1. Identifying Information:

Project title:	Village Based Participatory Breeding in the Mountain Slopes of Yemen
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2. Achievement and Constraints:

In three villages selected in the project area (Hasn Azam, Bit Al-Wali and Al-Ashmor) and described in the previous report, we planted successfully fifty barleys (four local varieties, collected from different areas in the Northern Highland, one local cultivars used as a common check, and 45 improved), and 50 lentils (15 local land races and 35 entries from the ICARDA lentil breeding program). The same genetic materials were also planted in the research station at Al-Erra using the same experimental design as in the villages with the difference that each crop was planted in separate trials. The experiments were planted in two replications in the three villages, with the individual plots arranged in a different number on the different terraces. The total number of terraces was 4,7 and 4 in Hasn Azan, Bit Al-Wali and Al-Ashmor, respectively. In Al-Erra research station a randomized complete block design (RCB) was used. Each entry was planted in 4 rows/plots, 3 m long and 25 cm apart.

Standard analysis of variance using the least was performed: the environmentally standardized data were use to analyze genotype x environment interactions using clustering and ordination procedures. The selections performed by the breeder and the farmers were compared by similarity analysis using the DICE coefficient: the dendograms of the various combinations of environments of selection and selectors were obtained by the unweighted pair group method with arithmetic average (UPGMA) cluster analysis.

In lentil, evaluation and selection were conducted by the breeder and farmers at the three villages and in the research station at three stages of growth; the first was carried out before flowering, the second at pod formation, and the third before harvesting. A simple form was given to the farmers to record their observations, individually and in group, on the most interesting characters. In barley, each farmer made his selection by tying numbered labels at the end of selected plots. In Hasn Azam selection was also performed by a group of four women from the village on both barley and lentil.

A number of quantitative data were measured: in lentil they were days to flowering, plant height, number of primary branches, number of pods per plant, days to maturity, straw yield, grain yield, biological yield, harvest index, and seed weight, while in barley the data recorded were: plant height, days to heading, days to maturity, biological yield and grain yield.

The data were analyzed with a standard ANOVA for RCBD.

In lentil, there was a much closer similarity, measured by the DICE coefficients, between the selections made by individual farmers and farmers groups within the same village than between the selections made in different villages. Also, the selections made by the breeder in Hasn Azam, Bait AlWali and Al Erra were the least similar among them as well as the farmers' selections (either individual or in group). In barley, the similarity was much lower that in the case of the lentil experiment. In some cases there was a close similarity between the selections made by the farmers and the breeder, as in the case of Hasn Azam, and to a lesser extent in Al Ashmor. In the case of Bait AlWali, and even more at Al Erra, the similarity between the selections made by the farmers and by the breeder was very low.

In general, the selections made by the breeder, the farmers and the woman, did not differ significantly for the agronomic traits, which were measured. Few differences were

significant when the comparison was made between the selections done by the breeder and those made by the individual farmers on barley. Women selected one lentil line and two barley lines that no other participants selected.

In the case of lentil, decentralized-participatory selection had a significantly higher efficiency (measured as the frequency of high yielding lines) than all other combinations of decentralization and participation).

Selections conducted only in the stations not only could lead to discard lines performing well elsewhere, but also affected the total number of lines preserved after one cycle of selection. The percent of lines after a cycle of different types of selection increases from 22% in lentil and 20% in barley with centralized - non participatory selection) to 56% in lentil and 50% in barley with decentralized - participatory selection.

The main constraint has been the lack of computing facilities, which has delayed the analysis of data.

3. Implication to the workplan:

The work plan was successfully implemented and the second and final year of the project will begin on solid basis. Enough seed of the selected entries, both in lentil and barley, is available to implement the second year activities. The AREA management, based on the success of the project, will add one additional area in the Central Highlands, which will include three villages and the research station of the Central Highlands at Dhamar. The details will be provided in the next report.

4. Communication and Dissemination of Information:

The project was part of the presentations made by S. Ceccarelli at the Workshop on "Scaling-up successful sustainable agriculture and natural resource management initiatives to benefit small farmers" (October 22), at the Seminar of the PRGA Systemwide Program on Participatory Plant Breeding (October 24), and at the International Workshop on "Broadening the Genetic Base of Crops" held at the Scottish Agricultural College (SAC), Edinburgh, and organized by SAC in collaboration with FAO and IPGRI.

5. Additional Comments:

The reporter visited the project area between 23 and 28 August 1999. Two of the three villages were visited during one of the selection sessions by farmers on both lentil and barley. Eventually the research station was visited, and the details of the work were discussed.

The AREA management has decided to extend the experiment in the Central Highlands (other three villages) in the year summer season (July-October) 2001 absorbing the additional cost.