Economic instruments for supplying agrobiodiversity conservation

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Declaration

I, Warwick Wainwright, declare that:

a) This thesis was composed by myself
b) The work contained herein is my own, except where clearly stated
c) The work has not been submitted for any other degree or professional qualification
d) Included publications are my own work

Signed: _____

Dated: _____

Abstract

Graphical abstract

Lay summary

List of abbreviations

Author's contribution to the field

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Chapter one

Introduction

1.1 What are Farm Animal Genetic Resources (FAnGR)

Farm Animal Genetic Resources (FAnGR) are

- Define FAnGR – what are they. Where are they most prolific (Figure X, FAO 2015, P.
- Brief history of FAnGR including domestication centres (see FAO, 2015 Figure P.10)
- Recent history of FAnGR including selective breeding under Robert Bakewell and technological advances in farm animal breeding

1.2 The importance of FAnGR

1.3 The state of FAnGR globally

1.4 Aims and objectives

1.5 Structure of the thesis

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

2.1

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

Conclusion and recommendations

References

Appendix