

## Preparatory action on EU plant and animal genetic resources

# Landrace inventories in Portugal

## Overview

### 1. Objectives

The objective of the present case study is to look into the impact of academic research and the possibilities of influencing policy making. The case study will demonstrate the importance of establishing collaborations with a variety of actors in the country which is the focus of the research. A second objective is to consider the importance of a national inventory in order to put in place efficient conservation strategies at the national level. A national inventory delivers the knowledge of where landraces can be found, their importance and numbers. This can then be linked to conservation and how they can be conserved on farm in particular. These objectives will be reached through the observation of a research project carried out in the context of an MSc thesis at Birmingham University in 2008 which consisted in an inventory of grapevine landraces in two regions of Portugal. This project eventually led to another research project which is currently being performed in the context of a PhD at Birmingham University, in cooperation with the Portuguese national genebank. This current research aims to do an as complete inventory as possible of Portuguese landraces, leading on to the establishment of a national landrace conservation strategy for Portugal.

### 2. Description of the case

Dr Nigel Maxted at Birmingham University is the supervisor of the two research projects that are at the focus of this case study. The importance of knowing what is in the field in order to outline a strategic approach to conservation is at the core of both projects since they both have the aim to establish a national inventory. The focus on Portugal in these two research projects is mainly due to the fact that it is one of the countries in Europe with the highest concentration of landraces. One of the main aims of the first research project carried out in 2007 was to demonstrate this high level of landraces through the example of grapevine in two specific regions (Douro and Colares)<sup>1</sup>. Furthermore, the research pointed at current issues and difficulties, as well as the need for prioritising conservation activities. The findings of the project were published in an ECPGR bulletin in 2008<sup>2</sup>, however, no specific activity, research, or response, followed the publication of this piece.

<sup>1</sup> Cardoso and Maxted (2008), Regional and crop-specific survey: Grapevine landraces in Douro and Colares, Portugal

<sup>2</sup> European landraces: on-farm conservation, management, and use (2008), Bioversity International / ECPGR

A few years later, Dr Maxted initiated a generic follow up of this research following the interest from the PhD student Maria Joao Almeida who started her PhD at Birmingham University in February 2014. This research project is closely linked with the national genebank in Portugal, and thus the possibilities for follow up activities are greater. Thanks to previous contact and collaboration through the European regional network ECPGR<sup>3</sup>, where both Dr Maxted/Birmingham University and Ms Barata/the head of the genebank are active, they decided to cooperate on this. The national genebank is a structure of the Ministry of Agriculture and was established in 1977. The genebank now belongs to the national research institute within the Ministry of Agriculture – INIAV (Instituto Nacional de Investigação Agrária e Veterinária - National Institute of Agricultural and Veterinarian Research).

While the objective of the research is an extensive and detailed national inventory of landraces carried out via the means of a questionnaire to be completed by farmers, there is a focus on common beans (*Phaseolus vulgaris* L.). For this crop, samples have been collected and will be genetically analysed. Beans were selected on the basis of their nutritional value, and in particular the high level of proteins contained. The genetic analysis will be carried out to check the diversity among and within the samples of the populations. The results will enable a more secure and stronger idea of how to develop the conservation guidelines and strategy. Ideally, this could be done for all landraces identified, however, it would be too costly and time consuming. About 240 samples have been collected for the genetic analysis. The questionnaire on the other hand, has been completed by around 200 farmers throughout Portugal. The research includes both the Portuguese mainland and the island archipelagos (Madeira and the Azores) and is thus very broad compared to the research project in 2007 which was limited to two regions and one crop. The expectations are that this research will be applied and that the national inventory will lead onto a strategic conservation strategy that can be implemented nationally.

In principle, 4 people are involved in the project: Ms Almeida who is performing the actual research and just recently concluded the collecting activities in Portugal, Dr Maxted who is supervising the thesis from Birmingham University, Ana Maria Barata who is the head of the national genebank and co-supervisor of the thesis, and Dr Joana Magos Brehm who is a Portuguese PGR conservation specialist and is also involved in the supervision. In addition, other researchers and professors at Birmingham University, as well as the employees of the national genebank, provide assistance and expertise when needed.

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<sup>3</sup> European Cooperative Programme for Plant Genetic Resources (ECPGR)

## Analysis

### 3. Funding and support

The funding and application for funding generally go through the university or research institution for this type of academic research. According to Dr Maxted, part of his job is to identify funding possibilities and apply for grants to finance his research. Some of this funding is channelled into Ms Almeida's research (in particular for collecting activities and genetic analysis) while she is financing tuition fees herself. The administrative burden related to funding applications is not seen as too heavy and Dr Maxted considers himself lucky to have received funding through various programmes via the European Commission<sup>4</sup>. The issue related to funding in general according to him, is rather the lack of consistency. Another point that was mentioned in regards to funding was the size of the grants. Too small sums make it difficult for researchers to achieve long term outcomes<sup>5</sup>.

In terms of other assistance, the support from the agricultural directorates and other institutions in PT has been important, including logistical support to identify farmers and organise field visits. The assistance, expertise, and knowledge stemming from the national genebank were also highlighted as very valuable for the project. The genebank has been providing advice and support for the evaluation of some of the material, and preparation of the DNA analysis to be carried out in Birmingham.

Regarding the Portuguese genebank, the national budget covers the salaries of the employees. However, for specific activities, the genebank applies for research grants in the same way as universities. According to Ms Barata, about 50% of her time is dedicated to the application for grants. The administrative burden was said to be particularly heavy for European funds. Through the Common Agricultural Policy, some specific measures for the conservation and breeding of both plants and animals are being used to support the genebank and field collections all over the country. Some activities are not classified as research (screening and evaluation of material) and are therefore not eligible for the research grants. This was mentioned as a problem, since there is less funding available for such activities. A specific programme set up and organised by the European Commission specifically for GR conservation, including not only research but also conservation strategy, screening, evaluation activities etc., was mentioned as a valuable opportunity.

### 4. Positioning at local or regional level

The involvement of local actors including farmers and regional authorities, has been important to this research project. It is crucial that there is an involvement of all actors (national, regional, and local) to implement and use a national conservation strategy, and thus their involvement at an early stage is beneficial<sup>6</sup>. Currently, it is still too early to discuss the motivation of the farmers in regards to the conservation and maintenance of landraces. The analysis of the 169 completed questionnaires will hopefully provide answers to this.

<sup>4</sup> E.g. EU biotech, FP5, FP6, Gen Res and FP7

<sup>5</sup> GENRES was mentioned as not providing sufficiently high sums for the projects and thus not maximising the achievements of the research projects.

<sup>6</sup> Maxted et al. (2014) Technical Guidelines for national landrace diversity conservation and use.

However, according to the national genebank, the reason for farmers to keep landraces is often related to quality and tradition. In many cases, landraces are specific to regions of the country and thus the interest in keeping them is linked to regional traditions. Based on the collecting activities, farmers sometimes seem to think that scientists are limited to their own academic world, which is not very practical nor close to reality. While this might sometimes be the case, in particular a new generation of academics and researchers seems to be more focused on providing practical solutions through applied research. Ms Almeida mentioned the importance of this, saying that the research should help the community, including farmers, agricultural directorates, and other actors working with conservation.

There are some agrotourism activities that maintain landraces and are part of the Slow Food Foundation, particularly in the north of the country. According to the head of the genebank this is a valuable way of keeping and using landraces. In the research and inventory activities carried out in 2007, tourism was mentioned as both a threat to conservation (due to increased prices for housing and land), but also as an opportunity in relation to agrotourism and related activities since this enables farmers to sustain themselves through business based on conservation activities<sup>7</sup>.

In regards to politicians, the field of GR conservation is not prioritised. However, compared to a few years ago, the general public is more aware and has more knowledge which in turn result in more pressure on the politicians.

## 5. Partnerships and networking

As mentioned above, the ongoing research project was launched with the help of cooperation through ECPGR. Both Dr Maxted/Birmingham University as well as Ms Barata/INIAV are active within this network. In addition to ECPGR, they are both also involved in other national European and global networking activities (e.g. Bioversity International, CGN) and such collaboration is considered valuable, also in regards to the contact and knowledge exchange with stakeholders and actors from different fields. The national genebank is working on many different levels with a variety of stakeholders within the country, including work with universities, other genebanks, and also companies (medicinal plants). The national genebank aims to touch upon different subjects and have a broad approach, however, it seems that the funding available is often insufficient and does not cover all the activities they would like to engage in. Ideally, more networking opportunities could be provided through ECPGR, which is already in place. Additional financial support for this cooperation would enable more networking activities and also enable to carry out other activities leading to increased results.

## 6. Communication

Both the genebank and Birmingham University aim to reach out to a broad public, and not only to a limited public working in research. The genebank generally interacts with a variety

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<sup>7</sup> Cardoso and Maxted (2008), Regional and crop-specific survey: Grapevine landraces in Douro and Colares, Portugal

of actors and also organises visits for schools, farmers, and other interested actors with the objective of disseminating their work. They also participate in several communication events outside of the genebank. Also, Dr Maxted aims to publish both in academic journals and popular articles which also target the general public. According to him, this is the only way of getting information out to the general public and once there is sufficient interest and action from the public, the government will no longer be able to ignore this field.

## 7. Outputs and added value

As the research project is still at an early stage, it is premature to talk about specific outputs at this stage. For conservation activities in Portugal, the research will have added value and effects following its completion. Since most of the work performed by Ms Almeida has been agreed together with the national genebank, it is well in line with their objectives. Furthermore, there is regular contact and communication between the genebank and Ms Almeida. The genebank mentioned added value in relation to knowledge on what is being produced and the importance of these varieties and landraces, in particular in regards to agriculture today. Furthermore knowledge on which varieties might be interesting for valorisation as well as aspects related to rural development and the situation of people keeping landraces are other important aspects.

## 8. Sustainability

As mentioned above, it is early to speak about the sustainability of the outcomes of this project since it is currently ongoing. However, the success indicator would be to have the guidelines and strategy developed based on the national inventory established and implemented in Portugal. The close cooperation with the national genebank should make this possible.

Another aspect related to sustainability is the support to farmers in order for them to be able to carry out on farm conservation. There seems to be a demographic issue related to farmers and the fact that mostly elderly people are involved in farming and conservation activities. This is *inter alia* due to urbanisation, and younger people moving into the cities<sup>8</sup>. However, according to Ms Barata from the genebank there has been an interesting development in this regard over the past few years. There is a new generation of farmers with a higher degree of knowledge and a different approach to agriculture. Most of them deal with high tech technologies, but others are focused on organic farming. This development, might have an important value and impact for on farm conservation in the coming years.

## 9. Upscaling and out-scaling

In other countries, similar initiatives and inventories have been carried out, however, there are different systems and realities depending on the country in question. The main challenge seems to be the lack of priority by national government. As long as sufficient priority and funds are not given, it becomes difficult to perform the necessary activities. Indeed, even in this case it is not an initiative stemming from a national decision, but rather a foreign research institution that took the initiative. Furthermore, in 2003, and in 2008, Dr Maxted did

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<sup>8</sup> Cardoso and Maxted (2008), Regional and crop-specific survey: Grapevine landraces in Douro and Colares, Portugal

initial survey work for landraces in the UK which demonstrated the need for a full inventory for fruit and vegetables. However, since then negotiations have been ongoing and nothing has happened due to a lack of funding even though there is a strong policy commitment to undertaking the necessary work.

## Conclusions

<b>STRENGTHS</b>	<b>WEAKNESSES</b>
Cooperation involving research institutions with links to national government; Cooperation involving the relevant country of the research as well as local and regional actors; Objectives of reaching outside of the academic sphere, aiming also for the general public; National inventory as a first step for national conservation strategy	Lack of funding and consistency; Lack of priority by national governments; Problem of eligibility for funding regarding some activities which are not considered as research (evaluation, screening, etc.); Limited time due to PhD period of four years.
<b>OPPORTUNITIES</b>	<b>THREATS</b>
Results and findings of the ongoing research demonstrating the importance of national inventories; Use of these findings for future national conservation strategies in PT; Involvement of a new generation of farmers with a high degree of knowledge; Development of agrotourism activities as a way of doing on farm conservation sustaining the farmers.	Lack of complementarity between ex situ and in situ conservation; Lack of applied research; Lack of initiative and funding to link academic research to policy making. Development of tourism activities leading to increase prices for land and housing; Urbanisation and decrease of farmers' activities related to conservation as a result.

This case study has aimed to investigate the impact of academic research and possibilities of influencing policy making, as well as demonstrate the importance of a national inventory as a basis for national conservation strategies that can then be implemented more effectively. In comparison to the research performed in 2007 regarding grapevine landraces in two Portuguese regions where there was very limited involvement of national institutions, the ongoing project seems to have greater opportunities to impact on future work and conservation strategies in Portugal.

The above SWOT analysis demonstrates the various strengths and opportunities related to this specific project as well as to conservation activities in Portugal. The aspects under weaknesses are mainly related to the lack of priority and funds which unfortunately hamper progress in this field. The importance of collaboration involving actors at the regional and local levels, as well as academia and policy has been clearly demonstrated in this report. It seems reasonable to say that there are high possibilities for this project to impact on policy

making and conservation in Portugal, however, funding and priority are crucial in order to ensure this. Possibly, other research projects will follow, hopefully along the same set-up.

## Figures



*Pia beans collected in Madeira. Photography: Maria Joao Almeida*



*Touquinho beans collected in Madeira. Photography: Maria Joao Almeida*



## Annex 1 – List of interviewees

- Dr Nigel Maxted, Birmingham University, 4 September, 2015
- Ana Maria Barata, Portuguese National Genebank (INIAV), 25 September, 2015
- Maria Joao Almeida, PhD student, Birmingham University, 22 September, 2015

## Annex 2 – List of references

Cardoso and Maxted (2008), Regional and crop-specific survey: Grapevine landraces in Douro and Colares, Portugal

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Maxted, N., Kell, S. & Magos Brehm, J., (2014). National Level Conservation and Use of Landraces Draft Technical Guidelines. Food and Agriculture Organization of the United Nations, Rome, Italy. 14 pp. <http://www.fao.org/3/a-mm564e.pdf>