



# RECP Experiences



## RECP Experiences at National Cleaner production Center

The efficient and environmentally sound use of materials, energy and water - coupled with the minimization of waste and emissions - makes good business sense. Resource Efficient and Cleaner Production (RECP) is a way to achieve this in a holistic and systematic manner. RECP covers the application of preventive management strategies that increase the productive use of natural resources, minimize generation of waste and emissions, and foster safe and responsible production. Benefits are eminent in many enterprises, regardless of sector, location or size, as demonstrated by the experiences of National Cleaner Production Centre in Pakistan.

### Achievements at a Glance

NCPC is working on the principles of Cleaner Production; through continuous application of integrated, preventive and proactive strategies. Using its internal technical experts, NCPC implemented RECP approaches in recycling of kitchen wastewater as an alternate source to reduce the consumption of water.

This achievement is a reflection of activities in all of the expertise offered by NCPC all over the Pakistan. RECP implementation in recycling of kitchen wastewater led to water saving up to 2100 liters per day from total consumption of 4000 liters per day by investing US\$ 8,500 on civil structure and other accessories. NCPC has demonstrated that applying the cleaner production at source led to taking care of materials, energy, water and waste makes good business sense. RECP covers the application of preventive management strategies that increase the productive use of natural resources, minimize generation of waste and emissions.

### Overview

NCPC is working as a non-profit organization with the ultimate aim to improve the environmental conditions which in turn contributes to the welfare of community. NCPC is carrying out the broad categories of environmental services, energy conservation services, and analytical services to meet National Environmental Quality Standards (NEQS), waste management services to dispose off hazardous waste and multi discipline trainings to build organizational capacity.

### Benefits

The RECP programme mainly focused on the fact that the waste water from the kitchen was recycled for achieving progressive objectivity mainly targeting at conserving water by adhering to the Eco Recycle concept, i.e. making available the supply of water by reusing after treatment the kitchen waste water against the everyday increasing demands, and minimizing the release of oil contents thereby reducing the harms encountered to the bio-system. Its cost effectiveness is the highlighting feature with an effective technological combination towards reducing the demands on potable sources of freshwater. In most cases, the quality of the wastewater, as an irrigation water supply, is superior to that of well water. Lawn maintenance and golf course irrigation is facilitated in resort areas. By undergoing this programme NCPC was able to understand the specific requirements of material, fuel, water and other resources necessary for production.

## Kitchen Wastewater Recycling Plant:



Drip Irrigation is being used to supply recycled wastewater to agricultural fields.

| Absolute Indicator | Change (%) Year 1 | Relative Indicator     | Change (%) Year 1 |
|--------------------|-------------------|------------------------|-------------------|
| Resource Use       |                   | Resource Productivity  |                   |
| Energy Use         | -                 | Energy Productivity    | -                 |
| Materials Use      | -                 | Materials Productivity | -                 |
| Water Use          | -4000 l/d         | Water Productivity     | -2100 l/d         |

**Note:** The absolute indicators provide a measurement of how much resource use has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The relative indicators provide a measurement of changes in resource use in relation to a specific process.

### Resource Efficient and Cleaner Production (RECP)

**Resource Efficient and Cleaner Production (RECP)** entails the continuous application of preventive environmental strategies to processes, products and services to increase efficiency and reduce risks to humans and the environment.

RECP addresses three sustainability dimensions individually and synergistically:

*- Production efficiency*

> Through improved productive use of natural resources by enterprises

*- Environmental management*

> Through minimization of the impact on nature by enterprises

*Human development*

> Through reduction of risks to people and communities from enterprises and supporting their development



## Success Areas

This entire project was cost effective with capital costs ranging from low to medium. For most systems they are recoverable in a very short time only excluding systems designed for direct reuse of sewage water.

- Operational and maintenance are relatively simple and inexpensive except in direct reuse systems
- System is ideal for areas facing shortage of water. If this technology gets replicated in water scarce areas then the societal groups of that respective area can get indulged in fruits and vegetable production by utilizing the treated waste water. This will not only help them save an equivalent amount of fresh water but also will help in the production of fresh edible commodities. The fruits and vegetables produced in excess can also lead them towards subsistence agriculture i.e. selling the excess produce. The sold products will generate economic benefits thus enhancing the stability and well being of the community.
- In most cases, the quality of the wastewater, as an irrigation water supply, is superior to that of well water and the plantation being irrigated get's enriched in return. The enrichment level refers to the improvement of the nutritious content of edible commodities being irrigated thus, leading towards a healthy society.

| Principal Options Implemented      | Benefits         |                      |  |  |
|------------------------------------|------------------|----------------------|--|--|
|                                    | Economic         |                      | Resource Use   | Pollution generated  |
|                                    | Investment [USD] | Cost Saving [USD/yr] | Reductions in energy use, water use and/or materials use (per annum) | Reductions in waste water, air emissions and/or waste generation (per annum) |
| Kitchen Wastewater Treatment Plant | 5,000            | 1,825                | Water consumption decreased up to 50%                                | Waste Water generation decreased up to 50%                                   |
| Drip Irrigation System             | 3,500            | -                    | -  | -  |

## Approach taken

The project was designed to treat refinery canteen wastewater. The goal of which was to value the precious resource and reutilize the waste water for beneficial aspects such as gardening purpose. The average consumption of Refinery canteen water is 4,000 liter/day and the objective of the project was to bring out a maximum output which turned out to be approximately 2,100 liter per day. The main purpose of this project remains at affording immense guidelines and awareness opting this method of kitchen waste-water treatment in an environment friendly manner.

## Business case

Although the RECP programme was mainly focused on reduction of resource use, but also an alternate water use is provided for agricultural purposes which benefits the surrounding community and builds the credibility of the industry.

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# RECP Experiences



## English Abstract (where applicable)

Wastewater treatment has gained importance worldwide, but there is an immense need to develop a low cost treatment system for recycling wastewater which can be used in agriculture sector. Grey water is wastewater from urban areas including water from showers, washing activities and kitchens etc. it is recommended proper treatment of wastewater before using it for irrigation purposes. It can be concluded that the adapted system is applicable to a small-scale pilot project, primarily in areas where there is a shortage of water for supply purposes. However, this technology can be applied to larger-scale projects also. Large-scale wastewater reuse can only be contemplated in areas where there are reticulated sewerage and/or storm water systems. (Micro-scale wastewater reuse at the household or farmstead level is a traditional practice in many agricultural communities that use night soils and manures as fertilizers.) Urban areas generally have sewerage systems, and, while not all have storm water systems, those that do are ideal localities for wastewater reuse schemes. Wastewater for reuse must be adequately treated, biologically and chemically, to ensure the public health and environmental safety. The primary concerns associated with the use of sewage effluents in reuse schemes are the presence of pathogenic bacteria and viruses, parasite eggs, worms, and helminthes (all biological concerns) and of nitrates, phosphates, salts, and toxic chemicals, including heavy metals (all chemical concerns) in the water destined for reuse

## ABOUT RECP EXPERIENCES

Through the joint Resource Efficient and Cleaner Production (RECP) Programme, the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Programme (UNEP) cooperate to improve the resource productivity and environmental performance of businesses and other organizations in developing and transition countries. The Programme is implemented in partnership with the Global Network for Resource Efficient and Cleaner Production (RECPnet). This series of enterprise success stories documents the resource productivity, environmental and other benefits achieved by enterprises in developing and transition countries through the implementation of RECP methods and practices.

These successes were achieved with the assistance of the National Cleaner Production Centres, which are part of RECPnet established with support of the UNIDO and UNEP. The success stories employ the indicator set described in *Enterprise Level Indicators for Resource Productivity and Pollution Intensity*, UNIDO/UNEP, 2010. The primer with accompanying calculator tool and further case studies are available at [www.recenet.org](http://www.recenet.org), as well as on [www.unido.org/cp](http://www.unido.org/cp) and [www.unep.fr/scp/cp](http://www.unep.fr/scp/cp).