Improved Health and Food Security in Armenia

Attributable impact

- 8,000 residents of Parakar benefit from improved health and water resources for agriculture as a result of a 150 m3 domestic, decentralized wastewater treatment plant[1].
- The plant has resulted in a 60% reduction of BOD (biological oxygen demand) and COD (chemical oxygen demand) values and an 85% reduction in suspended solids in discharged wastewater. The secondary treatment of discharged wastewater has also enabled the rehabilitation of around 20 hectares of cultivatable land, increasing agricultural production and food security.
- The supply of water for irrigation has increased by more than 10 liters/sec, providing farmers with a reliable source independent of rainfall.

Summary

GWP Armenia teamed up with the local community and the engineering consultancy JINJ Ltd. to propose and implement an affordable solution that would prevent the discharge of untreated sewage into the local environment. The solution they came up with also enabled the reuse of the treated wastewater, which increased the reliable supply of irrigation, thereby improving agricultural productivity and increasing food security.

Background

Located on the outskirts of the capital Yerevan, Parakar has a population of around 10,000 inhabitants, who are mainly involved in agriculture, horticulture, gardening and animal husbandry. In the mid-1990s, the Soviet-era pumping infrastructure that transported wastewater to the centralized plant serving Yerevan ceased to function. This led to untreated wastewater being discharged into open channels in the village, which provided irrigation for the local agricultural lands.

The situation led to acute intestinal infectious diseases, with an increased risk of epidemic outbreaks through direct exposure to untreated wastewater, as well as contaminated groundwater and drinking water supplies. Large areas of previously cultivated land were abandoned due to the pollution and lack of clean water for irrigation. This is a water scarce region and the situation is expected to get worse due to more intense and frequent periods of drought as a consequence of climate change.

GWP contribution

From the outset it was acknowledged that community involvement was needed to come up with technical and financial plans deemed acceptable to the local population.

According to GWP's Theory of Change, special attention was given to awareness-raising and capacity building among the communities and local administration for the wastewater management system. This led to consultations with heads of department of agriculture and natural resources, who then planned and implemented the project in collaboration with GWP and its partners. Various stakeholder consultations were held, which included involving and empowering the community. The

[1] Permanent Residents in the Armavir Region, Republic of Armenia, Pg 2, accesed Aug 18 2015 - http://www.gwp.org/Global/Activities/Impact%20Stories/Supporting%20documents/population%20parakr%20pg%202.pdf

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consultations were important to build ownership of the project within the communities, thus enhancing sustainability.

Together with the local authorities, GWP prepared the technical aspects of the project, the tenders and implementation phases. Strong partnerships and adequate knowledge management were crucial factors in the successful implementation of the project. A video showcasing the different aspects of the project was also produced.

In order to integrate the project principles in policy and governance (GWP Theory of Change), GWP organized a workshop with partners and the government to identify the conditions for promoting alternative approaches for urban wastewater treatment in Armenia. This included the legislative, institutional and financial framework, and the aim was to create environment enabling implementation and spreading the approaches in Armenia.

The Parakar community and GWP Armenia initially obtained funding from the Global Environment Facility's (GEF) Small Grants Programme to design and construct a decentralized wastewater treatment plant. It consisted of biological treatment facilities with a capacity of 150m3 per day; the first of its kind in Armenia. The non-conventional technology selected had the advantage of being relatively cheap to build (in comparison to reconnecting the village sewer system with the Yerevan centralized wastewater infrastructure) and operate whilst ensuring that the wastewater was treated to the necessary standard to eliminate health risks for the local population, and enable safe agricultural reuse.

To pay for the continued operation and maintenance of the system, a scheme to collect wastewater treatment charges from householders and charge fees for using the treated wastewater for irrigation was established.

Results

The initial construction of the treatment facilities was carried out within the first stage of the project between 2010 and 2012. This was followed by a second stage, financed through a combination of local funds and funds allocated through the GWP Water, Climate and Development Programme in Central Asia and Caucasus, which added a naturally aerated biological treatment pond system, enabling secondary treatment through aquatic plants.

During the project implementation, special attention was paid to public awareness-raising. The aim was to gain public acceptance for the choice of wastewater treatment technology, as well as the reuse of treated wastewater for agricultural production. The community population was informed about the project goals and outcomes through leaflets and round tables. This made a solid base for community approach in complex water solutions.

The main principles of the pilot project are (a) Consideration of wastewater as a valuable water resource and treated wastewater reuse for other purposes; (b) Development and maintenance of a decentralized wastewater system, (c) Investment of a new, relatively cheap wastewater treatment technology (in terms of construction and operation).

The Parakar wastewater treatment can be operated and maintained by locally trained staff, and it utilizes the treated wastewater as a resource, thereby boosting agricultural productivity and strengthening local resilience to climate change.

The choice of technology is a good example of an integrated solution whereby heath, economic and environmental needs are simultaneously addressed. In the context of climate change, the reuse of wastewater ensures a reliable supply of irrigation water, less dependent on rainfall patterns, which makes it a low regret solution. In the context of the ongoing nationwide initiative to rehabilitate the

country's wastewater management, the Armenian government has shown considerable interest in promoting the upscaling of the demonstrated technology elsewhere in the country.

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