

Use of Clean Energy in On-Farm Livelihood Security

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Livelihood security in rural areas can be broadly divided into three categories based on land use as primary criterion. Livelihood such as agricultural production depends on land. All such predominantly land dependent activities are covered under on-farm livelihood options. These include cultivation of paddy, wheat, vegetables, etc. Those livelihood activities that does not require cultivation but are of manufacturing or service category are called non-farm activities. These include input and output services for agriculture, agro-processing, transport, education, health, warehousing, retailing, etc. There are some activities which do not require large amount of land ownership are covered under off-farm category. These include goaterly, poultry, fishery, dairy, etc. They may require access to pasture for grazing, which can be part of community or forest land. On the basis of livelihood activities practiced by households in rural areas the clean energy requirement will vary. In this case study a cycle mounted solar operated irrigation system has been used. In this paper one case has been discussed from rural areas of South Odisha where the diffusion of clean energy products has taken place.

5.1 Use of Clean Energy in On-Farm Livelihood Security

Regions of South Odisha is basically a hard rock, hilly area, with scanty and uneven rainfall (Agri-Odisha Report, 2017). There is absence of irrigation facility and farmers in the area face difficult in harvesting a good yield in both Khariff and Rabi season (ibdi). In the view of providing round the year irrigation facility to the people, facilitating institution, financing institution, manufacturer and implementing agency came together to design and develop a cycle mounted solar operated irrigation system. The case has been discussed and actors and factors has been identified in the subsequent sections.

This study was undertaken for the member farmers of a cooperative called Pataneswari Agricultural Cooperative Society” (PACS) in South Odisha. The member farmers of the cooperative are also the rural consumers. “Pataneswari Agricultural Cooperative Society” (PACS) is basically a cooperative working in Jeypur and Kundra blocks of Koraput district of South Odisha dealing with agro forestry products.

Member farmers of the cooperative were facing the problem of water crises for irrigating their fields due to scanty rainfall and unavailability of reliable electricity. In order to provide solution, a cycle mounted solar operated irrigation system was designed and developed to help the member farmers and bring in livelihood security in the area. This system used a pentair DC operated submersible pump of 0.25 hp, with maximum head of 70 m head, with a discharge of 310 l/h. This submersible pump was donated by Tata Trusts to the facilitating institution, Harsha Trust. Harsha Trust is a professionally managed non-government organisation (NGO) based at South Odisha whose main objective is to implement grass-root level development projects for sustainable natural resource, enterprise-based livelihood promotion and provide better health care service in the rural areas of South Odisha. The cycle mounted solar operated irrigation system used 2 solar panels of 175W producing about 4.1 amp current. The system was used in a open dug well, with a overhead tank to store water. The solar panels were mounted on the carrier of a bicycle for easy movement from one farmer’s field to another. This system was basically used for irrigating small patch of land used for cultivation of vegetables. Member farmers of PACS used this system. The system was bought by the member farmers at Rs 25000. For purchasing the system it was difficult for the member farmers to access the capital at the initial stage. For solving this problem, member farmers were provided with easy financing options

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by making the payment on Equated Monthly Instalment (EMI) basis. The member farmers purchased the system with a minimum amount and rest amount was paid on instalment basis. Member farmers used this system and also rent it to other farmers who were facing the problem of irrigating their fields. Renting the system, helped the member farmers in paying their instalment in a easy and quick way. Through this initiative, defunct bore wells (due to unavailability of electricity) was revived for irrigation and the member farmers went for year-round vegetable production, helping in increasing of their income.

Here the cooperative took loan of Rs 2 lac from State Bank of India (SBI), to facilitate the promotion of cycle mounted solar operated irrigation system among the farmers. Community service providers (CSPs) of the cooperative were trained on technical and managerial aspects by the facilitating institution.

Further, the CSPs of the cooperative went on providing training to member farmers on installation of the system. Use of the system was considered as a ray of hope for the rural consumers having limited resources. Farmers, who had closely seen their crops dying due to scarcity of water, unavailability of electricity started using the system to ensure at least two-season crops in their field. After studying the case, a framework has been devised, presented in Fig 1.1. Various factors and actors have been identified and linkages has been established given in table 1.1, table 1.2 and table 1.3.

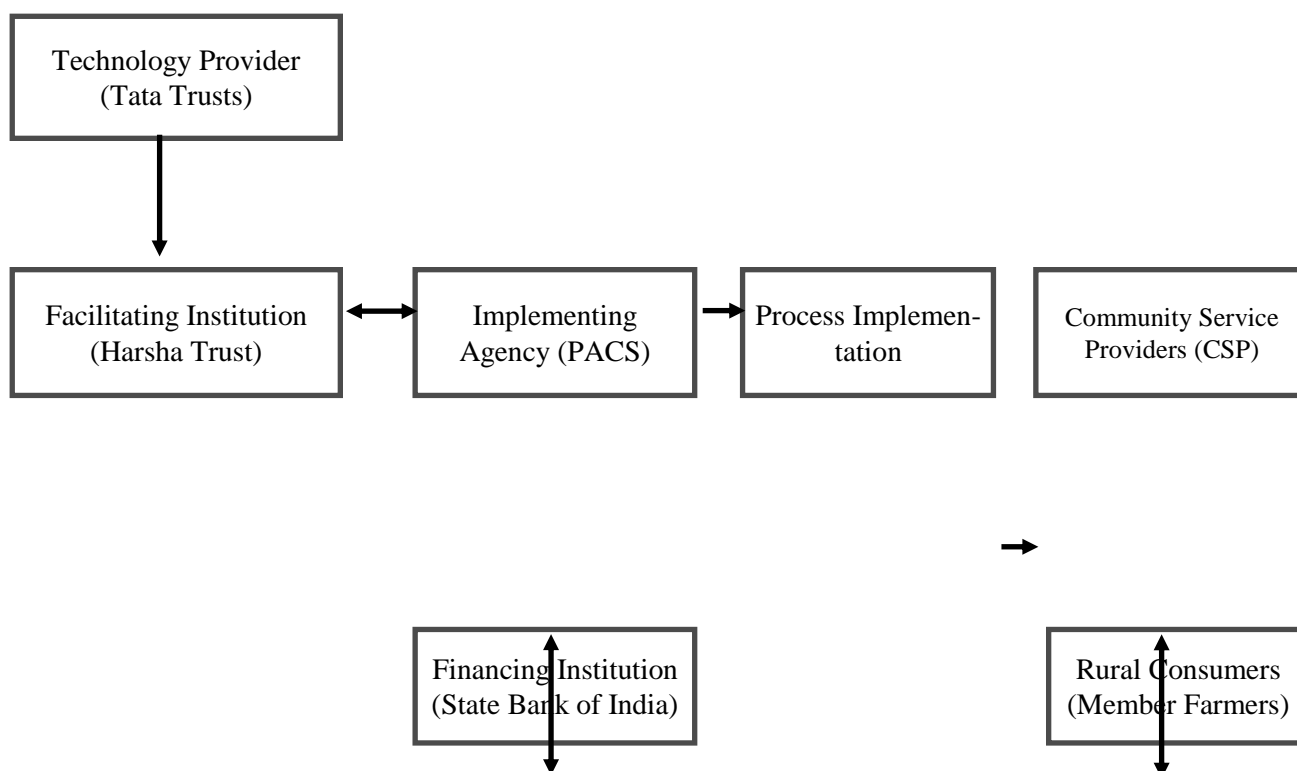


Fig 1.1: Framework for Clean Energy Use for On-Farm Livelihood Security

Tata Trusts act as a technology provider by donating the pentair DC operated submersible pump and its spares, to Harsha Trust. Tata Trust is among the India's oldest, non-sectarian philanthropic organisations which supports and drives innovation in the areas of energy, education, rural livelihoods, healthcare, water and sanitation, etc.

Harsha Trust act as a facilitating institution. It supported the implementing agency (PACS) in guiding, mentoring and providing handholding support through giving training to its CSPs. Harsha Trust provided the DC operated submersible pump to the implementing agency and guided in designing and developing the system. Harsha Trust helped the implementing agency in linking to the financing institution. It helped in preparation of the detail project report (DPR) for applying loan to the financing institution. Harsha Trust intention was not to earn profit but rather to promote clean energy usage. The reason for supporting the implementing agency was, although the member farmers of the implementing agency were getting enough profit from agro-forestry activities, but still they did not have access to clean energy which was important for improving quality of life.

State Bank of India (SBI) acts as a financing institution. It provided the loan with payable interest to the implementing agency, to facilitate the promotion of cycle mounted solar operated irrigation system among the farmers.

Pataneswari Agricultural Cooperative Society (PACS) act as an implementing agency. It developed a common thinking in identifying the problem of irrigation among its member farmers. It approached the facilitating institution, Harsha Trust and sought guidance and mentoring. It designed and developed the system. It approach the bank to provide loan for carrying out promotional activity, ultimately leading to diffusion of the system. PACS provided the system in easy financing options by making the payment for the system on EMI basis. It developed a monitoring mechanism to keep track of the payments being made by the member farmers. PACS implemented an IT enabled system. A designated toll free number was placed for receiving complains on malfunction of the system from the member farmers, which would help the CSPs reach the member farmers and provide service, repair and maintenance.

Process implementation focuses on the process of diffusion. Frequent interactions was held with the CSPs and member farmers by the implementing agency and facilitating institution. They were explained on the socio-economic benefits of using cycle mounted solar operated irrigation system. Live demonstration of the system was conducted in the field of a member farmer in order to create a sense of urge and motivating other member farmers to own it. More emphasis was given on how the use of the system would help in providing round the year irrigation facility, reducing drudgery, enhance income and easy instalments available, to own this system.

Community service providers (CSPs) were working in the implementing agency (PACS) in the field of agro-forestry, agriculture and livestock and were paid by PACS. They were given training by the facilitating institution on installation, repair and maintenance of the system. They focused on providing maintenance and service of the system when required and demanded by the member farmers.

Member farmers were the ultimate rural consumers for using the system. They took the system and used it in their fields. They were given training on installation of the system by the CSPs. They provided the system as rent to other farmers, which helped them in improving of their income and paying the instalment without any obstacle. From the case study, major actors and factors have been identified which are presented in the table 5.1 and linkages has been established.

Table 1.1: Actors and Factors Linkages for Clean Energy Use in On-Farm Livelihood Security

Factors and Actors	(i) Finance Related	(ii) Capacity Building Related	(iii) Technology Related	(iv) Infrastructure Related
(a) Member Farmers	<ul style="list-style-type: none"> Own the system in easy EMI Renting the system to other farmers 	<ul style="list-style-type: none"> Gained knowledge on technical aspects through attending training programs CSPs provided training to the member farmers 	<ul style="list-style-type: none"> Requirement of reliable, economic, efficient and affordable solution 	<ul style="list-style-type: none"> Creation of asset for the farmer
(b) Implementing Agency (PACS)	<ul style="list-style-type: none"> Developed the mechanism for easy payment of the system Approach bank for loan 	<ul style="list-style-type: none"> Identify problem through discussions and conducted meetings with member farmers and CSPs 	<ul style="list-style-type: none"> Design and developed the system Portable, easy to use, require less maintenance and require technical knowledge 	<ul style="list-style-type: none"> Developed a monitoring mechanism to keep track of the payments being made by the member farmers Toll free number for quick service delivery by CSPs
(c) Facilitating Institution (Harsha Trust)	<ul style="list-style-type: none"> Preparation of DPR Linking the implementing agency with Bank 	<ul style="list-style-type: none"> Provided training to the CSPs Held discussions with the implementing agency 	<ul style="list-style-type: none"> Donated the DC operated submersible pump Studied the technical features of the pump Provided technical guidance in design and development of the system 	<ul style="list-style-type: none"> Presence of Harsha Trust regional office Provided warehousing facility for keeping and storing of product and spare parts
(d) Technology Provider (Tata Trust)	<ul style="list-style-type: none"> No Linkage 	<ul style="list-style-type: none"> No Linkage 	<ul style="list-style-type: none"> Donated the DC operated submersible pump to implementing agency 	<ul style="list-style-type: none"> Robust supply chain was established by the implementing agency, CSPs and facilitating institution
(e) Financing Institution (SBI)	<ul style="list-style-type: none"> Provided loan to the implementing agency 	<ul style="list-style-type: none"> No Linkage 	<ul style="list-style-type: none"> No Linkage 	<ul style="list-style-type: none"> No Linkage

(ia) Finance Related- Member Farmers Linkage

The initial cost of cycle mounted solar operated irrigation system was high and the member farmers were weak in financial capability. Affordability without financial intermediation was low for the member farmers. Hence there was a need for financial intermediation. As a result the system was provided through easy financing options, by making the payment for the system on EMI basis. Member farmers rent the system to other farmers which helped them in increase of their income and pay the EMI easily.

(ib) Finance Related- Implementing Agency Linkage

The implementing agency developed the easy financing options. Implementing agency provided the system on EMI basis to its member farmers. They approached the bank in getting loan for undertaking promotional activity among the farmers in the region.

(ic) Finance Related- Facilitating Institution Linkage

The facilitating institution helped in linking the implementing agency with the bank. It guided the implementing agency in preparation of the detail project report for applying loan to the bank.

(id) Finance Related- Technology Provider Linkage

Tata Trusts, act as a technology provider by donating the pentair DC operated submersible pump to develop cycle mounted solar operated irrigation system. Tata Trusts under its philanthropic initiative donated the pump to the facilitating institution. From the present case, no such link could be establish between the finance and technology provider

(ie) Finance Related- Financing Institution Linkage

SBI acts as a financing institution. It provided the loan with payable interest to the implementing agency, to facilitate the promotion of cycle mounted solar operated irrigation system among the farmers.

(iia) Capacity Building Related- Member Farmers Linkage

Member farmers were given training by the CSPs which helped them in gaining knowledge on technical aspects related to operation of the system.

(iib) Capacity Building Related- Implementing Agency Linkage

The implementing agency held group discussion, meetings with the member farmers, CSPs and identified the problems being faced by the member farmers. They tried to find out possible solutions. They sought help from the facilitating institution.

(iic) Capacity Building Related- Facilitating Institution Linkage

The facilitating institution started providing training to the community service providers (CSPs) on different aspects. It ranged from technical to managerial aspects. They provided training on service, maintenance and repair of the system. In addition the facilitating institution conducted several meetings and provided handholding support in guiding and mentoring the implementing agency.

(iid) Capacity Building Related- Technology Provider Linkage

Tata Trusts objective is to undertake development programs at grassroots level in association with the Government bodies, international agencies and private organisations. They undertake various capacity building programs for NGOs, cooperatives, schools, etc. From the present case, no such link could be establish between capacity building and technology provider, as the Tata Trusts donated the pentair DC operated submersible pump to the facilitating institution.

(iie) Capacity Building Related- Financing Institution Linkage

Financing institutions conducts various awareness and sensitise programs for the rural consumers to adopt clean energy products. They provide loans and other financial products to the rural consumers. From the present case, no such link could be establish between capacity building and financing institution.

(iiia) Technology Related- Member Farmers Linkage

Member farmers were facing the problem of scarcity of water which led to dying of crops. They wanted a reliable, economic, efficient and affordable solution which would help them in providing round the year irrigation facility.

(iiib) Technology Related- Implementing Agency Linkage

The implementing agency bought the pentair DC operated submersible pump from the facilitating institution and started designing and developing the system. The DC operated submersible pump was placed in a bicycle and solar panels were placed on the carrier. They sought technical help from the facilitating institution. The system was portable, required less maintenance and was convenient to use. It did not require much technical knowledge to operate it.

(iiic) Technology Related- Facilitating Institution Linkage

The pentair DC operated submersible pump was donated by the technology provider. The facilitating institution undertook a thorough study on the technical features of the pump and its operating conditions. The pump was provided to the implementing agency. It provided technical guidance and mentored the implementing agency for designing and development of the system.

(iiid) Technology Related- Technology Provider Linkage

Tata Trusts undertakes initiatives to solve social problems by supporting innovators in technological sector. It works with some leading organisations to find and build innovative projects and also support them in funding. But from the present case, no such link could be establish between technology and technology provider as Tata Trusts donated the pump to facilitating institution.

(iiie) Technology Related- Financing Institution Linkage

Financing institutions like government, bank, donors, funding agencies, etc. provide financial support for setting up testing centres, laboratories, etc. which helps in design and development of clean energy product prototypes, but from the present case, no such link could be establish between technology and financing institution. As SBI only provided loan to the implementing agency for undertaking promotion for clean energy product among the farmers.

(iva) Infrastructure Related- Member Farmers Linkage

Cycle mounted solar operated irrigation system became an asset for the member farmers. As the system was placed on a bicycle carrier it became convenient to transfer from one field to another field for irrigation purpose.

(ivb) Infrastructure Related- Implementing Agency Linkage

The implementing agency developed a solar energy program card, which act as a monitoring mechanism to keep track of the EMIs being paid by the member farmers. Both the CSPs and the member farmers keep the solar energy program card to know the due date for payment of the EMI. In addition, the implementing agency also used an IT enabled system, a toll free number for quick service delivery by the CSPs.

(ivc) Infrastructure Related- Facilitating Institution Linkage

The presence of regional office of the facilitating institution act as a hub for discussions with the implementing agency and others. It provided a warehousing facility for keeping and storing the spare part of the system for easy accessibility by the CSPs.

(ivd) Infrastructure Related- Technology Provider Linkage

For any technology provider, having a robust supply chain infrastructure is a crucial requirement for its growth and reaching its consumers. An improved supply chain infrastructure will directly result in improvement of ease of doing business and helps in creating a larger consumer base. From the case, the supply chain was established by a collaborative approach between the implementing agency, CSPs and the facilitating institution.

(ive) Infrastructure Related- Financing Institution Linkage

Financing institutions like government, banks, donors, funding agencies, etc. undertakes efforts in building physical infrastructure such as availability of reliable electricity, rural transportation services, proper sanitation, etc. and for people's development availability of health centres, education institutions and housing facility in rural areas. But from the present case, no such link could be establish between infrastructure and financing institution, as SBI only provided loan to the implementing agency for undertaking promotion for clean energy product among the farmers.

From the case study, major actors and actors have been identified which are presented in the table 1.2 and linkages has been established.

Table 1.2: Actors and Actors Linkages for Clean Energy Use in On-Farm Livelihood Security

Actors and Actors	(i) Member Farmers	(ii) Implementing Agency (PACS)	(iii) Facilitating Institution (Harsha Trust)	(iv) Technology Provider (Tata Trust)	(v) Financing Institution (SBI)
(a) Member Farmers	No Linkage	<ul style="list-style-type: none"> Identify the problem of irrigation 	<ul style="list-style-type: none"> Have access to clean energy 	<ul style="list-style-type: none"> Requirement of reliable, economic, efficient and affordable solution 	<ul style="list-style-type: none"> State Bank of India (SBI) acts as a financing institution. No such linkage
(b) Implementing Agency (PACS)	Same as (iia)	No Linkage	<ul style="list-style-type: none"> Guided, mentored and provided handholding support Provided the DC operated submersible pump and its spares Provided technical guidance in design and development of the system Preparation of DPR Linking the implementing agency with Bank 	<ul style="list-style-type: none"> Bought the pentair DC operated submersible pump from the facilitating institution and started designing and developing the system. 	<ul style="list-style-type: none"> State Bank of India (SBI) acts as a financing institution. Provided the loan with payable interest to the implementing agency
(c) Facilitating Institution (Harsha Trust)	Same as (iiia)	Same as (iiib)	No Linkage	<ul style="list-style-type: none"> Donated the pentair DC operated submersible pump and its spares 	<ul style="list-style-type: none"> Linking to the financing institution Preparation of DPR
(d) Technology Provider (Tata Trust)	Same as (iiv)	Same as (iivb)	Same as (iivc)	No Linkage	<ul style="list-style-type: none"> No such linkage

Actors and Actors	(i) Member Farmers	(ii) Implementing Agency (PACS)	(iii) Facilitating Institution (Harsha Trust)	(iv) Technology Provider (Tata Trust)	(v) Financing Institution (SBI)
(e) Financing Institution (SBI)	Same as (va)	Same as (vb)	Same as (vc)	Same as (vd)	No Linkage

(ia) Member Farmers- Member Farmers Linkage

No link can be establish between member farmers and member farmers.

(ib) Member Farmers- Implementing Agency Linkage

Same link as established between implementing agency and member farmers.

(ic) Member Farmers- Facilitating Institution Linkage

Same link as established between facilitating institution and member farmers.

(id) Member Farmers- technology provider Linkage

Same link as established between technology provider and member farmers.

(ie) Member Farmers- Financing Institutions Linkage

Same link as established between financing institution and member farmers.

(iia) Implementing Agency- Member Farmers Linkage

Member farmers of the implementing agency were facing the problem of water crises for irrigating their fields due to scanty rainfall and unavailability of reliable electricity. Members farmers discussed their problem with the implementing agency. The implementing agency identify the problem of irrigation among its member farmers and tried to find out a reliable, economic, efficient and affordable solution.

(iib) Implementing Agency- Implementing Agency Linkage

No link can be establish between implementing agency and implementing agency.

(iic) Implementing Agency- Facilitating Institution Linkage

Same link as established between facilitating institution and implementing agency.

(iic) Implementing Agency- Technology Provider Linkage

Same link as established between technology provider and implementing agency.

(iie) Implementing Agency- Financing Institution Linkage

Same link as established between financing institution and implementing agency.

(iia) Facilitating Institution-Member Farmers Linkage

Harsha Trust act as a facilitating institution. The facilitating institution wanted the members of the implementing agency to have access to clean energy which was important for improving quality of life.

(iib) Facilitating Institution-Implementing Agency Linkage

The facilitating institution supported the implementing agency. Although the member farmers of the implementing agency were getting enough profit from agro-forestry activities, but still they did not

have access to clean energy which was important for improving quality of life. Hence, the facilitating institution guided, mentored and provided handholding support to the implementing agency in promoting clean energy usage. It provided the DC pump to the implementing agency and guided in designing and developing the system. It helped the implementing agency in linking to the financing institution. It also helped in preparation of the detail project report (DPR) for applying loan to the financing institution.

(iiic) Facilitating Institution- Facilitating Institution Linkage

No link can be establish between facilitating institution and facilitating institution.

(iiid) Facilitating Institution- Technology Provider Linkage

Same link as established between technology provider and facilitating institution.

(iiie) Facilitating Institution- Financing Institution Linkage

Same link as established between financing institution and facilitating institution.

(iva) Technology Provider- Member Farmers Linkage

Member farmers wanted a reliable, economic, efficient and affordable solution which would help them in providing round the year irrigation facility. Tata Trusts act as a technology provider. It only donated the DC operated submersible pump and its spares, to the facilitating institution.

(ivb) Technology Provider- Implementing Agency Linkage

Here facilitating institution provided the DC operated submersible pump and its spares to the implementing agency. Implementing agency bought the pentair DC operated submersible pump from the facilitating institution and started designing and developing the system. From the present case, no such link could be establish between the technology provider and implementing agency.

(ivc) Technology Provider- Facilitating Institution Linkage

Tata Trusts act as a technology provider. It only donating the pentair DC operated submersible pump and its spares, to the facilitating institution.

(ivd) Technology Provider- Technology Provider Linkage

No link can be establish between technology provider and technology provider.

(ive) Technology Provider- Financing Institution Linkage

Same link as established between financing institution and technology provider.

(va) Financing Institution- Member Farmers Linkage

State Bank of India (SBI) acts as a financing institution. From the present case, no such link could be establish between financing institution and member farmers.

(vb) Financing Institution- Implementing Agency Linkage

State Bank of India (SBI) acts as a financing institution. It provided the loan with payable interest to the implementing agency, to facilitate the promotion of cycle mounted solar operated irrigation system among the farmers.

(vc) Financing Institution- Facilitating Institution Linkage

State Bank of India (SBI) acts as a financing institution. Facilitating institution helped the implementing agency in linking to the financing institution. It helped in preparation of the detail project report (DPR) for applying loan to the financing institution.

(vd) Financing Institution- Technology Provider Linkage

Tata Trusts, act as a technology provider and State Bank of India (SBI) acts as a financing institution. From the present case, no such link could be establish between financing institution and technology provider.

(ve) Financing Institution- Financing Institution Linkage

No link can be establish between financing institution and financing institution.

From the case study, major factors and factors have been identified which are presented in the table 1.3 and linkages has been established.

Table 1.3: Factors and Factors Linkages for Clean Energy Use in On-Farm Livelihood Security

Factors and Factors	(i) Finance Related	(ii) Capacity Building Related	(iii) Technology Related	(iv) Infrastructure Related
(a) Finance Related	No Linkage	<ul style="list-style-type: none"> • Gaining knowledge on financial aspect • Ability to identify problem • Provision of training • Knowledge on techno-managerial aspect 	<ul style="list-style-type: none"> • Product given in easy financing option • Renting the system for EMI payment 	<ul style="list-style-type: none"> • Asset creation through easy financing options • Monitoring mechanism for tracking payment
(b) Capacity Building Related	Same as (iia)	No Linkage	<ul style="list-style-type: none"> • Training on installation of the system • Understanding the technical features through demonstration 	<ul style="list-style-type: none"> • Availability of physical space for discussion
(c) Technology Related	Same as (iiia)	Same as (iiib)	No Linkage	<ul style="list-style-type: none"> • Facility of warehousing and storing spare parts of the pump • IT enabled system, a toll free number
(d) Infrastructure Related	Same as (iva)	Same as (ivb)	Same as (ivc)	No Linkage

(ia) Finance Related- Finance Related Linkage

No link can be establish between finance and finance.

(ib) Finance Related- Capacity Building Related Linkage

Same link as established between capacity building and finance.

(ic) Finance Related- Technology Related Linkage

Same link as established between technology and finance.

(id) Finance Related- Infrastructure Related Linkage

Same link as established between infrastructure and finance.

(iia) Capacity Building Related- Finance Related Linkage

Member farmers gained knowledge on financial products, schemes, subsidy available, etc. which would help in diffusion of clean energy products in rural areas. Through discussion, experience they were able to identify the problems they were facing for irrigation. They were provided training on techno-managerial aspects related to operation, managing of the system.

(iib) Capacity Building Related- Capacity Building Related Linkage

No link can be establish between capacity building and capacity building.

(iic) Capacity Building Related- Technology Related Linkage

Same link as established between technology and capacity building.

(iid) Capacity Building Related- Infrastructure Related Linkage

Same link as established between infrastructure and capacity building.

(iia) Technology Related- Finance Related Linkage

The system was provided through easy financing options, by making the payment for the system on EMI basis. Member farmers rent the system to other farmers which helped them in increase of their income and pay the EMI easily.

(iib) Technology Related- Capacity Building Related Linkage

Member farmers were given training. Through discussions and demonstration of the system they understood operation of the system.

(iic) Technology Related- Technology Related Linkage

No link can be establish between technology and technology.

(iid) Technology Related- Infrastructure Related Linkage

Same link as established between infrastructure and technology.

(iva) Infrastructure Related- Finance Related Linkage

The system became an asset for the member farmers. The member farmers acquired the system though EMI, which helped the member farmers in providing round the year irrigation, reducing drudgery and enhancing their income.

(ivb) Infrastructure Related- Capacity Building Related Linkage

Availability of physical space for discussion with member farmers, and other actors helped in understanding the problems and come out with reliable, economic, efficient and affordable solution.

(ivc) Infrastructure Related- Technology Related Linkage

Availability of a warehouse facility for keeping and storing the spare part of the system helped in easy accessibility to the community service providers to provide quick service. An IT enabled system, a toll free number was in place for quick service delivery.

(ivd) Infrastructure Related- Infrastructure Related Linkage

No link can be establish between infrastructure and infrastructure.

From the case study, major role was played by the implementing agency, facilitating institution and member farmers. Factors such as cost of the product, payment through EMI, portability of the product, renting the product, easy to operate, demonstration of the product, repair and maintenance by CSP and system as an asset for the member farmers were some of the factors which helped for the

diffusion of cycle mounted solar operated irrigation system. There was a need for a strong technical service partner to last mile connectivity which was fulfilled by the facilitating institution, implementing agency and the CSPs. Presence of a warehouse facility with availability of system and spare parts of cycle mounted solar operated irrigation system, provision of training to CSPs on service, repair and maintenance and a designated toll free number for quick service delivery was also put in place. With the introduction of EMI scheme and the use solar energy program card, it was easier for the member farmers to pay for the system and track their payment easily. It act as an effective monitoring mechanism. Involvement of various actors and factors, helped in the diffusion to take place.

The cycle mounted solar operated irrigation was used by 6 member farmers of “Pataneswari Agricultural Cooperative Society” (PACS) working in Jeypur and Kundra blocks of Koraput district of South Odisha.

Reference

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