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Intrinsic and Extrinsic Motivations in Organic Farming Practices and Subjective Well-Being: *The Case of French Organic Farmers*[1]

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Abstract

This paper examines how different motivations for engaging in organic farming may impact the farmers' subjective well-being using a large-scale 2023 survey database from the French Agence Bio and leveraging the multi-dimension of well-being. Three measures capturing both affective and *cognitive* aspects of the well-being of farmers brought by their involvement in organic farming are used: Feelings of Pride, Satisfaction, and Feeling of Happiness. We focus on the effects of two types of motivations: intrinsic and extrinsic. Our results indicate that most intrinsic motivations, including concern about public health and human health, concern about the environment, and the request for autonomy in farming decisions, significantly and positively impact both the *affective aspect* (i.e., Pride, Happiness) and the *cognitive aspect* (i.e., Satisfaction) of farmers' well-being. In contrast, extrinsic motivations related to the request for profits earned from fair prices and the response to demand incentives exert a negative influence. Besides motivations, our multi-dimensional well-being analyses also reveal that income, farming experience and difficulty, and production types significantly impact both affective and *cognitive* well-being. It is shown that social comparison (income) does not matter while social ties do. Finally, some aspects of farming characteristics and lifestyle factors (e.g., number of working hours and number of vacation days) contribute to *cognitive* well-being, while others (e.g., support from family and others) are associated with *affective* well-being.

Keywords: cognitive well-being, affective well-being, intrinsic and extrinsic motivations, organic farming, pro-environmental decision, subjective well-being.

JEL classification: D62; I31

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1. Introduction

Farmers across Europe have recently taken to the streets of European capitals in protest and have implemented impactful actions in response to EU heavy regulation, unfair competition from other non-European nations, and decreased subsidies from the European Union for non-environmentally friendly practices (Cohen and Prickett, 2024). This crisis highlights the tensions between environmental policies and the material constraints faced by farmers. In France, while public support for farmers remains strong, resistance persists toward regulations aimed at facilitating the green transition in agriculture. Meanwhile, the urgency of the climate crisis necessitates a shift toward sustainable agricultural systems, including organic farming.

There is a growing demand from policymakers to understand how to enhance citizens' quality of life (Stiglitz et al., 2019). Subjective well-being (SWB) indicators serve as tools to identify determinants of individual well-being of specific subgroups, such as farmers, and thereby informing public policy. Given these observations, a question arises: is farmers' well-being compatible with the transition to organic and sustainable farming?

Numerous studies have examined rural populations and farmers' well-being (Sabillón et al., 2022; Janker et al., 2021; Qi et al., 2023; Jay et al., 2023; Howley, 2015; Peel et al., 2016, etc.). Sabillón et al. (2022), using data from 9 European countries, show that farmers' life satisfaction depends on work conditions, such as work-life balance, working time, and financial situation. Social ties (i.e., family, professionals, friends) have also been recognized as a major contributor to well-being. Social capital may matter for farmers' SWB. OBrien et al. (2012) found that Australian farmers' Satisfaction with connectedness can be strongly associated with self-efficacy and psychological life satisfaction. Similarly, Li et al. (2022) identify six dimensions of social capital (social network, social trust, social participation, social norm, social reputation, and common vision) that contribute to the SWB of farmers and herders in China's agropastoral transition zones. Some studies highlight the positive impact of pro-environmental decisions on well-being. For instance, Mzoughi (2013) found that organic farmers in France report higher life satisfaction than conventional farmers. Qi et al. (2023) show that environmental actions (reusing plastic bags) positively Chinese farmers' SWB. Brown et al. (2021), using data from Australian graziers, underline a strong link between regenerative agriculture and graziers' eudaimonic well-being and satisfaction with health.

While existing literature has explored the role of work conditions, farming practices, and social capital, few studies explicitly distinguish which types of motivations to engage in organic farming influence farmers' well-being. We build on this literature by examining how various motivations - intrinsic and extrinsic - for engaging in organic farming may affect the farmers' subjective well-being (SWB) associated with their involvement in organic agriculture. This knowledge can provide evidence to inform policies by aligning agricultural policies and practices with farmers' motivations, thereby enhancing both well-being and sustainable farming.

Our starting point relates to the standard theory of individual choice and Self-Determination Theory (SDT). Individual behaviors are driven by both intrinsic and extrinsic motivations and some constraints. Motivation is the underlying attitudes that give rise to guide and maintain goal-oriented behaviors (Ryan and Deci, 2008). Extrinsic motivation involves acting for external rewards or avoiding punishment, while intrinsic motivation involves doing something because it is inherently interesting or enjoyable. According to SDT (Deci and Ryan, 1985), behaviors intended to evoke a sense of competence, self-determination, or alignment with one's values satisfy psychological needs and enhance satisfaction. Kasser (2017), estimates that prioritizing materialistic goals (e.g. money, image,

and status) over intrinsic aspirations (e.g. personal growth, close relationships, and community connection), is associated with lower well-being.

We hypothesize that French farmers who are intrinsically motivated to engage in organic farming, rather than driven by extrinsic motivations, are more likely to experience higher well-being. Our conceptual framework aligns with Muri et al. (2020), who found that intrinsic motivations related to working with animals, such as animal welfare, are positively associated with job satisfaction among Norwegian sheep farmers, while extrinsic motivations related to financial rewards, such as income, are negatively associated. Similarly, Ocean and Howley (2023), using a hypothetical experiment, show that non-pecuniary benefits such as farming lifestyle and environmental preservation significantly impact UK farmers' utility.

However, our study differs from these studies in several aspects. *First*, we focus specifically on well-being linked to organic farming, rather than general life satisfaction. We define SWB as a multi-dimensional concept with both *affective* and *cognitive* components. We use three indicators: happiness, pride in involvement in organic farming, and satisfaction with organic farming. Happiness and feeling of pride capture the *affective* aspect, which reflects emotional experiences, i.e. frequency and intensity of pleasant and unpleasant feelings experienced in life (Schimmack, 2008). Satisfaction captures the *cognitive* aspect, assessing whether organic farming meets personal goals and expectations (Veenhoven, 2000). While these components are often correlated (Schimmack et al., 2008), they remain distinct: a farmer may feel happy due to meaningful work but dissatisfied due to economic constraints. In this regard, our study is innovative compared to the existing literature by analyzing how various intrinsic and extrinsic motivations impact these two components of SWB: cognitive *versus* affective. *Second*, our analysis uses a unique and large-scale dataset comprising 11625 responses, representing approximately 20% of over 60000 organic farmers in France. This data contains a rich list of intrinsic motivations (e.g., health protection, environmental concern, technical challenges and innovation, and autonomy) and extrinsic motivations (e.g., profitability, response to demand incentives). This breadth allows a nuanced analysis of the motivations influencing farmers' well-being and provides potentially generalizable insights within France. *Third,* we test the influence of social comparison in shaping well-being, a key hypothesis in the SWB literature (Clark et al. 2008, 2017; Pham et al. 2019). Specifically, we examine whether the departmental median income (obtained from INSEE), used as a reference income to which farmers might compare their income, affects farmers' well-being. If relative income matters, farmers in wealthier departments should report lower well-being.

Our empirical strategy employs an ordered probit model, accounting for potential endogeneity of income. We include four groups of explicative variables: (i) socio-economic characteristics (income, median income, age, gender, education level, marital status, and parents' profession); (ii) farming characteristics (farm size, farmer's experience, main production type, land ownership, and organic surface); (iii) lifestyle variables (organizational affiliations, challenging periods, working hours, vacation days, and support from others); (iv) individual motivations to engage in organic farming with five intrinsic motivations (human health concern, public health concern, environmental concern, technical challenges and desire for innovation, and request for autonomy) and two extrinsic motivations (request for profits earned from a fair price and response to consumers demand or cooperatives' incentives).

Our findings indicate that most intrinsic motivations positively impact both farmers' *affective* and *cognitive* well-being. In contrast, extrinsic motivations related to profitability and responding to demand exert a negative impact. Annual income positively influences farmers' well-being, but departmental median income has no significant impact, suggesting that social comparison in terms of income does not shape farmers' happiness, feeling of pride, and satisfaction in organic farming,

contrary to the usual findings in the SWB literature. In terms of farming and lifestyle factors, we observe a positive influence of social ties, organic farming surface, and organic farming experience on farmers' satisfaction with organic farming and their happiness. Challenging working conditions and difficult periods in the farming cycle, negatively affect *cognitive* well-being while support from both family and non-family members contributes to explaining the farmers' *affective* well-being.

The remainder of the paper is organized as follows: Section 2 presents the data and descriptive statistics. Section 3 outlines the econometric specification. Estimation results are presented in Section 4. Section 5 concludes. Additional details are given in the Appendix.

2. Data and descriptive statistics

This study uses a 2023 national survey conducted by French Agence Bio[2], targeting organic farmers across France. The dataset includes 11625 responses, representing approximately 20% of France's total organic farmer population (over 60000 organic farmers).

Table A1 in the Appendix summarizes the definitions of all explicative variables and three dependent variables. These dependent variables correspond to three measures of individual SWB. First, the *Feeling of Pride* is assessed through responses to the question "*Are you proud to be an organic farmer?*". Table 1 reports its distribution and indicates that most farmers (60.77%) are very proud to be organic farmers. Second, *Satisfaction* corresponds to the question, "*On a scale of 0 to 10, how satisfied are you with your involvement in organic farming*?". Its distribution is presented in Table 2, indicating that a high proportion of farmers (49.54%) feel satisfied (i.e., medium) with their involvement in organic farming. The third subjective measure is the *Feeling of Happiness* corresponding to the question « *Do you think being organic contributes to your happiness?* ». As presented in Table 3, 48.37% of farmers answered, « rather yes » and 39.01% « absolutely ».

Table 1: Distribution of Farmers' Feeling of Pride

Pride	Freq.	Percent	Cum.
Not proud (proud=1)	300	4.33	4.33
Rather proud (proud=2)	2420	34.90	39.23
Very proud (proud=3)	4214	60.77	100.00
Total	6934	100.00	

Notes: To the following question « Are you proud to be an organic farmer? », farmers are asked to report their choice among 4 proposed answers: « Yes, very proud », « Yes, rather proud », « No, rather not proud », « Not proud at all ». Given that both categories « No, rather not proud », and « Not proud at all » have few observations, we then merge them into one category « Not proud ».

Table A2 in the Appendix provides descriptive statistics for four groups of explicative variables: Motivations, Socio-economic Characteristics, Farming Characteristics, and Lifestyle. Regarding the motivation for engaging in organic farming, farmers express their most significant concern for the environment (87,9%), followed by human health (75,2%) and public health (55,1%). Technical challenges (32,8%) and requesting decision autonomy (29,9%) in organic farming practices appear to be relatively less important motivations. Only 6,7% of organic farmers care about responding

[2] Created in November 2001, Agence Bio, the French Agency for the Development and Promotion of Organic Farming, is the national platform for information and action on the development, promotion and structuring of French organic farming.

favorably to the incentives of consumers or cooperatives, while 34,7% cite the request for a fair price as a motivation. Drawing on SDT (Deci and Ryan, 1985), we can range motivations related to environmental preservation, human health, public health, technical challenges, and decision autonomy as intrinsic ones, while the motivations to respond to demand and request a fair price correspond to extrinsic drivers.

Table 2: Distribution of farmers' Satisfaction

Satisfaction	Freq.	Percent	Cum.
Low (satisfaction =1)	1109	16.05	16.09
Medium (satisfaction =2)	3424	49.54	65.59
High (satisfaction =3)	2378	34.41	100.00
Total	6911	100.00	

Notes: Farmers are asked to answer the following question « *On a scale of 0 to 10, how satisfied are you with your involvement in organic farming?»*. From the initial scale of 0-10 where 0 indicates « not satisfied at all » and 10 « very satisfied », we create this new variable « Satisfaction » with three categories like the two other measures of SWB: low level (corresponding to *0-5), medium level* (corresponding to 6-8)*, and high level* (corresponding to 9-10).

Table 3: Distribution of Farmers' Feeling of Happiness

Happiness	Freq.	Percent	Cum.
Not really (happiness=1)	874	12.62	12.62
Rather yes (happiness=2)	3349	48.37	60.99
Absolutely (Happiness =3)	2701	39.01	100.00
Total	6924	100.00	

Notes: To the following question "*Do you think being organic contributes to your happiness?*", farmers are asked to report their choice among 4 proposed answers: « Absolutely », « rather yes », « Rather no », and « Not at all ». Given that both categories « Rather no », and «Not at all » have few observations, we then merge them into one category « Not really ».

Regarding socio-economic characteristics, we consider income, among other variables such as education, marital status, age, etc., following the utility theory. Table A2 indicates that organic farmers report an average annual income of 10000-15000 euros. Median income represents the median value of the standard of living at the departmental level in 2022, ranging from 17070 to 29730 euros for 101 departments in France. The farmers are predominantly male (72.3%), with an average age of 48.39 years. Education levels vary, with the mean corresponding to a Baccalaureate +1/+2.

Concerning farming characteristics, most farmers have prior experience in agriculture, with an average of 15.4 years and 9.2 years specifically in organic farming. On average, farmers own their land (the average value of 2.086 in Table A2 corresponds to a percentage between 1% and 99%), and the share of organic areas on their farms is between 50% and 99%. Regarding Lifestyle and working conditions, around half of the farmers (49.7%) are members of professional organizations. More than

50% of farmers receive assistance from others. Finally, 69,2% of farmers report experiencing difficulty in farming activities. The mean weekly working hours is 48.4, with only 12.8 vacation days per year.

3. Econometric modeling

We model farmers' SWB using an ordered probit model, where the unobserved (or latent) well-being U_i^* is proxied by self-reported well-being at the time of the survey, and we consider the following conditional model:

$$U_i^* = X_i'\beta + \varepsilon_{i1}$$

where ε_i is an unobserved error term assumed normally distributed N(0,σ_ε^2). We can link U_i^* to the observed measures of individual self-reported SWB by using the following formulation of the ordered probit model:

$$U_i = \begin{cases} 1 \; if \; U_i^* \leq c_1 \\ 2 \; if \; c_1 < U_i^* \leq c_2 \\ 3 \; if \; c_2 < U_i^* \end{cases}$$

U_i reflects one of three proxies of SWB of farmer i: Satisfaction with organic farming, Happiness derived from being organic, and Feeling of Pride. Parameters c_1, c_2 are the cut-off values for the latent variable U_i^*, which will be estimated. Three models corresponding to three measures of well-being will be estimated.

X_i' consists of explanatory variables that are ranked into four groups, namely socio-economic characteristics (gender, age, income, median income, education, marital status, parents' profession), farming characteristics (main production, types of farm, farm surface ownership, organic surface, organic farming experience), lifetime (weekly working time, annual vacation days, difficulty periods, support for others, organization member), and intrinsic and extrinsic motivations.

Given the potential endogeneity of income, we apply a two-step procedure proposed by Wooldridge (2014) to test for the exogeneity of income in three models. The first step involves using linear regression for income with all explicative variables from the SWB equations plus the two excluded instruments (job before farming and type of farming). We computed the generalized residuals for the first stage regression and incorporated them as an additional regressor in the ordered probit regression of three models of well-being. Following Wooldridge's (2014) recommendation, we made a robust t-test to evaluate the null hypothesis following which the coefficient of generalized residual is zero. The null hypothesis corresponds to the exogeneity of income. If the null hypothesis is rejected, it would indicate that income is endogenous, validating the need for this two-step estimation.

4. Results and discussion

Before presenting the estimation results, we discuss the specification tests, which lead us to the appropriate econometric model. Our two-step procedure indicates that for all three models, we fail to reject the null hypothesis of income exogeneity as *t* statistics = 0.22, -1.01, 1.29, respectively. Therefore, based on the Wooldridge (2014) approach, we estimate three models using ordered

probit regressions and considering income as exogenous. The estimation results are reported in Table A3, the marginal effects are in Tables A4, A5, and A6 in the Appendix.

We begin by examining the group of *intrinsic and extrinsic motivations.* The estimation results (Tables 4 and A3) show that most intrinsic motivations are positively correlated with both *affective* and *cognitive* aspects of SWB. This finding corroborates the SDT (Ryan et al., 2008), which emphasizes that intrinsic motivation has a strong connection with personal well-being. Among the intrinsic motivations, environmental concern is the most influential as marginal effects show that it increases by 10.9% the probability of « high satisfaction » (Table A4), by 18,7% the probability of « very proud » when being involved in organic farming (Table A6), and by 17,8 % the probability of confirming that « organic farming absolutely contributes to happiness » (Table A5). Other intrinsic motivations - public health concern, human health concern, and request for autonomy decisions- also exhibit strong positive associations with both *affective* and *cognitive* well-being.

A more nuanced result is observed for the request for « satisfying needs for technical challenges, innovation, and reinvention in career ». While it appears to have a minimal positive impact on *affective* well-being (pride and happiness), it shows no effect on *cognitive* well-being (satisfaction). One possible explanation is the ambiguity in the surveyed question, which did not specify what technologies the farmers were expected to focus on, potentially leading to varied interpretations among respondents.

Table 4: Estimation results for three dependent variables

VARIABLES	**Dependent variables**		
	Model 1: Satisfaction	**Model 2: Pride**	**Model 3: Happiness**
Human health	0.192***	0.316***	0.268***
	(0.028)	(0.037)	(0.027)
Public health	0.138***	0.191***	0.190***
	(0.037)	(0.025)	(0.034)
Environment	0.341***	0.514***	0.554***
	(0.025)	(0.032)	(0.056)
Technical challenge	0.034	0.062***	0.062***
	(0.024)	(0.021)	(0.021)
Decision autonomy	0.180***	0.175***	0.344***
	(0.019)	(0.044)	(0.029)
Fair price	-0.106***	-0.013	-0.093***
	(0.021)	(0.019)	(0.024)
Cooperative/consumer incentive	-0.198***	-0.339***	-0.380***
	(0.055)	(0.061)	(0.067)
Pseudo R^2	0.0787	0.1043	0.1044
# observations	6911	6934	6924

Notes: Short table with only seven motivations as explicative variables. Table A3 in the Appendix presents the complete list of explicative variables. Significance levels: * 10% ** 5%, *** 1%.

In contrast, extrinsic motivations negatively affect all three dimensions of well-being derived from organic farming. In particular, the negative effect of « responding favorably to incentives from their cooperatives/consumers » is more pronounced. For example, this motivation reduces by 6.4% the

probability of « high satisfaction » (Table A4), by 12% the probability of « very proud » (Table A6), and by 12,3% the probability of confirming that « organic farming absolutely contributes to happiness » (Table A5). The negative impact of the two extrinsic motivations may arise from pressure and tension, as these motivations are considered as controlling (Nix et al., 1999). Farmers' concerns about cooperatives and consumers' incentives may create pressure regarding their ability to meet the expectations of organizational or market demand. Another explanation is that, since 2023, French organic farmers have faced market volatility, high profit margins of large retail chains, and declining consumer purchasing power, leading to financial instability (Lombardot, 2023; Delescluse, 2024). This disconnect between their expectations—such as receiving fair compensation for their sustainable efforts—and the harsh economic reality can result in frustration and lower SWB. Our findings seem to corroborate the Sheldon and Bettencourt (2002) analysis based on the SDT, indicating that intrinsic motivations (autonomy, competence, and relatedness) positively influence affective SWB, while extrinsic motivations (social status and perceived distinctiveness) have a negative impact.

Regarding *socio-economic characteristics*, results show that the effect of income differs by its specific range. The income effect is significant for groups 3, 4, 5, and 6 (compared to the reference group, earning less than 5,000 euros annually). This finding means that for farmers with an income higher than 10,000 euros, the higher their income, the more satisfied, proud, and happy they feel with their engagement with organic farming. The marginal effects (Tables A4-A6) support this observation. However, median income at the department level has no role in any of the three well-being indicators. This means that farmers' *affective* and *cognitive* well-being do not depend on the areas or average income/living standard of their department. In other words, social comparison in terms of income does not matter for their Happiness, feelings of Pride, and Satisfaction in organic farming, contrary to the usual fact in SWB literature.

Being married (single as a reference) impacts only the *affective* aspect of SWB. Men exhibit significantly lower levels of affective well-being as well as *cognitive* well-being compared to women. Age has a very small impact on the farmer's Happiness and Pride and no effect on Satisfaction. Compared to the reference group « Below Baccalaureate», farmers with the highest level of education - master or PhD level - have more tendency to feel satisfied with organic farming and be proud of being organic farmers. In contrast, the impact of lower degree education is somewhat negative, especially for those who just finished high school or have technician diplomas.

Regarding *farming characteristics*, the share of land owned has no significant impact on farmers' well-being, while organic farming surfaces do matter. Indeed, we observe that in three models, the larger the organic surface area owned by farmers, the higher the probability of « high satisfaction » (Table A4), being « very proud » (Table A6), and feeling « happy » (Table A5). And those possessing 100 % organic surface in their operation have the highest level of SWB. This finding can be explained by the fact that organic farmers are highly aware of the benefits brought about by increasing organic farming in terms of biotic abundance and richness, which in turn may satisfy their need to contribute to sustainable development (Smith et al., 2019). In contrast, farmers' overall experience has a slightly negative impact on their feelings about their involvement in organic farming and their Satisfaction with their engagement in it. These results seem to contradict the one investigated by Aydoğdu et al. (2021) in Turkey, in which farming experience has positive impacts at different levels on farmer's Happiness at irrigation. However, experience with organic farming positively impacts our three measures of SWB. Types of production systems may influence organic farmers' well-being. Farmers engaged in permanent crops and horticulture report higher affective and *cognitive* well-being compared to those engaged in field crops (reference category). Marginal effects confirm that these production types are associated with higher well-being.

For the *lifestyle characteristics*, weekly working hours slightly reduce *cognitive* well-being while the annual vacation days slightly increase it. However, these variables have no impact on *affective* well-being. This contrasts with Liu et al. (2024), who argue that the autonomy inherent in farming allows for a flexible work-leisure balance, thereby enhancing utility. One possible explanation is that the boundary between work and personal life may be less distinct for farmers, as farming can be experienced as a slow-paced lifestyle rich in meaning. As a result, factors such as holidays and working hours may have no impact on their feelings of Pride and Happiness.

Social ties and organizational affiliation significantly influence SWB. Being a member of an agricultural organization increases farmers' Satisfaction and Happiness. Having difficult periods reduces the probability of « high satisfaction » and « absolutely happy » while it does not impact the feeling of Pride when involved in organic farming. Finally, support from both family and non-family members positively correlates with the farmers' *affective* well-being. These findings corroborate the fact that social support and social integration can have, to a certain extent, meaningful contributions to the joy and happiness of farmers (Li et al., 2022).

5. Conclusion

Over the last decade, we have seen a decline in agricultural employment as a proportion of total employment and a decrease in the number of farms in France (INSEE, 2024). Understanding the drivers of organic farmers' well-being is crucial to ensuring the next generation of farmers and sustainable farming. A farmer who feels proud and satisfied with their activity would probably be less inclined to give up sustainable farming activity and green transition. This suggests that farmers' SWB should be included in sustainability analyses as a measure of agricultural sustainability (Brown et al., 2021).

In this context, our paper focuses on the impact of different motivations, intrinsic and extrinsic, for engaging in organic farming on the French organic farmers' SWB, using a large-scale survey database from the French Agence Bio and leveraging the multi-dimension of well-being. Our findings show that most intrinsic motivations for adopting organic farming including public health concern, human health concern, environmental concern, and request for autonomy decision exert significant and positive impacts on both the *affective* well-being (pride, happiness) and the *cognitive* well-being (satisfaction). In contrast, extrinsic motivations related to profitability and demand expectations exert a negative impact. These findings align with Self-Determination Theory and point to the importance of value alignment in reinforcing farmers' satisfaction and emotional engagement. Besides motivations, our multi-dimensional well-being analyses also reveal that income, farming experience and difficulty, production types, and social ties significantly impact both *affective* and *cognitive* well-being. Some aspects of farming characteristics and lifestyle factors (weekly working hours and annual vacation days) contribute to *cognitive* well-being, while others (i.e., support from family and others) contribute to *affective* well-being.

These findings shed light on the role of public policies in improving farmers' well-being. Policymakers should include more activities to increase social capital and address challenging work factors for farmers. Most importantly, all intrinsic motivations should receive special attention, especially environmental motives. Such motivations should be sustained and encouraged through targeted programs or information campaigns such as quality labels and certification, awareness campaigns, distribution channels that connect organic producers directly with consumers, encouraging exchange

between farmers and citizens about their practices, etc. ensuring that organic farmers feel their expectations align with prevailing social and moral norms. Aligning individual expectations with these norms, as highlighted by Ocean and Howley (2023), can significantly influence individuals' well-being. Furthermore, considering the significant impact of income on farmers' SWB, public policy should not only emphasize the health and environmental benefits of organic farming but also provide financial support and ensure fair income for organic farmers such as tax reductions, subsidies, support for agricultural cooperatives, supporting short supply chains, reducing intermediaries' margins, etc. A sustainable income is a necessary condition for ensuring the long-term viability of organic farming and acknowledging its societal benefits. Financial support for farmers can, in turn, shift social norms toward incentivized organic farming practices and crowd in farmers' intrinsic motivations to produce organically, reinforcing their commitment to sustainable practices and environmental goals (Bähr et al., 2023). Further research is needed to explore the role of monetary incentives in crowding in or crowding out the intrinsic motivations of organic farmers. Moreover, additional qualitative studies could help to understand which type of policies could be valorized and promote the intrinsic values of organic farmers, thereby improving their well-being.

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Appendix

Table A1: Variables description

Variables	Definition	Type
Dependent variables		
Satisfaction	Satisfaction with involvement in organic farming: 1 if low, 2 if medium, 3 if high	Discrete
Pride	Feeling proud of being an organic farmer. 1 if not proud, 2 if quite proud, 3 if very proud	Discrete
Happiness	Feelings of Happiness derived from being in organic agriculture. 1 if not really, 2 if rather yes, 3 if absolutely;	Discrete
Motivations	Factors motivating farmers to engage in organic farming	
Intrinsic motivations		
Human health	Protecting human health (relatives, family, friends…). 1 if yes, 0 if no	Dummy
Public health	Protecting public health (neighbors, consumers…). 1 if yes, 0 if no	Dummy
Environment	Taking care of the environment/environment awareness. 1 if yes, 0 if no	Dummy
Technical challenge	Satisfying needs for technical challenges, innovation, and reinvention in career. 1 if yes, 0 if no	Dummy
Decision autonomy	Having autonomy in decision-making relating to technical sales/ issues. 1 if yes, 0 if no	Dummy
Extrinsic motivations		
Cooperative/consumer's incentives	Responding favorably to incentives from their cooperatives/consumers. 1 if yes, 0 if no	Dummy
Fair price	Benefiting from fair, profitable, and stable selling prices. 1 if yes, 0 if no	Dummy
Socio-economic		

characteristics		
Age	Ranging from 19 to 84 years	Continuous
Gender	Male =1, female =0	Dummy
Marital status	1 (Single), 2 (married), 3 (living with a partner), 4 (divorced/ widower),	Discreet
Education	Highest education level in education and training 1 (Below Bac), 2 (Bac), 3 (Bac +1/+2), 4 (Bac +3/+4) , 5 (Bac +5 or more)	Discreet
Annual income	Revenue gained from farming activities 1 (Less than 5000€), 2(from 5000€ to 10,000€), 3 (from 10,000€ to 15,000€), 4 (15,000€~25,000€), 5 (25,000€~35000€), 6(>35,000€)	Discreet
Median income	Median value of the standard of living at the departmental level in 2022, ranging from 17,070 to 29,730 €. According to the INSEE, the standard of living is equal to the household's disposable income divided by the number of consumption units (CUs). https://www.insee.fr/fr/statistiques/2416808#tableau-figure1	Continuous
Professions of parents	Kind of jobs of the participant's parents. 1 if Farmer, 0 otherwise	Dummy
Farming characteristics		
Production type of organic farming	Main products of farmer's operation Field crops (grand culture)=1, permanent crops (culture permament)=2, horticulture= 3, herbivore=4, granivore=5, other=6	Discreet
Farmer's experience	Ranging from 1 to 74 years	Continuous
Organic farming experience	Ranging from 1 to 63 years	Continuous
Surface owned	Question: How many areas do you own? (0%=1, 1%-99%=2, 100%=3)	Discreet
Organic surface	Question: Specify the share of organic areas on your farm (0%~50 %=1, 50%~99%=2, 100%=3)	Discreet
Lifestyle characteristics		
Weekly working time	Number of hours from 10 to 100	Continuous
Annual vacation days	Number of days from 0 to 100	Continuous
Organization member	1 if yes, 0 if no	Dummy
Support	No help=0, help from family or non-family=1, help from both family and non-family=2	Discreet

Difficult period	1 if yes, 0 if no	Dummy
Excluded instruments for the income equation		
Job before farmers	Having another job before becoming a farmer yes=1, no=0	Dummy
Type of farm	Operation status: individual entrepreneur=1, others= 0	Dummy

Table A2. Descriptive statistics for explicative variables

Variable	# Obs	Mean	Std. Dev.	Min	Max
Human health protection	6911	.752	.432	0	1
Public health protection	6911	.551	.497	0	1
Environmental protection	6911	.879	.327	0	1
Technical challenges	6911	.328	.469	0	1
Decision autonomy	6911	.299	.458	0	1
Fair price	6911	.347	.476	0	1
Cooperative/consumer's incentive	6911	.067	.25	0	1
Gender	6911	.723	.448	0	1
Age	6911	48.39	10.575	21	84
Education	6911	3.046	1.305	1	5
Marital status	6911	2.333	.779	1	4
Parent's profession	6911	.503	.5	0	1
Production type	6911	3.134	1.456	1	6
Income	6911	2.881	1.627	1	6
Median income	6911	22.474	1.281	17.07	29.73
Farmer's experience	6911	15.375	11.633	1	61
Oranic farming experience	6911	9.201	7.706	1	63
Surface owned	6911	2.086	.631	1	3
Organic surfaced owned	6911	2.771	.571	1	3
Weekly working hours	6911	48.361	18.692	10	100
Annual vacation days	6911	12.788	13.163	0	100
Support	6911	1.112	.574	0	2
Organization member	6911	.497	.5	0	1
Difficult period	6911	.692	.462	0	1

Notes : Descriptive statistics for model 1 with Satisfaction in organic farming as dependent variable

Table A3: Estimation results for three models of well-being

Variables	Dependent Variables		
	Satisfaction	**Pride**	**Happiness**
Human health	0.192***	0.316***	0.268***
	(0.028)	(0.037)	(0.027)
Public health	0.138***	0.191***	0.190***
	(0.037)	(0.025)	(0.034)
Environment	0.341***	0.514***	0.554***
	(0.025)	(0.032)	(0.056)
Technical challenge	0.034	0.062***	0.062***
	(0.024)	(0.021)	(0.021)
Decision Autonomy	0.180***	0.175***	0.344***
	(0.019)	(0.044)	(0.029)
Fair price	-0.106***	-0.013	-0.093***
	(0.021)	(0.019)	(0.024)
Cooperative/consumer incentive	-0.198***	-0.339***	-0.380***
	(0.055)	(0.061)	(0.067)
Gender	-0.124***	-0.136***	-0.096***
	(0.024)	(0.031)	(0.035)
Age	0.003	0.003*	0.008***
	(0.002)	(0.001)	(0.002)
Education=2, Bac	-0.069	0.040	-0.106***
	(0.053)	(0.056)	(0.037)
Education=3, Bac+1/+2	-0.097**	0.027	-0.098***
	(0.040)	(0.039)	(0.036)
Education=4, Bac+3/+4	0.020	0.066	-0.031
	(0.041)	(0.051)	(0.037)
Education=5, Bac+5/+8	0.079**	0.078*	-0.013
	(0.031)	(0.043)	(0.046)
Marital status=2, Married	0.066	0.177***	0.075*
	(0.042)	(0.039)	(0.038)
Marital status=3, Partner	0.037	0.058	0.008
	(0.057)	(0.060)	(0.050)
Marital status=4, Divorced/Widower	0.079	0.158*	0.052
	(0.084)	(0.095)	(0.088)
Parents' profession=1, Farmers	-0.091***	-0.024	-0.000
	(0.023)	(0.026)	(0.022)
Permanent crops	0.285***	0.067**	-0.025
	(0.059)	(0.029)	(0.041)
Horticulture	0.223***	0.182***	0.096**
	(0.048)	(0.060)	(0.046)
Herbivores	-0.013	-0.004	-0.087*
	(0.044)	(0.036)	(0.044)
Granivores	-0.068	0.124	0.012
	(0.061)	(0.082)	(0.082)
Other crops	0.103	-0.017	-0.134**
	(0.067)	(0.042)	(0.065)

Annual income =2	-0.016	-0.084**	0.022
	(0.055)	(0.039)	(0.048)
Annual income = 3	0.201**	0.113***	0.091***
	(0.098)	(0.033)	(0.028)
Annual income =4	0.247***	0.110***	0.142***
	(0.060)	(0.039)	(0.035)
Annual income = 5	0.306***	0.099	0.144**
	(0.042)	(0.061)	(0.057)
Annual income = 6	0.318***	0.155**	0.122*
	(0.059)	(0.069)	(0.073)
Median income	0.015	-0.015	-0.008
	(0.011)	(0.015)	(0.018)
Farming experience	-0.006***	-0.007***	-0.007***
	(0.002)	(0.001)	(0.002)
Organic farming experience	0.015***	0.018***	0.016***
	(0.001)	(0.002)	(0.002)
Surface owned = 2	-0.085***	-0.043	-0.078*
	(0.031)	(0.089)	(0.043)
Surface owned =3	-0.051	0.022	-0.002
	(0.046)	(0.083)	(0.049)
Organic surface = 2	0.309***	0.322***	0.298***
	(0.061)	(0.041)	(0.060)
Organic surface =3	0.625***	0.613***	0.616***
	(0.046)	(0.047)	(0.040)
Working hours	-0.002**	0.000	-0.001*
	(0.001)	(0.001)	(0.001)
Vacation days	0.003***	0.000	0.002
	(0.001)	(0.001)	(0.001)
Support = 1	0.017	0.089***	0.099**
	(0.036)	(0.029)	(0.045)
Support =2	0.064	0.196***	0.248***
	(0.050)	(0.049)	(0.063)
Organization member	0.153***	0.046	0.151***
	(0.024)	(0.030)	(0.019)
Difficult period	-0.192***	-0.034	-0.135***
	(0.033)	(0.032)	(0.022)
/cut1	0.508**	-0.496	0.299
	(0.224)	(0.348)	(0.474)
/cut2	2.055***	1.174***	1.942***
	(0.234)	(0.360)	(0.472)
Pseudo R^2	0.0787	0.1043	0.1044
# Observations	6,911	6,934	6,924

Notes: Robust standard errors in parentheses. Significance levels: *10%, ** 5%, *** 1%.

Table A4: Marginal effect with Satisfaction as dependent variable

VARIABLES	Marginal effect in model 1: Satisfaction		
	1 : Low	2 : Medium	3 : High
Human health	-0.044***	-0.020***	0.064***
	(0.007)	(0.003)	(0.009)
Public health	-0.030***	-0.016***	0.046***
	(0.008)	(0.004)	(0.012)
Environment	-0.084***	-0.025***	0.109***
	(0.007)	(0.001)	(0.007)
Technical Challenges	-0.007	-0.004	0.011
	(0.005)	(0.003)	(0.008)
Decision Autonomy	-0.038***	-0.023***	0.061***
	(0.004)	(0.003)	(0.007)
Fair prices	0.023***	0.012***	-0.035***
	(0.005)	(0.002)	(0.007)
Cooperative/consumer incentive	0.046***	0.018***	-0.064***
	(0.014)	(0.003)	(0.017)
Gender	0.026***	0.016***	-0.042***
	(0.005)	(0.004)	(0.008)
Age	-0.001	-0.000	0.001
	(0.000)	(0.000)	(0.001)
Education =2	0.0151	0.008	-0.023
	(0.012)	(0.006)	(0.018)
Education =3	0.022**	0.011**	-0.033**
	(0.009)	(0.005)	(0.013)
Education =4	-0.004	-0.003	0.007
	(0.009)	(0.005)	(0.014)
Education =5	-0.016**	-0.011***	0.027***
	(0.006)	(0.004)	(0.010)
Marital status =2	-0.015	-0.007*	0.022
	(0.009)	(0.004)	(0.014)
Marital status =3	-0.008	-0.004	0.012
	(0.013)	(0.006)	(0.019)
Marital status =4	-0.017	-0.009	0.026
	(0.018)	(0.010)	(0.028)
Parents' profession	0.020***	0.011***	-0.031***
	(0.005)	(0.003)	(0.008)
Permanent crops	-0.060***	-0.038***	0.097***
	(0.012)	(0.009)	(0.020)
Horticulture	-0.048***	-0.027***	0.075***
	(0.010)	(0.006)	(0.016)
Herbivores	0.003	0.001	-0.004
	(0.011)	(0.004)	(0.014)
Granivores	0.017	0.005	-0.022
	(0.015)	(0.004)	(0.019)
Other crops	-0.023	-0.011	0.034
	(0.015)	(0.007)	(0.022)
Annual income =2	0.004	0.001	-0.005
	(0.013)	(0.004)	(0.017)
Annual income = 3	-0.045**	-0.022*	0.067**

	(0.021)	(0.012)	(0.033)
Annual income = 4	-0.054***	-0.029***	0.083***
	(0.013)	(0.007)	(0.020)
Annual income = 5	-0.065***	-0.038***	0.103***
	(0.008)	(0.007)	(0.014)
Annual income = 6	-0.067***	-0.040***	0.108***
	(0.012)	(0.008)	(0.020)
Median income	-0.003	-0.002	0.005
	(0.002)	(0.001)	(0.004)
Farming experience	0.001***	0.001***	-0.002***
	(0.000)	(0.000)	(0.001)
Organic farming experience	-0.003***	-0.002***	0.005***
	(0.000)	(0.000)	(0.000)
Surface owned = 2	0.018***	0.011**	-0.029***
	(0.006)	(0.004)	(0.011)
Surface owned = 3	0.011	0.007	-0.017
	(0.010)	(0.006)	(0.016)
Organic surface =2	-0.092***	0.008**	0.084***
	(0.018)	(0.004)	(0.016)
Organic surface = 3	-0.167***	-0.021***	0.187***
	(0.013)	(0.003)	(0.011)
Working hours	0.000**	0.000**	-0.001**
	(0.000)	(0.000)	(0.000)
Vacation days	-0.001***	-0.000***	0.001***
	(0.000)	(0.000)	(0.000)
Support = 1	-0.004	-0.002	0.006
	(0.008)	(0.004)	(0.012)
Support = 2	-0.014	-0.008	0.022
	(0.011)	(0.006)	(0.017)
Organization member	-0.033***	-0.018***	0.052***
	(0.005)	(0.003)	(0.008)
Difficult period	0.040***	0.025***	-0.066***
	(0.007)	(0.004)	(0.012)

observation: 6911

Notes: Robust standard errors in parentheses. Significance levels: *10%, ** 5%, *** 1%. Pj is the probability that Satisfaction= j, with j = 1,2,3.

Table A5: Marginal effect with Happiness as dependent variable

VARIABLES	Marginal effect in model 2: Happiness		
	P_1: Not really	P_2: Rather yes	P_3: Absolutely
Human health	-0.050***	-0.041***	0.091***
	(0.006)	(0.004)	(0.009)
Public health	-0.034***	-0.032***	0.066***
	(0.006)	(0.006)	(0.012)
Environment	-0.121***	-0.057***	0.178***
	(0.015)	(0.005)	(0.016)
Technical Challenges	-0.011***	-0.011***	0.021***
	(0.004)	(0.004)	(0.007)
Decision Autonomy	-0.056***	-0.065***	0.120***
	(0.004)	(0.007)	(0.010)
Fair prices	0.016***	0.015***	-0.032***
	(0.004)	(0.004)	(0.008)
Cooperative/consumer incentive	0.078***	0.046***	-0.123***
	(0.016)	(0.005)	(0.020)
Gender	0.016***	0.017***	-0.033***
	(0.006)	(0.006)	(0.012)
Age	-0.001***	-0.001***	0.003***
	(0.000)	(0.000)	(0.001)
Education =2	0.018***	0.018***	-0.036***
	(0.007)	(0.006)	(0.013)
Education =3	0.017***	0.017***	-0.034***
	(0.006)	(0.006)	(0.012)
Education =4	0.005	0.006	-0.011
	(0.006)	(0.006)	(0.013)
Education =5	0.002	0.002	-0.004
	(0.008)	(0.008)	(0.016)
Marital status =2	-0.013*	-0.012*	0.025*
	(0.007)	(0.006)	(0.013)
Marital status =3	-0.001	-0.001	0.003
	(0.009)	(0.008)	(0.017)
Marital status =4	-0.009	-0.008	0.018
	(0.015)	(0.015)	(0.030)
Parents' profession	0.000	0.000	-0.000
	(0.004)	(0.004)	(0.008)
Permanent crops	0.004	0.004	-0.008
	(0.007)	(0.007)	(0.014)
Horticulture	-0.016**	-0.018**	0.033**
	(0.007)	(0.008)	(0.016)
Herbivores	0.016*	0.014**	-0.030**
	(0.008)	(0.007)	(0.015)
Granivores	-0.002	-0.002	0.004
	(0.014)	(0.014)	(0.028)
Other crops	0.024*	0.021**	-0.045**
	(0.013)	(0.009)	(0.022)
Annual income =2	-0.004	-0.003	0.008
	(0.009)	(0.007)	(0.016)
Annual income = 3	-0.016***	-0.015***	0.031***

	(0.005)	(0.004)	(0.010)
Annual income = 4	-0.025***	-0.024***	0.049***
	(0.006)	(0.006)	(0.012)
Annual income = 5	-0.025**	-0.024**	0.049**
	(0.010)	(0.010)	(0.020)
Annual income = 6	-0.021*	-0.020	0.042*
	(0.012)	(0.013)	(0.025)
Median income	0.001	0.001	-0.003
	(0.003)	(0.003)	(0.006)
Farming experience	0.001***	0.001***	-0.002***
	(0.000)	(0.000)	(0.001)
Organic farming experience	-0.003***	-0.003***	0.005***
	(0.000)	(0.000)	(0.001)
Surface owned = 2	0.014*	0.013*	-0.027*
	(0.007)	(0.008)	(0.015)
Surface owned = 3	0.000	0.000	-0.001
	(0.008)	(0.009)	(0.017)
Organic surface =2	-0.075***	-0.013***	0.087***
	(0.016)	(0.004)	(0.017)
Organic surface = 3	-0.136***	-0.059***	0.195***
	(0.012)	(0.006)	(0.011)
Working hours	0.000**	0.000*	-0.000*
	(0.000)	(0.000)	(0.000)
Vacation days	-0.000*	-0.000	0.001
	(0.000)	(0.000)	(0.000)
Support = 1	-0.019**	-0.015**	0.033**
	(0.008)	(0.007)	(0.015)
Support = 2	-0.043***	-0.042***	0.085***
	(0.011)	(0.010)	(0.021)
Organization member	-0.026***	-0.026***	0.052***
	(0.003)	(0.004)	(0.007)
Difficult period	0.023***	0.024***	-0.046***
	(0.004)	(0.004)	(0.008)
# observation: 6924			

Notes: Robust standard errors in parentheses. Significance levels: *10%, ** 5%, *** 1%. Pj is the probability that Happiness = j, with j = 1,2,3.

Table A6: Marginal effects with Pride as dependent variable

VARIABLES	Marginal effect in model 3: Pride		
	P_1 : Not proud	P_2 : Quite proud	P_3 : Very proud
Human health	-0.026***	-0.086***	0.112***
	(0.003)	(0.010)	(0.013)
Pubic health	-0.014***	-0.052***	0.067***
	(0.002)	(0.007)	(0.009)
Environment	-0.051***	-0.136***	0.187***
	(0.004)	(0.008)	(0.012)
Technical Challenges	-0.005***	-0.016***	0.021***
	(0.002)	(0.006)	(0.007)
Decision Autonomy	-0.013***	-0.047***	0.060***
	(0.003)	(0.012)	(0.015)
Fair prices	0.001	0.004	-0.005
	(0.001)	(0.005)	(0.006)
Cooperative/consumer incentive	0.032***	0.088***	-0.120***
	(0.007)	(0.015)	(0.022)
Gender	0.010***	0.036***	-0.046***
	(0.002)	(0.008)	(0.010)
Age	-0.000*	-0.001*	0.001*
	(0.000)	(0.000)	(0.000)
Education =2	-0.003	-0.011	0.014
	(0.004)	(0.015)	(0.019)
Education =3	-0.002	-0.007	0.009
	(0.003)	(0.010)	(0.014)
Education =4	-0.005	-0.018	0.023
	(0.004)	(0.013)	(0.017)
Education =5	-0.006*	-0.021*	0.027*
	(0.003)	(0.011)	(0.014)
Marital status =2	-0.014***	-0.047***	0.061***
	(0.004)	(0.010)	(0.014)
Marital status =3	-0.005	-0.015	0.020
	(0.005)	(0.016)	(0.021)
Marital status =4	-0.013*	-0.042*	0.055*
	(0.008)	(0.025)	(0.033)
Parents' profession	0.002	0.006	-0.008
	(0.002)	(0.007)	(0.009)
Permanent crops	-0.005**	-0.018**	0.023**
	(0.002)	(0.008)	(0.010)
Horticulture	-0.013***	-0.049***	0.062***
	(0.004)	(0.016)	(0.020)
Herbivores	0.000	0.001	-0.001
	(0.003)	(0.009)	(0.012)
Granivores	-0.009	-0.033	0.043
	(0.006)	(0.022)	(0.028)
Other crops	0.001	0.005	-0.006
	(0.004)	(0.011)	(0.015)
Annual income =2	0.007**	0.022**	-0.029**
	(0.003)	(0.010)	(0.014)
Annual income = 3	-0.009***	-0.030***	0.038***
	(0.003)	(0.009)	(0.011)

Annual income = 4	-0.008***	-0.029***	0.038***
	(0.003)	(0.010)	(0.013)
Annual income = 5	-0.008	-0.026	0.034
	(0.005)	(0.016)	(0.021)
Annual income = 6	-0.011**	-0.041**	0.053**
	(0.005)	(0.018)	(0.023)
Median Income	0.001	0.004	-0.005
	(0.001)	(0.004)	(0.0005
Farming experience	0.001***	0.002***	-0.002***
	(0.000)	(0.000)	(0.001)
Organic farming experience	-0.001***	-0.005***	0.006***
	(0.000)	(0.001)	(0.001)
Surface owned = 2	0.003	0.012	-0.015
	(0.007)	(0.023)	(0.030)
Surface owned = 3	-0.002	-0.006	0.007
	(0.006)	(0.022)	(0.028)
Organic surface =2	-0.041***	-0.076***	0.117***
	(0.006)	(0.009)	(0.015)
Organic surface = 3	-0.065***	-0.156***	0.221***
	(0.006)	(0.011)	(0.017)
Working hours	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Vacation days	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Support = 1	-0.007***	-0.023***	0.031***
	(0.002)	(0.008)	(0.010)
Support = 2	-0.015***	-0.052***	0.067***
	(0.004)	(0.013)	(0.017)
Organization member	-0.004	-0.012	0.016
	(0.002)	(0.008)	(0.010)
Difficult period	0.003	0.009	-0.012
	(0.002)	(0.009)	(0.011)
# observations: 6934			

Notes: Robust standard errors in parentheses. Significance levels: *10%, ** 5%, *** 1%. Pj is the probability that Proude = j, with j = 1,2,3.