HOW MUCH MAY SPANISH FARMERS CONTRIBUTE TO MITIGATION? EVALUATION OF A MARGINAL ABATEMENT COST CURVE FOR SMALL CHANGES IN CROP MANAGEMENT

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1. Introduction

Climate change and agricultural policies need information about the mitigation potential and cost of greenhouse gas (GHG) mitigation strategies. The role of farmers and the potential of small changes in soil management is little understood. This paper considers some of the agricultural soil management practices that may contribute to the mitigation of greenhouse gas emissions, their cost, and potential implementation. .

Information on the cost of greenhouse gas reduction is limited and fragmented (MacLeod et al., 2010). An approach to evaluate costs and mitigation potential is to estimate marginal abatement costs curves (MACC). The MACC summarises our estimate of the realistic volume and costs of opportunities to reduce GHG emissions; MACC curves have been derived for the major sectors (McKinsey and Company, 2008; McKinsey and Company, 2008) and for agricultural greenhouse practices in some countries (MacLeod et al., 2010; Moran et al., 2011).

Here we evaluate the cost-effectiveness of GHG mitigation measures on crop and soil management at farm level in Spain. First, we select the most suitable mitigation measures according to the agronomic, climate and production factors for the case study based on a previous study (Sánchez et al., 2013). Then we collect representative and available data for the case study on crop production and impact of the implementation of the measure in terms of soil organic carbon (SOC), yield and costs. Finally, we estimate the cost-effectiveness of the mitigation measures applicable in the case study by a marginal abatement costs curve.

2. Methods

Our methodological approach includes the following components:

(a) The mitigation measures applicability: The applicability of the mitigation measures is established according to the agronomic, climate and production factors for the case study (Sánchez et al., 2013).

(b) The data collection of the mitigation measures: The data collection in the case study area takes information from existing publications and studies, analyzing the agronomic experimental evidence for the case study. The available data for the implementation of the mitigation measures selected is collected in terms of soil organic carbon (SOC), yield and costs

(c) The cost-effectiveness of the mitigation measures: Built on the data collection, we develop the marginal abatement cost curve to estimate the cost-effectiveness of the mitigation measures applicable in the Spanish case study.

3. Results and discussion

The cost per unit of CO_2eq saved of a particular mitigation practices in the case study area and a ranking of all the practices considered in terms of cost-effectiveness and abatement potential to reduce GHGs (Work in progress).

4. Conclusions

The MACC analysis to determine the cost-effectiveness of the mitigation measures in the agriculture for the Spanish case study can be an interesting contribution to the literature since there are not similar studies in this region so far (Work in progress).

Aknowledgements

We acknowledge funding from the SmartSOIL project (http://smartsoil.eu/), EU, 7th Framework Programme, and the support of the REMEDIA netwok (www.remedia.org).

References

MacLeod M, Moran D, Eory V, Rees RM, Barnes A, Topp CFE, Ball B, Hoad S, Wall E, McVittie A, Pajot G, Matthews R, Smith P, Moxey A (2010) Developing greenhouse gas marginal abatement costs curves for agricultural emissions from crops and soils in the UK. Agricultural Systems, 103: 198–209

McKinsey & Company, 2008. An Australian cost curve for greenhouse gas reduction. <http://www.mckinsey.com/clientservice/ccsi/pdf/Australian_Cost_Curve_for_GHG_Reduction.pdf>

McKinsey & Company, 2009. Pathways to a low-carbon economy – global greenhouse gases (GHG) abatement cost curve. Version 2 of the Global Greenhouse Gas Abatement Cost Curve – January 2009. <http://globalghgcostcurve.bymckinsey.com/>

Moran D, Macleod M, Wall E, Eory V, McVittie A, Barnes A, Rees R, Topp CFE, Moxey A (2011) Marginal Abatement Cost Curves for UK Agricultural Greenhouse Gas Emissions. Journal of Agricultural Economics, 62: 93–118.

Sánchez B, Álvaro-Fuentes J, Cunningham R, Iglesias A (2013) Towards mitigation of greenhouse gases by small changes in farming practices: Understanding local barriers in Spain. Submitted to Mitigation and Adaptation Strategies for Global Change.