EFFECTIVE UTILIZATION OF WATER IN THAR COAL PROJECTS
An indigenous resource, Thar Coal is sufficient to fuel electricity demand of Pakistan for several centuries.

Source: CPEC Energy Planning Report
**Brief History**

- **1992**: Thar Coal was discovered by GSP (Geological Survey of Pakistan).
- **2009**: GoS initiated an ICB process to select a private sector partner for development of coal reserves in Thar Coal Block II. Hence Engro Energy Ltd & GOS entered a JVA.
- **2010**: Bankable Feasibility Study (BFS) was conducted, which concluded that the project is technically, commercially, environmentally and socially feasible.
- **2011**: SECMC was issued a 30 year mining lease of Block II.
- **2014**: In 2014, both Mine and Power Projects were included as China Pakistan Economic Corridor (CPEC) Early Harvest Projects.
- **2016**: Financial
## Key Project Figures & Sponsors

### Main Sponsor

- **SECMC**
- 3.8 Mtpa Open Cast Mine
- Project cost ~ USD 845 Mn
- 75:25 Debt to Equity Ratio

### Other Sponsors

- **THIAL LIMITED** 11.9%
- **engro powergen thar** 11.9%
- **HUBCO** 8%
- **CMEC** 4%
- **SPIC** 9.5%
- USD 10 M Pref Shares

### Main Sponsor

- **Engro Powergen Thar** 50.1%

### Other Sponsors

- **Liberty** 5.4%
- **HBL** 9.5%
- **CMEC** 35%

---

**Thar Coal Projects constitute the largest Private Investment under CPEC with majority being financed by Pakistani Investors**
Phase-I Progress at a glance

- **3.8 MTPA**
  - Mine Capacity
- **660 MW**
  - Power Generation
- **USD 3 BN**
  - Project Cost
- **71%**
  - Thari Workforce
- **24 MN**
  - Safe Manhours
- **$**
  - 20% Lower Mining Cost Than Approved

**FIRST ELECTRON FROM THAR COAL TO BE ADDED TO THE NATIONAL GRID BY DECEMBER 2018, INSHALLAH!**
COMMERCIAL OPERATIONS DATE
JUNE 3, 2019, INSHALLAH!
View of EPTL Powerplant
On June 10th, 2018, SECMC unearthed the first seam of Indigenous coal from its 3.8 Mt/a open-pit coal mine at a depth of 141 meters.
THAR BLOCK-II IS THE SOLUTION TO PAKISTAN’S ELECTRICITY WOES
STATE OF HUMAN DEVELOPMENT IN THAR

Infant Mortality Rate
87/1000 births vs. 64/1000 births
(Thar vs. Pakistan)

Maternal Mortality Rate
297/100,000 births vs. 175/100,000
(Thar vs. Pakistan)

Access to Drinking Water
Lowest ranking in drinking water and sanitation coverage

Access to Health Facilities
24th out of 24 districts for health coverage in Sindh

Education
Lowest on learning, retention and gender parity out of all districts in Sindh

Thar is one of the poorest areas in the entire of Pakistan
Thar Foundation has been established by the Government of Sindh together with companies engaged in Thar coal projects for the betterment of the principal stakeholders of thar coal i.e. the people of Tharparkar through graduated and sustainable interventions.

THAR FOUNDATION IS A GOS MAJORITY SECTION 42 COMPANY WORKING FOR THE BETTERMENT OF THE PEOPLE OF THAR
Coal Fired Power Plants
Water Requirement
Thermal fuel based power plants require a steady supply of water for cooling & steam generation.

**Cooling Process in Power Plant**: Condensing of exhaust steam from steam turbine

---

*For a 330MW Coal Fired Power Plant in Thar, ~ 8.75 cusecs of Treated Water* is required

*Treated Water means TDS < 500ppm

In Thar, we have two main sources for water supply;

- LBOD Fresh Water Supply Scheme and
- Underground Water from Mining Operations
LBOD Water Supply Scheme
Left Bank Outfall Drain (LBOD)

- LBOD is located on the left bank of River Indus in Sindh Province
- The project command area exists in Nawabshah, Sanghar, Mirpurkhas and Badin districts
- LBOD was proposed to drain saline, municipal water, surface water and storm runoff to stabilize the water table
- LBOD started functioning in 1997
- LBOD is designed for a discharge of 4,400 – 4,600 cusecs
- Total length of LBOD Network is 385 KM

LBOD Water is presently being discharged into the Arabian Sea
Left Bank Outfall Drain (LBOD) – Route Map
LBOD Water Supply Scheme

- Govt of Sindh, as part of infrastructure development for Thar Coalfields, is constructing the Left Bank Outfall Drainage (LBOD) which is designed to supply 35 Cusecs of treated water to Thar coal based power plants

Segment I
- 26 Km open CC lined Chanel from RD 364 to Nabisar
- Raw & Brine water Pumping Stations at RD 364
- Pre Treatment Unit at Nabisar
- RO Treatment Plant at Nabisar
- Raw & Treated Water reservoirs at Nabisar

Segment II
- 35 Cusecs Pumping Station at Nabisar
- 61 Km underground 1200mm Diameter HDPE Pipeline
- Diesel Power Generation Facility at Nabisar
- 15 days capacity Treated Water reservoir Vajihar

150 Solar Tube Wells
- Installed along the LBOD canal to augment LBOD flow especially during drought seasons
LBOD Water Supply Scheme

- Raw & Brine Carrier Channels
- Laying of 61Km HDPE Pipeline
- Raw & Treated Water Reservoirs
- Vajihar Treated Water Reservoirs
WHY LBOD IS A COMPLEX WATER?
LBOD Water Quality
LBOD Water Quality

Turbidity

Turbidity (NTU)

Date:
- 27-Dec 2015: 17
- 15-Jul 2016: 19
- 31-Jan 2017: 45
- 18-Aug 2017: 51
- 22-Sep 2017: 45
- 10-Apr 2018: 30.5

Values:
- 27-Dec 2015: 225.5
- 15-Jul 2015: 160
- 31-Jan 2015: 198
- 18-Aug 2015: 50
- 22-Sep 2015: 61.5
- 10-Apr 2018: 56.5
LBOD Water Quality

Silt Density Index (SDI)

- 6.58
- 6.56
- 6.38
- 5.61
- 6.13
- 5.36
- 5.1

Dates:
- 10-Jun
- 27-Dec
- 15-Jul
- 31-Jan
- 18-Aug
- 06-Mar
- 22-Sep
- 10-Apr
- 27-Oct
LBOD Water Quality

Iron (Fe)

Fe (ppm)

- 06-Jan 2015: 0.9
- 25-Jul 2015: 5.9
- 10-Feb 2016: 1.9
- 28-Aug 2016: 1.1
- 16-Mar 2017: 2.1
- 02-Oct 2017: 1.7
- 20-Apr 2018: 1.3

- 06-Jan 2015: 3.5
- 10-Feb 2016: 3.3
- 28-Aug 2016: 2.5
- 16-Mar 2017: 3.2
- 02-Oct 2017: 0.3
Membrane Bioreactor (MBR) will be installed as a pretreatment system for 24 MGD Nabisar RO Plant.

MBR is the combination of a membrane process like microfiltration or ultrafiltration with a biological wastewater treatment process.

The area required to build MBR system, is nearly 50% less than Conventional Activated Sludge (CAS) systems.

MBR can be used at higher mixed liquor suspended solids (MLSS) concentrations compared to conventional settlement separation systems, thus reducing the reactor volume to achieve the same loading rate.

The waste produces by MBR is relatively low as compared to CAS Process.
SELECTION OF MBR TECHNOLOGY FOR LBOD PRE-TREATMENT IS ONE OF THE STEPS TAKEN BY SECMC TO ENSURE WATER CONSERVATION
24 MGD Nabisar RO Plant

- Nabisar RO Plant has a capacity to produce 24 MGD of treated water
- This water will cater for the water requirements of Thar Block-II IPPs
- The recovery of this system is 50% which produces same amount of Brine Water which will be sent back into the LBOD at RD-362
SECMC also plans to increase the recovery of this RO plant to minimize brine production.
Groundwater Extraction & Utilization
Thar Hydrogeology – Regional Extents (NS)
Thar Hydrogeology – Regional Extents (EW)
Ground Water of Thar Coal Field Block II comprises of Three Aquifers

- **1st** Dune Sand Aquifer
- **2nd** Coal Seam Roof Aquifer
- **3rd** Coal Seam Floor Aquifer

*Groundwater flow from north-East to South-west*
Thar Hydrogeology and Groundwater Sources – Groundwater Aquifer and Flow

I. Dune Sand Aquifer
- Spread all over the Thar region and extends to Indian side as well
- Located at the depth of 50m to 60m at the base of Dune Sand Formation
- Thickness of this Aquifer Ranges from 0 m to 5 m
- Recharge is dependent on Precipitation (rain fed aquifer)
- Water from this aquifer is extensively used by locals for their drinking & general needs

II. Coal Seam Roof Aquifer
- Spread across most of the Thar region
- Located at the depth of 120m at the roof of the Coal Seam Formation
- Thickness of this Aquifer ranges from 0m to 12m and averages 6m

III. Coal Seam Floor Aquifer
- This confined Aquifer also spreads whole over most of the Thar Region
- This Aquifer is located at the base of Coal Seam Formation at a depth of 180m to 190m
- Thickness of the Aquifer ranges from 30m to 50m
- Aquifer is under high pressure (~7 MPa) when punctured water will rise from 180 m to 55 m
Hydrogeological Investigation – Thar Block II

- From 1992 onwards, several hydro-geological investigation work has been carried out in Thar area by different organizations/companies to explore the hydrological characteristics of Thar aquifers.

- These includes; Ministry of Petroleum & Natural Resources, SAZDA, WAPDA, International Resource Ltd., China Shenhua Group, RWE Power International, NECB.

- In 2009-10, NECB conducted hydro-geological study in Block-II area. The study included;
  - Construction of 06 tube wells (2 for each aquifer) & 10 piezometers
  - 04 pumping tests (in 2nd & 3rd aquifer)
  - Water sample for quality analysis from dug wells in nearby 13 villages (40 wells)
  - Water Level Survey from 90 wells to find out the water level elevation, ground water flow direction and hydraulic gradient of the 3 aquifers
  - Meteorological data compilation
  - Compilation of aquifer database for all 03 aquifers

- A detailed report “Hydro-Geological Exploration Study Report of Thar Desert Block II”, has been compiled by the China Northeast Coalfield Geological Survey Bureau (NECB) in 2010 based on all above investigations.
In 2010, a Groundwater model was established by RWE based on NECB report, to predict the dewatering volumes necessary for safe mining conditions & the no. of dewatering wells to be installed throughout the mine life. It was estimated about 32 DW wells to be drilled initially, with annual volumes of ~37Mm$^3$/annum

In 2013, with a changed mining strategy (small box cut 600m), the GW model was revised which showed that the well requirement for initial years would be less (26 wells) with annual discharge volumes of ~30Mm$^3$/annum
Thar Block II – Hydrogeology & Well regime
# Thar Hydro-Geochemistry

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Parameters.</th>
<th>Unit</th>
<th>SSDWQ</th>
<th>Concentration August</th>
<th>Concentration April</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>pH Value</td>
<td></td>
<td>6.5-8.5</td>
<td>7.12</td>
<td>7.59</td>
</tr>
<tr>
<td>2</td>
<td>Odor</td>
<td>Non Objectionable</td>
<td></td>
<td>Non Objectionable</td>
<td>Non Objectionable</td>
</tr>
<tr>
<td>3</td>
<td>Taste</td>
<td>Non Objectionable</td>
<td></td>
<td>Non Objectionable</td>
<td>Non Objectionable</td>
</tr>
<tr>
<td>4</td>
<td>Color</td>
<td>PtCo</td>
<td>&lt;15</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Turbidity</td>
<td>NTU</td>
<td>&lt;5</td>
<td>&lt;5</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Total dissolved Solids</td>
<td>Mg/l</td>
<td>&lt;1000</td>
<td>5680</td>
<td>5040</td>
</tr>
<tr>
<td>7</td>
<td>Total Hardness</td>
<td>Mg/l</td>
<td>&lt;500</td>
<td>929.26</td>
<td>1197.5</td>
</tr>
<tr>
<td>8</td>
<td>Chloride</td>
<td>Mg/l</td>
<td>&lt;250</td>
<td>2783.1</td>
<td>2849.6</td>
</tr>
<tr>
<td>9</td>
<td>Fluoride</td>
<td>Mg/l</td>
<td>&lt;1.5</td>
<td>2.26</td>
<td>2.14</td>
</tr>
<tr>
<td>10</td>
<td>Nitrate</td>
<td>Mg/l</td>
<td>&lt;50</td>
<td>1.1</td>
<td>0.6</td>
</tr>
<tr>
<td>11</td>
<td>Nitrite</td>
<td>Mg/l</td>
<td>&lt;3</td>
<td>0.004</td>
<td>0.007</td>
</tr>
<tr>
<td>12</td>
<td>Residual Chlorine</td>
<td>Mg/l</td>
<td>0.5</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>13</td>
<td>Cyanide</td>
<td>Mg/l</td>
<td>&lt;0.05</td>
<td>0.019</td>
<td>&lt;0.010</td>
</tr>
<tr>
<td>14</td>
<td>Boron</td>
<td>Mg/l</td>
<td>0.3</td>
<td>2.15</td>
<td>3.27</td>
</tr>
</tbody>
</table>
### Thar Hydro-Geochemistry (Contd.)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Parameters</th>
<th>Unit</th>
<th>SSDWQ</th>
<th>Concentration Current</th>
<th>Concentration April</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Aluminum</td>
<td>Mg/l</td>
<td>&lt;0.2</td>
<td>0.021</td>
<td>ND</td>
</tr>
<tr>
<td>16</td>
<td>Phenol</td>
<td>Mg/l</td>
<td>0</td>
<td>0.26</td>
<td>0.14</td>
</tr>
<tr>
<td>17</td>
<td>Arsenic</td>
<td>Mg/l</td>
<td>&lt;0.05</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>18</td>
<td>Zinc</td>
<td>Mg/l</td>
<td>5</td>
<td>0.41</td>
<td>ND</td>
</tr>
<tr>
<td>19</td>
<td>Manganese</td>
<td>Mg/l</td>
<td>&lt;0.5</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>20</td>
<td>Chromium</td>
<td>Mg/l</td>
<td>&lt;0.05</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>21</td>
<td>Cadmium</td>
<td>Mg/l</td>
<td>0.01</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>22</td>
<td>Copper</td>
<td>Mg/l</td>
<td>2</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>23</td>
<td>Lead</td>
<td>Mg/l</td>
<td>&lt;0.05</td>
<td>ND</td>
<td>0.40</td>
</tr>
<tr>
<td>24</td>
<td>Mercury</td>
<td>Mg/l</td>
<td>&lt;0.001</td>
<td>ND</td>
<td>3.029 ppb</td>
</tr>
<tr>
<td>25</td>
<td>Selenium</td>
<td>Mg/l</td>
<td>0.01</td>
<td>ND</td>
<td>NO</td>
</tr>
<tr>
<td>26</td>
<td>Antimony</td>
<td>Mg/l</td>
<td>&lt;0.005</td>
<td>ND</td>
<td>BDL ppb</td>
</tr>
<tr>
<td>27</td>
<td>Nickel</td>
<td>Mg/l</td>
<td>&lt;0.02</td>
<td>ND</td>
<td>0.2</td>
</tr>
<tr>
<td>28</td>
<td>Barium</td>
<td>Mg/l</td>
<td>0.7</td>
<td>ND</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Thar Block II - Dewatering Operations

- Based on the Groundwater model, it was observed that 90% of the total volume of ground water will be pumped from Coal seam Floor Aquifer.

- 30 wells have to be drilled initially across the mine to pump out the water and keep the mine dry.

- Around 110 wells will be drilled for entire mine life.

- Average dewatering per annum is 30 Mm$^3$, which will be reduced in the later years to around 25 Mm$^3$. 
Thar Geology and Base Aquifer Pressure Head

Dune Sand

Rann of Kutch

Lignite

Base Aquifer
Groundwater will be drained through Piping network to the Main Effluent Intake point.
Thar Block II – Groundwater Monitoring Regime

- Groundwater levels are monitored through various boreholes ranging in depth from Dune sand to floor aquifer depth.
- A third party consultant GEMS is also involved to monitor the levels and parameters of groundwater on a monthly basis.
- Nearly 60 boreholes (dewatering, observation, dug wells, and RO plants) are monitored for groundwater levels.
- Water level Monitoring data is used for simulations of groundwater model.
- Most of these wells are extended till the 3rd aquifer.
- The Dune sand aquifer is also constantly monitored through separate 43 dug wells of Block II at shallow depths.
Thar Block II – Dewatering Operations Rationale

- Groundwater is being utilized in several beneficial projects that ranging from agriculture to fish farming besides domestic use
- Gorano pond is currently a habitat to diverse species of fish which provides an opportunity of employment to locals
- Bio-saline agricultural project has been carried out to utilize mine water for efficient farming
- The RO plants provide clean drinking water to locals
- The underground mine water is being utilized for sprinkling purposes in the Block II vicinity to minimize dust build up
- The whole SECMC facility is being catered to by the same groundwater after RO treatment

<table>
<thead>
<tr>
<th>S.No</th>
<th>Water Balance/Utilization</th>
<th>m³/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Daily mine dewatering volumes</td>
<td>87,000</td>
</tr>
<tr>
<td>2</td>
<td>Mine consumption (Mine sprinkling &amp; Colony)</td>
<td>2,400</td>
</tr>
<tr>
<td>3</td>
<td>Utilization for Bio saline Agriculture</td>
<td>285</td>
</tr>
<tr>
<td>4</td>
<td>Buffer pond</td>
<td>6,500</td>
</tr>
<tr>
<td>5</td>
<td>Gorano Pond Disposal/ Fish Farming Utilization</td>
<td>84,315</td>
</tr>
<tr>
<td>6</td>
<td>Expected utilization by Power plant – Dec’18</td>
<td>55,000</td>
</tr>
<tr>
<td>7</td>
<td>Current percentage of Ground Water utilization</td>
<td>77%</td>
</tr>
<tr>
<td>8</td>
<td>Expected percentage of GW utilization – Dec’18</td>
<td>98%</td>
</tr>
</tbody>
</table>
AT SECMC SITE, 100% OF DOMESTIC WASTER WATER IS BEING TREATED AND UTILZIED FOR HORTICULTURE & SPRINKLING FOR DUST SUPPRESSION AT MINE
Gorano Reservoir
Gorano Reservoir & Public Park
Gorano Intake

- Spread over 1400 acres with a total capacity of ~30 Mm³
- 26 km, 50 Cusesc pipeline from Block-II Mine
- At an elevation of 37.5 m from sea level
- Natural depression with three RCC reinforced earthen embankments
Gorano Reservoir

- An area of ~5.7 km² of water holding capacity of 30 Mm³
- Currently ~2 km² of area is filled with water
- Source of Water for nearby fields for bio-saline agriculture
- Reservoir currently sustains more than 100,000 fish
- A public park and a 50ft head water Fountain
Bio Saline Agriculture Using Underground Mine Water
Bio-saline Agriculture Initiatives

Three separate projects have been initiated to utilize underground water from mine for Bio-saline Agriculture:

1. Collaboration with Xinjiang Institute of Ecology and Geography, China

2. Institute of Halopytes, University of Karachi to grow fodder. Crop harvested and being tested on local cattle

3. Using local expertise, land has been developed at various locations in Block-II where local crops have successfully been grown with underground water from the mine. Project has successfully yielded crops like Jantar, Bajra and local vegetables

Once validated by scientific institutions, InshaALLAH bio-saline could bring a paradigm shift in agricultural potential of Thar – droughts would become irrelevant
Bio-Saline Projects (Local Bio-Saline)

Progression through the Years (2017 – 2018)

**Year – 2017 (1H)**

Project initiated in March – 2017 at a total area of 02 Acre. Species tested were:

- Guar (Custer Beans)
- Bajra (Millet)
- Fruit of Gidro (Melon)

Flood Irrigation method being used for watering.
Water utilized daily *(60K Ltr/Day)*

**Year – 2017 (2H)**

Seeing positive signs in growth of species, Project was expanded to 07 Acre with addition of following species.

<table>
<thead>
<tr>
<th>Cash Crops</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Janbho</td>
<td>Bhindi (Lady Finger)</td>
</tr>
<tr>
<td>Sunflower</td>
<td>Palak</td>
</tr>
<tr>
<td>Tooriyo</td>
<td>Makai (Maize)</td>
</tr>
<tr>
<td></td>
<td>Tenda &amp; Kadu</td>
</tr>
</tbody>
</table>

Flood Irrigation method being used for watering.
Water utilized daily *(200K Ltr/Day)*
Bio-Saline Projects (Local Bio-Saline)

Progression through the Years (2016 – 2018)

Year – 2018

After successful crops cultivation and yield – project was expanded involving community farmers at various locations in block-II. Total area 15 Acres

<table>
<thead>
<tr>
<th>Cash Crops</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bajra</td>
<td>Bhindi (Lady Finger)</td>
</tr>
<tr>
<td>Cotton</td>
<td>Khera</td>
</tr>
<tr>
<td>Jantar</td>
<td>Began</td>
</tr>
<tr>
<td></td>
<td>Tenda &amp; Kadu</td>
</tr>
</tbody>
</table>

Flood Irrigation method being used for watering.
Water utilized daily (270K Ltr/Day)
Bio-Saline Projects (KU Bio-Saline Project)

**Highlights:**

- Total Area 1.5 Acre
- 06 yields harvested in last 12 months, Average yield ~ 650 Kg/Acre
- Fodder growth rate observed is ~ 2 ft. in 45 – 50 days
- Plantation of Suaeda Fruticosa for salinity control
- Local workforce employed for on the job training and cattle grazing/testing
- Animal feeding trials in progress, showing positive signs in term of meat productivity

Drip Irrigation being used for watering
Water utilized daily (40K Ltr/Day)
Bio-Saline Projects – Xianjian Projects

**Highlights:**

- 40 species planted in Phase-I (Jan-2018)
- 25 old + 09 new species planted in Phase-II (April – 2018)
- Environmental expert working in collaboration to improve the species selection and survival rate

Flood Irrigation method being used for watering.
Bio-Saline Projects – Fish Farming

Highlights:

• In early 2018, 100,000 fish seeds released in Gorano Pond after rigorous testing of fish species in Green Park in Saline water ponds

• Fish were raised on organic feed and estimated average weight of is ~ 01 Kg in 04-05 months

• 3rd Party testing of Fish meat was carried out by SGS labs - Declared fit for human consumption

• Value chain is being developed to make it sustainable business opportunity
Thar Million Tree Project

Highlights:

• Plantation till-date: **301,850**
• Survival Rate: > 65%
• Development of biggest public-private sector nursery in Sindh
• Entire population of Block-II including all employees, Chinese & local workers, school children and all villagers are involved in tree plantation campaigns
• Adoption of innovative research's in field of forestry to maximize the survival and minimize the water utilization, few of the implemented ones are:
  • Mia-Walkie method
  • Olas Pitcher Irrigation
  • Sand Mix Development
  • Water Sprinkler for Irrigation
• Drip, Sprinkler & Manual Irrigation being used for watering of plants
# Ansari Green Park

## Current Facility
- Total 60+ acres area
- 70,000 sapling are planted till date
- Kids Playing area
- Domesticated Birds Conservation
- Mini Zoo (Peacocks & Deer)
- Ansari Heritage Park
- Bagh-e-Firdous (Ladies Park)

Drip & Manual Irrigation method being used for watering

## Future Plans
- Installation of Motorized Merry Go Round
- Expansion of Green Park in line with newly developed layout
- Extension of Mini Zoo
- New Swings in Kids Play area
- Food street
### Total Tree Plantation
- **301,850**

### TMT Nursery
| Plants 6" above | 175 K |
| Seedlings       | 57K   |

### Sept-2018 Plantation
- **14,450**

#### Partner NGO’s/Groups
- **Saylani**
- **YOUTH LIKE MIND PAKISTAN**
- **PPHI**
Summary

In the initial phase of the TMT Project, both RO and Saline water is being used for saplings

• Complete RO/treated water for initial 3 Months of plantation

• 50% RO & 50% Saline Water (up to 4500 TDS) is being used for next 3 months and gradually shifted to 100% saline water

• The requirements are as follows:

  Water Resources.

  Total Consumption of **Fresh water per day is 100k L/day**
  Total Consumption of **Saline water per day is 235k L/day**
DRINKING WATER FACILITIES
FIRST RO PLANT OF SECMC WAS INSTALLED
on JULY 26, 2016
To date, a total of ~75 Mn Liters of WHO Compliant Drinking Water has been produced.
RO Plants

- **Seengharo RO Plant**
  - Operational Since: Nov 28, 2017
  - Total Water Produced: 854,000 L

- **Dars Para RO Plant**
  - Operational Since: May 23, 2018
  - Total Water Produced: 197,000 L

- **Gorano RO Plant**
  - Operational Since: Apr 8, 2017
  - Total Water Produced: 1,974,000 L

- **Ehsan Shah RO Plant**
  - Operational Since: May 15, 2017
  - Total Water Produced: 1,840,500 L
RO Plants

Katan RO Plant
Operational Since: Mar 18, 2018
Total Water Produced: 451,300 L

Ganesar RO Plant
Operational Since: Dec 25, 2016
Total Water Produced: 4,196,000 L

Kholi Bheel RO Plant
Under Construction

Mutto Jo Tar RO Plant
Operational Since: Mar 4, 2018
Total Water Produced: 1,024,000 L
RO Plants

**Rescue Center RO Plant**
- Operational Since: Jul 31, 2016
- Total Water Produced: 23,719,200 L

**TSF1 RO Plant**
- Operational Since: Apr 1, 2017
- Total Water Produced: 1,026,000 L

**Green Park RO Plant**
- Operational Since: Feb 17, 2018
- Total Water Produced: 40,054,000 L
THAR FOUNDATION PLANS TO TAKEOVER ALL RO PLANTS LOCATED IN THAR BLOCK-II
Conserve Every Drop of Water

SECMC has constructed water pits near the distribution area of RO Facilities to conserve waste water from distribution system. Water flows by gravity into these pits which is consumed by domestic farm animals.
DRINKING WATER FROM SUNLIGHT
SECMC has installed 03 Pilot Scale Solar Distillation Plates which are currently under testing phase. Once proved, these plates will be beneficial to provide drinking water in villages where installation of RO Plants is not feasible due to low population.
WE BELIEVE **DRINKING WATER** SHOULDN'T BE ACCESSIBLE TO EVERYONE AND FOR THAT WE ARE TAKING ALL POSSIBLE MEASURES