

MACSUR Regional Pilot Case Study Mostviertel – AT



Preliminary results

Schönhart, M.¹, Schauppenlehner, T.², Schmid, E.¹, Sinabell, F.³

¹ Institute for Sustainable Economic Development, BOKU University of Natural Resources and Life Sciences, Vienna

² Institute for Landscape Development, Recreation and Conservation Planning, BOKU Vienna

³ Austrian Institute of Economic Research

✉ martin.schoenhardt@boku.ac.at, 01-47654-3663



Overview

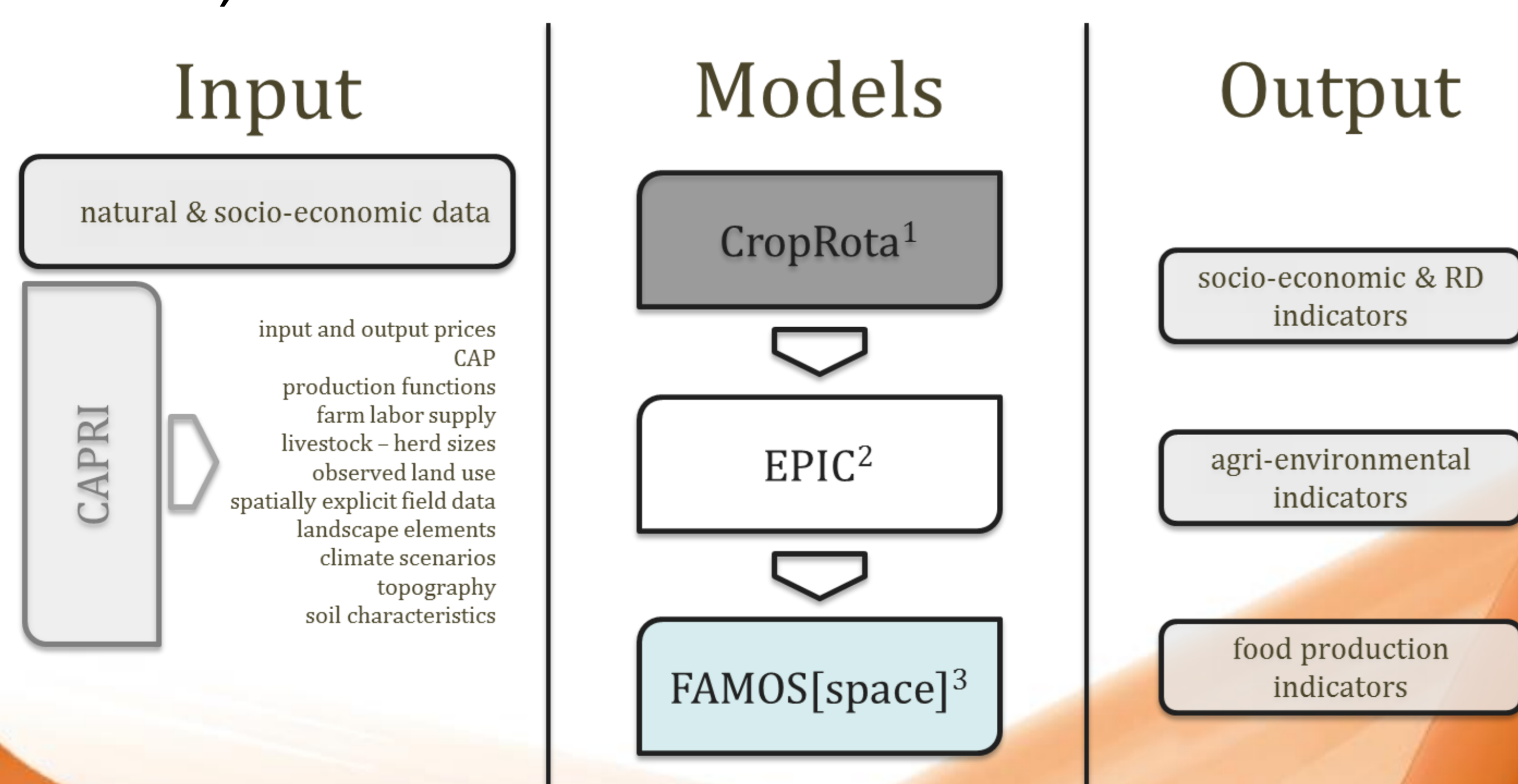
An integrated modelling framework (IMF) is developed to analyse impacts of climate and policy changes on farm welfare and the environment. The IMF is applied on two contrasting grassland (south) and cropland (north) dominated Austrian landscapes (Fig.1).



Fig.1: Location of case study landscapes

Methods and Data

The IMF combines the crop rotation model CropRota, the bio-physical process model EPIC and the bio-economic farm model FAMOS[space] and applies combined climate change and policy scenarios (Fig.2; Tab.1)



¹Schönhart et al. (2011). Eur J Agron 34, 263-277.

²e.g. Izaurralde et al. (2006). Ecol Modell 192, 362-384.

³Schönhart et al. (2011). J Environ Plann Manage 54, 115-143.

Fig.2: IMF Overview

Tab.1: Combined Policy and Climate Scenarios

Scenario name	AEP	CAP reform	Climate change in 2040	
			Δ temperature (°C)	Δ precipitation (%)
REF_2008	no	no	0.0	0%
BAU_2008	yes	no	0.0	0%
REF_2040	no	yes	0.0	0%
BAU_2040	yes	yes	0.0	0%
CS01	yes	yes	+ 1.6	0%
CS05	yes	yes	+ 1.6	+20%
CS09	yes	yes	+ 1.6	-20%

AEP: agri-environmental policy

Preliminary Results

Changing policies reduce farm gross margins by -36% and -5% in the two landscapes respectively. Climate change increases gross margins and farms can reach pre-reform levels on average (Fig.3). Climate induced intensification such as removing of landscape elements and increasing fertilization can be moderated by an agri-environmental program (AEP). However, productivity gains from climate change increase the opportunity costs for AEP participation.

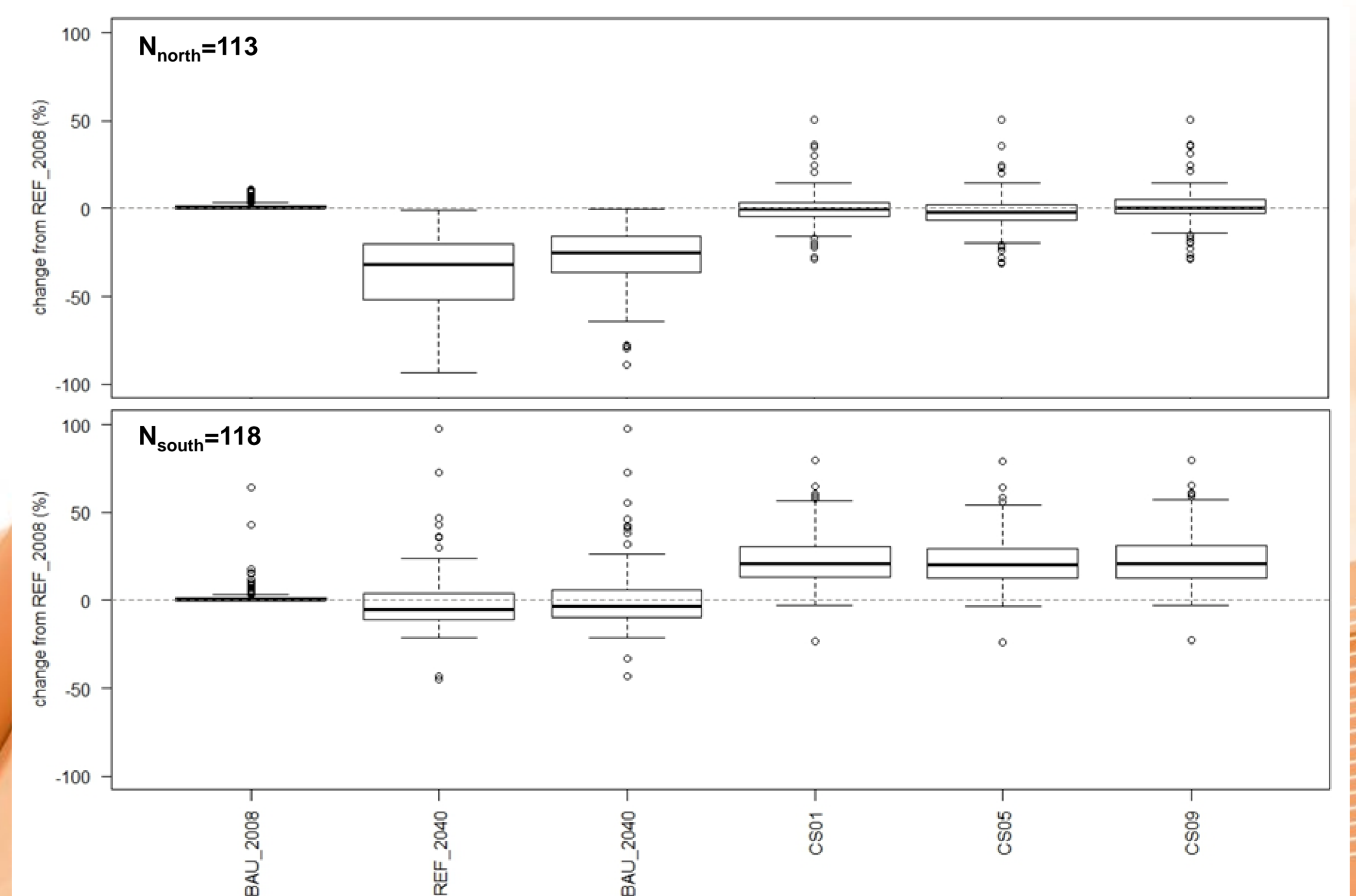


Fig.3: Changes in total gross margin from REF_2008

Research to this article has been supported by the CC-ILA project within the Global Change Programme of the Austrian Academy of Sciences (ÖAW). This article has also been supported by FACCE MACSUR – Modelling European Agriculture with Climate Change for Food Security, a FACCE JPI knowledge hub – and the Federal Ministry of Agriculture, Forestry, Environment and Water Management of Austria.

