



Survey Insights: Trends from Baseline to Endline

UpTrade- Goats for Water Impact Assessment 2022-2023
District: Tharparkar, Sindh, Pakistan



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Project Overview and Context

Overview



Enhancing Access to Water and Electricity for Women and Girls in District Tharparkar, Sindh

Funded by: British Asian Trust (BAT)

Project Goal: Establish short-term effects of solar water pump installation on women and household welfare in a resource-scarce communities, while collecting baseline data for long-term impact monitoring

Target Population: 2,400 women and girls in District Tharparkar, Sindh.

Implementation Approach: Installation of solar water pumps in 12 communities.

The project being evaluated is funded by British Asian Trust (BAT) and has an overarching goal “to increase access and affordability to key assets that give access to water and electricity to women and girls in remote, off-grid rural communities” and aimed to reach 2,400 women during the course of its implementation in District Tharparkar, Sindh. The project was designed on the premise that by having access to a solar water pump, water needs for the community will be met efficiently and sufficiently. The time spent on water collection will be reduced significantly, reducing time poverty for women and girls who are primarily responsible for water collection. This time saved will be put towards rest, leisure and income generating activity. With animals receiving more water; the quality, quantity and weight of animals available for sale for households increases. To study the impact, UpTrade installed 12 solar water pumps in 12 communities over a course of 12 months as part of its Goats for Water Project. There were 12 villages identified as:

Pump	Date	Villages	UC	HH	Members	Women	Girls	Total women and Girls Reached
1	7-Jan-23	Bhadharo	Chachro	52	7.34	104	104	208
2	8-Jan-23	Umer ji dhani	Jorau Mothi	38	7.34	76	76	152
3	12-Feb-23	Pandhi ji Dhani	Tar Ahmed	55	7.34	110	110	220
4	14-Feb-23	Nooro Khano	Ratan Jo Tar	65	7.34	130	130	260
5	8-Mar-23	Akber Ji dhani	Mithro charan	44	7.34	88	88	176
6	10-Mar-23	Jalal Jo Tar	Chachro	55	7.34	110	110	220
7	21-Apr-23	Mehari	Chelhar	50	7.34	100	100	200
8	27-Apr-23	Phulyo	Chelhar	86	7.34	172	172	344
9	19 June 2023	Mithro somar	Islamkot	55	7.34	110	110	220
10	13 July 2023	saleh ji dhani	Mithro charan	50	7.34	100	100	200
11	14 July 2023	Shakoor ji dhani	Mithro charan	65	7.34	130	130	260
12	01 August 2023	sonhry Ji dhani		53	7.34	106	106	212
Total				668		1336	1336	2672

Scope

Evaluated activities from installation in 8 out of 12 villages over 12 months.

Study Phases: Baseline study in December 2022; endline survey in September 2023.

Project Area: Covered 12 villages in Tharparkar district across Mithi, Daheli, and Chachro talukas.

Control vs. Treatment: Initially planned for 6 control and 6 treatment villages, but due to summer onset and material price hikes, solar panels installed in 8 treatment villages.

Evaluation Period: Examined the project's entire lifecycle and impact on communities.

Objective

Provide efficient and sufficient water supply to communities through solar water pump installations.

Outcome targets:

- 2,400 women and girls impacted
- Reduce time poverty for women and girls by minimizing water collection efforts.
- Enable women to allocate saved time for rest, leisure, and income-generating activities
- 2,400 women and girls increase monthly income by a minimum of PKR 300/ month
- Improve household income due improved quality, quantity, and weight of animals available for sale through increased access to water

Evaluation Methodology, Stakeholders and Respondents for Evaluation

The approach for the research was to undertake a systematic evaluation of endline indicators against baseline indicators by carrying out a survey using the same methodology and using the same population group included in the baseline survey. The use of comparison groups (control versus treatment) was the key element of the methodology to fully understand the impact.

The research was carried out in 12 villages of Tharparkar district that belonged to three talukas i.e., Mithi, Daheli and Chachro. Among 12 villages, four were classified as control and eight as treatment villages. On the average 12-15 HHs were interviewed in each village; every third house was selected for the interview. Community elders were engaged to identify women respondents. The table given on page 7 gives an overview of the villages and some of the relevant data that present the situation of essential services in target areas. It is important to highlight that these villages are far smaller in size as compared to the villages in other parts of country because availability of water plays a critical role in determining the size of villages in the area. Villages in Tharparkar are usually located near a water source, such as a well or a pond and due to limited water resources, the size of these villages remains small to ensure that the available water can meet the needs of the community.

Data collection methods comprised household surveys, key informant interviews (KIIs), and triangulation technique to verify veracity and integrity of information drawn from different sources through a core set of common research questions. The tools for this assignment were designed after a thorough desk review and focused on the following aspects:

- Household Characteristics
- Livelihoods and Time Use

- Household Livestock
- Water Use Behaviour & Attitudinal Attributes
- Village Livestock Health and Milk Production
- Village/Community level profiling/information

Research techniques and methods selected complimented research questions to obtain a diversity of perspectives, to ensure data accuracy and to overcome data limitations. The field researchers were selected locally from Tharparkar district and were trained on the tools and ethical guidelines before the study. To ensure quality of the data, daily field checks as well as de-briefs were done to address queries and ensure smooth data collection. It was also ensured that due consent was taken while explaining the aims of the research questions with due consideration given to confidentiality of the respondents. A verbal consent was taken from all the respondents after explaining the nature and scope of the study. In summary, 227 respondents were interviewed through the following methods:

Data Collection Method	No. of Respondents	Type of Data Obtained
Household level survey	167	Quantitative/Qualitative
Community level KIIs	12	Qualitative
Community level Group Interviews	48 (approx. 4 in each village)	Quantitative
Total	227	

Demographic Profile of Villages

Control						Treatment					
Village	UC	HHs	Livelihood	School	Health Facility	Village	UC	HHs	Livelihood	School	Health Facility
Kheknyo	Mithrio Bhatti	60	Daily Farm Laborer	Primary School	None	Umer Ji Dhani	Jorau	24	Agriculture/Livestock	Primary School	None
Jhamrisar	Vejhyar	80	Daily Laborer/Livestock Farmers	Primary School	None	Nooro Khano	Ratan Jo Tar	60	Daily Laborer/Livestock Farmers	Primary School	None
Borli Bheel	Chelhar	60	Agriculture/ Livestock	Primary School	None	Akber Ji Dhani	Chachro	50	Daily Laborer/Livestock Farmers	Primary School	None
Kharyo	Jorovo	80-90	Daily Laborer/Private Jobs	Primary School	None	Bhadaro	Chachro	40	Agriculture	Primary School	None
						Pandhi Ji Dhani	Tar Ahmand	50	Daily Laborer/Livestock Farmers	Primary School	None
						Jalal Jo Tar	Chachro Rural	60-70	Daily Laborer/Livestock Farmers	Primary School	None
						Mehaari	Chelhar	50	Daily Laborer/Livestock Farmers	Primary School	None
						Phulyo	Chelhar	90	Daily Laborer/Livestock Farmers	Primary School	None

Details of Key Informant Interviewers

S no.	Village Name	UC Name	Tehsil/Taluka	Profession	Gender	Religion
1	Jhamrisar	Vejhiyar	Chachro	LHV	Female	Hindu
2	Mehari	Chelhar	Chachro	Activist	Male	Hindu
3	Jalal jo tar	chachro	Chachro	Hafiz	Male	Muslim
4	Bhadhro	chachro	Chachro	TBA / Dai	Female	Muslim
5	Khekinyo	Mithro Bhatti	Mithi	Teacher	Female	Hindu
6	Bheel	Chelhar	Mithi	LHW	Female	Hindu
7	Umer Je Dhani	Jorou	Mithi	Activist	Female	Muslim
8	Phulyo	Chelhar	Mithi	CRP	Male	Muslim
9	Akbar Jo Tar	Mithro Charan	Chachro	CRP	Male	Muslim
10	Pandhi Ji Dhani	Tar Ahmed	Dahili	Teacher	Male	Muslim
11	Nooro Khano	Ratan Jo Tar	Chachro	Hafiz	Male	Muslim
12	Kharyo Nara	Jorrou	Mithi	CRP	Male	Hindu

Summary of Key Informant Interviews and Key Challenges

- **Health benefits for women:** Water pump installation eliminated the need for manual water pulling, reducing health issues significantly gynecological problems.
- **Time-saving:** Women spend less time on water procurement tasks, allowing for more time spent on household, family care, and agricultural activities.
- **Community health improvement:** Easier access to more water positively impacted the overall health of the community.
- **Animal well-being:** Water pumps increased water access for livestock, enhancing their health by allowing them to drink multiple times a day.
- **Universal community impact:** All respondents agreed that water pumps positively affected the entire community, demonstrating their widespread benefits in our results.

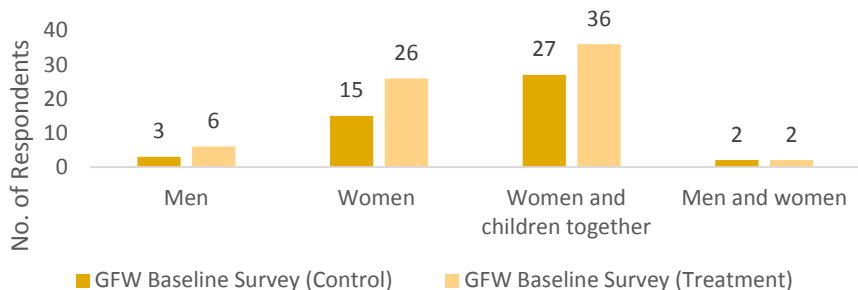
Key Challenge: Collection of goats from households to provide in exchange of water pumps

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Findings and Evaluation

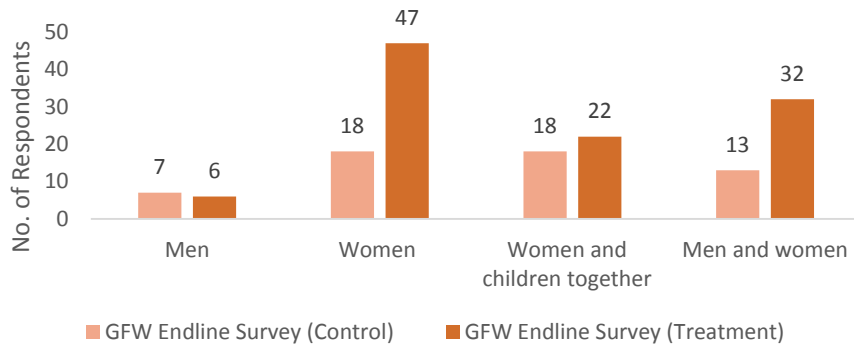
Responsibility of Fetching Water in the Household

Who is Responsible for Fetching Water in the Household?



The data reveals a consistent trend across both treatment and controlled villages: the responsibility of fetching water falls predominantly on women and children within households. The pattern underscores the enduring role of women and children as the primary caretakers of water-related responsibilities in these communities.

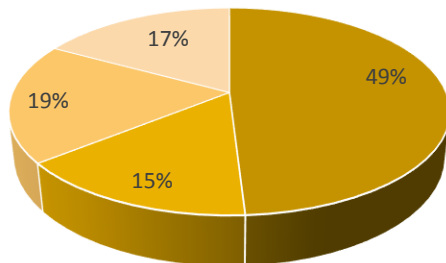
Who is Responsible for Fetching Water in the Household?



Here, results show a similar trend as in the baseline, however there is a significant increase in women fetching water in the treatment villages, as well as men and women fetching water as compared to the baseline, where this result was a lot lower. Another trend shows that men were shown to fetch more water in the endline survey.

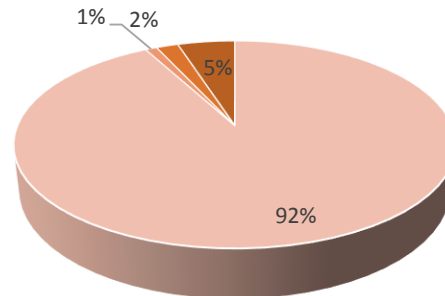
Collection of Water

How do you Collect Water? (GFW Baseline - Treatment)



■ Village well ■ Neighbour village well ■ Neighbour village pump ■ Other

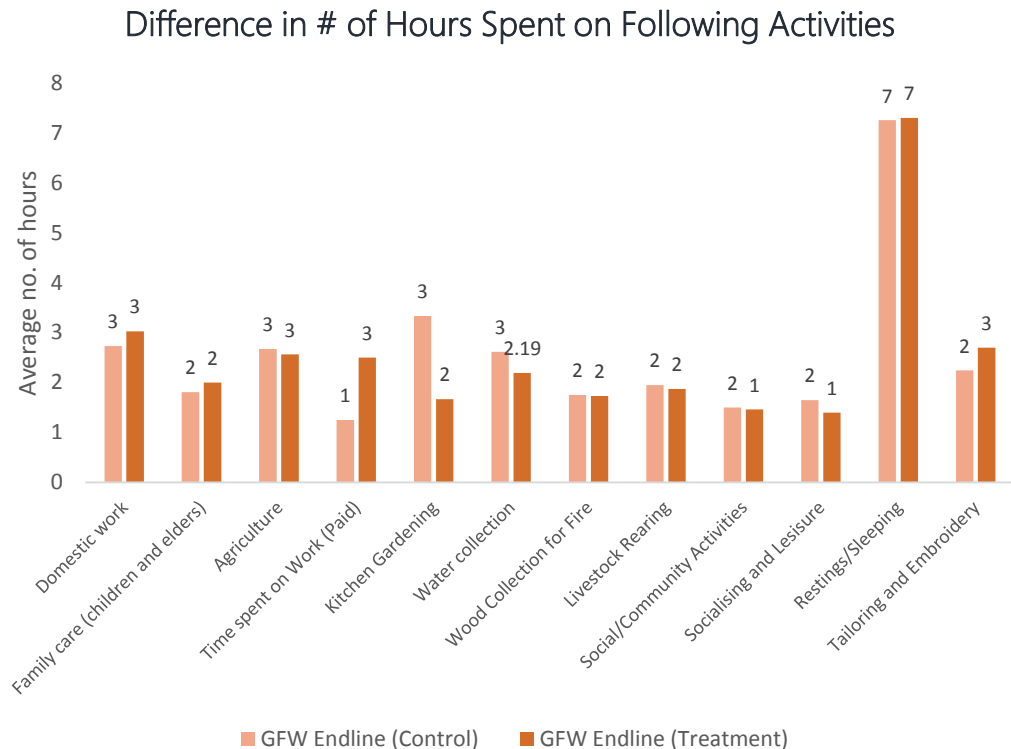
How do you Collect Water? (GFW Endline - Treatment)



■ Village well ■ Neighbour village well ■ Neighbour village pump ■ Other

Baseline trends shows that almost 50% of villagers and farmers predominantly rely on the village well for their water needs with almost 50% relying on neighboring village pumps for water. After pump installation own village, this proportion significantly where 92% reported using own village pump for water collection and 8% reporting using neighboring village's pump and well.

Use of Time Analysis for Women

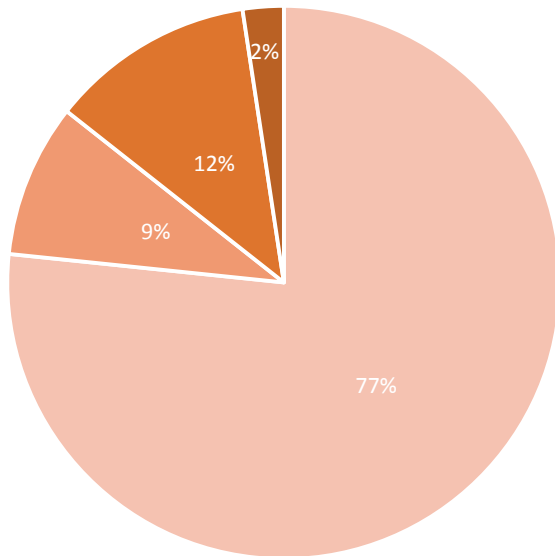


Time spent on water collection in treatment villages is reported less than in control villages.

More time spent on paid work (2 hours more) and tailoring and embroidery (1 hour more) in treatment villages as compared to control villages

Benefits to Women from Easy Access to Solar Pump

Women Benefitting From Easy Access To A Water Pump



■ 1. Big benefit ■ 2. to some extent ■ 3. Not any benefit ■ No response

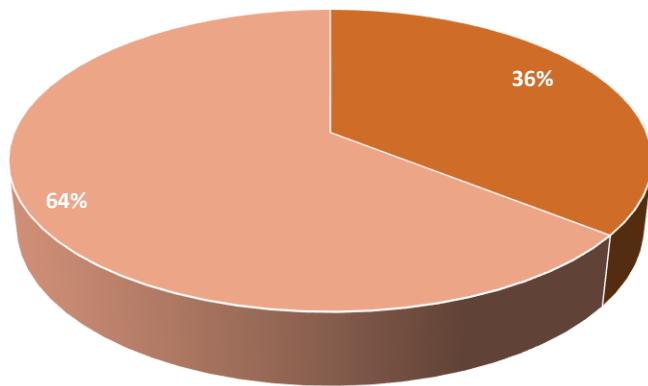
- **77 percent reported remarkable benefits for women:** Solar pump installation significantly improved the lives of women who previously spent hours collecting water daily.
- **Relief from strenuous exercise:** Manual water collection hindered women's participation in income-generating activities and negatively impacted their physical health.
- **Positive impact on women's health:** Access to water through solar pumps in village alleviated various health issues, including gynecological conditions and miscarriages caused by manual labor and long-distance water transfer.
- **Elimination of manual labor:** Solar pumps eliminated the need for manual pulling of water, reducing the physical strain on women.
- **Improved overall well-being:** The availability of water in villages positively affected women's health, allowing them to participate in economic activities and enhancing their quality of life.

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Impact on Income Levels

Who uses Income Generated from Milk

Who Uses Income Generated from Milk



■ Man ■ Woman

65% of respondents reported that women manage and sell the milk produced themselves

Treatment village goats produce 0.8 Kgs more milk daily than control villages' goats

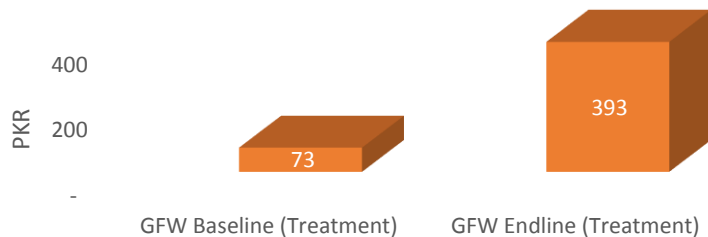
GFW Baseline (December 2022)				GFW Endline (September 2023)		
	Control	Treatment			Control	Treatment
Average Milk Production Per Household	0.89	0.43		Average Milk Production Per Household	3.8	4.8
Average Milk Production Per Goat	0.46	0.21		Average Milk Production Per Goat	1.2	2.0

Average milk production per goat has increase by **8.5x** between the baseline and endline for treatment villages, whereas average milk production per goat has increased by **1.5x** between the baseline and endline for control villages

Average milk production per household has increase by **10.3x** between the baseline and endline for treatment villages, whereas average milk production per household has increased by **3.3x** between the baseline and endline for control villages

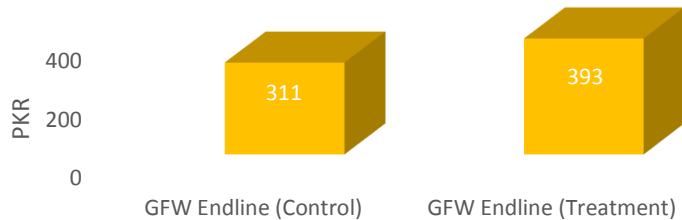
Impact on Income Generated via Milk Production

Average daily income Generated by a Household from Milk



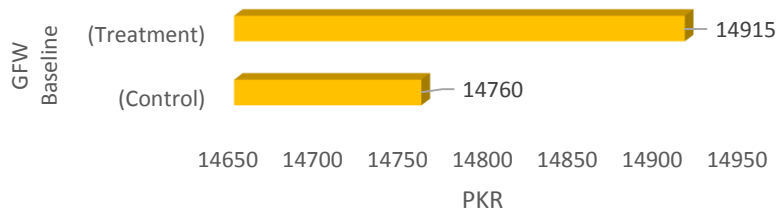
Increased income of PKR 2,430 per month per household and PKR 1,215 per month per woman

Average Daily Income Generated by a Household from Milk

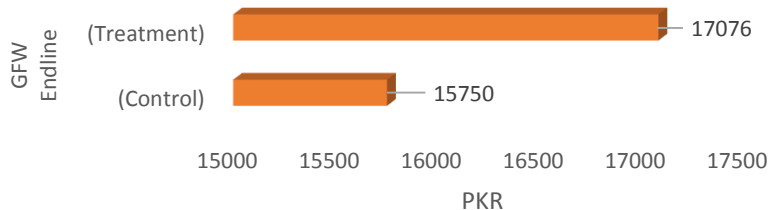


Impact on Income Generated from Selling Goats

Average Price of Each Goat Sold (GFW Baseline)

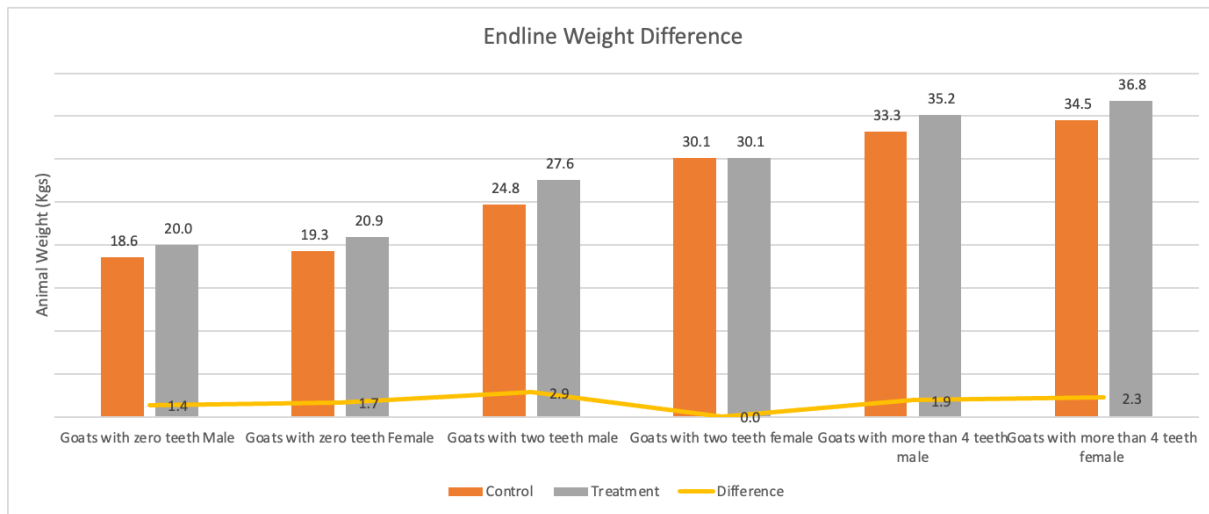


Average Price of Each Goat Sold (GFW Endline)



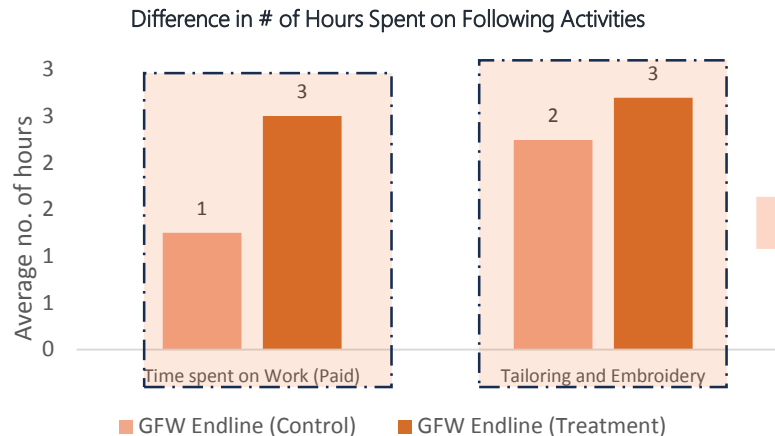
- Price received for goat from treatment village is significantly more than that received for goat from control village (PKR 1,325)
- This difference is not significant in baseline (PKR 155)
- Increase sale price of animal has strong association with increased access to water

Goats in villages with solar water pumps weigh more than goats in control



Across age groups, goats from treatment village weighed more than same age animals from control villages

Impact on Income Generated from Embroidery



Income Generated from Tailoring and Embroidery (PKR)		
	Control	Treatment
Before	3476	2258
After	3750	3389
Change	7.9%	50.0%

Reported income difference between 6 month interval in control group is PKR 274, while those in treatment villages reported income difference of PKR. 1,131

There is a corresponding increase of 1 hour difference in time spent on embroidery by women in treatment villages

Analysis of Total Income (By Categories)

Income from sale of animals

GFW Endline Survey				
Control		Treatment		Difference
Sale of all animals (PKR)	1,265,500	Sale of all animals (PKR)	1,772,150	40%
Less: Cattle Sales (PKR)	100,000	Less: Cattle Sales (PKR)	150,000	50%
Sale of Goats (PKR)	1,165,000	Sale of Goats (PKR)	1,622,150	39%
Total Goats Sold	74	Total Goats Sold	95	28%
Average animals per household*	8.3	Average animals per household*	7.7	-7%
Average Price(PKR)	15,750	Average Price(PKR)	17,075	8.4%

Average price per goat sold differs by PKR 1,325 between the control and treatment villages, which is a great impact. Moreover, Sale of all animals have also increase by more than PKR 550,000

Income from sale of milk

GFW Endline Survey				
Control		Treatment		Difference
Average Price (PKR)	82	Average Price (PKR)	82	-
Milk Sold (KG)	3.8	Milk Sold (KG)	4.8	26%
Daily Earning (PKR)	311	Daily Earning (PKR)	393	26.4%
Yearly Earning (PKR)	111,960	Yearly Earning (PKR)	141,480	26.4%

Households in treatment villages sell approximately 1 kg more milk than the households in control villages, which leads these households to earn PKR 29,520 more annually from just selling milk

Income from Tailoring and Embroidery

GFW Endline Survey				
Control		Treatment		
Income Before (PKR)	3,476	Income Before (PKR)	2,258	
Income After (PKR)	3,750	Income After (PKR)	3,388	
Increase(PKR)	274	Increase(PKR)	1,130	
% Change	7.9%	% Change	50%	

Households in treatment villages are earning 50% more than before, which will boost their annual income by PKR 13,560.

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Conclusion and Next Steps

Outcome Summary

Increase in Women's Income

- Women in treatment villages experience an average increase of PKR 1,130 in monthly income from income-generating activities like embroidery, stitching, and needlework.
- A significant portion of this increase comes from women's control over income generated from milk sales.
- Women save an average of 30 hours per month due to reduced time spent on water-related tasks.

Household-Level Income:

- An average household increases its income by approximately PKR 2,626 per year through the sale of livestock, attributed to increased animal weight and fertility rates.
- At the village level, this income increase amounts to around PKR 550,000 from the sale of animals.

Poverty Alleviation:

- The project significantly contributes to poverty alleviation in the community by increasing household income, allowing families to meet their basic needs more effectively.
- Reduced time spent on water collection leads to time savings, which can further contribute to poverty alleviation as women have more opportunities for income generation.

Social and Community-Level Empowerment:

- 77% of community members report significant health benefits from the project, particularly in terms of women's gynecological health.
- 85% of respondents in treatment villages express complete satisfaction with the solar pumps, indicating a positive impact on the community's quality of life.
- Women's empowerment leads to improved decision-making within households and the community, fostering a sense of agency and control over their lives.
- Increased income and better access to water result in improved nutrition and health outcomes for community members, leading to a more empowered and healthier

Next Steps for Impact Mapping

- **Longer-Term Impacts:** A two-year analysis is needed to capture the extended benefits of the project
 - **Seasonal Variations** A longer analysis can account for seasonal variations in water use, livestock productivity, and income
 - **Sustainability:** Confirming the sustainability of solar water pump installations requires monitoring continued positive impacts on women's health, as well as income generation
 - **Women's Empowerment:** A prolonged study can reveal how increased income and time reallocation continue to empower women in their households and the community
 - **Health Benefits:** A longer-term analysis can uncover sustained health benefits for women, including gynecological health improvements, potentially identifying other health gains
-