Together Association For development and environment
Non Governmental Organization (NGO)
Registered No.19 of 2006 at the Republic level

Aims to help the poor and marginalized communities in rural and semi-urban areas through integrated development based on the lessons learned and previous experiences at the local, regional and international levels through involving all community groups to express their actual needs and involving them in solving their problems and participating in the implementation.
We Seek Together to reduce poverty and improve the standard of living of citizens

The NGO works in Governorates

Minya- Beni Sueif- Fayoum- Qenna
Integrated Sanitation
Integrated Sanitation treatment
Simple Low-Cost Technology

Together Association
For development and environment

www.together-eg.com
The Objective
Designing a model to facilitate the safe disposal and treatment of wastewater and sewage wastes for re-use. This model is characterized by its simplicity and low cost construction, operation and maintenance, to become the model of the Egyptian rural areas in order to improve the level of public and environmental health.
The General Goal

Protection of underground water from pollution due to the use of old wastewater and wastes (toilets) disposal methods by poor communities and also to maintain the overall environment and to maintain health and reduce the incidence of diseases through the implementation of a low-cost sanitation model that can be replicated in other different places (rural/ unplanned areas)
Technology

- Nature simulation- Natural factors is the basis of technology
- Aerobic Treatment- the unit has no automation.
- Street slopes are designed under soil level.
Applying the pilot project

Cooperation between the private sector, Egyptian funding agencies, Micro-credits program, civil society organizations and involved government agencies. The pilot was implemented at the level of two villages (Gaafar and Ezbet Yaqoub) serving the total population of 10,000 in Markaz El Fashen - Beni Seuf Governorate.
Project components

- **Slope lines**: street lines tangent to buildings

- **Sewerage rising mains**: the main pipelines linking a lift station to a treatment plant

- **Lift station**: facilities designed to collect wastewater from the entire village and pump it through the sewerage rising mains to the treatment plant

- **Manholes**: collection facilities linking many houses for piping sewage to the lift station

- **Treatment plant**: it is the huge location in which such wastes are collected and processed. The resulting product is used in agricultural irrigation.
System advantages

- Only a small area of land is needed for the establishment of the treatment plant
- It simulates nature in terms of shape, operation, and easy maintenance operations
- Operation processes can be carried out by 2-3 workers only
- Costs as well as operation and maintenance expenses are low compared to the traditional system
System advantages

- good disposal of pathogenic organisms through quick killing and natural biological operations
- the more the number of water treatment basins, the better the effectiveness of the project
- Purity of the treated water can be enhanced through expanding the cultivated area
- increasing the slope angle of slope lines reduces energy consumption.
Costs of simplified sewage system, compared to traditional technology used

- Cost of unconventional system used in a village of 10,000 people is estimated at USD 250,000 (i.e. $25 per citizen)
- However, cost of the traditional system implemented by the government is estimated at USD 4.5 millions (i.e. $450 per citizen), which is 20 times the cost of the unconventional system.
Biogas production
Awlad Yaaqoub Village, Markaz El Feshn, Beni Suef

Pic. 41: Final image of the fermenter after installation and testing
Biogas technology depends on anaerobic fermentation of solid and water waste resulting from plant waste, animal waste, and garbage. Such technology is applied in an economic and healthy way to protect the environment from pollution. It also results in the production of the methane gas that is used as a new and renewable source of energy, which greatly reduces the consumption of traditional energy sources, such as petrol, and prevents the direct burning of biomass. It can also be used as a new source for energy in newly reclaimed lands and plant areas where electricity is scarce and energy sources are unavailable. The production of gas results in the generation of an organic fertilizer rich in organic materials as well as minor and major nutrients, of which amount is suitable for plants. In addition, it is free of pathogenic microbes, larvae, ova, and grass seeds which get ruined during the fermentation of organic wastes. This process produces a clean fertilizer that does not pollute the environment nor harm agricultural crops. Due to the abovementioned advantages of this technology, and its ability to save energy and safely dispose of organic wastes, a contract was concluded among the Academy for Scientific Research and Technology (financing entity), GIZ (advisory entity), The Centre for Enterprise Development and Technology Scientific Research (Implementing entity), and Together Association For development and environment (civil society organization) to establish a unit for producing biogas from sewage waste and animal feces in Awlad Yaaqoub Village, Markaz EL Feshn, Beni Suef.
The Project carried out in cooperation with:

- German society for international cooperation (GIZ).
- The Centre for Enterprise Development and Technology scientific research
- Together Association For development and environment
- Local Community Development Association Ezbet Yaqoub – El Feshn.

Pic. 35: Installing gas hoses between digester body and gas tank
The key stages of the pilot project implementation:

1. The construction stage
Designing a digester of brick and concrete, where stirring is done by a submersible pump
Pulled from the exit door and fermented material is pushed to the digester through iron pipe of 2 inches diameter.

Pic. 12: gas tank pit after construction
Pic. 5: digester and gas tank pit digging operations
• **Construction stages**

• Building the digester walls from white bricks as well as building organic material inlet and exit holes in the tank.

• **Constructing a steel chassis 3.4 m long and 3.1 m diameter (steel angle 5 cm) as a base for gas tanks painted with an insulating material (steel primer and black lacquer (paint))**

• **Continue construction (of the pit) over the chassis with a 2.8 diameter and 3.1 m depth. A 1 cm plaster layer is then then added (plastering) and a water insulating black insulator coating (بلاك).**

• After completing the pit body and digester body, a PVC 2m long pipe of 4 inch diameter (10 cm) is installed in the exit basin for discharging the remaining digested material in one of the sedimentation basins in the sanitation plant

• Completing the digester body apse cover using red bricks which is used as a gas chamber over the digested material.
The construction stages

Making a square iron cover with sides 80 cm long at one of Ismailia’s local workshops (6 mm thick) and bolting neck from a 5 cm angle with a rubber gas seal with 40 bolts to prevent gas leaking. Opening were done in the cover as follows:

1- gas intake 1 inch in diameter (gas exit steel pipe) and pressure meter
2- the return steel pipe opening 2 inch in diameter (which will be bolted to the submerging pipe at the outlet opening at the digester’s far end.
3- Installing sampling, temperature and pH value measuring pipe opening, 1.5 inch diameter. A 3 m long and 2.5 diameter steel gas tank is made with 3mm thickness, with a total volume 14.7 cubic meter for storing the gas resulting from the digestion process.

Installation Phase:

1. The gas tank has been moved from Ismailia to Awlad Yaccoub village on May 2nd
2. Plastering of the cover and neck with cement was completed.
Filling fermenter with organic wastes

First addition of organic materials (manure and sewage waste) was successfully made. However, only a small amount of manure was available. Filling was carried out over long and intermittent periods. Filling was completed on May 20.

Raising awareness of villagers

A visit was made to the village people and their knowledge of biogas and its uses was assessed. The advisory entity explained to them all there is to know about biogas, in terms of shapes and establishment methods of biogas units. They also informed them of the types of wastes used and explained to them how to benefit from biogas in:

- Cooking and baking
- Warming up water and heating
- Lighting lamps
- Generating electricity

Pic. 33: filling the fermenter with organic wastes (manure and sewage waste)
1. Gas tank was tested against gas leakage. Small holes resulting from welding operations were found. Such holes were filled with EPOBIND (Power Putty) which prevents the leakage of gas and liquids.

Pic. 34: testing gas tank against gas leakage

Pic. 34: testing gas tank for leakage
The operation

- Switching on the lighting lamp on June 14 by the advisory side.
- Igniting also the stove flame to make sure the quality of gas flaring and that fireplace is working.
- Installation of a Meter to measure the amounts of gas out daily to see the actual coverage of gas.

Pic. 37: operating lighting lamp by head of Ezbet Sheikh Yaccoub local CDA in Fashn
Training

The training of four staff members working in the sanitation treatment plant in Ezbet el-Sheikh Yaqoub El Feshn.

Types of Training
Trained on working in a biogas unit in terms of:
1- Safety factors and caution when dealing with biogas unit.
2- How to detect a gas leakage when it occurs.
3- The amount of wastes (animal waste manure - and sanitation) that should fill the digester with daily.
4- How to open and close the gas valves during operation and maintenance.
5- Factors that affect the production of biogas

Recommendations
1. To ensure that the amount of gas produced from biogas unit it should be fed by animal waste (manure) with sewage waste daily.
2. The feeding process not only done by sewage residues as that would lead to lack of proportion of the total organic materials and a lack of gas production.
3. Installation of a Submersible pump to the process flipping and the homogeneity of the solution inside fermented to produce gas with the required quantity and quality.