

ON-FARM CONSERVATION AND MANAGEMENT WG REPORT FOR PHASE IX (2014-2018)

Submitted to the 15th Steering Committee Meeting, Thessaloniki, Greece, May 2018
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1. CONTRIBUTION TO ECPGR OBJECTIVES

1.1. Achievements and success stories

Outcome 3. In situ and on-farm conservation and management of priority crop wild relative and landrace populations are implemented throughout Europe.

- The ECPGR Concept for On-farm conservation and management of plant genetic resources for food and agriculture was completed, agreed by the Steering Committee and published in January 2017.
- November 2017 to October 2020: EC H2020 SFS-04-2017 project 'Networking, partnerships and tools to enhance *in situ* conservation of European plant genetic resources' (FARMER'S PRIDE). The project was submitted by the Wild Species Conservation in Genetic Reserves Working Group and the On-farm Conservation and Management Working Group coordinating team (with key additional partners). It is focused on the ECPGR Concept for On-farm conservation and management in Europe. It will establish a network of stakeholders and conservation sites that effectively coordinates landraces (LR) (and crop wild relatives (CWR)) conservation actions to safeguard the wealth of Europe's *in situ* plant genetic resources (PGR) and integrates LR conservation with the user community to maximize their sustainable use. For the project deliverables please see the Wild Species Conservation in Genetic Reserves WG report for Phase IX (2014-2018) compiled by the FARMER'S PRIDE coordinator Nigel Maxted.
- Working Group members (German Federal Office for Food and Agriculture, and CGN Netherlands) were consortium members in the EU Preparatory Action ensuring consideration of on-farm management and strategies. The Preparatory Action recommended the development of a European agrobiodiversity strategy, and opened the opportunity for ECPGR to participate in the proposal GENRES-bridge submitted under the Horizon2020 Work Programme 2018-2020 SFS-28-2018-2019-2020: Genetic resources and pre-breeding communities.

Outcome 5. Relations with users of germplasm are strengthened.

The third Call of ECPGR Grant Scheme (2016) funded the project 'Assessing linkages between genebanks and direct users' (LINKAGES) The main expected product of the project is a set of recommendations on improving linkages between *ex situ* and direct users.

Following the launch of the online *ex situ* survey at the end of September 2017, 46 responses were presently received from genebank curators in 21 countries.

The on-farm survey was translated into five languages (English, French, German, Italian, Spanish) and coordinators of European seed networks or organizations were invited to circulate it in their respective communities through their routine communication channels. Réseau Semences Paysannes, Arche Noah and Pro Specie Rara, Rete Semi Rurali, Red de Semillas are the organizations involved until now. The launching dates varied but all on-farm surveys are now circulating with a deadline which hopefully will not go beyond the end of March, although reminders and extensions may be needed.

The results of both surveys will be analysed during the months of April-May and the final project workshop, to be held jointly with Diversifood, is planned for the end of May.

1.2. Gaps or constraints identified

Possibilities to include on-farm maintained landraces in AEGIS to be explored.

2. GRANT SCHEME ACTIVITIES

- **Grant Scheme proposals (submitted: 1; approved: 1)**
 1. [Assessing linkages between genebanks and direct users \(LINKAGES\)](#) – Third Call (2016)
- **Total number of partners involved: 7 from 5 countries**
 - ECPGR-funded: 4 from 4 countries
 - Self-funded: 3 from 2 countries
- **Meetings held**
 1. LINKAGES kick-off meeting, 12 January 2017, Bioversity International, Maccarese, Italy.
- **Reports and related data**

LINKAGES  [Report of the kick-off meeting](#)
- **Funds mobilized**
 - ECPGR granted funds: € 15 000
 - Inputs in-kind declared in Grant activities: (none)

3. OTHER ACTIVITIES (CROSS-WORKING GROUP ACTIVITIES, LINKS WITH OTHER NETWORKS, PROJECTS AND INITIATIVES)

- **Cross-Working Group activities**

Grant Scheme, Third Call:

LINKAGES Activity: joint proposal with Doc&Info WG

Links with Wild Species Conservation in Genetic Reserves WG (originally belonging to same “*In situ* and On-farm Network”) e.g. Farmer’s Pride project (see above).

- **Others**

- PGRSecure / EUCARPIA
[Enhanced Genepool Utilization – Capturing wild relative and landrace diversity for crop improvement](#). Joint international conference on utilization and conservation of crop wild relative (CWR) and landrace (LR) diversity for crop improvement of the PGR Secure consortium and the European Association for Research on Plant Breeding (EUCARPIA), 17–20 June 2014, NIAB Innovation Farm, Cambridge, UK.
- H2020-SFS-2014-2 Embedding crop diversity and networking for local high quality food systems (DIVERSIFOOD) (2015-2019). DIVERSIFOOD aims to evaluate and enrich the diversity of cultivated plants within diverse agroecosystems so as to increase their performance, resilience and quality through a multi-actor approach. By integrating existing experienced networks and using specific and relevant cases across Europe the project will strengthen “food culture” to improve economic viability of local chains resulting in a greater diversity of produce with a cultural identity. It focuses on the whole food chain from genetic resources to marketing, connecting and amplifying local existing actions. (Philipp Holzherr, ProSpecieRara, Dionysia Fasoula, ARI, Isabelle Goldringer INRA, Maarit Heinonen LUKE, Pedro Mendes Moreira, ESAC, Riccardo Bocci, RSR, involved partners).
- November 2017 to October 2020: EC H2020 SFS-04-2017 project ‘DYNAmic seed networks for managing European divERSITY (DYNAVERSITY)’. The project aims to facilitate exchange and integration of scientific as well as practical knowledge on how to best manage diversity in agriculture and in the entire food chain, restoring evolutionary and adaptation processes (Riccardo Bocci, RSR involved partner).
- January 2013 to February 2015: Bilateral Scientific & Technological Cooperation project between Greece (Hellenic Agricultural Organization–DEMETER, Institute of Plant Breeding and Phytogenetic Resources) and Slovakia (Plant Production Research Center Piešťany) funded by national and EU resources. The aims of the project ‘Exploration of cultivated species gene pool for the advancement and improvement of important European crops agronomical characteristics’ was the establishment of a cooperation between the two countries for the conservation of plant genetic resources *in situ* and *ex situ* and the exploration of small-scale applications for *in situ* and on-farm conservation, the implementation of the appropriate methodology for the monitoring of demographic parameters of some target–species of high priority and the development of an effective framework for sustainable protection. (Parthenopi Ralli, HAO-DEMETER involved partner).
- March 2018 to February 2021: EC FP7 ARIMNet2 project ‘Enhancing nutrient use efficiency through legumes in agro-ecosystems of the Mediterranean basin (CROSYMED)’. The project aims to increase the mutual benefit of legume-cereal intercropping in four Mediterranean agro-ecosystems and to promote their implantation. The positive effects of each intercrop on the other one will be examined through four different approaches: (i) evaluation in the field of the environmental conditions and varieties/cultivars combinations leading to the highest benefits of intercropping, (ii) identification of the microbial symbiotic and rhizospheric communities associated with the best intercropping performances, (iii) analysis of the processes responsible for the positive effects of intercropping, implying N, P and Fe acquisition and sharing. Farmers will participate in the project from the beginning and the knowledge gained by this project will be transferred from the scientific community to them. (Parthenopi Ralli, HAO-DEMETER involved partner).

- The German Ministry for Food and Agriculture supported the implementation of the ECPGR concept for on-farm conservation and management of plant genetic resources for food and agriculture through the following projects and actions:
 - o Development of the online database about historically used vegetable varieties <https://pgrdeu.genres.de/rlistgemuese>, within the framework of the project “Extension of the German Red List of cultivated plants for vegetables” (grant number 2811HS019). The database features about 7000 varieties, of which over 1000 were included in the German red list of cultivated plants.
 - o The project “on-farm conservation of old vegetable varieties” (2012–2016, grant number 2810BM001) established a regional network for participatory seed production and use of old vegetable varieties.
 - o Project “Varietal diversity at the organic food groceries’ – a new future for red listed varieties” (2017–2019, grant number 283111161A): The project will generate value chains for threatened vegetable varieties to rescue these varieties and provide incentives for their on-farm management.
 - o Project “Breeding and use of PGR through on-farm and in situ conservation and integration into value chains” (2017–2019, grant number 2815NA109): The project will make available old vegetable varieties, which are not available any more on the European seed market, for vegetable breeding. Furthermore it will support their on-farm management and commercialisation in the organic food sector.
 - o Active participation in the EU preparatory action 2012-2016.

4. WORKING GROUP DOCUMENTS AND PUBLICATIONS

ECPGR. 2017.  [ECPGR Concept for on-farm conservation and management of plant genetic resources for food and agriculture](#) (723 KB). European Cooperative Programme for Plant Genetic Resources, Rome, Italy.

Carvalho, M., Bebeli, P.J., Pereira, G., Castro, I., Egea-Gilabert, C., Matos, M., Lazaridi, E., Duarte, I., Lino-Neto, T., Ntatsi, G., Rodrigues, M., Savvas, D., Rosa, E., Carnide, V. 2017. European cowpea landraces for a more sustainable agriculture system and novel foods. *Journal of the Science of Food and Agriculture* 97(13), pp. 4399-4407

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Douma, C., Koutis, K., Thanopoulos, R., Tsigou, R., Galanidis, A., Bebeli P. J. 2016. Diversity of agricultural plants on Lesbos Island (Northeast Aegean, Greece) with emphasis on fruit trees *Scientia Horticulturae*, 65-84

Ganopoulos I., Xanthopoulou A., Mastrogianni A., Drouzas A., Kalivas A., Bletsos F., Krommydas K., Ralli P., Tsaftaris A., Madesis P. 2015. High Resolution Melting (HRM) analysis in eggplant (*Solanum melongena* L.): a tool for microsatellite genotyping and molecular characterization of a Greek Genebank collection. *Biochemical Systematics and Ecology* 58: 64-71.

Heinonen, M. 2014. Landrace *in situ* Conservation Strategy for Finland. MTT Report 163. 44 p. <http://urn.fi/URN:ISBN:978-952-487-570-7>

- Heinonen. M. 2016. Landrace Inventories and Recommendations for *In Situ* Conservation in Finland, In: Maxted N., Dulloo M.E. and Ford-Lloyd, B.V. (eds.), Enhancing Crop GenePool Use: Capturing wild relative and landrace diversity for crop improvement. CAB International, Wallingford. pp 335-341. ISBN 9781780646138
- Karanikolas P., Bebeli P.J., Thanopoulos R. 2018. Farm economic sustainability and agrobiodiversity: identifying viable farming alternatives during the economic crisis in Greece. *Journal of Environmental Economics and Policy* in press
- Karapanos, I., Papandreou, A., Skouloudi, M., (...), Bebeli, P.J., Savvas, D. 2017. Cowpea fresh pods - a new legume for the market: Assessment of their quality and dietary characteristics of 37 cowpea accessions grown in southern Europe 97(13), pp. 4343-4352
- Klaedtke S.M., Caproni L., Klauck J., De La Grandville P., Dutartre M., Stassart P.M., Chable V., Negri V., Raggi L. 2017. Short-term local adaptation of historical common bean (*Phaseolus vulgaris* L.) varieties and implications for in situ management of bean diversity. *International Journal of Molecular Sciences* (ISSN 1422-0067) 18: 493; doi:10.3390/ijms18030493, available from: <http://www.mdpi.com/1422-0067/18/3/493>
- Kyriakopoulou, O., Arens, P., Pelgrom, K.T.B., Karapanos, I., Bebeli, P., Passam, H. 2014. Genetic and morphological diversity of okra (*Abelmoschus esculentus* [L.] Moench.) genotypes and their possible relationships, with particular reference to Greek landraces. *Scientia Horticulturae* 171:58–70.
- Lazaridi, E., Ntatsi, G., Fernández J.A., Karapanos, I., Carnide, V.P., Savvas, D., Bebeli, P.J., 2017. Phenotypic diversity and evaluation of fresh pods of Southern European cowpea (*Vigna unguiculata* (L.) Walp.) landraces. *Journal of the Science of Food and Agriculture* (in press).
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- Pinheiro de Carvalho, M.A.A., Bebeli, P.J., Barata da Silva, A.M., Bettencourt, E., Slaski, J.J., Dias, S. 2015. Agro-biodiversity. The importance of inventories in the assessment of crop diversity

and its time and spatial changes. pp: 130-147. In: M.R. Ahuja, S.M. Jain (Eds). Sust. Devel. Biodivers., Genetic Diversity and Erosion in Plants, Vol. 8, Springer. 978-3-319-25953-6.

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Raggi L., Ciancaleoni S., Torricelli R., Terzi V., Ceccarelli S., Negri V. 2017. Evolutionary breeding for sustainable agriculture: selection and multi-environmental evaluation of barley populations and lines. Field Crops Research 204: 76-88, <https://doi.org/10.1016/j.fcr.2017.01.011>, available from: <http://www.sciencedirect.com/science/article/pii/S0378429017300904>

Suso, M.J., Bebeli, P.J, Christmann, S., Mateus, C., Negri, V., Pinheiro de Carvalho, M. A. A., Torricelli, R., Veloso M. M. 2016. Enhancing Legume Ecosystem Services through an Understanding of Plant-Pollinator Interplay. Front Plant Sci. 2016; 7: 333. <http://dx.doi.org/10.3389/fpls.2016.00333>

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Xanthopoulou A., Ganopoulos I., Kalivas A., Nianiou-Obeidat I., Ralli P., Moysiadis T., Tsafaris A., Madesis P. 2015. Comparative analysis of genetic diversity in Greek Genebank collection of summer squash (*Cucurbita pepo*) landraces using start codon targeted (SCoT) polymorphism and ISSR markers. Australian Journal of Crop Science 9(1): 14-21.

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WWW publications

Negri V., Pacicco L., Bodesmo M., Torricelli R. 2013. The first Italian inventory of *in situ* maintained landraces. On CD ROM. ISBN 978-88-6074-279-7. Morlacchi Editrice, Perugia. Also available at <http://vnr.unipg.it/PGRSecure/start.html/>

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http://www.pgrsecure.org/helpdesk_lr/

5. EXPECTED ADDITIONAL ACHIEVEMENTS AND FUTURE ACTIVITIES

LINKAGES Final Workshop to be held in 2018 in Rome, Italy, back-to-back with a workshop of the Horizon 2020 “Diversifood” project.