

# "Biogas production from agricultural waste in the Aral Sea Basin: development of pilot plants"

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 REPIC (Renewable Energy Promotion in International Cooperation) project. Duration: 2016 – 2018

Partners:

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## Existing problems

- ✓ Low level of natural gas/electricity supply in rural communities
- ✓ Low use of renewable energy sources
- ✓ Low Adoption of biogas technologies by farmers
- ✓ Ineffective biogas technologies chosen by livestock farmers
- ✓ Greenhouse Gas emissions from Organic wastes (i.e., manure) in rural communities
- ✓ Negative consequences of ecological-environmental situation in Aral Sea basin

## Project phases:

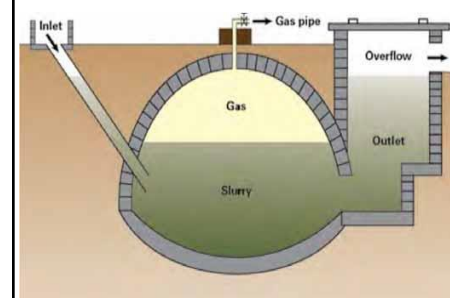
- 1) **Evaluation of the local situation:** agricultural production, local needs, energy supply, local industry
- 2) **Evaluation of local technology producers** and definition of best adapted biogas production system
- 3) **Implementation and pilot testing** of three to five biogas systems
- 4) **Dissemination** of the gained experience

2. Development of **local capacities** (consulting, construction) for planning, realization and operation of biogas plants.



Biogas Seminar was organized to 60 livestock farmers on September 21, 2016

## 4.2 Plug flow digester



## Local needs for:

- **Decentralized green energy** (i.e., biogas and co-generated electricity)
- **Smart agricultural waste management**
- **Decreasing Greenhouse Gas emission**
- **Production of organic bio-fertilizers** that
  - decrease water consumption
  - increase yield efficiency
  - decrease weed rate

3. **Understanding main challenges** in the realization / operation phase:

- Manure is mixed with stones and sand in stables to reduce humidity
- Organic wastes from agricultural crops and households show higher biogas potential than animal manure
- Extreme weather conditions in Aral Sea basin - extreme weather conditions
- Livestock farmers have low financing and professional knowledge, skills on biogas technologies
- Low financial capacities of farmers

## 4.3 Container batch digester



## Climate

- Continental cold arid desert climate
- Mean annual temperature **13.4°C**
- 320 sunny days per year
- Agriculture oriented region

## Project objectives

1. Development of **economically viable biogas production systems** applicable to local conditions.



Field trip to livestock farms were arranged to study existing biogas technologies

4. Delivering **technically safe and economically feasible biogas model plant**

## 4.1 Simple liquid digestion



## Further Actions:

- Organize **course on the fundamentals of biogas production** for engineers of the different disciplines involved, in order to be able to build up a **local biogas group with enough know-how to develop plants together** with the Swiss counterpart.
- **economic calculating** of at least one of the three designs in 2017.
- Possible **construction of the selected plant(s)** with local farmer/partners

Farmers with high interest in biogas production

