

100 – Solar Cooker for Paktia, Pilot Project

Survey Report

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To

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Date: 11 July 2021

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Introduction

The aim of this report is to analyze the effectiveness of the *Pilot Project, 100-Solar Cookers for Paktia*, funded by Afghanic Organization and implemented by its local partner, Khost Old Men Association (KOMA) in Khost Province. A total of 100 Solar Cookers have been distributed to 100 families/beneficiaries in various villages / areas of Khost Province. Moreover, it is intended to find out if the fruit trees distributed to the same beneficiaries grow well and determine the duration after which these trees shall produce their first harvest of fruits. The report and findings are based upon the data collected from 30 beneficiaries through interview-wise questionnaire. The questionnaire was developed by Mohammad Sediq Nawabzada and approved by Dr. Juergen Kanne. Before visiting the beneficiaries' houses, a meeting was held between Mohammad Sediq Nawabzada and Mr. Mirwais Tanai and Eng. Jabarullah Saeed. In the meeting a plan was developed and agreed upon by the members of the meeting. In addition, Eng. Jabarullah Saeed provided a list of the beneficiaries with all the relevant details including addresses and telephone numbers.

Data Collection

The data was collected from 30 beneficiaries of the *Solar Cookers*. In order to visit the Solar Cooker sites and collect the required data, the beneficiaries were selected upon convenience sampling method, i.e., the beneficiaries were reached out by phone and an appointment was made with five to six beneficiaries who agreed with the visit a day before visiting them in person. Some of the Solar Cooker sites were visited two or three days after the phone call at the request of the beneficiary. Since the beneficiaries are scattered over a large area in different districts and villages of Khost Province, only four to five or six families could be visited a day. During the survey, 10 families were visited in Karwansray, five in Shamal, five in Zadrano Village, two in Khalisa, two in Panzaya, two in Kundi, two in Center, one in Lattak, and one in Landi Vallages of Khost Province. The visits to all the 30 families took six days.

Findings of the Survey

The beneficiaries of the *100-Solar Cooker Pilot Project* are located in a widely scattered area and in various districts and villages of Khost Province. The survey was conducted through interview-wise questionnaires all of which were filled out during in person visit to the beneficiaries' houses. Apart from the demographic information, the questionnaire (annexed to this report) has a total of

eleven questions which were asked directly from the beneficiaries. The answers were noted down by the surveyor during the interview.

In general, almost all the families use the Solar Cookers for cooking and heating/boiling water. In the first question, the beneficiaries were asked about the duration of cooking various food items and boiling water with the Solar Cooker. The duration of cooking dishes such as potatoes, rice, meat, and beans and boiling water and other liquids such as milk depends mainly on the clarity of the sunlight (sunny weather), direction, proper set-up, and clean maintenance of the Solar Cooker. In addition, the duration of the cooking also depends on the state and type and size of the food being cooked. For example, meat, beans, rice, and alike items which are hard in nature take longer than potatoes, spinach, and other similar vegetables and soft food to cook. The average duration of cooking relatively harder food items ranges from 40 to 60 or 70 minutes, whereas the average duration for comparatively less harder food items ranges from 30 to 40 or 50 minutes. Moreover, the average duration of boiling water ranges from 25 to 35 or 45 minutes depending on the type and color of (tea)pot and the amount of water.

In the second question, the beneficiaries were asked how they cooked before receiving the Solar Cooker from KOMA. Most of the families use firewood, gas, dry animal dung, or coal or a combination of the two of these material for cooking and heating water. Ten out of 30 families use firewood, seven of them use gas, seven other use firewood and gas, four families use firewood and dry animal dung for cooking food or boiling / heating water.

The third question is about the cost the families incurred for cooking and boiling / heating water before they received the Solar Cooker. The costs of firewood, gas, dry animal dung or coal for cooking food and boiling / heating water and other liquid mostly depend on the size of the family. Generally, smaller families use less energy material in comparison to larger families. In addition, in almost all of the families, the women do most of the house works, including cooking and cleaning, who do not or cannot keep record of the actual amount of energy material consumed over a specific period such as over a week, month or quarter. In reply to the third questions, all of the beneficiaries stated how much of their firewood, gas, dry animal dung and other energy material consumption has reduced. The answers of the beneficiaries are summarized as follow:

- 21 beneficiaries said half of their gas/firewood/animal dung consumption has reduced since they have started using the Solar Cooker (an average family of 6 – 9 persons).

- Six beneficiaries said one-third of their gas/firewood/animal dung consumption has reduced since they have started using the Solar Cooker (large family of 10 – 16 persons).
- Two beneficiaries said one-fourth of their gas/firewood/animal dung consumption has reduced since they have started using the Solar Cooker (family of more than 16 persons)
- One beneficiary said three-fourth of their gas/firewood/animal dung consumption has reduced since they have started using the Solar Cooker (small family of fewer than six persons).

From the rough estimation of the families and my own calculations, an average family consumes around 210 kg of firewood plus 20 kg of gas per month. The price of medium quality firewood is 13 AFN per kilogram and the price of gas is 55 AFN per kilogram in the market. Therefore, the total estimated cost of firewood plus gas for an average family would be 3,830 AFG (2,730 AFN for firewood and 1,100 AFN for gas). As stated by the majority of the beneficiaries, the average size families, that half of their gas/firewood/animal dung consumption has reduced with the use of the Solar Cooker, the estimated average saving per month for an average family would be 1915 AFN per month.

The fourth question in the questionnaire is regarding the technical assistance delivered to the beneficiaries. All of the beneficiaries have received technical assistance and guidance from the project team. They frequently mentioned Mr. Azad Gul and Eng. Jabarullah Seed who have showed them how to use and set up the Solar Cooker. All the beneficiaries know that the pin in one side of the Solar Cooker must be set in upright or vertical position (with zero shadow) for the best results. In addition, they have received wrenches for tightening the nuts to place the Solar Cooker in a steady position.

In his visits to the families, Eng. Jabarullah had instructed them to remove the plastic coverings from the aluminum / steel sheets of the Solar Cooker. The plastic coverings were removed from all of the Solar Cookers.

The fifth question is regarding the difficulties or problems the beneficiaries face when using the Solar Cooker. As they had received enough instructions and guidance from the project team, none of the beneficiaries (and the female members in the families) had any difficulty or problem when using the Solar Cooker.

The sixth question is regarding the member(s) of the families who use the Solar Cookers. As mentioned in the previous section, women in almost all the families are responsible for doing house

works including cooking and cleaning. Therefore, all the Solar Cookers are used by female members of the families. The male members of these families have received instructions from the project team on how to use them properly, and they have taught the female members of their families how to use them.

The seventh question is about the color of the pots the beneficiaries use for cooking food and boiling / heating water and other liquids with the Solar Cookers. All the beneficiaries had received black pressure cookers from the project team which were used for cooking food with the Solar Cooker. Also, all of the beneficiaries had their own large teapots for boiling / heating water and other liquids which had black covering of the smoker from firewood. It was explained to all of the beneficiaries in simple words that the best results can be achieved from the Solar Cookers if they use black pressure cookers and other black pots when using the Solar Cooker.

The eighth question is regarding the beneficiaries' satisfaction with the Solar Cookers. All of the beneficiaries show full satisfaction with the Solar Cookers.

The ninth question is about the recommendation of using the Solar Cookers by the beneficiaries to their neighbors or relatives. All of the beneficiaries strongly agree to recommend the Solar Cookers to their neighbors and/or relatives. Some of them also stated that their neighbors had asked them if the project still continued and wished if they could have their own Solar Cookers.

The tenth question is regarding the fruit trees if the beneficiaries have received and planted the fruit trees and if they grow well. A total of 26 beneficiaries (out of 30) had received six fruit trees each but four of them, including two schools, had not received the fruit trees. All the 26 beneficiaries had planted each of the six trees, however, 18 of the 26 beneficiaries stated that all of their trees grew well, four of them said that five of the trees grew well and one-one of them dried, and two of the beneficiaries said that four of the trees grew well and two - two of them dried. When they were asked why some of the trees dried, they it is due to the lack of irrigation water and planting them later. They stated that they normally plant trees in early spring, however, they received these trees later.

The eleventh question is that when the beneficiaries expected to have their first round of fruit products from the trees distributed to them. They expected (based upon their experience from other fruit trees) to have their first round of the fruit products from their trees on 2nd or 3rd year.

Problems and Limitations

There were no problems seen or felt in the implementation of the *Pilot Project, 100-Solar Cookers for Paktia*, during the visits to the beneficiaries' houses. All of the Solar Cookers were properly cleaned, maintained and used by the respective beneficiaries. However, few of the beneficiaries were not cooperative and did not agree to visiting the Solar Cookers distributed to them. They stated that they were not at home and busy at works. Although, we offered flexible time for appointments such as early in the morning or late in the afternoon to visit their houses, they refused to cooperate. In addition, two beneficiaries received faulty Solar Cookers whose reflective plates were assembled upside down on the frame, i.e., the reflective face of the aluminum sheets which should normally be directed toward the sun was directed to the back of the Solar Cooker and the non-reflective or less reflective face of the sheets was directed to the sun. The beneficiaries had unassembled the Solar Cookers and had put the reflective sheets the right way by themselves.

Regarding the fruit trees which were also distributed to almost the same beneficiaries as of the Solar Cookers, they were distributed a little later than the usual time when farmers / gardeners plant trees. As a result of the delayed distribution and in some cases the lack of irrigation water, some trees had dried and had not grown at all.

Conclusion

Based upon the visits to and the survey from the 30% of the beneficiaries, *the Pilot Project, 100-Solar Cookers for Paktia*, has been successfully implemented and has resulted in an average monthly saving of 1,915 AFN (19.70 Eur) for an average family. All the beneficiaries have been fully familiarized and satisfied with the use and maintenance of the Solar Cookers. And they are willing to recommend the Solar Cookers to other potential users which may be considered as a positive word of mouth for the assessment of future demand. Furthermore, some neighbors and relatives of the current beneficiaries have expressed their wish for having such Solar Cookers which may imply that there could be an increased demand for the Solar Cookers if properly introduced.

Moreover, the fruit trees, though few of them have dried, shall produce their first round of fruits on the second or third year.

Annex1: Questionnaire

Questionnaire for Solar Cooker Effectiveness Survey

This questionnaire is designed to assess the effectiveness and proper use of the 100-Solar Cooker Pilot Project implemented in Khost province.

Name of the interviewee: _____ Age / Gender: _____ / _____

Address

City: _____ Village: _____ Phone No.: _____

Question 1: How long does it take to cook 1kg potatoes/rice/meat? Or boil 1Liter of water with the Solar Cooker?

Answer:

Question 2: How did you cook before using Solar Cooker? What energy/material did you use to cook?

Answer:

Question 3: How much did it cost you to cook or boil/heat water before using Solar Cooker?

Answer:

Question 4: Did you get any technical assistance from the project team for using the solar cooker properly? If so, what kind of assistance?

Answer:

Question 5: Do you have/face difficulty in using the Solar Cooker now? If yes, what kind of difficulty?

Answer:

Question 6: Who normally uses the Solar Cooker; male or female members of the family?

Answer:

Question 7: What kind of pot do you use when cooking meal or boiling/heating water with the Solar Cooker?

Answer:

Question 8: How satisfied are you with the Solar Cooker?

1. Very satisfied 2. Satisfied 3. No difference 4. Dissatisfied 5. Very dissatisfied.

Question 9: Will you recommend using the Solar Cooker to your neighbors/relatives?

1. Strongly agree 2. Agree 3. No idea 4. Disagree 5. Strongly disagree.

Question 10: In addition to the Solar Cooker, you had been given some fruit trees. Have you planted them, and do they grow well?

Answer:

Question 11: If they grow well, when do you expect to have your first round of fruit products from these trees?

Answer:

Recommendation:

The best result of using the Solar Cooker can be achieved by using black pots or black colored pots, therefore, the beneficiaries are kindly required to use black or black colored pots while cooking with the Solar Cooker.

Annex2: Photos



Visit to a beneficiary in Karwansray Village.



A photo of trees planted by the beneficiaries in Khalisa Village / Center



Interview with a beneficiary of the Solar Cooker in Bibi Khadeja Girls High School



Interview with a beneficiary of the Solar Cooker in Shamal Mahmoodkhil.