

USER INTERVIEW

SOLAR-POWERED WATER PUMP SYSTEM EVALUATION MIT CITE, INDIA 2016

Introduction

Hi, my name is _____. I am part of a project with the Massachusetts Institute of Technology (MIT), a university in the United States, and *[local project partner organization]* doing research on solar-powered water pump systems in India.

The main goal of our study is to learn about your experience using the solar pump system.

You have been selected as a possible participant in this study because *[local partner organization]* has identified you as someone that has adopted a solar pump system. You can choose to participate in the study or not. To help you decide, we will now tell you more about how you would participate and how the results of our research will be shared. Please ask questions about anything you do not understand.

If you agree to participate, please answer all questions as honestly as possible. You have knowledge and experience that is very important to us. What you tell us will be very important to the success of our study!

- Participation is entirely voluntary. You can choose not to answer any questions you wish, and you can end this interview at any time. The interview will last between 30 to 60 minutes.
- You will not be compensated for this interview.
- Any information you give us will be confidential, unless you give us permission to use your name and/or quote you in any publications that may result from this study.
- The results of this study will be used for academic publications, newspaper articles, and online content (blogs, social media). The results will also be made available in an online database, but your name and personal information will not be shared.
- (If applicable) To help us understand how your system performs, we want to attach a sensor. This will measure how much water is used, how often and at what rate. The sensor should not affect the performance of your system.

We will send the results of the study to *[local partner organization]*, and will encourage them to share our findings with you.

You will be given our contact information so you can ask us questions after the interview is complete.

This project will be completed by December 30, 2017.

CONSENT FORM

- Do you understand the procedures I have just spoken about? Yes No
Have all of your questions been answered to your satisfaction? Yes No
Do you agree to participate in this study? Yes No
Have you been given a copy of this form? Yes No

- Do you give permission for the following information to be included in publications and other content resulting from this study? Your name
 Photos of you
 Videos of you

- Do you give permission to record this interview? Yes No

- Do you give permission to have data from this interview included in an online database? It will not include your personal information. Yes No

Subject name: _____

Subject signature: _____ Date: _____

Investigator name: _____

Investigator signature: _____ Date: _____

Please contact our Research Affiliate, Vandana Pandya, at vandanaap@gmail.com or 99.25.069.216 with any questions or concerns.

If you feel you have been treated unfairly, or you have questions regarding your rights as a research subject, you may contact the Chairman of the Committee on the Use of Humans as Experimental Subjects, MIT, Room E25-143B, 77 Massachusetts Ave, Cambridge, MA 02139, phone +1.617.253.6787.

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General

1. Date: _____ dd _____ mm _____ yyyy
2. Taluka/tehsil: _____ 3. Village: _____
4. Co-op/mandala name (if applicable):

5. Location: _____ Lat. _____ Long.
6. Investigator: _____ 7. Interpreter: _____

Demographics

8. Age: _____ 9. Gender: Male Female
10. Education: Illiterate No formal school Primary or below (up to Course 5)
 Middle (Course 6 - 9) Secondary (Course 10)
 Higher secondary (Course 10+2) Diploma/certificate, graduate, above
11. Household size: Adults (18 and older): _____ Children (17 and younger): _____
12. What are your income-generating activities?

	Farming	Salt farming	Other:	Other 2:
Income (Rs.)				
Time unit				
No. times per year				

System Use and Characteristics

13. Was a sketch of the system made? Yes No

14. What components comprise your system?

	Solar panel	Electronics	Pump	Distribution system	Water storage	Energy storage	Other(s):
Tick if component is part of system							
Date installed (mm/yyyy)							
Specifications (dimensions, material, manufacturer), notes							
Condition (1: very bad, 2: bad, 3: okay, 4: good, 5: very good)							
Photo(s) taken?							

15. What is your distribution method from the water source?

- Flood Drip Sprinkler Other (specify): _____

16. How large is your farm/pan? _____ Acres Hectares

17. How many people work on the farm/pan?

_____ Beginning of season _____ During season _____ Post-season

18. Do you farm/produce salt alone, or as part of a group/cooperative?

- Alone Group/co-op Number of people in co-op (if applicable): _____

19. How often do you use water? How much? What are your water needs?

	Hrs./wk.	Days/wk.	Wk/month	Month/year
Solar				
Diesel				
Other (specify)				

20. What crop(s) do you farm? What are your growing seasons?

Crop 1: _____

Average production: _____

Crop 1 timeline: J F M A M J J A S O N D

Crop 2: _____

Average production: _____

Crop 2 timeline: J F M A M J J A S O N D

Crop 3: _____

Average production: _____

Crop 3 timeline: J F M A M J J A S O N D

21. Did you/do use a pump system prior to the solar system? (tick all that apply)

	Diesel gen.	Electric gen.	Hand pump	Treadle	Other:
Current use					
Past use					

22. (If applicable) How much did your previous/concurrent system cost?

23. (If applicable) How much did you pay for maintenance of your previous/concurrent system?

24. (If applicable) What is the lifetime of your previous/concurrent system?

25. (If applicable) How much did you pay for fuel/power for your previous/concurrent system?

_____ Before solar installation _____ After solar installation

26. What is the cost for your solar pump system?

	Solar panel	Electronics	Pump	Distribution system	Water storage	Energy storage	Total
Cost							

27. What do you think about the cost of your solar pump system. Was it...?

Expensive or inexpensive? Expensive Inexpensive

How much so: a little or very? A little Very

28. Do you pay for the maintenance of the system? Yes No N/A

If yes, how much? _____ Rs. How often? _____ per _____

29. Overall, is using and maintaining your system...?

Very difficult Somewhat difficult Neutral Somewhat easy Very easy

30. What steps are involved in maintenance? Who maintains the system? How often?

31. How long does it take to maintain the solar pump system?

32. Do you know a local representative who can help if there are problems?

33. Does the installation company come to check on the system performance?

Yes No If yes, how often?

34. Is there technical support available by phone? Yes No

35. Overall, the time it takes to maintain your system is...?

V. unacceptable S. unacceptable

About right S. acceptable V. acceptable

36. If you need to replace _____, do you know who or where to go to get it?

	Solar panel	Electronics	Pump	Distribution system	Water storage	Energy storage	Other(s)
Do you know where to replace ___?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Warranty? How long?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Satisfied with warranty?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

37. Have you had any problems with the solar pump? Yes No If yes, what are they? _____

38. Since you've had your solar pump system, have any part(s) broken or needed to be repaired or replaced?

	Solar panel	Electronics	Pump	Water storage	Energy storage	Distribution system	Other(s)
Have you had to stop pump production for at least 1 hour for _____? If yes, how long?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Why (what was the problem)?							
Was the part repaired? If yes, how long did this take? If yes, how much did it cost?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Was the part replaced? If yes, how long did this take?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

39. Do you hit any technical limitations of the system? Yes No

If yes, what are they? _____

40. Did you receive training or instruction about how to use and maintain your solar pump system?

	Solar panel <input type="checkbox"/> Yes <input type="checkbox"/> No	Electronics <input type="checkbox"/> Yes <input type="checkbox"/> No	Pump <input type="checkbox"/> Yes <input type="checkbox"/> No	Distribution system <input type="checkbox"/> Yes <input type="checkbox"/> No	Water storage <input type="checkbox"/> Yes <input type="checkbox"/> No	Energy storage <input type="checkbox"/> Yes <input type="checkbox"/> No	Total system <input type="checkbox"/> Yes <input type="checkbox"/> No	Notes:
Training or instruction?								
If yes, when? How many times? How long?								
Who gave the training or instruction?								
What did the training cover? What did you learn?								
Was the training adequate enough to be able to use the system correctly, or not? Why?								
Where was the training? Did you have to travel? How long?								

41.	Solar panel	Electronics	Pump	Distribution system	Water storage	Energy storage	Other(s)	Notes:
Is it easy or difficult to physically move ___?	<input type="checkbox"/> V. easy <input type="checkbox"/> S. easy <input type="checkbox"/> Neutral <input type="checkbox"/> S. difficult <input type="checkbox"/> V. difficult	<input type="checkbox"/> V. easy <input type="checkbox"/> S. easy <input type="checkbox"/> Neutral <input type="checkbox"/> S. difficult <input type="checkbox"/> V. difficult	<input type="checkbox"/> V. easy <input type="checkbox"/> S. easy <input type="checkbox"/> Neutral <input type="checkbox"/> S. difficult <input type="checkbox"/> V. difficult	<input type="checkbox"/> V. easy <input type="checkbox"/> S. easy <input type="checkbox"/> Neutral <input type="checkbox"/> S. difficult <input type="checkbox"/> V. difficult	<input type="checkbox"/> V. easy <input type="checkbox"/> S. easy <input type="checkbox"/> Neutral <input type="checkbox"/> S. difficult <input type="checkbox"/> V. difficult	<input type="checkbox"/> V. easy <input type="checkbox"/> S. easy <input type="checkbox"/> Neutral <input type="checkbox"/> S. difficult <input type="checkbox"/> V. difficult	<input type="checkbox"/> V. easy <input type="checkbox"/> S. easy <input type="checkbox"/> Neutral <input type="checkbox"/> S. difficult <input type="checkbox"/> V. difficult	
How do you move ___?								
How much does it cost to move ___?								
Do you store ___? Is yes, where?								
Do you use ___ for non-farming/salt farming use? If yes, how?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	

42. What do you like and dislike about the system? What, if anything, would you change about the system (to make it easier to use)?

Like:

Dislike:

What would you change:

43. Is the flow rate consistent or inconsistent over time? Consistent Inconsistent

How much so? Very A little

Why? _____

44. Has the solar pump system's performance changed since installation? Yes No

If yes, how so?

45. How satisfied/dissatisfied are you with the amount of water the system is able to pump?

V. dissatisfied S. dissatisfied About right S. satisfied V. satisfied

If dissatisfied, why? _____

46.	Solar panel	Electronics	Pump	Distribution system	Water storage	Energy storage	Total
How often do you expect each part to last?							
How long until you own the system?							
Was how long until owning a factor in buying?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

47. How did you pay/are you paying for the pump system?

One lump sum With borrowed money With own money

Installments Combination of the above

48. Were you given a choice on how to pay for the system? Yes No

If yes, why did you choose this payment method over the other choices?

49. Would you have bought the system without a group program/financing? Yes No

50. What made you decide to purchase/receive the solar pump system?

51. What influenced/convincing you to buy this system (over others, if applicable)?

52. How many people in your mandali/neighborhood have a solar pump? ____ out of ____
 Of the ones that don't, how many... _____ want one? _____ are uninterested?

53. Can you name the brand or manufacturer of your system? Of any other systems?
 Is the brand or manufacturer important to you?

54. How likely or unlikely are you to recommend this system to your friends or colleagues?
 V. unlikely S. unlikely Neither S. likely V. likely
 Why or why not? _____

55.	Solar	Diesel	Other:
Do you think any part of using the solar pump system is dangerous? If yes, which part and why?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Do you know of anyone getting hurt from using the solar pump system? If yes, how?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

56. Do you think having a solar pump system has changed/will change or impact your life/livelihood in any way? Yes No
 If yes, how so? _____

57. What is the main/primary advantage of the solar pump system?

58. Is theft a concern for you? Yes No
 If yes, have you taken any steps to address this concern? Yes No
 If yes, what steps have you taken to address this concern?

59. Does your demand for water change throughout the season/year? If yes, how?

60. Is your cash flow seasonal? Yes No
 If yes, when during the year do you have the most money? The least?

61. Is there anything else you want to tell us that you think we should know?

62. In the future, we may want to complete follow-up interviews. Would you be interested in participating in future interviews? Yes No
 If yes, you will need to provide us with your mobile number. _____

Notes/observations:

General Data		
User ID:	Long.	Lat.
Taluka/tehsil:		
Village:		
Ownership:	<input type="checkbox"/> Individual <input type="checkbox"/> Group	
Date installed (d/m/y):		
Pipe distance to flow (m)		
Pipe diameter (cm)		
Were pictures taken? <input type="checkbox"/> Yes <input type="checkbox"/> No		

General Notes

Capacity Test			
Avg. pumping rate (user estimate, w/ units):		Flow meter start:	
Test Pumping Rate:		Flow meter end:	
Static Water Level (m)		Duration of test:	

Electronics		
	Panel	Pump
Voltage		
Current		

Water Quality			
	pH	TDS	Turbidity
			EC (uS)

Time (min)	Water Level (m)	Drawdown (m)	Pumping Rate (lps)	Notes
0				
5				
10				
15				
20				
30				
40				
50				
60				