



SAMTA POWER



NON - PROFIT EARNING COMPANY

Registered U/S 25 Company Act 1956
Registration No. K-17-022443 (2006-2007)

(An Initiative in Power Sector reform through People Participation)

Exploring Opportunities for Energy Access and Clean Drinking Water through Smart Mini-Grid (SMG) DC Microgrid and Solar Pumping System



Prepared for Rajasthan India

By

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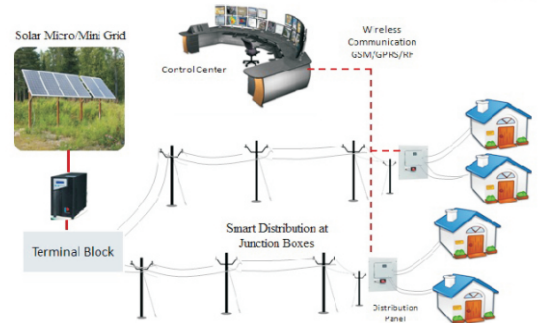


SMART MICROGRID PROJECT BY SAMTA POWER WITH TERI & MRIDAENERGY

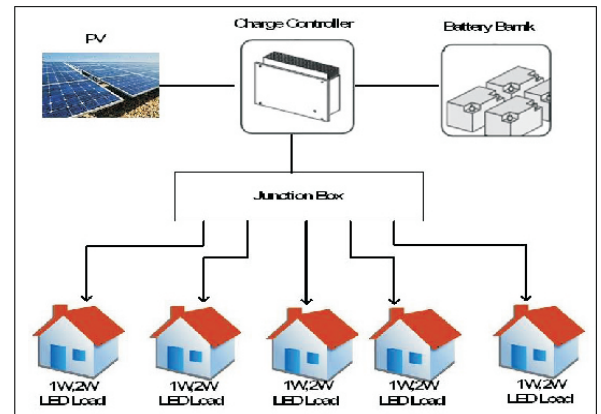
Stakeholders: Sarpanch, Village Committee, Local NGO, and Implementation Partners.



Future Technological Innovatio



240 Watt DC Solar Microgrid- 20 Households



INTRODUCTION - Samta Power a non-profit earning company, registered u/s 25 company act 1956, registration no. K-17-022443 (2006-2007) – An initiative in power sector reform through people participation.

- Samta Power has been providing consultancy services for project development and project facilitation services, we under take projects for promotion, use, testing and feasibility for renewable and conventional energy, and the popular acceptance and use of hybrid energy system. We have a dedicated team of engineers and people with technical expertise in the company.
- Samta Power begin to work with the poor rural people and with the rural women by helping them come together, articulate their need and aspiration a group and concentrate their impressive determination and strength on organizing them selves into a people's development organization.
- The renewable energy technology (RET) is the only be a means to empower rural people. Samta power (NGO) undertake the projects related to RET for sustainable Energy Solution, in rural areas/access to energy for the rural people.

ACCESS TO ENERGY FOR THE POOR IN RURAL AREA –

Access for reliable electricity for all is one of the key drivers of socio-economics development. However, according to the 2017 census data. 45 percent of rural household (HHs) lack access of electricity supply.

- The National electricity policy 2005 recognize electricity as a major driver of rural development and hence that of poverty alleviation.
- Poor people have been living in some of the worst condition for centuries in spite of these people have learnt to survive as there were no other option available with them. Major percentage of population (about 75 percentage of population) lives in villages spread through out the country. Some of the villages are located in very remote and far-flung areas and there fore in accessible. Over 35 percentage of people in rural area of india are living below poverty line majoring of the people living in these villages have either no access or only limited access to sustainable energy.
- The failure of government to achieve significant rates of electrification has meant that off grid energy sources such as solar lighting system, small

scale “decentralized renewable energy generation system” in an off grid stand alone remote system can be used for electrification of remote villages.

- “DRE System” use local renewable resources like biomass, water, sunlight and wind, to generate electricity. Such microgrids can play an important role in bridging the electricity access deficit by providing access to remote villages which can not be electrified through central grid extension due to techno Economic consideration.
- Several government and non government agencies are promoting DRE in India. The ministry of power (MoP) through its DDG (Decentralised Distribution Generation) policy and ministry of new renewable energy (MNRE Standard) through its various scheme such as the village energy security programme (VESP) and remote electrification (RVE) program play a central role in remote rural electrification but still the poor rural house hold residing in remote-village-dhanis could not be provided with the electricity through any of the scheme mentioned above.
- Recently this matter was discussed with the authority of jodhpur discom and as intimated by Discom chief engineer @ 1.10 Lacs of such rural house hold can not be electrified by Discom through grid connecting lines or through any off grid solar system.

RURAL PEOPLE AND PRESENT ENERGY USES FOR DOMESTIC PURPOSE –

Rural people in India have been meeting their domestic cooking needs from fuel, wood seasonal biomass from crop and animals residues, burnt as inefficient fuels which are mainly collected by women. This is the main cause which contribute to their drudgery and leads to both indoor and outdoor pollution and environment problem.

- The male of the house is not critically aware about the drudgery of the female and children.
- In the house hold in collecting fuel wood and making animal dung cake as fuel, for cooking of food.
- Male are much less concerned about indoor pollution due to cooking affecting health of women, girl child and children staying with their mother in the house.

- Children education is also affected due to no proper lighting arrangement in the house and environmental and health risk.
- Efforts have been made in last two decade to solve the rural energy problem using renewable energy technology (RET).
- In the socio – technical approach the local community/NGO can only be a means to implement RET program in rural areas. “RET” is only be a mean to empower such poor rural people.

DRINKING WATER CRISIS IN RAJASTHAN –

Rajasthan is India’s largest state with its area of 342.24 sq km. It has an estimated population of 5,64,73,122 (male – 3,93,81,653) (Female – 2,30,91,465) spread over its 41538 villages The economy of the state is primarily based on agriculture and animals husbandry. In Rajasthan 90 % of the population depends on ground water for drinking and irrigation purpose. The ground water table is going down at the rate of @ one meter per year. As a result, the water supply system of many towns, villages and habitations have been put under great strain due to reduction in yield from hand pumps, tube well and open well.

The rural habitation in the villages are being categorized on the basis of settlement pattern in to “Gaanvs” and “Dhaanis. The ‘Gaanvs’ being more concentrated with a high population density and ‘Dhaanis’ being a location of low population density. Also it is found that the problem faced by the people living in ‘Dhannis are quite different from those living in Gaanvs. While there are tube well in the ‘Gaanvs”, the woman in Dhannis have to collect water from open dry wells, ponds, water log ponds of rainy water. In remote habitation Govt. of Rajasthan is not proposing any scheme for making availability of drinking water for such rural people. Water tankers are being sent in villages of dense population but the poor people staying in remote low population density Dhanis are not getting any Support from the Govt. agencies, and have to depend upon these old traditional source of water which is not good for their health. Few example of such areas are given below –

- In Sadavatin village of Jodhpur Dist the villagers have revived a 40 years old village pond, now hold rainy water to last the families for a years.
- Credit goes to the women of Aknandhana village for recharging the largest number of traditional berries. The 100 No of berries de silted in Akhandhana are said to be 200 years old.

- People of Jajiwal village near Jodhpur have been facing water crisis as the ponds from which they use to collect water from the dry pond by digging in the mud. There are 400-500 families in village and they are left with no choice but to drink the water from the ponds. Only source of water is the pond as the pipe line is not working.
 - With only 44% of its rural habitation fully covered by drinking water supply, Rajasthan rank low in a recent Niti Aayog report.
 - NDTV News – women are walking 3-5 km for fetching water and do three trips a day.
- *13500 village in Rajasthan run out of drinking water.

MAP OF RAJASTHAN -



Map of Jodhpur Distt. –



WATER harvesting in place and its potential for remote – village & Dhanis – Water harvesting and conservation at basin, area, field at micro level can bring sustainability to the water sector. There are several kind of rain water harvesting system such as Talab, Nadi, Tanka, Khadin, Kund and harvesting of roof water. With the implementation of Govt. scheme for domestic water supply in many areas, some of these systems were neglected.

Dependency on drinking water sources is rural areas - The dependency of population on the sources of drinking water in such remote village / Dhanis are as under.

S.No	Sources	% of Population dependency
1.	Nadis	42.4%
2.	Tankas	34.7%
3.	Openwell / T.Well	15.0%
4.	Kund / other	7.8%

Need for addressing issues effectively – The technological approach to the implementation treat the RET as an end to end it self/choosing right RET solution. An important task for each area village or even family is to choose the best solution among the many option available. In other words local people are expected to invest their saving in technologies sold by manufacturer who use rural area as market place without addressing to the important need of local people.

Therefore it has become necessary for Government to look into the gravity of the problem of drinking water of these poor people and support for their lively hood.

Sustainable Energy Technology – Various Sustainable energy technologies which are largely proved to have benefited the poor rural people are put up below.

A. Devices – The national Program on improved Chula (NPIC) was started in 1986-87 by Govt. of India as Program for women, by women with the following objective.

- Conservation of fuel wood and other biomass.
- Removal of smoke from kitchen.
- Reduction in the drudgery of women and girl child from cooking in smoky Kitchen.
- Reduction of health hazard.

Still most of the HHs are not being provided with such improved Chula. and cause health hazardous to women & girl child of such population.

B. Electricity & Mechanical Devices –

A large population are completely deprived of electricity (energy). Some of the sustainable energy technologies developed to produce electricity through several models as –

1. Photovoltaic system – The following type of systems are used for home lighting in such remote rural areas –

- Solar lantern
- Solar D/c micro grid home lighting system
- Solar street light

- Solar pumps for pumping drinking water from kund, Tanka, Nadi, Khadin, Talab, open well near the dhaanis.
- Solar photo voltaic refrigerator

Achievements of Samta Power –

Samta Power is working for the project : “Access to energy for the poor in rural Areas” The (Clean energy option) Jointly collaborate with “TERI” “GRAM – power and Mrida energy in the following projects as under –

1. “TERI” smart solar microgrid (SMG) for “ off grid” Rural Electrification and energization of solar pump in Rajasthan.
2. “GRAM POWER” smart solar micro grid for “off grid” Rural electrification in Rajasthan
3. “MRIDA ENERGY” and Samta power are Jointly working for remote village electrification, empowering villages life through solar DC Mini Grids, Solar DC Micro grid.

Smart Micro grid Project by “Samta Power” with “GRAM POWER” – Electrified a Dhani namely “Upali Bhabhan” of Sojat road Pali Distt. In the year 2012. The No. of Houses 60 Nos. having 330 Population The Dhani is in forest Area and the Forest Department do not permit the Discom to lay the electricity Line in the Areas.







OFF GRID DC MICROGRID FOR ELECTRIFICATION OF RURAL HOUSE HOLDS BY JODHPUR DISCOM - Jodhpur Discom has installed off grid DC Micro grids at @ 40,000 Rural House Hold. Still @ 1.10 Lac rural House holds remain pending for Electrification and DISCOM has no any Scheme for electrifying there house holds, as the house holds are scattered and are in remote area.

Details of material installed for SPV Home Lighting System (200 wp)

S.No	Item	Capacity	Qty.	Standards
1.	P.V. Modules	200 wp	1 No. of 200 W or 2x100 wp	Crystalline mono/poly as per MNRE Standard
2.	Pole with Module Mounting Frame Structure	Suitable for 200 wp Module	1 No.	As per Specification
3.	Battery Bank	Lithium Ferro Phosphate (Lifepo4) Battery 12.8 V (DC) 80 AH.	1 No.	Single cell of the battery should be of 3.2 v, 40 AH & 80 AH
4.	MPPT Charge Controller with retook monitoring provision.	Suitable MPPT, inter-grated DC charge controller.	1 No.	As per Specification
5.	Cable	2Cx1.5 sq.mm	30 Meter	As per specification

	(controller/fixture /applications)	(copper cable)		
6.	Electric Application	Fixture of LED Luminaries of 7 W _D each with in built driver and control electronics.	5 No.	As per specification
		DC Fan (15 W – 20 W)	1 NO.	As per specification
		12 V TD 50 ck x	1 No.	As per specification
		USB Port for mobile charging	1 No.	

STATEMENT SHOWING RURAL HOUSE HOLDS TO BE ELECTRIFIED THROUGH SOLAR SYSTEM (OFF GRID DC MICROGRID) IN JODHPUR DISTRICT

S.NO.	NAME OF BLOCK	DISCOME SUB DIVISION	NO. OF HOUSE HOLDS
1	BALESAR	BALESAR	672
2	OSIA	MATHANIA	576
3	LOHAWAT	MATORA	531
4	LUNI	SALAWAS	710
5	SHERGARH	SHERGARH	998
6	BAROI	BAROI	2282
7	BHOPALGARH	BHOPALGARH	2835
8	BILARA	BILARA	879
9	BILARA	BORUNDA	508
10	SHEKHALA	CHAMU	307
11	DECHU	DECHU	339
12	OSIA/BAORI	HATUNDI	850
13	MANDORE	MANDORE	564
14	BILARA	PIPAR CITY	2224
15	MANDORE	NANDARI	299
16	BAP	BAP	677
17	PHALODI CITY	PHALODI	73
18	PHALODI	AAU	1491
19	LUNI	LUNI	652
20	BALESAR	SHEKHALA/KHETU	630
21	PHALODI	PHALODI (RURAL)	950
22	OSIA	TINWARI	1087
23	OSIA	OSIA	780
24	PHALODI	LOHAWAT	761
Total			21679

Electrification of Schools in Remote rural Area - In this regard it is to bring to your kind notice that Samta Power (NGO) registered under section 25 of company act 1856, has carried out preliminary survey of schools in remote village of Gram Panchayat P.S. Bap and found that in 24 No. Gram Panchayat of P.S Bap 279 No. of Primary/Middle school are functioning in remote village of these 24 Gram Panchayat and out of these 279 school only 71 No. of schools are having electricity connection by Discom and about 208 No. of schools are not been connected by Discom grid, as the net work is not existing near by within radius of 2 to 8 Kms.

- The children are coming to school from 2 to 8 Kms from their home. The basic requirement of electricity and potable/filtered drinking water is not being provided to the children.
- Such schools can be electrified through solar PV Roof Top System with battery back up ie. Solar off grid system, and RO Plant/Filter Plant can be operated through solar PV System.
- The status of electrification has been found as under.

S.No	Name of Gram Panchayat	Total No. of Primary/Middle Schools	No. of Schools having electricity connection of Discom	No. of Schools having No. Electricity connection
1	Jaisala	13	1	12
2	Kalensar	15	4	11
3	Champasar	14	2	12
4	Kanasar	19	2	17
5	Raneri	12	3	9
6	Rohina	10	3	7
7	Jamba	15	6	9
8	Nokhada-Charana	11	4	7
9	Morai	11	4	7
10	Malar	9	3	6
11	Kalyansingh Ki Sid	12	6	6
12	Chimana	10	2	8
13	Tekara	11	2	9
14	Chatchu	16	3	13
15	Tepu	9	1	8
16	Sekhasar	17	2	15
17	Neneu Village	13	3	10
18	Badi-Sid	7	3	4

19	Bawari-Kalla	13	6	7
20	Gator	10	1	9
21	Charnai	9	1	8
22	Dedasari	5	2	3
23	Sh. Surpura	10	4	6
24	Sanwara-Village	9	3	6
Total		279 Nos.	71 Nos.	208 Nos.

Such un electrified schools can be electrified under DDUGJY Scheme through off grid solar system

भास्कर सांड रिपोर्ट 2 रिपोर्ट, 13 जिले, 2000 किमी यात्रा ₹37 हजार करोड़ का ईस्टर्न कैनाल प्रोजेक्ट, 6 साल बाद भी मिला क्या... 9,600 करोड़ का वादा आप पढ़ रहे हैं देश का सबसे विश्वसनीय और नंबर 1 अखबार

दैनिक भास्कर
राजस्थान
जोधपुर, मंगलवार, 22 मार्च, 2022
दैनिक भास्कर पृष्ठ-5, 2078

अल इंडियन आज
शुक्र-रविवार
सं 15 बार
पञ्चवार, एक
दो सप्ताह हर
सप्ताह पाचों से
परसोती लोक
आगर राजस्थान
पुष्पा का जलवा
चुनौती स्टेट ने
मिशनर बनाई
डोसीआर

कागजों में कैनाल
प्यासा आधा राजस्थान

अपनी सरकार से मांगो पानी; आगरा के गांव से जल
ला रहीं भरतपुर की महिलाएं, रोज सुनने पड़ रहे ताने

प्रदेश सरकार, केंद्रीय बंगी-सांसद, इस तस्वीर पर शर्मावा हैं आप?
हाथ-पैर अकड़ें, टेढ़ा हो गया मुंह

भास्कर Explainer
ईआरपी अटकने की प्रमुख वजह-संबल का खलत पानी मग से आता है
उत्तरी अरुण के किनारे एआरपी का लिए

500 परिवारों ने छोड़े घर, 3अड हो गये गांव
पुरुष पर टिकी सरकार, 14 मंत्री भी खरी से...
भाजप नेता ईआरपी पर केंद्र में पैरवी करें- सांसद

जहां-जैसा दिख जाए, बस जुट जाओ, सबसे बड़ी समस्या पानी रातों की उड़ी नींद: पानी के लिए जद्दोजहद

पानी. पारा बढ़ते ही राजनगर में ग्रामीणों तालाब के बीच गड़ड़ा खोदकर कुएं का रूप देकर उस पानी से अपनी व मवेशियों की प्यास बुझा रहे हैं। रात में गांव के लोग जलदाय विभाग की हौंदी पर पानी लेने आते हैं, बच्चे व महिलाएं दो से तीन किलोमीटर का गर्मी में पैदल सफर कर जरीकेन भरकर पानी ले जाती हैं। छोटे गड्ढे में जहां भी पानी दिख जाए, महिलाएं इसकी जुगत में जुट जाती हैं।

फोटो: दिनेश शर्मा

PROJECTS TO BE TAKEN UP BY SAMTA POWER IN JODHPUR DISTRICT :

The following projects to be taken up by SAMTA POWER for Jodhpur District in phase manner as under;-

- (1) Providing of off grid DC Micro grids(Home Lighting System) for 5326 House Holds in 1412 Habitations(Dhanis) for which Jodhpur Discom is not having any scheme for their electrification.
- (2) Providing of 1HP/2HP off grid portable solar pump for water lifting from Kunds/Nadis/Open wells/Talab for drinking water. In the vicinity/nearby 200 Nos. Dhanis of scattered and remote areas house holds. where Government Department is not having any scheme for providing them drinking water and the poor people purely depend upon rainy water.
- (3) Providing of 2kw roof top solar off grid system for electrification of schools in remote rural areas in BAP P.S of Jodhpur District.Jodhpur Discom is not having any schemes of their electrification.

DETAILS OF THE WORKS TO BE EXECUTED DURING NEXT FIVE YEARS.

S.No	Particular of works	Total Qty.	1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
1	Providing off grid DC micro (Home Lighting System at RHS	1412 Dhani	100	350	350	350	262
2	Providing of 1hp/2hp off grid Portable solar pumps for drinking water	200 Nos.	40	40	40	40	40
3	Providing of 2kw off grid solar system At schools in remote rural area	200 Nos.	20	45	45	45	45

ESTIMATE FOR EXECUTION OF WORKS OF FIRST PHASE (FIRST YEAR)

S.No	Particulars of Works	Qty.	Rate	Total Estimated Cost
1	Providing of HLS at rural H/H	100 Nos.	Rs.40000/-	Rs.40.00 Lacs
2	Providing of Solar Pumps	40 Nos.	80000/- each	Rs. 32.00 Lacs
3	Providing of 2Kw SPV System for schools in remote area	20 Nos.	2.00 Lacs/each	40.00 Lacs
TOTAL				112.00 Lacs

The total funds requirement comes out to be Rs.112.00 Lacs which can be provided by any Agency/Govt. of Rajasthan/Govt. of India. In three phases as under:-

S.No	Phases	Rs
1	For first phase Pilot Project	50.00 Lacs
2	For Second Phase	30.00 Lacs
3	For third Phase	32.00 Lacs

FOR PILOT PROJECT DETAILS OF WORK TO BE EXECUTED -

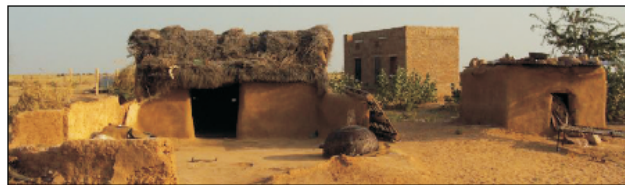
S.no	Particular of works	Qty.	Rate	Estimated cost
1	Providing of SPV Home Lighting system for rural house hold	30 nos	40,000/- each	Rs. 12.00 Lacs
2	Providing of 1 Hp/2Hp solar pump for dewatering drinking water.	10 nos.	80,000 /- each	Rs. 8.00 Lacs
3	Providing of 2kw SPV system for Electrifications of schools	15 nos.	2.00 Lacs / each	Rs. 30.00 Lacs

After accessing the work progress of Pilot Project the funds can be released by the Agency for taking up the balance works of First Phase (First Year). The proposed works can be completed by Samta Power if the required funds are made available as per phasing for five years. These proposed works for the rural people can only be done by NGOs as neither Govt. of India nor Govt. of Rajasthan are having any scheme for execution of the works and the poor rural people in remote area are compelled to live in this condition for generation to come.

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Retd. Chairman & Managing Director (CMD)
Jodhpur Discom
Director Samta Power Jodhpur



SMART MICROGRID PROJECT WITH TERI
Bhato Ki Dhani BAP



Bishnoi Ki Dhani BAP






Thank you



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