



Farming is charming: Informal learning of farmers in Coimbatore, Tamil Nadu, India

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Abstract

The agricultural sector in India has come to prominence as a source of employment and livelihood. It is one of the most significant informal sectors in the country, and one in which informal learning plays a major role. This article analyses the informal learning of farmers in Coimbatore, Tamil Nadu, India. In the course of this research, qualitative interviews with 34 farmers in Coimbatore were conducted and analysed with regard to informal learning. The findings show that informal learning is life-long and chiefly takes place at home in a family and peer group context. Informal learning is facilitated by training courses specifically adapted to farmers' needs, which can help them improve their situation on their respective farms. However, not every farmer attends these courses, indicating a need to strengthen the programmes, conduct information campaigns to raise awareness, and improve accessibility, especially for farmers and agricultural labourers.

Keywords India · Farmers · Informal sector · Informal learning · Skill formation

Résumé

La culture de l'agriculture : l'apprentissage informel des fermiers à Coimbatore, dans l'État indien du Tamil Nadu – Le secteur de l'agriculture en Inde a pris de l'importance en matière d'emplois et de moyens de subsistance. C'est l'un des principaux secteurs informels du pays, un secteur dans lequel l'apprentissage informel joue un rôle essentiel. Cet article examine l'apprentissage informel des fermiers à Coimbatore, dans l'État indien du Tamil Nadu. Pour cette recherche, des interviews

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qualitatives menées auprès de 34 fermiers à Coimbatore sur l'apprentissage informel ont été analysées. Les résultats indiquent que l'apprentissage informel se déroule tout au long de la vie, et ce principalement à la maison dans un contexte familial et au sein d'un groupe de pairs. Organisé dans le cadre de cours de formation spécialement adaptés aux besoins des fermiers, l'apprentissage informel peut aider ces derniers à améliorer leur situation dans leurs fermes. Néanmoins, tous les fermiers ne suivent pas ces cours, ce qui indique la nécessité de renforcer les programmes, de mener des campagnes de sensibilisation et d'améliorer l'accessibilité, en particulier pour les fermiers et les ouvriers agricoles.

Introduction

India has a large population and the fifth-largest economy in the world. It also has an extensive informal sector (FICCI 2017) which for the most part operates without state regulations, offering training not standardised by institutional norms (Kundu and Sharma 2001; Krishna 2005). The sheer size of India's informal sector indicates its significance as a source of livelihood, raising the question of how the working individuals learn, apply and pass on their knowledge to others (King 2012).

Among the various informal sectors in India, the agricultural sector is still highly important in terms of the size of its workforce (Venkatram and Sakthirama 2018). It is also important in terms of employment generation, especially in rural areas (ILO 2021). The workers in this informal sector possess skills and competences which are worth further exploration and recognition.

This article analyses the informal learning of farmers in Coimbatore, India, where agricultural activities are carried out following traditional methods handed down from generation to generation. In the course of this research, qualitative interviews were conducted with farmers in the region. The aim was to gain an insight into the nature of informal learning among farmers in the South India.

Terms and classification

This section introduces three basic concepts relevant to the research we present in this article: informal learning, the informal sector in India, and the agricultural sector in India.

Informal learning

The beginning of the 20th century saw the formation of professions requiring specific knowledge, which in turn led to the establishment of standardised education systems (Marsick 2009). The concept of informal education gained importance over time, finding its way into adult education in the USA in the 1950s and becoming fully established in 1972 with the publication of the UNESCO report *Learning to be* (Faure et al. 1972). A lack of formal education, particularly in developing countries,

often generates an interest in *self-education* beyond established institutions (ibid.). Informal education thus empowers marginalised sections of the population (Coombs and Ahmed 1974).

In the following years, distinctions were drawn between formal, non-formal and informal learning. Non-formal learning takes place alongside mainstream systems of education and training and does not typically lead to formal certificates. The European *Memorandum on Lifelong Learning* defines non-formal learning as follows: “Non-formal learning may be provided in the workplace and through the activities of civil society organisations” (CEC 2000, p. 9).

The same *Memorandum* defines informal learning as a “natural accompaniment to daily life” (CEC 2000, p. 9). This may make it difficult to record informal learning processes, since it is not always possible to distinguish clearly between formal and informal learning (Marsick 2009). Moreover, informal learning can be classified in various ways based on duration or different learning styles (Eraut 2004).

Even these very abbreviated explanations make it clear that different understandings of these terms prevail in academic discourse (Kumar et al. 2018; Pilz 2023). The present study takes an explorative approach, appealing to a broad understanding of informal learning along the lines of that defined in the above-mentioned European *Memorandum on Lifelong Learning* (CEC 2000), even though the limitations of this definition are obvious. With reference to the particular situation in India, we also take into account aspects of non-formal learning.

The informal sector in India

The informal sector in India generates over 54% of the country’s gross value added (FICCI 2017), covering a wide range of economic activities. The people engaged in these activities include farmers, fishermen, agricultural labourers, those engaged in animal husbandry, construction workers, weavers, vegetable and fruit vendors, barbers, and others (Koops and Pilz 2019; Regel and Pilz 2019). The reasons for the development of such informal structures are many, and often result from the unrecognised positive effects of formalisation, which can usually be seen at the lower end of society (FICCI 2017). However, informal enterprises are also associated with certain risks. Informal work is carried out without legal safeguards such as employment contracts, labour protection, minimum wage and holiday entitlement, to name just a few concerns. Low pay and low qualifications often go hand in hand with labour-intensive production without social protection (Kundu and Sharma 2001; Krishna 2005).

Since the informal economy produces goods and services for most households, the question also arises of how those working in the informal sector are treated. The vast number of informal workers and their importance for the overall economy cannot be denied. We can therefore assume that the people working in this sector have a high level of competence despite lacking formal education and training (Pilz et al. 2015; Regel and Pilz 2019; Carswell and De Neve 2023). According to Joel Mullan and Caine Rolleston (2020) and Trent Brown (2022a), besides social barriers, other barriers to skills development are based on four main factors:

- availability of training;
- quality of training;
- usability (application) of what is learned; and
- perks of the training on offer (e.g. fee waivers, payments to participants, free accommodation etc.).

Improving these areas supports skills development, particularly when learning is shared among all employees in a company or community (Mullan and Rolleston 2020).

The agricultural sector in India

The Indian agricultural sector is almost exclusively informal (99.7%) (ILO 2021). It covers four major areas: arable crops, livestock, fisheries and forestry. Subsidiary activities such as storage, transportation, processing and marketing arise from these production activities. Taken together, agriculture and related sectors form India's largest employment sector. According to the United Nations (UN), 41.1% of India's population works in the agricultural sector and 70% of households are significantly dependent on agriculture. Crop production by small farmers (holding less than 2 hectares each) accounts for about 80% of total output (see FAO 2023).

According to the World Bank (2012), Indian agriculture faces three major challenges: improving efficiency (output per unit of land), combating poverty through social strategies, and maintaining agricultural growth congruent with the country's food security requirements. The underlying goal of all identified measures is the creation of a productive, internationally competitive and diversified agricultural sector (World Bank 2012). Ever since India attained independence in 1947, the agricultural sector has undergone considerable transformation. Technological improvements have enabled a progression from subsistence level to mass production capable of feeding the country's growing population. Farmers are offered periodical trainings with regular on-field contact programmes conducted by experts and farmers' meetings organised by local bodies. This helps farmers to keep their skills up to date and facilitates the smooth adoption of new technologies. The value of informal learning in the Indian agricultural sector is therefore recognised (Venkatram and Sakthirama 2018).

State of research

Research on informal education in India is based largely on Madhu Singh's (1998) studies on informal learning in New Delhi. Her comparison of eight typical occupations in the informal sector shows that workers in small enterprises are subject to considerable social and economic repression, which is also associated with a low level of education. "Learning a vocation as on-the-job training is the most widespread method of vocational training in the informal sector" (Singh 1998 p. 256). The transfer of skills and knowledge to others is limited due to socio-economic

barriers (Brown 2022a) and a lack of pedagogical skill. A high degree of specialisation means that the competences of each individual worker are limited (Basole 2016; Singh 1998). The same applies to economic competences such as marketing, financing and accounting, as these skills have little relevance for day-to-day business on the farm. Interpersonal skills and personality traits are also essential for the success of an enterprise.

In his study on a car mechanic's workshop in northern India, Jamie Barber (2004) found that, alongside work experience, tacit knowledge in the form of a "feeling" is built up through informal training structures. However, this knowledge is often resistant to change, hampering innovation which could improve informal learning (ibid.). Other research (Pilz et al. 2015) confirms these findings, revealing (for example) that street food vendors in India have a high degree of technical skill. Informal learning processes, especially directly at the workplace, are essential for the development of these skills.

The informal sector is therefore not to be equated with a low level of skills. Nevertheless, workers in the informal sector continue to experience various challenges in connection with their work. Similar results were also found in a 2019 study conducted in South India which focused on the skills of mechanics in small companies, classified under the informal sector (Koops and Pilz 2019). Research reported elsewhere (Venkatram and Sakthirama 2018) reveals that the agricultural sector is strongly affected by new developments such as technological innovations. Training beyond experiential knowledge is therefore particularly important in this sector.

Brown (2022b) found other interesting aspects in his study of the agricultural sector. Obstacles to practical learning go beyond pedagogical concerns and are often linked to socio-economic conditions. Hands-on learning is rarely observed in training situations, inhibited by administrative constraints, local agrarian structures and regional patriarchies. Practical learning must therefore be supported by regional strategies and financial aid for investment into the business (Brown 2022b, 2023).

It is also important to note that informal ways of acquiring skills require a demand-driven approach to vocational education and training (VET) which fosters acceptance and adoption (Carswell and De Neve 2023). Even stigmatised occupations such as waste management are associated with social practices that involve learning and skills acquisition (Rajendra 2022). In agriculture in particular, a lack of formal skills development opportunities can often be traced back to socio-demographic factors (Iyer and Rao 2022). This is confirmed by Brown's (2020) study, which also identifies different pathways to developing agricultural skills. A meta-study by Mullan and Rolleston (2020) identified the four main barriers to skills development already mentioned. Improving the availability, quality, usability and benefits of training would result in significant overall improvements to the informal sector (ibid.).

Most existing studies on farmers focus on the adoption of agricultural technologies, the way farmers' trainings are organised, and issues related to input management (Azumah et al. 2022; Kiwanuka et al. 2020). However, very few studies assess the informal sector, particularly agriculture, and issues related to acquisition of knowledge and the role of experience (lifelong learning) in farming. The present study makes it possible to explore and document how farmers update their

knowledge through informal means and how neighbourhoods and peer groups support each other, despite competing for resources and opportunities. Our study also measures the competency of the respondents in production and marketing, thus making an original contribution in these areas which have been neglected in previous studies.

Research design

Our research team consisted of the authors of this article, local field investigators and one translator (while participants' first language was Tamil, we analysed the data in English).

Research region

We conducted our study in Coimbatore, Tamil Nadu, which is located in the southern part of India. Agriculture is the main occupation in Tamil Nadu state. Due to its geographical location, a wide variety of crops can be found. Coimbatore is the third-largest city in the state. Located in the far west, the fertile soils and comparatively moderate temperatures offer good agricultural conditions. The goal of the local Department of Agriculture is to increase productivity through high-yielding crop varieties, which in turn increase farmers' income. Coconut palms are the most widely grown crop in the region. Pulses, oilseeds, vegetables, cotton and sugarcane are also cultivated (see GoTN 2023).

Research questions

Since agriculture in India is classified as part of the informal sector, it is important to explore the existing informal structures and the resulting learning opportunities and situations. In line with the research activities described above, we felt it would also be relevant to investigate whether there are formal learning structures in place to provide farmers and other farm workers with further knowledge. Our study explored how the informal learning environment provides farmers with the knowledge they need to practise agriculture effectively and independently, through the support of neighbourhood and peer groups. Finally, we consider whether informality in knowledge acquisition puts farmers at a disadvantage. The results are intended to contribute to the study of informal learning with a special focus on Indian agriculture.

Methodical approach

For the purposes of our investigation, we selected a small sample of Coimbatore farmers by suggestion and support of local field investigators. Our selection criteria were location in different villages around Coimbatore and different crop and fruit production. In the course of our study, we collected respondents' socio-economic data and linked these to questions on their existing competences, how

these were acquired, and how they are applied in agriculture. We organised interviews on the basis of local relations, supplemented by a translator. The interviewees were interviewed onsite at their homes, in their fields or at a pre-arranged location. This method served to verify the statements made and is the usual procedure in this field of research (Singh 1998, 2000). While the average duration of the interviews was about half an hour, this varied greatly due to time constraints on the part of the interviewees. Translation errors cannot be ruled out. However, we tried to limit these by asking specific questions and performing cross-checks.

Primary data collection was made through 21 individual farmer interviews (E) and two focus group discussions (with 2 farmers in FG 1 and 11 farmers in FG 2). The total number of interviewees was 34. In guided expert interviews, we interviewed the participants in their capacity as farmers; as experts regarding their informal learning processes and existing competences (Bogner et al. 2009). The wording and sequence of the questions varied slightly in the course of a semi-structured interview.

A second tool we used to generate information was a semi-open questionnaire based on an existing questionnaire for investigating the qualification level of street food vendors in the informal sector in India (Pilz et al. 2015). We adapted the questions to make them applicable to farmers. The questionnaire is divided into five topic areas with a total of 67 semi-open and open-ended questions, as well as an introductory section to record socio-economic conditions. Personal data are followed by a set of questions on informal learning, trainings attended, skills, competences and knowledge, and treatment in the informal sector. Interviewees' informal learning was assessed by framing both open-ended and closed-ended questions, such as:

- How long have you been practising agriculture?
- What changes have you made in crop cultivation?
- What technical support have you received from experts and neighbourhood farmers?
- What skills and competences do you possess?

Competences were bundled in the areas of production, sales and marketing. We further adapted the questionnaire after a pre-test. The interviews, which we conducted in a mix of Tamil and English, were recorded during the survey and later transcribed using keywords. This made a partial transcription into English possible. Linguistic peculiarities were disregarded, errors in syntax and grammar corrected and transferred back into first-person singular. We conducted each interview with the support of local field investigators who were trained briefly prior to the field enquiry and also at the time of pre-testing the interview schedule. We compiled socio-economic data as quantitative data in tabular form and applied a simple percentage analysis. We evaluated the remaining data in the course of a qualitative content analysis. The categories of our analysis are based on the question design and the dimensions developed in advance (Mayring 2014).

Results

The socio-economic situations of the sample respondents are presented in Table 1. In the region of Coimbatore, most farmers are male (by self-identification) and own cultivated land. Our sampling is therefore in line with the overall socio-economic situation of farmers in the region.

Informal learning

The interviewees reported that their learning takes place chiefly within the family framework across generations. It is not a matter of formal learning processes that can be observed in a concrete way; rather, learning occurs through watching and imitating activities since childhood, in line with the concept of *lifelong learning* (see CEC 2000). The father is most often mentioned as the person who shares his experiences with his children. Emphasis is placed on sharing and building up one's own experience. A decisive factor for informal learning is the presence of other nearby farmers (peer groups) who, as neighbours, are in constant exchange with each other.

“My father and some neighbours showed the techniques and shared information needed to run the farm business.” (E 8)

It is therefore not surprising that the family is largely cited as the actor (institution) which had brought our interviewees to farming. Whilst a number of

Table 1 Socio-economic status of sample respondents ($N = 34$)

| | |
|---------------------------------------|---|
| Age structure | 24–83 years |
| Women | 3% |
| Men | 97% |
| Occupational status | |
| Employee | 0% |
| Owner | 100% |
| Literacy rate | 91% |
| Highest level of formal education* | |
| Primary education (1–5 years) | 6% |
| Upper primary education (6–8 years) | 17.5% |
| Secondary education (9–10 years) | 23.5% |
| Higher secondary education (12 years) | 15% |
| Graduated (above 12 years) | 38% |
| Approximate annual family income | INR 100,000–1,200,000 (EUR 1,250–15,000) |
| Cultivated area | 0.5–15 acres |

*Children in Tamil Nadu join primary school when they are 6 years old. Formal schooling is compulsory and free for all children aged 6–14 (i.e. up to completion of upper primary level). The language of instruction in state-run schools is primarily Tamil.

respondents claimed to have established their business purely out of self-interest, these statements must be viewed critically, because:

“It is the usual way to start your own business when your family works in agriculture.” (E 4)

Since local infrastructure conditions and environmental factors all point in the direction of agriculture, it is likely that a decision to take over a farm results from these factors. The role of the family is therefore essential, a finding corroborated by other research (Pilz et al. 2015; Singh 1998; Brown 2020).

Informal learning is disseminated among diverse agricultural labourers, since each farm has either a fixed or a varying number of employees. Their knowledge is partly responsible for the farmers’ success. This is the reason why farmers prefer to hire experienced labourers who do not need any training. For example, one of the farmers in our sample reported that he and his employees followed a technique of staking and tying up tomato bushes with a rope in order to prevent bending of tomato crops or lodging during rain and storms. The owner of the farm had adopted this technique having seen that his workers experienced success with it. Learning thus takes place at the micro level and is integrated into everyday life on the farm. Workers bring their own prior knowledge with them and transfer it to their fellow workers and employers.

A large proportion of respondents reported that they had not made any major changes in their farm business, as the family farm had been run in the same way for generations. However, changes in the farm’s operations can be seen in the crops grown.

“Yes, since this year I only grow coconut. Before that I had vegetables like onion, and oil seed crops like groundnut. I still have livestock of 4 cows, 10 goats and some poultry. I quit because there were problems with wild animals like elephants, pigs and deer damaging the crops. So I decided to change to coconut.” (E 9)

The changes here also occurred due to the necessity of adapting to changing environmental conditions. Crops better adapted to the local soils are preferred. Other changes are related to water management. The lowering of the water table due to climate change is forcing many farmers to change their irrigation techniques or to rethink their choice of crops.

“Twenty years ago I planted many kinds of water-consuming crops, but because of high costs for labour and difficulties obtaining clean water, I shifted to other crops like vegetables (onion) and drip irrigation five years ago.” (E 1)

“We grew paddy and sugarcane, but these crops need a lot of water. Ground water sank down from 50 to 100 and even up to 1,000 feet. That is why we had to change our crops.” (FG 1)

The farmers are constantly reacting to environmental conditions as they go about their daily work, indicating informal learning of the “reactive” type. Changing

conditions create problems which have to be solved through intentional learning processes.

In addition, there is mutual exchange between government officials in the agricultural sector, owners of local agricultural produce shops and organisations such as the Farmer Producer Organisation (FPO). These actors share and pool their knowledge, thus promoting and initiating informal learning processes. For example, state government officials have been instrumental in the nationwide information campaign to promote drip irrigation, leading all respondents to adopt this subsidised technology.

The operators of the surrounding shops also serve as a source of information for farmers (Aga 2019). However, some respondents pointed out that their aim was to sell their products. The use of modern high-yield seeds and subsequent dependence on seed producers, and the declining fertility of the soil in connection with the growing need for chemicals, constitutes a major problem. These issues reinforce a growing interest in organic farming. Organisations such as the FPO regularly exchange information and receive subsidies in bundles which they pass on to their members. There are also people who report prior professional knowledge that helps them in their farming activities. When asked about their willingness to share their knowledge, they present a positive picture.

“Yes, I share with my family and friends. We all want to get a profit. That’s why we have to do it.” (E 10)

Reciprocal information exchange has a positive effect on economic conditions. We did not find any explicit or standardised procedures to pass on experience of the sort which is common in formalised learning processes. This could be due to farmers’ low pedagogical competence and is in line with other research results (Singh 2000). Instead, experiential knowledge points to the existence of implicit informal learning.

Farmers’ participation in trainings

Generally, two different arguments are made with regard to the word “training” organised exclusively for farmers. In line with the definition of the *Memorandum* (CEC 2000, p. 9), training is described as “formal” if it is of long duration, culminates in the issue of a formal certificate, and enables the trainees to train others in turn (Anikin 2021). Non-formal training, by contrast, usually lasts only a day or two. The subjects attending the training are exposed to some special topics and techniques where the farmer’s existing knowledge (prior learning) helps deepen their understanding (see also Moahid and Maharjan 2020; Wonde et al. 2022; Alotaibi et al. 2019).

Participation in non-formal training courses was partly confirmed by the interviewees but evaluated differently. Training courses in which farmers can gain information about technical developments and processes are offered by Tamil Nadu Agricultural University (TNAU), the Department of Agriculture and agricultural input firms. However, many farmers expressed scepticism about the training courses offered and mentioned problems attending them.

“No, there is no need for that, and we all know that. We have enough knowledge in agriculture. There is no need for training in agriculture at all.” (E 18)

“The TNAU will inform me when training takes place, but the new techniques don’t fit for me, because the labourers should be trained too.” (E 7)

If the added value of the training is not recognised, respondents decide against participating in it. They prefer informal learning, since many working on small farms cannot afford to take time off to leave the farm for training.

“No, I have no time and did not attend.” (E 1)

Nevertheless, some farmers did realise the potential benefits of attending training. Some interviewees reported that they attended such courses and found a positive influence on their production processes. For example, the use of fertilisers has been reduced as a result of training and other new techniques have improved the cultivation process.

“Sometimes you won’t learn something new, but sometimes there are new techniques we try on our own. We try to grow several crops and see what we will get as profit. We also have to spend our time on our farm.” (FG 2)

We did not find any formal vocational training in agriculture, since agriculture belongs to the informal sector and the training courses on offer do not explicitly aim at further qualification or certification. In general, our respondents were not convinced of the usefulness of the training on offer.

Skills and competences

We determined participants’ agricultural and economic competence levels on the basis of the interview statements, focusing on four main areas: crop cultivation, marketing, pricing and bookkeeping.

Crop cultivation

Since the cultivation process is multifaceted, farmers do not perform the same tasks every day. What does occur on an almost daily basis, however, is a visit to the fields to check conditions and respond accordingly.

“I visit my farm every day. Whenever necessary, I use fertiliser or spray chemicals when there is a pest attack.” (E 9)

The respondents’ experience ensures that they know what steps to take in any event.

“I see the signs if there are pest attacks. When I see this, I know what I have to do.” (E 11)

Employees, acquaintances or family members can also help farmers to choose the right way of dealing with problems that arise. Which course of action is appropriate varies according to the crop being grown.

Smallholders' professional activities are difficult to pin down in terms of time because they tend to be involved in all processes on their farms due to the size of their enterprises, and often live in the immediate vicinity of their fields. The knowledge they need to perform their work successfully is gained experientially through participation in agricultural activities.

“Based on what happened previously. We have to think about what happened. It is the experience we actually need. And with that we can think about the future. Learning from the past and applying it to the future. It also depends on the monsoon. We may have plenty of water. Accordingly we have to think of things that should be done or not done.” (E 18)

“Hard work is needed for success in this business. It is not easy, you have to take care of the product quality.” (E 16)

As farmers are subject to an ever-changing environment, a high degree of adaptability and tenacity combined with hard work is crucial for success.

Different crops are grown in markedly different ways. Coconut farmers achieve steady yields after five years of growing, unlike farmers growing legumes or vegetables. Depending on the crop, the length of time from sowing to harvest ranges from a few weeks to several months. Farmers therefore need to plan precisely in order to earn a regular income.

“We cultivate many different crops simultaneously. That's how to get a steady profit: planting something new every three months.” (FG 1)

Process planning in combination with sound product knowledge helps to solve this problem. Besides, the quality of the products grown determines the market price.

Marketing

“[We] separate between good and bad quality. We only sell good quality to the market to get the best price. The low quality we keep on the farm. They have to be destroyed or given for free to friends or labourers.” (E 10)

This procedure can be seen as a kind of quality assurance.

“Hard work will give you good quality. It also depends on the fertilisers.” (E 16)

However, some farmers found it difficult to name quality-promoting conditions, citing quality characteristics rather than methods.

No less important is the knowledge of market economic factors. Marketing products effectively and maintaining business contacts are crucial skills.

“You have to keep close business contacts, so you have a steady exchange of knowledge. With that we can learn from each other. That’s how to get experience.” (E 6)

“Marketing. You have to analyse the price. According to the season and climate you learn how the prices change.” (E 10)

Farm products are marketed exclusively via the local market or its traders. The buyers are called “middlemen” (E 7, E 8, E 9, E 13), “commission agents” (E 1, E 3, FG 2) or “local traders” (E 5, E 19, E 20, E 21, FG 2). The relationship with these middlemen is crucial because farmers are dependent on the price they dictate.

Pricing

“Prices are fixed by the middleman.” (E 1)

“I have to sell at his price. There is no opportunity to bargain over the price.” (E 6)

“I can’t fix prices on my own. Trying to sell on my own I would get a bad price.” (E 7)

The middlemen are a group over whose pricing the farmers have no influence. Escaping their control is difficult because of farmers’ limited time resources, even if, according to some statements, no price strategy is then applied. Other means to achieve the best possible price for the farmers’ products are evident, apart from maintaining quality through chemicals.

“There is no real strategy. When the price is too low, I will plough the field directly, because the cost of harvesting is higher. Then I go with another vegetable crop depending on demand and the season.” (E 9)

Farmers understand the cost of production of individual crops in relation to the selling price of the harvested goods. They therefore show an understanding of business management. Furthermore, the quotation above suggests that the interviewees have a precise understanding of the cost of covering labour and overall production. Since prices are largely pre-determined, other methods have emerged to generate a higher selling price.

“No, I have to go with the price the middlemen say. But I can store the onions until the price is higher.” (E 3)

Farmers need to monitor market prices daily in order to sell at the highest possible price. Although their business is affected by seasonal fluctuations, they can achieve a higher yield by positioning their crops efficiently. However, crops like tomato require cost-intensive cold storage and small-scale processing facilities. Dependency therefore also reflects the farmer’s crop choice.

Another form of securing income is through the government’s procurement policy. For food and seed security, some farmers grow pulses with technical support

from the Department of Agriculture and sell the final produce at a pre-announced price.

“I get the seeds like black gram or green gram from the government and they procure the final produce once harvested. The price is always set according to the quality.” (E 19)

Government officials advise on the cultivation process. Farmers compare their own experience with the advice given by the officials and either adopt or discard policies accordingly.

The importance of price and the pressure it exerts is also confirmed by statements from both focus groups:

“There is always a hike in the price of all products, but they don’t come to the farmers’ products in the end. The cost of water, labour and fertiliser increases. But our output price is not growing in the same way as the input prices. The cost of rice has risen 22% and that of onions 34% in the last 10 years.” (FG 1)

“There are two different markets, and we compare their prices. We get this information through friends.” (FG 2)

It is evident that our respondents had a high level of knowledge about the market and were in constant exchange with others in order to realise a good price. Even if they were unable to use pricing or marketing strategies in their daily business operations, they still showed an awareness of these structures.

Bookkeeping

Bookkeeping is an important aspect of farmers’ business management skills. Some farmers collected invoices received at the time of sale or kept simple books recording income and expenditure.

“I know how to record but nowadays I don’t maintain any records because I sell directly to the market and get a bill. So there is no need for recording.” (E 3)

“I record them in a simple diary. I do this from my experience. It is good to see if there is a profit or a loss.” (E 13)

“We maintain our records every day to track how much we spend on labour and other inputs. Also the amount of fertiliser we applied. So we know exactly what we earned and how much profit we made. In agriculture you need this. We learned to manage the account by experience.” (E 18)

These marketing and bookkeeping skills result from many years of experience. This also applies to the estimated profit of the farmers. None of our interviewees were able to give us an exact picture of the profit achieved. Profit is determined based on the harvest and the price that prevailed at the time. Nevertheless, most farmers had at least a rough sense of the current level of success of their business.

“I see the profit at the end of the season. Last year I made a loss, but this year it will be better. Loss and profit will equalise.” (E 3)

Since the price offered for the harvested crop is imprecise and subject to change, livestock is considered to be of greater importance as a source of income than daily earnings, since the milk from the cows guarantees a regular income.

Subject to the crops, the required operating capital differs in cost per acre and can be quantified approximately. Onions are the most expensive crops to grow. Prices for crops like banana and coconut palms are fixed annually, again indicating the farmers’ knowledge of the market. The same applies to regular operating costs.

“I lease one acre of land for 40,000–50,000 INR/year. For ploughing I have to calculate 1,000 INR/acre.” (E 5)

Farm business is largely financed from farmers’ own reserves, previous profits and regular income from livestock. In some cases, farmers also receive financial assistance in the form of loans based on the size of their land, or by depositing jewellery with the bank as collateral. Accordingly, some farmers have outstanding loans, but the exact amount was not disclosed.

Although farmers deny using pricing or marketing strategies, it is therefore clear that they have an awareness of these factors, even if the scope of application of these competences in daily operations is limited.

Impact of the socio-economic situation on learning

Since their products fetch low prices, the farmers we interviewed described themselves as a low-income group. They are fundamentally happy with their work, but their low earning capacity is a source of worry. Their options are limited. Nevertheless, previous learning and experience gives them enough confidence to survive in the business.

“I have no other way to go because I only know farming, so I have to be happy.” (E 19)

Most of our interviewees were family farmers who had been involved in farming all their lives and knew little of alternative models of livelihood. This was also confirmed by focus group FG 2. Due to difficulties such as falling prices and rising operating costs, some respondents were considering changing their business by growing other crops. A few were even considering relegating farming to a sideline or exiting the business completely. This option, however, would be a waste of their previous knowledge and require the development of new competences.

The farmers’ main demand is for stronger support from the government.

“The government should fix prices and support new ways of farming like organic agriculture. The price is the major problem.” (E 4)

In one of the focus group discussions, an alternative solution emerged:

“[Fixed] price is not enough. Storing facilities are important. Shoes are sold in air-conditioned rooms, but vegetables are sold on the market. Exporting our products would also help. The government could buy at a fixed price and sell to outsiders/foreigners. The profit realised should then come back to the farmers (...) Also, the middlemen should be eliminated.” (FG 1)

Some farmers would like to see a return to traditional cultivation techniques which do not use modern hybrid seeds and chemicals. These ideas, which sometimes seem nostalgic, are justified by a reduction in supply, which would result in rising prices. Moreover, using traditional methods makes farmers independent of large companies. The farmers felt that this made them more secure, since it avoided the financial risks involved in being too closely tied to the dominant chemical companies and seed producers. In terms of learning, this strategy carries the advantage that farmers already possess the necessary skills to implement traditional farming methods.

Discussion of the findings

Our findings show that farmers' skills and qualification levels are heterogeneous. It is evident that farmers possess diverse competences which allow them to fulfil the requirements of their occupation and to cope with changing, complex and specialised fields of activity. Whilst the small sample size means that we should be cautious in assuming that these findings apply across the board, it seems reasonable to think that the situations of farmers in other regions may be similar.

The ecosystemic classification of the stakeholders involved in the implementation of informal learning yields interesting insights. In situations where informal learning is dominant, family, friends, neighbours, acquaintances, land owners and agricultural officials all play a role in triggering learning processes in the individual. While government officials and TNAU training providers are responsible for capacity building through targeted programmes and the introduction of new systems, and thus teach farmers formally, the other stakeholders do not share this responsibility. They are simply part of farmers' daily lives, activating learning processes partly unintentionally. Informal learning therefore takes place in the confrontation with everything and everyone in a learner's environment. Our study also shows that different agencies, including the government, offer periodical trainings to farmers. However despite no major barriers in availability, quality, usability and benefits, few farmers felt that such trainings would add value to their existing skills and competences.

Ultimately, informal learning is by far the most important form of learning among Indian farmers. Formal learning on the farm was either not evident or found to be unimportant. Non-formal learning, on the other hand, is available in the form of training courses that serve to further educate and improve the farm and living conditions. We were able to identify implicit, reactive and deliberative informal learning processes, providing a comprehensive picture of informal learning.

The farmers in our sample had a comparatively high level of school education (38% had graduated at upper secondary level; followed by 23.5% who had completed lower secondary level) and remained actively involved in farming activities

until old age (Mehrotra et al. 2014); our oldest respondent was 83 years old. Their above-average level of literacy (91%) presumably reflects the fact that they need and maintain basic reading and writing skills in order to manage everyday business. We did not, however, find any connection between annual income, level of education, size of cultivated land and level of satisfaction.

All farmers in our sample benefited from informal, family-based learning processes. The consensus was that the family is the most valuable source of learning, followed by other groups from the social ecosystem. Although such informal learning opportunities do not occur in a planned and systematic way, they nevertheless contribute significantly to the development of a wide range of experiences. In a competitive environment, individuals share the knowledge that they accumulate in order to improve their working and environmental conditions. This is quite unique in the agricultural sector.

Farmers' participation in the formal trainings on offer was confirmed many times and showed the same problems that other studies have found (Mullan and Rolleston 2020; Brown 2020; Brown and Ali 2022). Clearly, these trainings must be made more relevant to farmers' needs if participation rates are to improve. They should supplement the various subject-specific skills and knowledge that the farmers already possess. These were shown to be considerable, disproving the idea that the informal sector goes hand in hand with a low level of competence. Comprehensive knowledge of all processes related to one's profession is essential for economic success. These results are also in line with other research findings concerning the informal sector (Brown 2022b; Brown and Ali 2022; Pilz et al. 2015; Venkatram and Sakthirama 2018; Koops and Pilz 2019). Whilst farmers may lack theoretical knowledge in some areas, they show a high degree of practical, action-based skills.

The statements that emerged with regard to farmers' treatment in the informal sector showed mostly a positive attitude, although there are suggestions for improvement in the conditions prevailing there. This finding is also in line with other research that promotes a needs-based approach to VET (Carswell and De Neve 2023). Hands-on learning is found to be essential, providing an opportunity to support regional strategies and sustain progress (Brown 2022b; Brown and Ali 2022). In these circumstances, the farmers take a rather demanding position towards state regulation. Independent initiatives such as joining forces with other farmers or selling their produce by themselves are not discussed. As a result, the interviewees only (self-)reflexively deal with changing economic conditions, to a limited extent. The results also show that farmers in Coimbatore learn in a similar way to other workers in the informal sector, which is largely in line with findings of other research (Pilz et al. 2015; Regel and Pilz 2019; Koops and Pilz 2019).

Conclusion

Although it focused only on a single region of India, this study has nevertheless generated profound insights. Whilst an unqualified generalisation of the findings is to be avoided, our study demonstrates that informal learning is a lifelong process. Though many other studies have also found that learning takes place at

home in the family context, our study shows that fellow farmers and the entire social environment can also trigger learning processes. The sharing of knowledge through neighbourhood or peer group support evidently plays a crucial role. In addition, non-formal training specifically adapted to farmers' needs helps them to improve their situation on their respective farms (Ramasamy and Pilz 2020). However, many farmers do not attend such trainings. This indicates a need to adjust and expand these programmes and make them more relevant, not only for the farmers themselves but also for farm employees, as they are also important players in the processes of skills acquisition and transfer of knowledge. There is also a need to strengthen the information campaigns, since we found that some respondents were insufficiently informed about the trainings already on offer and their advantages. This result is in line with other studies (Venkatram and Sakthirama 2018; Brown 2020).

Our findings also show the particular importance of targeted group-orientated communication via trustworthy multipliers in the region. The insight into concrete process structures shows that professional competences exist on a far-reaching level which goes beyond daily use. However, these competences are interwoven with the prevailing economic and agricultural context, which makes it difficult to look at them in isolation. In addition, the passing on of one's own experience to others seems to take place rather casually. Structured, concrete learning opportunities are not in evidence, nor are formal pedagogical competences.

Despite many day-to-day issues in crop cultivation and overall farming operations, most of the farmers reported satisfaction with their work. This deep insight into the learning processes of farmers in rural areas is very interesting, but the significant agricultural and cultural differences within India mean that further differentiation is urgently needed by including other regions in the research. It would also be relevant to extend the research method, e.g. over longer observation periods (Barber 2004), in order to avoid, for example, the phenomenon of social desirability (providing likeable responses rather than earnest ones) in interviews which is frequently encountered in India (Jambo and Pilz 2018). Questions about the possibility of a demand-oriented redesign of existing trainings in order to boost attendance are interesting for future research (Ramasamy and Pilz 2019). It remains to be seen how the implementation of such training would affect informal learners. It may even trigger a sustainable change in qualification and further learning through informal means.

In sum, our study confirms and extends previous findings about informal learning. In order to gain a more precise picture of informal learning in the agricultural sector, it would be useful for future research projects to differentiate between specific farming activities, such as cattle breeding, fishing or other kinds of farming. Any differences that emerge there could prove interesting (Pilz and Wilmshöfer 2015). Local differences in informal learning from other regions in India would also be relevant and informative, as would gaining a broader international perspective. Due to both cultural and agricultural/climatic differences, our findings cannot be transferred to other countries without reflection (Brown 2022a; Li and Pilz 2023). For this reason, it would be worthwhile to conduct similar studies in other countries and to compare them (Alotaibi et al. 2019; Azumah et al. 2022). There is therefore much to be discovered in the field of informal learning in the future.

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Declarations

Competing interest The authors declare no financial or non-financial interests that are directly or indirectly related to the work submitted for publication.

Ethical approval According to German legislation, ethics approval is not required for this research. The authors declare that the farmers provided informed verbal consent to participate in this study.

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