

SIP Farmers Survey – Behavioral Study
SoLAR Project – Pakistan Component

Thank you for making time to speak with us today. The survey we will conduct today is part of a larger project to understand better what the right kind of investments are for the irrigation sector. Your answers will greatly help us to understand how you and your fellow irrigators use surface and groundwater, and we are very grateful for your participation.

This survey will take about 40 minutes of your time, and we have a small gift to thank you for your time. We don't expect any risks to you for your participation. The data that we collect will be used within our organizations to investigate appropriate investments for the region, but in no way will it be possible in these applications to link back to you and your responses.

Your participation in the survey is voluntary, and that you don't have to answer any questions that you do not wish to answer. Also, you are free to withdraw from the survey at any time. Once again, your responses are anonymous, and none of the applications of this experiment will link back to you. With this in mind, do you consent to participate? **Yes / No**

Respondent's signature	
Verbal consent (if respondent is hesitant in giving consent by signature, take verbal consent and tick this option)	

Instruction for the Enumerator

The respondent should be same as for rapid enumeration if that person is not available then any household member over the age of 16 aware of the details concerning the household's agricultural practices should respond. If there are several such people, please interview the person who makes the majority of decisions for the farm.

SECTION-A: INTRODUCTION

Enumerator name: _____ Date of Survey: _____

Characteristics of the Respondent

Village: _____ **Tehsil:** _____ **District:** _____

Q-1: Type of farmer? _____

1=Solar Only	2=Non-Solar Only	3= Solar + Non-Solar
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In case respondent at this survey differ from respondent at rapid enumeration, make sure they both are from same family and actively looking after the same agricultural land. **Match Unique ID from the list given, make sure *Unique ID should be same for specific respondent (referring to same agricultural land)*.**

	A- At socio-economic survey (present survey)	B- At rapid enumeration survey (previous survey)
Q-2: Name of respondent		
Q-3: Unique ID		

Q-4: Respondent Mobile #: _____

Q-5: Respondent Age: _____ (years)

Q-6: Gender of the respondent: 1=Female 2=Male 3=Did not respond

Q-7: What is your status with the land?

1=Owner 2=Tenant 3=Partner 3=Worker

SECTION-B: HOUSEHOLD SIZE AND COMPOSITION

All the individual usually living together and who take their meals from a common kitchen (common pot) are considered as members. Members permanently absent for more than 6 months are excluded.

Q-1: How many members do you have in your household? _____

Q-2: How many members under the age of 15 are in your household? _____

Q-3: How many members who are 15 and above are in your household? _____

Q-4: How many members of your household assist you in agriculture¹? _____

SECTION-C: CROPPING PATTERN

Q-1: How long you/head of household is doing agriculture? _____ Year(s)

(If respondent is tenant, partner or worker then Skip Q-2 and continue from Q-3)

Q-2: Area of different types of land your household owns (enter 0, if none),

1. Farmland- self-cultivated (*in acres*) _____
2. Farmland- share cropped out (*in acres*) _____
3. Farmland- rented out (*in acres*) _____
4. Fallow land (*in acres*) _____
5. Homestead land (*in kanals/marlas*) _____

Q-3: In the last 12 months, did you cultivate land owned by other households or groups? _____

1=Yes 2=No

If answer to Q-3 is **No** then skip Q-4

Q-4: Area of other household's land cultivated in the last 12 months? in acres

1. Share-cropped in _____
2. Rented in _____
3. As worker _____

¹ (Those members of the household will be counted in doing agriculture if major portion of their day is spent in carrying out agricultural activities)

Q-5: What is the soil type of the land? _____

1=Sandy	2=Clayey	3=Silt-loam	4=Clay loam	5=Sandy loam	6= Don't know
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Kharif season refers to this monsoon cropping season ranging approximately from April 2021 to October 2021.
Rabi season refers to the agricultural season ranging from October 2020 to March/April 2021.

Information for all crops grown in Kharif (2021) and Rabi (2020-21) to be collected below.

[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
Name of the crop	Month of sowing	Month of harvesting	Season	Area under the crop (in acres)	Production in maunds (per acre)	Main source of irrigation for the crop (in case more than two sources are used, ask for most used source)	What is the method of irrigation used for this crop	Which equipment is used to lift the water for this crop (select multiple options, if more than one pump is used)	Who owns this equipment used for this crop	Number of irrigations needed in the season (from own pump(s))	Hours required to irrigate per acre (from own pump(s))	Per acre cost of irrigation from own pump(s) (fuel + O&M costs)	Total number of canal irrigations

*Highlighted questions have the coding given below.

[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]	[33]
Per acre hours taken to irrigate per canal irrigation	Per acre Abiana for canal irrigation	Number of purchased irrigations needed in the season (from other's pump(s))	Hours required to irrigate per acre (from other's pump(s))	Per acre cost of irrigation from other's pump(s) (rent)	Depth of water in the field after irrigation (in Inch)	Per acre quantity of seeds (Kg)	Per acre cost of seeds (Rs)	Per acre cost of pesticide	Per acre cost of weed control	Per acre cost of fertilizers	Per acre cost of hired labor	What % of the produce do you sell?	Price of the produce/maund

Codes [Q6]		
01=Rice	15=Tomato	30=Mangoes
02=Wheat	16=Onion	31=Bananas
03=Cotton	17=Chili	32=Lemon/Lime
04=Sugarcane	18=Ginger	33=Orange/Citrus
05=Maize	19=Brinjal	34=Watermelon
06=Mustard	20=Radish	35=Other fruits
07=Sunflower	21=Cauliflower	
08= Other oilseeds	22=Cabbage	
09=Potato	23=Carrot	
10=Sesame (til)	24=Pumpkin	
11=Lentils, pulses	25=Garlic	
12=Peas	26=Turmeric	
13=Beans	27=Cucumber	
14=Peanuts	28=Other gourd	
	29=Other vegetables	

Codes [Q9]
1=Kharif season 2021
2=Rabi season 2020/21
3=Annual crop
4=Other

Codes [Q12]
1=Groundwater
2=Canal
3=Tank/pond/lake
4=Other

Codes [Q13]
1=Drip irrigation pipes
2=Sprinkler
3= Center Pivot
4= Flood irrigation

Codes [Q14]
1=Solar pump
2=Diesel pump
3=Electric pump
4=No pump, canal/gravity flow

Codes [Q15]
1=Own private
2=Private water seller
3=Water User Group
4=Community
5=Other

SECTION-D: GROUNDWATER IRRIGATION

Q-1: How many borewells/ tube well do your household own? _____

Q-2: How many SIP pumps do your household own? _____

(Answer to Q-2 will determine number of rows in the table below)

Collect information for all the Solar Pump(s) used for irrigation/water selling in last 12 months

	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
Solar Pump ID	Year in which SIP was installed (in years)	Horse power of the pump	Capacity of Solar Panels (in Kilo Watts Peak)	How did you finance the pump	Total Cost of Installation for Solar pump + PV panels (in rupees)	Is this pump permanently fixed? 0=No, mobile 1=Yes	Area of land which it irrigates (in Acres)	Number of <u>days per month</u> used (in last Rabi Season)	Number of <u>hours per day</u> used (in last Rabi Season)	Number of <u>days per month</u> used (in current Kharif Season)	Number of <u>hours per day</u> used (in current Kharif Season)	Total cost of O&M in last 12 months. In Rupees	Did you sell water from this pump in the last 12 months? 0=No, 1=Yes	Did you rent out the pump in the last 12 months? 0=No, 1=Yes
1														
2														
3														
4														

Codes [Q6]
1=Self finance
2=Bank loan
3=Subsidy from government
4=Subsidy from NGO

Let's focus for the rest of this section on the Solar pump that irrigates the largest farmland. Ok?

Q-17: Out of the above-mentioned pumps, which Solar pump irrigates the largest farmland? Indicate the pump ID _____ (cross check it from Q-9 of this section given in the table above).

Q-18: Do you happen to know the discharge rate of the pump? _____ (cubic feet per second)

Q-19: Tube well on which that pump is installed, is that tube well owned by your household?
 _____ 1=Yes 0=No

Q-20: What is the depth of the tube well, in feet? _____

Q-21: What is the depth (feet) of water table for that tube well? _____

Q-22: What is the diameter of the outlet pipe, in inch? _____

If the farmer sell water from the pump used to irrigate largest farmland (Q-15=1) (if farmer does not sell the groundwater then skip Q-23 till Q-26).

		Rabi Season (2020-21)	Kharif Season (2021)
Q-23:	To how many farmers did you sell water in each season?		
Q-24:	What do you charge per hour for selling water from your pump?		
Q-25:	For how many hours did you sell water in each season?		
Q-26:	How much did you receive from water selling in each season? (in rupees)		

Q-27: Who in general does repair and maintenance of pumps owned by your household? _____

1=Pump Mechanic	2=HH members	3=Other farmer in the village
4=Water seller	9=Other	

SECTION-E: GROUNDWATER IRRIGATION (To Be Filled for Non-SIP Pumps)

Q-1: How many pumps do your household own (diesel and electric pumps)? _____



(Answer to Q-1 will determine number of rows in the table below)

Collect information for all the Non-SIP Pump(s) used for irrigation/water selling in last 12 months

	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]
Pump ID	Type of pump	Year in which pump was installed (in years)	Horse power of the pump	How did you finance the pump	Total Cost of Installation for the pump (in rupees)	Is this pump permanently fixed? 0=No, mobile 1=Yes	Area of land which it irrigates (in Acres)	Number of days per month used (in last Rabi Season)	Number of hours per day used (in last Rabi Season)	Number of days per month used (in current Kharif Season)	Number of hours per day used (in current Kharif Season)	Total cost of O&M in last 12 months. In Rupees	Did you sell water from this pump in the last 12 months? 0=No, 1=Yes	Did you rent out the pump in the last 12 months? 0=No, 1=Yes
1														
2														
3														
4														

Codes [Q2]
1=Electric submersible
2= Electric centrifugal
3= Diesel centrifugal

Codes [Q5]
1=Self finance
2=Bank loan
3=Subsidy from government
4=Subsidy from NGO

1=Electric submersible	2=Electric centrifugal
	

Let's focus for the rest of this section on the Diesel or/and Electric pump that irrigates largest farmland.
Ok?

		1=Diesel Pump	2=Electric Pump (if present)
Q-16	Out of the above-mentioned pumps, which pump irrigates the largest farmland? Indicate the pump ID (confirm it from Q-9 of this section given in the table above)		
Q-17	How large is the farmland fed by this pump? (in Acres)		
Q-18	Do you happen to know the discharge rate of the pump? (cubic feet per second)		
Q-19	Tube well on which that pump is installed, is that tube well owned by your household? 1=Yes 2=No		
Q-20	What is the depth of the tube well, in feet?		
Q-21	What is the depth (feet) of water table for that tube well?		
Q-22	What is the diameter of the outlet pipe, in inch?		

If diesel pump is used

Q-23: How many times did you have to buy diesel for irrigation in the last 12 months to store and use?

Q-24: Price of diesel during this kharif season 2021? _____ Diesel (Rs/litre)

Q-25: Price of diesel during this Rabi season 2020-21? _____ Diesel (Rs/litre)

If electric pump is used

Q-26: How much was your electricity bill in Kharif 2021? In Rupees _____

Q-27: How much was your electricity bill in Rabi 2020-21? In Rupees _____

If the farmer sell water from the pump used to irrigate largest farmland (Q-14=1) (if the farmer does not sell groundwater then skip Q-28 till Q-31)

		Rabi Season (2020-21)	Kharif Season (2021)
Q-28:	To how many farmers did you sell water in each season?		
Q-29:	What do you charge per hour for selling water from your pump?		
Q-30:	For how many hours did you sell water in each season?		
Q-31:	How much did you receive from water selling in each season? (in rupees)		

Q-32: Who in general does repair and maintenance of pumps owned by your household? _____

1=Pump Mechanic	2=HH members	3=Other farmer in the village
4=Water seller	9=Other	

SECTION-F: SURFACE WATER IRRIGATION

Q-1: Do you use canal water? _____ 1=Yes 2=No

(If answer to Q-1 is **No** then skip this section-F, otherwise continue)

Q-2: For this farmland, what is the duration of availability of canal water? _____

- i. All year around
- ii. Half yearly from _____ till _____

Q-3: How large is the farmland fed by canal water? _____ Acres

Q-4: How long is the turn cycle/warabandi in this distributary? _____ days

Q-5: About how long was this Kharif season, from planting to harvest? _____ turns/weeks

Q-6: How many times during this Kharif season did you have the problem that you didn't get any water? _____ times

Q-7: How many times did you have water during your turn, but the flow was low (less than half of what you were supposed to get)? _____ times

Q-8: Proportion of ground and surface water used for this farmland?

Season	Proportion of Ground water (%age)	Proportion of Canal water (%age)
Rabi Season, 2020/21		
Kharif Season, 2021		

SECTION-G: USE OF WATER STORAGE PONDS

Q-1: Do you use pond to store water for irrigation? _____ 1=Yes 2=No

If answer to Q1=1 then continue, otherwise go to Section-I

Q-2: What is a source of water for pond? _____

1= Groundwater 2=Canal water 3=Both

Q-3: If groundwater is a source of pond, how do you pump groundwater into the pond? _____

1=Diesel pump 2=Electric pump 3=Solar pump

Q-4: How do you pump pond water into the field? _____

1=Diesel pump 2=Electric pump 3=Solar pump 4=Slope/gravity

SECTION-H: WATER QUALITY

Q-1: Describe the salinity of your groundwater? Is there no salinity, low salinity, or higher salinity?

1=No Salinity 2=Low Salinity 3=High Salinity 4=Prefer not to respond

Q-2: Do you mix your groundwater with surface water?

- i. Yes
- ii. No
- iii. Prefer not to respond

Q-3: If so, how many parts groundwater to parts surface water?

_____ Parts GW to _____ Parts SW

SECTION-I: MOTIVATION OF INSTALLING TO SIP (To Be Filled for Solar Pump Farmers)

Q-1: What was the source of energy before installing SIP? (multiple options possible) _____

1=Diesel pump	4=Canal water
2=Electric pump	5=Rainwater
3=Renting pump	6=Buying water from others

(Skip Q2 till Q4 if answer to Q-1 is 4, 5 or/and 6)

Q-2: Have you abandoned your previous used pump(s)? _____ 1=Yes 2=No

Q-3: How many times did you use that pump this Kharif season 2021?

	Diesel pump	Electric pump
Number of times		

Q-4: What time of the day do you use other pumps?

1=At daytime	2=At nighttime	3=Throughout the day
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Q-5: What was the motivation of switching to SIP? (select all applicable) _____

1=High electricity/diesel prices		3=Load shedding
2=No operational cost for SIP		4=Low maintenance
5=unreliable surface water supply		6= others (specify).....

Q-6: What are the disadvantages of using SIP? (select all applicable) _____

1=High upfront cost	3=Low discharge rate
2=No maintenance facilities	4=Can only work at daytime
5= others (specify).....	

SECTION-J: SHOCKS AND ADAPTATION

Purpose of this section is to identify any shocks and resulting adaptation steps taken which can affect agriculture and irrigation practices as a result

Q-1: During the past 5 years, have you experienced any natural disaster which has affected your agriculture?

Q-2: If you have experienced any natural disaster during past 5 years, what adaptive measures have you taken? (if answer to Q-1 is **NO**, then skip this question).

SECTION-K: ASSETS

Q-1: What is the status of the house in which you live?

1=Own 2=Rent Occupied / Lended

Q-2: Does anyone in your household currently has a bank account? _____ 1=Yes 0=No

Q-3: Do you own a mobile? 1=Yes 0=No

Skip Q-4, if answer to Q-3 is No

Q-4: Which type of mobile you own? 1=Basic Mobile 2=Smartphone

Q-5: Which of the following assets does your household currently own/rent?

Statement	Own [1]	Do not own [3]
1. 1=Car		
2. 2=Motorcycle		
3. 3=Tractor		

Q-6: Which of the following agricultural equipment does your household currently own/rent or not use?

Statement	Own [1]	Rent [2]	Do not use [3]
i. 1=Thresher			
ii. 2=Rotavator			
iii. 3=Seeddrill			
iv. 4=Reaper			
v. 5=Tubewell			
vi. 6=Ridger			
vii. 7=Sprayer			
viii. 99=Any other (specify)			

Q-7: What is your livestock inventory?

Livestock	Yes=1	No=2
1. Bullocks		
2. Cows		
3. Buffaloes		
4. Sheep		
5. Goats		
6. Donkeys		
7. Horses		
8. Chicken		
9. Camels		