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The objectives of the Preparatory action are to better understand the stakes of European neglected genetic resources in agriculture and to tap onto their economic potential.

It aims to provide inspiring examples of how to make the conservation of neglected breeds and varieties economically viable and encourage farmers and other stakeholders to engage.

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1 Introduction

The Vale do Sousa (VASO) program is a long-term program, of on-farm maize landraces biodiversity management and valorisation by participatory breeding.

In this project; local maize landraces, with quality for bread production - “Pigarro” and “Amiúdo” – among others, were submitted to a participatory population improvement programme.

The VASO project is recognised to be the oldest participatory breeding initiative in the EU.

2 Description of the genetic resource

The focus of the VASO project is the improvement of a number of Portuguese maize landraces almost extinct in the country.

During the preliminary phase of the project, in 1984, two key maize varieties were identified: “Pigarro”, cultivated in the best soils and used for human consumption and for the production of traditional maize bread (called “broa”), and “Amarelo Miúdo (or Amiúdo)” and adapted to the poorest soils and also showing good qualities for the production of bread.

These two landraces are being used in the participatory breeding program that has been developed to date.

3 Objectives of the project

American maize hybrids were introduced in Portugal after the Second World War. Despite good results in terms of yields, these hybrids were not considered suitable for the Portuguese Northwest farming systems, and above all also not for the needs of the local processing industry. The search for a compromise between yields and quality led Portuguese maize breeding stations to produce maize hybrids from American and Portuguese germplasm. New adapted hybrids became more and more wide-spread among Portuguese farmers during 1960’s and 1970’s, while a parallel sharp decrease was registered in the use of local landraces, which were progressively replaced by hybrid varieties.
The main objective of VASO project is to recover and manage the diversity of typical local maize landraces in Portugal through the involvement of local farmers and a continuous improvement of quality parameters of the product.

The improved high quality local varieties are intended for the production of maize flour and further processed into a traditional maize bread called “broa”.

In parallel, the project is working to disseminate and improve the valuation of products obtained by local maize varieties to consumers, processing industries and farmers.

A final and overall objective is an enhanced sustainability of the farming systems related to the cultivation of local maize landraces through an increased value for the related products and a consequent increase in farmers’ income.

4 Actors involved and roles

A key aspect of the project is the development of a value chain for the local maize landraces “from seed to bread”.

The historical importance of local landraces for the production of the tradition broa bread is a relevant factor for the achievement of the economic sustainability of the cultivation of these varieties.

In this framework, the value chain integrates all the actors which cooperate to the production of this bread: farmers producing traditional varieties or improved landraces, composite and synthetic varieties which have the necessary qualities for the production of bread, millers producing high quality flour for baking, bakers who process the flour in bread and, finally, consumers.

The program has a multi-actor approach, involving key stakeholders along the whole supply chain, from seed to bread. The main actors involved thus include:

1. Farmers producing traditional varieties or improved seeds, crucial for ensuring the quality of the raw material;
2. Millers who grind maize in order to have high quality flour for baking;
3. Bakers, who have the knowledge of the necessary characteristics of the flour to manufacture “broa”;
4. Consumers, which include both households and restaurants;
5. NGO, as local platform of exchange knowledge among actors helping to promote rural development activities, mobilizing the communities for the valorisation of traditional varieties as part of development strategy; and
6. Academia and research centres, which worked with all the actors of the value chain.
5 Steps and activities undertaken

VASO project started in 1984 as a pilot project in “Vale do Sousa” region in the Northwest of Portugal by Dr. Silas Pêgo. The activities of the project can be brought back to two main phases:

The first phase (VASO Program 1.0), implemented in an area traditionally devoted to the production of maize, and started with the identification of farmers likely to be involved in the project. In the same period, also the activities of identification of the local landraces were implemented. At the end of this first phase, the project team selected the Pigarro and Amiúdo varieties for their agronomic characteristics and for their suitable qualities for the production of bread. In the following years, both varieties were progressively improved in terms of yields, tolerance to pests and diseases, and indirectly, adaptation to climate changes.

By using a collaborative approach between professional breeders and farmers, all these activities were carried out in the own farmers’ fields, facilitating the identification and implementation of breeding processes and agronomic practices particularly accessible to farmers, thus securing their participation to the next phases of the project.

In the second phase (VASO Program 2.0), new farmers were involved in the project, mainly located in Northwest Portugal where the typical production of “broa” takes place. Project activities in such phase included further genetic studies and above all food technology research, meant to identify the most suitable varieties and characteristics for the production of broa bread. Thanks to this complex of activities, the project actually went beyond the on-farm activities, developing a food chain with the direct involvement of all the stakeholders (i.e. millers, bakers).
6 Results to date

During the more than 30 years of the project, appropriate breeding methods for these varieties were identified, with the participation of farmers and their involvement in all the steps of the project. The participative approach, associated with the on-farm diversity management of landraces, contributed to the economical sustainability of the project and to attracting a high number of farmers (about 50 farmers).

The current results of the VASO project also suggest that there is a potential for the economic use of these local varieties for the production of traditional processed foods. Next activities of the project will be dedicated to develop these supply chains at local level.

7 Next steps

The most relevant activities to be implemented as further steps of the project are the identification of the market potential for products obtained from the local maize varieties and their promotion, with the objective to enlarge the market itself.

Specifically, the following steps are foreseen:

1. Building up or strengthen the partnerships with the other actors of the food chain, including traders, millers, bakers and retailers;
2. Exploring the niche markets for traditional maize landraces, including the market of products for gluten intolerant people and people suffering from celiac diseases;
3. Developing communication campaigns to improve consumers’ awareness, including specific labels for processed products obtained from local maize varieties;
4. Developing ecotourism activities (e.g. visits to farms and local markets; participation to agricultural activities and to typical bread preparation; food tasting; local feasts); and
5. Collaborating with local, national and international farmers and biodiversity networks, to strengthen the support to the research on ancient varieties and to farmers choosing these productions.

8 Lesson learned and good practices

VASO project performed a number of activities with the objective to improve local maize landraces and their uses for the production of specific high-quality types of bread.

Good results have been achieved in terms of involvement of farmers, also thanks to a good cooperation between farmers themselves and the project team.

The area in which the project is still expected to improve its results is related to the bottom part of the value chain, where a stronger and enlarged cooperation between farmers and mills/processors is still to be reached.
A number of factors can be identified which contributed to the success of the VASO project.

Among these good practices:

- The choice of an appropriate network of project partners, including individual farmers, farmers’ associations, breeders and processors, enhancing the possibility for all of them to find in the project a good opportunity to improve results for the respective activities;
- The identification of a good number of processed products to develop, in order to secure a potential market for the final product;
- The development of participatory approach in which farmers play a crucial role;
- The building and development of strong relationships with local authorities which have a key role in supporting and disseminating the project and its results;
- The organisation of quite frequent project meetings to share and discuss needs and expectations from different actors of the project; and
- The organisation of meetings to share and validate the results achieved during each step of the project and collect opinions and suggestions for the following steps.

The use of a participatory approach is considered as a key factor for the success of the project. Also, the focus on the existing agricultural systems, on local varieties and on traditional knowledge of farmers played an important role. The project team has been able to work with several actors, targeting activities on plant breeding, maize seed selection and participatory tools as well as integrating all the information and stakeholders to build the maize chain from seed to bread.

VASO project achievements and activities were only possible due to a successful succession of publically science funded projects, hence the public support of activities to manage diversity of neglected varieties is considered as another key success factor.

Finally, the length of VASO project, which started more than 30 years ago, allowed providing additional inputs and adjustments during the implementation of the activities. In conclusion, this improved the development of the project, facilitating the achievement of its objectives.

The decreasing number of farmers caused by abandonment of agriculture and the ageing of rural population can be an obstacle to the future development of the project and to the involvement of a higher number of farmers. A further constraint for the successfully development of the project could be the lack of a structured maize food network and some constraints in the EU legislation on seed.

9 Participation to other projects and to networks/ funding

During the years, the project has been linked to other funded projects having similar / related objectives. Among these it is possible to cite the European Consortium for Organic Plant Breeding, the On-farm Conservation Working Group from ECPGR and Urban Agriculture in Europe.

Currently, VASO project has some activities funded in the context of the project “LIVESEED” under Horizon 2020, with the aim of improving the performance of organic agriculture by boosting organic
seed and plant breeding efforts across the EU. VASO project is also funded with the Horizon 2020 project named “DIVERSIFOOD” with the aim to sustain crop diversity and networking at farm level. In previous years, other activities were carried out in the framework of EU and national projects, currently ended.

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