

CGIAR Systemwide Program on Participatory Research and Gender Analysis

Village-based Participatory Breeding in the Mountain Slopes of Yemen

Small Grant Final Report:

1. Identifying information

Project Title: Village-Based Participatory Breeding in the Mountain Slopes of Yemen

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2. Achievements and Constraints

The first progress report, covering the period 1 April 2001 – 31 March 2002, and submitted on 19 May 2002, reported on outputs of the participatory breeding component of the extension phase of the project, which was concluded.

Since then an additional cycle of seed multiplication of the promising entries has been undertaken:

- Two barley lines, El-Irra 58 and El-Irra 60, and three lentil lines (YG 35007, YG 35008, FLIP96-53L) were multiplied at El-Irra station and the seed distributed to five villages in the Kuhlan Affar area.
- At Beit El Wali the participating farmer multiplied the same lines.
- In Dhamar area the second year trials were planted both for lentil and barley in two locations. The trials comprised 5 barley entries (4 selected lines and the local variety) and six lentil entries (5 selected lines and the local variety).

The socio-economic and gender analysis survey of participatory households was completed and is currently being analyzed. A preliminary report is attached.

The main constraint encountered in completing this work, was the capacity of the women extension staff to participate in the work. The potential is there, but additional training on the participatory approaches and gender analysis is still needed both in data collection and analysis.

A video of the PPB approach in Yemen has been produced and a copy will be provided to SP-PRGA.

3. Implications

The achievements and constraints of the socio-economic component of the project confirm the pre-established Workplan in terms of research design, partnerships and participatory and gender-sensitive methods, tools and approaches.

The main partnership to complement this component was with the Agricultural Research and Extension Authority (AREA) including both research and extension staff. Considering the particularity of the project in terms of the approach, all partners were agricultural engineers, with limited knowledge on the approach. Also, the women extension workers have never attended any training course on the use of these tools. Therefore, many meetings were held in their presence in order to explain the process of data collection with women and men. The data has been collected, but still some questions were not interpreted correctly by the enumerators in spite of the training given during the study. This can be further improved through intensive training for both male and female researchers and extension workers.

The overall experience of this assessment is considered as positive in terms of having confronted the staff (women and men) to the use of these tools and methods, and that the investigation has resulted in important understanding of the characteristics of the participating households in the project.

4. Communication and Dissemination of Information

A report on the analysis of the surveys is being analyzed and results written in a final report. A paper authored by the involved scientists will summarize the results of the investigation.

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Small Grant: Village-based Participatory Breeding in the Mountain Slopes of Yemen

**Narrative Report on
Socio-economics/Gender Analysis in the Mountain Slopes of Yemen**

By Malika A. Martini and Aden Aw-Hassan

Introduction

As part of a larger study on participatory barley breeding in Yemen, this report summarizes the socio-economic component consisting of an assessment of gender roles in participatory research in the agriculture of the terraces, in participatory research and in the types of products from post-harvest of barley production.

In a first stage a rapid appraisal was conducted in the the project area of Kuhlan Affar, and the two villages selected in the project area of Dhamar with an objective to prepare a socio-economic assessment and gender analysis of the characteristics of the agricultural households participating in the selection processes of both barley and lentil varieties. The appraisal included the villages of Beit al-Wali and Al-Ashmor in Kuhlan Affar area and Balasan and Yarim in Dhamar area. The socio-economic survey covered these four villages.

Focus group meetings were conducted. The meetings included both men and women both jointly and separately. The selection of varieties in relation to the decision-making processes within the households were discussed. As the selections were conducted separately with men and women , an understanding of the decision-making process was necessary to help in the preparation of a socio-economic survey of the participating households in the project.

The output of the appraisal was used to prepare a formal survey aiming at characterizing the participating households by income levels, labor and other resources. The data of the survey are currently being analyzed.

Methodology of Data Collection

Qualitative and quantitative methods of investigation were used in collecting information including informal group discussion survey with women and men in the selected households, and formal survey using questionnaires.

During the period of March 14-22, 2001 an exploratory visit in preparation of a social science study including a gender analysis was conducted in Beit al-Wali and Al-Ashmor villages in Kuhlan Affar area and in Balasan and Yarim villages in Dhamar area. with the objective of understanding the socio-economic and gender aspects of the farming households involved in the participatory barley breeding project. Based on the information gathered from these households, a questionnaire was prepared in order to collect additional information on these communities.

During the period September 2001-March 2002, a formal questionnaire interview was completed on the selected households. The sample included 20 households from a total of 6 villages in Kuhlan Affar area (Al-Ashmor, Beit Al-Wali and Hisn El-Naqi villages) and 17 households from Dhamar area (As-Sawad and Yafa' villages) and Ibb (Al-Dharw).

The qualitative data was analysed using gender analysis tools. The quantitative information was analysed using the Statistical Package for Social Science (SPSS). Descriptive statistical results were generated from the data, using frequencies, means and standard deviations. Cross-tabulations were used in order to analyse two or three dimension relationships between the variables. The Chi-square (χ^2) test was used to test the significance of the relationships between variables.

Preliminary results

General characteristics

All farmers in the area follow the same rotation at the same time i.e. they all plant the same crop at the same time on their lands. The reason lying behind that is to avoid that young children eat the crop at its green stage on their way to and from school. In Yemen most crops can be eaten before maturation such as faba bean, chickpeas and others. Also, farmers prefer the varieties that will be harvested early. They make sure that they all plant and harvest at the same time to avoid having their field "invaded" by children in case their production ought to be harvested later on.

Land tenure also plays a role in the management of the trials, as farmers take care of their own land more than the shared or rented land, which also affect the management of crops including barley.

On the plains of Dhamar, land holdings are much larger and mechanization has been introduced mainly for land preparation. Thus decisions of farmers are more independent in relation to rotation and to the selection of varieties within the PPB project.

Cropping Patterns in Kuhlan Affar and Dhamar and Rotation

Farmers have a multiple and quite complex farming system. Barley and lentils are the main crops grown in this area in addition to sorghum, wheat, peas, maize, and alfalfa.

In Kuhlan Affar, all farmers consult each other in order to set a period where they graze their land at the same time.

In Dhamar, farmers grow mainly potatoes (for those who have a source of irrigation), sorghum, wheat, barley, peas, lentil, maize, alfalfa, vegetables, and some fruit trees. The main crops are wheat and barley and are grown under rainfed conditions.

Rotation is a serious matter and is largely taken into consideration as all neighboring farmers decide upon previous agreement to plant the same crop at the same time mainly in Kuhlan Affar.

Farming Pattern in the Study Area

	Governorate			Total
	Amran	Dhamar	Ibb	
1 Rainfed	20 76.9% 54.1%	6 23.1% 16.2%		26 100.0% 70.3%
2 Rainfed + Irrigated		5 50.0% 13.5%	5 50.0% 13.5%	10 100.0% 27.0%
3 Irrigated			1 100.0% 2.7%	1 100.0% 2.7%
Total	20 54.1% 54.1%	11 29.7% 29.7%	6 16.2% 16.2%	37 100.0% 100.0%

As for the participation of farmers in the PPB trial, 78.4% of the total farmers have participated in the trials of barley breeding before the project, and 21.6% were non-participants.

Participating and non-participating farmers in field trials before PPB

	GOV Governorate			Total
	Amran	Dhamar	Ibb	
0 no	Count 15	Count 11	Count 3	Count 29
	% of Total 40.5%	% of Total 29.7%	% of Total 8.1%	% of Total 78.4%
1 yes	Count 5	Count 0	Count 3	Count 8
	% of Total 13.5%	% of Total 0%	% of Total 8.1%	% of Total 21.6%
Total	Count 20	Count 11	Count 6	Count 37
	% of Total 54.1%	% of Total 29.7%	% of Total 16.2%	% of Total 100.0%

Farmers' experience in agriculture.

The land on the mountains of Kuhlan Affar is all rainfed, whereas that on the plains of Dhamar is partly rainfed, and partly irrigated. All former NARS researcher and extension work in Dhamar focused on irrigated crops. The PPB project is the first activity with farmers whose trials are located on rainfed lands. The socio-economic study, is considering for instance the low rainfall areas versus the high rainfall areas.

About 50% of the farming households surveyed have 30 years of farming experience, and only 8.1% have less than 10 years experience.

It was found that among the local varieties of barley grown in Kuhlan Affar, the large-grain barley types were grown on the highest areas and the small-grain types on the lowest areas. The small-grain barley is more likely to be adapted to different climatic

conditions, and the large-grain type is more resistant to pests and diseases. Also the 5-row barley variety performs better if there is enough rainfall.

Women headed households exist in all Yemen regions including the study area. In addition to all types of agricultural activities, the women heads of households also market their production particularly in Taz region, whereas in the study area they limit their activities within the household boundaries.

Selection of Barley and Lentil in Kuhlan Affar by Women and Men Farmers

One of the most important selection criteria of women and men's selection is early planting and thus early harvest. The early planting and harvesting means varieties of short growth period. Farmers of the same village would decide and agree on criteria for early planting and harvesting, preferably at the same time for the whole village. The reason behind this is that if most farmers prefer a variety that is due to be harvested early, and only one farmer has planted a different variety that will be harvested later, this field will be affected by animals grazing on neighbors' fields who have already harvested.

Discussions at the meetings held with both men and women, revealed that men farmers mainly base their selection on market prices. Thus grain size is the most important selection criteria. Women think more about food and animal feed characteristics, which make both grain and straw important in their selection. Also, on small terraced fields of Kuhlan Affar smallholdings lead farmers to take group decisions concerning rotation, and they practically select the same varieties of barley in the PPB project, although the reasons behind their choices are different.

Criteria of Barley and Lentil Variety Selection by Farmers in Dhamar

In order to better understand the choices of farmers for particular varieties and plant characteristics, it is important to mention that the PPB trials were planted in rainfed areas only. In this area, the collaborating women and men farmers selected the early planting and harvesting varieties with a short growing period or "early varieties". The main reason behind this choice is because the rainy season is short and lasts only two months and precipitations in the area do not exceed 200 mm in this short rainy season. Farmers do not prefer the late varieties that need a period of four months to maturity. Another reason for farmers' reluctance of long-duration varieties is that frost falls during the last two months with negative effects to crop yields.

Selection of Barley and Lentil Varieties by Women and Men in Dhamar

Both women and men base their selection on the growth period. They prefer the varieties of short growing period even if other varieties produce bigger grains but are grown during a longer period of time. Also varieties of long growth period need a source of irrigation. However, few farmers who have a source of irrigation in Dhamar area have selected the varieties of large grains.

Three local barley varieties were grown in the area before the introduction of the new varieties by the PPB project. The preliminary results of the formal survey show that most women have selected the same varieties as their male relatives. Thus their actual selection is based on agronomic characteristics of the plant and on the agro-ecological

conditions of their area in relation to the varieties. Furthermore, they are still very much influenced by their male relatives; husbands, brothers and fathers' choices. Women explained this congruency of selection by the fact that they perceived such would increase the chance of approval of new variety for their area. Considering this and the subsequent explanation of the process to women participants, it is expected that women will have a more independent selection of the varieties and may select different varieties than men in the coming years when they will have the chance to use these new varieties at a larger scale in their different food and feed purposes.

The color of the grain is not of a great importance for farmers despite that bread is actually made of a dark grain, it is of an excellent quality. Women did not express any willingness to have a lighter color of the grain given that the taste is good. All new varieties of barley are called "Masri" (meaning Egyptian) in the area because the few varieties that were introduced in the past in the area originated from Egypt, and "Masri" is still used for any new variety of grain introduced in the area regardless of its origin.

In contrast to Kuhlan Affar area, in Dhamar, grazing in crop residue is an independent initiative which takes place regardless of whether the neighbors are grazing their land or not. It is not a problem if a land is grazed next to a field that is not harvested yet. Apparently herders protect animals from damaging neighboring fields.

Future participation of women to the selection process in neighboring areas

Farmers have agreed that the women of their households (wives, daughters, daughters-in-law) participate in the future to other selection processes that will be conducted in other areas. Although women are not used to express their opinion openly, men have ensured that women are the decision-makers on selection of different varieties, and that they have already refused to use bags of grains that their husbands had bought from the market, which they did not like for making bread or feeding their animals. The Yemeni customs prevent women to state openly that they have some decision-making on the varieties, but in fact as indicated earlier, they do decide especially when they have tested the varieties for different domestic purposes.

Skills of Farmers

The women and men farmers have undoubtedly acquired additional knowledge from their participation in the PPB project. First of all, they have learned about the existence of other varieties that can perform well in their environment. Before the project's activities, they knew about the existence of only three local varieties (Sagla, Shiha and Aswad), which they grew on their lands. They have also learned about different management practices of barley and lentil. The future seems promising as these farmers (women and men) are very cooperative with the project.

Linking barley and lentil to the livelihoods of rural people

Barley and lentil are both important crops for the livelihoods of rural communities in the study areas. They are used both for human and animal nutrition.

- For human nutrition, barley is either used alone after grounding or as mixture with lentils. It is widely used for making bread called "*Malug*" or "*Gahin*". Barley

grains are used as a drink called “*coffee from barley*”. It is also used to make “*khamir*” a bread made of maize flour mixed with barley. It is also used to make soup and cake. Barley grains are used as medicine for the relieve of kidney problems. Milk and barley are cooked together, a meal that can be served anytime of the day is called “*Zawm*”. Other types of bread and food called “*Chiza*” and “*Mathani*” are made of barley. More information about these types of food will be given in the final report.

- For animal nutrition, barley grains are fed to ewes after lambing, and to sheep in general. Straw is fed to animals.
- For other purposes, straw from barley is used for building after being mixed with soil. It is also used as bed for chicken (under chicken).

The sample shows that 100% of the surveyed farms use barley for human nutrition, mainly for bread making. Barley is an important crop for the livelihoods of rural poor in the dry mountains of Yemen similar to the study area. Forty three percent (43%) of the sample use barley grain as a drink (*barley coffee drink*), and 29.7% of the total sample use barley grain for soup and as a medicinal plant for kidney problems.

As for the use of barley straw, the results show that it is mainly used as fodder for animals, and is widely used as chicken bed. It is also mixed with soil and used as a material for building purposes.

About eighty nine percent (83.8%) of the sample use straw for animal feeding, and 10.8% use straw for building purposes.

Characteristics of the Participating Women

The characteristics of the participating women help understand the selection that has taken place in the two research sites. The selection process undertaken had a significant impact in terms of participation of women in this project. They usually perform all types of activities without discussing their work with anybody. The project has given them the opportunity to interact and discuss their concerns with others. However many characteristics of the participating women ought to be highlighted.

1. ***Illiteracy:*** All women who participated in the selection process are illiterate. They have never had a chance to go to school and neither have their daughters simply because there is no school in their village. They live in small villages with no school and due to social reasons, they were not allowed to study in schools located in other villages. This made the communication with these women very difficult, however the presence of women from the extension services at the discussion greatly facilitated the understanding and the extent of these discussions.

As women are all illiterate they have never had access to the PPB farmers record books. Some farmers are able to register their financial accountings, but nothing else. Illiteracy includes also women’s ignorance of family planning; some women were married five years ago and have already four children. This implies a very high demand on women’s labor in house and farm activities. It also implies high

population growth rates, which requires additional needs for sustaining the livelihoods of larger rural population in these very marginal environments.

2. ***Social Status of Women in Yemen:*** Women in the study area have been raised by their families in such a way that men are favored in all aspects of life, and should have the last word whenever differences in opinion arose between women and men. Women are not allowed to argue, however, few of them do, particularly when they have the entire responsibility of the farm.
3. ***Decision-Making:*** As the selection process is a new initiative in those villages, it was perceived both by women and men more like an exam than as an individual assessment and selection of new varieties to be planted in their areas. Therefore, this has led to the fact that before the selection process starts, they visit the experimental field together, and decide about the best varieties they want to select for their area. They had enough time to discuss all the characteristics together. Then at the time of the formal selection in presence of scientists and extension agents, although women and men do the selection separately, they still select the varieties that they have agreed upon earlier on.

This does not mean that the selection was done in an improper way, in fact the pre-selection discussion which was farmers initiative may have helped to use the pool of knowledge and may have led to “better” selection (this is some thing that could be tested?). But it shows on one hand that there is a discussion going on between women and men about the selection of barley and lentil varieties on field trials, and on the other, that they understood the message given to them as to select **one variety** for their area. This may be the reason for women and men selecting the same variety.

Women do complain that their husbands are the main decision-makers concerning agriculture, but implicitly they do agree that they do make decision in their domain of activities such as the type of flour used to make bread. They also have strong decision-making in animal feeding using all types of plants and plant residues. Women have expressed that in case they disagree with their husbands about a variety, it is always the opinion of the husbands that predominate, otherwise, they will be blamed for a bad choice they may have done. Finally women who manage the farm in absence of their husbands who come back home only at harvest time decide about the crops to plant.

4. ***Division of Labor on Farm:*** Women do most of the agricultural work (planting, thinning, harvesting etc) including livestock management (milking, feeding, feeding cows by gavages, veterinary activities), post-harvest activities and food processing. Men do only plowing the land using draught animals such as donkey, bull or even a dromedary (camel), and are followed by women broadcasting the seeds at the planting time. They also take over the responsibility of irrigating the land. They may be working off-farm all year long, but do come back to work on farm with their families during peak periods of planting and harvesting. They ensure the marketing of the farm products. Women perform all the other agricultural activities consisting mainly of planting, weeding and harvesting. They

also do the post-harvest activities and insure water supply to their households in addition of food preparation and caring of children. Women were found to work everywhere during all daytime up to the evening time.

5. ***Women's Understanding of the Participatory Plant Breeding Project:*** The purpose of the project is understood by women as “a means to select the best varieties of barley and lentil”. Although women have participated in the PPB in Yemen, they have never heard about the performance of the different varieties in the different locations because they know only the two or three local varieties grown in Yemen. Men of these households have expressed their willingness to let their wives and daughters participate in field trips organized by the scientists and extension agents involved in the PPB project in order to allow them learn more about the performance of different varieties in different agro-ecological conditions.

Although during the early stages of women's participation in the PPB project they have learned about the existence of many varieties. They do discuss many aspects of agriculture production with their husbands and children, and they may acquire more knowledge and experience during the later stages of their participation in the PPB project. Men do not affect very much the knowledge of women in agriculture because women are busy all day long until sleeping time performing all types of activities. They sometimes do discuss their work with their husbands. However, men's opinion about women's knowledge in agriculture is negative. This can be true to some extent for women whose husbands work on-farm but not true for those whose husbands work off-farm and whose wives and daughters do the farming.

6. ***Discussions of the PPB between Men and Women:*** Men do inform women in general about their activities related to agricultural production. Discussions take place between them, and when women are consistent in their discussion and present strong arguments to support their ideas, men may take her opinion into consideration, but the last word is always for men.
7. ***Preferences of Women to Barley and Lentil Varieties:*** Women prefer the large grains of both barley and lentil because of their high market prices. The size of the grain is favored even if the quantity of grains on the spike is small. Women favor all types of straw (millet, fenugreek, lentil, faba bean, barley) for their value as animal feed except wheat. They perceive that wheat straw makes animals very weak. There is a consensus on which varieties women and men select. Women base their selection on their own knowledge but their choices are very much affected by their husbands' opinion. Women were asked individually about the characteristics of the selected varieties, and later on they were asked within groups in order to reach the best choice of varieties for the area.
8. ***Opinions of Women on the Selection Process:*** It is premature for women to constitute an opinion on the viability of the selection process. However their independence in expressing opinion is well developed as far as their husbands' opinion is not involved. More time is needed until women are more acquainted to the selection process in order to assess and develop the methodology further.

9. ***Guarantee for the Selection Methodology to be Operational Everywhere:*** When men (scientists and farmers) were asked about what they think of the selection process, they expressed that an additional selections should be conducted at different growing stages of the PPB trials. This could improve the PPB selection despite that it will involve additional costs. However, the selection process seems to work fine in all trials locations.

Concluding remarks

The main constraint to the PPB selection process at this stage in Yemen is that women and men think that selection is an exam. In other words, the understanding of the participatory process itself is not yet well established especially with women farmers. For both women and men farmers, the main concern is to select best variety (not varieties) for their area. For some farmers it is not clear yet that more than one variety can be selected for the area as far as they like it and it can perform well in their environment. In the actual selection process women and men visit the field together and agree on the variety they want to select, which also means there is a consensus between them and they do discuss with each other the selection process and the varieties planted in their area. Then during the selection process, although women and men are separated, they still select the same varieties. The main idea that still needs to be explained is that men and women can select different varieties according to their different needs and uses. This is anticipated to happen more in the future once women use the new varieties both for human and animal nutrition.

Results of the PPB in the next years are promising because women will be able to express their opinion based on their uses of the different varieties for animal feeding, bread making or other purposes. For now, their selection is based on the varieties physical appearance, such as grain size and the rainfall patterns of their area.