



SUSTAINABLE & ENVIRONMENT-FRIENDLY INDUSTRIAL PRODUCTION (SEIP) **Activities in Vapi, Gujarat: Monthly Progress Report – August, 2017**

“Sustainable and Environment-friendly Industrial Production – SEIP” is a joint project of the Ministry of Environment, Forest and Climate Change (MoEFCC) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH within the framework of Indo-German Technical Cooperation. The objective of the SEIP project is to enable Indian public and private stakeholders to jointly implement strategies for efficient, environment- friendly, and climate-friendly industrial development.

The project aims at mitigating environmental problems caused by industrial production focusing on industrial wastewater and solid waste management. During the project duration, technical solutions as well as business and management models to reduce acute environmental pollution and to improve resource efficiency in industrial production are piloted in five Indian industrial estates. Visible positive direct impacts of the solutions showcased are to improve conditions directly at the sites, and to unfold a strong signal effect leading to the replication and upscaling of solutions in industrial parks throughout India. Project activities focus on wastewater conveyance systems, the treatment, recycling and reuse of wastewater, waste management as well as the management and planning practices in the industrial areas. Solutions are piloted in 5 selected industrial areas located in the states of Delhi, Gujarat and Uttarakhand.

Further cross-cutting activities, such as the development of a market-driven training system for technicians and operators of effluent treatment plants, the development of industry-wide environmental standards, the work on a green rating system for industrial areas, and the setting up of a technology platform offering international exchange of best practice technologies target the improvement of enabling framework conditions for sustainable industrial production in India.

SEIP started in March 2015 and will run until February 2018 (with a likely extension of 12 months) and has a budget of EUR 6.5 million. A brief overview of the SEIP Project is given at Annexure 1.

Activities in Vapi

- 1) **ENVIRONMENTAL IMPROVEMENT** in 50 individual industries to reduce pollution and increase resource efficiency at company level
- 2) Demonstration of **IMPROVEMENT IN 10 ETPS** and replication
- 3) Improvement in **STORM WATER DRAINAGE SYSTEMS**
- 4) **MOISTURE REDUCTION IN CETP SLUDGE** and improved management
- 5) Improved **ENERGY EFFICIENCY AT CETP**
- 6) Improvements through **CROSS-LEARNING AND FACILITATION**
 - a. Environment Drives
 - b. Cleaner Production
 - c. Wastewater Management
- 7) **MISCELLANEOUS**

1. Environmental improvement in 50 individual industries to reduce pollution and increase resource efficiency at company level

About the activity:

GIDC in Vapi is the base of some severely polluting industries producing thousands of litres of wastewater per day. The reduction of water pollution and the improvement of the way industrial effluent is disposed is a great area of concern. Many companies operate inefficiently and hence bear a significant potential for environmental improvement.

This objective of this activity is to implement measures that will lead to either a reduction in pollution or an increase in resource efficiency thereby improving the environmental improvements of a company and demonstrating the effectiveness of the measure at hand.

50 companies at which technically sound and financially viable techniques and technologies are to be implemented, have been selected. The first step is the assessment for the scope of process optimisation and improvements in resource efficiency (materials, water, energy) before detailing and implementing the solutions suggested. Subsequently, the replication of successful solutions is to be enabled in other industries/industrial areas.

Summary of progress so far:

- Questionnaire developed together with representatives of industries, government body representatives (GIDC/GPCB) and members of industrial associations in order to inventory industries. The final questionnaire was circulated amongst industries.
- German consultancy (Adelphi-led consortium) had a pre-site visit during February 16-17, 2017 to collect basic data and meet with industries.
- Kick off meeting (22nd to 24th of February 2017) at Delhi office with GIZ and adelphi to plan project activities, approach and work processes.
- Information event (3rd to 4th of March 2017) with GPCB, GIDC and industries arranged by GIZ and addressed by Dr. Malini Subramaniam, TERI. Representatives of over 45 industries participated. Directly after the session, two industries submitted their interest in joining the activity via the application form.
- Stenum Asia/adelphi visited about 15 industries during March 24-31st, 2017. Rapid Assessment (RA) conducted with 5 industries. They approached 25 industries out of which 9 industries have submitted their preliminary assessment forms till end of April 2017
- GPCB officials also giving support to GIZ and Stenum Asia team in co-ordinating with industries.

- In total, 60 industries were approached till end of May 2017. Successful rapid assessment has been completed already in 25 industries.
- In total, 38 Industries had submitted their RA forms by the end of June 2017.
- RA reports, prepared by Stenum Asia, were sent to 16 industries by email.
- In total, 43 Industries had submitted their RA form by the end of July 2017

Progress for the current month:

- In total, 50 Industries had submitted their RA form by the end of August 2017. RA reports have been completed for 45 industries.
- A workshop with industries that are selected for RA and DA (Detailed Assessment) is scheduled on September 8th 2017 at VIA.
- 4 DAs are to be conducted during 6th to 9th September 2017.

2. Demonstration of improvement in 10 ETPs and replication

About the activity:

There are more than 1500 industries from various sectors, such as chemical, paper, dye, drug and pharmaceutical, pesticide, fertilizer, electroplating, etc., located at GIDC. Most of these companies are members of the CETP of Vapi which has a capacity of 55 MLD. Due to the large volume and diversity of wastewater, the treatment of the effluent at the CETP, however, is an expensive and non-viable solution. Hence, effluent parameters should be reduced at their source, i.e. at the company itself, in order to reduce CETP inlet parameters and pollution load at the inlet of the CETP.

The CETP is experiencing difficulties in treating effluent parameters such as Colour, COD, BOD, TDS, TSS, Ammonical Nitrogen, Phenol, etc. and is at the borderline of meeting the pollution board compliance. The CETP treated effluent is directly discharged to the Daman Ganga River.

This activity aims at improving the performance of 10 ETPs. Successfully implemented measures are subsequently to be upscaled to 30 ETPs.

Summary of progress so far:

- VIA has finalized a questionnaire to be distributed amongst 30 selected industries in order to gather data on parameters such as colour, COD, BOD, TDS & TSS. Each industry was approached individually by GIZ to support them in completing the questionnaire.
- VIA formed a committee for “Wastewater Pollution Reduction”.
- VIA has denied to support GIZ and proposed to continue cooperation with VGEL, GPCB and GIDC, Vapi.
- Several industries did not cooperate with GIZ in filling up the questionnaires. GIZ approached RO, GPCB, Vapi to provide a list of industries not meeting pollution parameters. Industries are now being approached through GPCB.
- A German expert (Gopa Infra) visited Vapi from 6th-10th February 2017. A new version of the questionnaire developed by the consultant was circulated to the industries on the list.
- GIZ collected onsite samples from the industries. Gopa infra had submitted the draft report with generalized solutions.
- Next visit to Vapi by Gopa Infra planned to take place from 1st-10th May 2017 for a detailed study of selected industries.
- Dr. Ulrich Schmitz from Gopa Infra visited again during 2nd to 11th May 2017. He visited industries individually as per the availability of the technical persons of the industry and provided some instant

on-site solutions to the industries for wastewater treatment. These solutions will also be part of the report.

- On 11th May 2017, a workshop with industries was arranged. Basic understanding about wastewater treatment observations witnessed during his visit were presented by Dr. Schmitz.
- Draft feasibility report from Dr. Ulrich was submitted and has been reviewed. Comments were communicated to Dr. Ulrich.
- Dr. Ulrich will offer his support during the implementation of the improvement measures suggested to the industries.

Progress for the current month:

- The final draft report is currently being reviewed by industries.
- Action plan for implementation of solutions is in preparation in coordination with industries.

3. Improvement in storm water drainage systems

About the activity:

The storm water drainage network at GIDC Vapi is nearly 25 years old and has been undergoing several modifications since coming into existence. It has, however, not been especially designed to cater to the needs of an industrial area. In some areas the network consists of pipes, whereas open drains are used in others. The inadequateness and bad state of the system as well as waste dumps choking the system lead to overflow and clogging. The storm water lines are not well maintained and many lids at junction points are broken. During monsoon season the situation is aggravated since some areas are frequently flooded due to the lack of a proper drainage system. For SEIP the network is of utmost importance, since it discharges into the River Damanganga and several industries discharge their wastewater into the storm water drains.

Under this activity, the storm water drainage systems is mapped in order to identify the stretches and locations which are in need of maintenance or retrofitting. The aim of this activity is to provide suggestions and concepts for improving the entire storm water drainage system.

Summary of progress so far:

- available data was gathered and a GIS map of all the phases, roads, storm water, drainage and effluent networks was prepared. Together with VIA, it was decided to improve the storm water drainage system of Phase IV area.
- GIZ performed a preliminary survey based on the GIS mapping of the storm water network and road identifying problems related to clogging, spillages, contamination etc.
- German consultancy (Vössing GmbH) collected data with the support of GIZ and GIDC officials.
- GIZ discovered some effluent penetration in the Bill Khadi (Receiving River) from the storm water lines near Phase 3-4 as well as new waste dumps during field visits.
- Vössing GmbH has submitted the pre-visit report.
- Experts from Vössing GmbH visited Vapi from 24th-28th of March 2017 to discuss current problems and to share proposed concepts
- Experts visited Bill Khadi in Phase IV as well as other phases of GIDC to explore problems related to storm water drainage along with GIZ and local GIDC officials.
- Proposed concepts and solutions for identified issues were presented to Mr. Jayesh Patel, Executive Engineer, Notified Area Authority, Vapi (other officials were not available).
- Vössing GmbH has submitted the report on storm water drainage system presenting 2 alternatives for the improvement including estimations of both alternatives.
- Jointly with VCMD and GIDC, the decision was taken to consider the “storm water improvement” activity independently from the activity on retrofitting the master plan which is running in parallel.

- VCMD and GIDC will dedicate an officer for the storm water improvement activity.
- The final report on the storm water drainage system was submitted to local officials of GIDC/NAA. Further, a presentation was shown to Mr. Jayesh Patel, Exe. Engineer of Notified Area Authority on July 21st 2017.
- After viewing the improvement measures, Mr. Jayesh Patel suggested to discuss the report with Mr. Warli, I/C Chief Engineer, GIDC, Gandhinagar.

Progress for the current month:

- The implementation plan for storm water management including all necessary documents for GIDC has been prepared. After having been reviewed by head office, all documents will be formally submitted to GIDC by the end of next month.

4. Moisture reduction in CETP sludge and improved management

About the activity:

The CETP in Vapi produces around 70'000 [t/year] of sludge. Currently, the sludge is disposed on a landfill in Vapi. The disposal of the sewage sludge causes problems due to its high moisture content. Site visits have found that the sludge is being de-watered mechanically. This partially dried sludge is then packed in a bag and pet dried in sludge drying beds. However, this procedure is not sufficient to dry the large quantity of sludge and is further a very time consuming activity.

This activity aims at finding a sustainable solution for the sewage sludge disposal.

Summary of progress so far:

- GIZ visited VGEL to discuss the problem of sludge moisture. VGEL agreed to give their support for this activity.
- GIZ visited the site and collected data, such as quantity, characteristics after different stages of treatment, chemical dosing patterns etc.
- A German consultancy (Aqua Consult) visited the site during 6-10th March 2017 and met with the CEO, VGEL and other employees at the CETP to explore the sludge generation and drying mechanism of the CETP as well as its disposal process.
- Aqua Consult submitted a report proposing various technologies that can be used for sludge dewatering. The report was shared with VGEL.
- VGEL raised further questions regarding standard procedures (SOP) for setting up of a pilot plant which were forwarded to Aqua Consult.
- Aqua Counsult has submitted the final report with SOP for pilot plant.
- GIZ SEIP team prepared a cost comparison for the report submitted by Aqua Consult and asked VGEL for an action plan to implement the solution.
- VGEL has not yet responded to the pilot-scale study.
- GIZ approached GIDC for the implementation action plan.
- A meeting was held at GIDC, HO with Mr. Warli on 21st July 2017 at GIDC Vapi.
- A meeting was arranged at COE, Vapi on July 21st, 2017 to discuss the report on CETP sludge moisture reduction along with other points of SEIP project activities; however, due to time restriction, the issue could not be discussed with Mr. Warli.
- Eventually, the presentation was shown to Mr. Chetal Patel, Director and CEO, VGEL with all the options incorporated by the expert.
- VGEL agreed to the options of Solar Drying and Sun Drying. The Director of VGEL further asked to have a closer look at the technologies in detail as VGEL has already finalized a local consultant to prepare a detailed report for sludge moisture reduction.

Progress for the current month:

- The draft implementation plan has been prepared and finds itself currently under review by VGEL.
- The finalized implementation plan will be officially submitted to VGEL for approval by their board.

5. Improved energy efficiency at CETP

About the activity:

The CETP at Vapi is one of the biggest in Gujarat with 55 MLD capacity running on a conventional treatment process. However, the CETP faces issues due to high energy consumption.

The aim of this activity is to identify energy conservation measures for the CETP and its pumping stations through an EESCO.

Summary of progress so far:

- GIZ has collected data for energy consumption from VGEL and GIDC for CETP and respective pumping stations
- Equipment/machinery displaying a high level of energy consumption and measures for increased energy efficiency available in the market are to be identified
- GIZ has prepared TORs for the experts. Interaction with EESCO companies is established. Proposal for conducting study will be taken accordingly.
- References of ESCO companies have been gathered from the local experts of the field.

Progress for the current month:

- This activity is currently on hold.

6. Improvements through cross-learning and facilitation

Under SEIP, facilitation teams on the topics of 1) Environmental Drives, 2) Cleaner Production and 3) Wastewater have been established at the industrial areas. Facilitation teams are supposed to provide a platform for discussion amongst entrepreneurs and other stakeholders of the park covering various topics and including the demonstration and sharing of best practices from industries. GIZ team will provide external field experts (both within and outside GIZ), organisations like DSIIDC, DPCC to educate the industrialists about available best practices in the field. Through these meetings the industrialists themselves educate/guide each other about available best practices.

a. Environment Drives

About the activity:

This activity will focus on developing and implementing retrofit concepts for systematically transforming the industrial estate to a Green Industrial Estate. The pollution of the GIDC has affected the trees and other ecosystems in proximity of the industrial estate. The number of the trees has been decreasing at an exponential level which might be linked to increased pollution from the industries of the estate.

Summary of progress so far:

- A GIS map of the industrial estate was used to identify problem areas. The database for plots and respective industries shall be incorporated into the future retrofitting job.
- Industries of Phase III decided to invest in the upgradation of their area using CSR. GIZ was approached to assist with technical inputs to develop a master plan.
- Introductory meeting (23rd November 2016): decision taken that GIZ will engage an international expert to support in the preparation of a master plan for the upgradation of Phase III.
- 2nd meeting (14th December 2016): decision to form a not-for-profit company especially for the purpose of upgrading Phase III. GIZ will coordinate and support the development of the master plan and its implementation which will be funded through CSR of industries located in that area.
- GIZ was informed that the activity of retrofitting has been put on hold.
- Cleanliness drive was initiated from 23rd of March 2017 in coordination with GIDC and the Notified Area Authority. The activity was performed with 2 NAA officials, 12 labourers, 1 loader and 2 tractors. The storm water chamber near NSIC hospital, which was filled with waste dumps creating a choking problem in the rainy season, and consequently lead to flooding, was cleaned. In total, about 30 tonnes of waste has been removed from the area to prevent the drains from choking during the monsoon.
- A Cleanliness Drive which had been initiated on 23rd of March 2017 in coordination with GIDC and the Notified Area Authority (NAA), was continued throughout April 2017. As a result, the surrounding area of GPCB office has been cleared of all dumped waste. In total, about 45 tonnes of waste has been removed from the area near GPCB office
- Also, in the areas near COE, Vapi, the storm water drain near Anupam Colour in Phase IV and near Hath Chemical in 100 shed areas were cleaned.
- In total, about 350 tonnes of waste were removed till the end of April 2017 through the initiated cleaning activities.
- A joint meeting with GIZ, VIA and GPCB was held to discuss the theme and plan for the World Environment Day (WED) 2017 at VIA office.
- It was decided to initiate a month-long drive to create environmental awareness and to start the WED 2017 on 3rd June 2017 with a blood donation camp. The camp was held at Aarti Industries Unit -1 in Phase 3. 306 units of blood were collected that day.
- A meeting was held on 9th June 2017 at VIA conference room to discuss the detailed action plan for month long WED 2017.

PLANTATION DRIVES

- The plantation of trees was started on 3rd June 2017: A free plantation sapling distribution point was allotted near Ramleela Maidan, Gunjan where a Municipal School boundary wall was painted with different themes of WED by a School from Valsad district.
- On 5th June 2017, each industry started the plantation activity depending on the space available in their premises.
- On 5th June 2017 a Plantation Drive was started near UPL, Phase 1, CETP, COE etc. in which VIA, GPCB, GIZ office bearers participated.
- Nearly 50,000 trees were planted during WED 2017.

CLEANLINESS DRIVES

- GIZ identified waste dumps in all 4 phases of GIDC Vapi. President, VIA took a note for the waste dumps and asked industries, GIDC, GPCB and GIZ for the co-operation in the success of WED 2017.
- A meeting was held on 12th June 2017 at VIA between GIZ, VIA and GPCB to finalize the action plan for Cleanliness Drive 2017. VGEL agreed to provide loaders and dumpers to remove and transport the waste. It was decided to bring the debris from GIDC estate to the CETP. It was further decided to perform a Cleanliness Drive in all four phases of GIDC Vapi including housing areas. The Cleanliness Drive 2017 was initiated on 14th June 2017 from Phase 1 with 1 loader and 1 dumper.
- During June 2017, about 1,000 tons of waste were removed from Phase 1 & 2 of GIDC, Vapi area.

OTHER ACTIVITIES

- A Seminar on Resource Efficiency and Cleaner Production was held by GIZ at the VIA Conference Hall on 16th June 2017 to increase the awareness of pollution reduction in the industry. *Attendance sheet enclosed as Annexure 2.*
- A seminar on *Battery Rules* was held by GPCB at VIA Conference Hall on 23rd June 2017 to increase the awareness of battery pollution and its reduction measures.
- A seminar on *Air Pollution Control and Effective Landscaping* was held at VIA on 30th June 2017 to acknowledge the air pollution exerted from the boiler and reduction of pollution through advance techniques.
- The duration of the Cleanliness Drive was extended due to heavy rainfall in Vapi .
- Phase 3 and Phase 4 were covered during July 2017
- In total, 2,700 tons of solid waste were removed from Vapi IA till the end of July 2017.
- A “Samixa Samaroh” is to be held on 28th July 2017 to validate the Environment Drive in presence of Dist. Collector, Valsad and Mr. Kanubhai Desai, MLA, Pardi.

Progress for the current month:

- The documentation of success story is under progress.

b. Cleaner Production

About the activity:

The facilitation team on cleaner production is to meet on a regular basis to discuss solutions and best practices promoting cleaner production (e.g. best available techniques). The facilitation team is supposed to become a self-organised platform for industries fostering knowledge exchange and promote the idea of financially attractive solutions leading to decreased pollution and increased resource efficiency.

Summary of progress so far: the activity has not yet started

Progress for the current month: the activity has not yet started

c. Wastewater Management

About the activity:

Summary of progress so far: the activity has not yet started

Progress for the current month: the activity has not yet started

7. Miscellaneous

a. Establishing a baseline – site visit to Vapi

About the activity:

In order to measure the achievement of the activities implemented in the course of the project and their actual effect on pollution reduction, a baseline study of the current situation is being undertaken.

Summary of progress so far:

- Ms. Sonal Jain, Environment Expert hired to assess the baseline situation at Vapi. All relevant information and data were submitted to Ms. Sonal and she visited Vapi from 6th to 9th March 2017.

- During the site visit, meetings with CEO, VGEL and office barriers of the CETP and the TSDF site took place. She documented the CETP, TSDF regarding the energy consumption, process, sludge dewatering and disposal process of the CETP.
- Locations of waste dumps in the industrial area including dumps inside storm water drains as well as the municipal solid waste disposal site were documented.
- Final presentation of the baseline situation at Vapi presented at GIZ head office.
- Follow-on contract to further monitor and measure progress with regards to pollution reduction and resource efficiency has been initiated
- The report on environmental impacts was been submitted to GPCB by Delhi Office.
- GIZ communicated with RO of GPCB who was waiting for the order from HO of GPCB
- GIZ informed Mrs. Dipti Shah, Unit Head, Vapi, GPCB at Gandhinagar on 28th June 2017 and she confirmed to issue a letter to RO, GPCB about the action plan and baseline. The letter was issued on 20th July 2017.

Progress for the current month:

- The letter was received by RO, GPCB from head office. The site team is co-ordinating with RO, GPCB for conducting the baseline.

Annexures

Annexure 1: SEIP Project Overview

Annexure 1: SEIP Project Overview

Objective: The SEIP project has focus on efficient, and environment and climate-friendly industrial development. The objective of the project is: “Private and public stakeholders jointly implement strategies for efficient, and environmental and climate-friendly industrial development.”

Duration: The project has a duration of 3 years from March 2015 to February 2018. The project is likely to be extended by about 8 to 10 months.

Budget: The total budget available for the duration of the project is 5 million EUR. An additional budget of 1.5 million EUR has been committed by the German for augmenting the activities for controlling industrial pollution to River Ganga.

Project Sites: The project has its focus in selected sites at the Gujarat Industrial Development Corporation’s (GIDC) Industrial Estate at Vapi (Gujarat), Delhi Industrial Infrastructure Development Corporation’s (DSIIDC) industrial areas at Patparganj and Lawrence Road (Delhi), and the Integrated Industrial Estate State Industrial Infrastructure Development Corporation of Uttarakhand Ltd. (SIIDCUL) in Haridwar (Uttarakhand).

Partners: The Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India and GIZ are the main project partners. An Implementation Agreement has been signed between MoEF&CC and GIZ on 16th June 2016. The Central Pollution Control Board, as a technical arm of MoEF&CC, plays an important role. The key stakeholders for the project site in GIDC, Vapi, Gujarat) are:

- (Name of industrial development corporation)
- (Name of pollution control board/committee)
- (Name of CETP¹ company/ society)
- (Name of industries associations)
- (others)

Approach

The SEIP project works on selected environmental problems of national importance, with the main thematic focus on industrial wastewater and solid waste management. The project aims to showcase solutions on how acute environmental pollution can be reduced and how resource efficiency in industrial production can be improved. Project outputs are grouped into 3 areas:

- Output A: Environment-oriented modernization of three industrial areas (showcasing solutions),
- Output B: Establishing appropriate framework conditions at the national and state levels, and
- Output C: Knowledge management and dissemination.

To accomplish these outputs, various activities are being taken up at the national level as well project site level. The project activities are focused on wastewater conveyance, treatment, recycle/reuse, waste management, monitoring, process modification in individual industries etc. These will be complemented by training and skills development, and setting up of a technology platform. At the national and state level, the project supports the creation of an enabling framework by suggesting measures for new policies, plans and support programmes to prevent and reduce pollution and improve resource efficiency in industrial zones. Further, the project will create practical examples of management and planning for sustainable industrial zones supporting women. The project will include private stakeholders such as industry associations, operators of industrial sites and companies, and relevant entities in the states and the centre. The public and private sectors will be effectively engaged at various stages of the project.

¹ Common effluent treatment plant

Expected Results of SEIP Project

The SEIP project will demonstrate solutions resulting in positive impacts and improved environmental conditions at the selected sites. The successful cases will serve as models that can subsequently be taken up on much larger scales. The key indicators for measuring the results are:

- Decrease in pollution by an average of 20 percent in the surroundings of three industrial sites.
- Launch of development programmes and promotional guidelines that aim at increasing resource efficiency and reducing pollution in selected states.
- Launch of two additional compulsory central government policies, plans and/or programmes, and measures to prevent and reduce pollution as well as improve resource efficiency in industrial zones.
- Adoption of best practices through technology and management methods for an efficient, environment- and climate-friendly industrial development in 10 industrial zones.
- Provision of two additional practical examples regarding management and planning methods of sustainable industrial zones that support women.