

***Detail Project Reports on***

***Solar Based  
Drinking  
Water Supply  
System***

***Prepared by***

***APS Infratech Services Pvt. Ltd.***

***(An ISO 9001:2015 Certified Company)***

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## About Us

Founded in the year 2015, We **APS Infratech Services Pvt. Ltd.** has become a renowned name in **Supplying, Wholesaling, and Trading of Solar Power System** within a short span of time. Our wide assortment of products comprises of Solar Based Drinking Water Supply, Solar Power System, Solar Home and Street Light and Solar Panel. Furthermore, our products provide excellent performance, energy savings and high efficiency at very competitive prices. We provide products and solutions which are used by domestic, retail and industrial consumers. Owing to our quality-oriented outlook, economical price structure, convenient payment modes and timely delivery schedule; we have developed a wide base of clientele across the domestic market. Recently we implemented 59 numbers of Solar Based Drinking Water Supply System in Ranpur Block of Nayagarh District.

We aim to maintain highest quality standards in all respects.

# **Abstract**

- 1. At present as per UNICEF report approximately 783 million people in the world still lack access to safe potable drinking water and most of them live in the developing countries of Africa and Asia.**
- 2. UN believes every person should have access to safe water and basic sanitation as a human right.**
- 3. Poor sanitation, water and hygiene have a significant impact on children's health and education.**
- 4. More than 1.2 million children die each year as a result of water borne diseases such as diarrhea, malaria, and trachoma.**
- 5. The solar energy based submersible-pump has been seen to be a viable option for supply of safe drinking water throughout the year.**

# Present Scenario

- 1. India's water sources are prone to contamination. According to statistics, almost 77 million people across India lack access to safe drinking water.**
- 2. India ranked 120th in a survey of 123 nations on safe water index by United Nations Development Programme (UNDP). This is because people in both urban and rural areas mostly children are largely affected by water-borne diseases.**
- 3. According to World Bank reports, 21% of communicable diseases in India are due to unsafe water.**
- 4. Death toll due to diarrhea is 1600 per day.**
- 5. Odisha is among 8 poorest states in India. As 2,657 lakh habitations in the State do not have safe drinking water supply due to contamination of fluoride and heavy metals at the sources.**
- 6. Even as 18 of the 30 districts of the State are affected by the problem of water contamination.**

- 7. Districts more affected by water fluoridation include Gajapati, Nuapada, Nayagarh, Khurda, Angul, Baudha, Phulbani, Khandhamala, Kalahandi, Balangir, Bargarh etc.**
- 8. In Odisha women spend up to six hours a day for collection of drinking water from a distance source.**
- 9. In traditional scheme with reservoir, particularly in small and remote habitations power supply is either not available for pumping or is highly irregular.**
- 10. Causes affect to traditional scheme**
  - a. Huge electricity bills.**
  - b. Low voltage & power cut.**
  - c. Not possible in hilly area.**
  - d. High operations & maintenance cost.**
  - e. No electricity (power cuts)- scheme doesn't work**

# Justification

1. Small habitations (up to 750 populations) need small schemes.
2. Bigger piped water supply scheme is not possible.
3. Initial per capita cost is high.
4. Hand pumps, wells, river situated at distance.



5. Problem of fetching water manually.
6. Wasting of precious time & energy .
7. In rural areas, it is usually the women and girls who have to bear the burden of pumping and fetching water at enormous cost to their time and health.

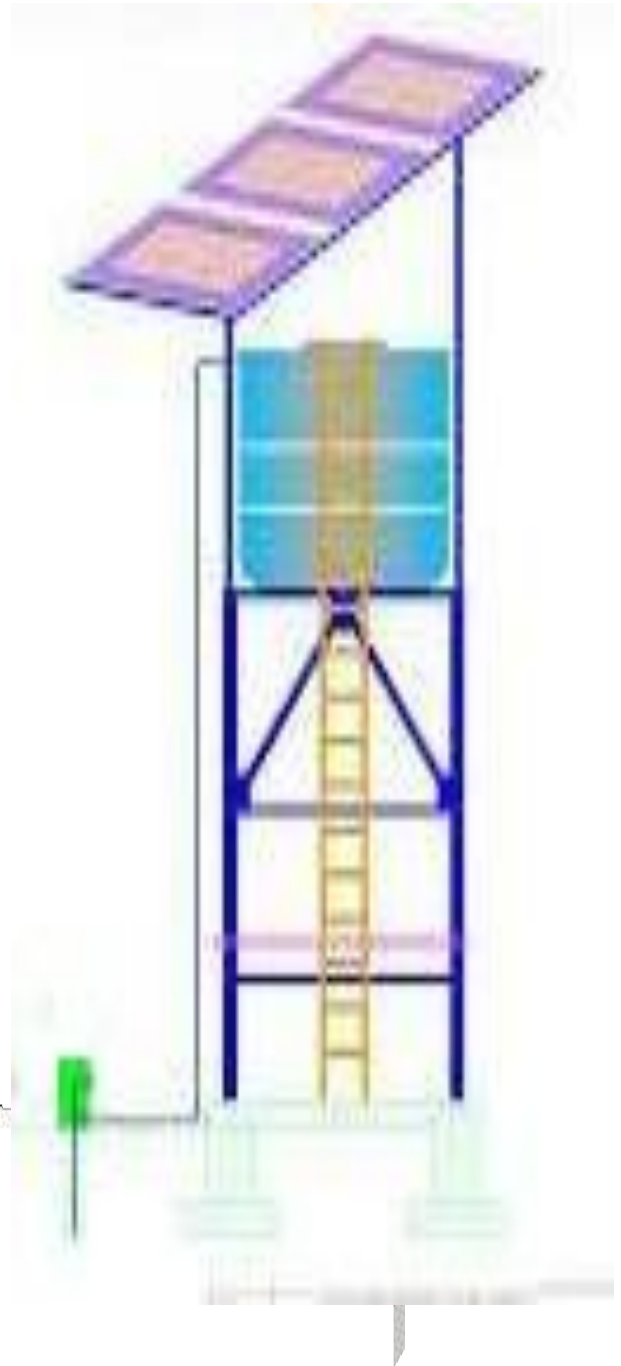


8. More than 75 percent of India's population live in rural areas and 85 percent of Rural Water Supply schemes in India are groundwater based.
9. Hence the bore well with a India Mark II hand pump is the most important element of Water Supply in rural areas.
10. During summer, when the water level deplete, the efforts required to pump the water increases. If ground water level depletes below the lifting capacity of the hand pump, i.e. about 36 meters, they stop working and Water scarcity is declared in the area, in spite of the fact that water is a available below 36 meters in the bore well.
11. Hence these pumps, proposed to be run on renewable solar energy, are highly appropriate decentralized solutions.



# Solar Energy Based Pump Scheme

1. The water supply scheme should have a bore well of yield not less than 2800 liters per hour (0.77 liter per second).
2. 900 Watt Solar energy based submersible pump is installed in the bore well
3. The pumped water is stored in a 5000 liters HDPE (High density polyethylene) tank mounted on a 3m high pre fabricated MS steel structure.
4. This type of project can be utilized in many ways like household water consumption, irrigation water supply, etc.
5. This scheme suffices requirement of drinking water needs of 750 persons.
6. Stand post are installed as per the necessity





# Project objectives

1. Safe drinking water shall be made available to the beneficiaries there by promoting good health.
2. With reduced burden of pumping and fetching water, there would be reduction in malnutrition levels of women and children.
3. There would therefore be increase in time available for education, productive work among women and children.
4. The process being energy saving and non-polluting, there would be a clean environment as well.
5. Very little Operation & Maintenance cost shall mean continuous water availability at less cost and disruptions.
6. Continuous availability of safe drinking water shall mean a transformation in the lives of people in the Integrated Action Plan (IAP) habitations.



# Components

**Water Storage  
Tank 5000 Ltr.**



**DC  
Submersible  
Solar Pump  
System for 5  
" Bore well**



**Solar Panel -300W X  
3 pcs.**

**MS Steel Structure with  
Foundation.**



# Advantages

1. **Effortless pumping. Assurance of 24 X 7 water supplies in low cost.**
2. **No electricity charges. Easy to operate and maintain.**
3. **Low recurring costs. Once this project is implemented the operation and maintenance cost is around Rs 300.00 per month.**
4. **Security of water due to 5000 liters storage tank.**
5. **Availability of spare time to rural women for agriculture and other house works.**
6. **Leads to student reporting in schools on time due to the assured supply of water.**
7. **Uninterrupted water supply during summer ( when hand pump become non functional due to depletion in static water) due to functioning of solar water pump .**
8. **Can be installed in far flung areas wherever no grid supply is available.**
9. **System runs by renewable energy.**



**10. Projects  
can be  
completed  
within one  
week.**





# Greenhouse Effect

1. Total saving up to 5 years per unit ( Diesel cost/electric cost for 12 hrs. ) Diesel-Rs.2,50,000 /-per HP Electricity-Rs. 90,000/-per HP approximately.
2. Coal need not to be burnt for producing this much electricity.
3. Near about 0.6 to 1.2 metric tons coal saving per scheme per year.
4. That is about 15-30 tons of coal for 25 years for only one scheme.
5. Due to one scheme, 30-37.5 tons greenhouse gases not produced in one year.





# Technical Details

## 1. Submersible

### Pump Set:

- a. **Type- Vertical Pump.**
- b. **Capacity-1 hp (as per water yield).**
- c. **Flow Range 900 lph to 1500lph.**
- d. **Pump head 55 to 75 m.**
- e. **MOC Stainless steel.**
- f. **Rated Speed 500 to 3600 rpm.**
- g. **Pump dia. 96mm (max.).**

## 2. Solar Panel:

- a. **Type-Mono / Polycrystalline Solar Panel.**
- b. **Wattage 900 watts.**
- c. **Wattage of each Panel 300 Watts.**
- d. **Output Voltage 36v – 45V.**
- e. **Frame Material Anodized Aluminum.**



# Parameters

## Preparation of Scheme

- It should not be far away from Bore well to avoid current losses.
- It should not be located under a tree or in shadow area.
- It should have proper foundation as the steel structure of solar panel has to withstand wind of up to 100 km/hr velocities.
- Hence it should not be located on exposed rocks.

## Storage Tank

- It should not be far away from source to minimize rising mains.
- It should be located such as to give adequate distribution by gravity to cover the entire habitation.
- It should have proper foundation within 2 m depth.

*Only one disadvantages is  
Pump operating limitation  
only in day time*



**Solar  
Drinking  
Water  
Solution  
should  
consider next  
CSR  
initiative.**



**Thank you**

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