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Innovative Solutions for Clean Water in Green Street (Sequencing Batch Reactor system SBR & WaterGen) in Abasan Al-Kabira

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Session 3: Goal 6 - Clean Water and Sanitation



Introduction: Study Area

01

Gaza Strip (GS) is part of the Palestinian occupied territories.

02

GS is one of the most densely populated areas in the world (5500 inhabitants/km²)

03

Annual population growth in GS is about 3%.

04

KhanYounis Governorate (KG) is the largest governorate in GS(112 km²)

Palestine 27,000 km²



Gaza Strip 365 km²



Abasan Al Kabira 18 km²



Gaza Strip Governorate

01

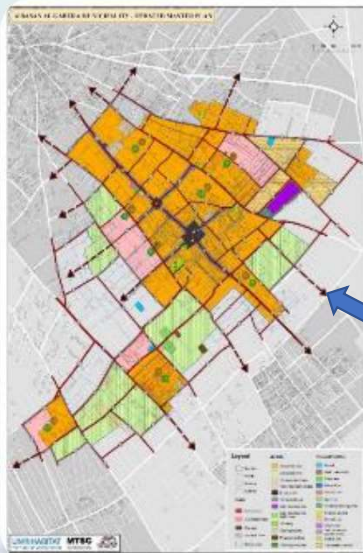
Populations of KG about 400,000 inhabitants.

02

Abasan Al Kabira (AK) area(18km²)

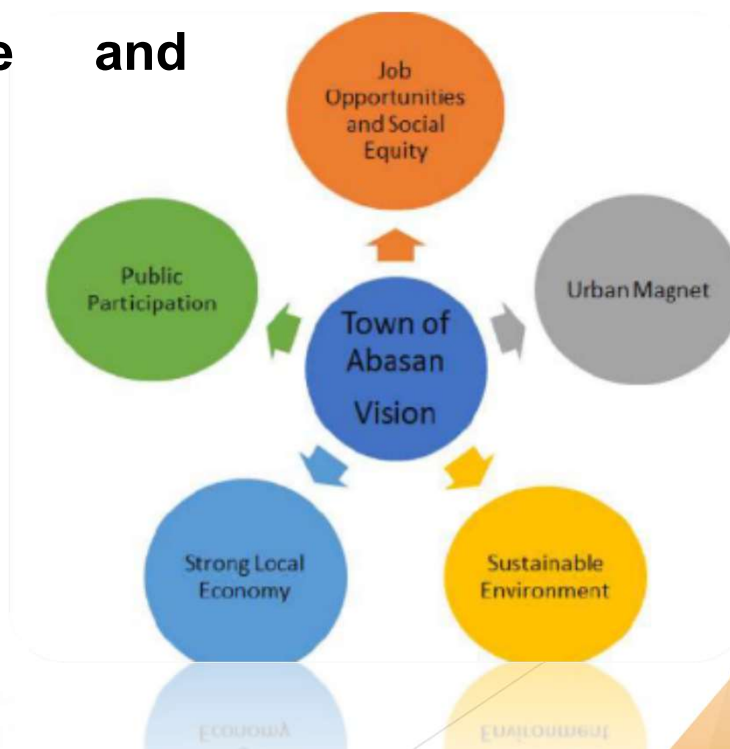
03

Populations of AK about 30,000 inhabitants.



Vision Components Of Abasan

Abasan is an ancient green town with an integrated urban center that enjoys sustainable and innovative services.



Abasan Al-Kabira is, the first city from the ENP South Region to join the Covenant of Mayors for Climate & Energy!

The Covenant of Mayors is an EU initiative that has committed von Mayors to reduce CO2 emissions by at least 40% by 2023.



ABOUT JOIN PLANS & ACTIONS NEWS & EVENTS SUPPORT

Abasan Al-Kabira, first city from the ENP South Region to join the Covenant of Mayors for Climate & Energy!

29
JUL 2016



On 12 July 2016, Abasan Al-Kabira municipal council made the decision to join to the Covenant of Mayors for Climate & Energy. **Abasan** has committed to the **Covenant objectives** of reducing its CO2 emissions by at least 40% by 2030, increasing resilience to climate change, and also strengthening its efforts to provide secure, sustainable and affordable energy to its citizens.

Mayor of Abasan Al-Kabira Mustafa Al-Shawaf at the signature event:

"Today, Abasan Al-Kabira signs this new global initiative leading the fight against climate change. The Covenant of Mayors aims to create an inclusive and sustainable city, not only for the future, but already for the present".

Khanyounis Treatment Plant

01

In Palestine, particularly in Gaza Strip, Water scarcity considers the main problem in the water sector, the average quantity of water available to citizens per day is 74-95 liters in the West Bank and Gaza Strip respectively according to Water Sector Regulatory Council WSRC report.

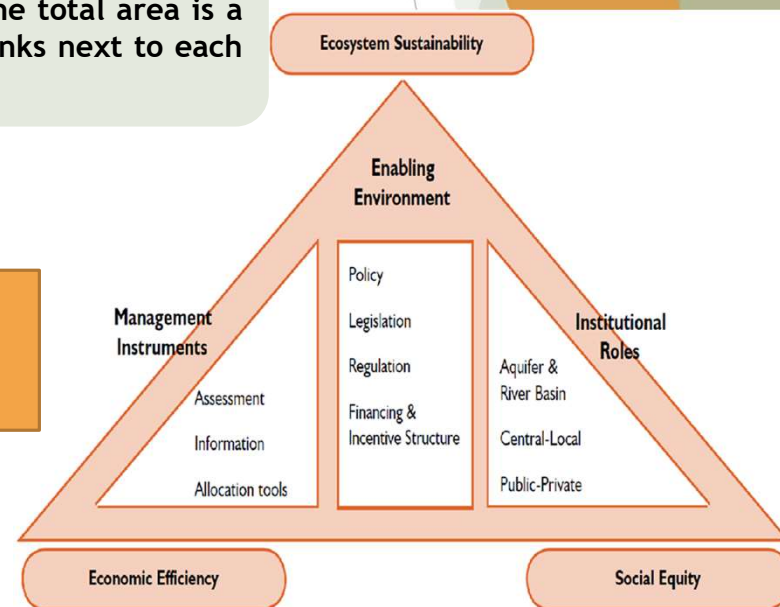
02

Abasan Al-Kabira is located in the southern part of the Gaza Strip, in the Khan-Younis governorate. It is about 18 km² and the inhabitants are 30000. About 40% of the total area is a built-up area, and the rest (60 %) is an agricultural area. People use Cesspits tanks next to each home for wastewater disposal in the municipality of Abasan Al-Kabira.



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Integrated Water Resource Management IWRM Implementation Triangle



Khanyounis Treatment Plant

Total cost 56,000,000 \$

01

Treatment Plant

Capacity: 26,500m³/day

02

Infiltration Basin

Area: 98,000m²

03

Emergency Line

Length: 13.5km, \varnothing 100 cm



Khanyounis Treatment Plant

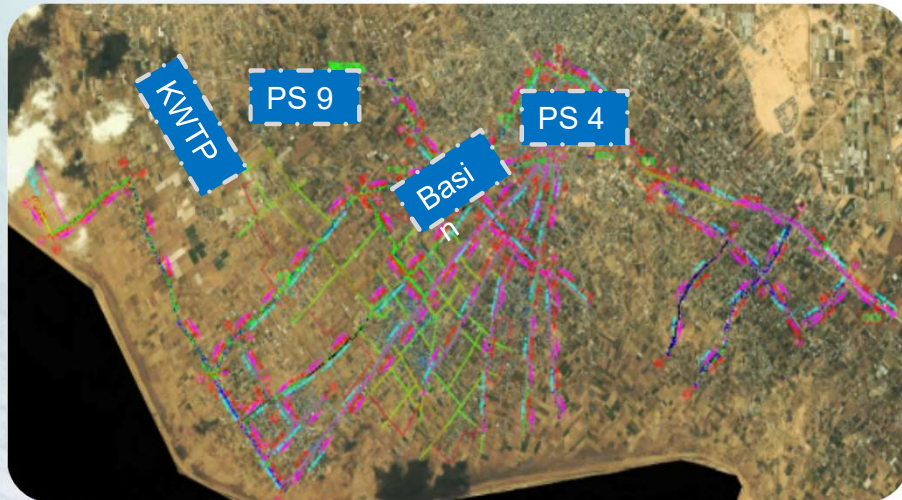


Khanyounis Treatment Plant



Khanyounis Treatment Plant

There is no sewage network system in Abasan Al-Kabira, therefore people depend on Cesspits tanks next to each home for wastewater disposal. A sewage network master plan is available. The project is running with the first phase now...



General Plan for Pump stations & proposed carrier lines



Executed Innovative Solutions

(1) Sequencing Batch Reactor system (SBR) 100m³/day



(2) Watergen 1m³/day



(3) Green Street

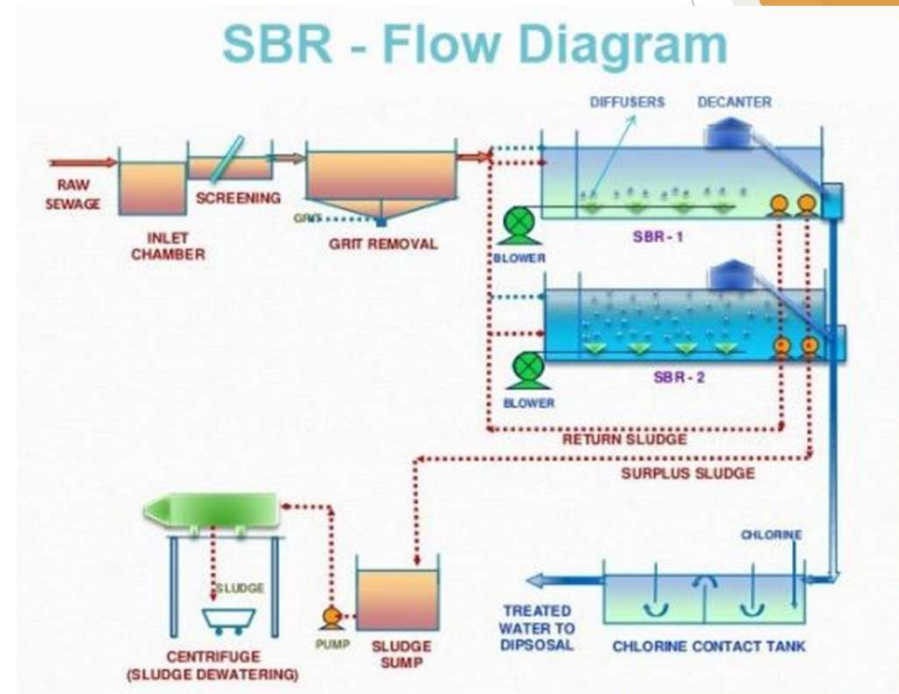


Sequencing Batch Reactor system (SBR)

Contribute to the reduction of the negative environmental impact of cesspit tanks for wastewater disposal in Abasan Al-Kabira within two years.



Non-Conventional Water Resources NCWR



Sequencing Batch Reactor system (SBR)

The project aims to use the SBR sewage treatment units equipped with a treated average rate of 200m³/day, this system is innovative and sustainable for this area. The SBR collects wastewater from 1500 citizens and in this way, less sewage will seep into the groundwater. The produced treatment freshwater will be used for public benefits (agriculture irrigation of agriculture areas and public green areas).

The SBR systems use conventional aeration technology; these systems are low electricity consumption and need a small area to install.



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Sequencing Batch Reactor system (SBR)

Implementation and installation stage



WaterGen

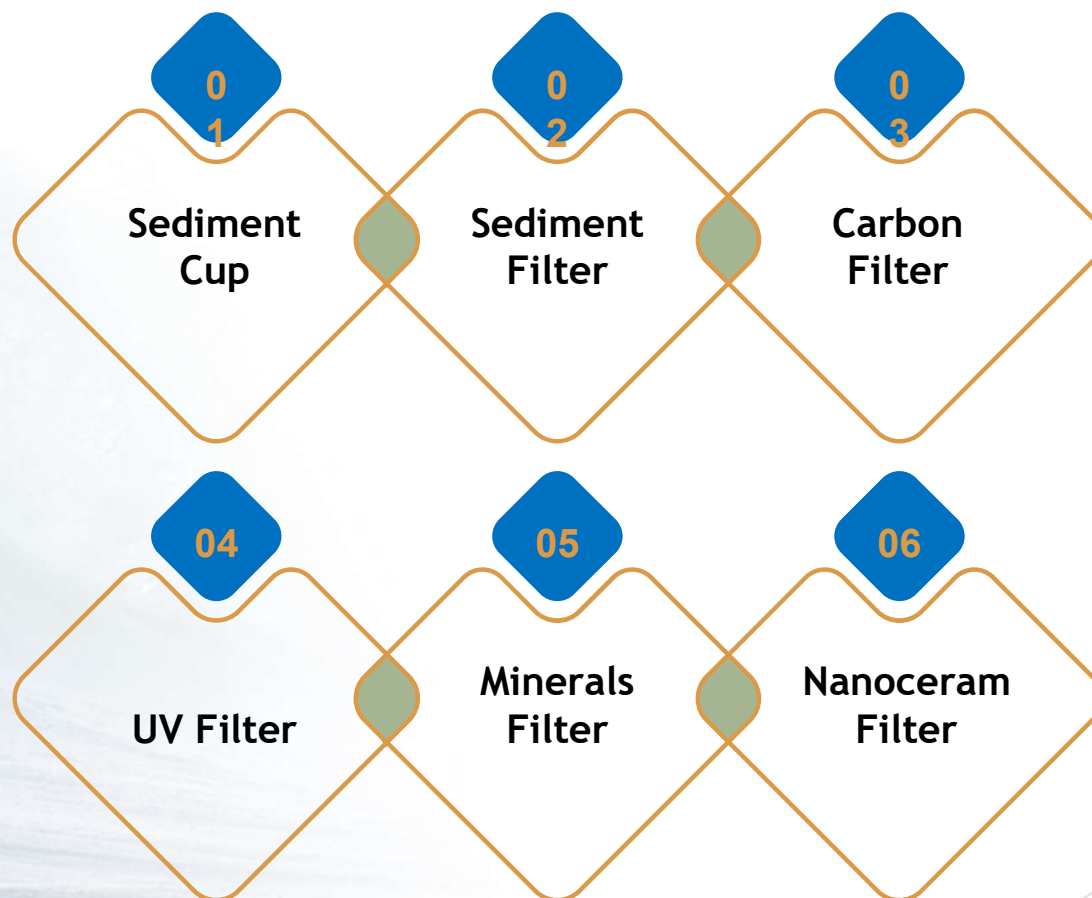
Based on Watergen GENius™ heat exchanging technology, the WaterGen is a standalone machine that is an atmospheric water generator that harvests water from the humidity in the local air. WaterGen provides physical, biological, and chemical water filtration.



WaterGen produces freshwater 1m³/day



Water filter types



Green Street – Wadi Saber

A green street is a stormwater management approach that incorporates vegetation (perennials, shrubs, trees) to slow, filter, and cleanse stormwater runoff from impervious surfaces at the valley Wadi Saber Area. Green streets are designed to capture rainwater at its source, where rain falls. A traditional street is designed to direct stormwater runoff from impervious surfaces into storm sewer systems that discharge directly into surface waters, and streams.

The design of green streets typically involves collaboration among engineers, landscape architects, and community members to create a tailored solution that meets the unique needs of the locality. With the implementation of green streets, communities can take a major step towards a more sustainable future by managing stormwater, improving water quality, and creating vibrant public spaces.



Conclusion

01

Our goal is to improve the sustainable integrated management of non-conventional water resources, focusing on rainwater harvesting and greywater reuse, in Abasan Al-Kabira and its surrounding areas.

02

By implementing cost-effective methods for water availability and climate change adaptation, we aim to support the Municipality of Abasan Al-Kabira in achieving its Sustainable Development Goals, as outlined in its SDIP Action Plan. Our ultimate vision is for Abasan Al-Kabira to become an eco-city by 2030.

03

we aim to contribute to developing the National Water Management Plan for the Palestinian Water Authority, enhance the capacity of local authorities to manage NCWR, and educate students and teachers on NCWR to increase awareness of sustainable water use.

04

We also seek to promote multi-stakeholder partnerships for local NCWR initiatives and advance the use of NCWR as a sustainable, innovative, and cost-effective way to improve community access to water in water-scarce areas.

05

This, in turn, will contribute to climate adaptation at the local level. Finally, we aim to promote knowledge sharing and exchange of experiences on the various aspects of NCWR applications that can be further used.





Thank
You!

