



# How farmers' self-identities affect agri-environmental transition in Grassland Use: a mixed method study in the Swiss Alpine Region

Martina Spörri<sup>1</sup> · Maria Haller<sup>2</sup> · Nadja El Benni<sup>3</sup> · Gabriele Mack<sup>3</sup> · Robert Finger<sup>4</sup>

Accepted: 29 June 2024 / Published online: 3 October 2024  
© The Author(s) 2024

## Abstract

Agri-environmental policies programmes mainly focus on economic incentives for the agri-environmental transition in grassland use. However, barriers rooted in farmers' self-identities, which determine their behavioural intentions toward environmentally friendly practices, are often unaddressed in policy design. We conceptualise two self-identity gradients, productivist–multifunctionalist–conservationist and traditionalist–innovationist, to analyse drivers and barriers of agri-environmental transition processes among farmers. In order to grasp the complex multidimensional and hierarchical concept of self-identity as initially proposed by Stryker (*Journal of Marriage and Family* 30: 558–564, 1968), our analysis comprises a triangulation of qualitative and quantitative methods on a comprehensive dataset of 75 interviews with Swiss alpine grassland farmers. Through the semi-deductive coding of responses to open questions (revealing hierarchical aspects) and a factor analysis of closed, Likert-scale questions (revealing multidimensional aspects), we positioned each farmer along the conceptualised self-identity gradients. Our framework allows to explain contradictory behaviours exhibited by farmers: Our results revealed a mismatch between the farmers' prevailing conservationist-innovationist self-identity and their actual intensification behaviour. This mismatch can be explained by the discrepancy between the individual self-identity and the prevailing productivist–innovationist idea of a good farmer, on which farmers continue to base their decisions. Within this discrepancy, however, lies the potential for a shift in the idea of what constitutes a good farmer and a consequential agri-environmental transition.

**Keywords** Agri-environmental policy · Alpine farming · Post-productivist · Triangulation of methods · Land use intensity

---

✉ Martina Spörri  
martina.spoerri@alumni.ethz.ch

Maria Haller  
maria.haller@bfh.ch

Nadja El Benni  
nadja.el-benni@agroscope.admin.ch

Gabriele Mack  
gabriele.mack@agroscope.admin.ch

Robert Finger  
rofinger@ethz.ch

## Abbreviations

FOAG	Federal office of Agriculture
LSU	Livestock unit
Ha	hectare
CHF	Swiss francs
AGFF	Swiss Grassland Society
FSO	Federal office of Statistics
SI1 to SI6	Self-identity questions
IB1-IB3	Intensification or extensification questions
IPF	Integrated principal factor analysis
ID-1 – ID-75	Identifier for individual farmers

## Introduction

Grasslands play a vital role in providing ecosystem services, including forage production, carbon sequestration, biodiversity, erosion control, and recreation (Allan et al. 2015; Schmidt et al. 2018; Le Clec'h et al. 2019; Huber et al. 2022). An agri-environmental transition towards more

<sup>1</sup> Agroecological Transitions Group, Universitätstrasse 2, Zürich 8092, Switzerland

<sup>2</sup> School of Agricultural, Forest and Food Sciences, Berne University of Applied Science, Länggasse 85, Zollikofen 3052, Switzerland

<sup>3</sup> Research unit competitiveness and systems evaluation, Agroscope, Tänikon 1, Ettenhausen 8356, Switzerland

<sup>4</sup> Agricultural Economics and Policy, ETH Zürich, Sonneggstrasse 33, Zürich 8092, Switzerland

sustainable grassland cultivation practices, particularly in the alpine regions, has been encouraged by various policy measures (Huber et al. 2017; Hunter et al. 2020). Financial incentives of policy measures allow farmers to maintain or increase their income while reducing their grassland use intensity (Pedolin et al. 2023). However, these policies often overlook cognitive barriers and drivers rooted in farmers' self-identities, which shape their attitudes, motivations, and intentions toward environmentally friendly practices (Burton and Wilson 2006; McGuire et al. 2013; Sulemana and James 2014; van Dijk et al. 2016; Cullen et al. 2020; Zemo and Termansen 2022; Schaub et al. 2023).

With this study, we want to answer the question of how self-identities of Swiss alpine farmers influence their individual decision-making processes with regard to grassland use intensity. In order to answer this question, we contribute to the existing literature by expanding both theoretical and methodological perspectives. We introduce a conceptual framework that outlines two gradients of self-identities found in theoretical and empirical literature: productivist–multifunctionalist–conservationist and traditionalist–innovationist. These self-identity gradients are recognized as influential drivers or barriers of agri-environmental transition processes. In terms of methodology, we employ a concurrent mixed methods approach (Collins et al. 2006; Tashakkori et al. 2020), triangulating quantitative and qualitative methods in both data collection and analysis (Strijker et al. 2020), using a comprehensive dataset of 75 interviews with Swiss alpine grassland farmers. This approach allows us to delve into the complex multidimensional, hierarchical concept of self-identity as proposed by Stryker (1968).

The self-identity concept of Stryker (1968) is a framework previously employed to describe farmers' self-identity formation and re-formation, and to explain farmers' behaviour and behavioural transitions (Zemo and Termansen 2022). Self-identities are assumed to be multidimensional and hierarchical (Stryker 1968; Burton and Wilson 2006). This assumption is crucial, as it allows a more comprehensive understanding of the complex, nuanced, and seemingly contradictory behaviour of farmers.

Burton and Wilson (2006) conceptualised a farmer-driven agri-environmental transition based on the productivist/post-productivist/conservationist transition model (Clope and Goodwin 1992) as well as the self-identity concept, followed by a large body of literature addressing different aspects of farmers' complex self-identities, their notions of what makes a good farmer, and the resulting effects on behaviour. For instance, Sulemana and James (2014) revealed that specific self-identity traits substantially influence farmers' attitudes toward environmentally friendly practices. Several studies have examined the direct association between farmers' self-identities and their observed behaviour, such as McGuire et al. (2013), van Dijk et al. (2016) and Warren et al. (2016).

Howley et al. (2015) concentrated on intended behaviour, while Hyland et al. (2016) and Cullen et al. (2020) adopted a two-step modelling approach to connect farmers' self-identities with their attitudes and subsequent behaviour. However, it's worth noting that to the best of our knowledge, no previous studies explicitly integrated the multidimensional, hierarchical nature of self-identity in their methodological design, nor did they have a comparably comprehensive database at their disposal.

## Conceptual Framework: transition processes and self-identity theory

Agri-environmental transitions have been conceptualised from a macroeconomic perspective, shifting from a productivist to a multifunctional paradigm (Clope and Goodwin 1992; Wilson 2001; Mather et al. 2006). In a productivist agricultural society, agricultural land primarily serves the production of food and fibre, while a multifunctional approach recognises the broader spectrum of ecosystem services. The transition from a productivist agricultural society to a multifunctional agricultural society manifests in less intensive land use practices, as trade-offs among different ecosystem services are acknowledged (Allan et al. 2015; Schirpke et al. 2019).

This macroeconomic lens might suggest that external factors, such as policy changes, are the primary drivers of these transition processes (Evans et al. 2002). Nevertheless, these strategies often lack efficacy and efficiency, as exemplified in Switzerland where incentive-based agri-environmental schemes to promote landscape elements primarily attract farmers who can participate without significant changes to their existing practices (Mack and Huber 2017; Mack et al. 2020). Other studies support the observation that farmers often engage in agri-environmental schemes for convenience, but are hesitant to adopt significant agri-environmental adjustments, such as transitioning towards less intensive land use (Ingram et al. 2013; Lastra-Bravo et al. 2015; Pavlis et al. 2016).

To better understand farmers' behaviour and internal transition processes, a shift from a macroeconomic perspective that overemphasises farmers' economic considerations (Brown et al. 2021), to a microeconomic, actor-based perspective is needed. Central to this understanding is the concept of self-identity (Stryker 1968), which encompasses how individuals (i.e. farmers) perceive themselves, others, and how they desire to be perceived. In his identity theory, Stryker (1968) postulated that the variability in individuals' behaviour is caused by a corresponding variability in self-conception (i.e. self-identity).

This self-identity concept offers three features that make it a powerful tool for deciphering farmers' decision-making:

complexity, self-categorisation, and evolvement. Firstly, the complex multidimensional and hierarchical design of self-identities allows to explain ambiguous, allegedly contradictory behaviours of farmers (Burton and Wilson 2006). Secondly, an individual's self-identity remains consistent across different situations (Stets and Burke 2000), but not over time: The formation of self-identities is a dynamic process involving self-categorisation (Stets and Burke 2000), which enables individuals to express their self-identities in survey or interview contexts. Lastly, an individual's self-identity is shaped and reshaped through interactions with the social environment (Stryker 1968; Riley 2016; Bruno et al. 2022). Consequently, understanding how self-identities evolve and how they influence decision-making is pivotal for fostering transition processes towards more environmentally friendly behaviours (Lequin et al. 2019).

Burton and Wilson (2006) introduced a farmer-driven agri-environmental transition model rooted in Stryker's identity theory, and established farming-related self-identity concepts which have since been used and extended in various studies to analyse farmers' behaviour, internal transition processes, and policy implications in Europe and the US (McGuire et al. 2013; Sulemana and James 2014; Howley et al. 2015; Hyland et al. 2016; van Dijk et al. 2016; Warren et al. 2016; Naylor et al. 2018; Cullen et al. 2020; Bartkowski et al. 2022). Building upon this collective research, we propose two gradients within farmers' self-identities as essential drivers in the transition towards more environmentally friendly, less intensive agricultural practices.

The first gradient encompasses self-identities categorized as productivist, multifunctionalist, and conservationist, a categorization used in studies like Burton and Wilson (2006); McGuire et al. (2013); Sulemana and James (2014); Hyland et al. (2016); Cullen et al. (2020); and Letourneau and Davidson (2022). Productivists focus on intensive land cultivation and agricultural products, while Multifunctionalists consider both agricultural production and other ecosystem services to be equally important. Conservationists perceive themselves as stewards of the environment and providers of ecosystem services. Consequently, we anticipate extensification behaviours among conservationists and intensification among productivists (Home et al. 2014; Howley et al. 2015; Hyland et al. 2016), while multifunctionalists may exhibit nuanced behaviour (Karali et al. 2014; Letourneau and Davidson 2022).

The second gradient encompasses the two opposing identities of traditionalist and innovationist, as described in Karali et al. (2013) and Cullen et al. (2020). Traditionalists uphold tradition in farming practices and resist change, in particular regarding new technologies (Cullen et al. 2020). In contrast, innovationists view change as vital for successful business-making and securing the future of their farms

(Cullen et al. 2020), and are open to new technologies (Sulemana and James 2014). As a result, we anticipate substantial changes in production intensity among innovationists towards both intensification and extensification.

While these gradients offer insights into individual self-identities, understanding their hierarchical arrangement is critical to comprehend farmers' behaviours. This hierarchy is established by embedding self-identities into a common, often subconscious idea of a good farmer (Burton et al. 2020; Westerink et al. 2021). In visibly adhering to the common idea of what constitutes a good farmer, individuals can maintain or increase their cultural, symbolic and social capital (Burton and Wilson 2006; Sutherland and Darnhofer 2012). Consequently, farmers may defy their individual self-identities to conform to the ideal behaviour expected of a good farmer. The traditional, productivist idea of a good farmer has been regarded as a barrier to agri-environmental transition processes (Burton 2004). However, similar to individual self-identities, this idea of a good farmer is shaped and reshaped in its environment, and may evolve over time (Burton et al. 2020; Westerink et al. 2021).

## Materials and methods

### Study area

Our interviews were conducted with farmers in the Swiss agricultural mountain zones I to IV<sup>1</sup>, 88% of which are comprised of agricultural area (FOAG 2019). Permanent grasslands are the dominant type of agricultural cultivation in these zones, as the topography and climate constrain arable farming and horticulture. Mountain grasslands contribute greatly to the ecosystem services of the Swiss agricultural sector (Huguenin-Elie et al. 2019). The zones represent a natural type of heterogeneity, as conditions for agricultural production become increasingly difficult with increasing zone numbers. Within our study area, we also observe substantial heterogeneity in the land use strategies adopted by farmers. We classified these strategies into three categories: conventional extensive (stocking rate lower than 1 ruminant livestock unit per hectare [LSU]/ha), conventional intensive (stocking rate higher than 1 LSU/ha) and organic. These boundaries fit the Swiss alpine conditions very well. Due to production constraints, the average stocking density is around 1 LU/ha. Therefore, intensities higher than 1 LSU/

<sup>1</sup> In Switzerland, agricultural zones classify the agricultural land into six levels: plain, hill and mountain I to IV. The detailed classification considers climatic conditions (e.g. length of growing season), accessibility and land slope. For more details, consult the corresponding regulations (FOAG 2020).

**Table 1** Summary statistics of the interview partners

	Extensive	Intensive	Organic
Total number of interview partners	25	25	25
Number of interview partners by mountain zone:			
I	3	11	6
II	11	12	5
III	9	2	7
IV	2	0	7
Roughage-eating livestock unit [LSU]	26.4	39.1	26.8
Hectares of grassland [ha]	32.0	24.7	26.6
Grassland use intensity [LSU/ha]	0.8	1.6	1.0

ha point towards the use of additional input such as fertilizer, irrigation, or additional fodder.

In Switzerland, the multifunctionality of the agricultural sector (i.e. food production, decentralized settlement and resource and landscape protection) is defined by the constitution. Upon fulfilling environmental cross-compliance obligations, farmers are eligible for governmental financial compensation for non-market ecosystem services, the so called direct payments (Mann and Lanz 2013). Further voluntary measures aim to de-intensify agricultural production. For grasslands, examples are the promotion of biodiversity (Mack et al. 2020; Wuepper and Huber 2022) or livestock production restricted to grasslands (Mack and Kohler 2019). Direct payments are an important part of farmers' income, especially in the less productive mountain zones (Möhring and Mann 2020).

## Sampling

To recruit interview partners, we reached out to members of the Swiss Grassland Society (AGFF<sup>2</sup>) in February 2020. We informed them that participation in the interviews was voluntary, and to encourage participation, we offered compensation in the form of a 75 CHF gift card. A total of 242 farmers from the Alpine region accepted our invitation and provided additional information on their location, farm size, production type and stocking density through a short questionnaire (Appendix A).

This information helped us create a sample of 75 interview partners grouped into the three management intensity categories conventional extensive, conventional intensive, organic farmers. Our selection process considered the total numbers of each category within mountain zones I to IV, ensured an even spatial distribution, and avoided extreme

cases (consult Table 1 for summary statistics of the interview partners). The interviews took place from October to December 2020, and were conducted via phone due to the COVID-19 crisis. Prior to these interviews, the farmers received detailed information about data use, privacy and processes in case of emergency (Appendix B). In terms of ethical approval, all participants signed a letter of consent (Appendix B). All interview partners gave consent for recording the phone call for further (anonymised) data processing.

## Data collection

Our semi-structured interview questionnaire included a mix of open and closed questions aiming to capture farmers' self-identities and their future land use intentions (see Table 2). Farmers also granted us permission to connect their interview data with census data from the Farm Structure Survey (FSO, 2016), allowing us to gain insights into their past intensification or de-intensification strategies.

In line with the feature of self-categorisation (Stets and Burke 2000), we adopted an indirect approach to assess farmers' self-identities. First, we asked what it means to be a farmer nowadays (SI1), aiming to evoke an affect (feeling, emotion or mood, see Hogg and Abrahams 2004) towards their self-identities. Subsequently, we analyzed the internal and (perceived) external idea of a good farmer (SI2 and SI3), inquired about barriers to achieving that image (SI4), and probed for the top-most layer of a farmer's self-identity (SI5). Regarding closed questions on self-identity, we asked the farmers to indicate their level of agreement with a series of statements (SI6) (Cullen et al. 2020). Most of these statements directly addressed one of our conceptualized gradients of self-identity, while two statements were considered to be neutral in this regard (SI6c and SI6h). The sequence of open questions preceded the closed questions to prevent any priming effects (Podsakoff et al. 2003) and leverage the affective imagery related to self-identity (Slovic et al. 2007). We also indirectly analyzed intensification

<sup>2</sup> The 'Arbeitsgemeinschaft zur Förderung des Futterbaues/Working Group for the Promotion of Forage Production' (AGFF) is an association of all farmers and institutions in Switzerland interested in forage production. The association has about 3,000 members.

**Table 2** Open and closed interview questions

Farmers' self-identity	
<i>Open Questions</i>	
SI1	What does it mean to be a farmer nowadays?
SI2	What makes for a good land manager/good farmer?
SI3	What do you think other farmers would consider a good farmer/land manager?
SI4	What barriers do you think there are to farmers being good land managers/farmers?
SI5	What is the best moment in your life as a farmer?
<i>Closed Questions<sup>a)</sup></i>	
SI6	Please can you tell me how strongly you agree or disagree with the following statements: a. To be successful in farming it is important for me to adapt and use new technologies b. I am good at finding different types of information to help me run my business c. I have to keep my farm running to ensure I have something to pass on to my children d. Farmers should be allowed to maximise their income irrespective of the environmental consequences e. We need to produce more food, even if some damage is caused to the environment f. Farmers are good caretakers of the countryside g. Farmers have a strong positive role to play in protecting the environment h. I enjoy farming much more than I would other potential sources of employment i. I don't think it is a good idea to take too many risks when it comes to farming j. I am cautious about adopting new ideas and farm practices
<i>Farmers' intensification or extensification intentions</i>	
IB1	Are there plans to change grassland area in the next 5–10 years? If yes, by how much?
IB2	Are there plans to change the type and/or number of animals in the next 5–10 years? If yes, what animals and by how much?
IB3	Under what circumstances would you consider to in- or extensify your production?

<sup>a)</sup>(Likert Scale with five levels: strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree)

or extensification intentions through questions IB1-IB3 (see bottom of Table 2). Changes in grassland area and/or the number of livestock revealed the general direction of their intended behaviour, while IB3 revealed more context around these changes.

For the interviews, all questions were translated into French and German. We assume no loss of information due to these translations.

Our interviews were part of a broader study assessing the drivers and barriers related to the adoption of environmentally friendly grassland management practices. On average, each interview took 1.5 h. Prior to the open self-identity questions, we presented a set of general open and closed questions related to the farm, production conditions, and management strategies (see Appendix C: complete interview guide). This initial block of questions facilitated the creation of a trusting rapport between the interviewers and farmers. By framing the interviewers as allies rather than researchers (Lune and Berg 2017), we aimed to make farmers more comfortable discussing their self-identities. This approach also helped counter any potential possible response bias towards socially desirable behaviour (Social Desirability Bias, Nederhof 1985): Farmers might expect the researchers in this project to favour more environmentally friendly behaviour, as they were informed in advance about the overall aim of the

project (i.e. assessing the drivers and barriers related to the adoption of environmentally friendly grassland management practices).

To understand past changes in grassland use intensity, we accessed census data from the Farm Structure Survey (Federal Statistical Office FSO, 2016). This data source provided detailed information on land use and animal production at the farm level. The stocking rates of roughage-eating livestock on grasslands was a suitable measure of grassland use intensity and its changes. To assess past changes within the last five years, we subtracted the stocking rates of 2016 from those of 2020 for each individual farm.

### Qualitative analysis: Coding and data conversion

The analysis of open questions SI1-SI5 (see Table 2) involved a semi-deductive coding process (Miles and Huberman 1994) that aligned responses with the two conceptualized self-identity gradients outlined in our framework. The primary author assigned farmers' statements to codes such as 'productivist', 'multifunctionalist', 'conservationist', 'traditionalist', or 'innovationist' according to the definitions provided in our conceptual framework. Additional support for statements was coded as a separate statement, while responses against a particular identity were coded with

the opposing identity. This coding process occurred in three stages. The initial stage established a comprehensive codebook with accompanying coding rules, documented in Appendix D. The second stage involved refinements and standardisations of all codes in adherence to the coding rules. To minimize personal bias, all co-authors of this paper confirmed and revised both the coding rules and the coding during a third stage. For coding and structuring of this qualitative data, we used MAXQDA, 2022 (Software 2021).

To facilitate the comparison of the results derived from both qualitative and quantitative data (Tashakkori et al. 2020), we converted our qualitative findings related to the two self-identity gradients into quantitative values. Statements coded as “productivist” or “innovationist” were assigned a value of 1, while statements coded as “conservationist” or “traditionalist” received a value of -1. Statements coded “multifunctionalist” were assigned a value of 0. Subsequently, we calculated the sum of all values for “productivist”, “multifunctionalist” and “conservationist” statements to position each farmer along a numeric productivist–multifunctionalist–conservationist gradient. In a similar fashion, the sum of values for “traditionalist” and “innovationist” statements allowed us to position each farmer along a numeric traditionalist–innovationist gradient. These two sums were divided by the total number of statements to generate normalised values within in the range of -1 to 1.

### Quantitative analysis: Factor analysis and data conversion

The closed questions SI6 generated Likert-type scale data. To identify underlying self-identity factors, we applied iterated principal factor analysis (IPF, Cullen et al. 2020), selecting four factors based on both empirical criteria (elbow criterion on scree plot) and the four corners of our two conceptualized self-identity gradients. Eigenvalues and the scree plot, as well as results of the validity tests can be found in Appendix E. These factors were labelled “productivist”, “conservationist”, “traditionalist” and “innovationist”. Factor analysis was conducted in R Statistical Language (R Core Team 2020) using the `fa()` function of the “psych” package (Revelle 2021).

We determined each farmer’s position along the two self-identity gradients using factor scores. By subtracting the conservationist factor scores from the productivist factor scores, we placed each farmer on the productivist–multifunctionalist–conservationist gradient. Similarly, subtracting the traditionalist factor scores from the innovationist factor scores placed each farmer on the traditionalist–innovationist gradient. These values were normalised to the range of -1 to 1, aligning with the quantified results of the qualitative analysis.

## Results

### Results of the qualitative analysis

#### Statements along the two self-identity gradients

In response to open interview questions (see Table 2, SI1–SI5), farmers conveyed their self-identities along the two conceptualized self-identity gradients. It is worth mentioning that we did not find a prevalence of certain self-identity statements among the three sampling groups conventional extensive, conventional intensive, and organic farmers.

Among the 75 interviewed farmers, 41<sup>3</sup> expressed productivist aspects of their self-identity, leading to 65 productivist statements. These statements often revolved around the idea of a good farmer (Burton et al. 2020) as one who produces food to “*feed people*” and generates their income from sales rather than “*only direct payments*”. Productivist statements also perceive environmental protection regulations as barriers (“*obstacles*”):

*SI1: I want to feed people, and that is actually the most important thing for me. Yes, and it means a lot to me, yes. (ID<sup>4</sup>-19, organic suckler cow farmer)<sup>5</sup>*

*SI1: Then you have to make sure that you make ends meet [financially], not that you end up having to live only on direct payments. (ID-68, extensive dairy farmer)*

*SI4: Now the junior comes, wants to enlarge the stable a little, wants to invest, and is now reaching the limits because of the ammonia. It’s actually crazy that they put up such obstacles. (ID-42, intensive suckler cow farmer)*

On the other hand, 39 farmers expressed multifunctionalist aspects of their self-identities, generating 57 multifunctionalist statements. These statements emphasized “*sustainability*” in terms of social (“*population well-being*”, “*society*”), environmental (“*landscape preservation*”) and economic aspects (“*food production*”). Unlike productivist views, multifunctionalist statements embraced a balance between production and site-specific adaptations:

<sup>3</sup> In line with the multidimensionality of self-identities, most farmers expressed aspects of more than one self-identity in their statements. As a consequence, the sum of number reported here and in the following paragraphs will be much higher than 75.

<sup>4</sup> ID = Identifier, i.e. ID 19 is farm nr. 19.

<sup>5</sup> Quotes are translated for the purpose of the publication (original language is German/French). We do not assume loss of information due to these translations.

*SI1: Yes, so you cultivate soil sustainably. So that you can produce something with the resources you have there. (ID-10, organic dairy farmer)*

*SI2: Farmers manage a large part of Switzerland's area. And we have a great influence on the well-being of the population. In addition to production and landscape preservation. (ID-67, extensive suckler cow farmer)*

*SI1: We have several vocations, we have food vocations for society, landscape vocations, symbolic vocations that go with aesthetics. (ID-54, intensive dairy farmer)*

A total of 53 farmers expressed conservationist aspects of their self-identities, resulting in 121 conservationist statements. They show their close connection with the environment (“*working with nature for nature*”) and the perceived beauty of it (“*orchids*”):

*SI2: A good farmer works with nature for nature. (ID-16, intensive dairy farmer)*

*SI5: No, there is no such thing as the best [moment]. There are moments every year when you simply see that all of a sudden there is an achievement through the work that you have done for perhaps 10 or 20 years. For example, the extensive areas, you've been working on them for 20–30 years, and then you find an orchid somewhere where you didn't have one before. (ID-25, organic mixed rearing dairy cow and goat farmer)*

Only 9 farmers expressed traditionalist aspects of their self-identities, contributing 15 statements. Traditionalist statements often criticised the pursuit of “*innovative*” farming approaches or “*taking risks*”. In other statements, the farmers expressed fatigue towards changes and reminisced about times when everything was “*easier*”:

*SI3: Yes, so I think, a lot of people talk about a good farmer that is innovative and farmers that are interested in mechanisation and digitalisation. I think a lot of farmers think that a good farmer is someone who is a step ahead of the others but also maybe takes more risk. But at the end of the year, the best farmer is the one who paid all his or her debts, took his/her holidays and her/his farm is well organised and maybe even could invest a little. (ID-41, intensive mixed dairy beef and goat farmer)*

*SI4: I always get the feeling, when I hear what people say about the past, that it used to be easier. You had a guaranteed sale. It's certainly much easier. You could just go ahead and produce, and you didn't have to think so much about how you could be more efficient or whether [doing] something else would make more sense. (ID-58, extensive mixed suckler cow, horses and sheep farmer)*

In contrast, 43 farmers revealed innovationist aspects of their self-identities, providing 95 statements. These statements, often triggered by questions about the idea of a good farmer (SI2–SI3) highlighted the importance of “*self-reflection*” (or “*review*”), self-responsibility and “*resilience*” (“*react and act*”), and forward-looking mind (“*in line with the times*”):

*SI2: For me, a good farm manager is someone who regularly reflects on what exactly he is doing and what he is achieving with his actions, and questions whether their actions are still in line with the times. Yes, a good farmer also regularly tries to develop himself further. (ID-23, organic suckler cow farmer)*

*SI2: A good education, a good resilience, ongoing review of the factors we have, react, act. (ID-33, intensive dairy farmer)*

### Hierarchies and current movements in farmers' self-identities

Farmers framed their statements differently based on their self-identities, giving insight into a common, subconscious idea of a good farmer. Again, these findings are independent from three sampling groups conventional extensive, conventional intensive, and organic farmers. Productivist self-identities led to confident generalizations, with farmers assuming views were shared by “*most farmers*” due to common “*professional pride*”. Moreover, farmers did not defend innovationist attitudes, but rather directly discredit those farmers with a traditionalist attitude who say “*if something is new, it's nothing,*” and claim that they are “*not in the right profession*”.

*SI1: Most farmers would rather receive their income from the products than from direct payments.... So farming would be a privilege per se, but the danger is that we will be degraded to landscapers. And that's not so good for professional pride. The farmer should be the nation's breadwinner. (ID-59, extensive dairy farmer)*

*SI2: Complaining certainly doesn't help. And if something is new, to say it's nothing, then it doesn't turn out so well anyway. (ID-44, intensive dairy farmer)*

*SI4: [...] Then there is the other point which a lot of people have difficulties with: the attitude, the mindset that we have taken with us since the Second World War, during which the Wahlen<sup>6</sup> plan for food security simply got stuck in many people's heads. The thinking here, at least here in the canton of Lucerne, is to have*

<sup>6</sup> The “Plan Wahlen” was a Swiss program that promoted food production during the Second World War to ensure self-sufficiency.

*to produce as much as possible, after me the Deluge<sup>7</sup>. So in that sense, this restricts us in the area of ecology; actually in all areas—ecology, social and economic—that we are not where we should be because we are trapped in old patterns. And then there are also some who are not in the right profession. They are farmers by tradition and lack the ability to innovate. (ID-46, intensive suckler cow farmer)*

Farmers with multifunctionalist and conservationist self-identities often framed their statements defensively, seeing themselves as conflicting with the idea of a good farmer. They feel “discredited” or were considered as “too green”, but also perceive a “movement” among farmers (especially from the “older generation” to the “younger generation”) towards a greater conservationist awareness, that is, a shift in self-identities:

*SI1: But it is also very important that we take part in the public discourse and positively participate in these secondary factors of agriculture, the whole landscape quality management, even if it is a bit discredited, it is absolutely part of it. (ID-28, organic mixed dairy and beef fattening farmer)*

*SI2: In my view, simply producing as much as possible is not what makes a good farmer. (ID-75, extensive dairy farmer)*

*SI4: For example, when it comes to ecological thoughts. My parents grew up with the principle of producing as much as possible and earning as much money as possible. That was the way it was after the war. And we, the younger generation, are moving away from that again. And that hurts them a bit when the meadows are no longer almost dark blue from all the nitrogen fertiliser. The older generation thought that was so great! [...] And then you hear critical voices from the people around you, that you are a bit too green or something. (ID-66, extensive mixed dairy and beef fattening farmer)*

### Past and future grassland use changes according to the qualitative results

We converted qualitative data into numeric values within the range of -1 to 1, placing each farmer on the two proposed self-identity gradients, as illustrated in Fig. 1. The majority of farmers exhibited a conservationist–innovationist self-identity (upper left quadrant). This group exhibits large changes in grassland use intensity in the past (first row, darker colours), and also inclined to alter (especially

intensify) their grassland use in the future (it is, however, important to note that most farmers indicated they do not plan to change their grassland use intensity).

Furthermore, Fig. 1 reveals that farmers identifying as purely conservationist (along the line) did not necessarily opt for extensification. Surprisingly, many organic farmers (squares) with a conservationist self-identity chose to intensify their production and intend to continue doing so. Extensive farmers (circles), on the other hand, often engaged in extensification or maintained their grassland use intensity. Among those who intensified in the past, many were intensive farmers (triangles). However, it’s interesting to note that no intensive farmers expressed intentions for future intensification.

## Results of the quantitative analysis (factor analysis)

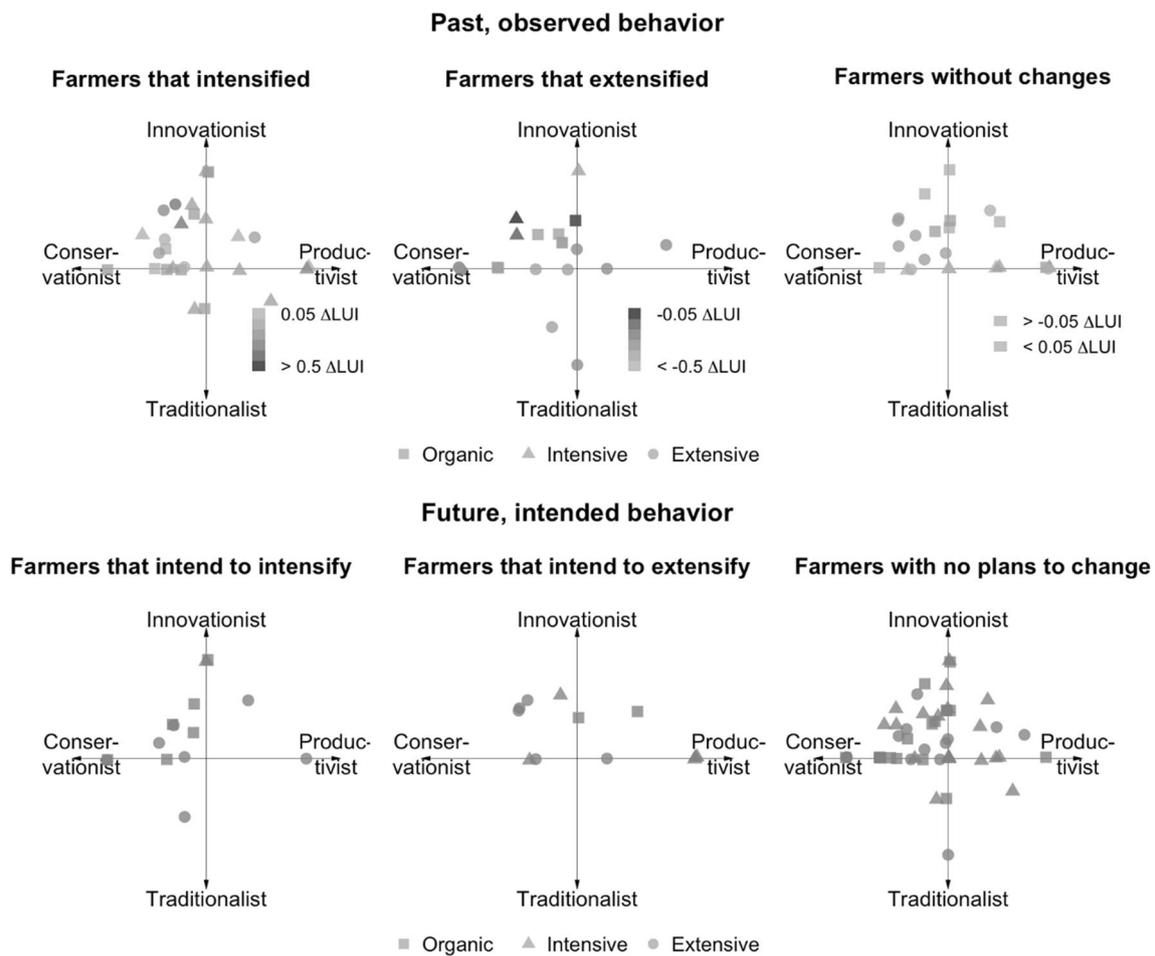
### The two gradients according to the factor analysis

Our factor analysis of the quantitative data revealed four clearly distinct factors (see Table 3), each aligned with specific self-identity dimension: “productivist”, “conservationist”, “traditionalist” and “Innovationist”, as indicated by the statements in SI6 (see Table 2). Despite our relatively small sample size ( $n = 75$ ), the overall Kaiser–Meyer–Olkin value of 0.56 and a significant Bartlett Test of Sphericity indicated that our data were acceptable for factor analysis. Nearly all statements strongly load on one primary factor, with minimal or negative loadings on the other factors. Only two statements, “Farmers should be allowed to maximise their income irrespective of the environmental consequences” and “Farmers are good caretakers of the countryside” exhibit cross-loadings. However, these variables are retained in the analysis due to their conceptual relevance.

The productivist factor encompasses statements related to income maximisation and production, even at environmental expense. This factor also includes the neutral statement regarding the importance of keeping the farm running in order to pass it on to children. In contrast, the conservationist factor includes two statements: farmers playing a strong positive role in protecting the environment and farmers being good caretakers. The two factors oppose each other, with statements loading positively on one factor and negatively on the other, confirming our conceptual gradient.

The traditionalist factor encompasses the statements reflecting a cautious approach and risk aversion. On the other hand, the innovationist factor includes statements about adopting new technologies and finding different types of information, along with the statement that farming is the most enjoyable profession.

<sup>7</sup> Proverb that indicates indifference towards whatever happens after one is gone.

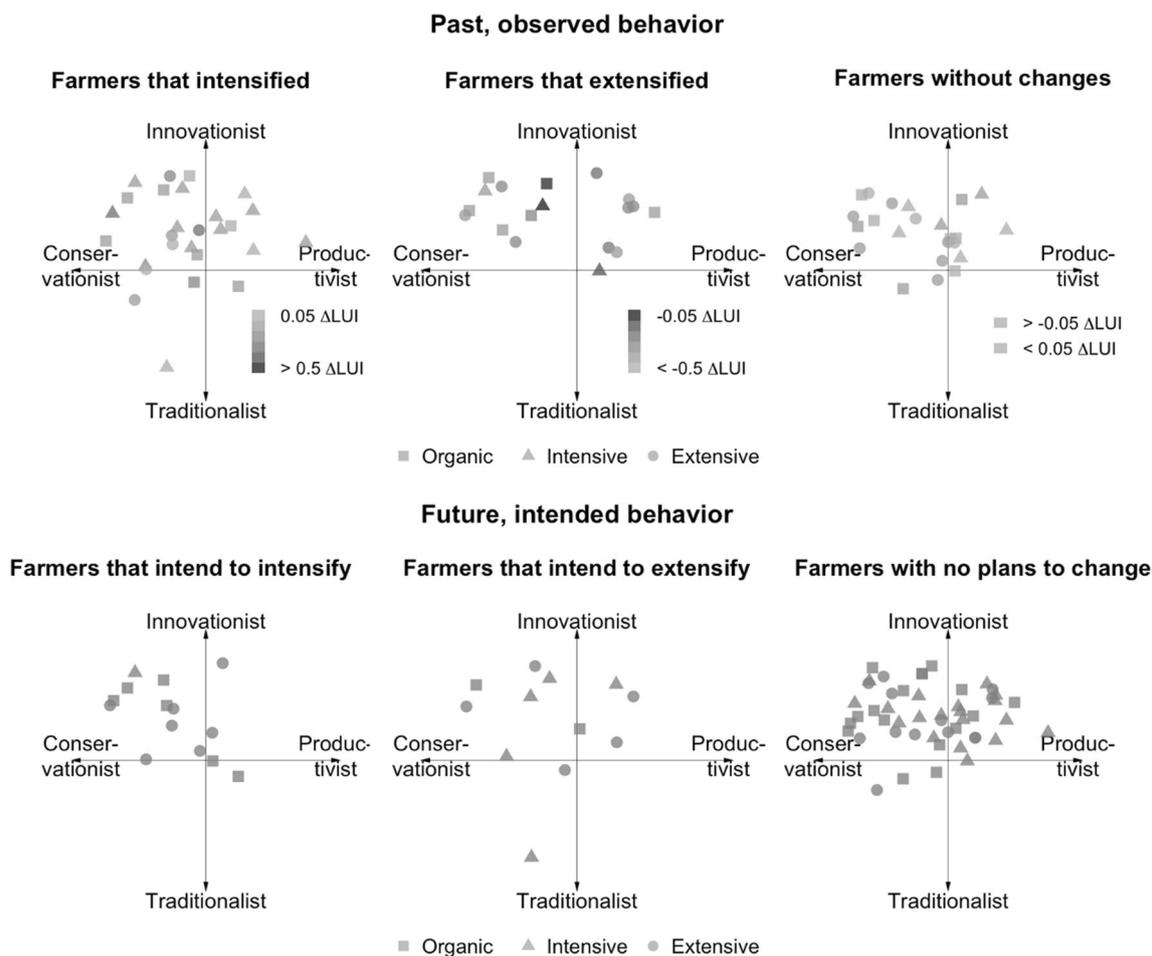


**Fig. 1** Farmers locations within the two identity gradients, according to the *qualitative* analysis. The top row shows farmers who intensified, extended or kept their grassland use intensity  $\Delta$ LUI (according to census data) in the past. The bottom row shows farmers who intend to intensify, extend or keep their grassland use intensity

in the future. Squares, triangles and circles indicate organic, intensive (stocking rate higher than 1 LU/ha) and extensive (stocking rate lower than 1 LU/ha) farmers, respectively. The saturation of the dots relates to the extent of the changes: the darker the dot, the stronger the change

**Table 3** Results of the factor analysis: Factor loadings

Statement	Productivist	Conservationist	Traditionalist	Innovationist
I have to keep my farm running to ensure I have something to pass on to my children	<b>0.61</b>	0.01	-0.12	0.01
We need to produce more food even if some damage is caused to the environment	<b>0.60</b>	-0.08	0.08	0.07
Farmers should be allowed to maximise their income irrespective of the environmental consequences	<b>0.57</b>	<b>-0.39</b>	-0.03	0.13
Farmers have a strong positive role to play in protecting the environment	-0.17	<b>0.62</b>	-0.11	0.2
Farmers are good caretakers of the countryside	-0.02	<b>0.38</b>	0.11	<b>0.32</b>
I am cautious about adopting new ideas and farm practices	0.10	-0.07	<b>0.54</b>	-0.15
I don't think it is a good idea to take too many risks when it comes to farming	-0.12	0.04	<b>0.54</b>	0.02
To be successful in farming, it is important for me to adapt and use new technologies	0.08	0.03	-0.17	<b>0.44</b>
I enjoy farming much more than I would other potential sources of employment	0.16	0.18	0.06	<b>0.4</b>
I am good at finding different types of information to help me run my business	-0.26	0.20	-0.17	<b>0.36</b>



**Fig. 2** Farmers' locations within the two identity gradients, according to the *quantitative* analysis. The top row shows farmers who intensified, extensified or kept their grassland use intensity  $\Delta$ LUI (according to census data) in the past. The bottom row shows farmers who intend to intensify, extensify or keep their grassland use intensity in the future. Squares, triangles and circles indicate organic, intensive (stocking rate higher than 1 LU/ha) and extensive (stocking rate lower

than 1 LU/ha) farms, respectively. The saturation of the dots relates to the extent of the changes: the darker the dot, the stronger the change. Federal Office for Agriculture FOAG (2020). Weisungen und Erläuterungen 2020 zur Verordnung über den landwirtschaftlichen Produktionskataster und die Ausscheidung von Zonen (Landwirtschaftliche Zonen-Verordnung; SR 912.1). Bern, Switzerland, Bundesamt für Landwirtschaft

### Past and future grassland use changes according to the quantitative results

Figure 2 complements the information of Fig. 1 on qualitative results. However, Fig. 2 represents farmers' positions based on the quantitative results on farmers' self-identity derived from the factor analysis. The overall trends observed in the quantitative results mirror those uncovered through the converted qualitative results. Again, the majority of farmers showed conservationist–innovationist self-identities. In contrast to the qualitative results, Fig. 2 shows hardly any points on the axis lines. This discrepancy arises from the fact that the farmers were required to give a statement about all self-identity dimensions in SI6 (see Table 2).

### Discussion

Our conceptualized multidimensional and hierarchical framework of self-identities has proven valuable for understanding the drivers and barriers in agri-environmental transition processes. Triangulating qualitative and quantitative methods allowed us to analyse the prevailing self-identities and their influence on Swiss farmers' behaviour, shedding a new light on the diversity and complexity of their actions.

Both our qualitative and quantitative methods revealed the presence of the conceptualized two self-identity gradients: productivist–multifunctionalist–conservationist and traditionalist–innovationist. Our quantitative approach

provided a comprehensive view of the multidimensionality of farmers' self-identities. The qualitative results, although less complete in all dimensions, aligned with these findings. Neither the qualitative nor the quantitative results allow any conclusions to be drawn about a connection between the sampling groups conventional extensive, conventional intensive, and organic farmers.

At first glance, there seems to be a mismatch between self-identities and farmers' past, observed and future, intended behaviour. However, our qualitative analysis of responses to open questions offered a possible explanation for these alleged inconsistencies, i.e. through a hierarchical order of identities embedded in a subconscious idea of a good farmer. The framing of statements allows us to conclude that the idea of a good farmer among our interview partners combines the productivist and innovationist self-identities. Especially productivist self-identities have been shown to be an important part of the idea of a good farmer in other countries and environments as well (Burton 2004; Burton et al. 2008, 2020).

The results of our factor analysis further support the interpretation that the innovationist self-identity belongs to the idea of a good farmer, as the corresponding factor includes the neutral statement that farming is the most enjoyable profession. The innovationist self-identity is associated with the willingness to take risks and move away from traditional practices. In the past 20 years, the Swiss agricultural sector has been subject to several policy reforms, including both market liberalisation and greening measures (Mann and Lanz 2013; Spörri et al. 2023). These changing conditions required innovative, creative responses from farmers to cope with evolving policy and market dynamics (Sutherland and Darnhofer 2012).

Farmers with multifunctionalist or conservationist self-identities tend to adopt a more and more defensive position, fearing that environmentally friendly practices may be perceived negatively. This contrasts with findings from other studies, such as Cullen et al. (2020), where the belief that farming is the most enjoyable profession aligns with conservationist self-identity.

Despite the prevailing idea of a good farmer as productivist and innovationist, we found that a majority of the farmers identify as conservationist–innovationist. They deviate from the traditional productivist idea of a good farmer in terms of their beliefs and motivations. However, many of them, especially organic farmers, continue to act in a productivist manner, intensifying their grassland use. This identity conflict is not unique to our study and has been observed elsewhere (Bruno et al. 2022; Letourneau and Davidson 2022).

Farmers play a dual role as both contributors and victims of environmental changes, including land degradation or climate change. This complex role has led to a shift in the productivist–multifunctionalist–conservationist self-identity

gradient. However, agricultural policies in Switzerland have not been able to reach their environmental goals (El Benni et al. 2023). The same can be observed for the rest of Europe (Brown et al. 2021). Farmers tend to participate in agri-environmental schemes when they do not have to change their practices to fulfil the requirements (Börner et al. 2017; Mack et al. 2020). Thus, the emerging conservationist aspect of farmers' self-identities has not yet been strong enough to drive substantial behavioural change. Meanwhile, the innovationist aspect of self-identity serves as a common ground for both farmers' individual self-identities and the prevailing idea of a good farmer. It is a critical driver for change towards more environmentally friendly practices. However, the main component of agri-environmental policies in Switzerland still consists of action-based measures which precisely dictate to farmers how to cultivate their land more sustainably (Forney 2016).

## Conclusion

Our framework of hierarchical and multidimensional self-identities not only shows, but also explains inconsistencies between farmers' self-identities and corresponding behavior. In particular, we showed a discrepancy between the prevailing productivist–innovationist idea of a good farmer and the prevalence of conservationist–innovationist self-identities among most farmers.

Our analysis allows us to draw conclusions in regard to possible internal and external drivers of a future agri-environmental transition. As an internal driver, the discrepancy between the idea of a good farmer and conservationist–innovationist self-identities may influence the positioning of the good farmer idea on the conceptualized productivist–multifunctionalist–conservationist gradient (Letourneau and Davidson 2022). When farmers see the conservationist aspect of their self-identities better reflected in the idea of a good farmer, they may feel encouraged to act accordingly. Shifts in the perception of what constitutes a good farmer have been observed in relation to organic farmers in England (Sutherland and Darnhofer 2012) as well for US Corn Belt farmers (McGuire et al. 2013).

Our results also have clear policy implications as external drivers. To meet farmers at their idea of a good farmer, policy designs should focus on the innovationist aspect of farmers' self-identities rather than the conservationist aspects. More precisely, policy measures should be designed such that they are perceived as innovative and forward-looking. Current agri-environmental policies targeting Swiss grassland farmers may be partly ineffective, as they primarily trigger conservationist self-identities (Letourneau and Davidson 2022). Similar conclusions were drawn by Burton et al. (2008) for German and Scottish farmers, advocating

entrepreneurial, result-based agri-environmental schemes that empower farmers to innovate in achieving environmental goals. To some extent, action-based may have posed a barrier to transition towards more environmentally friendly practices (Wunder et al. 2018), as they clash with farmer's innovationist self-identities. Our observations on future, intended behaviour of organic farmers illustrate this very well: while these farmers have to follow a list of action-based rules for certification, they use their remaining freedom to intensify. Beyond policy measures, further leverage points lie in farmer education and improved communication from policymakers to enhance system understanding.

Our analysis also holds implications for future research. Our theoretical discussion and analysis highlight the importance of methodological triangulation when considering a multidimensional, hierarchical self-identity framework (Stryker 1968). In future research, both methods could be refined to better capture the multidimensionality and hierarchy of self-identities. By predefining topics and statements that reveal all assumed aspects of farmers' self-identities, open questions can be designed to reveal multidimensionality. Closed questions can uncover hierarchy by incorporating steps to evaluate the importance of different statements. Our results are specific to grassland farmers in Swiss alpine regions. However, the explanatory power of self-identities in relation to contradictory behaviour and corresponding solutions for policymaking justify the additional effort needed to expand the analysis to other contexts.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s10460-024-10608-w>.

**Acknowledgements** This work has been supported by many valuable people and we want to express our greatest thanks. The semi-structured interview guide used for data collection has been conceptualized by the WP 4.2 team of the SUPER-G project, namely Sophie Tindale, Yiyang Cao, Olivia Green, Michael Burd, Victoria Vicario-Modroño, Natasha Auch, Sydney Clingo, Rosa Gallardo-Cobos, Pedro Sánchez-Zamora, Erik Hunter, Simona Miškolci, Gabriele Mack, Nadja El Benni, Martina Spoerri, Samantha Outhwaite, John Elliot, Paul Newell Price and Lynn J. Frewer. Data collection for this work has been supported by Matthias Baumann (Interviews, Transcripts), Severin Henzmann (Transcripts, Translation), Philippe Mathys (Transcripts, Translation), Sarah Vogelsanger (Transcripts), Simon Schlebusch (Transcripts). Thorough feedback by Stefan Galley, Sarah Conradt and Johanna Jacobi has substantially improved the manuscript. We further thank all our interview partners for their collaboration and valuable insights.

**Funding** Open access funding provided by Swiss Federal Institute of Technology Zurich

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in

the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## References

- Allan, E., P. Manning, F. Alt, J. Binckenstein, and S. Blaser et al. 2015. Land use intensification alters ecosystem multifunctionality via loss of biodiversity and changes to functional composition. *Ecology Letters* 18(8): 834–843. <https://doi.org/10.1111/ele.12469>.
- Bartkowski, B., C. Schübler, and B. Müller. 2022. Typologies of European farmers: approaches, methods and research gaps. *Regional Environmental Change* 22(2): 43. <https://doi.org/10.1007/s10113-022-01899-y>.
- Börner, J., K. Baylis, E. Corbera, D. Ezzine-de-Blas, and J. Honey-Rosés et al. 2017. The effectiveness of payments for Environmental services. *World Development* 96: 359–374. <https://doi.org/10.1016/j.worlddev.2017.03.020>.
- Brown, C., E. Kovács, I. Herzon, S. Villamayor-Tomas, and A. Albi-zua et al. 2021. Simplistic understandings of farmer motivations could undermine the environmental potential of the common agricultural policy. *Land Use Policy* 101: 105136. <https://doi.org/10.1016/j.landusepol.2020.105136>.
- Bruno, J. E., M. E. Fernández-Giménez, and M. M. Balgopal. 2022. Identity theory in agriculture: understanding how social-ecological shifts affect livestock ranchers and farmers in northeastern Colorado. *Journal of Rural Studies* 94: 204–217. <https://doi.org/10.1016/j.jrurstud.2022.06.007>.
- Burton, R. J. 2004. Seeing through the 'good farmer's' eyes: towards developing an understanding of the social symbolic value of 'productivist' behaviour. *Sociologia Ruralis* 44(2): 195–215. <https://doi.org/10.1111/j.1467-9523.2004.00270.x>.
- Burton, R. J. F., and G. A. Wilson. 2006. Injecting social psychology theory into conceptualisations of agricultural agency: towards a post-productivist farmer self-identity? *Journal of Rural Studies* 22(1): 95–115. <https://doi.org/10.1016/j.jrurstud.2005.07.004>.
- Burton, R. J. F., C. Kuczera, and G. Schwarz. 2008. Exploring Farmers' Cultural Resistance to Voluntary Agri-environmental schemes. *Sociologia Ruralis* 48(1): 16–37. <https://doi.org/10.1111/j.1467-9523.2008.00452.x>.
- Burton, R. J., J. Forney, P. Stock, and L.-A. Sutherland. 2020. *The good farmer: culture and identity in food and agriculture*. Routledge.
- Cloke, P., and M. Goodwin. 1992. Conceptualizing Countryside Change: from Post-fordism to Rural Structured Coherence. *Transactions of the Institute of British Geographers* 17(3): 321–336. <https://doi.org/10.2307/622883>.
- Collins, K. M. T., A. J. Onwuegbuzie, and Q. G. Jiao. 2006. Prevalence of mixed-methods sampling designs in Social Science Research. *Evaluation & Research in Education* 19(2): 83–101. <https://doi.org/10.2167/eri421.0>.
- Cullen, P., M. Ryan, C. O'Donoghue, S. Hynes, and D. Ó. hUallacháin et al. 2020. Impact of farmer self-identity and attitudes on participation in agri-environment schemes. *Land Use Policy* 95: 104660. <https://doi.org/10.1016/j.landusepol.2020.104660>.
- El Benni, N., C. Grovermann, and R. Finger. 2023. Towards more evidence-based agricultural and food policies. *Q Open*. <https://doi.org/10.1093/qopen/qoad003>.
- Evans, N., C. Morris, and M. Winter. 2002. Conceptualizing agriculture: a critique of post-productivism as the new orthodoxy. *Progress in Human Geography* 26(3): 313–332. <https://doi.org/10.1191/0309132502ph372ra>.

- Federal Statistical Office FSO. 2016. Factsheet - Farm Structure Survey. from <https://www.bfs.admin.ch/bfs/de/home/statistiken/landforstwirtschaft/erhebungen/stru.assetdetail.6993.html>.
- Federal Office for Agriculture FOAG. 2019. Agricultural Report 2019. from <https://www.agrarbericht.ch/de>.
- Federal Office for Agriculture FOAG. 2020. *Weisungen Und Erläuterungen 2020 Zur Verordnung über den landwirtschaftlichen Produktionskataster Und die Ausscheidung Von Zonen (Landwirtschaftliche Zonen-Verordnung; SR 912.1)*. Bern, Switzerland: Bundesamt für Landwirtschaft.
- Forney, J. 2016. Blind spots in agri-environmental governance: some reflections and suggestions from Switzerland. *Review of Agricultural Food and Environmental Studies* 97(1): 1–13. <https://doi.org/10.1007/s41130-016-0017-2>.
- Hogg, M. A., and D. Abrahams. 2004. Social cognition and attitudes. *Psychology*. N. Carlson, G. N. Martin and W. Biskist. Essex, UK, Pearson Education: 616–649.
- Home, R., O. Balmer, I. Jahrl, M. Stolze, and L. Pfiffner. 2014. Motivations for implementation of ecological compensation areas on Swiss lowland farms. *Journal of Rural Studies* 34: 26–36. <https://doi.org/10.1016/j.jrurstud.2013.12.007>.
- Howley, P., C. Buckley, C. O. Donoghue, and M. Ryan. 2015. Explaining the economic 'irrationality' of farmers' land use behaviour: the role of productivist attitudes and non-pecuniary benefits. *Ecological Economics* 109: 186–193. <https://doi.org/10.1016/j.ecolecon.2014.11.015>.
- Huber, R., R. Snell, F. Monin, H. S. Brunner, and D. Schmatz et al. 2017. Interaction effects of targeted agri-environmental payments on non-marketed goods and services under climate change in a mountain region. *Land Use Policy* 66: 49–60. <https://doi.org/10.1016/j.landusepol.2017.04.029>.
- Huber, R., S. Le'Clec'h, N. Buchmann, and R. Finger. 2022. Economic value of three grassland ecosystem services when managed at the regional and farm scale. *Scientific Reports* 12(1): 4194. <https://doi.org/10.1038/s41598-022-08198-w>.
- Huguenin-Elie, O., L. Delaby, K. Klumpp, and S. Lemauviel-Lavanant. 2019. The role of grasslands in biogeochemical cycles and biodiversity conservation. In *Improving grassland and pasture management in temperate agriculture*, 23–50. Burleigh Dodds Science Publishing.
- Hunter, E., S. Quatrini, E. Lieberher, S. Tindale, and Z. Sanchez et al. 2020. The effectiveness of policies promoting sustainable permanent grasslands across five European countries (representing five biogeographic regions): Mapping, understanding, and key stakeholder perceptions. *WP4, Deliverable 4.1 c, SUPER-G (Sustainable Permanent Grassland Systems and Policies), EC Project Number 774124-2*.
- Hyland, J. J., D. L. Jones, K. A. Parkhill, A. P. Barnes, and A. P. Williams. 2016. Farmers' perceptions of climate change: identifying types. *Agriculture and Human Values* 33(2): 323–339. <https://doi.org/10.1007/s10460-015-9608-9>.
- Ingram, J., P. Gaskell, J. Mills, and C. Short. 2013. Incorporating agri-environment schemes into farm development pathways: a temporal analysis of farmer motivations. *Land Use Policy* 31: 267–279. <https://doi.org/10.1016/j.landusepol.2012.07.007>.
- Karali, E., B. Brunner, R. Doherty, A. M. Hersperger, and M. D. A. Rounsevell. 2013. The Effect of Farmer attitudes and objectives on the heterogeneity of farm attributes and management in Switzerland. *Human Ecology* 41(6): 915–926. <https://doi.org/10.1007/s10745-013-9612-x>.
- Karali, E., B. Brunner, R. Doherty, A. Hersperger, and M. Rounsevell. 2014. Identifying the factors that Influence Farmer participation in Environmental Management practices in Switzerland. *Human Ecology* 42(6): 951–963. <https://doi.org/10.1007/s10745-014-9701-5>.
- Lastra-Bravo, X. B., C. Hubbard, G. Garrod, and A. Tolón-Becerra. 2015. What drives farmers' participation in EU agri-environmental schemes? Results from a qualitative meta-analysis. *Environmental Science & Policy* 54: 1–9. <https://doi.org/10.1016/j.envsci.2015.06.002>.
- Le Clec'h, S., R. Finger, N. Buchmann, A. S. Gosal, and L. Hörtnagl et al. 2019. Assessment of spatial variability of multiple ecosystem services in grasslands of different intensities. *Journal of Environmental Management* 251: 109372. <https://doi.org/10.1016/j.jenvman.2019.109372>.
- Lequin, S., G. Grolleau, and N. Mzoughi. 2019. Harnessing the power of identity to encourage farmers to protect the environment. *Environmental Science & Policy* 93: 112–117. <https://doi.org/10.1016/j.envsci.2018.12.022>.
- Letourneau, A. M., and D. Davidson. 2022. Farmer identities: facilitating stability and change in agricultural system transitions. *Environmental Sociology* 1–12. <https://doi.org/10.1080/23251042.2022.2064207>.
- Lune, H., and B. L. Berg. 2017. *Qualitative research methods for the Social Sciences, Global Edition*. Pearson Education Limited.
- Mack, G., and R. Huber. 2017. On-farm compliance costs and N surplus reduction of mixed dairy farms under grassland-based feeding systems. *Agricultural Systems* 154: 34–44. <https://doi.org/10.1016/j.agsy.2017.03.003>.
- Mack, G., and A. Kohler. 2019. Short- and Long-Run Policy evaluation: support for Grassland-based milk production in Switzerland. *Journal of Agricultural Economics* 70(1): 215–240. <https://doi.org/10.1111/1477-9552.12284>.
- Mack, G., C. Ritzel, and P. Jan. 2020. Determinants for the implementation of Action-, result- and multi-actor-oriented agri-environment schemes in Switzerland. *Ecological Economics* 176: 106715. <https://doi.org/10.1016/j.ecolecon.2020.106715>.
- Mann, S., and S. Lanz. 2013. Happy Tinbergen: Switzerland's new direct payment system. *EuroChoices* 12(3): 24–28. <https://doi.org/10.1111/1746-692X.12036>.
- Mather, A. S., G. Hill, and M. Nijnik. 2006. Post-productivism and rural land use: cul de sac or challenge for theorization? *Journal of Rural Studies* 22(4): 441–455. <https://doi.org/10.1016/j.jrurstud.2006.01.004>.
- McGuire, J., L. W. Morton, and A. D. Cast. 2013. Reconstructing the good farmer identity: shifts in farmer identities and farm management practices to improve water quality. *Agriculture and Human Values* 30(1): 57–69. <https://doi.org/10.1007/s10460-012-9381-y>.
- Miles, M. B., and A. M. Huberman. 1994. *Qualitative data analysis: an expanded sourcebook*. sage.
- Möhring, A., and S. Mann. 2020. Causes and impacts of mislabeling agricultural policy - the case of Food-Supply Security payments in Switzerland. *Journal of Policy Analysis and Management* 42(2): 466–482. <https://doi.org/10.1016/j.jpolmod.2020.01.002>.
- Naylor, R., A. Hamilton-Webb, R. Little, and D. Maye. 2018. The 'Good Farmer': Farmer identities and the control of exotic livestock disease in England. *Sociologia Ruralis* 58(1): 3–19. <https://doi.org/10.1111/soru.12127>.
- Nederhof, A. J. 1985. Methods of coping with social desirability bias: a review. *European Journal of Social Psychology* 15(3): 263–280. <https://doi.org/10.1002/ejsp.2420150303>.
- Pavlis, E. S., T. S. Terkenli, S. B. P. Kristensen, A. G. Busck, and G. L. Cosor. 2016. Patterns of agri-environmental scheme participation in Europe: indicative trends from selected case studies. *Land Use Policy* 57: 800–812. <https://doi.org/10.1016/j.landusepol.2015.09.024>.
- Pedolin, D., P. Jan, A. Roesch, J. Six, and T. Nemecek. 2023. Farm diversity impacts on food production, income generation and environmental preservation: the Swiss case. *Journal of Cleaner*

- Production* 388: 135851. <https://doi.org/10.1016/j.jclepro.2023.135851>.
- Podsakoff, P. M., S. B. MacKenzie, J.-Y. Lee, and N. P. Podsakoff. 2003. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology* 88(5): 879. <https://doi.org/10.1037/0021-9010.88.5.879>.
- R Core Team. 2020. *R: a Language and Environment for Statistical Computing*. Vienna, Austria. R Foundation for Statistical Computing.
- Revelle, W. R. 2021. *Psych: procedures for personality and psychological research*. Evanston, Illinois, Northwestern University.
- Riley, M. 2016. How does longer term participation in agri-environment schemes [re]shape farmers' environmental dispositions and identities? *Land Use Policy* 52: 62–75. <https://doi.org/10.1016/j.landusepol.2015.12.010>.
- Schaub, S., J. Ghazoul, R. Huber, W. Zhang, and A. Sander et al. 2023. The role of behavioural factors and opportunity costs in farmers' participation in voluntary agri-environmental schemes: A systematic review. *Journal of Agricultural Economics* 74(3). <https://doi.org/10.1111/1477-9552.12538>.
- Schirpke, U., S. Candiago, L. Egarter Vigl, H. Jäger, and A. Labadini et al. 2019. Integrating supply, flow and demand to enhance the understanding of interactions among multiple ecosystem services. *Science of the Total Environment* 651: 928–941. <https://doi.org/10.1016/j.scitotenv.2018.09.235>.
- Schmidt, S., C. Alewell, and K. Meusburger. 2018. Mapping spatio-temporal dynamics of the cover and management factor (C-factor) for grasslands in Switzerland. *Remote Sensing of Environment* 211: 89–104. <https://doi.org/10.1016/j.rse.2018.04.008>.
- Slovic, P., M. L. Finucane, E. Peters, and D. G. MacGregor. 2007. The affect heuristic. *European Journal of Operational Research* 177(3): 1333–1352. <https://doi.org/10.1016/j.ejor.2005.04.006>.
- Software, VERBI. 2021. MAXQDA. Berlin.
- Spörri, M., N. El Benni, G. Mack, and R. Finger. 2023. Spatio-temporal dynamics of grassland use intensity in Switzerland. *Regional Environmental Change* 23(1): 23. <https://doi.org/10.1007/s10113-022-02023-w>.
- Stets, J. E., and P. J. Burke. 2000. Identity theory and Social Identity Theory. *Social Psychology Quarterly* 63(3): 224–237. <https://doi.org/10.2307/2695870>.
- Strijker, D., G. Bosworth, and G. Bouter. 2020. Research methods in rural studies: qualitative, quantitative and mixed methods. *Journal of Rural Studies* 78: 262–270. <https://doi.org/10.1016/j.jrurstud.2020.06.007>.
- Stryker, S. 1968. Identity salience and role performance: the relevance of Symbolic Interaction Theory for Family Research. *Journal of Marriage and Family* 30(4): 558–564. <https://doi.org/10.2307/349494>.
- Sulemana, I., and H. S. James. 2014. Farmer identity, ethical attitudes and environmental practices. *Ecological Economics* 98: 49–61. <https://doi.org/10.1016/j.ecolecon.2013.12.011>.
- Sutherland, L.-A., and I. Darnhofer. 2012. Of organic farmers and 'good farmers': changing habitus in rural England. *Journal of Rural Studies* 28(3): 232–240. <https://doi.org/10.1016/j.jrurstud.2012.03.003>.
- Tashakkori, A., R. B. Johnson, and C. Teddlie. 2020. *Foundations of mixed methods research: integrating quantitative and qualitative approaches in the social and behavioral sciences*. Sage.
- van Dijk, W. F. A., A. M. Lokhorst, F. Berendse, and G. R. de Snoo. 2016. Factors underlying farmers' intentions to perform unsubsidised agri-environmental measures. *Land Use Policy* 59: 207–216. <https://doi.org/10.1016/j.landusepol.2016.09.003>.
- Warren, C. R., R. Burton, O. Buchanan, and R. V. Birnie. 2016. Limited adoption of short rotation coppice: the role of farmers' socio-cultural identity in influencing practice. *Journal of Rural Studies* 45: 175–183. <https://doi.org/10.1016/j.jrurstud.2016.03.017>.
- Westerink, J., M. Pleijte, R. Schrijver, R. van Dam, and M. de Krom et al. 2021. Can a 'good farmer' be nature-inclusive? Shifting cultural norms in farming in the Netherlands. *Journal of Rural Studies* 88: 60–70. <https://doi.org/10.1016/j.jrurstud.2021.10.011>.
- Wilson, G. A. 2001. From productivism to post-productivism ... and back again? Exploring the (un)changed natural and mental landscapes of European agriculture. *Transactions of the Institute of British Geographers* 26(1): 77–102. <https://doi.org/10.1111/1475-5661.00007>.
- Wuepper, D., and R. Huber. 2022. Comparing effectiveness and return on investment of action- and results-based agri-environmental payments in Switzerland. *American Journal of Agricultural Economics* 104(5): 1585–1604. <https://doi.org/10.1111/ajae.12284>.
- Wunder, S., R. Brouwer, S. Engel, D. Ezzine-de-Blas, and R. Muradian et al. 2018. From principles to practice in paying for nature's services. *Nature Sustainability* 1(3): 145–150. <https://doi.org/10.1038/s41893-018-0036-x>.
- Zemo, K. H., and M. Termansen. 2022. Environmental identity economics: an application to farmers' pro-environmental investment behaviour. *European Review of Agricultural Economics* 49(2): 331–358. <https://doi.org/10.1093/erae/jbab049>.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Martina Spörri** recently completed her doctoral thesis at ETH Zurich on farmers' decisions regarding the intensity of grassland use. Her research is characterized by interdisciplinary, applied approaches with a strong focus on relationships within the agroecosystem.

**Maria Haller** holds a master's degree in agricultural sciences from ETH Zurich, and currently works at the Berne University of Applied Science. Her research interests lie in the interdisciplinary consideration of the entire agricultural sector, with a special focus on people.

**Nadja El Benni** is head of the research division Sustainability Assessment and Agricultural Management at Agroscope, Switzerland. Her research focuses on the effect of agricultural policies on farmers' decision making and incomes.

**Gabriele Mack** is the head of the research group economic modelling and policy analysis of Agroscope, Switzerland. Her research focuses on agricultural policy evaluation, farmers' decision-making and impacts on sustainability.

**Robert Finger** is professor of agricultural economics and policy at ETH Zürich, Switzerland. His research focuses on the economics and policy of farmers' decision-making and aims to contribute to more resilient and sustainable agricultural systems.