



प्रशासनिक सुधार और लोक शिकायत विभाग  
DEPARTMENT OF  
**ADMINISTRATIVE REFORMS &  
PUBLIC GRIEVANCES**

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## **NATIONAL GOOD GOVERNANCE WEBINAR SERIES 2022-23**

**"PM's Award Winning Initiatives under the  
theme Environment"**

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---AUGUST 26th 2022---

**"REVIVAL OF SASUR KHADERI-2"**

Government of Uttar Pradesh

**"CANAL TOP SOLAR POWER PROJECT"**

Government of Gujarat

---ORGANIZED BY---

National Centre for Good Governance (NCGG)  
Department of Administrative Reforms & Public Grievances  
Ministry of Personnel, Public Grievances & Pensions  
Government of India

**“In the Amrit Period of Independence, we are marching ahead rapidly to create a transparent system, efficient process and smooth governance to make development all-round and all-inclusive. The Government is committed to strengthening good governance, that is pro-people, and proactive governance. Guided by the ‘citizen-first’ approach, we remain untiring in our efforts to further deepen the outreach of our service delivery mechanisms and make them more effective.”**

**– Prime Minister Narendra Modi<sup>1</sup>**

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<sup>1</sup> Message of Hon’ble Prime Minister Narendra Modi Ji at the Sushasan Saptah dated December 20, 2021

## BACKGROUND

To realize the vision of the **Hon’ble Prime Minister of India Shri Narendra Modi** of a self-reliant India, the NCGG under the aegis of the Department of Administrative Reforms and Public Grievances, Government of India is organizing the National Good Governance webinar series for the year 2022-2023. These webinars covering Award Winning Initiatives which will help different stakeholders to broaden their skills, as well as to attain new knowledge that can supplement or complement their work areas.

The thirteen webinars would be on different themes and sectors under the good governance initiative that have been felicitated with the Prime Minister’s Award for Excellence in Public Administration. Award winning nominations under the PM Awards since the inception of the scheme which have proved replicable and sustainable will present their experiences.

The purpose of conducting the webinars is to highlight the best practices and award-winning achievements to create a precedence for other states to follow. Doing so would also infuse a new spirit and enthusiasm among administrators and other stakeholders involved in the implementation of different government governance schemes.

As a part of the National Good Governance Webinar Series (NGGWS), NCGG has convened the 05<sup>th</sup> Webinar on “PM's Award Winning Initiatives under the theme Environment" on August 26<sup>th</sup> 2022.

**THEME – “ENVIRONMENT”**

“Environment and Sustainable Development” aims to protect and sustain the nature along with empowerment of the citizens by ensuring that not to harm nature and optimal utilization of natural resources, which is largely beneficial to the citizens. It has been the objective of the Government of India to bring to citizens, a multi-regional development by sustaining and rejuvenating energy sources for future demands and needs at the local level in this context administrative system must use natural resources efficient manner possible using local indigenous resources so that the citizens can access clean and green environment and optimal supply natural goods and services, and energy, conveniently at their doorstep by affordable cost. An effective, efficient and prompt service delivery system through the concern of nature and the environment will derive only when the optimal level of utilization and development of natural resources for future needs.

**INITIATIVE – “SASUR KHADERI-2 RIVER & THITHORA LAKE”  
REVIVAL PROJECT IN DISTRICT FATEHPUR (U.P.)**

“Sasur Khaderi-2 River & Thithora Lake” Revival Project is the program Launched at In District Fatehpur (U.P.) Like many rivers and lakes in our country Sasur Khaderi-2 Rivulet and its origin Thithora Lake got shrunk and dried- up long back due to reasons like: 1. drought conditions for long.2. encroachment and reduction of catchment area. 3. no feeding from groundwater due to its overuse. 4. flattening of slope and aggradations of river bed due to siltation. The district administration came to know about these dried-up water bodies through a local saint ‘Swami Vigyananand’ and some other residents who have been trying for their revival for a decade, but in vain. In this backdrop, it was decided to rejuvenate both the water bodies by the state administration in the summer of 2013-14 under MNREGA. This initiative was for their revival.

The objectives of the mission were, Thirty-eight km stretch of 46 km. Long River

Sasur Khaderi–2 and its origin Thithora Lake in district Fatehpur (U.P.) were dry for years. The initiative sought to tackle the acute water crisis in the dry season and the problem of water logging during rains by way of revival, restoration and rejuvenation of the rivulet and the lake. There was a need to recreate water storage capacity in the lake area of 7.537 hectares and also improve groundwater recharge together with flood mitigation during rains. At the same time, there was a need of preventing the soil from turning sodic and infertile.

### **INITIATIVE – “WORLD’S FIRST 1 MW CANAL TOP SOLAR PV PROJECT” - GUJARAT STATE ELECTRICITY CORPORATION LTD**

**“WORLD’S FIRST 1 MW CANAL-TOP SOLAR PV PROJECT”** India's first 1MW canal-top solar power plant at Chandrasan village near Mehsana, 45 kms from Ahmedabad. The solar power plant will generate 1.6 million units of electricity per year. The project has been developed by the Gujarat State Electricity Corporation Limited (GSECL) on Narmada branch canal network, to the national grid at Chandrasan in Mehsana district.

The objective of **“WORLD’S FIRST 1 MW CANAL TOP SOLAR PV PROJECT”** is an innovative merger of "jal and urja shakti" for a greener tomorrow, which virtually eliminates the need to acquire huge tracts of land, as is typically needed in setting up such plants across India.

**“WORLD’S FIRST 1 MW CANAL TOP SOLAR PV PROJECT”** The project covers 750 metres of Sardar Sarovar Narmada Nigam Limited (SSNL) branch canal passing through remote village of Chandrasan, with a network of solar panels, developed by the Gujarat State Electricity Corporation (GSECL). The plant was set up at the cost of around Rs 17.50 crore by the US-based Sun Edison and is projected to generate 1.6 million units annually and simultaneously prevent evaporation of 9 million liters of water.

**PROCEEDINGS – WEBINAR ON “ENVIRONMENT”**

WELCOME AND INAUGURAL ADDRESS BY **SHRI N.B.S. RAJPUT (IAS)**  
JOINT SECRETARY, DEPARTMENT OF ADMINISTRATIVE REFORMS &  
PUBLIC GRIEVANCES, GOVERNMENT OF INDIA

**Shri N.B.S. Rajput (IAS)** Joint Secretary, Department of Administrative Reforms & Public Grievances, Government of India commenced the inaugural session by extending his warm and hearty welcome to the distinguished lead speakers, Directors of State ATIs, State AR Secretaries, State IT Secretaries, District Collectors, IAS Probationers from LBSNAA, Officer Trainees from State ATIs etc.

He mentioned that the Hon’ble Prime Minister of India Shri Narendra Modi on the auspicious occasion of Civil Services Day held on April 21<sup>st</sup> 2022 mandated DARPG to conduct virtual conferences with State Governments and District Collectors over the next twelve months, to disseminate award-winning initiatives which have been conferred the Prime Minister’s Award for Excellence in Public Administration in the past years since its inception in 2006. Hence The Central Government through DARPG we are making lot of efforts and comprehensively revamping the whole system of public grievance disposal. Various states also taking various initiatives and some of the states have done outstanding job in this regard. Now today we have to outstanding Civil servants who had done excellent work in their own districts and this gives an opportunity for us to listen to them how they went about, what are the challenges they faced and what are the issues which other districts can basically tackle. Through this platform They can get in touch with officers directly also and they can devise how experience from these two districts and from these two officers can be replicated in other states and districts.



## “INITIATIVE – “SASUR KHADERI-2 RIVER & THITHORA LAKE” REVIVAL PROJECT IN DISTRICT FATEHPUR (U.P.)

LEAD SPEAKER - **SMT. KANCHAN VERMA (IAS)** INSPECTOR GENERAL, STAMP & REGISTRATION, GOVERNMENT OF UTTAR PRADESH

The speaker started by briefing about how the project was started and what are the factors forced it. “Sasur Khaderi-2 River & Thithora Lake in District Fatehpur” **These initiatives aimed to:** Carve out the trajectory of 46 km long river and Re-create and Restore its 38 km silted and encroached reach and De-siltation of 7.537 ha area of the lake. **(Thithora Jheel-5.4 ha, Thithoratalab-1.137 ha and Rawatpur Jheel- 1 ha)** To resolve this issue, it was decided to rejuvenate both water bodies by the State administration under MNREGS (Mahatma Gandhi National Rural Employment Scheme) in the summer of 2013. And Devise a mechanism to feed the river from the lake in lean season along with connecting the two adjoining canal tails to feed the lake with their residual and surplus water make Clear the drains which open into the river in its course by Constructing a few well-designed check dams in the river channel to retain water at different reaches for various uses and Carry out plantation on Lake Periphery and river banks along with Developing lake site as a local picnic spot.

Project was launched on a mission mode Meetings at all forty-two villages falling in the project area were held with gram pradhans and community members to solicit their support. Social groups, media, college principals, local industrialists etc. were also involved to support the mission.

To combat this problem, we decided to start the work in the month of march and made a working plan as follows:

1. The river was divided into 46 stretches of 1 kilometer each for easier management.

2. Villagers from all the villages worked on the patch which passed through their village. This meant that villagers had to travel less for their work-site.

3. All villages were responsible for excavation of soil and reviving the 1 kilometer allotted to them.

4. We held meetings with all the stakeholders in all the 42 villages. These meetings led to a sense of ownership.

Demarcation of land was done as per revenue records and the excavation plan was revised and Qunet model adopted to reduce the quantity of earthwork to 1/4th in river section and thereby reducing cost and time of the project to 1/3rd. Training was given to supervisory staff for effective deployment of labour so as to ensure proper slope (20 cm to 1 km) and trajectory of the channel. The river channel being dug. Utmost care of the labour was taken to ensure their wellbeing in the extremely hot weather. Arrangements for the drinking water, shed, stay, food and emergency medicines like ORS and making on-site payments to the laborers were made at work-site. Vacant school buildings during May-June were utilized to provide shelter to the labours from far-off villages. Starting from a modest 100, the number of work-force swelled to 4000 to 5000 every day as the project became the favorite of the people. MNREGA guidelines were followed throughout the implementation of the project. No complaint or criticism was made against the project team. A coordination meeting of all departments and agencies involved was held every evening to review the progress and problems and do the planning for the following day.

### **Citizen Movement-For Sustainable Environment**

The project was possible only because of the support of residents of the district and villagers from all the 42 villages and 50 other villages who had worked on the lake made the project achievable and we propagated the sense of loss of a river which was a life line to the socio-agro-economic status of so many villagers and local old generation people had a deeper connect river and they remembered the river with



the sense of a cultural loss through which we successfully gathered around 5000 - 7000 people from all over the district motivated to work on this project and at the lake site, we had villagers from far off places coming especially to contribute and we also involved students from all colleges of the district who participated in the project. And each one kilometre of stretch was marked out for shramdan or voluntary labour work and students used to come to this stretch and we also given a space for various types of volunteers and people from all walks of life like traders, journalists, politicians, lawyers, doctors, teachers cooperated in project implementation and we conducted regularly localized meetings along the villages, including police stations and schools.

### **Completion of the project**

The project began in April 1st week and was completed on 12th of June and apart from this We also did the seeding/plantation work along the river and lake so as to hold the excavated soil from flowing back into the rivulet during the rains we also built a gated barrier to regulate water-flow from the lake to the river.

### **Outcomes of the Initiative**

Drainage of the catchment area improved considerably and No flooding and water logging even in the heavy monsoon rains last season. On July 16,2013 the discharge measured at chainage 44.00 (2 km downstream from Thithora Lake) was 689.95 cusecs which was a good sign of rejuvenation for an almost dead river in this locality the Availability of water for irrigation increased for all villages along the river and The water stored in the lake was measured as 96000 cum on the same date. And there is No marooning of villages even during heavy and incessant rains of 2013, thus requiring no relief measures, which otherwise was a common feature in the earlier years in such situation

## **Environmental impact**

The soil would have been rendered ‘sodic & infertile’ if timely action was not taken. The freed land from encroachments on the river banks and lake site is providing a huge scope for plantation of trees. 35,000 saplings have been planted on the perimeter of lake/along the river in monsoon season. Dense seed sowing of desi babool, jangle jalebi, shisham and khair have been done in three rows on each bank in 17 km stretch of the river. More plantation is being done which is bound to give an impetus to the environmental quality of the region in near future. After 2013, the district has received very poor rains, the district was declared drought affected. However, Thithora lake and river had sufficient water to meet the needs of the 52 villages. The project has led to a rise in water tables and many hand pumps and wells which had no water were also revived. The villagers were satisfied as they saw it as an immediate benefit. Two major canals which fed the lake were also cleaned and in 2014-2015 so that the lake has water at all times.

## **Socio Economic Benefits**

Mass Participation of people for a cause of water and soil conservation. No marooning of villages even during heavy and incessant rains this year, thus requiring no relief measures, which otherwise was a common thing in the past in such situation. Generation of rural employment to the tune of 2,00,000 man-days in just 45 days. The district people have realized the importance of water management programs and every year new canals and lakes are being revived.

### **Other success stories – Inspiration**

similar river projects have been taken up in the districts of Mahoba, Jhansi, Kanpur, Shravasti, Amroha and Auraiya. We planned and executed a stretch of river Sot, in Amroha and executed the same in 2015 when posted there for 4 months. Recently in last 3 years many districts of Uttar Pradesh like Ayodhya, Mirzapur have done

similar projects. Last month work on Sasur Khaderi 2 was started by the District administration.

### **Way forward**

Storm water management is as crucial and important as Wastewater management. We lose huge financial resources every year due to bad drainage either in built-up areas or in open fields. As a policy, ground water use should be discouraged and surface water should be conserved and used to meet all our needs. Check dams should be designed in the gated fashion to facilitate flushing of the silt and avoid aggradation. All drains to be desilted regularly to allow for rivers and lakes to receive water during rains.

### **Administrative lessons**

Projects that are community driven have a much greater sense of ownership and success AND Inter departmental coordination, in the team we had Irrigation, Block, Revenue departments taking the lead and facilitating each other’s work. THIS Short term mission mode projects get more work done when all sections of society are involved HERE We are only in custody of the planet for a short time through this initiative Our future generations deserve to have their planet given to them in good shape.

### **Sustainability Takeaways:**

The initiative involved the local community and leadership which has ensured the ownership and commitment of the local citizen and political representatives. this strengthened the sustainability requirement. Since the funds were drawn from MNREGA and the deputy commissioner NREGA was/is actively involved. the maintenance of the infrastructure created is continuing. this again has provided the impetus for its sustainability. Thirdly, the cause itself addresses the local community without any bias and created common property/assets for common use. Its acceptance and ownership was at a high level.

## “WORLD’S FIRST 1 MW CANAL TOP SOLAR PV PROJECT” - GUJARAT STATE ELECTRICITY CORPORATION LTD

LEAD SPEAKER - **SHRI M. PRASANNA KUMAR**, MANAGING DIRECTOR OF GUJARAT STATE ELECTRICITY CORPORATION LIMITED (GSECL)

The speaker started by briefing about the India’s Solar Resource and he was given Some broad view on the potentialities of renewable energy resources from across the country Among that, solar energy potential is the highest in the country and India blessed with huge solar potential for which The states that have the maximum insolation are GUJARAT and RAJASTHAN in addition, the states of Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Maharashtra and Chhattisgarh also enjoy good insolation levels.

The main vision of the Canal Top Solar Project is that make A new direction to green and clean energy by a unique nexus of energy, Land, and Water and solar system (**SAUR URJA SHAKTI, JAL SHAKTI**) The state of Gujarat has made great strides in harnessing the tremendous potential of solar energy through the path breaking concept of installing solar photovoltaic panels on canal top to generate environment-friendly power

To address the issues of environment Canal Top Solar PV Plant in Gujarat A Unique Nexus of Energy, Land, and Water The state of Gujarat has made great strides in harnessing the tremendous potential of solar energy through the path breaking concept of installing solar photovoltaic panels on canal top to generate environment-friendly power. Canal Top Solar PV Plant in Gujarat protection and rehabilitation due to renewable energy installations

It is for this reason that renewable energy utilization, particularly solar energy, is being enthusiastically enforced in India. Hence this innovative project came up with the following greater advantages are follows:

1. Clean and Green power,

2. Huge Carbon Emission reduction
3. Energy Security.
4. Power at doorstops – reduction in Transmission losses
5. Solar Panel cooling effect – Higher Efficiency as compared to ground solar power plants.
6. Land Conservation
7. Reduction in Evaporation loss
8. Reduced photosynthesis & Algae formation by blocking Radiation

### **The Challenge:**

Hon’ble Chief Minister of Gujarat put forth a challenge to the Private Sector for establishing a Solar Power Plant on a Canal While the private sector appreciated the idea, however there was a reluctance to come forward. GSECL took up the initiative to establish this Pilot path-breaking Project. The contract agreement was signed on 9th September 2011, and the project was completed in 5½ months. Today, this concept is now proven, and replicable in entirety with all its advantages globally

### **Project Implementation – Multiple Stakeholders:**

This project was involved by multiple stake holders with the following multiple roles and responsibilities

1. Project Proponent: Energy & Petrochemicals Dept. Government of Gujarat
2. Project Owner: Gujarat State Electricity Corporation Limited (GSECL)
3. Site (Canal) Owner: Sardar Sarovar Narmada Nigam Limited (SSNNL)
4. Power Purchaser: Uttar Gujarat Vij Company Limited (UGVCL)
5. Financial Assistance: National Bank for Agriculture and Rural Development (NABARD)
6. EPC Contractor: M/s Sun Edison Energy India Private Limited

**The project also undergone with following major challenges like are follows:**

Module Mounting Structure – Design & Development and Need to Rope in Expert Manufactures for Rapid Implementation and we do not have any Prior Experience of Project Implementation and O&M

### **Benefits from Project-A Valuable Insights Significance & Sustainability**

This project has been befitted by many ways to save energy resources from all the ways;

The solar panels mounted on the canal top block the radiation of the sun, thus helping to keep the water in shade. This reduces the evaporation of the water in the canal. According to conservative estimates, a 1 MW plant can save million liters of water per year. As the area covered by the solar panels increases, a large quantity of water is saved. The water in the canals gives rise to algae growth due to abundant sunlight and moisture. Algae block and clog the irrigation and water pumps and spoil the quality of water. Thus, due to the fitment of solar PV panels and absence of sunlight, algae growth is drastically minimized.

This helps in lowering the cost of maintenance and extends the life of irrigation equipment. Furthermore, the solar panels can provide electricity to the irrigation pumps. Since the pumps are often located at remote locations, this would also solve the issue of transmission of electricity as well as strengthen the grid. This way, the canal top becomes the best administrative model for community scale solar powered water pumping/ village electrification program.

Solar pumps no longer need to be installed in isolation since they are susceptible to theft, mishandling, poor maintenance, etc. Canal top offers better administrative model. The authors believe that canal top solar PV project has a very big role to play in the Smart City Program, National Solar Mission, and greater use of irrigation pumps. Another advantage of the canal top solar power plant is that the energy

generation is closer to the point of consumption. Other Significance advantages of the project are follows:

- Green energy generation at the door step of farmers.
- Grid strengthening by generation at remote consumption Centers.
- Increased Reliability of power.
- Reduction of 12,80,000 Kg CO<sub>2</sub> per year
- Alternate development for the most precious and finite resource, Land.
- Saving of water by reduction in evaporation (Approx. 9 million Ltr per year).
- Reduction in silting of canal (from banks)
- Reduction in transmission and distribution losses.
- Sustainable alternative for densely populated countries.
- Retardation in growth of algae
- Total Generation of 1.49 crores unit since inception (till FY 2022) & performing satisfactorily

### **Replication of the Innovation:**

The canal top power plant presents an amazing potential for replication. The project is easy to begin as very few approvals/clearances are required. Further, it offers a faster implementation period as no land acquisition/development is required. Since irrigation canals exist throughout India, it provides a fairly simple and economically viable model for replication. In Gujarat alone, where the pilot project is successfully implemented, there exists a canal network of 80,000 km.

As per the estimation of the Gujarat State Electricity Corporation Limited (GSECL), even if 30 per cent of this canal network is used for solar PV plant installation, it can generate up to 18,000 MW of power and a saving of 90,000 acres of land. Similar large canal networks exist across the entire country, ensuring a cost effective and smart model for generating energy. Many other canal top plants have been set up in India itself—a 10 MW plant has been replicated in the city of Vadodara in Gujarat),



a 1 MW plant has been set up in Karnataka, and a canal top plant has also been added in Andhra Pradesh.

It is pertinent to note at this juncture that similar canal networks exist throughout the world. Also, the possibilities to further implement this idea are endless. Recognizing its importance, the Government of India has prepared the policy for absorbing 100 MW of capacity addition through canal top solar projects. The first pilot project demonstrated by the GSECL received the prestigious Prime Minister’s Award for Best Project in Public Administration for the year 2015.

1. After success of 1 MW Canal top PV project at Sanand and 10 MW at Vadodara in Gujarat, Ministry of New and Renewable Energy (MNRE), Government of India has initiated Canal-top Solar Policy on 5th Dec. 2014.
2. As per Canal-top Solar Policy, total 100 MW solar PV projects shall be installed in 12th plan period (Year 2014-15) with an estimated cost of USD 150.72 Million (INR 975 Cr.) with central financial assistance of up to USD 35.24 Million (INR 228 Cr.).
3. Out of 100 MW projects, 50 MW shall be on canal top and balance 50 MW on canal bank.
4. Central financial assistance is available up to USD 0.46 Million
5. (INR 3 Cr.)/ MW for canal top and USD 0.23 Million (INR 1.5 Cr.)/MW

### **Sustainability of Innovation:**

The canal top solar power plant is an innovative idea that efficiently utilizes land and conserves water. It provides a better administrative model for smart village, smart city, and irrigation projects. Further, it can be developed under the public private partnership (PPP) mode. With declining cost trends, canal top projects are expected to acquire a larger share of national solar targets. Large capacity canal top solar parks may offer faster and more economical deployment of solar power projects in India.

**Prof. Poonam Singh** from the National Centre for Good Governance (NCGG) proposed the Vote of Thanks at the Webinar. She threw light on how these innovative initiatives led to become an example and serve as an opportunity for the officers to connect with and serve the poor people.

Before concluding she expressed her heartfelt gratitude to the eminent speakers who presented their views on “Prajavani-Janahitha & Sarkar Aapke Dwar” at the webinar. On behalf of NCGG, she thanked all the participants of the webinar comprising of Chief Secretaries/Administrators of All States and UTs of India, District Collectors, IT Secretaries, AR Secretaries, Heads of Administrative Training Institute of All States and UTs of India, LBSNAA, Capacity Building Commission (CBC), Sr. Administrators, Eminent Academicians, Sr. Officials from DARPG and NCGG Team.

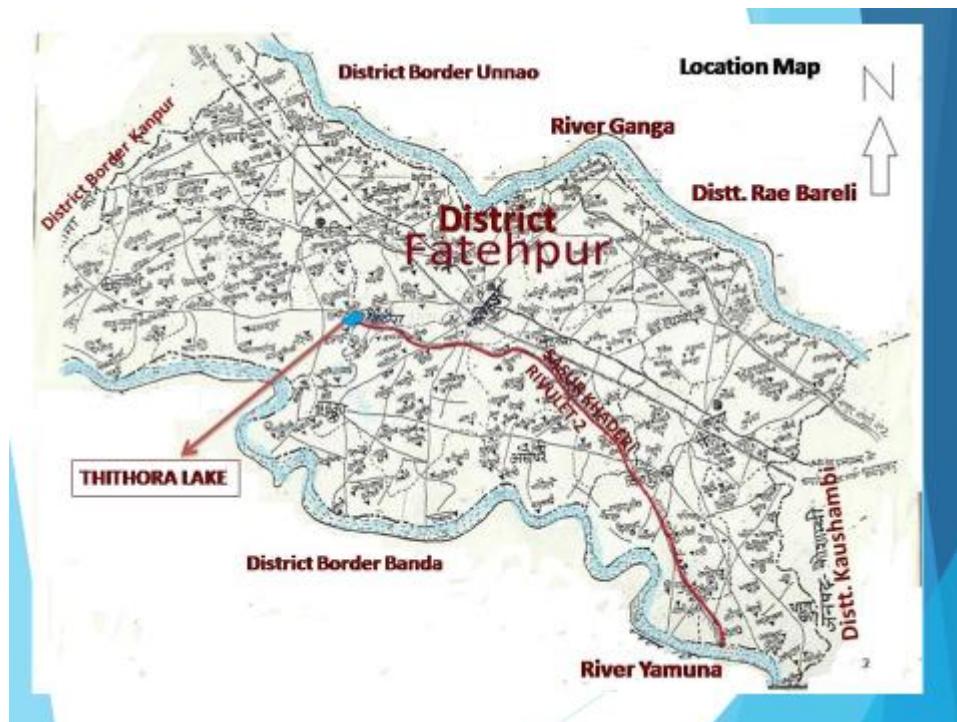
**ANNEXURE – I – PRESENTATION – “SASUR KHADERI-2 RIVER & THITHORA LAKE”**  
**REVIVAL PROJECT IN DISTRICT FATEHPUR (U.P.)**



## Uttar Pradesh

- ▶ The State of Uttar Pradesh is home to rich natural resources and capable human resources.
- ▶ It is the foremost producer of many agriculture crops due to ample water availability.
- ▶ State comprises of 75 administrative **districts**, which are further divided into 820 development **blocks**
- ▶ **Fatehpur** is one such district of Uttar Pradesh which has 13 blocks.





## Background - District Fatehpur

- ▶ District Fatehpur is situated on the **doab** (confluence) of rivers Yamuna and Ganga. It has a population of 2.3 million.
- ▶ In 2013, the Remote Sensing Report showed that 1071 blocks of India were '**critical**' in terms of aquifers and ground water level, of which 111 were in Uttar Pradesh state. A total of **SEVEN** out of the 13 blocks were in **CRITICAL** category.
- ▶ A detailed plan was drawn up to revive water bodies and various projects were envisaged to improve the situation. MNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) was the most immediate option for implementation because of availability of funds under the scheme.

## Mapping of water resources

- ▶ The ground water resources are assessed in units i.e Blocks/ Talukas/ Mandals/ Watersheds.
- ▶ These assessment units are categorized for ground water development based on two criteria:
  - a) stage of ground water development, and
  - b) long-term of pre and post monsoon ground water levels.
- ▶ The long term ground water level trends are computed generally for the period of 10 years. The significant rate of water level decline are taken between 10 to 20 cm per year depending upon the local hydrogeological conditions.

## Mapping of water resources

- ▶ After this data is collected and blocks are divided into four categories, namely -
  - ▶ 'SAFE' areas which have safe ground water levels and potential for development.
  - ▶ 'SEMI-CRITICAL' areas where cautious groundwater use is recommended.
  - ▶ 'CRITICAL' areas and 'Over-exploited' areas, where there should be intensive monitoring and evaluation and future ground development be linked with water conservation measures.



## Project background

- ▶ Revival of all ponds of 2-5 acre was undertaken in all the 1516 villages of the Fatehpur district.
- ▶ One of the major projects of this initiative was to revive 46 Km Sasur Khaderi Rivulet and 7.377 hectare Thithora Lake. This was suggested to us by Shri Vigyanand ,a social activist.
- ▶ Sasur Khaderi Rivulet-2 and Lake Thithora had been silted and encroached upon for long time and there had been no water-flow even during the Monsoons, which caused floods, water logging and harm to paddy crop and people’s life in the vicinity.
- ▶ To resolve this issue, it was decided to rejuvenate both water bodies by the State administration under MNRGS (Mahatma Gandhi National Rural Employment Scheme) in the summer of 2018.

## Reasons for extinction

- ▶ **Long drought conditions** resulted in shrinkage of Lake and River as Fatehpur is a district bordering ‘Bundelkhand region’ - a drought prone area.
- ▶ Encroachment & Reduction of catchments areas due to **expansion of agriculture and other man-made obstructions** such as, roads, buildings, etc.
- ▶ Almost **no feeding from ground water recharge** on account of excessive pumping and over-exploitation.
- ▶ **Flattening of the slope and aggradations of river bed** owing to deposition of silt induced by construction of ungated check-dams.

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## Objectives

- ▶ **Restoration** of the original shape and flow of the 46 km long river by making it free of encroachment, dredging and de-silting its stretch .
- ▶ **Prevention of Water-logging** in the 42 villages along the river.
- ▶ **Revival and Restoration of the Lake Thithora**, which had a area of 7.377 hectare and was the source of the river.
- ▶ Maintaining the flow of the river by using lake water during lean season by **making gated check-dams** at the Lake & River reaches.
- ▶ To **increase the availability of water** for irrigation and improve the overall agro-climatic situation.
- ▶ Plant trees around the lake/ river banks **to prevent soil erosion** and improve environmental quality of the area.





## Challenges

- ▶ ***Convincing the farmers*** to free land from encroachments.
- ▶ ***Availability of labour:*** as the Restoration plan was prepared in the month of April 2013, which was to be executed before the onset of monsoon. Availability of Labour was an issue because it is the harvest and marriage season for the locals during May & June.
- ▶ ***High Temperature*** of around 42 to 45 degree in the month of May & June affecting the speed of work.
- ▶ The district falls in the dry belt of the state and the ***riverbed was very hard and parched.***

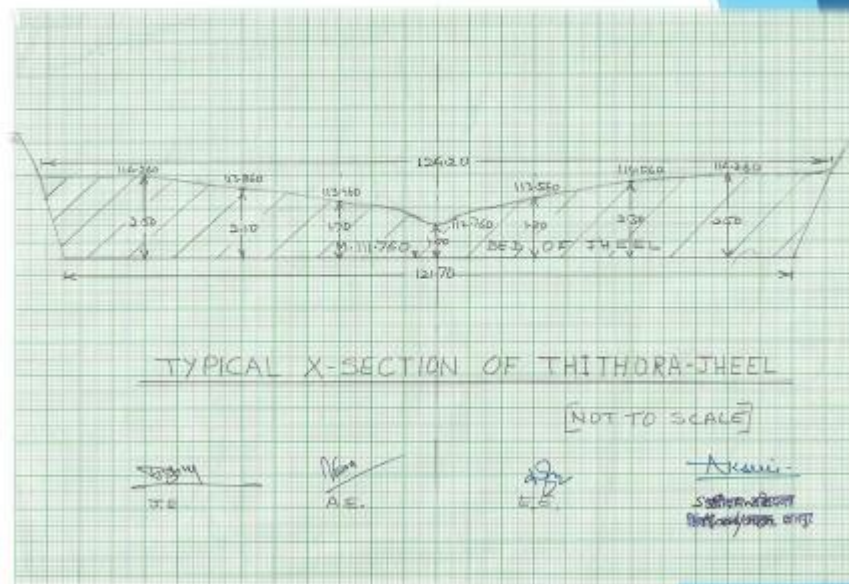
## Highlights of the Project



## Formulation of the Project

- ▶ The project was prepared by the Lower Ganga Canal Division of Irrigation department
- ▶ This quantity was *neither economically nor practically feasible* to execute, hence a *rethinking* was done. Since **RIVER IS NOT A CANAL**; river develops its regime on its own, based on discharge and velocity, the *only need was to provide a minimum section with proper slope* at bed level along entire length of the channel. A slope of 20 cms every kilometer was maintained
- ▶ So the desilting was planned in a *gunet shape* of only 1/3rd width, thereby reducing the quantity of earthwork to 1/4th and also the Project cost to around **Rupees 40 million**.
- ▶ A cross section of every 500 meters of the river was taken and calculated on the amount of soil to be excavated and man power required.

## Typical X-section of Thithora Lake



## Implementation Strategies

- ▶ Meetings at the Village Hall/Schools/Panchayat Ghar of all the **42 villages** of project area to gain support for mission and **encourage villagers** to come to work .
- ▶ These village meetings made us realise that the villagers were committed to the project. They saw in it the revival of their agricultural lifeline as well as a cultural symbol.
- ▶ Meetings with social workers, media, college principals, and local people **to propagate the objectives** of the mission.
- ▶ The **entire stretch of 46 kms was divided** into 1 km sections allotted to a Junior Engineer, Rozgar Sewak, Village Secretary, Lekhpal (Land record Keeper) for better outcome .







## Preparatory ground work

- ▶ We began work on this project in December 2012, the most important task was to ***demarcate the borders*** of the river.
- ▶ This required all revenue officials to actually ***measure every inch of the land***.
- ▶ We had to measure the land fairly, so that no farmer lost even an inch of his/her land.
- ▶ This was also a time when the officials tried to convince the villagers about the ***need/ benefits*** of the project.

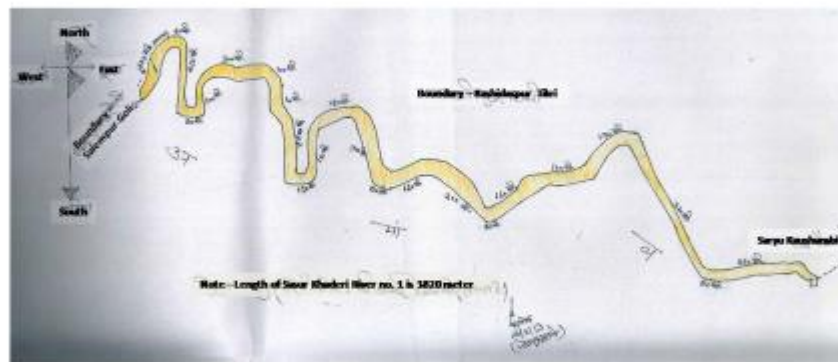
## Working plan

- ▶ The river was divided into 46 stretches of 1 kilometer each for easier management.
- ▶ Villagers from all the villages worked on the patch which passed through their village. This meant that villagers had to travel less for their work-site.
- ▶ All villages were responsible for excavation of soil and reviving the 1 kilometer allotted to them.
- ▶ We held meetings with all the stakeholders in all the 42 villages. These meetings led to a sense of ownership.

## One kilometer maps



Village – Amav - Block – Hathgam - Tehsil – Khaga - District Fatehpur



## Citizen movement

- ▶ The project was possible only because of the **support of residents** of the District. Villagers from all the 42 villages and 50 other villages who had worked on the lake made the project achievable.
- ▶ The **sense of loss** of a river which was a life line to the socio-agro-economic status of so many villagers had a **deeper connect**.
- ▶ Old people remembered the river with the **sense of a cultural loss**.
- ▶ We had around **5000 - 7000 people** from all over the district motivated to work on this project.
- ▶ At the lake site, we had villagers from far off places coming especially to contribute.



## Citizen movement

- ▶ We had *students from all colleges* of the district who participated in the project. A one kilometer stretch was marked out for Shramdan or voluntary labour work.
- ▶ Students used to come to this stretch and *volunteer*.
- ▶ *People from all walks of life* like traders, journalists, politicians, lawyers, doctors, teachers cooperated in project implementation.
- ▶ We had *localized meetings* along the villages, including police stations and schools.





## Project implementation



## Work-site

- ▶ All measures were taken to ensure that the villagers were comfortable in the working conditions.
- ▶ We had arranged for tents, water and medicines at all the work site. The village nurse was there at every point to attend any emergency .
- ▶ We had arranged for the stay of some workers in the village school at the lake , as some families wanted to stay for a month and complete the work.
- ▶ The goodwill of the project was such that voluntary organizations and NGOs came forward to provide drinks and snacks at worksite.

## Work site

- ▶ **Arrangement of basic needs:** drinking water, shed, stay, food and emergency medicines like ORS & making on site **payment to the labourers** were made **at work-site**.
- ▶ Vacant school buildings were utilized to provide **shelter** to the labours from far-off villages during May-June .
- ▶ We had tied up with banks and arranged for mobile payments in which the workers/villagers received their payments in a weeks time , which contributed to the project attracting workers.





















## Completion of the project

- ▶ The project began in April 1<sup>st</sup> week and was completed on 12th of June.
- ▶ We did the seeding/plantation work along the river and lake so as to hold the excavated soil from flowing back into the rivulet during the rains.
- ▶ A gated barrier was built to regulate water-flow from the lake to the river.





## Thithora Lake



Before

After



## River Sasur Khaderi



Before



After



## Outcomes of the Initiative

- ❖ **Drainage** of the catchment area *improved considerably*. No flooding and water logging even in the heavy monsoon rains last season.
- ❖ On **July 16, 2013** the discharge measured at chainage 44.00 (2 km downstream from Thithora Lake) was **689.95 cusecs** which was a good sign of rejuvenation for an almost *dead river*.
- ❖ Availability of water for irrigation for all villages along the river.
- ❖ The water stored in the lake was measured as **96000 cum** on the same date.
- ❖ The groundwater table has shown improvement in the vicinity.
- ❖ **No marooning** of villages even during heavy and incessant rains of 2013, thus requiring no relief measures, which otherwise was a common feature in the earlier years in such situation.



## Environmental impact

- ▶ The soil would have been rendered '*sodic & infertile*' if timely action was not taken
- ▶ The freed land from encroachments on the river banks and lake site is providing a huge scope for *plantation of trees*
- ▶ **35000 saplings** have been planted on the perimeter of lake/along the river in monsoon season
- ▶ **Dense seed sowing** of desi babool, jangle jalebi, shisham and khair have been done in three rows on each bank in 17 km stretch of the river. More plantation is being done which is bound to give an *impetus* to the *environmental quality* of the region in near future

## Environmental impact

- ▶ After 2013, the district has received very poor rains, the district was declared drought affected. However, Thithora lake and river had sufficient water to meet the needs of the 52 villages.
- ▶ The project has led to a rise in water tables and many hand pumps and wells which had no water were also revived. The villagers were satisfied as they saw it as an immediate benefit.
- ▶ Two major canals which fed the lake were also cleaned and in 2014-2015 so that the lake has water at all times.

## Socio Economic Benefits

- ▶ Mass Participation of people for a cause of water and soil conservation.
- ▶ **No marooning** of villages even during heavy and incessant rains this year, thus requiring no relief measures, which otherwise was a common thing in the past in such situation.
- ▶ Generation of rural employment to the tune of **2,00,000 man-days** in just **45 days**.
- ▶ The district people have realized the importance of water management programs and every year new canals and lakes are being revived.

## Other success stories - Inspiration

- ▶ Similar river projects have been taken up in the districts of Mahoba, Jhansi, Kanpur, Shravasti, Amroha and Auraiya.
- ▶ We planned and executed a stretch of river Sot, in Amroha and executed the same in 2015 when posted there for 4 months.
- ▶ Recently in last 3 years many districts of Uttar Pradesh like Ayodhya, Mirzapur have done similar projects. Last month work on Sasur Khaderi 2 was started by the District administration.

## Rise in Groundwater Level at locations nearby river &amp; lake

*Pre and Post Initiative*

SI No.	Piezometric location	Block	GROUNDWATER LEVEL, m			
			Pre		Post	
			GWL	Measurement Date	GWL	Measurement Date
1	Tikri	Asothar	3.90	15-11-12	1.44	12-11-13
2	Banarsi	Bahua	15.20	15-11-12	10.5	15-11-13
3	Gazipur		16.55	15-11-12	13.9	15-11-13
4	Shah		17.50	15-11-12	13.85	15-11-13
5	Mahammadpur		14.15	15-11-12	10.45	14-11-13
6	Badanpur		13.22	15-11-12	9.97	12-11-13
7	Bhairwa		13.10	15-11-12	8.30	11-11-13
8	Sahili	Teliyani	10.10	16-11-12	6.00	10-11-13

(Source: Groundwater deptt, Fatehpur)

## Rise in Productivity of area adjacent to the river &amp; lake

Location			CROP YIELD (Qt /ha) Pre & Post Initiative									
Block	Village	Area (ha)	Paddy		Wheat		Pulses		Millets		Gram	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Bahua	Shah	40	29.0	36.5	32.0	37.0	-	-	-	-	-	-
	Mahimapur	60	28.0	35.0	33.0	35.0	-	-	-	-	-	-
	Laxmanpur	30	28.5	36.0	31.5	36.5	-	-	-	-	-	-
Asothar	Janikpur	60	28.0	37.0	30.0	40.0	-	-	-	-	-	-
	Ayadpur	30	26.0	34.0	27.0	39.0	-	-	-	-	-	-
Haswa	Kusumbhi	300	-	-	-	-	-	-	1.0	1.60	-	-
	Tikar	200	-	-	-	-	3.0	4.5	-	-	-	-
	Rithwa	175	-	-	-	-	3.0	6.0	-	-	-	-
	Bhairwa	160	-	-	-	-	3.0	4.0	-	-	6.0	8.0
	Gehuri	180	-	-	13.0	21.0	-	-	-	-	-	-
	Pasidpur	200	18	25.0	-	-	-	-	-	-	-	-

(Source: Agriculture deptt, Fatehpur)

## Way forward

- ▶ **Storm water management** is as crucial and important as **Wastewater management**. We lose huge financial resources every year due to bad drainage either in built-up areas or in open fields.
- ▶ As a policy, **ground water use should be discouraged** and surface water should be **conserved** and used to meet all our needs.
- ▶ **Check dams** should be designed in the **gated** fashion to facilitate flushing of the silt and avoid aggradation.
- ▶ All drains to be desilted regularly to allow for rivers and lakes to receive water during rains.

## Administrative lessons

- ▶ Projects that are community driven have a much greater sense of ownership and success.
- ▶ Inter departmental coordination, in the team we had Irrigation , Block, Revenue departments taking the lead and facilitating each others work.
- ▶ Short term mission mode projects get more work done when all sections of society are involved.
- ▶ We are only in custody of the planet for a short time . Our future generations deserve to have their planet given to them in good shape.

Officers doing spadework for revival of Rivulet



Students volunteer for revival of Rivulet



Water flows in 2 extinct rivers



20 Kms of Sasur Khaderi excavated



Students take a vow to revive the river

बच्चों ने यह ठाना, नदी में जलधारा लाना



जिलाधिकारी कांपन बर्मा के प्रयास में दस सप्ताह से सूखी पट्टी नदी में जल को खोल लाने के जो प्रथम शुभक हूर उधारी धारणी में उमसाह है। मसला है 21 कोटि की कार्य योजना बनाकर एक साथ दस दर्जन गाँवों में काम शुरू करवाया गया। मसलूरी की कच्ची से काम शुरू पट्टा हो मसलूरी बन्दे आने का पर। जलसमस्या के लिए नई पट्टी की सज्जनता बंदी को शकलित करी है।

मसलूरी के पास मसलूरी नदी में कोटिखंड इतर कोरने के 200 बरने परवड़ा व तल्ले के साथ धुधधारा की गुंफा काम पर चले। तेज धूर की पकड़ न करी हूर बच्चों ने मिट्टी खोदी और तल्ले उर में रखकर खोदी गई मिट्टी को दूर जलकर निकाल। तल्ले के पास मसलूरी के मसलूरी के साथ मसलूरी पट्टा को देखकर तल्ले के 20 व 25 तल्ले आ गए और बच्चों के साथ काम में लूट गए। जो की देखल था यही कहल कि देखल हमने अच्छे तो यह बन्दे हैं, काम में काम वही बचने के लिए हलके और एक जुट है। नदी की क्षमता में लाने के लिए बच्चों के पतित प्रयास की सज्जनता संधे करी रहे। दस प्रथम हूर

**जेलीबी से हो नदी की खुदाई**

लोक संघल सज्जनता पतित की जेलीबी से मसलूरी नदी के पुनर्जीवित करने के प्रयास की सज्जनता की गई। जुद्धसंधी ने कहा कि नदी के प्रयास उमसाह से आ बने से क्षेत्र के दो दो गाँवों में हलसल से मसलूरी आर। जलसमस्या की दिशा में शीघ्र काम बर्मा के प्रयास की तल्ले की तल्ले की मसलूरी की बर्मा से पर पट्टा ने काम पर चिल जल्ले की मसलूरी में कहा कि मसलूरी की बर्मा से खोला हो गई है, ऐसी पकड़ कायू तल्ले में कोटि खोला न आर। जलसमस्या मसलूरी दिशा में, मसलूरी संधे और तल्ले मसलूरी दिशा, दसलल धीरे खल रहे।

शिक्ष मसलूरी, मिट्टी मिट्टी, विहालल के प्रथम कोटिखंड मसलूरी, प्रयासलल उमसाह मसलूरी, मसलूरी बुद्ध, कोटिखंड रहे।

खुदाई कार्य में श्रमदान करने कोटिखंड इतर कोरने के बर्मा। जलसम

मसलूरी निज जेलीबी : मसलूरी की कच्ची से संध वर मसलूरी नदी की खुदाई के कार्य में दस प्रथम हूर जेलीबी व जुद्ध के साथ जेलीबी आ संध जल कोटिखंड इतर कोरने प्रयास के 200 बरने परवड़ा, तल्ले के साथ काम में लूट गए। जिलाधिकारी धूर में बच्चों को जलसम बल्ले देखल साथ के लो

**मसलूरी नदी की खुदाई में 200 बच्चों ने किया श्रमदान**

श्री मसलूरी में खुदाई कार्य में जुट गए। जिला की मसलूरी तल्ले के निकलने बल्ले बल्ले की मसलूरी नदी मसलूरी की खुदाई का कार्य 15 जल्ले से शुरू हुआ।









**ANNEXURE – II – WORLD’S FIRST 1 MW CANAL TOP SOLAR PV PROJECT” - GUJARAT STATE ELECTRICITY CORPORATION LTD  
GOVERNMENT OF GUJARAT**

**PRIME MINISTER AWARD (2013 – 14) WINNER**



**WORLD’S FIRST  
1 MW CANAL TOP SOLAR PV  
PROJECT**

A new direction to green and clean energy



**M PRASANNA KUMAR**  
Managing Director (GSECL)

26<sup>TH</sup> AUGUST 2022



**GUJARAT STATE ELECTRICITY CORPORATION LTD**

**Generation at the Door Step, Energy Independence for the Society**



**“A Society must be built in which every village has to be self-sustained and capable of managing its own affairs.”**

**Mahatma Gandhi (Father of the Nation)**

**“My idea is to create a rural-urban connect, where the soul is of a rural bent but with an urban touch”**

**Sh. Narendra Modi (Honorable Prime Minister of India)**

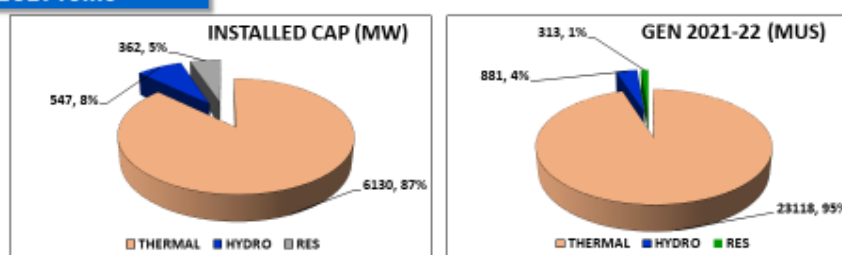


## PRESENTATION OUTLINE

1	GSECL Profile	6	Project Implementation - Stakeholders	11	Benefits From Project
2	Gujarat Solar Potential	7	Project Location / Implementation Challenges	12	Awards Received
3	The Vision Of Canal Top Solar Project	8	Project Technical Data	13	Replication Potential
4	The Innovation	9	Performance of Project	14	National Policy for Canal Bank & Top Solar Projects
5	The Challenge	10	Project Inauguration	15	GSECL Growth Plan

1

### GSECL Profile

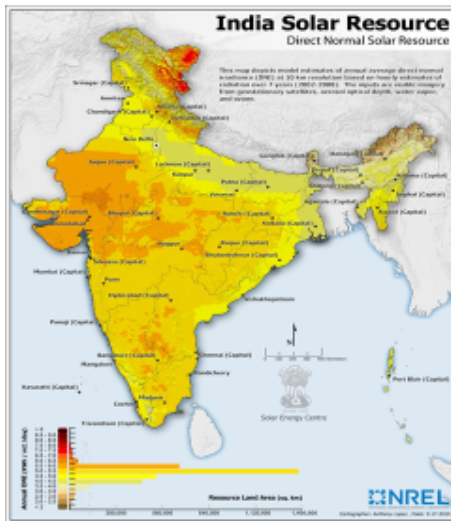


- GSECL –Power Generating company of Govt of Gujarat
- Company owns & operates Coal, Lignite, Gas, Hydro & RE (Solar & wind) Power Projects of different fuel/capacity/vintage
- Majority Share - Coal based – Capacity share (66 %) Gen Share (84%)
- The share of GSECL in State Generation is about **20 - 23%**
- 2 x 250 MW Lignite based Bhavnagar Energy Corp Ltd (BECL) merged with GSECL
- The annual turnover during last 02 years was @ **Rs 10000 Crores**

2

Gujarat Solar Potential

## INDIA'S SOLAR RESOURCE



- Among the various renewable energy resources, solar energy potential is the highest in the country.
- India blessed with huge solar potential
- The states that have the maximum insolation are **GUJARAT** and **RAJASTHAN**.
- In addition, the states of **Tamil Nadu**, **Andhra Pradesh**, **Madhya Pradesh**, **Maharashtra** and **Chhattisgarh** also enjoy good insolation levels.

3

The Vision Of Canal Top Solar Project

A new direction to green and clean energy by combining



## 4

## The Innovation

1. Clean and Green power,
2. Huge Carbon Emission reduction
3. Energy Security.
4. Power at doorstops - reduction in Transmission losses
5. Solar Panel cooling effect - Higher Efficiency as compared to ground solar power plants.
6. Land Conservation
7. Reduction in Evaporation loss
8. Reduced photosynthesis & Algae formation by blocking Radiation



## 5

## The Challenge

- Hon'ble Chief Minister of Gujarat put forth a challenge to the Private Sector for establishing a Solar Power Plant on a Canal
- While the private sector appreciated the idea, However there was a reluctance to come forward.
- GSECL took up the initiative to establish this Pilot path-breaking Project.
- The contract agreement was signed on 9<sup>th</sup> September 2011, and the project was completed in 5½ months.
- Today, this concept is now proven, and replicable in entirety with all its advantages globally.



## 6

Project Implementation – Stakeholders

### ROLES & RESPONSIBILITIES

Project Proponent	Energy & Petrochemicals Dept. Government of Gujarat
Project Owner	Gujarat State Electricity Corporation Limited (GSECL)
Site (Canal) Owner	Sardar Sarovar Narmada Nigam Limited (SSNNL)
Power Purchaser	Uttar Gujarat Vij Company Limited (UGVCL)
Financial Assistance	National Bank for Agriculture and Rural Development (NABARD)
EPC Contractor	M/s Sun Edison Energy India Private Limited



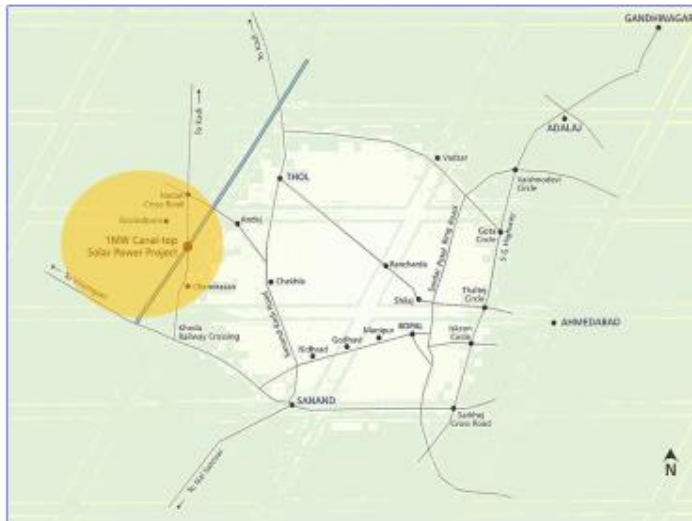
## 7

Project Location

### PROJECT SITE:

#### NARMADA BRANCH CANAL

Village : **CHANDRASAN**  
Taluka : **KADI**  
District : **MEHSANA**





7

Implementation Challenges

**MAJOR IMPLEMENTATION CHALLENGES**

- **Module Mounting Structure – Design & Development**
- **Need to Rope in Expert Manufactures for Rapid Implementation**
- **Lack of Prior Experience of Project Implementation and O&M**



8

Project Technical Data

<b>Installed Capacity</b>	<b>1 MWp</b>
<b>Canal Length used</b>	<b>750 Meters</b>
<b>Nos &amp; Type of Module</b>	Total 3616 Nos / Polycrystalline 280Wp each 8 Blocks each of 125 KWp, OEM - MEMC (USA)
<b>Nos Of Inverter</b>	4 (OEM – Power One, Italy)
<b>Power Evacuation System</b>	11 KV
<b>Total Project Cost (Rs)</b>	Rs. 17.73 Crores
<b>Compact Sub Station (OEM)</b>	ABB
<b>Foundation Stone Date</b>	Sept - 2011
<b>COD</b>	24.03.2012



## PROJECT DEVELOPMENT

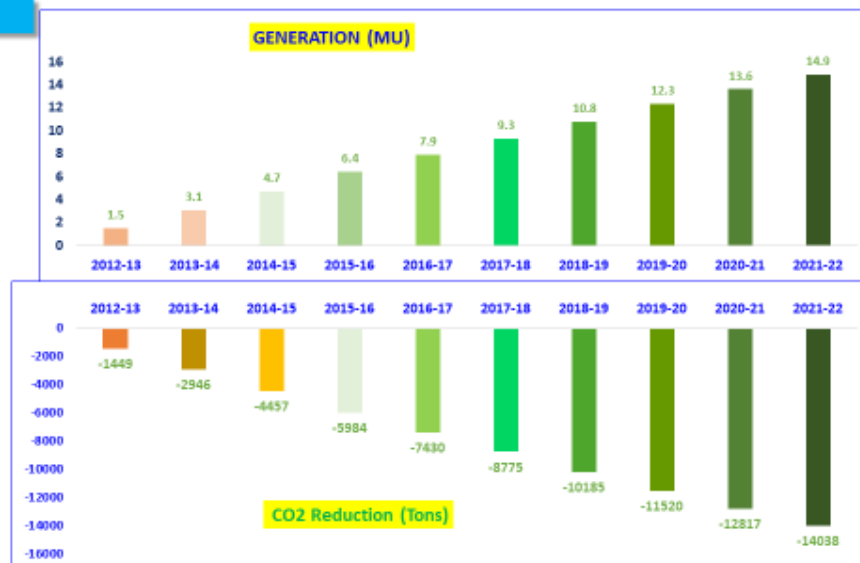
**PROJECT COMPLETION DATE 24<sup>th</sup> MARCH 2012**



9

Performance of Project

## PERFORMANCE



9

Performance of Project



Ground Installation



2.5%

Gain (%)

ENDURING BENEFITS –  
ENHANCED ENERGY GENERATION  
(COOLING EFFECT)



Installation Over Water Body (Canal)

10

Project Inauguration

PROJECT INAUGURATION (24<sup>TH</sup> APRIL 2012)











10

Project Inauguration

PROJECT INAUGURATION (24<sup>TH</sup> APRIL 2012)



11

Benefits From Project

## VALUABLE INSIGHTS SIGNIFANCE & SUSTAINABILITY

- Green energy generation at the door step of farmers.
- Grid strengthening by generation at remote consumption Centres.
- Increased Reliability of power.
- Reduction of 12,80,000 Kg CO<sub>2</sub> per year
- Alternate development for the most precious and finite resource, Land.
- Saving of water by reduction in evaporation (Approx. 9 million Ltr per year).
- Reduction in silting of canal (from banks)
- Reduction in transmission and distribution losses.
- Sustainable alternative for densely populated countries.
- Retardation in growth of algae
- Total Generation of 1.49 crores unit since inception (till FY 2022) & performing satisfactorily

12

Awards Received



## AWARDS RECEIVED

NAME OF AWARD	CATEGORY
Prime Minister's Award -2013-14	For Excellence in public Administration - For Outstanding Initiative
Global Solar EPC Award -2014	Finalist in the category of Project Innovation: Utility Scale for outstanding Contribution towards development of Solar Energy.
7 <sup>th</sup> India Power Award - 2014	For valued Contribution to Energy Sector
India Tech Excellence Award - 2012	For Green Power initiative

13

## Replication Potential

## REPLICATION POTENTIAL

- 458 km of open Main Canal in Gujarat alone!
- Including sub-branches:
  - 20,000 km already built
  - Final aim: 85,000 km
- Canals in any direction can be used: East-West, North-South, etc.
- No restriction in water flow.



14

## National Policy for Canal Bank &amp; Top Solar Projects

## NATIONAL POLICY FOR CANAL TOP &amp; CANAL BANK SOLAR PROJECTS

- After success of 1 MW Canal top PV project at Sanand and 10 MW at Vadodara in Gujarat, Ministry of New and Renewable Energy (MNRE), Government of India has initiated Canal-top Solar Policy on 5<sup>th</sup> Dec. 2014.
- As per Canal-top Solar Policy, total 100 MW solar PV projects shall be installed in 12<sup>th</sup> plan period (Year 2014-15) with an estimated cost of USD 150.72 Million (INR 975 Cr.) with central financial assistance of up to USD 35.24 Million (INR 228 Cr.).
- Out of 100 MW projects, 50 MW shall be on canal top and balance 50 MW on canal bank.
- Central financial assistance is available up to USD 0.46 Million (INR 3 Cr.) / MW for canal top and USD 0.23 Million (INR 1.5 Cr.) / MW.

## CANAL TOP & CANAL BANK PROJECTS REPLICATED, AFTER SUCCESS OF 1 MW CHANDRASAN PROJECT

NO	STATE	DISTT	CAP (MW)	TYPE
1	ANDHRA PRADESH	WEST GODAVARI	1.0	CANAL TOP
2			5.0	CANAL BANK
3	WEST BENGAL	UTTAR DINAJPUR	10.0	CANAL BANK
4	UTTAR PRADESH	LALIT PUR	5.9	CANAL TOP
5	KERELA	KANNUR	3.0	CANAL TOP
6	PUNJAB	PATIALA	7.5	CANAL TOP
7		SANGRUR	10.0	CANAL TOP
8		LUDHIANA	2.5	CANAL TOP
9	KARNATAKA	BAGALKOT	10.0	CANAL TOP
10	GUJARAT	VADODARA	35.0	CANAL TOP
11	UTTRAKHAND	DEHRADUN	19.0	CANAL BANK
12	JHARKHAND	RANCHI	2.0	CANAL TOP
13	RAJASTHAN	HANUMANGARH	2.0	CANAL TOP
14	MAHARASHTRA	JALGAON	7.5	CANAL TOP
TOTAL			120.4	

15

### GSECL Growth Plan

## GSECL GROWTH PLAN



Aggressive Renewable Capacity Addition – Planning to add about 7500 MW RE Capacity in next 05 years

- Major Share of 3325 MW at Khavda Hybrid RE Park
- Govt Wasteland Solar PV Projects – 2500 MW
- Floating Solar Development – 500 MW +
- Wind Energy Development – 200 MW +
- First GENCO to award Solar with battery storage
- Green Hydrogen Projects Development

R & M of Existing Conventional Coal Based Plant - role as Balancing Power Provider likely to increase in future

- Energy Efficiency R & M for Efficiency Improvement
- Flexible Operation (40%) for increasing RE Integration







**ANNEXURE – III – LIST OF PARTICIPANTS**

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