

# Financing of Solar Energy Generation by Regional Rural Bank

## (A Case Study of Aryavart Gramin Bank in Uttar Pradesh)

Dr. Anoop Kumar Singh\*, Saima Dilshad\*\*

\* Assistant Professor, Department of Applied Economics, Faculty of Commerce, University of Lucknow

\*\* Research scholar in the Department of Applied Economics, Faculty of Commerce, University of Lucknow

**Abstract-** Regional Rural Banks are the banking financial intermediaries working especially for the development of rural sector of Indian economy. The main aim of establishing these institutions was to facilitate the rural people with core banking functions in general and loaning to those landless and marginal farmers, artisans, field workers etc. who could not access to other sources of organised financial system. RRBs not only work for providing finances but also cater additional responsibilities of developing rural areas through various development programmes like rural employment schemes, women entrepreneurship, rural infrastructural development, SHGs etc. This paper highlights the role of Aryavart Gramin Bank in lending to priority sector and their achievements so far. A special emphasis has been given to the study of solar homes lightening system (SHLS) provided by Aryavart Gramin Bank through micro finance to the rural people of Uttar Pradesh for solar home lights, for which they were honoured with “ASHDEN INTERNATIONAL AWARD” in 2008 and “INDIA POWER AWARD” in 2009. The proposed study is exploratory and descriptive in nature and based upon the analysis of secondary data.

**Index Terms-** SHGs, SHLS, RRBs, AGB

### I. INTRODUCTION

Rural financial institution builds sound social and institutional infrastructure that can meet educational, health, drinking water, transport, communication and energy needs of rural household. A regional rural bank not only deals with providing loans and other banking facilities to rural poor but also caters additional needs of micro-finance. “Micro-finance refers to provision of small scale savings, credit, insurance and any other financial services to those who cannot access them from financial institution.” Due to issue of risk and cost associated with servicing the larger no. of small low input capital business, the formal sector lending to micro-enterprise is low. Regional rural bank offers a variety of potential advantage for financing micro-enterprise like commercial outlook and relatively sophisticated skills. Apart from acting as a credit provider, the bank acts as a change agent by helping people in acquiring the basic knowledge of business, policy environment etc.

Aryavart Gramin Bank which is one of the leading banks among the RRBs of Uttar Pradesh has sanctioned total of 100273.83 lakhs loan by the end of financial year 2011-12 for priority sectors and the total outstanding amount of the bank has

been Rs 163538.05 lakhs as on end of financial year 2011-12. Solar home lightening system which is one of the constituent of priority sector lending by Aryavart bank has issued loan of Rs 12883 lakhs up to financial year 2011-12, for the rural electrification purpose which is the second highest lending for this project by any other rural bank till the 2012.

### II. OBJECTIVES OF THE STUDY

- To review the role of regional rural banks in priority sector lending.
- To review the role of Aryavart Gramin Bank in priority sector lending.
- To focus on the scope of solar energy in India.
- To highlight the role of Aryavart Gramin Bank in promoting the rural electrification through solar energy.
- To assess the future prospects of financing for solar energy by RRBs

### III. REVIEW OF LITERATURE

At the moment, solar energy and distributed generation is the best space for rural energy in India. A large part of the country receives good insulation for over 300 days. One of the chief advantages of solar energy is its ability to be customised for individual household needs – generation can be tailored to closely match the demand and financial constraints of the household. Installation does not require much time and maintenance, requirements are minimal. As aspirations and affordability rise, modules can be added, allowing greater loads and consumption. The range of applications, and the institutional mechanisms that have evolved to disseminate them, have made solar-based applications flexible as well as affordable. As a stop-gap measure, solar lanterns as a stop-gap measure, solar lanterns are perfect substitutes for kerosene lanterns. If we consider the negative implications on health, the poor quality of light and the cost of subsidised kerosene over the lifetime of a solar lantern, we can very easily see how it fares better on a head-to-head basis. For the 28 million households that will remain un-electrified at the end of RGGVY, the total kerosene subsidy for lighting requirements is estimated to be about Rs 170 billion over 15 years (less than the lifetime of a typical solar lantern). For the sake of comparison, providing solar lanterns with a 2.5W LED bulb and costing around Rs 1,600 (Chaurey and Kandpal 2009),

with a 90% subsidy, would cost the government Rs 40 billion.6 Solar home systems can come in multiple sizes and are amenable to configuration customisation in terms of panel wattage, battery capacity and number of lights and applications can be supported.

Government backing is required especially to provide access to poorer households for whom Affordability is a major barrier; even the down-payment requirements for loans, after factoring in capital subsidies, were found to be out of reach for many rural homes (Wong forthcoming).Further, quality and maintenance have been major issues with many donor-based programmes, where systems were given away for free or with very high subsidies, and this has also been the case in India (Chaurey et al 2004; van der Vleuten et al 2007).

The solar services industry in India is perhaps unique in leveraging the formal financial infrastructure. Sri Lanka and Bangladesh have relied on microfinance (World Bank 2008). In Latin America (Rogers 2006) and in certain regions in Africa (Gustavsson and Ellegard 2004), the leasing approach or micro-leasing, as it is called, has been prominent. Under this approach, the service provider has an energy service contract with the customer over the period of a few years. The customer pays a monthly fee while the service provider provides maintenance and continues to own the system.

#### IV. RESEARCH METHODOLOGY

The present study appraises the growth and performance of regional rural bank in priority sector lending. The concept of this paper was generated after an interview with the various officials of Aryavart Gramin Bank in Lucknow and around areas. This study is exploratory as well as descriptive in nature and made the use of secondary data by studying the websites of Aryavart Gramin Bank and furthers the financial report and review of financial statement of Aryavart Gramin Bank 2011-12 has been used for the statistical data and various schemes of the banks and their growth so far. The growth rate for solar home lightening system has been calculated by using simple growth rate formulae.

#### V. ARYAVART GRAMIN BANK

The **Aryavart Gramin Bank (AGB)** was established by [Government of India](#) Notification F. No. 1/4/2006-RRB dated 3rd October 2006, as a result of the amalgamation of three smaller Regional Rural banks namely Avadh Gramin Bank, Barabanki Gramin Bank and Farrukhabad Gramin Bank. It currently has 333 branches in rural areas of Uttar Pradesh, covering 7 districts with 254 rural branches. It functions under Regional Rural Banks' Act 1976 and is sponsored by Bank of India. As on 30<sup>th</sup> may 2012, AGB has registered Rs. 38.66 lakhs saving bank accounts with Rs. 4353.94 crore of deposits. There are total Rs. 5.47 lakhs loan accounts with a loan amount of Rs 2440.65 Crore.

One of the major focus of Aryavart Gramin Bank was to promote priority sector lending in the rural areas of Uttar Pradesh which brought about many key developments in the rural arenas, and the project of solar home lightening system was first time introduced by Aryavart Bank which was appraised by

Government of India as well as worldwide for which they were given ASHDEN INTERNATIONAL AWARD In 2008.

#### CONCEPTUAL FRAMEWORK AND WORKING OF SOLAR HOME LIGHTENING SYSTEM (SHLS) FINANCING SOLAR HOME LIGHT SYSTEM:

The bank's journey to improve living standard and welfare of the people residing in rural, semi urban and the urban area beset with frequent power cut through its innovative scheme of financing small product of solar home lightening system with mission of "ghar ghar mein ujala". Impressed with the bank effort, the Govt. of India, Ministry of New and Renewable Energy has launched new schemes in the name of "**capital subsidy-cum-refinance scheme**" under "**Jawaharlal Nehru national mission (JLNNSM)**". As many as 33679 solar projects have been financed till 2012 by AGB.

AGB started working on this concept to bring light in the lives of 14.86 million villagers residing in 8542 villages in its area of operation covering 6 districts (area 20396 sq km) in the state of Uttar Pradesh. Out of these villages, 2504 villages have no electricity at all and in electrified villages also the electric supply was erratic and hardly for seven hours in 24 hours, thus leaving the households in acute darkness. The life comes to a standstill after sunset in these villages.

To achieve the objective of bringing lights to these villages a financing scheme in the name of "ghar ghar me ujala saur urja se" meaning "every home to be lightened upon with the help of solar power" was developed and was started in the year 2006. **AGB** has tied up with TATA BP solar for supplying the SHLS to the customers. **TATA BP SOLAR** is a joint venture between Tata power co. limited, a pioneer in the power sector in India and BP SOLAR one of the largest solar companies in the world. Their model "Venus solar home lightening system" being cost effective was chosen as the product for the home loans. The bank had won international ASHDEN award in 2008 and two national award namely "India power award in 2009" presented by ministry of power, govt of India in November 2009 and by Bharti vikas trust, Udupi for excellent work done by the bank for promotion of solar energy by introducing its innovative scheme. The effort made by the bank were continued to be recognised at various national and international levels. In the year 2011-12 bank received \$65,117 USD as revenues of carbon credit. So total carbon credit revenues earned during the last two years is Rs 68.00 lakhs. This could be possible due to continuous follow up with micro energy credit corporation, USA and their kind support to relax certain norms and making agreement practically feasible with an amending agreement signed on 22.09.2010. **Aryavart Gramin Bank is the first bank in the country to receive such carbon credit on behalf of its customer on voluntary emission reduction (VER) basis.** The ministry of New and Renewable Energy, GOI has released Rs 23.83 lakhs including Rs 5.00 lakhs for cash award to top three branches of the bank under their incentive scheme for promoting solar energy for the year 2009-10.

Many rural areas of Uttar Pradesh have no grid electricity and even where the grid is available there is frequent power cuts. The 2008 ASHDEN award to Aryavart Gramin Bank highlights the significant contribution which the banking sector can make in bringing the solar photovoltaic (PV) electricity to rural

households. The major contribution of *AGB* in rural electrification was as follows:

- Bank finances two standard solar homes system: 35 WP of PV with two fluorescent lights and a socket and 70 WP with four lights and sockets.
- System cost us\$ 340 and us\$ 680 respectively, including installation and one year of service.
- Solar loan were provided only to existing *AGB* customer with a track record of reliable credit repayment.
- Customer makes a 20% down payment and loan for remaining 80% is paid back over five years. The repayment cost was relatively less than the cost of kerosene used for lightening.
- *AGB* branches promote SHGs by holding credit camps in villages, where speaker demonstrate the system and explain how the financing works. 1000 or more customers may sign up for solar loan at each camp.
- It is benefitting around 1, 00,000 people in the satrik, town of Barabanki itself.
- Students can study longer with solar lightening and neighbours can socialise more.
- Rural families can work in evening and earn more, which is particularly useful to women.
- *AGB* branches also use PV- powered back up power during main power cuts.
- Solar home lightening system has brought about reduction in carbon emission in an environment, thus reducing the pollution at larger level.

**SHARE OF ARYAVART GRAMIN BANK IN TOTAL RRBs WITH REGARD TO FINANCING TO SHLS**

S.NO.	CATEGORIES	RRBs	ARYAVART GRAMIN BANK
1.	TOTAL VILLAGE FINANCED	20508	1500
2.	NO. OF BORROWERS	152014	32414
3.	LOAN ISSUED	54162 (LAKHS)	12883 (LAKHS)
4.	LOAN OUTSTANDING	22515.97(LAKHS)	3207.18 (LAKHS)

India can be financed, thus eliminating the problem of electrification to a large extent. Looking at the mounting pressure of electricity demand and increasing significance of this sector, Government of India has also provided various incentives schemes to different rural banks which are working in this arena to promote the rural electrification through solar energy.

**SUPPORT AND SUBSIDY TO ARYAVART GRAMIN BANK BY GOVERNMENT OF INDIA**

When the scheme of solar electrification was launched there was no such financial or other support available from the government, but now the ministry of new and renewable energy (MNRE) govt. of India, has come out with an incentive scheme, giving incentives to banks and micro finance institution to support installation of solar homes lightening system and other small solar system through loans. This incentive is given to those bank and MFIs who have financed more than 3000 system. The amount of incentive is based on performance of banks and MFIs. *AGB* has been included in the group set up by MNRE, New Delhi to finalize the modalities to take the initiative for financing solar lightening system through banks.

**FINANCING SOLAR HOME LIGHTENING SYSTEM BY AGB**

S.NO	YEARS	NO. OF SOLAR HOME LIGTENING SYSTEM	GROWTH %
1	2006-07	134	-
2	2007-08	4404	31.86
3	2008-09	16130	119.37
4	2009-10	24684	183.20
5	2010-11	31287	232.48
6	2011-12	33679	250.33

Source: website of Aryavart Gramin Bank as on 01.05.2013

As per the reports of Aryavart Gramin Bank, till September 2012, 33679 solar home lightening systems have been sanctioned in various districts. Over a period of six years, the no. of SHLS financed by *AGB* has amazingly increased by around 250 times. Assuming that there is an average consumption of 8 litres of kerosene per month, it will result in annual saving of 32, 33,184 litres of kerosene. Assuming that there is an average of 5 family members in a family, *AGB* has benefited around 1, 68,395 villagers in one district alone.

- With capacity of 35 watt per SHLS, *AGB* have generated installed capacity of 1.1 megawatt.
- Most of all, it had led to carbon emission reduction up to 41419.84 tonnes for an average of 2 years.

**SOURCE: KEY STATISTICS OF RRBs**

Out of 82 RRBs in India only 33 RRBs deal with solar home lightening system and Aryavart Gramin Bank has been the key player in this system. In the last 5 years it has financed 1500 villages in single state, where the electric grid was not available. Its total share in the no. of borrowers as well as in loan issued has been remarkable with alone contributing more than 20% share. If all the RRBs of India undergo the financing of SHLS at the rate at which 33 banks are operating, around 50959 villages all over

**VI. CHALLENGES FACED**

With every success and achievement there comes a challenge and problems, of which main are given below:

- Lack of awareness and publicity regarding this system among the public.
- Lack of fully skilled personnel in the banks.
- In ensuring security of advance.
- Creating demand for solar home lightening system.
- After sale service and repair.
- Maintaining the system.
- Low repaying capacity of most of the villagers.

## VII. ACHIEVEMENTS

To begin with, the bank has covered 10 villages namely:

- Badri Purwa, Jhabaria, Gondwa And Bannai Of Hardoi District.
- Ambaur, Khanpur, Shivrajpur, Ranjeetpur, Pataunja and Satrik of Barabanki district, wherein 100% households have been financed with SHLS.
- The bank also plans to popularise already devised two or more schemes namely “financing for purchase of solar water heating system” and “ financing for purchase of solar power packs” from 2012 itself.
- The bank has an ambitious plan to provide SHLS to the villages where either grid power is not available or power supply is erratic.

## VIII. FINDINGS

- Aryavart Gramin Bank is one of the leading banks among all RRBs of Uttar Pradesh.
- It has issued loan up to Rs. 100273.83 lakhs for priority sector lending.
- A total of Rs 12883 lakhs has been issued so far for solar home lightening system by the end of financial year 2011-12.
- There have been a total of 32414 borrowers of *AGB* for SHLS itself.
- *AGB* has received carbon revenues up to Rs 68 lakhs in the last two years.
- Govt. of India has released Rs. 23.83 lakhs, including Rs 5 lakhs for cash award to *AGB* as incentives for promoting solar lights.
- It can be projected that around 51000 villages across the nation can be covered for financing for solar system if all 82 RRBs take initiative at the rate of financing by 33 RRBs for the same. Thus in the near future it may become a better alternative of electricity supply by Govt. Agencies.
- It has also led to the reduction in carbon level from those areas where solar system is being used.

## IX. SUGGESTIONS AND CONCLUSION

There has been a higher level of growth in installation of solar home lightening system over the years. Aryavart Gramin Bank has made significant contribution in the solar home lightening system and has also successfully planted the solar

energy in the rural areas of in an around Lucknow district. *AGB* has helped generating women empowerment as now more and more women are using their skills of embroidery and other handmade activities even after the evening in the dark hours as they have solar lightening in their home, children of these areas are now in a better position to focus in their studies as they have facility of solar lights, furthermore it is also helping in keeping our environment clean. In this era when our country is faced with huge problem of depletion of natural resources, and increase in the pollution level, solar home lightening system can be proved as the economic saviour both in the terms of saving environment and its resources.

The expansion of this system and growth trends can further be continued if all RRBs of India starts taking initiative for financing SHLS. Government of India is also taking interest in providing SHLS, where the grid is not available. It is providing the subsidy for these solar projects. But many parts of our rural economy are still in dark, people are unaware about SHLS and even if they are aware they are afraid to go to banks for the loaning process. For the proper implementation of SHLS, more of awareness programme should be launched by the Government and after sale services should be properly implemented and regular training should be provided to the consumers regarding its usage and keeping. Further government should direct all the regional rural banks to implement this solar home lightening system for rural electrification where grid power supply is not available. While looking at the trends of expansion SHLS during last one decade, we can visualise a rosy picture of our rural economy with respect to energy in the next 10 years to come.

## REFERENCES

- [1] Chaurey, A. & Kandpal, T.C., 2009. "finance, "Energy, Elsevier, vol. 37(1), pages 115-125, January
- [2] Gustavsson, M and A Ellegard (2004): "The Impact of Solar Home Systems on Rural Livelihoods: Experience from the Nyimba Energy Service Company in Zambia", *Renewable Energy*, 29(7): 1059-72.
- [3] Rogers, J (2006): "Innovation in Rural Energy Delivery-Accelerating Energy Access through SMEs",
- [4] Van der Vleuten, F, N Stam and R van der Plas (2007): "Putting Solar Home System Programmes into Perspective: What Lessons Are Relevant?", *EnergyPolicy*, 35(3): 1439-51.
- [5] Wong, S (undated): "Overcoming Obstacles against Effective Solar Lighting Interventions in South Asia", *Energy Policy*, forthcoming.
- [6] World Bank (2008): "Designing Sustainable Off-Grid Rural Electrification Projects: Principles and Practices", Operational Guidance for World Bank Group Staff, the Energy and Mining Sector Board, Washington DC.

## AUTHORS

**First Author** – Dr. Anoop Kumar Singh, Assistant Professor, Department of Applied Economics, Faculty of Commerce, University of Lucknow. Contact detail: Mob. No. 919450931858, Email- singhaklu@gmail.com

**Second Author** – Saima Dilshad, Research scholar in the Department of Applied Economics, Faculty of Commerce, University of Lucknow Contact detail: mob. No. 919454385812, Email- saimadilshad30@gmail.com

