USE OF SOLAR OVENS IN THE DOMINICAN REPUBLIC

Survey of Recipients and Users of Solar Ovens in Communities of the Dominican Republic

October 2019 - March 2020

Executed by:
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For:
La Iglesia Evangelica Dominicana
(The Dominican Evangelical Church)

And

Solar Oven Partners - United Methodist Church (SOP-UMC)
In the United States of America

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SURVEY OF RECIPIENTS AND USERS OF SOLAR OVENS IN THE DOMINICAN REPUBLIC

The population

The target population consists of people who have in some way obtained a solar oven provided by the Solar Ovens Program. As such, it includes those who have obtained an oven directly from the program as well as those who have obtained it in another way: by purchasing from another person, as a gift, among others.

The Study Sample

The Solar Ovens Program records 1,200 ovens distributed through October, 2019. Based on this information, we designed a survey with a wide sample, equivalent to 50% of the total oven recipients.

However, when we began the field visits to carry out the interviews, we came up against various difficulties in locating the people who had received the oven:

- Some had moved.
- Others were registered in the locality where the training took place, but they live in other communities.
- In other cases, it was not possible to find someone who would serve as a guide to locate the oven recipients.
- Among those that were located, a portion were not home on any of several visits.
- Some would not be available until a date after the timeframe established for the survey.
- During one of the trips to communities on the northern coast, we encountered intense rains which limited mobility in the area for two days, forcing a reduction in the number of surveys from what had been anticipated. This occurred during the week that we visited Gaspar Hernández, Villa Progreso y Sosúa.

Because of the situation created by these circumstances, we only interviewed those oven recipients that were located and were available in each community at the time of the visit.

Thus, we collected information through administration of the questionnaire to 247 people who at some point have had the oven and to whom we had access. A copy of the questionnaire is attached.

Time and Place of the Survey

The surveys were carried out between October 28, 2019 and March 3, 2020 in 24 communities. The program has distributed solar ovens in 23 of them. Tenares is not one of the communities reached. The reason we included it in the report is because we interviewed a lady who is a resident in this location who received an oven as a gift from someone who had, in turn, obtained it through a training from the program.

Field Staff

We worked with a total of 22 interviewers. A different group was formed in each of the seven trips made. In most cases, they were recruited from the membership of the local churches who have supported the Solar Ovens program.

In La Jagua:
Mileni Montaño.

Tamayo, Uvilla, Neiba, Mella, Jaquimeyes and Paraíso:
Silvio Reyes, Sergio Méndez Carvajal and Jairol Puente.

In Pedernales:
Eliezer Lembert, Estefany Almonte, Luz del Carmen Zarzuela, Franky Sylvert, Veline Sylvert and Laguerre Guitho.

In Dajabón, Chacuey and Clavellina:
Georgina Peña, Taiseba Villafaña and Addiel Toribio.

In Montecristi, Carbonera, Las Matas de Santa Cruz and Villa Vásquez:
Urania Martínez, Noemí García, Loreini Jorge and Olga Lidia Michel.

In Gaspar Hernández, Villa Progreso and Sosúa:
Mirian Marmolejos and Robert Anthony Peña.

In Samaná: Villa Clara, Monte Rojo and El Limón:
Noelia Kelly Rodríguez, Elianny Pérez Johnson and Josefina de Peña Figaro.

Creation of Zones for the Communities Where the Program Has Worked

For the purposes of this investigation, we grouped the communities where the Solar Ovens Program has worked into three zones: South-West, West and North.

- ***South-Western Zone***
  - **La Jagua, Jaquimeyes, Batey Seven, Tamayo, Uvilla, Neiba, Mella and Paraíso**.
  - The defining factor to group these communities is their location on the western side of the Southern band of the Dominican territory, whether that be directly on the coast of the Caribbean Sea or relatively close to it.

- ***Western Zone***
  - **Pedernales, Jimaní, Dajabón, Chacuey and Clavellina**.
  - These are the ones located along the border with Haiti.

- ***Northern Zone***
  - **Montecristi, Carbonera, Las Matas de Santa Cruz, Villa Vásquez, Gaspar Hernández, Villa Progreso, Sosúa, Tenares, Villa Clara, Monte Rojo and El Limón**.
  - The primary defining factors to group these populations is the Atlantic Ocean. The majority of them are located right on the coast; the location of the remainder is relatively near to it. Tenares is included here even though it is not part of the communities where the program worked; it is a special case, as we indicated earlier.

PRIMARY SURVEY RESULTS

I. RETENTION OF THE OVEN

Recipients of the solar oven by zone and community according to if they still retain the oven or not

Community	Retain the Oven	No Longer Retain	TOTAL
SOUTH-WEST Zone			
La Jagua	6	6	12
Jaquimeyes	7	4	11
Batey Seven	2	2	4
Tamayo	11	-	11
Uvilla	7	-	7
Neiba	10	-	10
Mella	1	1	2
Paraíso	10	1	11
Sub-total	**54**	**14**	**68**
WEST Zone			
Pedernales	22	1	23
Jimaní	8	-	8
Dajabón	9	-	9
Chacuey	14	2	16
Clavellina	14	-	14
Sub-total	**67**	**3**	**70**
NORTH Zone			
Montecristi	19	3	22
Carbonera	10	1	11
Las Matas Sta. Cruz	11	-	11
Villa Vásquez	10	-	10
Gaspar Hernández	2	2	4
Villa Progreso	1	3	4
Sosúa	1	-	1
Tenares	1	-	1
Villa Clara	13	1	14
Monte Rojo	19	3	22
El Limón	7	2	9
Sub-total	**94**	**15**	**109**
TOTAL	**215**	**32**	**247**

How Many Still Retain the Solar Oven?

Number of recipients of the solar oven by zone according to still retaining or no longer retaining the oven

Zone	Retain the Oven		No Longer Retain		TOTAL
	Number	%	Number	%	
South-West	54	79.4	14	20.6	68
West	67	95.7	3	4.3	70
North	94	86.2	15	13.8	109
TOTAL	**215**	**87.0**	**32**	**13.0**	**247**

- Of the 247 persons interviewed, 215 (87 %) still have their solar oven.
- 32 (13 %) said that they did not keep it.
- The Western Zone showed the largest percentage of people who have the oven (95 %); only (3 of 70) have decided to get rid of the equipment.

What did those who did not keep their solar ovens do with it?

Number of people who no longer retain their solar oven by zone according to what happened to it

Zone	Gave It Away	Sold It	Was Stolen	Threw It Away	TOTAL
South-West	9	-	1	4	14
West	1	1	-	1	3
North	12	1	-	2	15
TOTAL	**22**	**2**	**1**	**7**	**32**

Reasons for Not Keeping the Solar Oven

- It takes a long time to cook. This was the most frequently given answer (35 % of respondents) for not keeping the solar oven.
- The oven is damaged
- I didn't like it
- Someone needed the oven and respondent decided to give it away
- Lack of sunshine.
- Lack of available time.
- Not enough cooking space.

In Batey Seven, Ms Matilde Florián (known as Tinamá) says she threw out the oven because mice ate the cardboard bottom of the oven.

Time That Those Who No Longer Retain the Oven Kept It

Number of people who do not still have the solar oven by zone according to the amount of time they kept it

Zone	Less Than 6 Months	6 Months-1 Year	More Than 1 Year	TOTAL
South-West	8	3	3	14
West	2	-	1	3
North	6	2	7	15
TOTAL	16	5	11	32

- 50 % of those that do not still have the oven kept it for less than six months
- 15.6 % held on to the oven for a period of six months to one year.
- While 34.4 % kept it for more than one year.

II. USE OF THE SOLAR OVEN

The Vast Majority Have Used the Solar Oven at Some Point

Number of solar oven recipients by zone according to if they have used the equipment at some point or not

Zones	Have used the solar oven at some point?		TOTAL
	Yes	No	
South-West	60	8	68
West	68	2	70
North	99	10	109
TOTAL	**227**	**20**	**247**

- 91.9 % (227) of persons interviewed have used the solar oven at some point.
- 8.1 % (20) have never used it.

Why have they never used the solar oven?

The 20 persons who said that they have never used their solar oven indicated the following reasons:

- "*The solar oven takes a long time to cook*"; 40 % of the answers highlighted this reason.
- "*Not having enough time to cook with the oven*"; 20 % raised this issue.
- "*Little sun in the zone*" or "*Little sunlight gets to my house*"; both reasons, closely related, covered 15 % of the responses.

To a lesser extent they indicated that:

- "*The oven is very small for the amount of food that I have to cook*";
- *The pots are very small*.
- "*The oven is damaged*"
- Some people say that they don't cook
- Others say that they don't know how to use the solar oven.

Current Use of the Solar Oven

Number and percentage of solar oven recipients by zone according to current use or no-use of the equipment

Zones	Uses the oven		Doesn't use it		TOTAL
	Number	%	Number	%	
South-West	26	48.1	28	51.9	54
West	55	82.0	12	18.0	67
North	44	46.8	50	53.2	94
TOTAL	**125**	**58.1**	**90**	**41.9**	**215**

Of 215 interviewees que retain the solar oven:

- 125 persons use it (58.1 %).
  - 82.0 % of the interviewees in the Western zone use it.
  - In contrast, in the South-Western and Northern zones, the oven users are less than 50% in each case.

- Another 90 people who retain the solar oven do not use it.

Users of the solar oven by zone and community according to whether they use the equipment or not

Community	Use the oven	Don't use it	TOTAL
SOUTH-WEST Zone			
La Jagua	3	3	6
Jaquimeyes	2	5	7
Batey Siete	-	2	2
Tamayo	5	6	11
Uvilla	3	4	7
Neiba	7	3	10
Mella	-	1	1
Paraíso	6	4	10
Sub-total	**26**	**28**	**54**
WEST Zone			
Pedernales	17	5	22
Jimaní	7	1	8
Dajabón	4	5	9
Chacuey	13	1	14
Clavellina	14	-	14
Sub-total	**55**	**12**	**67**
NORTH Zone			
Montecristi	14	5	19
Carbonera	6	4	10
Las Matas Sta. Cruz	7	4	11
Villa Vásquez	3	7	10
Gaspar Hernández	-	2	2
Villa Progreso	-	1	1
Sosúa	-	1	1
Tenares	1	-	1
Villa Clara	4	9	13
Monte Rojo	8	11	19
El Limón	1	6	7
Sub-total	**44**	**50**	**94**
TOTAL	**125**	**90**	**215**

Ms Rosa Peña, in Dajabón, says that she has filmed videos about the functioning of the solar oven to show others the effectiveness of the equipment.

Solar Oven Use Rates by Community

Of 23 communities visited:

In 9 communities (39.1 %) there are more who use the oven than who don't.

- **South-Western** Zone (2): Neiba y Paraíso.
- **Western** Zone (4): Pedernales, Jimaní, Chacuey y Clavellina.
- **Northern** Zone (3): Carbonera, Las Matas de Santa Cruz y Montecristi.

In one community the number of solar oven users and non-users is equal.

- **South-Western** Zone: La Jagua.

In 13 communities (56.5 %) the number who do not use it is greater.

- **South-Western** Zone (5): Jaquimeyes, Batey Siete, Tamayo, Uvilla and Mella.
- **Western** Zone (1): Dajabón.
- **Northern** Zone (7): Villa Vásquez, Gaspar Hernández, Villa Progreso, Sosúa, Villa Clara, Monte Rojo and El Limón.

Why Not Currently Using the Solar Oven?

Of the 90 people who currently are not using the solar oven, we got 81 replies to this question.

- Two reasons were presented as primary:
  - "*The oven takes a long time to cook*"; 39 % of the responses indicated this reason.
  - "*Little time that the sun is shining*"; 39 % of the responses leaned in this direction.

In Batey Seven, Ms Altagracia Medina (Cucuta) says that she "can't stand" the slowness of the solar oven to cook.

- Other reasons for not using the solar oven:

    - The oven and pots are very small for the amount of food being cooked.
    - Damaged oven.
    - Lack of pots.
    - Doesn't have the time to cook with the oven.
    - It doesn't cook /Doesn't know how to use the oven.
    - It rains a lot
    - House without sun. The sun rays do not get to some homes with much intensity because of trees in the yard and surrounding area; sometimes they have buildings that block the sunlight.

Last Time the Solar Oven Was Used Prior to the Survey

All of those who have ever used the oven are included here, even those who no longer have it and those who retain it but do not use it.

Past and current users of the oven by zone according to the last time they used the equipment prior to the survey

Zone	This week	A month ago	3-6 months	1 year or more	TOTAL
South-West	12	5	18	25	60
West	30	22	14	2	68
North	16	18	32	33	99
TOTAL	**58**	**45**	**64**	**60**	**227**

- 25.6 % used it during the week of the survey.
- 19.8 % in the last month.
- 28.2 % had used it 3 to 6 months ago.
- 26.4 % last used it a year or more ago.

Kinds of Food Cooked in the Solar Oven

Use of the solar oven by zone according to kinds of food that they cook with the equipment

Zone	Rice	Beans	Meats	Starchy Vegetable	Eggs	Fish	Desserts	TOTAL
South-West	15	11	11	9	-	-	8	54
West	39	49	30	27	-	-	22	167
North	27	28	24	18	2	2	19	120
TOTAL	**81**	**88**	**65**	**54**	**2**	**2**	**49**	**341**

- **Beans** (also including other grains) took first place as the kind of food most cooked in the solar oven. They were mentioned in 25.8 % of answers.

    - In many homes where they have retained the solar oven, they use it exclusively to cook this food item.

    - Beans, in addition to being a primary ingredient in the Dominican population's daily diet is the food that requires the longest cooking time; thereby using the greatest amount of fuel.

- In the interest of saving gas, many families turn to charcoal or firewood to cook beans and other grains. Thus, the solar oven provides an option for household savings while avoiding the use of these smoke-producing fuels.

- **Rice** appears as the kind of food that is the second most cooked in the solar oven according to 23.7 % of responses.

- **Meats** were indicated as the third most prepared food item in the solar oven (19 % of the references).

- **Starchy and other vegetables** took fourth place in the references (15.8 %) as one of the kinds of food most cooked in the oven.

  - It is possible that the lessor number of references to these important elements of the Dominican diet is due to the tendency to consume them mostly at the supper (evening meal) and they are not prepared during the hours of sunlight.

- **Desserts**. 14.4 % of the responses referred to this category of foods, always sweet.

  - These desserts consist primarily of breads, cakes, cookies and other foods prepared with wheat flour and, less often, with corn flour.
  - We often found people who only use the oven for this food category.
  - The majority of desserts indicated require little cooking.

Several testimonials told that food cooked in the solar oven has a different and better flavor.

Frequency of Use of the Solar Oven to Cook

Users of the solar oven by zone according to the frequency with which the use the equipment to cook

Zone	Daily	1-2 per week	+ than twice per month	Once per month	Occasion-ally	**TOTAL**
South-West	4	10	2	3	6	25
West	7	37	4	6	2	56
North	4	20	6	5	9	44
TOTAL	**15**	**67**	**12**	**14**	**17**	**125**

Of the people interviewed who use the solar oven, the frequency with which they cook in it is as follows:

- Once or twice a week: 53.6 %.
- Occasionally: 13.6 %
- Daily: 12 %.
- Once per month: 11.2 %
- More than twice per week: 9.6 %.

Of the 67 people who said that they cook once or twice per week:

- 37 are in the Western Zone (55.2 %);
- 20 in the Northern (29.8 %);
- 10 in the South-Western (14.9 %).

For How Many People Do You Cook in Your Solar Oven?

Solar Oven users by zone according to the number of persons for whom they cook with the equipment

Zone	Cooks for				TOTAL
	One person	2-3 people	4-6 people	7 and up	
South-West	1	5	10	9	25
West	3	17	30	5	55
North	-	14	24	5	43
TOTAL	**4**	**36**	**64**	**19**	**123**

The people interviewed who use the solar oven cook for:

- 52 % cook for families of between 4 and 6 people.
- 29.3 % cook for groups of between 2 and 3 members.
- 15.4 % cook for families of 7 or more persons.
- 3.3 % cook for just one person.

When observing the size of families for which they must cook, it is understandable why they object to the use of the oven because "the oven and the pots are small for the amount of food that is needed."

"When I cook in the oven, I give food to my neighbors to try"
Martina Vázquez, in Las Matas de Santa Cruz.

Purification of drinking water

Zones	Boil water in the solar oven?		TOTAL
	Yes	No	
South-West	5	20	25
West	10	45	55
North	11	33	44
TOTAL	26	98	124

- 21 % of the people interviewed that use the oven use it to boil water.
- 79 % do not use it for this purpose.

Source of Drinking Water

Sources of drinking water by zone

Zone	Obtain drinking water from				TOTAL
	Piped	Rain	Truck	Bottled	
South-West	2	-	-	66	68
West	4	-	-	66	70
North	6	11	1	91	109
TOTAL	**12**	**11**	**1**	**223**	**247**

- 90.3 % obtain bottled water.
- 4.9 % drink piped water. The consumption of water from this source was most reported in the communities of Montecristi, Pedernales and, to a lesser extent, in La Jagua and Paraíso.
- 4.4 % collect and store rain water. We found this practice to be very extensive in
- Monte Rojo, in Samaná.
- 0.4 % (one case in Las Matas de Santa Cruz) gets it from a cistern truck.

Ms Juana María López, in Las Matas de Santa Cruz, uses the solar oven exclusively to boil water and milk.

Boiling Milk

Zones	Do you boil milk with the solar oven?		TOTAL
	Yes	No	
South-West	1	23	24
West	6	49	55
North	6	38	44
TOTAL	**13**	**110**	**123**

Just 10.6 % (13) of the people interviewed that use the oven use it to boil milk.

Criteria to Decide on Daily Use of the Solar Oven

Users of the solar oven by zone according to criteria to decide on use of the equipment

Zone	Kind of food	Amount of sun	Time available	Lack of gas	Amount of food	Don't know	TOTAL
South-West	2	12	12	1	1	-	28
West	7	38	15	2	-	1	63
North	2	36	12	1	-	-	51
TOTAL	**11**	**86**	**39**	**4**	**1**	**1**	**142**

The vast majority of the replies to this (88.1 %) focus in on two reasons:

- Amount of sun: 60.6 % of the answers.
- Time available: 27.5 %

Other answers indicate, to a lesser extent:

- Kind of food
- They use the oven when they run out of gas
- Amount of food to be cooked.

Other Uses of the Solar Oven

We found some instances in which the solar oven is used for activities other than cooking or boiling water or milk.

These alternative uses are primarily:

- To store kitchen utensils.
    - One person in La Jagua, who did not like the solar oven for food preparation, found another use in the kitchen, though perhaps in a direction opposed to the objectives of the Program.

In contrast, it is possible that the rest of the cases of unexpected uses of the solar oven can indeed contribute in some way to the Program.

- To bake craft pieces.
    - Ms Carmen Cabrera de Rivas, resident of Villa Vásquez, in addition to cooking and boiling water, uses the solar oven to cook material with which she makes dolls out of wheat flour and wax as part of a craft project.
- Dry mangos.
    - Mr Jesus Virgilio Herrera uses the solar oven to **dry mangos**. He received the oven during a training session in Dajabón, but he resides in the Monte Grande community, in the municipality of Loma de Cabrera.
- Soap-making.
    - Ms Gregoria Garcia uses the solar oven for the preparation of different types of artisanal soaps.
    - She resides in Tenares and she obtained the oven as a gift from a sister who obtained it from the Solar Ovens Program training session.
- Ripen bananas.
    - Some people in Samaná alluded to this use.
- Roasting peanuts.
    - We observed this practice primarily in Pedernales.

The Solar Oven Cooking Pots

- In Batey Seven they commented that the pots are the most important.
- Almost everyone who doesn't still have the oven does still have the pots.
- Some people have used the pots with direct fire (primarily on a stove) and they have been damaged.
- They think that if the pot is of good quality it should be fit for cooking with the same results by any means that is used.
- They do not associate the pots with exclusive use in the solar oven.
- Many expectations regarding the pots are raised among the people, but most of them trade in inaccurate information about them.

III. FUELS USED AND THE IMPRACT OF THE SOLAR OVEN

The Most-Used Fuel

Most-used fuel by zone

Zone	Most-Used Fuel			TOTAL
	Gas	Charcoal	Firewood	
South-West	63	5	-	68
West	63	1	6	70
North	108	1	-	109
TOTAL	**234**	**7**	**6**	**247**

- 94.7 % of the people interviewed use gas as their primary cooking fuel in the three zones.
- Only 5.2 % of this population puts charcoal and firewood in first place.

The Second Most-Used Fuel

Second most-used fuel by zone

Zone	Second Most-Used Fuel					TOTAL
	Gas	Charcoal	Firewood	Electricity	None	
South-West	5	38	5	3	17	68
West	5	19	22	4	20	70
North	-	32	29	4	44	109
TOTAL	**10**	**89**	**56**	**11**	**81**	**247**

However, upon inquiring about the second most-used fuel, we found that:

- 36 % use charcoal in this category.
- 22.7 % use firewood.
- And 4.5 % turns to electricity.

This implies that there is extensive use of charcoal and firewood as a complement to gas, especially when trying to stretch the latter

The Third Most-Used Fuel

Third most-used fuel by zone

Zone	Third Most-Used Fuel		TOTAL
	Charcoal	Firewood	
South-West	1	3	4
West	-	2	2
North	1	1	2
TOTAL	**2**	**6**	**8**

Furthermore: when asking about the third fuel, first firewood and then charcoal appear again, though in smaller proportion, and now as the only options in play.

- In total, we found charcoal and firewood in use in 167 cases, which represents 67.6% of the 247 persons interviewed.

These cases are distributed as follows:

- Charcoal consumers: 98 persons, which represents 39.7 % of total interviewees.
- Firewood users: 69, that is to say, 27.9 % of the total interviewed.

Obtaining Firewood and Charcoal

Users of firewood by zone according to ways of obtaining it

Zona	How do you obtain firewood?			TOTAL
	They buy it	They look for it	It is given to them	
South-West	2	7	-	9
West	7	18	5	30
North	-	26	4	30
TOTAL	**9**	**51**	**9**	**69**

- 74 % (51 cases) of the 69 users of firewood search for it themselves.
- 13 % purchase it.
- 13 % obtain it as a gift from another person.

The firewood used by these people to cook consists of dry branches fallen from trees. In all cases, they get it from the area around their houses.

Users of charcoal by zone according to ways of obtaining it

Zone	How do you obtain charcoal?		TOTAL
	They buy it	It is given to them	
South-West	42	2	44
West	17	2	19
North	35	-	35
TOTAL	**94**	**4**	**98**

- 96 % of the people interviewed who use charcoal purchase it. According to statements of the interviewees, in most cases charcoal is brought in from the bateyes[1], produced by Haitian people. For example, in Batey Seven, where a large portion of the population is Haitian or descended from Haitians, they produce charcoal.
- The remaining 4 % receive it for free from other people.
- None of the recipients of solar ovens that were interviewed produce charcoal.

> *"She prefers to use charcoal out of habit".*
>
> Altagracia Medina (Cucuta), in Batey Seven,

[1] A batey is a small, poor village whose population is almost entirely Haitian or descendants of Haitians. The bateyes were company towns established by the sugar producers to keep their laborers in conditions that can be classified as slavery. With the fall of the cane industry, these villages remain Haitian and poverty-stricken.

Perceptions About the Health Effects of Firewood and Charcoal

We asked the interviewees who use firewood and charcoal if the use of these fuels causes them any health problem or difficulty.

Users of firewood and/or charcoal by zone according to health problems attributed to the use of these fuels

Zone	Cough	Irritated Throat	Difficulty Breathing	Eye irritation	Sub-total	None	TOTAL
South-West	14	1	7	3	**25**	23	48
West	14	-	9	10	**33**	19	52
North	11	1	4	9	**25**	38	63
TOTAL	**39**	**2**	**20**	**22**	**83**	**80**	**163**

- 50.9 % (83 persons) indicated the conditions recorded on the chart.
- 49.1 % (80), by contrast, responded that said fuels do not affect them.

Impact of the Solar Oven on Harmful Effects of the Use of Firewood and Charcoal

We asked people who used firewood and/or charcoal who are also solar oven users if the health situation caused by these fuels has improved with the use of the equipment. We found that:

- 36 people responded affirmatively.
- One person said that the situation had not improved at all.

IV. TRAINING IN THE PROPER USE OF THE SOLAR OVEN

The vast majority affirmed that they learned to use the solar oven during the training courses (also referred to as "Seminar") offered by the Solar Ovens Program.

Nevertheless, 18 cases stray from this pattern:

- Two people indicate that they learned on their own.
- Six persons say that someone else taught them.
- Two admit that they still have not learned to use the oven.
- Eight did not participate in the training and acquired the oven from another person, through purchase or gift.

The Instruction Manual

Solar oven recipients by zone according to whether or not they received an instruction manual

Zone	Did you receive an instruction manual?		TOTAL
	Yes	No	
South-West	66	2	68
West	69	1	70
North	102	7	109
TOTAL	**237**	**10**	**247**

Ten people stated that they did not receive the manual. They were found in:

- Zone **South-West** (2): Neiba and Paraíso.
- Zone **West** (1): Clavellina
- Zone **North** (7): Montecristi (2), Carbonera, Gaspar Hernández, Villa Progreso, Villa Clara and Monte Rojo.

Reading and Use of the Instruction Manual

Number of solar oven recipients by zone according to whether or not they have read the instruction manual

Zone	Have you read the instruction manual?		TOTAL
	Yes	No	
South-West	57	11	68
West	67	3	70
North	96	13	109
TOTAL	**220**	**27**	**247**

The 27 people who have not read the manual are distributed throughout the three work zones and in the majority of the program's communities.

In Batey Seven, Ms Altagracia Medina (Cucuta) says that she didn't read the manual because "it's in English".

Helpfulness of the Instruction Manual

Number of people who have or have not read the instruction manual by zone

Zone	Has the instruction manual helped you?		TOTAL
	Yes	No	
South-West	49	9	58
West	54	16	70
North	88	7	95
TOTAL	**191**	**32**	**223**

Yes 85.7 % No 14.3 %

"I have never read the manual; I haven't had a need to use it, I learned through practice".

Rafael Adriano Pérez, in Chacuey.

Do you need to know something more about the solar oven?

Number of solar oven recipients by zone according to whether or not they need to know something more about the equipment

Zone	Do you need to know more about the solar oven?		TOTAL
	Yes	No	
South-West	22	46	68
West	13	57	70
North	12	97	109
TOTAL	**47**	**200**	**247**

Yes 19 % No 81 %

Those who need to know something more about the solar oven asked questions such as:

- Why can't another type of pot be used in the solar oven?
- Why not equip the solar oven with rechargeable batteries?
- How do you keep cooking with the solar oven "*if the sun goes away*"?

Do you need to know something more about the solar oven?
"Yes, because we're never finished learning".
Porfiria Mieses, in Chacuey, Dajabón.

V. CARE OF THE SOLAR OVEN

Conditions in Which the Equipment is Kept

Conditions of the solar oven by zone

Zone	What condition is the oven in?		TOTAL
	In working condition	Not in working condition	
South-West	53	1	54
West	66	1	67
North	92	2	94
TOTAL	**211**	**4**	**215**

We asked everyone who still has the oven about the condition the equipment is in.

- 98.1 % said it is working well.
- Only 1.9 % indicated that it's not working.

Care of the Solar Oven

Number of people with the oven by zone according to the place where they store the equipment

Zone	Where do you store the oven?		TOTAL
	Place with a roof	Without a roof	
South-West	51	3	54
West	64	3	67
North	88	5	93
TOTAL	**203**	**11**	**214**

We asked everyone who still has the solar oven about the conditions in which they store the equipment.

- 94.9 % stores it under a roof, in almost all cases inside the house.
- 5.1 % store it someplace without a roof.

These results indicate that the great majority of those who kept the oven appropriately follow recommendations for safe storage.

VI. ASSESSMENTS OF THE SOLAR OVEN

Do you see any advantage in using the solar?

Solar oven recipients by zone according to whether or not they see any advantage in using the equipment

Zone	Do you see any advantage in using the solar oven?		TOTAL
	Yes	No	
South-West	53	15	68
West	66	4	70
North	99	10	109
TOTAL	**218**	**29**	**247**

- 88.3 % of all persons interviewed responded in the affirmative.
- 11.7 % indicated they don't.

"I prepare the food well in advance, I can go out and leave the food in the oven".
Milagros Morrobel, in Chacuey, Dajabón.

Opinions on the Advantages of Using the Solar Oven

The question was asked of all the people interviewed.

The two most named advantages (together coming to 69.8 % of replies) referred to the saving of resources:

- Savings of money: 38.3 % and Savings of gas: 30.9 %
- Healthy food (12.7 % of the responses) is in third place.

Other advantages highlighted:

- The oven is easy to use and does not require much attention, the cook does not have to be exposed to very much heat.
- It doesn't use firewood or charcoal.
- It does not produce smoke.
- It is safe to use the oven.
- Food is steam-cooked.

Problems with Using the Solar Oven?

Solar oven recipients by zone according to whether or not they have had problems with the equipment

Zone	Problems with the solar oven?		TOTAL
	Yes	No	
South-West	15	53	68
West	9	61	70
North	20	89	109
TOTAL	**44**	**203**	**247**

- 82.2% did not encounter any problems with the solar oven.

- 17.8 %, though, said that they have faced drawbacks to using the equipment. Among the difficulties noted were:

    - Slowness in cooking
    - Its dependence on the sun, which means that it can't be used at all times.
    - Instability of the equipment when it is windy. In Pedernales, at least two people told us that their equipment was damaged by getting banged up when the wind picked it up.
    - Difficulties with the springs.
    - The size of the oven only allows for cooking small quantities of food.
    - Very small pots.

What should we improve so that you can use the solar oven more and better?

48.9 % of all the interviewees said that the equipment does not need improvements. We found a similar percentage in the Northern zone (46.7) and in the South-West (45.6). This assessment is much higher in the Western zone, where it increases to 55.7 %.

Among those who proposed a need for improvements to the equipment, the primary recommendation is:

- Preserve the heat in the oven for a longer time. Another way of expressing the idea was "reduce the time needed to cook".
    - This was the request of 26.9 % of the interviewees.
    - That request increased to 30.8 % in the Northern zone and to 32.3 % in the South-Western zone. But, it reduces significantly to 15.7 % among the oven recipients in the West zone, where there is greater use of the equipment.

Other recommendations made are:

- Increase the size of the pots. 6.5 %

- Changes to the design of the solar oven. 6.1 % Include:
    - "Make the oven lid more flexible".
    - "Improve the base of the oven to give it greater stability" and
    - "Make the springs more flexible".
    - Make the reflector more manageable for storage.
    - Someone made the observation that the edge of the reflector is very sharp and creates a risk for cuts.

Although to a lesser extent, it was also requested:

- To increase the size of the oven.

Some isolated observations were:

- The oven should be smaller.
- Improve the quality of the pots so that they can be used on the stove.
- More training (a person in Montecristi).
- More recipes in the manual.
- That the oven not be limited to only work with the sun.
- That the food "brown better".

Telling Others About the Solar Oven

Solar Oven recipients by zone according to whether or not they have told others about the equipment

Zone	Have you talked about the solar oven?		TOTAL
	Yes	No	
South-West	49	19	68
West	62	8	70
North	78	31	109
TOTAL	**189**	**58**	**247**

Yes: 76.5 % No: 23.5 %

"I always tell them that the oven is very important. They offered me one thousand five hundred pesos (RD$ 1,500) for it and I said I wasn't selling it".

Elsa Taveras, resident in Clavellina.

The most frequent comments made by oven recipients to family, friends and neighbors about the equipment referred to the following themes and expressions:

- *Importance of the oven.*
    - 40 % of the interviewees use this expression to refer to their comments about the oven. They use the same expression in reference to the utility and convenience of the oven due to the reported benefits.
- Savings.
    - The notion of savings set forth here refers to two related yet different aspects: savings of gas and savings of money as a result of savings of gas. Combined they capture the attention of 32.5 % of the interviewees.
- *How the equipment works and use of it.*
    - 13.3 % indicated this aspect as the primary topic of their comments. Some people highlighted having the sun as a source of energy. Others indicated/emphasized the benefit that in the solar oven food doesn't burn.

- *Healthy food.*
    - Another 13.3 % highlighted the healthy quality of food cooked in the solar oven. They used expressions such as…

Other comments

- One person noted that in the place where she lives people have commented that they see the solar oven as a "weird" and "strange" object.
- One very noteworthy factor in the comments was the slowness of the solar oven in cooking.

> *"Right now I don't have a place to set the oven out where the sun will reach it. But I'm adding on to the house; when I finish building the addition, I'm going to set the oven out on the roof of the porch".*
>
> Ana Mercedes Guzmán, in Las Matas de Santa Cruz.

Have you recommended use of the solar oven to anyone?

Number of people that have recommended use of the solar oven by zone

Zone	Have you recommended use of the solar oven?		TOTAL
	Yes	No	
South-West	45	23	68
West	59	11	70
North	77	32	109
TOTAL	**181**	**66**	**247**

- 73.3 % said yes
- 26.7 % expressed that they hadn't.

VII. PROGRAM CONTACT WITH THE LOCAL POPULATION

Publicity to the Local Population

We asked each interviewee: How did you find out about solar ovens?

Zone	IED[2]	Other Church	Community Org.	Word of Mouth	Press	Other	TOTAL
South-West	60	-	-	4	-	4	68
West	2	34	2	30	1	1	70
North	73	18	5	12	-	1	109
TOTAL	**135**	**52**	**7**	**46**	**1**	**6**	**247**

- One hundred and eighty-seven (187) people (75.7 %) found out about it through a church.
- In Batey Seven they knew by way of the Community Evangelism Health Committee (ECS), a work area of the IED.
- Only 7 people (2.8 %) were made aware of the information through a community organization other than a church.
- 46 persons (18.6 %) found out through another person. But it is possible some of these people who were sources are part of the church.
- Only one (1) person (0.4 %) became aware through mass communications, in this case, the radio.
- 6 people (2.4 %) were informed through another unspecified source.

Obtaining the Solar Oven

Eight (8) persons acquired the oven other than through the Solar Ovens Program, that is to say, from another person, as a gift or purchased. These eight people who obtained ovens are in: Tenares, Jimaní, Montecristi (2), Neiba, Paraíso, Clavellina and Carbonera.

Solar Ovens Project Follow-up

We asked: After you acquired the solar oven, did someone get in touch with you to see if you need any help to use and take care of the equipment properly?

Follow-up with people who acquired solar ovens according to zone

Zone	Has someone been in touch with you?		TOTAL
	Yes	No	
South-West	23	45	68
West	10	60	70
North	22	87	109
TOTAL	**55**	**192**	**247**

22.3 % said yes. 77.7 % replied no

[2]The IED is the denomination Solar Oven Partners partners within the Dominican Republic. The initials stand for Dominican Evangelical Church.

VIII. SOLAR OVEN RECIPIENTS AND THEIR RELATIONSHIP TO THE CHURCHES

We asked each person we interviewed the question: Were you involved with a church (or a frequent attendee) prior to participating in the activities of the Solar Ovens program?

Solar oven recipients by zone according to whether or not they were involved with any church prior to obtaining the equipment

Zone	Were you a involved with any church?		TOTAL
	Yes	No	
South-West	45	21	66
West	53	17	70
North	95	14	109
TOTAL	**193**	**52**	**245**

- 78.8 % were already involved with a church, either as a member or as a frequent attendee

- 21.2 % did not have a relationship with a church.

We asked those who were involved with a church, either as a member or a frequent attendee:

Has your participation in the Solar Ovens program helped you to be more involved with this church?

- 17.3 % responded in the affirmative.

- 82.7 % said no.

Based on the responses offered, it does not appear that the relationship with the Solar Ovens Program has strengthened the ties of members and frequent attendees to the church that hosted the training.

We asked those interviewees that were not involved with a church:

After participating in the Solar Ovens program, have you begun to attend the church where you received your training or any other church?

- Yes: 14 %

- No: 86 %

IX. OBSERVATIONS AND RECOMMENDATIONS

In general terms, evaluations can take an approach using three types of questions:

- **Descriptive questions**, which point to what is taking place. They are concerned with the processes, conditions, organizational relationships and stakeholder views.
- **Normative questions**, which compare what is taking place with what should be taking place. They assess activities and whether or not targets are accomplished. These questions can be applied to inputs, activities and outputs.
- **Cause-and-effect questions**, which focus on attribution. They ask about what difference the intervention makes to outcomes.

(Paul J. Gertler and others *Impact Evaluation in Practice*. World Bank, 2017, p. 8.

The research requested by Solar Oven Partners about the Solar Ovens program in the Dominican Republic calls for an evaluation using the descriptive type of questions. Nevertheless, I think it is useful that I make some general observations and recommendations with reference not only to the process, conditions and relationship in which the program is carried out, but also to certain normative aspects of the same. To that end, the following considerations are offered.

The Use of the Oven and Weather Conditions

How well the solar oven works is dependent on the amount of heat from the sun. Therefore, the climate and its factors (temperature, atmospheric pressure, wind, humidity and precipitation) make up a key variable for accomplishment of the program objectives based on the use of the equipment.

The three zones of the Dominican territory into which we grouped the program's working communities have relatively unique climactic characteristics. These differences in climate have resulted in a considerable difference in program performance with respect to use of the equipment by zone

The communities in the **Northern zone**, along the Atlantic coast, experience conditions of humidity and ocean temperatures.

- The season when the most rain falls is between November and January; however cloudiness and cold breezes lead to reduced heat in the sun rays from September to March.
- The season with the least rain is summer, from June to September.
- In the communities included in this zone, we recorded the lowest rate of equipment use at 46.8% of the interviewees.

- In three communities in Samaná (Villa Clara, Monte Rojo y El Limón) we interviewed 45 people, of whom 39 still have the oven. Of the latter, only 13 (33.3%) use it.

- In another three communities on the Atlantic coast a (Gaspar Hernández, Villa Progreso y Sosúa): of 9 persons interviewed only 4 of them have the oven and none of them use it.

- One more indicator of this point: Of 10 communities that we grouped in the Northern zone, only in three is there a greater number of persons who use the oven than who

don't. And two of these communities (Carbonera and Las Matas de Santa Cruz) are the farthest inland.

A significant part of the communities included in the **South-Western zone** are influenced by the conditions imposed by proximity to the Caribbean Sea. One example is Paraíso, on the coast, where the heat of the sun is tempered by the sea breezes, particularly at the end of the year. Use of the oven in this zone reaches 48.1% of those who retain the oven.

On the other hand, the communities grouped into the **Western zone** along the border with Haiti, are located in a geographical space with very different geographical and natural conditions:

- A large portion of the ground is arid, with an extensive semi-desert countryside, where the hottest temperatures in the country are recorded as well as the most hours of bright sunlight, with little rain and a tendency to experience prolonged periods of drought.

- Here the program results are different. We found the greatest oven-use rate among this population: 82% of the interviewees.

We can also observe the impact of the climactic factors (especially rain, cloudiness and ocean breezes) in the reasons cited by the oven recipients for not using it, and in some cases, for not retaining it.

The 10% of those who have never used the oven attribute their decision to the lack of time that the sun shines. The 39% who still have the oven, but don't currently use it, state the same reason. And this represents 9.7% of the responses giving reasons for not keeping the oven.

It is advisable to encourage those who retained the oven in the communities of the Northern zone to use it in the season with the greatest amount of sunshine. One option is to organize activities promoting oven use at the start of each summer.

The Solar Oven in the Rural Environment

We observed that the Solar Ovens program in the Dominican Republic has directed its activities primarily to urban populations or those in the process of urbanization.

Of the 23 communities included in the program and considered in the study, two of them retain more rural characteristics: Chacuey and Clavellina, in the province of Dajabón. And it is precisely their residents who show the highest percentage in the solar oven use rate. Between the two locations, of 30 people interviewed, 28 still have the oven and 27 use it. That is to say:

- 93.3 % of the persons interviewed still have the oven and
- 96.4 % of those that still have it, use the equipment to cook.

We do not see these recordings as being due to chance. It is true that these communities are located in the geographical area with the most favorable climactic conditions for oven use; but, in addition, some of the characteristics of Dominican rural life that are present there make it easier to accept this cooking technology.

This has to do with aspects of the chores performed by the residents there, which are distinguished from urban life, such as, for example:

- More time available. This makes it possible to overcome one of the primary objections to solar oven use. With their rural notion of time, these populations are less pressured by time constraints.
- Traditional use of firewood. People who use firewood to cook know that this chore takes up more of their time. The transition from this fuel to the solar oven does not create as negative an impact as it does in the city. Here, the solar oven can compete in better conditions with firewood.
- Less fast access to obtaining gas. In this situation this fuel is more appreciated and it makes it easier to present the oven as a substitute.
- The limited job and economic activity opportunities reduce the flow of money. In these conditions, there is increased advantage to the oven as a means of household savings.

These are some of the characteristics that allow the rural environment to offer better social and cultural conditions for solar oven use, in particular; and for the attainment of the social objectives of the program in a wider sense.

The Source of Drinking Water and the Use of the Solar Oven

90.3 % of persons interviewed drink purified bottled water.

However, the remainder drinks from the pipes, stores collected rain water or they drink it directly from a cistern truck. These means of obtaining water for human consumption were recorded in places such as Montecristi, Pedernales, La Jagua, Paraíso, Monte Rojo (in Samaná) and Las Matas de Santa Cruz. But it is highly likely that it exists, to a greater or lesser extent, in other places, possibly everywhere.

According to the above:

- On the one hand, we have a considerable segment of the program's target population (near 10% of those interviewed) who drink water from sources that endanger their health.

- On the other hand, we observe that part of this same population is unlikely to purify their water. Furthermore, the expense of bottled water is not exempt from difficulties in its use, storage and distribution. One example is the prolonged exposure to the sunlight of water contained in plastic bottles.

- For the program, this reality keeps the challenge of tying solar oven use to the health objectives for the community latent.

Effects of the Use of Charcoal and Firewood on Deforestation

The use of firewood in the communities considered here does not appear to represent a significant threat of deforestation, because those who use it limit themselves to collecting dried branches.

In contrast, charcoal can indeed be considered a threat in this regard, because of its high consumption and because it implies a commercial network spread over wide areas of the land.

Perceptions of the Health Effects of the Use of Firewood and Charcoal

Half of the people interviewed who use firewood and charcoal indicated various conditions caused by said fuels. But the other half considers the use of them to not cause them any harm.

Digging deeper into this topic, everyone recognizes the possible harmful health effects of these fuels. However, a large portion believes they are not exposed to the risk because they keep a distance from the fire and smoke while cooking. In other words, they are unaware of the ways that the results of burning firewood and charcoal pollutes the air, permeates surfaces and remains in them and enters the human body.

The Solar Ovens program can add to their actions permanent health education activities for the target population. The purpose is to raise awareness of the real, not just potential, harmful effects of the use of charcoal and firewood as well as to demonstrate how these effects present themselves.

Reading of the instruction manual

At every training, the program distributes instruction manuals to facilitate knowledge about and use of the solar oven. But some people that receive this equipment do not know how to read. We were able to observe this situation, for example, in *Batey Seven* with three of the four people interviewed. Fortunately, their daughters and sons read the manual to them.

It is often difficult to determine when a person is illiterate because many people tend to hide this condition, especially in urban areas. Because of this, we cannot eliminate the possibility that some of the people who said they read the manual may have lied. And the likelihood is high that in the future the program will deal with people who are unable to read the manual.

With this in mind, we consider it to be relevant:

- To inquire about the conditions and literacy needs in the work zones.
- And, from this, to strengthen the program with objectives aimed at literacy training for the target population that needs it.

Assessment of the Solar Oven's Impact on Household Savings

One of the primary positive assessments of the solar oven is its contribution to savings for families. This notion of savings presented by the recipients of the equipment refers to two closely related, yet different aspects:

First is the savings of gas. This is a benefit that is very much appreciated in household savings. Savings on gas is important for low-income people. That is why they tend to use the second choice of fuel to reduce the use of gas. One choice is charcoal, the other is firewood as substitutes that are used to cook foods that are common to the daily diet that require relatively long cooking times, such as beans; and something similar happens with beets. This also applies to items that are occasionally cooked, for example, desserts. During the interviews, the usefulness of the oven "when the gas runs out" was referred to repeatedly.

The second aspect was **savings of money as a result of saving fuel**. Between the two they constitute 32.5% of the topics of comments shared with family members, neighbors and friends about the solar oven.

Why Do Some People Who Do Not Use the Solar Oven Recommend It to Others?

Nearly three quarters of the people interviewed said that they recommended use of the solar oven to someone. Some who don't use it and some who didn't even keep it decide to recommend it to family members, neighbors and friends. This seems to be contradictory. But in these cases, the greatest criticism of the oven is the slowness in cooking.

These same people tend to appreciate the other key aspects: the contribution to savings of gas and money; the benefit to the environment, as it eliminates or reduces the consumption of firewood and charcoal and tends to prevent smoke emissions; the ease of use and the small amount of attention that needs to be paid to it while it cooks.

One lady in Chacuey decided to give her oven away because "it takes a long time to cook"; nevertheless, she considers it to be "ideal" for someone "who has enough patience". In this comment we find the reason why the oven can find greater acceptance in rural life.

The ways of publicizing to the local population

It appears that in each community the program has been supported primarily by a local church to relate to the population and invite them to the presentation about and training in the use of the solar oven.

But it is likely that these religious organizations have limited their publicity to members and participants. This may be why 78.8% of the recipients of solar ovens who were interviewed stated that they were part of a church, either a member or frequent attendee.

If the program intends to reach different segments of the population, with wide representation from the life of each community, it is advisable to establish relationships with a more diverse range of local social organizations, without limiting itself to only one type.

Strengthen the program in the communities where ovens have been distributed

We found that some solar oven recipients moved to another address within the same town or they reside in a different community. Others received the oven in the place where the training was held, but they came from other communities and did not correctly register their place of residence.

Likewise, in various places we observed that there was dependence on the churches and pastors that have supported the program by organizing activities such as trainings for access to a large part of the information about the oven recipients and their location.

But there is the impression that this support: is not an expression of a commitment; that it has not been formally established, nor does it appear to have a medium or long-term vision; and further, it has not given rise to effective coordination of activities. As such, in practice, the demonstration of this support seems to depend on factors of circumstances and the will of the individual in each situation.

These situations are real limitations that can meaningfully impact the program operations and the accomplishment of the desired results.

We also believe that the program needs to go beyond the phase of oven distribution. The success of its primary objectives related to overcoming certain social realities requires the decisive and sustained involvement of the target population. That is why it is necessary: 1) **to become embedded in each community**, 2) **to remain there and** 3) **to ally with the people through various forms of organization.**
Let's look at each recommendation and some examples of actions that could be carried out:

- Design and follow through on a plan to ***embed in each community***

    - Establish a dialogue between the objectives of the program and the objectives of the community organizations.
    - Participate in their important activities as a way of becoming part of the dynamics of their action.

- Establish some form of ***permanency of the program in the communities***

    - Consider the formation of support committees that contribute to sustaining enthusiasm around the program objectives in each community.

    - In addition to working with the already existing leaders, it is important to contribute to developing your own leaders who arise out of the program dynamics.

    - The above requires the identification from among the oven users of persons with leadership potential who can contribute to promotion of the program at the local level.

    - Likewise, carry out a **follow-up plan** in each location that includes: up-to-date registration of each person who obtains an oven and his or her location, as well as follow-up visits. This is not simply a question of knowing where the equipment went, but rather to follow the course of action each recipient takes with it. This monitoring will allow for the evaluation of the indicators of success or lack thereof of the program's social objectives.

- Make ***alliances with community organizations***

    - Identify potential allies from the local public sector and community organizations.

    - Coordinate actions with allied organizations and keep up permanent contact with them.

    - Give priority to women's organizations. In several communities Centros de Madres (Mother's Centers), which bring together a considerable number of women, are in operation.

The Solar Oven in Hands of People Who Do Not Use It

One challenge for the program is to motivate those who have a solar oven but do not use it to get them to use it again.

There are natural realities, such as the amount of sun that a zone receives, which objectively limit the use of the equipment. Nevertheless, this is not something completely impossible to control because it is a seasonal situation, that is, it does not occur throughout the entire year.

It is necessary to offset the tendency to lose enthusiasm or to become frustrated that can be caused by the impossibility of using the oven at will whenever desired or every time it is needed. Let us think about how the possibilities to wash and dry clothes are equally limited when it rains; and when the sun comes out again, in every house they wash clothes again. People can be helped to manage this type of limitation in the case of solar oven use, especially in communities along the coast of the Atlantic Ocean.

There are people who do not use the oven because the sun does not shine enough at their homes due to trees in the yard or other higher construction around them. In these cases the program can consider the situation and, if possible, offer them applicable suggestions that allow them to use the equipment again.

Similarly, they can be shown how to deal with the issue of time required by the oven to cook. As we proposed earlier, this issue can be more easily dealt with in the rural than in the urban environment.

Some don't use the oven because of a lack of sufficient understanding of how the equipment works. It is advisable to identify these cases and offer the relevant assistance.

Ovens with low usage

- It is necessary to carry out **encouragement and support actions** for current oven users with the objective of maintaining and increasing the use of the equipment. Examples:
  - Actions in response to required information about the use of the oven, Exchange of new cooking recipes, repair of the equipment, parts provision, answering questions related to various topics and other such matters.

Recovery of ovens

The program can consider the possibility of recovering the oven if it is not possible to convince the owner to use it again. Otherwise, it is likely that the equipment will deteriorate in disuse. Furthermore, keeping the oven without taking advantage of it for a long time may cause the recipient to perceive it as evidence of a waste of money on her part and as a sign of failure of the program.

Related to this matter, there are unique cases such as the following.

A short story in Carbonera

A participant in the training was enthusiastic and decided to acquire the oven, but she did not have the money. She got a loan from Ms Rosa Pérez, who held the oven as a guarantee until the debt was paid. At the time of the interview, the debtor still had not returned the money and Ms Pérez continued to hold the oven.

What is the situation today? The person who was interested in the oven doesn't have it, but it is being held and not being used. Meanwhile, the lender, not knowing what to do with it has no interest in it. She doesn't even know how to use it and she appears as the

registered recipient of the equipment even though she has never been related to the program.

Ms Rosa Pérez resides in Carbonera, at Primera Street # 85 in Barrio Nuevo, where she runs a corner store on her property.

Continuity in the promotion of the program

- It is recommended that **periodic solar oven use promotional activities** be organized in communities where distributions have taken place.
    - Identify relevant festivities in the community and participate in them with promotion of the oven.
- Promote the program through the presentation of images (photos and/or videos) of uses of the solar oven other than to cook. Some examples:
    - Ms Carmen Cabrera de Rivas, in Villa Vásquez, who uses the solar oven to cook the material with which she **makes dolls out of wheat flour and wax as part of a crafts project**.
    - Ms Gregoria García, in Tenares, who uses the solar oven in the **preparation of various types of artisanal soaps**.
    - Mr Jesús Virgilio Herrera, in Monte Grande, in Loma de Cabrera, who uses the solar oven to **dry mangos**.
- Promote the usefulness of the solar oven for various tasks, in addition to cooking, that require the use of heat and for which the equipment provides the necessary conditions. Example: drying and toasting peanuts and similar items.
    - In the trainings, participants could be encouraged to share ideas to identify different activities in which the solar oven would be feasible.
- Promote the program through presentations by solar oven users who are convinced of its usefulness. Examples:
    - Mr Rafael Adriano Pérez, resident in Chacuey, in Dajabón.
    - The Pedernales high school principal and her mother, who live in neighboring houses and have united their kitchens with two solar ovens.

Some kinds of food are good for oven use promotion

Beans, rice and meats constitute the usual meal of the Dominican noon meal; that is why it is commonly known as “the national flag”. These three foods, along with starchy and non starchy vegetables, and some desserts were identified as the kinds of food most often cooked in the solar oven.

Beans (with which we include other grains) took first place.

- This food, in addition to being a basic ingredient in the daily Dominican diet, is the one that requires the longest cooking time. As such, it is the primary consumer of fuel.

- In the interest of saving gas, many families turn to charcoal or firewood to cook beans and other grains. This has made the oven attractive for many housewives. In fact, in many homes, especially urban ones, they use the oven exclusively to soften this grain.

- This experience presents an opportunity to promote the solar oven as a significant contribution to savings of money, savings of gas and as a substitute for charcoal and firewood. This promotion is particularly important in urban areas, where there is greater resistance to the use of the equipment.

With regards to desserts, the most often cooked in the solar oven are, breads, cakes, cookies and other foods prepared with wheat flour and, less frequently, with corn flour.

- We frequently found people who use the oven only for this type of food, almost always sweet.

- Most of the desserts indicated require little cooking. Therefore, the program can use this type of food to promote the oven to those who object because “it takes a long time to cook”.

Priorities for program expansion

One.
When continuing the expansion of the program, it is recommended to give priorities in the selection of rural locations, especially those that are located in what we have named the Western zone.

Two.
The sun is an absolute requirement to make the equipment operate, which imposes conditions related to the geographical space where it will work. Nevertheless, this selection is also conditioned upon the social objectives of the Project. For example: economic, environmental and health impact, among others. Hence:

- It is necessary to gather relevant information about the social, economic, cultural and other information about each population and to subject all the variables involved to analysis before deciding to establish community work with the dimensions projected by the Solar Ovens program.