

From

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To


Chief conservator of Soils,
Department of Soil and Water Conservation, Punjab
Chandigarh

Memo No.: 1104 /PFDC
Dated, Ludhiana, the: 04-07-2016

Subject: Evaluation study of the "Solar Powered community Micro irrigation project for Talwara and Hajipur blocks of the Hoshiarpur District".

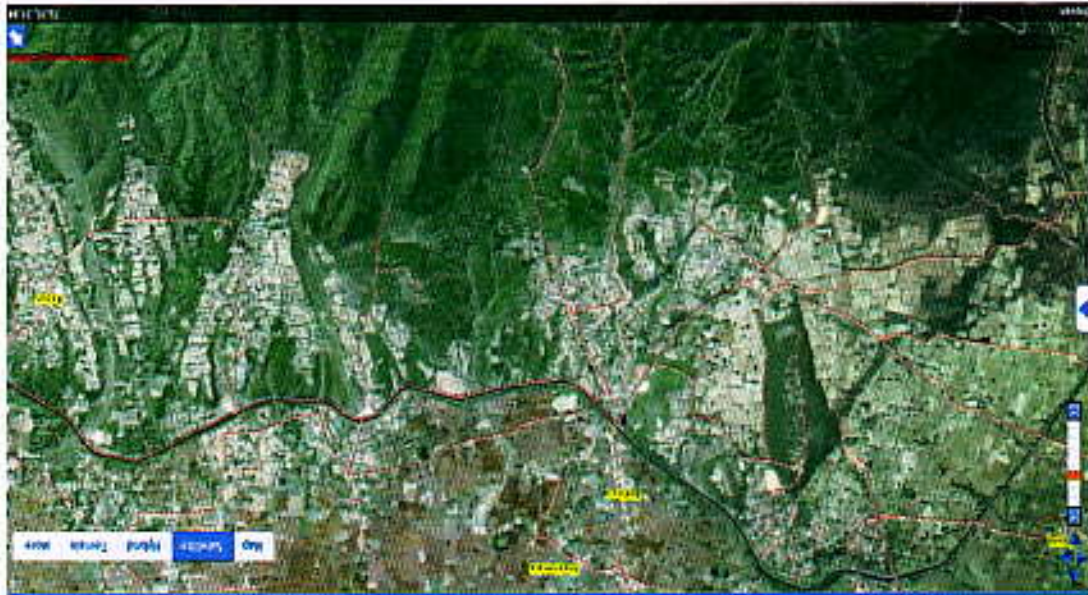
Precision Farming Development Center conducted an Evaluation study of the "Solar Powered Community Micro irrigation project for Talwara and Hajipur blocks of the Hoshiarpur District" during Rabi 2015-16. Five copies of the same are enclosed herewith for your kind information and record.

Yours sincerely,



(Dr. Rakesh Sharda)

Solar Powered Community Micro Irrigation Project in Talwara and Hazipur Blocks of District Hoshiarpur



An Evaluation Study

by

Precision Farming Development Center,
Department of Soil and Water Engineering,
Punjab Agricultural University, Ludhiana

June, 2016

Executive Summary

The Department of Soil and Water Conservation, Punjab is executing a "Solar Powered Community Micro Irrigation Project in Talwara and Haajipur Blocks of Hoshiarpur District". In this project water from Kandi canal is being lifted through solar pumps and is being supplied to the farmer's field through micro irrigation system. The project is remote controlled and monitored through the central server station. It is proposed to cover an area of 665 ha in the project, which was mostly rainfed prior to its execution. The implementation of the project started during the April, 2015 and the water was supplied to the farmers for the first time during Rabi, 2015-16.

The Precision Farming Development Center (PFDC), Department of Soil and Water Engineering, Punjab Agricultural University (PAU), Ludhiana was involved in training of farmers and capacity building of field staff of the department. At the end of the Rabi season, an evaluation study of the project area was conducted during June, 2016 to evaluate the performance of this project.

It has been observed that most of the farmers in the project area are small and marginal farmers. They were able to sow their crops well in time and their yield levels also improved, in some cases even by 100%. Being the first season of implementation of the project, the mechanization levels were very low. The project is socially inclusive. This project will go a long way in contributing to improve the livelihoods of the farmers and thereby in improving their socio-economic condition. The project will also have a demonstrative effect and may lead to its replication in other parts of the Kandi area of the state.

Introduction:

The Project area falls in Talwara block of Tehsil Mukerian Distt. Hoshiarpur and covers an area of about 664 Hectares and drains in to West Soan river, a major natural drainage stream of the area. The project area lies between the latitude of 31°52'4" to 31°56'2"N and longitude of 75° 51'56" to 75° 57'1E and forms a part of Mukerian Tehsil District Hoshiarpur.

The area is typically characterized by the problems of severe erosion, which is eating up the cultivated area, lack of Irrigation facilities due to deep ground water table, skeletal soils which have stones in the control section, low fertility and have problem of nutrient losses with erosion in rainy season, deforestation in hilly area, problems of choes as they are flooded during the rainy season and damage the adjoining area and poor socio-economic condition of the farmers. Yield levels were very low and most of the fields were either barren or used as pastures for the milch animals. The agriculture was carried out by either the women folk of the family or by the old people in the family. Most of the young members of the area have migrated in search of better earning avenues.

The area has sub-humid climate characterized by monsoon season of about three months (15th June to September). The average rainfall varies between 900 mm to 1200 mm. The major portion of rainfall is received during monsoon season i.e. from last week of June to mid of September. The mean annual temperatures during summers are 38^oC maximum and 18^oC minimum and during winter season the maximum and minimum temperatures are 27^oC and 8^oC respectively.

The Implementation of the project started during the April, 2015 and the water was supplied to the farmers during Rabi, 2015-16. This was for the first time, when the farmers near to the scheme-I were provided Irrigation water from the project. Prior to this the farmers were practicing rainfed agriculture. The project envisages to cover 664 ha of land, which comprises of rainy season torrents, hilly areas, forests and plain areas marred by stone and boulders sometimes of the size 5-10 kg.



Plate-1: Inspection of Solar PV Panels in progress



Plate-2: Wheat field in village Jugial

Precision Farming development Center (PFDC) has been involved in the training of farmers regarding use of micro irrigation for raising of crops including irrigation and fertigation schedules. The center is working in close coordination with the water users associations institutionalized in the project command. PFDC is also involved in capacity building of the field staff of the Department in the field of micro irrigation, solar photo voltaic pumping systems and operation and maintenance of the system.



Plate-3: Meeting with farmers in progress

Methodology adopted:

The trial run of the first phase of the project was conducted during Rabi 2015-16, when the farmers adjoining to the pumping stations were supplied water for irrigation of crops. The major Rabi crop was wheat and mustard.

PFDC carried out a study to evaluate the benefits accruing to the farmers from the project. For this purpose a questionnaire was developed (Annexure-1) which was filled by interview method. The questionnaire was designed in a way, so that firsthand information from the benefitted farmers can be obtained. In all 30 farmers were selected randomly and were personally interviewed and the information was obtained. Major chunk of the farmers belonged to village Jugial and few of them belonged to village Siprian. Even though Siprian is not covered under the project, but farmers of this village have land in Jugial. The data so collected has been analyzed based upon the size of the land holding, the yield levels attained after the availability of water vis a vis yields levels before the introduction of the project. The level of mechanization, the problems encountered by the farmers in the operation of the system, and level of satisfaction. In all 29 farmers supplied the complete information.



Plate-4: Impact Evaluation Study in progress



Plate-5: Field Day in Village Jugial

Results and Discussion:

Though the sample size was small but due to the limited coverage during the trial run, the scope of the study was also limited. Based on the information supplied by the farmers the data was analyzed and it has been observed as under:

1. Size of the farm, category of the farmers and cropping pattern followed:

From the table no. 1, it has been observed that only 14 % of the farmers have land more than one acre and rest of the farmers are marginal farmers. The sizewise distribution of holding indicates that 41 % of farmers are having farm size less than 2000m². Out of 29 farmers surveyed, 8 belongs to SC category, 3 belong to Backward Class and 18 belong to general category.

Before the installation of the system there was no source of water and farmers practiced rainfed agriculture. The cropping pattern followed was Wheat-Maize rotation or Mustard-Maize rotation. After the installation of the system few farmers were very enthusiastic about the system. They have gone for vegetables as well as planted mango orchards in part of their fields. The farmers were cautious in their approach. Some of the farmers are planning fencing of their farms because of the problems of stray animals.

Farm	No	Source of irrigation water before the installation of system	Crops sown in Rabi 2014	Crops sown in Kharif 2015	Category of Farmers			Crops Grown after installation of system During Rabi 2015	Crops Grown after installation of system During Kharif 2015
					SC	BC	Gen		
>8 kanals	4	Rainfed	Wheat/ mustard	Maize	1		3	Wheat/ mustard	Maize/Veg etables
6-8 kanals	5	Rainfed	Wheat/ mustard	Maize	1		4	Wheat/ mustard	Maize
4-6 kanals	8	Rainfed	Wheat/ mustard	Maize	3	1	4	Wheat/ mustard	Maize
<4 kanals	12	Rainfed	Wheat/ mustard	Maize	3	2	7	Wheat/ mustard	Maize

Table- 1: Basic information about the surveyed farmers

2. Increase in yield levels:

All the farmers reported increase in the yield levels. The perusal of table 2 shows that the yields of wheat, maize and mustard doubled as compared yield levels obtained during 2014-15. One farmer started growing vegetables and earned Rs. 30000 from the sale of onion nursery and Rs. 15000 by selling onions. Three farmers have planted mango orchards.

Crop	Average Yield levels before installation of system	Average yield levels after installation of system	Difference
Wheat	8-10 quintals per acre	16-20 quintals per acre	8-10 quintals per acre
Mustard	2.0- 2.5 quintals per acre	6-8 quintals per acre	4-5 quintals per acre
Maize	6-8 quintal per acre	12-15 quintals per acre	6-7 quintals per acre
Vegetable	Not grown	One farmer started growing vegetables	
Orchard	No planned orchards	Three farmers have planted Mango Orchards	

Table-2: The productivity level of crops

3. Level of mechanization:

The existing level of mechanization was very low in the Project area. There was no tillage equipment with the farmers and most of the tillage was carried with the help of rented farm machinery. It was observed that the four tractors available in the project area are used mainly for transportation of goods.

Name of the equipment	Number
Sprayer	28
Tractor	4
Tiller	-
Rotavator	-
MB Plough	-

Table-3: Mechanization status of the surveyed farmers

4. Satisfaction Level of the farmers:

From the perusal of table 4 it was observed that 22 farmers were satisfied, 6 were satisfied to some extent and 1 was unsatisfied. When inquired about the dissatisfaction, the farmer replied that water delivered to his field was less as compared to flood irrigation. The major problem faced by the farmers of the project area is that of stray animals. These animal damage the crops of the farmers. One progressive farmer was planning fencing of the farm.

Of course in due course of time with increase in income levels of the farmers, they will start fencing their farms on their own and that can save their crops.

Satisfied	Satisfied to some extent	Not satisfied
22	6	1

Table-4: Satisfaction level of the farmers

Conclusions:

The field evaluation was carried out for the Community Solar Powered Lift and Micro Irrigation Project in Talwara and Hazipur Blocks of District Hoshiarpur in the month of June 2016. It was concluded from the evaluation that the farmers were able to sow their crops well in time and their yield levels also increased. Being the initial stage the mechanization level was very low, most of the farmers small and marginal farmers. The project is socially inclusive. This project will go a long way in improving the socio-economic status of the project area.


(Rakesh Sharda)

Annexure 1
SURVEY OF MICRO IRRIGATION SYSTEM

(Community Solar Powered Lift and Micro Irrigation Project in Talwara and Hazipur Blocks of District Hoshiarpur)

1. Farmers Name & Address and mobile number

2. Farm Size:

- a) Total area of the farm
- b) Area under drip/sprinkler irrigation
- c) Crops grown and their areas

3. Year/month of Installation

4. Method of Irrigation before the installation

5. Type of Micro Irrigation system used:

a.) Drip/ Sprinkler/ both

b) Area under Irrigation

b) If both what is the area under each system of irrigation

6. Details of crop grown on the farm before installation of the system

Name of the crop	Monthly/year of sowing	Area under the given crop	Water availability for pre sowing irrigation	Water availability during the season			Fertilizers used			Method of application of fertilizers	Yield Per unit area	Remarks
				daily	weekly	monthly	Urea	SSP	Muriate of potash			

7. Machinery available with the farmer

Name of the equipment	Numbers	Type/hp	Brand
Sprayer			
Tractor			
Tiller			
Rotavator			
MB plough			

8. Plant protection measures taken if any

Weedicides		Insecticides

9. Details of crops grown after installation of system

Name of the crop	Month/year of sowing	Area under the given crop	Water availability for pre sowing irrigation	Water availability during the season			Fertilizers used			Method of application of fertilizers	Yield Per unit area	Remarks
				daily	weekly	monthly	Urea	SSP	Muriate of potash			

10. Care and maintenance:

- i. Who looks after the system _____ self/technician/laborer
- ii. How do you manage, like
 - Rodent damage Yes/no _____
 - In case of damage, repair is done By self _____ By company agent _____
 - Any leakage/breakdown problem faced _____
- iii. Have you ever flushed the system. Yes/No _____
- iv. In case of physical damage to pipes,
 - How do you repair By self _____ By company agent _____
 - Do you need to pay for extra pipe Yes/No _____

Indicate your level of satisfaction of the provisioning of system

Satisfied	Satisfied to some extent	Not satisfied

11. Other constraints in adoption of micro irrigation system _____

12. Farmers impression about the performance of drip irrigation _____