



The diversity of organic farmer motivations and livelihoods in the Global South – A case study in Kerala, India

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ARTICLE INFO

Keywords:

Organic agriculture
Sustainable livelihoods
Farmer motivations
Farmer decision-making
Kerala

ABSTRACT

Organic agriculture is often promoted as a means to achieve sustainable agriculture and livelihoods. Yet, the evidence is mixed on the outcomes of organic adoption. We conducted a case study in the South Indian state of Kerala to understand farmer motivations to adopt organic agriculture, their livelihood characteristics, and outcomes of adoption. To do so, we designed a conceptual framework bringing together key constructs from the theory of planned behaviour and the sustainable livelihoods framework. Focusing on the two districts of Thrissur and Wayanad, our work is informed by semi-structured interviews and focus groups with organic and conventional farmers and key informants. Based on this study, we developed a typology of organic farmers that we found to be analytically powerful: three core groups were identified – wealthy “hobby farmers”; poorer “non-certified farmers”; and middle class “export farmers”. Our study revealed that these organic farmer types differ not only in their livelihood characteristics, but also in their motivations for adopting organic agriculture, as well as in their satisfaction with organic agriculture as a livelihood strategy. We found that the perceived success of organic agriculture in Kerala depends both on *who* adopts it and *why*. These differences have important policy implications. In Kerala, we suggest that policy support for organic agriculture should primarily target non-certified farmers who are poorer and ideologically committed to it, but should also address the concerns of export farmers who are more likely to persist with organic farming under favourable economic conditions. More broadly, our study shows that for states and non-profits to better support organic agriculture, nuanced understandings of the farmers involved are required.

1. Introduction

Organic agriculture (OA) is growing rapidly in the Global South, mostly catering to demand from high-income countries (Willer and Lernoud, 2017). One-third of the world’s organic agricultural land and over three-quarters of organic producers are in poor and middle-income countries, but 96 percent of organic food is sold in Europe and North America (ibid.). Demand for organic produce is also growing in the Global South (Freidberg and Goldstein, 2011; Scott et al., 2009; Shi et al., 2011), but production is lagging behind (Willer and Lernoud,

2017). Despite the growth in OA in the Global South, many farmers remain unconvinced (Crowder and Reganold, 2015), creating a major obstacle for the global organic market to grow (European Commission, 2010; Willer and Lernoud, 2017). For these reasons, we need to understand the motivations of farmers to convert to OA, and the consequences of OA for farmer livelihoods. This is particularly important in the Global South where many organic producers are situated but research on OA is scarce (Seufert and Ramankutty, 2017).

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<https://doi.org/10.1016/j.geoforum.2022.103670>

Received 15 February 2021; Received in revised form 18 November 2022; Accepted 8 December 2022

Available online 20 December 2022

0016-7185/© 2022 Published by Elsevier Ltd.

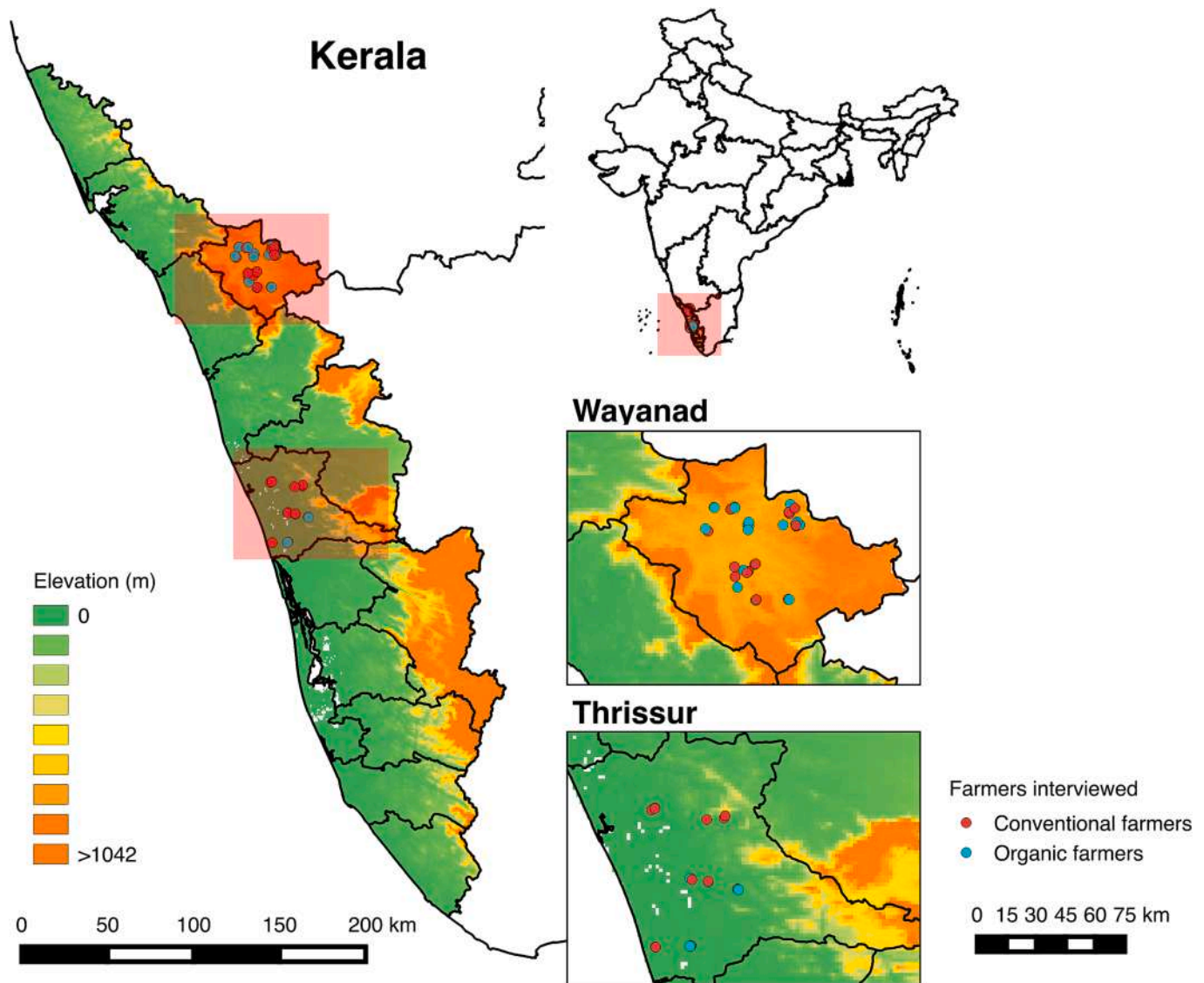


Fig. 1. Map of study region, showing India (top right), Kerala (left) and the two study districts with locations of interviewed farming households (bottom right).

1.1. Organic farmer motivations and livelihoods

Organic farmers in high-income countries are often motivated by health and environmental values (Padel, 2008) and land stewardship (Padel, 2001), but also by premium prices and organic subsidies (Darnhofer et al., 2005; Fairweather, 1999). The limited studies on farmer motivations in the Global South - predominantly in India and South-East Asia - suggest that organic farmers are especially driven by health concerns relating to chemical pesticides, soil fertility, input costs, and premium prices (Grimm and Luck, 2020; Mendoza, 2004; Panneerselvam et al., 2012; Riar et al., 2017; Thapa and Rattanasuteerakul, 2011). Whereas OA in the Global North has evolved bottom-up through farmer initiatives and networks (Padel, 2001) and is driven by domestic demand (Seufert et al., 2017), it often spreads top-down in the Global South. Here it is usually export-oriented and dependent on development agencies or non-governmental organizations (NGOs), who provide certifications and access to international markets (Bray et al., 2002; Goldberger, 2008; Salazar, 2014).

OA's livelihood outcomes are also strongly context-dependent and variable (Bennett and Franzel, 2013; Seufert and Ramankutty, 2017). The profitability of OA for small farmers is critically dependent on the price premium (Crowder and Reganold, 2015), apart from yields and

production costs, all of which can vary spatially and temporally. While organic farmers often receive higher, more stable, prices than conventional farmers¹ (Bacon, 2005; Bolwig et al., 2009; Valkila, 2009), and organic inputs are often cheaper and production costs lower (Forster et al., 2013; Patil et al., 2014; Valkila, 2009), OA sometimes requires increased knowledge and training. Moreover, there are often high entry, labour, and certification costs (Calo and Wise, 2005) that are aggravated by the 2–3 year transition period when farmers have to use organic practices but cannot sell their products at a premium (Calo and Wise, 2005; Lyngbaek et al., 2001). Also, organic inputs such as coffee husks or chicken manure can be expensive (Chongtham et al., 2010; Valkila, 2009). Often, farmers have to sell their organic produce in conventional markets without premiums, due to limited buyers and exporting companies who frequently have high quality criteria and unreliable demand (Chongtham et al., 2010). Further, while organic yields can sometimes be comparable to or higher than in low-input

¹ We use 'conventional farming' to mean the predominant capital and input-intensive "Green Revolution" farming today. We use 'traditional farming' to mean the pre-Green Revolution farming in India, using low synthetic inputs, but maintaining soil health using manure and compost.

traditional farming (Eyhorn et al., 2007; Forster et al., 2013; Panneerselvam et al., 2011), they are typically lower than for intensive conventional agriculture (Seufert and Ramankutty, 2017). In turn, premium prices sometimes insufficiently compensate where OA has higher costs and/or lower yields (Bray et al., 2002; Calo and Wise, 2005; Patil et al., 2014). Nonetheless, a recent *meta*-analysis of 44 studies (mostly from Europe, North America, and India), concluded that, overall, OA is more profitable than conventional agriculture (Crowder and Reganold, 2015).

Apart from financial considerations, OA can improve resilience. Organic cash crops are often part of a diverse farming system including livestock and other crops for subsistence or local markets (Bacon, 2005; Jacobi et al., 2015), thus reducing dependence on a single crop. Further, organic management can promote higher yield stability under extreme weather and climate change, owing to improved soil structure (Lotter et al., 2003; Milestad and Darnhofer, 2003). However, the autonomy of organic farmers, a critical aspect of resilience (c.f. Stock et al., 2014), can suffer given fluctuating global markets, changing consumer preferences, and the power of certifiers, export companies, and transnational buyers (Raynolds, 2004; Scott et al., 2009). Nonetheless, their reduced dependence on external inputs (Mendoza, 2004; Valkila, 2009) and their collective organization in organic cooperatives (Bray et al., 2002) can enhance their autonomy. Such organization, typically required for organic certification and access to foreign markets, can also provide livelihood benefits, by way of training and access to health and credit programs (Bakewell-Stone et al., 2008; Bray et al., 2002; Jacobi et al., 2015).

1.2. Research objectives

Due to these varied and ambiguous implications for farmer livelihoods, and the limited literature on organic farmer motivations and livelihoods in the Global South, a better understanding of why farmers adopt OA in specific contexts is needed. In this paper, we examine the motivations and livelihoods of organic farmers in Kerala, India. Kerala has a strong certified and non-certified organic movement, partly due to a government policy decision in 2010 to convert the entire state to OA by 2020. We pose three research questions: First, what are the *livelihood characteristics* of different types of organic farmers in Kerala? Second, what *motivates* different types of farmers in Kerala to undertake OA? Third, how do farmers perceive the effects of OA on their *livelihood outcomes*?

Organic farmers in this study are defined as farmers who are not necessarily *certified* organic, but who identify themselves as organic farmers and *intentionally* use organic practices as defined in regulations (e.g., do not apply chemical inputs). Farmers who practice ‘organic-by-default’, namely those who do not apply chemical inputs since they do not need to or cannot afford them, are not considered organic farmers in this study.

In the following section, we introduce the state of Kerala, including its agrarian transition and the rise of OA over the last three decades. Next, we outline our conceptual framework, to explain farmer decision-making based on the theory of planned behaviour and the sustainable livelihood framework. After detailing our methods, we analyze our results regarding the livelihoods and motivations of organic farmers in Kerala. A key outcome of our study is the development of a typology of organic farmers, which we argue is analytically important in several ways. We conclude with conceptual and policy implications, derived from a clearer understanding of the who, what, and why of OA in the Global South.

2. Context: Kerala, India

Kerala – in south-western India (Fig. 1) – has intrigued scholars for decades, having achieved the highest human development of all Indian states (on par with many middle and high-income countries),

despite low economic growth (Franke and Chasin, 1994; Parayil, 1996). Kerala’s economy is dominated by the service sector and strongly influenced by foreign remittances (Prakash, 1998; Zachariah and Rajan, 2012). The high human well-being despite low economic growth – the ‘Kerala model’ of development (Franke and Chasin, 1994; Heller, 1999) – has been explained by many factors including its high level of gender equality, owing to matrilineal systems in some communities, and universal public education since the 1800s (Alexander, 2000; Ramachandran, 2000). Most importantly, sweeping policies by democratically elected leftist governments since the 1950s have significantly reduced socio-economic inequalities, which enabled the active participation by all in the economic and political life of the state. These far-reaching policies include the historical Land Reform Act of 1963, which capped land holdings and redistributed land from landlords to poor tenants and landless labourers (Heller, 1999), and the Kerala Agricultural Workers Act of 1974, which led to regulated work hours, minimum wages, employment security and labour unions for agricultural workers (ibid.). Moreover, in 1980, Kerala was the first state to implement a pension scheme for agricultural workers (Gulati, 1990).

These developments led to the decline of agriculture in Kerala during the last three decades, due to high land prices, small land-holding sizes, high labour costs, and waning interest in farming by a highly educated population (Chand et al., 2007; Fox et al., 2017; Nair and Menon, 2009). This decline has been exacerbated by labour scarcity due to emigration to the Middle East, and skilled labour moving to non-agricultural sectors (Nair and Menon, 2004). Concurrently, farmers have increased the share of high-value, less labour-intensive cash crops like pepper, rubber and coffee, while labour-demanding, low-value staples like paddy and tubers have declined (Kumar, 2005). Today, Kerala has highly diverse agroforestry systems with numerous species of cash and staple crops being grown in small home gardens (Jose and Shanmugaratnam, 1993).

Kerala has become one of the Indian states with the smallest agricultural sectors, representing only 9 percent of state-level GDP in 2012, compared to 14 percent nationally (Planning Commission, Government of India, 2014). This agrarian transition has created considerable challenges, combined as it was with low agricultural prices in the late 1990s and early 2000s, and a large-scale outbreak of the *Phytophthora fungus* (‘quick-wilt’) in black pepper, resulting in massive yield losses (Mohanakumar and Sharma, 2006; Thottathil, 2012). The combination of low profits, indebtedness, and high rates of farmer suicides have led to an ‘agrarian crisis’ in Kerala (Mohanakumar and Sharma, 2006; Münster, 2012; Palackal, 2019; Thottathil, 2012).

The Kerala government has responded to this crisis in part by promoting OA. In 2010, it adopted the Kerala State Organic Farming Policy, the first of its kind nationally, aiming to transform all agriculture to organic management within ten years, to address soil fertility and health concerns (particularly exposure to pesticides), and increase food security and sovereignty (Palackal, 2019; Government of Kerala, Department of Agriculture, 2010; Thottathil, 2012). The degree to which this policy has resulted in concrete measures supporting organic farmers is debatable (Thottathil, 2012).

Additionally, Kerala, leveraging its history of exporting crops like coffee, pepper and tea, also leads in export-oriented certified OA (Nair and Menon, 2004). Numerous NGOs have been promoting certified organic export agriculture in Wayanad, Idukki, and Kannur districts (Thottathil, 2012). The National Program for Organic Production, formulated in 2000, provides a legislative framework for organic certification, and national standards for exporting organic produce to foreign markets. Kerala was the first state with an organic certification agency (INDOCERT), and an organic producer company (IOFPCL, Indian Organic Farmers Producer Company Limited) directly involving farmers in marketing their produce (Thottathil, 2012; Vakkayil, 2010; Venkattakumar and Sontakki, 2012).

Despite these efforts, Kerala’s certified OA in 2019–20 was estimated

at only around 2.3 percent of net sown area (Government of India, 2022).² To further bolster OA, the Kerala Agro Ecology Based Biodiversity Conservation project was announced in 2020. It is currently being implemented on 25,000 ha, with plans to cover 84,000 ha (Government of India, 2022; Hindu, 2020; Kallungal, 2021), and includes on-farm production of biological inputs, marketing assistance for eco-shops, organic farming of fruits and vegetables, and wider implementation support (Government of Kerala, 2022). Chemical fertilizer subsidies were also recently slashed (Newslick, 2022).

Our study focuses on two districts within Kerala (Fig. 1) – Thrissur, which is highly urbanized, densely populated, and relatively wealthy (ranked 6/15 on GDP in Kerala, 6 % of GDP from agriculture, and 1031 people per km²; Supplementary Materials Table S2), and Wayanad, which is more agriculture-based and poorer (ranked 14/15 on GDP in Kerala, 24 % of GDP from agriculture, and 384 people per km²). We chose these districts because they represent contrasting positions in the agrarian transition; whereas Wayanad has one of the strongest agricultural sectors and among the highest levels of certified OA, Thrissur has one of the smallest agricultural sectors in Kerala (Supplementary Materials Table S2).

3. Conceptualising farmer motivations and livelihoods

There are multiple theories explaining the motivations driving farmer decision-making. Some take a primarily economic approach, assuming farmers are rational actors driven by profit (e.g., rational choice theory, Herath et al., 1982; Lin et al., 1974), or bounded by their cognitive capacities (e.g., bounded rationality, Einhorn and Hogarth, 1981; Simon, 1982). Behavioural approaches, which consider individual attitudes (e.g., theories of planned behaviour (Beedell and Rehman, 1999) and reasoned action (Rehman et al., 2007)), explain decision-making better than purely economic ones, but somewhat neglect the economic and political contexts (Austin et al., 2001; Beedell and Rehman, 1999; Heong and Escalada, 1999). Hence, some studies combine farmer behavioural and household characteristics with socio-economic and biogeographic drivers (e.g., Siebert et al., 2006; Valbuena et al., 2010; Willock et al., 1999).

We are interested in understanding farmer decision-making but also how different motivations underlying livelihood strategies influence livelihood outcomes. We therefore combine behavioural decision-making with the sustainable livelihood framework, which strongly conceptualizes farmers' diverse livelihood sources.

Livelihood approaches critically respond to purely employment- and income-based poverty discussions, and assess livelihood outcomes through factors contributing to enhanced capabilities, equity, and sustainability (Chambers and Conway, 1991). While a livelihood comprises the “capabilities, assets, and activities required for a means of living” (DFID, 1999), it is considered sustainable when “it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base” (ibid.). This conceptualization of sustainable livelihoods is strongly related to social resilience (Obrist et al., 2010); therefore, we include resilience explicitly in our framework, and assess reactive and adaptive capacity rather than vulnerability alone. Desirable livelihood outcomes in our view include income generation, well-being, and food security, but also resilience building, or the “human capacity to anticipate, resist, cope, adapt, or recover from the impact of a hazard” (Obrist et al., 2010: 285).

In our conceptual framework (Fig. 2), farmer livelihoods are situated within a context of transforming structures and processes, and vulnerability. Farmer decision-making is influenced by internal (e.g., assets or livelihood resources, farm characteristics, and individual motivations)

and external (e.g., political, historical, agro-ecological, and socio-economic) factors. Using Valbuena et al. (2010)'s framework, we differentiate between internal factors related to *livelihood characteristics* and *farmer motivation*. *Livelihood characteristics* include what Valbuena et al. (2010) and Mills et al. (2017) term the ‘ability to adopt’. We conceptualize these factors based on farmers' access to the five capitals of the livelihood framework. *Farmer motivation* relates to what these authors term ‘willingness to adopt’, which we conceptualize using the theory of planned behaviour (TPB).

The TPB assumes that a behavioural intention is directly related to individuals' *attitudes* towards this behaviour (i.e., their personal evaluation of whether it is positive or negative), combined with social influences (*subjective norms*) and the degree to which individuals believe they are able to control the outcome of their behaviour (*perceived behavioural control*) (Beedell and Rehman, 1999). Numerous authors have expanded on this TPB model. Here we follow the TPB model from Mills et al. (2017), who added *response efficacy* (belief that actions make a difference) and *self-identity* (extent to which behaviour is part of the self).

Our framework conceptualizes the success of livelihood strategies (like organic farming) as an interplay of farmer motivations and decision-making (‘willingness to adopt’) based on TPB (Mills et al., 2017), combined with core elements of the sustainable livelihood framework to characterize livelihood assets (‘ability to adopt’) and their changes (livelihood outcomes) after adopting OA.

4. Methods and data

Fieldwork by the first two authors included interviews – during October-December 2013³ – with 36 organic and 36 conventional farmers, utilizing closed (quantitative) questions on household, farm, and management characteristics, and semi-structured open-ended (qualitative) questions. Purposeful snowball sampling was used to identify organic farmers who represented a range of farm sizes, wealth levels, crops grown, and marketing channels. These farmers identified as organic farmers following organic management practices. Conventional farmers, comparable in farm size, wealth, and location, were also interviewed, based on criterion-led and snowball sampling. These interviews were only used as a reference to characterize the organic farmer study population and are not analyzed in detail here. Additionally, we conducted three focus groups (one each with organic farmers, conventional farmers, and a mixed group). The semi-structured interviews and focus groups covered themes such as pathways to organic adoption; personal experiences with, and opinions on benefits and problems of OA; and livelihood outcomes. Despite our best efforts, farmer interviewees were overwhelmingly men (see Table 1). We also interviewed 22 key informants from academia, state government departments, NGOs, and the organic movement.

Our data are median ± median absolute deviation (MAD), unless otherwise specified. We created three indicators: a multidimensional wealth indicator comprising five variables characterizing relative household wealth status (land holding size, ownership of consumer goods, highest education level, housing type, number of rooms); a social capital indicator comprising five variables representing links with non-nuclear family members, neighbours, other farmers, and villagers (frequency of attending farmer and village meetings, degree of help shared with relatives within and outside the village, and with neighbours); and an organic commitment indicator, defined as those who had adopted OA more than 10 years ago, were not associated with an NGO promoting OA, farmed all their land organically, and carried out organic

² These numbers refer to certified OA; the area under uncertified organic management remains unknown.

³ Although our field work was conducted nearly 10 years ago, the Kerala government continues to strongly promote OA and there is no comparative study such as ours that has been completed in the meantime. Hence our findings and recommendations remain relevant and informative for achieving OA goals.

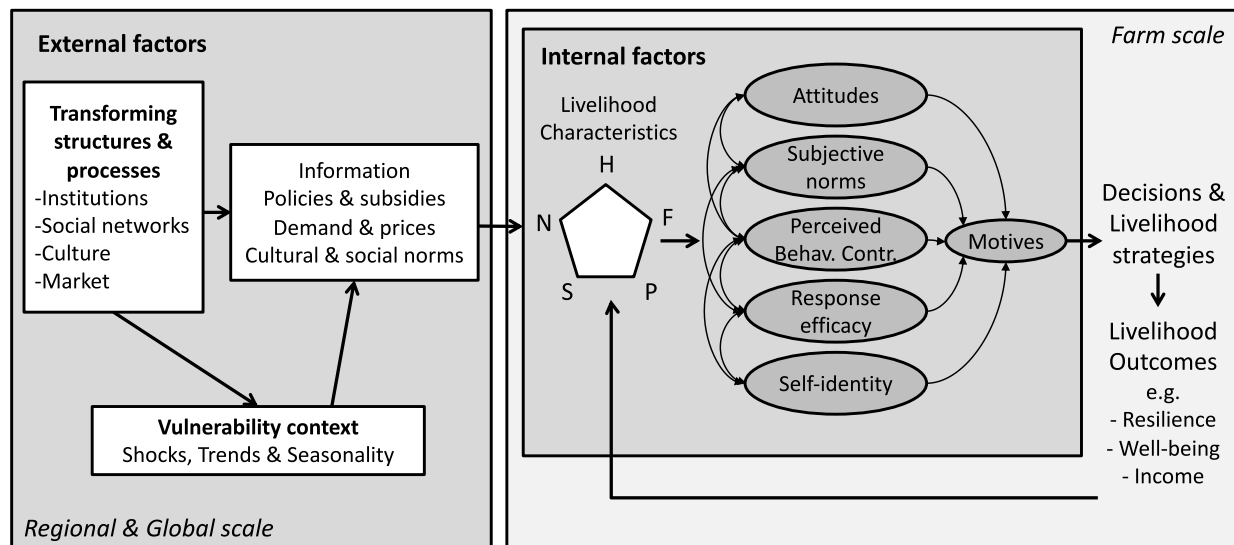


Fig. 2. Our conceptual framework combines the sustainable livelihood framework (see Fig. 1 in DFID, 1999), and farmer decision-making based on TPB (Mills et al., 2017). N, H, F, P and S denote the five capitals, i.e., natural, human, financial, physical and social capital.

management despite not receiving premium prices.

We used farmer education to assess human capital, ownership of consumer goods for financial capital, housing type for physical capital, the social capital indicator for social capital, and size of land holding for natural capital. We assessed agricultural productivity across all crops grown in each plot in terms of biomass weight, caloric content, and economic productivity per unit area. Finally, several indicators of agroecosystem resilience were chosen following Cabell and Oelofse (2012): membership in farmer groups (indicating social self-organization); crop diversity and economic production diversity (indicating functional and response diversity and redundancy); low external nutrient dependency (indicating coupling with local natural capital); caloric plot productivity; and low labour dependency (indicating autonomy). We inferred resilience outcomes for organic farmers in comparison to conventional farmers, whereas other livelihood outcomes (the five capitals) were derived from the semi-structured interviews and focus groups. See Supplementary Materials 1 for our calculation methods. Our qualitative data were analyzed using thematic and axial coding (Cope, 2010).

When analyzing our data, we discovered that farmer motivations and livelihoods could be usefully explained by grouping farmers into three categories. The development of this typology is an important result in itself, which we discuss in the next section.

5. Results: Livelihoods and motivations of different types of organic farmers in Kerala

Nearly all the organic and conventional farmers interviewed were managing agroforestry plots (typically 'home gardens'), while cultivating subsistence and cash crops, including coconut, banana, nutmeg, arecanut, coffee, pepper, vegetables, tubers, and paddy rice (Supplementary Materials Fig. S1). All 36 conventional farmers were using chemical fertilizers, and most (72 %) also applied chemical pesticides (i.e., no 'organic-by-default' farmers in our sample). This is unsurprising, given the widespread adoption of Green Revolution practices and chemical inputs in Kerala since the 1970s (Government of Kerala and State Planning Board, 2013). Only four organic and five conventional farmers reported receiving remittances from family members overseas; these varied from small one-time support (e.g., for medicines), to 30–50 percent of total household income.

As noted, our analysis revealed that organic farmers in Kerala are not

homogeneous, and that important insights can be gained by developing a typology of farmers. We categorized the 36 organic farmers into three distinct types based on two key variables – whether farming was the main source of household income, and whether the farmers were certified (Table 1).⁴ First, "Hobby Organic Farmers" (N = 12) are part-time farmers who derive over half their income from non-agricultural sources, and grow organic produce for their own consumption, export and/or domestic markets. Second, "Non-certified Organic Farmers" (N = 15) are full-time farmers (deriving over half their income from agriculture) who focus on non-certified domestic organic markets. Third, "Export Organic Farmers" (N = 8) are certified full-time farmers who primarily produce certified organic spices and coffee for export. All the export organic farmers in our study were in Wayanad, a region targeted by organic NGOs since the early 2000s (see Section 2).

While analyzing the characteristics of these three groups, we found clear differences in their livelihood characteristics and motivations to adopt organic farming; marketing and management strategies; commitment to organic farming; and livelihood outcomes.

5.1. Livelihood characteristics and farmer motivations

We start by briefly discussing the *livelihood characteristics* of different organic farmer types (i.e. the 'Ability to adopt', Mills et al., 2017), and *farmer motivations* to adopt organic management (i.e. the 'Willingness to adopt', Mills et al., 2017).

Livelihood characteristics. The three farmer groups differed in their household and farm characteristics. *Hobby organic farmers* received their income mainly from non-agricultural activities like banking, teaching, or business. They were highly educated (bachelor's degree or higher), and typically had large land holdings (Table 1). They had the highest multidimensional wealth score (Table 1), lived in large houses, and owned many consumer goods. *Non-certified organic farmers* were full-time farmers who were typically less wealthy, farmed a smaller plot of land, and were less educated than other organic farmers (Table 1). *Export organic farmers* were also full-time farmers, and middle-class. They cultivated more land (being in Wayanad, where farm sizes are larger, see Supplementary Materials Table S2), and were well-educated.

⁴ One organic farmer was excluded as he could not be easily classified (he practiced farming out of necessity but derived only 50% of income from it).

Table 1

Average household and farm characteristics of the three organic farmer groups, as well as conventional farmers. Values are medians \pm MAD, unless otherwise indicated.

	Hobby	Non-certified	Export	Conventional
N	12	15	8	32
Household characteristics				
% income from agriculture ^a	19 \pm 22	98 \pm 4	100 \pm 0	90 \pm 15
% farmers certified organic ^a	36	7 ^b	100	/
% farmers in Wayanad (vs Thrissur)	58	40	100	56
Farm size (acres per holding)	3.7 \pm 2.0	2.3 \pm 1.5	5.6 \pm 2.5	3.0 \pm 2.9
Age of interviewed farmer	60 \pm 5	63 \pm 18	51 \pm 5	54 \pm 15
Sex (% men)	75 %	93 %	100 %	91 %
Religion ^c Christian				
(% farmers) Hindu	64	50	100	56
(% farmers) Muslim	36	50	0	31
(% farmers)	0	0	0	13
Household size (number of people) ^d	3.5 \pm 2.2	4.0 \pm 1.5	4.5 \pm 2.2	4.0 \pm 1.5
Total number of children staying in household	2 \pm 0.74	2 \pm 1.48	2.5 \pm 0.74	2 \pm 0
Years of schooling of farmers	16 \pm 1.5	10 \pm 3.0	12 \pm 1.5	10 \pm 3.0
Years of schooling of adult children	17 \pm 1.5	13 \pm 1.0	16 \pm 0.7	14 \pm 1.7
Duration farming (years)	30 \pm 23	41 \pm 13	33 \pm 10	33 \pm 18
Standardized wealth score (out of 10)	7.0 \pm 0.0	5.0 \pm 0.8	6.0 \pm 0.4	5.5 \pm 2.3
Standardized social capital score (out of 10)	5.0 \pm 1.0	7.3 \pm 2.0	6.7 \pm 1.0	5.3 \pm 1.0
Farm characteristics				
Livestock (LSU) ^e	0.04 \pm 0.06	2.08 \pm 1.61	1.80 \pm 1.63	0.61 \pm 0.91
LSU change compared to 10 years ago	-4.11	-1.43	-2.08	-2.62
Part-time labour employed (% of farmers)	75	86	88	75
Part-time labour employed (# of labour-days)	50 \pm 74	30 \pm 44	251 \pm 335	50 \pm 74
Full time labour employed (% of farmers)	42	13	25	28
Full time labour employed (# of labour days) ^f	-	-	-	-
Economic plot productivity ('000 INR acre ⁻¹)	105 \pm 83	74 \pm 65	71 \pm 33	94 \pm 67

^a Variables used in farmer classification.

^b One 'Non-certified farmer' had received organic certification but did not sell produce in certified markets. As he had sought certification without an NGO's help and was not producing for organic export markets, we included him as a 'Non-certified farmer' rather than an 'Export farmer'.

^c While we are highly cognizant of the role of caste throughout India, we did not ask farmers their caste directly given the sensitivity of this question. Instead, we used religion, income, education status, and social networks as variables that could give us similar (albeit not fully identical) insights into the farmers' positions and opportunities in society.

^d Family members are considered household members if they are currently living in the household or absent for less than 1 month.

^e LSU = livestock units (i.e., different livestock types aggregated using coefficients from Eurostat (2015); reference unit (=1 LSU) is the grazing equivalent of one adult dairy cow).

^f the unit of #labour days is not relevant to full-time labour.

A majority of the hobby organic farmers and conventional farmers, and all the export organic farmers interviewed were Syrian Christians (Table 1).⁵ While there are class differences among Syrian Christians,⁶ they are on the whole caste-privileged, and many of them are also class privileged (Thomas, 2018). Indeed, Syrian Christians have the highest land ownership of all communities in Kerala (Zachariah, 2006). Besides, they have strong links to and share class interests with upper caste Hindus (Thomas, 2018), are economically and politically strong (Zachariah, 2006), and have considerable influence in public affairs.

Agriculture is a major occupation among them. They have been engaged in cultivating cash crops, including various tropical fruits in home gardens, since the early 20th century. Following the establishment of coffee, tea, and rubber plantations by the British in the 19th century (Jeffrey, 1992), they have dominated the cultivation of these and other crops such as cashew, cardamom, and pepper. These activities have made many Syrian Christians affluent.

Their influence has been further strengthened through their highly effective political organization, because of the extensive network of their church (Thomas, 2018). Indeed, as discussed in Section 5.1, the

⁵ They claim descent from high caste Brahmins converted to Christianity by the apostle St. Thomas, who is believed to have arrived in Kerala in 52 CE. Because of the pervasiveness of caste in India, and its persistence even after conversion, Syrian Christians claim, and are regarded to have, upper caste status in Kerala (Thomas, 2018).

⁶ Lower class Syrian Christian peasants migrated in the early 20th century from Travancore in southern Kerala to Wayanad in northern Kerala, where they bought land cheaply and cultivated it (Thottathil, 2014).

church and associated NGOs have played an important role in motivating farmers to adopt OA, and developing markets for their OA produce.

Examining the livelihood assets of the organic farmer groups also highlights important differences (Fig. 3). *Hobby farmers* had the highest human, financial, and physical capital but low social and natural capital (due to small land holdings). *Non-certified farmers* had high social capital, intermediate physical capital, and low human, financial, and natural capital. *Export farmers* showed the most even distribution – with intermediate values – across the five categories (Fig. 3).

Hobby farmer motivations. Hobby farmers said they adopted OA due to an interest in farming, and a desire for tasty, safe, and healthy food, rather than for economic reasons. One of them noted: "I am basically a couch-potato who is interested in growing my own food without any pesticides". Another said: "I get satisfaction from farming. I'm working [in the office] and most of the time I'm not satisfied in this work. [...] But in my farming, I get more satisfaction".

Hobby farmers noted that their most important motivation for practicing OA was to avoid chemical inputs, which they believed led to cancer and deformities in children. They also saw themselves as stewards of the land and believed that farming had an important societal role. They were well versed in organic ideas, and deeply involved in the OA movement (Table 2), organizing meetings, teaching, editing journals, and writing on OA. Drawing on the constructs of the TPB, hobby farmers were strongly driven by their attitudes toward and self-identification with OA, and the belief that their actions made a difference (response efficacy).

Non-certified farmer motivations. Non-certified farmers we

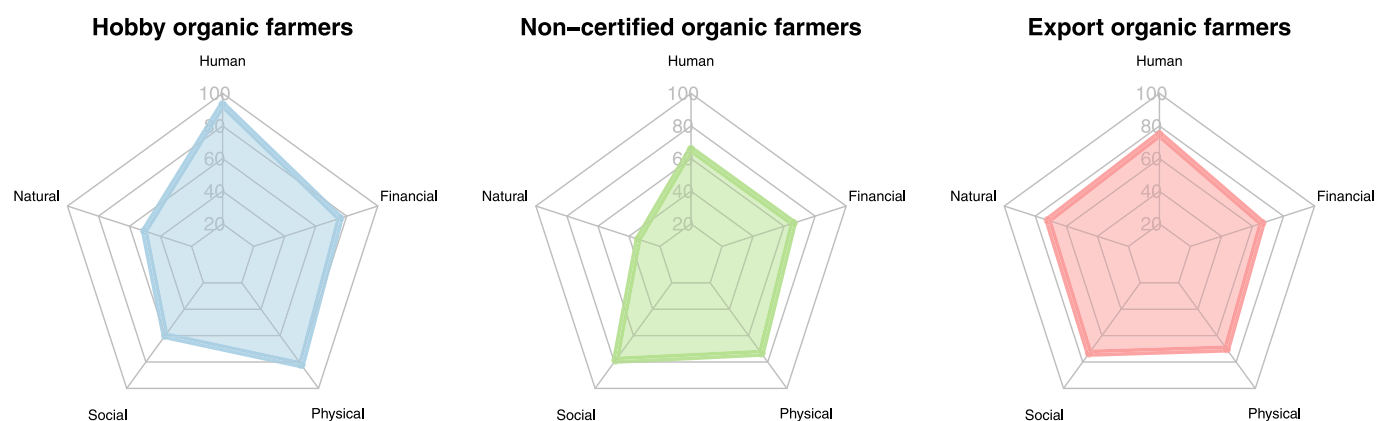


Fig. 3. Livelihood assets of the three organic farmer groups. Spider diagrams are scaled by the maximum value of each indicator across farmer groups (including conventional farmers, who are not depicted here). Farmer education (years of schooling) is used to depict human capital, consumer goods (number of goods owned, out of 8 key consumer goods) for financial capital, housing type (on a 4-point scale) for physical capital, social capital indicator (see Table 1) for social capital and size of land holding (acres) for natural capital.

Table 2

Organic management and marketing characteristics of organic farmer groups. Values are percentages of all farmers, unless otherwise indicated.

	Hobby	Non-certified	Export
Farming some area conventionally (%)	25	13	63
% of farm area organic ^a	100 ± 0 ^b	100 ± 0 ^b	88 ± 18 ^b
Duration farming organic (years) ^a	12.0 ± 11.1	7.5 ± 5.2	6.5 ± 3.0
Previously farmed conventionally (%)	73	69	100
Receives premium price (%)	22	73	100
Receives premium on all produce (%)	0	33	13
Knows of organic farm subsidies (%)	60	17	57
Receives organic farm subsidies (%)	30	8	43
Taken OA courses (%)	63	86	100
from NGO	50	29	100
from university/government	13	21	25
from organic movement ^c	0	36	0
Learned organic management (%)			
from NGO	29	23	88
from university/government	0	23	13
from organic movement ^c	0	38	0
from childhood	29	8	13
from media	29	15	0
from friends or family	0	23	13
Member of organic NGO (%)	25	7	100
Participation in organic movement ^c (%)	25	20	0
Commitment indicator (out of 1) ^a	0.75 ± 0.37	0.67 ± 0.25	0.12 ± 0.19

^a Represents median ± MAD.

^b Note that these values represent medians, which explains why e.g., 25% of Hobby farmers farm some area conventionally, but the median of the farm area that is farmed organically is 100%.

^c Organic movement here denotes talks, workshops organized by, or membership in the Kerala Organic Farming Association (KOFAI), or lectures or talks by key figures of the organic movement.

interviewed started OA on their own, without NGO intervention. They reported learning about OA from talks, media, friends, or members of the organic movement (Table 2). Like hobby farmers, they were often influenced by Subhash Palekar's 'Zero Budget Spiritual Farming' (Münster, 2016; Palekar, 2010).

Non-certified farmers practiced OA mostly for ideological rather than economic reasons. They were typically unaware of, nor receiving, subsidies or financial support (Table 2). Their most common motivations included better food quality and health (reduced exposure to chemicals, and chemical-free, nutritious food), improved soil fertility, more resistant crops, and better long-term yields.

For some non-certified farmers, OA provided a 'lifeline' amidst financial and personal hardships. One farmer had lost his wife to cancer and decided to transform his lifestyle, adopting a vegetarian diet and OA. For another, OA, along with naturopathy, meditation, and religious practices, was a response to health and financial problems. They firmly believed in the superiority of OA in terms of higher yields and addressing

food security, and that they were playing an important societal role through it. Non-certified farmer motivations to adopt OA were similar to those of hobby farmers, strongly driven by attitudes, self-identity, and response efficacy. However, social norms were likely to hinder persisting with organic because some non-certified farmers felt isolated from their neighbouring conventional farmers.

Export farmer motivations. Export farmers have been strongly motivated to adopt OA by NGOs such as the Catholic Wayanad Social Service Society (WSSS), Organic Wayanad, and Fair Trade Association Kerala (FTAK), who often aim to convert entire villages to organic farming, and provide training, organic certification, and access to international organic markets. Farmers frequently reported considerable pressure to convert from the NGO or their neighbours. One young export farmer reported that, according to an NGO, "there is no other way, the only way is to cultivate organically". Organizations like WSSS have leveraged their connections to the Church to successfully develop export markets, and promote OA among Syrian Christian farmers.

Export farmers were also motivated by the premium price for certified organic cash crops, especially after the low prices of the late 1990s and early 2000s (Section 2), which caused financial distress for many farmers producing for export (Mohanakumar and Sharma, 2006; Thottathil, 2012). According to an export farmer in our focus group: “We decided to try organic expecting higher prices ... and ... more money. Only for that reason we adopted organic agriculture. Or else what is the advantage for us to cultivate coffee and pepper organically? Because we’re not eating that”.

Export farmers also frequently emphasized family values, social status, and the desire to provide a good education and standard of living to their children. Another farmer in the same focus group added: “We need money, we want to educate our children, we want to live prestigiously in society. We don’t wish to live for long but we would like to live prestigiously as long as we live. For that we need money. We’re not thinking of adopting organic to improve our health. We don’t have time to think about that. How can a person without money think in such a way?”.

Nonetheless, a few export farmers also spoke about being motivated by organic principles and its benefits for the land and people. Drawing on the constructs of TPB, export farmers were mainly motivated to adopt by social norms (pressure from neighbours and NGOs). But organic farming was inconsistent with many of their attitudes and beliefs, nor were they motivated by wanting to make a difference (response efficacy). Importantly, OA was not a part of their self-identity.

5.2. Organic farming strategies

Given their differing livelihood characteristics and motivations, different types of organic farmers adopted different farming strategies, using different marketing channels and management methods, with differing levels of commitment to OA.

Marketing characteristics. *Hobby farmers* typically sold their produce in conventional markets,⁷ often without premium prices (Table 2, Fig. 4). Most *non-certified farmers* sold their organic produce (especially paddy rice and vegetables) in organic stores or directly to consumers (Fig. 4), often receiving a premium price (Table 2). *Export farmers*, usually associated with NGOs exporting certified organic coffee and spices, consequently produced more coffee and pepper than other farmers (Supplementary Materials Fig. S1), and received a premium price for at least a portion of their produce (Table 2).

Management characteristics. *Hobby farmers* often used agricultural practices requiring minimal labour (e.g., no livestock, mechanical weeding, and fertilizer; Tables 1, 3); they employed few part-time workers⁸ and were often unable to work on their farms due to other employment or old age. *Non-certified farmers*, being relatively poor, used little labour (Table 1) and agricultural inputs (Table 3). They owned more livestock than other farmer groups (Table 1) and used complex organic composts and pesticides – often based on Palekar’s ‘Zero Budget Spiritual Farming’ (Münster, 2016; Palekar, 2010). The most common crops grown by both groups were coconut, arecanut, banana and pepper, while export farmers most commonly grew pepper, coffee, coconut and banana (Supplementary Materials Fig. S1). Similar to hobby farmers, *export farmers* purchased about half their nutrient inputs (Table 3) in the form of manure, or other organic inputs like oilcakes or bacterial inoculants (e.g., *Trichoderma* or *Pseudomonas*). Some of these inputs were

⁷ Conventional markets are the predominant type of market, and do not focus exclusively on organic produce. When farmers sell their produce in conventional markets, they access the current market price, but not the organic premium.

⁸ While hobby farmers employ full-time workers more than other farmer groups, they usually employ single labourers who also help with household chores. These single labourers cannot work as much as dozens of temporary labourers employed throughout the season, e.g. by export farmers.

subsidised by organic NGOs. Export farmers often perceived OA as an intensive system dependent on external inputs. As one young export farmer from Wayanad explained: “In OA, we receive everything from the outside. Even the organic manures; all the things we use, we buy from outside. While in traditional farming everything is obtained from the field itself.” Export farmers also often managed parts of their land conventionally and used chemical fertilizers and pesticides (Tables 2, 3).

Commitment to organic agriculture. Organic farmers also differed in their commitment to organic farming. *Hobby farmers* were typically highly committed, having farmed their entire land organically longer than others (Table 2). Indeed, almost one third of them had never farmed conventionally (Table 2). *Non-certified farmers* were also highly committed, farming all their land organically, often being involved in the organic movement, and some never having farmed conventionally (Table 2). *Export farmers* were the only ones who applied chemical fertilizers on some of their plots (Table 3), and typically practiced both organic and conventional farming (Table 2). They had adopted OA more recently than other groups, having previously farmed conventionally (Table 2).

5.3. Livelihood outcomes from organic agriculture

It is difficult to tease apart livelihood characteristics that *drive* OA, from livelihood outcomes that *result* from the adoption of OA (Fig. 2). We asked farmers about their perceptions of how OA had changed their lives and livelihoods, to assess its livelihood outcomes, and examine changes in livelihood capitals. Self-expressed, emic, perspectives are more culturally appropriate and sensitive, than externally assessed etic quantitative indicators like household income or food security. We did not assess changes in farmers’ physical capital since adopting OA in Kerala primarily involves changes in inputs but not crop types, harvesting methods, or other management methods requiring changes to farm buildings, infrastructure, or machinery.

Financial capital. Most *hobby farmers* said that organic management had caused declining yields and income share from agriculture (Fig. 5). However, for *non-certified farmers*, OA often improved incomes (Fig. 5b); a non-certified farmer in Thrissur explained: “There is no question - organic is ... much, much, much [more] profitable than conventional farming”. This was likely because they produced most of their agricultural inputs themselves and employed little labour, while receiving higher prices for their produce. Indeed, over one third of them said they did so on *all* of their produce (much higher than other groups, Table 2). Unlike other groups, *export farmers* typically voiced strong discontent with the economic performance of OA; several of them felt it was inadequate for maintaining their livelihoods.

The lower income from OA was due to yield reductions, cost increases, and insufficient premium prices (Table 4). According to export farmers, organic yields for coffee are half that of conventional (as in Latin America, Lyngbaek et al., 2001; Valkila, 2009), while pepper can perform as well (or better) with organic methods. The higher costs resulted from expensive inputs and higher labour requirements for producing and applying organic fertilizers and pesticides. Farm labour is scarce in Thrissur (due to higher education levels and a strong tertiary sector) and Wayanad (partly due to the Rural Employment Guarantee Scheme⁹) (Thadathil and Mohandas, 2012). Labour scarcity and costs affected export farmers the most due to their strong reliance on hired labour (see Table 1). Finally, the premium they received for their certified organic produce did not compensate for yield losses and higher labour costs. Even the head of a large organic export NGO in Wayanad

⁹ In 2006, the national government introduced the Mahatma Gandhi National Rural Employment Guarantee Scheme, which guarantees work for part of the year to eligible households. This scheme has been criticized for removing labour from agriculture, but under some conditions, can provide cheap farm labour (Thadathil, 2012).

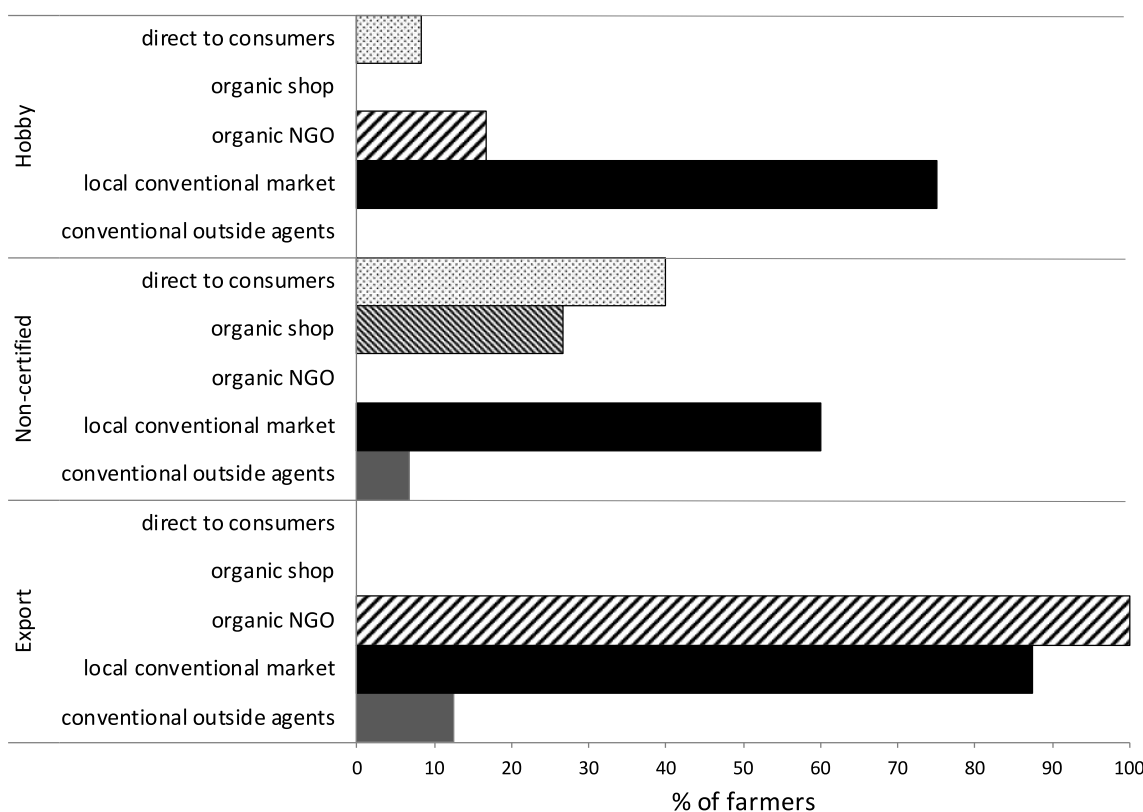


Fig. 4. Marketing channels of organic farmer groups. ‘Conventional outside agents’ represents agents from neighbouring states (e.g., Karnataka) who come to the farm and buy produce from the farmers.

Table 3 Management practices of different organic farmer groups. Values are percentages of all farmers, unless otherwise indicated.

		Hobby	Non-certified	Export
Fertilizer	Chemical fertilizer	0	0	50
	Animal manure	100	73	75
	Compost	42	60	50
	Jeevamrutha ^a	25	47	38
	Oilcakes	25	27	63
	Bacterial inoculants	8	7	25
	Purchasing fertilizers	83	60	88
	% of fertilizers purchased	50 ± 8	20 ± 30	47 ± 31
	Purchasing animal manure	67	27	38
Pest control	Chemical pesticides	8	7	13
	Organic pesticides	58	80	75
	Biological pesticides	17	0	50
	No pesticides	33	13	13
Weed control	Herbicides	0	0	0
	Manual weeding	75	93	100
	Mechanical weeding	42	20	38

^a Jeevamrutha is a fermented compost mixture based on the principles of ‘Zero Budget Spiritual Farming’ (Münster, 2016; Palekar, 2010).

acknowledged this situation.

Although NGOs introduced OA to address the dramatic price drops in cash crops in the early 2000s, it appears not to provide financial benefits under current economic conditions. Market prices were as low as 60 INR (\$0.84) per kg for pepper, and 28 INR (\$0.39) per kg for coffee, in 2004–2005 (Government of Kerala and State Planning Board, 2008), and organic farmers received a price premium of 50–100 percent over conventional markets. By 2013, as conventional market prices increased considerably (to 347 INR (\$4.86) per kg for pepper, and 66 INR (\$0.92) per kg for coffee; Government of Kerala and State Planning Board,

2013), premiums dropped to only 15–20 percent for organic coffee.

Additionally, export farmers often experienced marketing problems. NGOs that provided an organic premium were considered unreliable regarding their purchase quantities and timing; the periods of highest international market and NGO demand often did not coincide with harvest periods. Consequently, many export farmers had to sell part of their organic produce in conventional markets without any premium (Fig. 4).

Natural capital. While the size of their land holdings had usually not changed recently, 75 percent of hobby farmers, 80 percent of non-certified farmers, and 88 percent of export farmers, as against 26 percent of conventional farmers, experienced increased soil fertility on their farms over the previous 10 years, after adopting OA (Fig. 5c). Additionally, many organic farmers reported increased pest resistance due to improved soil health. OA thus appeared to restore soil fertility, increase pest resistance, and – as many farmers believed – improve long-term yields. Most organic farmers across all groups reported these natural capital benefits of OA.

Human capital. Adopting OA often enhanced human capital through increased knowledge and training for some farmers. For hobby farmers, who were already highly educated, OA provided limited knowledge gains, and only a few had received associated training (Table 2). Most non-certified farmers, however, had received training through the Kerala Organic Farmer Association (KOFAI), as did all export farmers from NGOs (Table 2).

Social capital. While hobby farmers generally had few close relationships within their local communities and thus low social capital (Table 1), they often had strong relationships with fellow organic farmers and key figures within the organic movement. Non-certified farmers had high social capital that was critical to their success – they were well integrated into their local communities and depended on social networks to access organic markets and premium prices, given their lack of organic certification (Table 1). Non-certified farmers were often

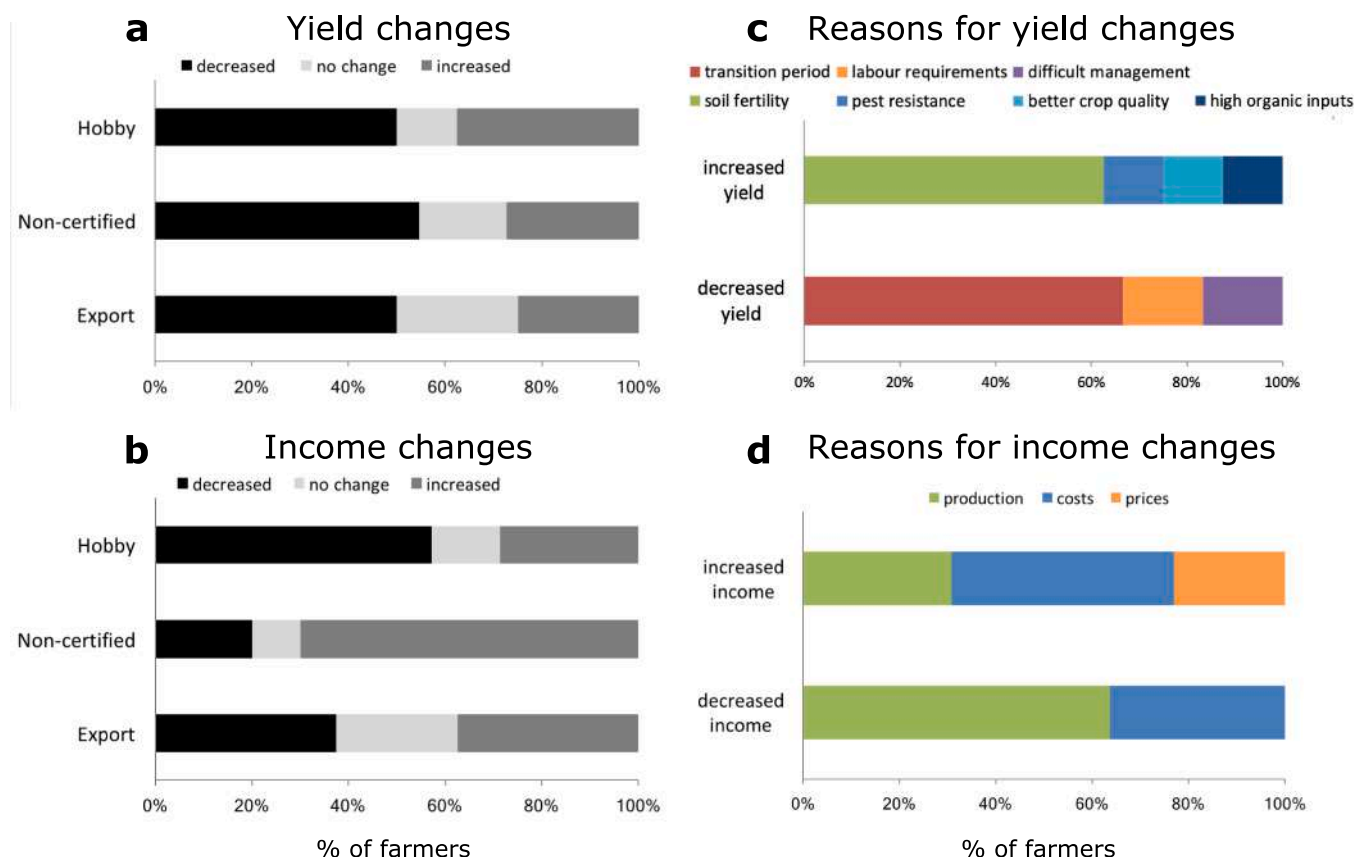


Fig. 5. Livelihood changes experienced by the three organic farmer groups after adoption of OA (panels a and b) and explanations for these changes across all farmer groups (panels c and d). Income changes refer to changes in total household income due to adoption of OA resulting from changes in crop production, management costs or prices received for produce.

Table 4

Impact of OA on livelihood outcomes of different organic farmer groups. This table summarizes the most common tendencies for each group. An upward arrow indicates a positive impact (e.g., lower production costs, higher resilience), a downward arrow a negative impact (e.g., higher production costs, lower resilience) and a long dash indicates no or little change in livelihood outcomes (relative to previous conventional management). Social capital for non-certified farmers shows both an up and down arrow as social capital increased for some non-certified farmers but declined for others (see main text). Changes to physical capital were not assessed as we assumed negligible impacts from the adoption of OA.

	Hobby	Non-certified	Export
Financial capital	↓	↑	↓
Yields	↓	↓	↓
Low production costs	↓	↑	↓
Prices	—	↑	↑
Natural capital	↑	↑	↑
Social capital	↑	↑↓	↑
Human capital	—	↑	↑
Resilience	—	↑	↓

members of KOFAI (Table 2), which enabled them to receive training, exchange knowledge, and access organic markets. Many non-certified farmers were highly respected in their communities for their entrepreneurship. However, some, often the only ones in their village farming organically, reported antagonism with neighbours. One such farmer in Thrissur explained: “There was a lot of animosity because my products were getting more profits, and more demand. [...] and many people became enemies”. For export farmers, organic certification required participation in farmer groups resulting in close relationships and cooperation with neighbours who also farmed organically. Additionally,

association with an organic NGO created a strong social network and a sense of belonging. Adopting OA thus clearly improved their social capital (Table 4).

Resilience. As described in our methods, changes in resilience from adopting OA were measured relative to conventional farmers, not over time. Hobby farmers showed intermediate resilience similar to conventional farmers. They had low labour dependency, and high economic production diversity (due to diverse crops), but low caloric productivity and dependency on nutrient inputs (Fig. 6). Non-certified farmers showed the highest resilience (Fig. 6), despite often being poorer, with fewer assets, than other farmers (Table 1). They were ‘globally autonomous and locally interdependent’, using Cabell and Oelofse (2012)’s terms, as they employed little external labour, applied few external inputs, sold directly in local rather than export markets (Fig. 4), and produced a diversity of high calorie crops (Fig. 6), thus spreading economic risk more widely. Despite strong social networks, export farmers showed low resilience (Fig. 6) since they depended on a few cash crops, high labour, external nutrient inputs, and external marketing agencies (that dictated prices, the quality and quantity of produce purchased, and management rules). Export farmers also highlighted the sad irony that they were growing conventional produce for the domestic market and their own consumption, while exporting their organic produce, because of inadequate domestic demand.

Satisfaction with organic agriculture. Hobby farmers commonly experienced income decreases after adopting OA, as discussed (Fig. 5b). Yet, their livelihoods were not significantly affected, as they were financially well off, and agriculture was not their major source of income. Further, since they farmed organically for ideological reasons, they would never consider returning to conventional agriculture. Non-certified farmers adopted OA on their own initiative to align their

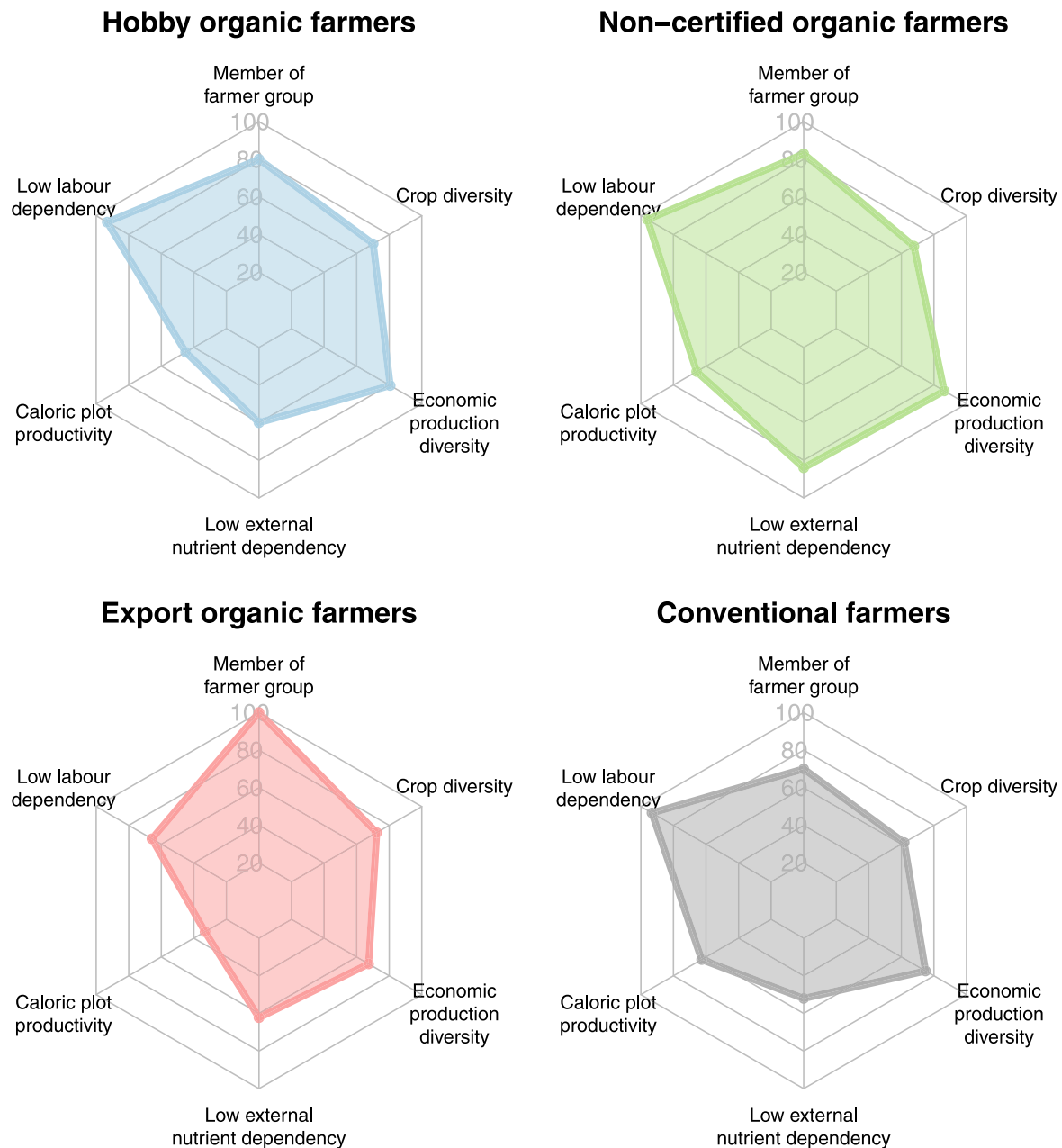


Fig. 6. Resilience outcomes of organic farmers due to adoption of OA, measured relative to the resilience of conventional farmers as the reference. Spider diagrams are scaled by the maximum value of each indicator across farmer groups (except for labour dependency and caloric plot productivity, where median + MAD (median absolute deviation) is used to scale due to existence of high outliers). Units are: member of farmer group (% of farmers); crop diversity (average number of crop species grown per plot); economic production diversity (Shannon diversity index of economic production in INR/acre, see methods); low external nutrient dependency (proportion of nutrient inputs purchased); caloric plot productivity (cal/acre, see methods); low labour dependency (part-time labour employed, in labour-days).

livelihood with their values. They often did so believing that it would increase long-term yields, although very few had experienced yield increases (Fig. 5a). Despite reduced yields, and selling some produce in the conventional market (Fig. 4), they were typically adamant about never reverting to conventional agriculture. As one non-certified farmer in Wayanad explained:

"Chemical and organic agriculture are like using allopathic or ayurvedic medicines. If you're using ayurvedic medicines, it'll take time to get absorbed in the body, but it acts long-term. On the other hand, if you're using allopathic medicines it will work quickly. The disease will be cured easily but after some time it will start again. [...] And it's the same way with chemical fertilisers compared to organic fertiliser: For chemicals, good yield will be there, but it will slowly destroy the soil."

Export farmers, who had typically entered OA for higher profits, voiced the strongest concerns about it and their own future. They complained about having to follow onerous guidelines, and incurring extra charges by the exporting NGO, while also facing yield reductions (which were particularly pronounced for coffee), high labour costs, and threats such as climate change and pest outbreaks. Importantly, they felt neglected by the government, which they believed provided little support. As one put it: "Organic is promoted only with the tongue". Many export farmers were considering reverting to conventional methods. However, some said they would continue organic farming longer, hoping for improved yields after the transition period; they also hoped that an organic NGO's new processing plant would help them sell more produce at a premium.

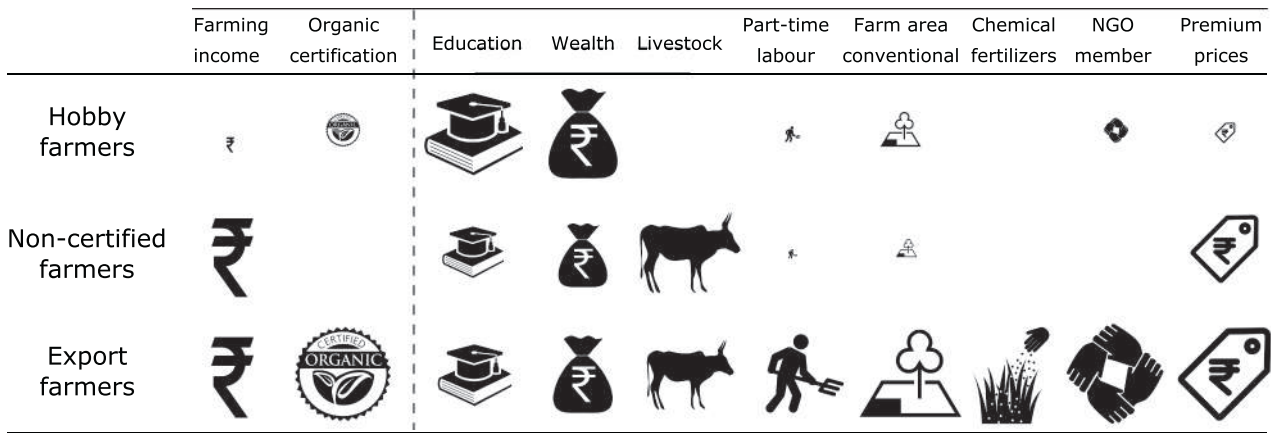


Fig. 7. Overview of key differences in livelihood characteristics and organic farming strategies between organic farmer groups. The size of each icon is scaled by the maximum value amongst farmer groups. The first two indicators are the ones used to categorize farmers into farmer groups. Indicators include: % income from agriculture (Farming income), % farmers certified organic (Organic certification), years of schooling (Education), wealth indicator (Wealth), LSU (Livestock), part-time labour employed (Part-time labour), farming some area conventionally (Farm area conventional), use of chemical fertilizers (Chemical fertilizers), member of organic NGO (NGO member), receives premium prices (Premium prices). For values of indicators see Tables 2, 3 and 4.

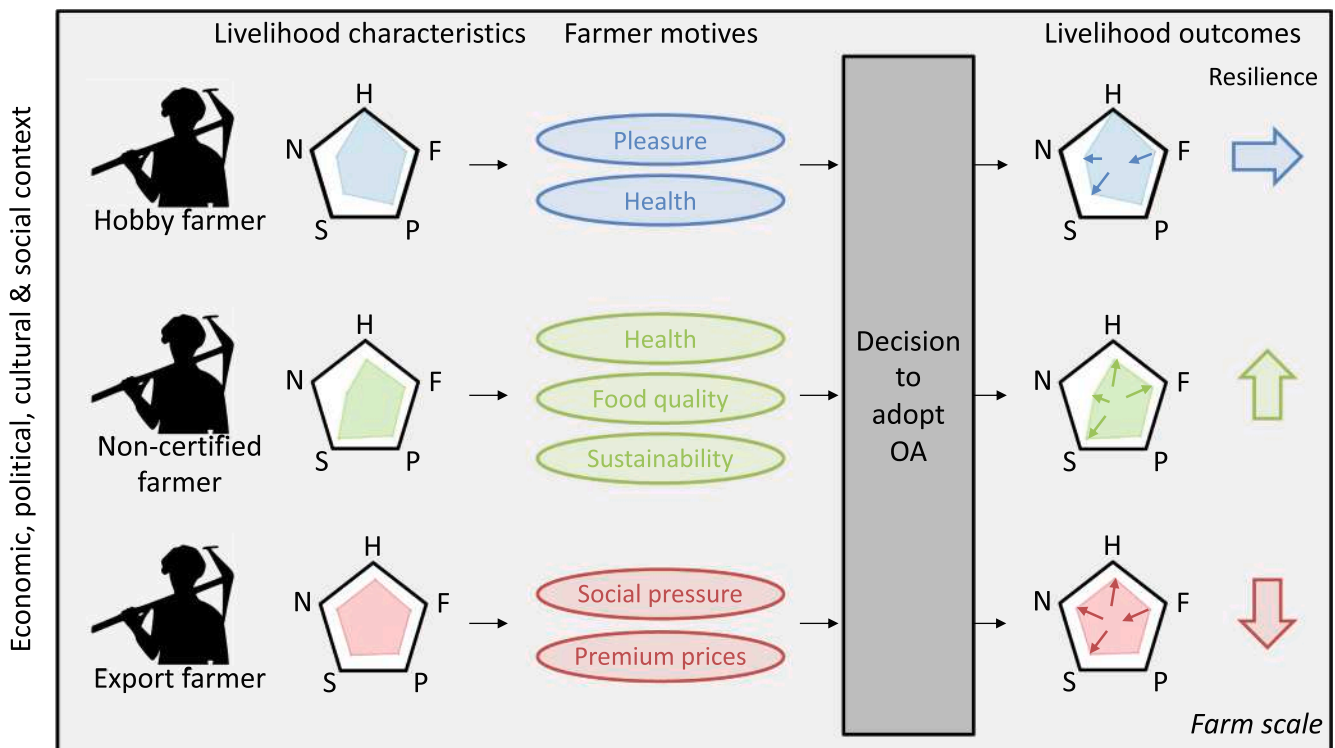


Fig. 8. Conceptual summary of study results. Different organic farmer types differed in their livelihood characteristics, their motivations to adopt, as well as the livelihood outcomes from adopting OA. No arrow in the livelihood outcomes 5 capitals pentagon indicates no change in this dimension. H in the asset pentagon denotes human capital, N natural, F financial, P physical and S social capital. See Fig. 3 for further details on livelihood characteristics, Table 4 for further details on livelihood outcomes and Fig. 2 for further explanation of the conceptual framework used in the study.

6. Discussion and conclusions

We have identified three broad types of organic farmers in Kerala’s Thrissur and Wayanad districts: hobby, non-certified, and export farmers. Creating this typology is useful to highlight clear differences in farmer characteristics (Fig. 7), motivations, and livelihood outcomes (Table 4) – it offers insights into differing pathways into, and outcomes of, OA. In turn, we argue that different policy interventions are vital for different types of organic farmers.

Studies in the Global North have classified organic farmers according to their ‘pragmatic’ or ‘committed’ motivations (Darnhofer et al., 2005;

Fairweather, 1999). Similar typologies have been developed for other agro-environmental decisions (Fish et al., 2003). Our study is one of the first, to our knowledge, to create a typology of organic farmers in the Global South, and investigate comparative motivations and livelihood outcomes.

6.1. Success of organic agriculture depends on who adopts it and why

We examined the success of OA based on farmers’ own emic perceptions of its outcomes. Farmers defined success as enhanced financial capital and well-being, which included health benefits, social

connections, and livelihoods aligning with personal values. Our case study highlights how tightly linked the success of a livelihood strategy is with farmers' beliefs and motivations, and their livelihood characteristics (Fig. 8). The degree of positive livelihood outcomes and satisfaction farmers noted with OA was influenced by their motivations for adopting it, the form of OA they practiced (e.g., staple versus cash crops, for domestic versus export markets), and their livelihood assets (e.g., poor versus middle-class versus wealthy, owning livestock or not) (Fig. 8).

Although hobby farmers were motivated by their positive attitudes and self-identity as organic farmers, rather than improved livelihood assets, adopting OA did influence some of their livelihood outcomes (Table 4, Fig. 8). Notably their financial capital decreased, while their social and natural capital improved. Yet the reduced financial capital was not as important for hobby farmers given that their livelihood assets were not determined by their farming activities.

Non-certified farmers generally had positive livelihood outcomes from OA (Table 4, Fig. 8), due to reduced costs, better prices, and increased resilience. They prioritized risk minimization and stability over maximizing production and income. Their OA practices resembled low-input traditional Indian farming that inspired Howard (1943) to promote OA in the west.

Export farmers experienced negative livelihood outcomes due to lower yields, higher costs, and lower resilience, despite receiving higher prices and other benefits from belonging to organic farmer associations (Table 4, Fig. 8). Their OA resembled modern farming, reliant on external labour, fertilizer inputs, distant markets, and profit maximization. Thus, export farmers practised a type of 'conventionalized' OA (Darnhofer et al., 2010). Münster (2016, p. 232) similarly observed that certified organic farmers in Wayanad "change as little as possible and simply [to] replace chemical inputs with 'permitted' organic inputs".

Given high labour costs, low organic premiums, and generally low livestock (and manure) levels in Kerala, the most successful type of OA appears to be practiced by non-certified farmers, who use more livestock compared to other farmer types (Table 1). Non-certified farmers thus closely follow traditional farming practices, rather than a modern farming system as practiced by export farmers. This conclusion aligns with results from neighbouring Karnataka, which has a similar agricultural context. There, modelling studies concluded that OA benefitted farmer livelihoods if organic inputs were produced on the farm rather than purchased (Purushothaman et al., 2013), with smaller farms benefitting more than larger ones (Purushothaman et al., 2012).

Our study also underscores the importance of attitudes and self-identity (a key TPB construct) in how farmers experienced livelihood changes from adopting OA. Non-certified farmers had voluntarily adopted, and were strongly committed to, OA. Their livelihood outcomes were often accompanied by other changes in their lives (e.g., becoming vegetarian, and more religious), so OA was an important part of their self-identity and they had strong positive attitudes towards it. We suggest that this, in turn, influenced how they experienced the adoption of OA – they expected and experienced positive outcomes. In contrast, export farmers did not self-identify with OA. They adopted it due to subjective norms/social influences (i.e., pressure from NGOs and peers), and anticipated financial benefits. As they depended on NGOs for marketing and premium prices, they also felt a lack of control over farming and its outcomes. They had negative attitudes towards OA to begin with, which, we suggest, influenced how they experienced and interpreted their experiences with it.

Importantly, personal beliefs and values resulting in satisfaction (or not) with OA also depend on the economic capabilities of farmers, i.e., the 'willingness to adopt' is influenced by the 'ability to adopt' (Mills et al., 2017). Norms and concepts regarding what constitutes 'good farming' are culturally constructed and shaped by economic context (Sutherland, 2013). Non-certified farmers perhaps value environmental stewardship and chemical-free food more than profitability due to their limited financial options (the 'taste of necessity', *ibid*). Meanwhile, the emphasis by export farmers on economic profitability, consumer goods,

and childrens' education might be shaped by their relative 'taste of luxury' due to larger financial assets.

The success of OA thus depends on *who* adopts OA (the livelihood characteristics of farmers, their financial capabilities and expectations), *what type* of OA is adopted (traditional or modern farming), and *why* farmers adopt OA (for ideological or economic reasons).

6.2. Internalized ideological commitments are a necessity for the persistence of organic agriculture

Although economic factors are often emphasized in farmer decision-making, it is also strongly influenced by personality traits, attitudes, and values (Austin et al., 2001; Mills et al., 2017; Siebert et al., 2006). As we reported, export farmers were motivated to adopt OA primarily due to financial and social factors. Meanwhile, non-certified and hobby farmers typically adopted OA following strong beliefs about its superiority (i.e., personal attitudes) and internalized organic values as important parts of their self-identity. Many export farmers in our study were considering reverting to conventional farming, while hobby and non-certified farmers were committed to continuing OA. Studies have shown that environmentally responsible behaviour that is intrinsically motivated, initiated, and maintained is more likely to be sustained than when driven by extrinsic motivations like monetary incentives or social norms (Brown and Kasser, 2005; De Young, 1996; Zepeda et al., 2013). Similarly, the success of agro-ecological programs is often hindered by environmental values not being internalized (Nelson et al., 2009; Stobbelaar et al., 2009). Other studies have also highlighted the importance of self-identity for pro-environmental farmer behaviour (Burton and Wilson, 2006; Lokhorst et al., 2014; Lokhorst et al., 2011). Self-identifying with organic values thus emerges as a key pre-requisite for continued commitment to and the perceived success of OA in our study.

Our study also highlights that personal attitudes are important for the perceived success of OA. For example, non-certified farmers were typically convinced that OA would produce long-term yield increases, despite not necessarily having experienced them. Alternatively, export farmers expressed disappointment about the same yield losses, without believing in long-term yield benefits. Ideological commitment and positive personal attitudes therefore appear to be crucial for sustained participation in OA, particularly given the challenges during the transition.

Interestingly, institutional support through NGOs, or their attempts to generate social or human capital – suggested as important pre-conditions for successful uptake of environmental practices (Burton and Paragahawewa, 2011; Mills et al., 2017) – did not, by themselves, create positive attitudes towards OA. Rather, our study shows that the degree to which farmers self-identified with OA, and felt control over the adoption of OA, are key preconditions for this purpose. We thus hypothesize that the TPB constructs that proved important for continued adoption of OA in this study (i.e., attitudes, self-identity, perceived behavioural control) are inter-dependent: positive attitudes towards OA were only persistent in farmers for whom organic values had become a part of their identity, adoption had been initiated voluntarily, and control was felt over their management and marketing activities.

Siebert et al. (2006: 318) note that "financial compensation and incentives [are] a necessary, though clearly not sufficient condition" for farmers to adopt conservation measures. However, by drawing on our conceptual framework, we conclude that strong pro-organic attitudes and self-identity as organic farmers are a necessary condition for the adoption of, and continued satisfaction with, OA, in a context that is unfavourable for agriculture generally, and OA particularly.

6.3. Implications for the success of organic agriculture as a livelihood strategy in the Global South

OA is frequently portrayed as a success story with a growing market

and expanding area (Willer and Lernoud, 2017). However, this view might hide complex dynamics of entrance and exit (Harris et al., 2008). EU data suggests that at least half as many farmers are leaving as are entering the sector annually (European Commission, 2010). However, the degree of exit, and its reasons, are not well studied (Flaten et al., 2010; Harris et al., 2008).

Kerala and India have seen considerable fluctuation in the area of certified OA (Government of Kerala and State Planning Board, 2015; NCOF, 2010; similar documents from Government of Kerala for 2013 and NCOF for 2005–2010 and 2012 were reviewed to compile this data). We believe that this might be caused by concurrent high levels of entry into and exit from the sector. Several export farmers and key informants we interviewed reported high drop-out from OA. In one village, of the 48 farmers who had adopted OA, only 16 were practicing it four years later; in another, this number dropped from 98 to five. The experience of the Organic Wayanad NGO (formerly the largest organic marketing agency in Kerala) is similar: of the 2000 new members in Wayanad in 2004, only 350 remained in 2013. As a key informant from Organic Wayanad explained, most members left because they did not receive the expected financial benefits, as yield losses were not compensated by organic premiums. Organic Wayanad now only accepts new members if farmers approach them, having learned that only those committed to OA will remain in it.

The many challenges facing organic farmers in Kerala highlight the need for increased policy support. While all the organic farmers in our study were facing labour shortages and yield reductions, many challenges were particular to specific farmer groups across our typology - e. g., procurement problems for export farmers, expensive external inputs for export and hobby farmers, and a sense of isolation for some non-certified farmers.

Kerala has continued to promote and support OA. We argue that the nuanced understandings of organic farmers, and their diverse motivations and livelihood characteristics generated by our study will enable more effective policies and support mechanisms to be tailored to the particular needs, motivations, and concerns of each organic farmer type we have identified. We recommend that policy support for OA should primarily target non-certified farmers, who are the poorest group and have a strong ideological commitment to OA, and are thus likely to persist with it long-term. Policy support for them should foremost include strengthening and improving access to the domestic organic market. Also important would be subsidies during the transition, help with certification (e.g., participatory guarantee systems), and access to services including extension and peer-to-peer networks.

While export farmers show low commitment to OA, they are likely to persist with it if economic conditions for OA become more favourable. This would require a higher premium for organic coffee and spices, more reliable marketing outlets, and targeted research and extension support to reduce yield losses keeping in mind their specific management characteristics (e.g., low livestock numbers, high labour costs). Assuming funding constraints, our findings do not justify policy support for hobby farmers. They are as ideologically committed to OA as non-certified farmers, but are not farming for economic reasons, and will continue their practice without further support.

Our study also suggests that a large-scale transition to OA requires a cultural shift in farmer (and consumer) mindsets about what is 'good farming', alongside changes in the economic context. Only if farmers identify with and internalize organic values will they remain in OA long-term, even under changing economic conditions. Such a cultural transformation is already on-going in Kerala, as evidenced by all farmer types in our study expressing serious concerns regarding the detrimental effects of chemical inputs for human health, soil fertility and the environment, and aspiring to play a role in mitigating these effects. But many Kerala farmers still see such inputs as a necessary evil for achieving sufficient yields and income (see e.g., recent large-scale farmer protests against slashing fertilizer subsidies; NewsClick (2022)). Sutherland and Darnhofer (2012) argue that changes to cultural norms around farming

are usually neither linear nor rapid, but dynamic, often including time delays between changes in the 'rules of the game' (i.e., changes in policy, economic or socio-economic context) and changes in 'habitus' (i.e., farmers' habits and dispositions, including attitudes and self-identity). Importantly, given the high value farmers place on economic viability, profitability of OA might still be a pre-requisite for many farmers (particularly for 'pragmatic' export farmers) to consider adopting OA. But once they have converted to OA, continued exposure to OA practices and principles can change farmers' attitudes (Sutherland and Darnhofer, 2012). This suggests that if enough farmers transition to OA through increased policy support and better economic conditions, a tipping point could be reached that shifts the dominant notion of what 'good farming' is, enabling an easier and more enduring transition to OA.

CRedit authorship contribution statement

Verena Seufert: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Visualization, Writing – original draft, Writing – review & editing. **Stephanie E. Austin:** Investigation. **Madhav G. Badami:** Conceptualization, Methodology, Supervision, Writing – review & editing. **Sarah Turner:** Conceptualization, Methodology, Supervision, Writing – review & editing. **Navin Ramankutty:** Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Some of the data are confidential and cannot be shared as per the ethics agreement of our research, but any publicly available data that we compiled can be made available upon request.

Acknowledgements

We are grateful for the extensive and thoughtful comments from 3 anonymous reviewers, which greatly improved this manuscript in the course of the review process. This work was supported by a Heller Fellowship awarded to V. Seufert, and a Natural Sciences and Engineering Research Council (NSERC) Discovery Grant (RGPIN 341935-12) awarded to N. Ramankutty. We thank Dr. Kunhamu T. K. and the Kerala Agricultural University, as well as Wayanad Social Service Society (WSSS), Rasta, Organic Wayanad, and Fair Trade Association Kerala (FTAK) for hosting us and for providing logistical support. We are also grateful to Haseena Kadiri and Vishnu Satheesan for their outstanding research assistance in the field, Thomas Fox for logistical support in the field, and Kathy Impey, Aneeta Antony, Lea Rakovsky and Luca Seufert for help with transcription. We also thank Natasha Salter for help with the price and calorie analysis, Dr. Kimberly Nicholas and Dr. Hannah Wittman for helpful feedback on an earlier version of the manuscript, as well as the farmers and key informants for sharing their knowledge and opinions with us. Finally, we would like to thank Julie Fortin for help with some of the figures, and Yogi Joseph, Jacob Baby, and Sreelakshmi Ramachandran for useful discussions on Syrian Christians.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.geoforum.2022.103670>.

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