Economic instruments for supplying agrobiodiveristy conservation

# Abstract

# Acknowledgements

# Authors contribution to the field

# Introduction

# Literature review: Valuing rare livestock breeds and farm animal genetic diversity: preferences, institutions and prospects

The chapter focuses on the distinction between ‘rare breeds’ and FAnGR more generally. Highlighting the links between FAnGR and the sustainable intensification (SI) agenda, we discuss the prioritisation of efficiency objectives in the food system (and associated supply chains) over culture and heritage values. Drawing on the latter, we link this example to the case of rare breeds which often possess attributes of value not linked to production efficiency. The chapter concludes with wider discussion concerning three potential threats to rare breeds; SI, climate change and disease events. But opportunities for rare breeds, in the form of new production and market opportunities, are also discussed in the form of these three issues.

Chapter type: Review chapter

Completeness: 90%

Expected completion date: June 2017

# Contracts for supplying Farm Animal Genetic Resources (FAnGR) conservation services in Romania

The chapter explores the barriers to participate in rare breed conservation programmes for farmers in small scale systems in Romania. We use a choice experiment (CE) to determine attributes of a conservation contract that may be less or more desirable from a farmer perspective whilst also measuring WTA conservation subsides. The former are used to inform the design of contracts whilst the latter are contrasted with subsidy payment rates (Euro/head livestock/year) proposed by the EU for keeping rare breeds. We outline the probability of contractual enrolment among different farmer groups and suggest options for improving farmer uptake. The chapter discusses the importance of embedding FAnGR conservation in other policy measures linked to wider rural development policy, such as those targeting preservation of traditional agricultural systems.

Chapter type: Empirical work

Completeness: 80%

Expected completion date: Sept 2017

# Economic costs for in-situ conservation of Crop Wild Relatives (CWR) in Zambia: An application of Competitive Tender (CT)

The chapter identifies the lack of robust economic estimates concerning the costs surrounding in-situ CWR conservation. We discuss the cost implications of using different Area management options (AMOs) for conservation services and how the ‘mix’ of these might lead to fundamentally different conservation outcomes (i.e. species and diversity) and costs. The article moves to discuss the resource requirements should a national *in-situ* CWR conservation strategy be implemented in Zambia. The article concludes with a summary of wider deliberation concerning the use of PES including equitability and cost effectiveness considerations.

Chapter type: Empirical work

Completeness: 60%

Expected completion date: November 2017

# Developing a prioritisation metric for conserving cattle native breeds at risk (NBAR) in the UK

Prioritisation measures and indicators currently developed to inform FAnGR conservation planning are too data intensive and specific. Consequently, there has been low/no uptake of these indicators by governments or NGO’s to inform their conservation efforts. Using multi-criteria decision analysis (MCDA) we hope to demonstrate the benefits of developing more comprehensive policy support tools to improve genetic resources conservation, using UK cattle NBAR as a case study. The MCDA will consider a set of holistic criteria including diversity, utility and endangerment to inform decision making and the use of incentives to support NBAR. The chapter will discuss some concerns raised by participants to a recent workshop, organised by SRUC, discussing the use of indicators for NBAR conservation. These concerns explicitly related to how such metrics might be used, the potential for misuse and the need for improved communication between NBAR stakeholders and government.

Chapter type: Methodological contribution

Completeness: 30%

Expected completion date: February 2018

# Determining optimal sampling strategies and conservation costs associated with ex-situ gene banks

There is much information in the literature providing guidance on cryoconservation of farm animal genetic resources yet surprisingly little is documented on the costs of developing ex-situ collections. This is a problem because it inhibits our understanding of how to develop collections through economically rational approaches, such that benefits are maximised and costs minimised. This corresponds with a need to identify an optimal sampling strategy for developing ex-situ collections that considers i) the merits of different breeds; ii) quantity of material to be collected; iii) risk and iv) cost effectiveness.

This chapter seeks to address these issues firstly through the development of survey that will be sent to gene bank managers in Europe to determine how costs for developing ex-situ collections varies by country, species and collection method.

The degree of overlap between different collections will be analysed and quantified based on data collected recently in a different survey. A linear programming (LP) model will be developed to determine the optimal conservation strategy for collecting and storing genetic material relative to cost, breed endangerment and conservation benefit. The contribution will provide important guidance for decision makers (i.e. genebank managers, multilateral organisations and governments) concerning the resources required to develop ex-situ collections under a number of different scenarios.

Chapter type: Empirical work

Completeness: 10%

Expected completion date: March 2018

# Conclusion and recommendation’s

# References

# Appendix