The International Treaty
ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE
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MINISTRY OF LIVESTOCK, FISHERIES AND RANGELANDS

Development of Strategy for Building the resilience of Pastoral Communities to Climate Change in Two Ecosystems of Sudan Project (PSAP)

Research Paper: on the Genetic Resources of Forage Sorghum (Sorghum bicolor (L.) Moench) Cultivar Abu Sabeen

Title: State of diversity among local genetic resources of forage Sorghum (Sorghum bicolor (L.) Moench) cultivar Abu Sabeen in Sudan

Implementing institute:

Plant Genetic Resources Unit, Agricultural Research Corporation

Summary Report (April 2013)

Background

A study of field and desk work has been conducted during the period extending between March and April 2013 with the objective to assess the current status of diversity among local genetic resources of forage Sorghum (Sorghum bicolor (L.) Moench) cultivar Abu Sabeen in Sudan. This work has been fully funded by the project *"Development of Strategy for Building the Resilience of Pastoral Communities to Climate Change in Two Ecosystems of Sudan",* which is implemented by the Range and Pasture Administration of Ministry of Animal Resources and Fisheries This summary report highlights the main activities conducted and major findings and general recommendations of this work.

Activities carried out

Activities conducted during this study included literature review, compilation of related data in the Plant Genetic Resources Unit of the Agricultural Research Corporation (PGR Unit / ARC), and field survey on existing stands of Abu Sabeen. Around 40 accessions were identified within the collection of the genebank of the PGR Unit / ARC, and passport and characterization data related to these accessions were compiled together. More than fourty farms were surveyed in Khartoum and Gezira states. Farmers were interviewed using a questionnaire covering aspects related to production and diversity of Abu Sabeen. Both genebank and field data were statistically analyzed using appropriate statistical packages in order to describe the results obtained and assess the level of variability within the studied materials

Major findings

A considerable level of variation was detected within the germplasm material of forage sorghum (Abu Sabeen type) conserved with the PGR Unit / ARC that were collected previously from different sources within Sudan. The multivariate analysis run on the phenotypic characterization data resulted in clustering pattern of more than ten distinct groups at similarity level of 50%. This number of distinct groups tends to increase at higher levels of similarity indicating higher levels of variation.

Farmers in the fields had different views on the concern that Abu Sabeen characteristics have changed through time during the last years. However, most of the farmers (60%) did not think that those characteristics had changed while the rest were of the view that there were evident changes being observed.

Otherwise, different responses were recorded on different production aspects such as farming systems, areas cultivated, experience of farmers, seed rates used, sources of seeds, fertilizers applied, harvesting stage, and number of cuts. Some of these responses were remarkable with very high majority adopting and practicing the same or carrying similar views, while the others are more or less equally distributed around variable responses.

Recommendations

This work reveals generally that while there is some concern among Abu Sabeen growers of changes in the characteristics of Abu Sabeen plants they grow, there is a considerable variability of genetic resources of forage sorghum that is already collected and being conserved in the genebank of the PGR Unit / ARC. However, it seems that this collection might not be extensive enough, and it is advisable to say that more collecting efforts targeted to forage sorghum in the traditional areas of cultivation are needed for conservation and research purposes. Further morpho-agronomic and molecular studies are required on the present germplasm collections as well as any future collections in order to evaluate them for genetic diversity and desirable traits for necessary breeding programmes.