

Positive Effects of Solar Powered Irrigation Pumps on Subsistence Farmers in Rural Nepal

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INTRODUCTION

Subsistence farmers in rural parts of Nepal face many issues in everyday life. These farmers are reliant on successful yields to provide for their families. The underdevelopment of these areas lead to limited access to water, electricity, new technologies and farming practices. This makes access to sufficient amounts of water for irrigation challenging and the success of their harvests uncertain. Providing sufficient food for your family isn't something you want to leave to chance. Having a reliable and affordable way to irrigate their farmland is a much sought after ambition for many of these farmers. Imagine having to grow all of the food your family needs to consume throughout the year with unreliable access to water, this makes a hard task more difficult. Fortunately ICIMOD has recognized these struggles and has a solution to help these subsistence farmers. Solar Powered Irrigation Pumps (SPIP) are changing the lives of many smallholder farmers throughout Nepal. My summer was spent working with these smallholder farmers that were utilizing SPIP. My contribution to the project was to interview farmers and record how SPIP is having impacts on their overall livelihood. I was then able to write detailed profiles about each farmer and how this new technology is having an impact on them. These profiles will be beneficial for future funding and installation of more SPIP pumps to struggling farmers.

METHOD

Participants:

The participants of this study were the subsistence farmers from the Terai region of Nepal. Terai is the southern strip of Nepal when the climate is much hotter and the access to water, electricity, and modern technology is limited. There were a total of **50 participants** in this study, all of whom were Solar Powered Irrigation Pump owners or operators. **All of the farmers lived in the Terai region but were spread out into various districts. Including; Rautahat, Sarlahi, Bara, and Saptari.**



Procedure:

The design process of this experiment was simple and straightforward. First, I designed a questionnaire that inquired about various aspects of their livelihood focusing on; **income, production, nutrition, and home atmosphere.** These questions were designed to tell the story of each farmer's past, present, and future ambitions. I was able to determine affects SPIP has had on each aspect listed above, which has helped lead me to a conclusion. Next, we identified our participants. Tracking whom and where the owners of SPIP resided and recorded how long each pump has been installed. We planned our 12 day field excursion, mapping where and how we would be able to travel to each farm and complete the interviews in a timely manner. Finally, we headed out into the field to gather our information from each site.

Three steps:

- **Demonstration of SPIP**
- **Observation of farmland**
- **Interview & Record Responses**

During the interview the participants were asked about **various changes and similarities in their practices since the installation of SPIP.** The questions gave a perspective of **affects SPIP has had on their farms and how this has impacted their overall livelihood.** Many farmers specified a **larger diversity of crops, and an increase in production since the installation of SPIP.**

Interviewing a subsistence farmer that was able to take barren land productive with SPIP.

"Now that we have reliable access to water, we will be able to have two or three cropping seasons."
-Panna Lal Mahato

Sukhari Devi Shah, a fully independent female farmer since the installation of SPIP.

Satya Narayan Chaudhary, now is able to grow a sufficient amount of food for his family throughout the years since the installation of SPIP.

The daughters of an SPIP farm owner.

"Our farm is performing so well because we work together and we have a system that can keep up with our production."
- Jiten Yadav

RESULTS

- **100% of the participants have seen some form of production increase since the installation of SPIP.**
- This affect on their production is also increasing their income. Now with an excess of food many subsistence farmers are able to sell the extra at the market or expand into more commercialized production. **This increase in income is getting invested, mainly back into agriculture or in children's education.**
- Many participants are also **expanding their practices and their overall land value**, now that they have a reliable source of water. Farmers are **expanding into aquaculture and vegetable farming**, both of which require a sufficient amount of water that was not available to them before the installation of SPIP.
- **48 out of the 50 participants had some form of plans for expansion since the installation of SPIP.** That is **96% that are seeing such a positive impact on their farms** they have the income, and the means to expand in the future.
- SPIP is also having a **major impact on the empowerment of women through agriculture.**
- **Out of 53 sites 41 have land and the SPIP in a woman's name.**
- **Over 36% of the participants interviewed had mentioned that there has been an increase in at least one woman's involvement in agriculture** since the installation of SPIP. SPIP is having positive effects on smallholder farmers in rural Nepal.
- **SPIP is so beneficial that all 50 participants have identified SPIP as their main source of water.**

CONCLUSIONS

- My hypothesis has been concluded to be true. **Necessities such as food, water, income, education and many more are now at easy access because of SPIP.**
- SPIP has started a domino affect within the lives of farmers. Reliable access to water has not only given safe water and sustainable food but has lead to **an increase in production**, which has caused an **influx in income**, this income can then be **invested in children's education, farm expansion**, or on the **improvement of living standards**
- **SPIP have an overall positive affect on the livelihoods of smallholder farmers.**
- **Empowerment of female farmers with SPIP.**



FUTURE DIRECTIONS...

Smallholder farmers are eager to adopt these new modern practices. The only issue, is **how do we effectively get this new technology and information to the rural areas?** Not only getting the technology to the farmers but **ensuring the proper use and education of the new practices.** The introduction of these modern practices correctly could have major impacts on the overall development of the area which is so interconnected to the development of rest of the country. **The expedited development of the rural areas and farms that could potentially be responsible for feeding a much larger population, which could have huge impacts on the country as a whole.**

In the future to continue this theory of expedited development with the introduction of more modern technology and farming practices. We could potentially take a much similar approach as we had for the introduction of Solar Powered Irrigation. **Start with pilot sites and local field offices and work one on one with the individual farmers tracking their progress.** Continue to branch out to more farmers and to new technologies, continuing with the practices that farmers are seeing the most overall success and continuously introducing new modern technologies. This would be the best way to be able to ensure farmers are getting access to new practices and are correctly utilizing them. **We can then closely monitor how smallholder farmers success is affecting larger populations.** Overall there are much broader topics to consider with smallholder farmers and how modern technology is affecting them and the overall. (Tacoli, 2003)

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