts.
- 3- All projects and water compacts are equipped with chlorine, alum and turbidity testing devices.
- 4- Existence of central lab in the directorate equipped with recent equipment, devices and apparatuses, in addition to other labs located in Kirkuk water project to control the quality of water, identify alum and chlorine rates and test the elements in raw water and produced water.
- 5- Existence of water trucks with different capacities to distribute water in remote areas, districts, sub district or areas unserved with water networks.
- 6- Kirkuk directorate of water comprises a large number of skilled, experienced and qualified technical and engineering staff to operate and maintain all water treatment plants, water compact units and voltage regulator .

### **Weakness**

- 1-Aging water networks in Kirkuk city, districts and sub-districts .There is a need to replace them with new ones, according to the established international standards.
- 2- A number of water treatment plants or water compact units, RO units need rehabilitation or expansion.
- 3-Lack of specialized vehicles and trucks, such as excavators.
- 4- Wastes, leakages, broken pipes and unauthorized tapping to water networks.
- 5- Reduction of revenues (service charges fees) most citizens do not pay the service charges.

### **Threats**

- 1-Absence of cooperation with the directorate in order to lift illegal uses and unauthorized tapping to the distribution networks
- 2- Poor power supply, power outage and lack of generators.
- 3-Shortage of water share allotted to the province (raw water) to establish water projects.
- 4-Lack of water meters to identify the actual consumed amounts from the networks.

5-Rise of demand for drinking water due to the increase of population number and number of displaced and immigrants in Kirkuk province.

6-Poor number of (Engineers, operators and technicians) required to operate water treatment plants and water compact units

### **Opportunities**

1-Availibility of financial allocations to execute top priority projects, which contribute in supplying citizens with their need of water.

2-Availibility of financial allocations within the (petrodollar and regional development funds) to execute and replace networks, provision of required materials and equipment to sustain the workability of water treatment plants and water compact units.

3-Availibility of funds to implement central and strategic projects.

4-Availibility of recent equipment, tools and specialized vehicles and trucks.

### **Performance indicators**

the aim behind the SDIP, analysis and study of all elements included in the work is to improve the oversight process and monitoring the services delivery down to raise the level of services provided to, which are listed below.

1. Service Coverage
2. The amount of water provided per capita
3. Continuity of service
4. Quality of supplied water
5. Measuring supplied water
- 5- Response to citizens' complaints

## Operational projects in Kirkuk province

S.no	Type	Kirkuk city	Al-Dbes	Tal Ali	AL-Hawija	Al-riyadh	A,zaab	Yaji	A,ton kubri	Almultaqa	Al-Abbasi	Al-Daqooq	Taza	Al-Rashad	Sarkan	Shwan	Qarat Henjeer	Lylan
1		1	1	1	2	2	2	-	1	-	-	-	-	-	-	-	-	-
2		10	-	-	23	18	16	6	48	12	18	15	14	7	16	3 3	2 7	20
3		2	-	-	-	-	-	2	-	-	-	1	2	6	-	-	-	2
4		-	-	-	8	6	-	2	-	2	8	3	-	2	-	-	-	1

### Analysis of elements causing the gap in the service performance:

Due to drinking water shortage, climate change and the lack of raw water, the ability of supplying sufficient amount of water becomes a critical issue. The area is well known by its high temperature degrees during summer and scarcity of rain in winter. Hence, ,water consumption rate rises in summer which is associated with high temperatures degree and reduction of rain levels .Rain fall rate varies from one session to another , Usually summer session does not witness and rain fall ,which is resulted in the reduction of river's levels , or rivers flow rates . According to the available information on AL-Zab Al-Zagheer river, it appears that this river can

supply sufficient amount of raw water to feed future projects with water and limits water scarcity. Currently AL-Zab Al-Sagheer river is used as feeding source to supply water treatment plants and water compacts in Al-Debes area with raw water , and Al-Ray channel ( Reservoir No.9 ) in Kirkuk city ,which also is fed by Al-Zab Al-Sagheer river to supply Kirkuk unified water treatment plant with raw water .

### **1- Standard of Service coverage to the district center /Kirkuk city / Population served through direct connection to the water net.**

Standard 100 % /Indicator 90% / Gap 10%

#### **Analysis of elements causing the gap**

- 1) **Human resources:** Lack of engineers, tank trucks drivers. The effect of this element on the gap is high.
- 2) **Financial issues:** Poor allocations in the provincial budget prevent the completion of expanding water networks. The effect of this element on the gap is high.
- 3) **Infrastructure:** This element has no effect on the gap.
- 4) **Equipment:** This element has no effect on the gap. Equipment always supplied by the contractor
- 5) **Capacity building:** The need for to qualify new engineers in the rehabilitation center of the Ministry of municipalities.
- 6) **Technical obstacles:** This element has no effect on the gap.
- 7) **Authorities:** There is a need to expand the financial legal and administrative authorities of the managers in the districts and sub-districts, vesting contractual authorities to the directorate. The effect of this element on the gap is high.
- 8) **Coordination:** Poor coordination among the directorate and other relevant departments during the execution of projects. The effect of this element on the gap is high.
- 9) **Political intervention:** This element has no effect on the gap.
- 10) **Misuse of human resources:** This element has no effect on the gap.
- 11) **Maintenance and operation:** This element has no effect on the gap.
- 12-**Security situation:** This element has no effect on the gap.
- 13-**Logistic support** this element has no effect on the gap.
- 14-**Displaced and immigrants:** There are more than 75000 displaced family, who are in need to be served with water service.

**Based on the above explanation, the following elements have the highest impact on the gap: -**

- 1- Human resources
- 2- Financial issues
- 3- Authorities
- 4- Coordination
- 5- Displaced and immigrants

## **Recommendation**

### **1- Human resources :-**

**Immediate solutions:** Conclude contracts with (18) engineers of different specialties, (18) technicians holding technical diploma as maintenance technicians, (100) skilled workers, (20) drivers/ specialized vehicles and trucks, and engage them in training sessions on projects management, networks installation in the directorate of water training center.

**Long term solutions:** Appoint permanent (6) engineers and (10) drivers.

### **2- Financial issues : -**

**Immediate solutions:** Allocate 3,000,000,000 IQD /Three billion Iraqi dinar from the provincial budget (Petrodollar – Regional development funds)

**Long term solutions:** Allocate 20,000,000,000 IQD Twenty billion Iraqi dinar, from the Ministry investment budget and the provincial budget, to laydown water nets, according to the below table, which was developed in accordance with the actual need and priorities.

**3- Authorities :** No information provided

**Immediate solutions:** None

**Long term solutions:** Expand the financial authorities to purchase all required materials for water treatment plants and water compact units. Vest the directorate with contractual authorities in order to conclude agreements with the reliable and experienced companies to implement projects for the favor of the directorate, expand the legal and administrative of the managers in the districts and sub-districts.

### **4- Coordination :-**

**Immediate solutions:** Activate and expand the joint coordination committees authorities among the directorates. Develop executive and clear courses to specify the roles and responsibilities of the directorates which their services overlap with each other.

**Long term solutions:** Set up committee involving the advisors and experts from all governmental departments to outline plans and future solutions for all problems facing the service directorate and under the GO oversight.

### **5- Displaced and immigrants**

**Immediate solutions:** Provide displaced and immigrants with drinking water through tank trucks.

**Long term solutions:** lay down water networks with the assistant of International organizations.

## **2- Standard amount of water supplied per capita in the city center**

The standard is 450 liters / person /day) indicator (256 liters / person /day) the Gap is 44%.

### Analysis of elements causing the gap

- 1- **Human resources:** Water treatment plants, which exceeded their life time, are in need for technicians to undertake maintenance.
- 2- **Financial issues :** None
- 3- **Infra-structure:**

Currently ,there are two water treatment plants supplying Kirkuk center with water ( Kirkuk unified water project ,which was establish in 1993 ,its life time is up to 2005 and AL-Debs water treatment plant which was establish in 1956 ,its life time was ended in1993.

Appearance of differential settlement (in most of Kirkuk water treatment plant which may lead to collapse of the facilities, and great loss of the produced quantity amounted at 12600 m<sup>3</sup>/h.

4- **Equipment:** None.

5- **Capacity building:** Train new staff in the training center.

6- **Technical obstacles: Presence** of turbidity, reduction of raw water levels in the channel feeding the water treatment plant.

7-**Authorities:** None

8- **Coordination:** There is a need for coordination between the directorate and the directorate of water resources.

9-**Polictical intervention:** None

10- **Misuse of human resources:** Illegal use and unauthorized tapping to the conveyance lines at 10%.

11- Maintenance and operation: Replace the pumps in main water treatment plants (K1) first stage and water storage reservoir .Provision of heavy duty generators (4 Mega) in the unified water treatment plant.

12-**Security situation:** None

13- **Logistic support:** Provide transportation means to transport the operators to the water treatment plants.

14- Displaced and immigrants: There about 75000 displaced family.

**Based on the above explanation, the following elements receive the figure 3 during the analysis of the gap and have direct impact in minimizing the value of gap: -**

1-Human resources

2-Infrastructure

3-Financial issues

4-Equipment

#### **1- Recommendations:**

##### **1-Human resources:**

**Immediate solutions:** Conclude contracts with (36) maintenance technicians (Electricity and Mechanics), 80 operators, 12 lab technicians, fund their salaries from the provincial budget, petrodollar and regional development funds.

**Long term solutions:** Appoint permanent (36) maintenance technicians (Electricity and Mechanics) 12 lab staff.

##### **2-Financial affairs**

**Immediate solutions:** Increase the revenues of the directorate by educating and promoting citizens to pay water bills, rationalize use water, reduce wastes, and lift illegal use and authorized tapping to water distribution networks.

**Long term solutions:** Allocate 200 billion Iraqi dinars to establish Alton Kubri water treatment plant, with a capacity of 12000m<sup>3</sup> /h .Allocate 10 billion Iraqi dinar to treat the differential settlement in Kirkuk unified water treatment plant.

##### **3- Infrastructure**

**Immediate solutions:** Develop a study to address the reasons of the differential settlement of Kirkuk unified water treatment plant -First stage

**Long term solution:** Establish Alton Kubri water treatment plant with a capacity 1200 m<sup>3</sup>/h, project price is amounting to 200 billion Iraqi dinars. Allocate 10 billion Iraqi dinars to treat the differential settlement. Develop a study to execute Khasa Ghay water treatment plant with a capacity of 8000m<sup>3</sup>/h.

##### **4-Equipment**

**Immediate solutions:** Provide disinfection and filtration materials (50 ton chlorine, for six month, with a price amounting at 390 million Iraqi dinar.

**Long term solutions:** Supply (2) generators, 3 Mega, amounting to 170 million Iraqi dinars. Supply (12) high pressure pumps to Kirkuk unified water treatment plant.

4- **Continuity of service:** As for the water treatment plants 12h/day, value of the gap is 66.7%.

### Elements influencing the gap

#### 1- Infrastructure

**Immediate solutions:** Establish high pressure pumps system to increase the quantity of water pumped from water storage reservoir No. 2 to water storage reservoir no. 3.

Establish water storage reservoir with a capacity of 900 m<sup>3</sup> in water storage reservoir No.3.

**Long term solutions:** Connect Proposed Alton Kubri water treatment plant with water storage reservoir No.2.

Accelerate the implementation of the unified water treatment plant / Stage 2.

Transfer the suction pipes and the inlet pipe of the unified project, stage 1 and stage 2 to Al-Debs Lake.

2- **Equipment:** There is a great shortage in the alum due to the increase of the levels of turbidity in raw water resulting in the reduction of the efficiency of pumps and quality of supplied water.

**Short term solutions:** Provide alum for filtration. The required quantity is 200 ton per month, with a price amounting at 600,000 Iraqi dinars per ton and 50 ton /month of chlorine for disinfection.

3-**Technical obstacles:** Poor power supply, which is resulting in poor operation of pumps and other electrical appliances.

**Immediate solutions:** Improve provision of power, secure stable voltage to operate water treatment plants.

**Long term solutions:** None

#### 4-Coordination:

**Immediate solutions:** There is a need to increase coordination between the directorate and Kirkuk directorate general of electricity distribution to secure sufficient voltage, as well as the directorate of water resources to maintain the quantity of supplied water.

**Long term solutions:** N/A

#### **5- Logistic support.**

**Immediate solutions:** Provide logistic support to the staff working in all water projects, increase their awards and allowances, and provide them with health insurance. to increase working hours and maintain continuity of the service.

#### **4- Efficiency of response to citizens' complaints**

##### **1-Human resources**

**Immediate solutions:** Create citizens service desk "CSD"

##### **2--Capacity building**

**Immediate solutions:** Train citizens service desk staff on the art of dealing with citizens and timely response to their complaints.

##### **3- Coordination**

**Immediate solutions:** Coordinate with CSD in the province, issue monthly reports on the complaints and response to complaints.

##### **4-Logistic support**

**Immediate solutions:** Provide an electronic system to follow up citizen complaints

#### **Where do we want to be?**

Based on aforementioned the information, and in order to identify the standards and the performance objectives which fall under the name of the SMART (specific, measurable, achievable, realistic and time-bound) , the goals of the Kirkuk Water Directorate involves the execution of strategic and central projects and developing studies to improve the performance of the projects and advance their efficiency , implement water compacts , expand water nets and serve all areas and villages with drinking water .

#### **The goals of Kirkuk Water Directorate**

1- Expand and modernize Al-Debs water treatment plant, which is currently in process by increasing its production capacity from 2700 m<sup>3</sup>/h to 4500 m<sup>3</sup>/h.

2- Lay down and expand the length of the networks up to 50 km to serve 25000 people in Kirkuk city, up to the end of 2018.

3- Replace and rehabilitate the aging water networks at a length of 5 km in the center of Kirkuk city, at the end of 2015. to address water shortage in water distribution networks in the city, addressing water pollution.

4- Rehabilitate ground storage tanks (GST 2, 3, 4) to insure continuity of water supply to citizens, up to the end of 2017.

5- Activate the works of the joint committee to remove the illegal use and unauthorized tapping to the work nets, there are 5000 trespasser per/year and follow up subscribers and contributions.

6- Install water meters to about 5000 houses in the center of Kirkuk city and follow up other needs with the concerned departments to install the water meters.

7- Execute Alton Kubri water treatment plant with a capacity of 12000 m<sup>3</sup>/h, to cover Kirkuk city with drinking water, up to the end of 2019.

8- Develop studies to establish Khasa Ghay water treatment plant with a capacity not less than 8000 m<sup>3</sup> /h, up to the end of 2018.

### How can we get there?

Kirkuk Water Directorate and in cooperation with USAID GSP/Taqadum program completed the gap analysis model developed by Taqadum program to actively contribute to the gap analysis. The importance of gap analysis in the services provided to citizens is that: -

1. Use of the scientific method in the analysis of all elements that cause the gap in indicators of the service provided to citizens compared with the value of standard.
2. Determine the priority of the elements influencing the gap in services through the power of their influence.
3. Put the proposed immediate and long-term solutions to address the elements the gap in order to minimize it.
4. The results of the analysis which represent proposed immediate and long-term solutions will be the input for the preparation of relevant service delivery improvement plan in the province.

Kirkuk Water Directorate has relied on the use of measurements average that have been collected in the administrative units with a focus on the most vulnerable units in order to develop effective solutions to reduce the gap and improve the services provided to citizens through the immediate and long-term solutions. The successful use of the model will lead to get accurate results that help determine the right and realistic solutions that executable in reducing the gap and improving service.

### How can we ensure the success?"

In order to ensure the success of Services Delivery Improvement Plan (SDIP), it is important to continuously control the standard and indicators of achieved progress evaluation to improve the performance and its external factors at all levels, and to provide data and reactions using the appropriate mechanisms in writing reports. This allows the management to determine the actual and potential success and failure in early enough time to facilitate timely adjustments. There should be a unit within the Directorate of Water in Kirkuk that will be responsible for coordinating the activities and performance evaluation in line with the agreed targets according to a

monthly basis. This report will be submitted to the concerned bodies, and the preparation of progress and performance quarterly and annual reports; completing the rest of the required procedures to insure the implementation of the plan, according to the adopted approach.

### **Proposed Recommendations for Immediate solutions**

1-Set up a joint committee headed by Kirkuk governor to determine raw water quota to the future projects and specify provision outlets to the proposed projects to Kirkuk city.

2-Execute a project including the identification of the projections of old and current water distribution networks in Kirkuk city ,in order to develop as built diagrams for all distribution networks pipes and water projects in Kirkuk city , in order to create a basic data base including technical details to determine the amount of water supplied to the sectors ,control these amounts according the number of population , address shortage of supplies , broken pipes ,leaks and unauthorized tapping to networks, which effect the quantity and continuity of supplied water in Kirkuk city.

3-In coordination with consultative bodies develop studies to look for alternative raw water resources to feed new water treatment plants to address water shortage in some areas in Kirkuk city.

4-Set up a committee involving experts from concerned governmental departments to diagnose technical problems and obstacles and introduce recommendations and solutions, under the supervision of the Kirkuk Assistant technical governor.

5-Improve and provide sufficient electrical power to operate water treatment plants in Kirkuk city and insure continuity of water supply to citizens.

6-The total number the permanent staff is (1114) staff, the defect is (128) one in different specialty, accordingly we recommended to address this defect by appointing the following cadre:

S.No	Required specialties	Number	Assumed responsibilities
1	Engineers	18	Implement new water treatment plants and expand old ones.
2	Technicians	36	To work in and operate water treatment plants
3	Administrators	14	To perform administrative works and work in collection unit.
4	Craftsmen	50	Fix broken pipes ,leaks and undertake maintenance works

5	Drivers	10	To drive water trucks and excavators
Total number of required positions		128	

7-Supply the directorate with the below vehicles and trucks

S.No	Type of vehicle or truck	Number	Purpose
1	Excavator	2	Fix broken pipes ,leak and lay down networks
2	Sewer vacuum trucks	2	To intake water during fixing broken pipes
3	Concrete and Asphalt breaker	2	To break and drill streets to repair broken pipes in water networks
4	Asphalt cutter machine	2	To cut streets during the repair and lay out of networks

3-Diversification of water resources by the establishment of commercial projects to produce bottled water.

4-Support follows up unit and provides services in cooperation with the State institutions and NGOs, civil society organizations, carry out surveys on water quantities and continuities.

### Standard of supplying drinking water.

No.	Standard	Standard description	Standard unit	Data required for standard measurement	description	Measurement unit
1	People served through direct connection to the network	The total number of houses that have a direct connection to the network of drinking water out of the total number of total houses in the area.	%	A. Total number of houses in the area	Housing units registered in the Real Estate Registry Department that have building licenses	Number
				B. Total number of houses that have direct link with network	Housing units that have direct and systematic subscription with the network	Number
				Indicator calculation= $100 \times \frac{B}{A}$ (calculation is done quarterly)		%
2	The amount of water provided per person per day (450 liters in provincial centers, 360 liters in districts, 250 liters in sub-districts)	Total water provided per person per day, according to the Iraqi Specifications	Liter/day/person	A. Quantity of monthly supplied water	Measuring the daily product amount which is pumped to the network with consideration to measurements on a daily basis and find the total during the month, taking into account the non-calculation of the lost in network, which can be estimated at a minimum of 15%.	Liter/month
				B. Number of people served in the area	Number of people who have a direct connection to the network within the service area	Person (number)
				C. Number of days monthly	Number of days per specific month	Day/month (number)
				Indicator calculation= $B / \frac{A}{C}$		Liter/day/pers

				on		
3	Measuring the extent of the amount of water for subscriptions	Total subscription supplied with meter out of the whole total subscriptions	%	A. Total number of houses that are directly connected to the network	Housing units that have subscription in water department	Number
				B. Total number of houses that are supplied with consumption meter	Housing units that are equipped with the gauges of consumption and are adopted in calculation of consumer water wage	Number
				Indicator calculation= $100 \times \frac{B}{A}$		%
4	Service continuity	Continuity of pumped water is measured in average hours of pumping water in the network during one day where the level of water height reaches in housing units, one floor at a minimum	Hour/day	1. Average of pumping hours per day	Daily pumping hours for a period of 7 days is calculated and draw rate as a monthly average	Number
				Indicator calculation= number of hours in 7 days/7 (calculation is done quarterly)		%
5	Quality of water supplied to person	The quality of drinking water provided per person per day, which matches or exceeds the Iraqi standards specifications	%	A. Number of models drawn monthly related to water quality	The actual number of samples of water drawn for examination monthly. Models must be taken from the ends and exits and	Number/month

					middle of network project.	
				B. Number of samples matching the specifications monthly	The total number of models that are drawn whose tests result match or exceed the applicable standard specifications water	Number/month
				Indicator calculation= $100 \times \frac{B}{A}$		Liter/day/person
6	The efficiency of dealing with citizens' complaints	The total number of complaints about water service, which are dealt with within 24 hours from the moment of receipt of the complaint	%	A. The total number of all complaints received from citizens during the month	Complaints registered within complaints office in registry and follow up system should be effective	Number/month
				B. the total number of complaints that have been directed and handled during the month C. 000000+	The number of complaints that have been handled correctly and satisfactorily within 24 hours or the next working day from the moment of registration of the complaint	Number/month
				Indicator calculation= $100 \times \frac{B}{A}$		%