



# Farmers' perception of their decision-making in relation to policy schemes: A comparison of case studies from Switzerland and the United States



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## ABSTRACT

Farmers are decision-makers in a complex system of cause and effect. They decide with respect to their own attitude and beliefs, according to their farm structure and they take into account programs and regulations of the overarching policy scheme. In this paper we used mail surveys with identical questions to establish a cross-national comparison of two case study areas. The questionnaire investigates farmer's perspectives on what influences their own decision-making as well as their perception of the socio-ecological environment to relate these findings to the respective policy schemes in the case study areas. The two case studies are located in Southern Illinois, United States and in central Switzerland. The analysis shows that full-time farmers of the Southern Illinois case study area rate constraining factors such as financial aspects higher than Southern Illinois part-time farmers and farmers from the central Switzerland case study area. Furthermore, it is apparent that Swiss case study-farmers rate aspects of their land use responsibility and the Illinois case study-farmers rate ecological aspects higher. The empirical findings can be qualitatively explained through analysis of agricultural policy schemes.

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## Introduction

Agricultural policy schemes worldwide are developing to cope with WTO standards, meanwhile guaranteeing an income for the farming community producing food and other ecosystem services. While these national and international developments influence farmers particularly via public policies, farming practice is the result of more complex relationships of at least three different levels, namely the individual level (attitude, motivations, beliefs or characteristics of a farmer), the level of the farm business, and the structure of policies and regulations (e.g. Aerni, 2009; Aerni et al., 2009; Valdivia and Poulos, 2009).

With respect to the individual level, the analysis of values individual farmers place on the landscape is important for understanding agricultural development and the related landscape changes (Busck, 2002). Multiple identities may explain inconsistencies

many researchers have found between attitudes toward conservation and the actions toward the environment (Burton and Wilson, 2006). Cross et al. (2011) show that economic dependence is diminishing the motivation to participate in conservation programs, but that it is a subjective experience, related to but separate from farm income and land characteristics. In their review, Prokopy et al. (2008) show that even more factors determine land use decisions and organizes the factors into three categories namely 'capacity' to adopt (human capital variables), 'attitude and awareness', and 'farm characteristics', showing that certain influence factors such as education, attitudes toward the environment are consistent across different studies. Karali (2012) finds two general conclusions from these kind of empirical studies: farmers' decision-making is influenced significantly, but not only, by economic factors and farmers are a heterogeneous group in terms of farmer characteristics and decision making.

With respect to the farm business level, farm business types and their structures are also known to significantly influence farmer's decision making through coining individual attitudes and farm history. For example, Finger and El Benni (2013) find that adoption of a conservation practice is more likely if it fits into farm structure, and Pannell et al. (2006) show that farmers' expectations to achieve

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their goals are positively related to the adoption of conservation practices.

With respect to the level of policies and regulations, the various agriculture subsidy systems of the different regulative authorities are important decision-making factors. The other way around, Aerni et al. (2009) argue that individuals or their representatives influence the political agenda. Contemporary agricultural policy systems use the concepts of “compliance” and “cross-compliance” to steer farmer’s behavior or implement incentives for ecological farming. OECD (2010) suggest that cross-compliance may influence the perception of farmers if they perceive a link between compliance and payments. Furthermore, cross-compliance may have impact on the farmer’s awareness regarding their behavior.

In this study, we investigate farmer’s decision making factors and their socio-ecological environment for two different case studies. A cross-national comparison may serve as tool for developing classification of phenomena and a mean to better understand different societies, their structures and institutions (Hantrais, 1995). The comparison allows analysis of the relationship between policy schemes and farmer’s decision making and enables insights to support sustainable development.

## Method

### Data collection

In order to examine if factors influencing agricultural decision-making differ over the case study areas, standardized questionnaire items were designed measuring agreement on agricultural decision-making factors and perception of the socio-ecological environment (including economic characteristics). Decision factors were identified through literature review (cf. Edwards-Jones, 2006; or studies conducted in Southern Illinois, cf. Flint and Gasteyer, 2007) and interviews in the case study areas. The set of survey items consisted of 25 factors with possible influence on the general decision-making of a farmer. In the USA twelve and in Switzerland eight semi-structured interviews with farming experts and farmers were conducted according to a question guide (according to Dunn, 2001). Interviews were transcribed and evaluated for possible decision factors. These covered biophysical, economic, political and social factors. We define ‘decision factors’ here as drivers that influence a farmer with respect to his decisions on his farm and his farming practices. The questions measuring perceptions of the socio-ecological environment were designed to explore agricultural decision-making in a broader context. The topics of these questions were oriented on the subjects that were brought up in the interviews and on reflections on the concept of cultural ecosystem services (Daniel et al., 2012).

As a preliminary step in shaping the questionnaire, we conducted a qualitative pretest to validate the farming specific expressions and the understanding of the formulated questions. In the Southern Illinois study area (SISA), we used five interviews with farmers to test and evaluate the questionnaire. In the Swiss study area (SWSA) the questionnaire was also pretested with farmers. The items were measured on 5-point scales according to either the perceived importance in the farmer’s decision-making or agreement with each statement.

In Switzerland, 417 questionnaires were posted in June 2011. According to the acreage of the farms (to receive a distribution over all farm sizes), stratified sampling (Fowler, 2009) was used to obtain 400 addresses (out of 1062). Additionally, 17 addresses were added to the sample as reserve. In the USA, the procedure to obtain addresses of potential land use decision-makers was based on a spatial analysis. The sample consisted of 70% farmers holding between 8 and 32 ha of land – 5.5% own more than 81 ha. For comparison, 75% of the farms in the SWSA sample are between

8 and 32 ha (Dienststelle Landwirtschaft und Wald des Kantons Luzern (lawa, 2011)). For both samples a thank you- and reminder-letter was sent out a week after the questionnaire.

In the Swiss case study, 101 surveys were returned sufficiently completed resulting in a response rate of 24.2%. Respondents’ acreage encompasses about 10% of the total farm land in the study area. In the American case study area, 420 questionnaires were sent out in June 2011. Eight surveys were returned marked as undeliverable. Seventy-six surveys were sufficiently completed and returned resulting in a response rate of 18.4%. The relatively low return rate, although not uncommon in similar studies (Reimer and Prokopy, 2013), may be due to the fact that the questionnaires were relatively long (eight and twelve pages) and might have discouraged farmers to respond.

### Analysis

As the two case studies differ in many aspects we created a ‘least common denominator’. This artificial basis was introduced by joining the two samples and conducting a principal component analysis (PCA) in order to create condensed components of factors perceived to influence farmer’s decision-making. In the PCA analyses we checked for the Kaiser–Meyer–Olkin measure (KMO) and the significance according to Bartlett. We tested the significance of the difference of the samples by applying Mann–Whitney–U. To gain insight in the two case study areas we averaged the PCA items (which themselves were averaged over the sample) belonging to a component. This is referred to as ‘rating of a component’. Analyses were performed with SPSS 19 and 21 (IBM, 2010).

In order to account for the different farm structure in the two case study areas literature suggests that specifically with regard to attitude, values and beliefs, part-time farmers may be separated from full-time farmers (Bharadwaj and Findeis, 2003; Buttel, 1982; Mann, 2005, 2007; Primdahl, 1999). Therefore, the sample was split according to this separation which was established by questions asking about the share of income farmers earn directly from farming and from jobs outside their farm business. To operationalize the terms in the surveys, we applied the common definition for part-time farms of Switzerland, which defines a part-time farm if more than 50% of the income is coming from paid work outside of the farm business. The additional condition spending less than 50% of the available working time on the farm was neglected to facilitate the comparison between the case study areas. In comparison, a common definition of part-time farming in the U.S. would assume that a farmer works 150–200 days in an off-farm sector (Paudel and Wang, 2002). The common U.S. indicator though was not retrieved in the survey.

### Case study areas

We looked at two catchments differing in size as well as in the structure of the farming sector, but chosen for comparison due to similar rural surroundings. In Switzerland the study area reflects a catchment and in Southern Illinois, following consultation with the Department of Natural Resources and Environmental Sciences, University of Illinois at Urbana-Champaign, it was agreed upon to use a combination of three Hydrologic Unit Code System (HUC 12) watersheds (Big Creek–Cache River, Dutchman Creek and Lick Creek–Cache River) in Union County (to the west) and Johnson County (to the east). Both study areas do not comprise any large urban settlement and are dominated by the agricultural sector. The SWSA encompasses a catchment of 481 km<sup>2</sup> and Southern Illinois study area occupies about 45% of the Union and Johnson county area and encompasses 888 km<sup>2</sup>. It should be noted that the Southern Illinois region is considerably unique compared to the rest of the state, particularly related to farm size (generally smaller),

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