


## Article

# Enhancing Rural Resilience in a Tea Town of China: Exploring Tea Farmers' Knowledge Production for Tea Planting, Tea Processing and Tea Tasting

Xudan Lin <sup>1</sup> , Hong Zhu <sup>2</sup> and Duo Yin <sup>2,\*</sup>
<sup>1</sup> School of Geography, South China Normal University, Guangzhou 510635, China; [linxudan@m.scnu.edu.cn](mailto:linxudan@m.scnu.edu.cn)
<sup>2</sup> School of Geography and Remote Sensing, Guangzhou University, Guangzhou 510006, China; [zhuhong@gzhu.edu.cn](mailto:zhuhong@gzhu.edu.cn)

\* Correspondence: [yinduo@m.scnu.edu.cn](mailto:yinduo@m.scnu.edu.cn)

**Abstract:** Rural areas have undergone visible transformations in recent decades. It leads to some ecological problems. Enhancing rural resilience is necessary in the face of these changes. However, previous literature often ignored the roles of indigenous actors in this process. Consequently, we conduct participant observation and in-depth interviews to explore the process by which local farmer knowledge is produced in Fenghuang, a rural area that concentrates on the tea industry in China, and how this process contributes to the agriculture resilience of individual and rural areas. We find that local knowledge is a dynamic composition of daily practice highlighting the nature of adaptability in farmers' pursuits. Such knowledge is found to be constructed, exchanged, and then reshaped into a new and heterogeneous form that involves a mix of scientific forces and local practices, building a solid basis for individual and rural resilience. In addition, both sustainable agriculture and successful market promotion can be achieved by knowledge production. In this way, the meaning of "place" is reconstrued, morphing from a barren and backward rural area to a green and unique land with idyllic beauty. This metamorphosis offers belongingness to tea farmers and imposes on them the responsibility to contribute their efforts to the land.

**Keywords:** local knowledge; resilience thinking; rural development; agriculture



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## 1. Introduction

Currently, due to increasing modernization and industrialization, several social, economic, and environmental problems have emerged globally [1]. These changes are experienced differently at various spatial scales and obviously affect rural areas [2]. Continuous productivist dominance leads to several social and ecological issues, such as crop degeneration, biodiversity reduction, and environmental deterioration [3,4]. These are manufactured risks derived from dramatic technical changes [2] that decrease farmers' ability to withstand disasters [5] and imply that we need to enhance rural resilience to the unpredictable, dynamic, and "slow burn" disturbances of the present [6].

Building resilient rural areas is closely related to traditional agricultural development [7,8]. Although large-scale and standard agricultural production plays a dominant role in many rural areas, research has noted that such expert knowledge fails to consider local areas' specific contextual needs, leading to maladjustments and problems [9]. Consequently, local agriculture knowledge, which is a type of knowledge rooted in the land, is the most adaptive in the face of crisis and requires close attention [5]. Farmers are vital in this process because their "tacit knowledge of the social context", which draws from lived and embodied natural experience, provides a solid basis for production [10] (p. 5). Only by strengthening the resilience of individuals and communities can rural areas develop successfully [8,11].

Additionally, in contrast with previous claims of resilience, which emphasize a “bounce-back” process that involves “accommodating disturbances without experiencing changes to the system,” recent research suggests that in addition to recovery, being flexible and capable of reform is critically important [12]. This is an evolutionary approach that underscores the “bounce-forward” process [1]. In other words, a discussion of local knowledge is necessary to underscore the process through which indigenous experience absorbs external information, promotes itself, and becomes prepared to deal with unknown challenges, rather than being restricted to a range of traditional daily practices [7]. Consequently, this paper investigates how local knowledge changes and how it contributes to rural resilience.

In recent decades, considerable debate has centered around resilient development within the context of a developed world; however, many developing areas remain touched [13–15]. Therefore, we address our research questions by looking at the production and accumulation of local knowledge by tea farmers in Fenghuang, China, the cradle of Dancong tea. Dancong, a type of oolong tea, is famous due to the varied aroma of each type of tea tree in China. Residents of Fenghuang have made their living by planting Dancong tea trees for hundreds of years. This area was once poor due to its complex and challenging geophysical conditions. Nevertheless, after reform and opening up (a revolutionary Chinese economic policy) in 1978, the tea market became fully open and tea farmers owned the right to sell tea for profits. Additionally, with the growing popularity of tea tasting, Dancong sales rose annually, resulting in a Fenghuang economic development boom that largely eradicated farm poverty [16]. However, while healthy economic growth is necessary to create a resilient rural area, it is not sufficient. Extreme transformations have taken place in Fenghuang, which has experienced social and ecological conflicts between traditional agricultural practices and large-scale production practices that can lead to agricultural and environmental problems. It is important to understand how to deal with these problems in order to achieve a comprehensively resilient development. Moreover, it is important to determine how farmers can survive when faced with such dramatic changes while still preserving their resilience.

This paper elaborates the above questions by examining farmers’ knowledge production and its role in rural resilience, a topic that has scarcely been considered in prior resilience thinking. Additionally, based on the viewpoints of farmers, this paper offers a new perspective and a fine-grained approach for reproducing the social-cultural understanding of rural resilience. The paper is structured as follows. First, the theoretical framework of local knowledge and knowledge production in the context of the rural resilience development approach is discussed, followed by an overview of related research. Then, we present our findings thematically around the process of local knowledge production and the effect of this knowledge on rural resilience, specifically sustainable agriculture and market promotion. Finally, we provide a discussion and conclusion.

## 2. Local Knowledge Evolution

While we focus on the development of local knowledge, our starting point is to clarify its nature. Many scholars have explored and enriched knowledge’s meanings. Barth highlighted the characteristics of knowledge, which include a substantive corpus of ideas about the world, communication through various media as a series of representations, and distribution within a social context [17]. Local knowledge is presented in the same way within particular areas. Agrawal provided several definitions of local/indigenous knowledge, which is passed down through generations, gained from local people’s everyday life experiences [18]. In the agricultural context, Fonte defined similar forms of knowledge as “the technical knowledge utilized by farmers and producers to grow or prepare food in the specific agro-ecological context in which they operate” [19] (p. 210). Similarly, Šūmane et al. [7] (p. 2) used the term “informal knowledge” to represent forms of knowledge that are rooted in practitioners’ daily experiences; such knowledge comprises an “intimate understanding” of local culture and natural resources.

However, local knowledge often becomes marginalized when standardized industrial production expands [20]. In a similar vein, Nygren revealed that the modern system's mechanism of "decontextualization" removes discourse from local contexts and allows it to be expressed in an infinite space and time. It is accordingly incompatible with local knowledge because this trend emphasizes local and historical contexts [21]. Additionally, due to the domination of capital-based industrialization, local knowledge has been labeled as a source from "the other" who always requires assistance [19,20,22]. Moreover, when a local paradigm was applied to disaster risk reduction, the validity of such indigenous attempts was disparaged as primitive and insular [23].

Recent years have seen a growing body of literature that highlights the importance of local knowledge and clarifies the relationships between indigenous practices and formal scientific approaches. Local knowledge was important because it provides people with rich notions of alternatives to the scientific paradigm [24,25] that are local, shared, empirical, practical, and flexible [26]. This approach was emphasized as a means to resist the oppression of indigenous people's voices [27]. As the global environmental crisis has further intensified, local knowledge has been rediscovered as a resource that can help explain and solve the crisis. Specifically, local knowledge offers insights that complement scientific knowledge in many fields [28–30].

Nevertheless, adopting local knowledge wholeheartedly and uncritically may result in misunderstandings and misconceptions [31]. In addition, scholars still failed to "scale up" local knowledge from a specific area to a wider one, which led to disappointments in improving local knowledge to arrive at the level of scientific knowledge [32,33]. From this perspective, Berkes and Berkes [34] stated that local knowledge plays different roles from those of scientific measurements. Rather, local knowledge is indeed embedded within particular contexts; thus, it concentrates on the local area, enriching the contributions to the understanding of indigenous environments by presenting locally derived views at microscale.

Critical consideration of local knowledge is not only to clarify the function of local knowledge; it is also related to the relationships between local knowledge and scientific knowledge. Knowledge is unevenly distributed within populations and thus does not follow a fixed set of norms and values [25]. In this regard, scientists' data are based on testing the validity of theoretical models in a designed environment; in contrast, information belonging to indigenous people is practical because its source is nature [26,35]. Neither scientific nor local information, in isolation, is sufficient to ensure the sustainable use of natural resources. Thus, both scientific and indigenous knowledge can benefit from dialog and collaboration [25]. It is important to integrate knowledge from various actors, promoting communication among them to, for example, combine the knowledge of farmers and scientists [36]. Merged body of knowledge can complement the empirical data that science needs. Moreover, it offers tools, methods, and theoretical concepts to local communities, enabling them to make forward-looking decisions that are suitable for their real situations and beneficial for their future development [25,35,37].

In sum, while local knowledge develops within a particular context, it is not a static entity unable to interact with the "outside world"; it changes continuously because it reflects people's adaptations to changes in their environment [31]. However, local knowledge does not assume community homogeneity; therefore, it is a complex, heterogeneous, diverse, and highly localized source of wisdom that should be deeply explored [29,38].

### 3. Rural Resilience and Knowledge Production

The concept of "resilience" was adopted from the engineering field and refers to an object characteristic that returns to its initial state after being affected by an external force. In the 1970s, Holling [39] introduced the term into ecological research defining it as recovery capability after acute disturbance. Subsequently, it has been applied widely in the natural ecological field. After the 1990s, the concept of resilience was extended to social systems where its evolutionary nature was emphasized instead of the ability to maintain

a state of equilibrium [6]. It is worth noting that resilience in the social context not only means recovering but also changing, adapting, and transforming in response to external stimuli [40,41]. Concretely, the research focus on resilience has ranged from swift recovery after “shock” disturbances, such as floods and earthquakes, to “slow burn” transformations including urban decay, population aging, and economic dependency [6].

Resilience thinking has been adopted in rural agriculture studies for many years. Related research has focused on which factors contribute to weak or strong resilience. From a holistic view, Fraser et al. [42] suggested that for farming, environmental, economic, and social aspects act as positive incentives that can improve resilience. In addition, a relational perspective is emphasized that should include the above systems, instead of only focusing on economic values of agricultural production [1]. The role of local stakeholders was highlighted in this process. At the regional level, governments provide a platform for promoting collective wisdom, learning, and innovation processes [4,43]. At the community level, activation of community resources is frequently seen as an important path to developing resilience because it is a structural power of mutual assistance. The community thus owns the capability to anticipate potential risk and bounce forward through adaptability and evolution [44]. Additionally, public participation in community activities is beneficial for building resilience because such activities strongly enhance farmers’ sense of belonging and attachment to a place [45]. Shared values and opinions constitute a “strong voice” for rural vitalization [43]. While the government and the community focus on general forces, the household, as the first defense against agriculture challenges, is paid more attention to individual experience. While agriculture experience is the base, abilities to cope, adapt, and transform are the keys to developing resilience [46]. In this process, researchers try to figure out how individuals’ abilities to learn and innovate are fully activated to help the household successfully resist a crisis [47].

Resilience thinking emphasizes local knowledge production because it is the primary way to promote agricultural efficacy, even the whole rural development [48,49]. Previous studies have regarded “industrialization and technological innovation” as key drivers of development [50] (p. 30). In other words, scientific knowledge is considered a dominant tool for improving resilience. However, following debates about rural development patterns, the neo-endogenous (network) development model was presented [51–53]. This new approach paid attention to specific localities and advocated that practitioners should “rediscover a cultural/historical territory” [52] (p. 25). Concretely, it initiated practices to underscore the participation of local actors, such as the Farmer First model [54], the international assessment of agricultural knowledge, science, and technology for development report [55], which refers to the importance of local roles in enhancing rural agriculture sustainability and to farmers’ resilience that involves economic, social, cultural, and environmental dimensions [5,7]. This finding goes beyond the argument that farmers are only able to guarantee household resilience, and enriches the understanding of the role of farmers to contribute to the sustainability of rural agriculture.

Neo-endogenous development model inspired the farmers to become primary participants, animating their knowledge production to vitalize their land and ensure genuine and lasting development [56]. It implies the significance of a process of continuous learning. School learning, e.g., Farmer Field Schools, is one of the most popular ways for farmers to learn new skills and techniques. It provides formal knowledge resources and encourages farmers to conduct season-long and participatory learning [57]. However, sometimes traditional learning modes are not applicable to farmers, who prefer seeking information on their own, rather than being trained in a school setting [58]. Therefore, social learning is recommended for learning from interactions and cooperation among farmers. It underscores the learning journey through observing, evaluating, and modeling others [59]. “A process of social learning” is critical for enhancing resilience because it challenges the stereotype of farmers as static and backward recipients, and shows instead their potential of active learning and the power of informal knowledge [7,60].

Knowledge is the source of the ability to manage complexity and uncertainty, particularly when combined in various ways [60,61]. Therefore, achieving resilience requires a consideration of the interactions among various actors and then elaborating on collaborative networks [62]. Echoing the neo-endogenous framework, how to identify place attributes and then achieve more adaptive schemas for rural areas through both internal and external actors became the key issue for increasing rural resilience. Bruckmeier and Tovery [48] (p. 326) noted that a “process-oriented view of ‘knowledge in action’ would identify sustainable development problems. Knowledge production must be treated as a dynamic process between local and extra-local resources. Lowe et al. [50] (p. 28) defined this pattern as “vernacular expertise” since it is “place-based but is also crucially nourished by outside sources and agents”. For example, based on the specific context of a rural area, farmers are able to consider various conditions and then make suitable choices for farming [8,28]. Similarly, agricultural scientists and experts can compensate for the absence of knowledge regarding skills, values, and perspectives in the local context. Eventually, “more open, fluid, democratic knowledge networks where scientific/formal and local/informal knowledge are mutually enhanced” were built [7] (p. 3).

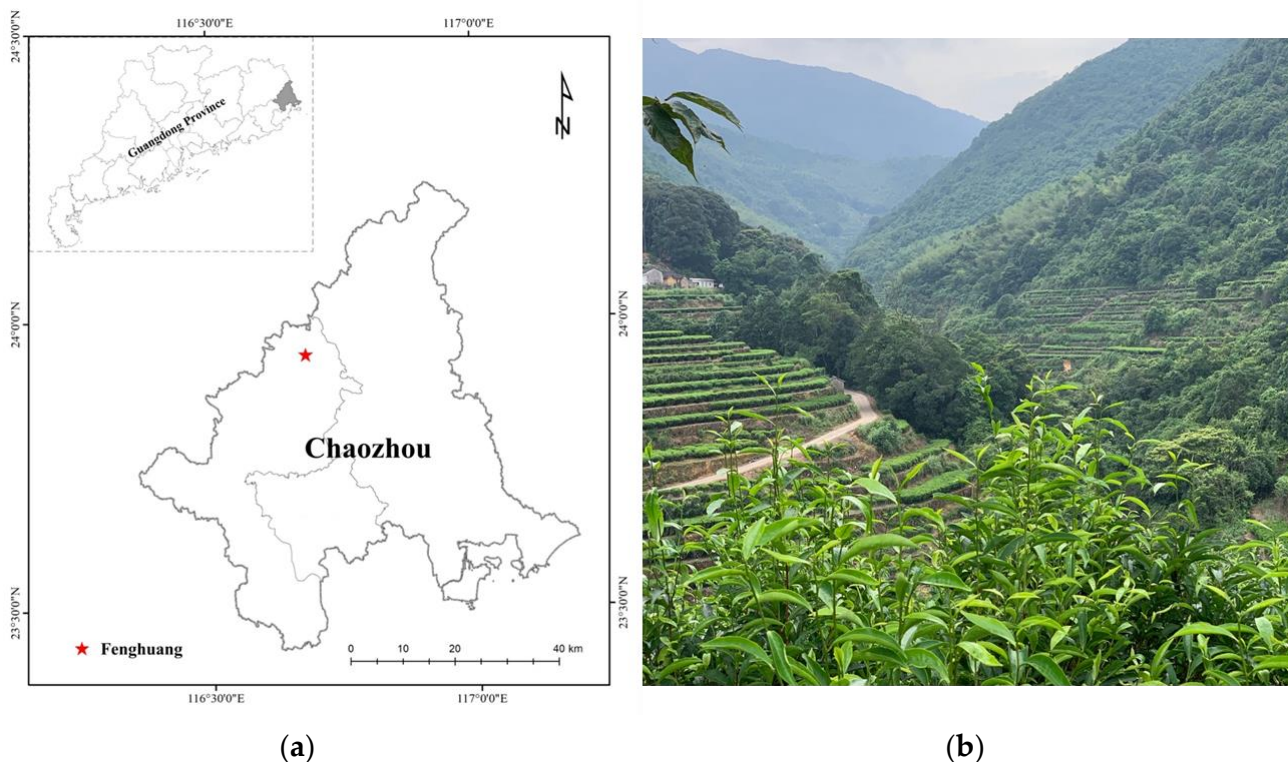
In the Chinese context, how knowledge production contributes to rural resilience is worthy of investigation. At the 19th National Congress of the Communist Party of China held on 18 October 2017, President Xi Jinping first mentioned the rural revitalization strategy and underlined the significance of solving the problems of “agriculture,” “rural areas,” and “farmers”. The main goals of this strategy are to increase the income of farmers, promote the development of agriculture, and protect the stability of rural areas. Given the strong support from the state, a vibrant rural economy has gradually formed. However, many rural area problems, such as rural hollowing and environment degradation, appeared in this process. Previous studies focused primarily on the top-down process, especially the role of policy for solving problems [63,64]; however, adopting one-way dissemination of knowledge makes sustainable and resilient development unachievable [37]. Specifically, rural resilience is a hybrid network that requires both endogenous and exogenous nutrition [8,65,66]. The farmer is a significant group because they provide an intrinsic perspective on “cultural and environmental differences of rural areas” [13] (p. 244). Moreover, farmers, who used to be considered poor and backward, were able to make a living by themselves. It led to more vigorous knowledge production and resilient livelihood. Up-to-date research has paid scant attention to this bottom-up approach, largely ignoring the roles of farmers and how their local knowledge contributes to individual resilience and to the resilience of rural areas. In addition, although many studies have discussed the mutual interactions between local knowledge and formal knowledge, they are based on the context of capitalist countries [13]. In the context of socialism, how do local/informal knowledge and scientific/formal knowledge interact with each other to reconstruct rural governance and reshape rural areas? Research is needed to explore these questions.

#### 4. Fieldwork Contexts and Methods

Fenghuang is the birthplace of Dancong tea, which is located in northern Chaozhou, Guangdong, China, and has a total area of 231.75 km<sup>2</sup> containing 239 natural villages (naturally formed by family, clan, or other historical reasons) and a population of 40,449 people (Figure 1a). To date, the town’s tea plantation area covers about 4666.67 hm<sup>2</sup>, has an annual output of 5 million kg of tea and an output value of 1 billion yuan. Tea production now occupies entire towns and is the leading agricultural industry (Figure 1b). Compared with tea from other regions, Dancong tea is primarily classified into various species and picked separately according to these species, which enables the locals to invent a proverb: single plant picking, single plant processing. Later, the tea is manually processed in small family workshops. Therefore, tea farmers play a major role in tea production because most of the tea mainly relies on their hands for production. Until now, automatic tea picking and tea processing machines have been adopted in some large tea enterprises in order to



pursue higher productivity. However, this industrial tea production approach was not recommended and remained marginalized in Fenghuang.



**Figure 1.** (a) Map of the research area in Guangdong, China. (b) Tea plantation in Fenghuang. Source: photograph by the first author.

Before the reform and opening up, tea farmers stayed away from the national market and Fenghuang seemed barren and backward from an outside perspective. Tea farmers planted and processed tea for living on a low income. However, after the full opening of the tea market in 1978, tea prices rose sharply so tea farmers eradicated poverty, and the tea economy developed in Fenghuang. However, as many stakeholders wanted to capitalize on the windfall economic profits, it caused some ecological problems, such as the death of ancient tea trees caused by over-picking and poor growth of tea trees caused by the abuse of chemical fertilizers and pesticides. For instance, some tea enterprises rented tea farmers' land and used automatic tea picking machines or hired unskilled workers to pick tea. They ignored the natural rules and picked excess tea leaves, causing the tea trees to fail to grow in a healthy way. Consequently, the number of old trees started to decline, and many died. According to Huang [67]'s survey of old tea trees (average tree age is above 100 years) in Wudong (one of the high mountain villages in Fenghuang) in 1998, there were 68 dead old trees at that time. A recent study conducted by an agricultural project team in 2016 found 47 newly dead trees and forecasted that the mortality rate of old tea trees would exceed 30% in the next 20 years. Moreover, tea quality decreased because of the poor growth of tea trees. It undoubtedly affected the terminal market where consumers' trust in food quality and safety was hurt.

When confronted with a series of ecological problems and their derived issues, local people realized the risks and their responsibility to protect the land. They made various efforts in the production of local knowledge in order to ease the crises and improve rural resilience. This paper explores this phenomenon.

The research data for this study were based on participant observation and in-depth interviews conducted in Fenghuang between 2018 and 2020. Semi-structured interviews lasting from 45 to 90 min were recorded. The interviewees consisted of 22 Fenghuang local tea farmers. Snowball sampling was adopted in this process. First, we contacted 3 tea

farmers we knew, and they introduced us to 22 other tea farmers for interviews. However, because tea farmers' daily lives are simple and tea production techniques were repeatable and shared in the community, new content failed to appear when we interviewed the 22nd farmer, which means we reached data saturation and these farmers are able to represent the farmer group in Fenghuang [68]. Thus, we stopped the interviews. Since farmers are familiar with each other, the conversations were conducted naturally and showed real emotions. The participants included 19 males and 3 females, all of whom were older than 30 years. The oldest participant was 87 years old. In addition, we visited 3 government officials working in the Fenghuang district government, 5 tea traders, and 2 experts working in the local agricultural institute to gather complementary information.

We conducted most of our interviews at tea farmers' residences and tea processing sites (these two places were often in a single location) and asked open-ended questions on topics such as tea farmers' daily lives, interactions between people and places, tea production process, and tea tasting. We also accompanied the farmers as they picked tea and processed tea to gain more comprehensive perspectives. All the interview transcripts were transcribed and then read through several times to obtain a sense of the information they contained and to identify generalities. For detailed analysis, themes were generated through a coding process based on the information gathered during the interviews. Interrelated themes, such as the perception and construction of local knowledge, were analyzed and explained to explore how tea farmers' local knowledge is produced to build individual or family resilience and in what ways local knowledge stimulates resilient rural development.

## 5. How Local Knowledge Is Generated and Developed in Rural Areas

When faced with ecological problems, farmers built a strong local knowledge base to sustain their individual resilience. To be specific, local knowledge inheritance and production are important for resilience improvement. Firstly, Fenghuang is famous for having produced great tea for centuries, dating back to AD 1535; consequently, local knowledge production in Fenghuang has accumulated, grown, and been refined for many years. It is passed from generation to generation and is thus stable and largely protected from outside shocks (Figure 2) [5]. Secondly, farmers' knowledge is constituted through accumulating practice and is embodied through daily experiences [69]. Thus, their knowledge is adaptive according to specific conditions. Four sections of tea production—growing seedlings, picking tea, processing tea, and tasting tea—are introduced below in order to show how local knowledge is generated and spread.



**Figure 2.** Tea farmer's son learning how to process tea. Source: photograph by the first author.

Breeding good tea seedlings is the initial important step in tea production. The older tea farmer FH08, who is good at seedling work, said that tea tree breeding and planting can be traced back to the year of Kangxi (AD 1705) in the Qing Dynasty. Until the Guangxu Period, several strains of high-quality tea were bred in Fenghuang. This spirit of professionalism has been passed down to today's tea farmers:

*“Usually, I will pay attention to the growth of each tea plant. Then, when picking tea, attention is given to the number of new leaves and the size of the leaves on each tea plant. In addition, when processing tea, attention is given to the color, aroma, and taste of each finished tea plant. By comparing different kinds of tea, I will determine the target of future seed breeding.” (FH19)*

Such practices are normal agricultural skills that include unique cultural engagement, underscoring their inherent variety [70]. Farmers use their bodily experiences from the senses of their bodies, such as smell, touch, and vision, to form their knowledge and then apply it to practice. Local knowledge involves not only inheritance but also positive production. Due to the large production demand from the modern market, tea farmers have started to select specific types of Dancong tea based on a comprehensive assessment of breeding, pest resistance, and cold and drought tolerance.

The second significant step is picking tea. When we followed tea farmer FH02 in hiking to a peak to pick tea, he often introduced picking techniques he used for tea trees on the sides of the mountain road. For instance, he mentioned that the top leaves grow a pair of clips; then, 3–5 days later, the leaves mature. When 60–70% of the new tea leaves have reached the matured status, the tea leaves are ready to be picked. After many years of training, FH02 had become intimately familiar with the local environment and trees, so there was no need for him to perform repeated observations before picking. He can pick several pounds of tea leaves per day. Knowledge inhabits the land where people build connections with the countryside [36]. Such ties between farmers' daily experiences and the environment are being confirmed.

Since indigenous knowledge is place-produced, the essence of protecting the place where farmers grew up is inherently embedded in this knowledge. During the tea picking season, tea farmers hire tea pickers to help them perform the work. They are very active in teaching these workers the techniques of tea picking. The reason is that the farmers believe that tea trees are valuable treasures left by their ancestors. Only after the workers learn the techniques well can the tea trees avoid damage from careless and unskillful picking. In the words of farmer FH07:

*“Generally, after picking several leaves, you have to put the leaves in the basket, you cannot hold them in your hand, the tea will be injured.”*

Another farmer FH18 expressed his worries about tea picking:

*“Some experienced tea workers leave an old leaf on the tree when picking, this old leaf will be helpful for the trees to grow new leaves for the next year. However, I hired some unskilled tea workers from outside, and they usually broke down the whole tea branch. I was so sorry that my tree was hurt. If the old leaves are not left intact, the tree will fail to absorb enough water, which has a serious impact on its overall growth.”*

The accumulation of local knowledge and emotional connection with place is further highlighted in the tea production process. The five stages in the primary processing of Dancong tea are sun-drying green (shaiqing 晒青), making green (zuoqing 做青), killing green (shaqing 杀青), rolling (rounian 揉捻), and baking (beihuo 焙火) (Table 1). Tea farmers need to concentrate on each step in this process as soon as the tea leaves are picked.



**Table 1.** Introduction to five steps of tea processing.

Tea Processing	
Sun-drying green	Put the tea leaves under the sun to dehydrate.
Making green	The tea leaves are shaken, collided, and rubbed by alternating manual and mechanical means to stimulate fragrance.
Killing green	The tea leaves are put into the pot for frying in order to further dehydrate and stimulate fragrance.
Rolling	The tea leaves are pressed and kneaded by a machine in order to be shaped into strips.
Baking	The tea leaves are roasted in an oven to dehydrate it thoroughly.

All the tea is handmade by the farmers themselves. Wang [71] (p. 124) describes “Chaozhou gongfu tea” as “an integrated ceremony encompassing the reflected spirit, the etiquette, the skills of both preparing tea (which refers to the process of pouring hot water into a teapot filled with tea leaves and pour out the tea into small teacups) and pouring tea for guests.” Similarly, tea farmers claim that their tea processing skills reflected the word “gongfu,” which implies that adequate amounts of effort are required for tea processing. Farmer FH08 compared the sun-drying green process of Dancong with that of other kinds of tea as an example:

*“I used to see farmers in other places sun-drying the tea. They used a rake to turn the tea. However, the rake is so hard and sharp that it hurts the leaves. When the tea leaves are hurt, it is difficult to make high-quality tea. Look at this tea leaf, it is not injured, and the whole leaf is thick and intact. If the tea is injured, the scar will remain there forever, and when tasting this leaf, it will be bitter. That is why it failed to be a high-quality tea.”*

Farmers use expressions such as “injured” or “hurt the leaves” to describe the tea’s conditions, showing their tendency to protect the tea, which presents their attachment to the land through traditional practice [5].

When we interviewed farmer FH05, he mentioned that he stayed awake until 4:00 am in the previous night to process tea. Then, he rested for only 2 h and rose early to make green. He admitted that it is hard to stay up until late, but he did not worry much when processing tea only by himself. The mere availability of advanced technology does not convince most local people to apply it to their production [72]. Although technology modernization has led to the invention of automatic tea processing machines, tea farmers still doubt their reliability; instead, they prefer processing tea manually, which reflects their intimate and sensual attachment to nature [73]. In the words of FH03:

*“Only when my hands touch the tea leaves can I know how far it has come, what strength I need to use, and how long the process will take.”*

In addition, better manual skills are able to enhance farmers’ market performance and grow their income [7]. Considering the enormous potential profits from selling tea, farmers were motivated to update their knowledge and improve their tea processing skills. In the words of farmer FH16:

*“I kept on learning consumers’ new preferences. For example, older people may like tea with a stronger and thick taste, so I would bake the tea longer to achieve this flavor. Younger people may prefer tea with a great aroma, so I bake the tea at a lower temperature and for a shorter time. In line with their needs, there will be countless repeat customers.”*

During the slack season, tea farmers visit their neighbors to share problems they encountered in tea production and discuss how to solve these problems. The farmers even attend competitions so that they can interact with other farmers and learn new advanced tea plantation and production skills (Figure 3). This “social learning” process systematically improves farmers’ local knowledge [58,59]. As farmer FH17 suggested:

*“My dad taught me how to process tea in the past, and some of his techniques are slightly out of date. After participating in tea competitions and meeting other tea farmers, I now know some other ways to improve my tea quality. For example, to make this tea smell better, you need to extend the ‘killing green’ process.”*



**Figure 3.** Tea farmers in a tea processing competition. Source: WeChat channel “Zero distance with Fenghuang (与凤凰零距离)” (WeChat is one of the most famous social media in China).

As the final step of tea production, tea farmers should taste the tea to confirm its quality, which relies on their own tea-drinking habits based on their everyday experiences, such as the amount of tea leaves to put into the teapot. Farmer FH01 taught us pouring tea techniques: *“the amount of tea is also very important, if you use a full cup of tea leaves, it is too wasteful to achieve the correct tea flavor. The ratio of tea leaves and water is not correct. All of our efforts to make good tea would be ruined.”* They denote that armed only with such skills, tea-tasting acts as a perfect terminus for tea production.

For each step of tea production, tea farmers possess corresponding local knowledge. Their knowledge is comprehensive and flexible, sourced from their daily practice and inspired by engagement with the materiality of Dancong tea and the natural environment [45,73]. Through inheritance, sharing, and self-improvement, local practices become exclusive knowledge shared among the members of a particular tea-farming community [7,72,74], which contributes to building solid protection for their individual enterprises.

## 6. The Role of Local Knowledge in Developing Rural Resilience

After the reform and opening up in 1978, environmental problems came along with economic development. In a rural area where tea is the pillar industry, if the environment deteriorates, the tea industry in the area will be seriously affected. Therefore, in addition to examining how the farmers’ knowledge safeguards the resilience of individual households, it is important to investigate how farmers’ knowledge contributes to the resilience of rural agriculture in the face of these problems [11,73]. Moreover, farmers often keep a benign interaction with scientific knowledge while preserving locality to protect their land and enhance rural resilience [53]. Therefore, in this section, we explore how local knowledge is involved in developing rural resilience through interactions with experts.

### 6.1. Local Knowledge and Sustainable Agriculture

In Fenghuang, tea farmers' energetic local knowledge is a resource that should be rediscovered to help develop sustainable agriculture and protect the natural environment. Local knowledge is the implicit, subjective, and contextual knowledge embodied in farmers' brains and bodies [75]. This tacit knowledge is passed down through generations and is rooted in the places farmers live, which are not accessible to outsiders [69]. Thus, rather than relying on scientific training, they relied on the family tradition, which is passed down through observing, imitating, and repeated practice. As farmer FH12 said:

*"For skills, there is no book that can help us learn. That is why my daughter now follows me to pick tea, observing and practicing every day. These things are all based on my experience and understanding of this place and these plants."*

Consider picking tea leaves as an example. As mentioned above, tea farmers emphasize that when picking tea, they should leave 1–2 old leaves because *"old leaves are beneficial and help the tree grow new leaves next year."* Moreover, the number of tea leaves they picked depends on the tea's specific conditions as determined through observation and experience. In contrast to traditional practice, the scientific approach uses mechanical tea picking machines, which pick tea leaves at large scales, all using the same mode. In the words of farmer FH07, this machine process may *"pick tea leaves that do not need to be picked. Regardless of the situation, the tea tree will be overly damaged, lack of nutrients and die."* Thus, most of them reject using machines and insisted on spreading proper tea picking methods to others. Tea farmers may not be able to explain these planting and picking rules in academic language, but they protect their places with the indigenous understanding rooted in the environment to promote tea tree growth. Local practice is *"trying to work with the social and biophysical idiosyncrasies of a particular farm,"* does not *"expect uniformity,"* and can protect rural areas by preserving *"variability"* [9] (p. 387). In other words, local practice is an adaptative capability when facing outward challenges that help farmers protect their land and build resilience [11].

In terms of pest control, tea farmers adopt a primitive way to eliminate insects, they told me that if they sow a large area with pesticides, it would also hurt some beneficial insects, because *"an overclean environment is not conducive to the growth of tea trees."* Therefore, they do not apply the chemicals that the market sells. Consider moss as an example; moss attached to a tea tree will block its respiration and siphon off water and nutrients. To eliminate the moss, farmers manually peel the parasitic moss from the tea trees to promote good growth. An expert FH23 from the local agriculture institute mentioned that now they are working with farmers in order to develop pest control chemicals. However, he pointed out, *"Although we recommend using some pesticides, their potential side-effects are not fully studied. We do not know the land as well as tea farmers do. So far, their conservative manners are more appropriate."* As Kloppenburg [76] (p. 530) noted, science sometimes *"fails to respect the exigencies and needs of a specific locality"* and may cause problems such as biodiversity damage, soil pollution, and threats to people's health. That is why farmers use fewer chemicals [5]. Their deep place connections enable them to ecologically preserve the farm and offer a distinctive approach to combat modern and scientific threats to the land [73].

Additionally, some local knowledge provides exploratory experience for forming reliable scientific knowledge. Specifically, although farmers do not know the scientific laws which may embed in local knowledge, their indigenous experiences inspire experts to verify some theories. For example, in regard to the daily care of tea trees, tea farmers tend to take natural actions to look after the trees. They are worried that chemicals will attack the trees and affect the quality of the leaves. Farmer FH05 told us, *"I do not use those market-bought fertilizers because I am not sure what has been added to them. I compost and fertilize with soybean residue and the tea trees grow very well."* They also use *"guest soil mulching"*—replacing chemical fertilizer with acidic soil from other places to supplement the tea plant's nutrition. Expert FH24 said that while doing research in Fenghuang, they noticed farmers' methods of taking care of the trees. It inspired them to conduct a study on the acid-base

preference of tea trees, which confirmed that tea trees are in favor of an acidic environment. Natural fertilizers that tea farmers use are acidic or neutral, and therefore suitable for tea tree growth.

However, local practices are exhibited by tea farmers and thus are influenced by their personal interests. Farmers protect their own plantations based on economic and identity considerations, but their interests make it difficult for them to obtain a global and long-term perspective. Thus, scientific knowledge provides farmers with a broader view and systematic training, which is able to encourage farmers to protect their land effectively and further enhance resilience [57]. It is often integrated and disseminated through formal organizations [7]. For instance, the Tea Farmers Association, a public interest civil society organization established in 2019, promotes the concept of green, ecologically sustainable development and provides scientific help for tea production. An official told us,

*“The goal of establishing our association is to introduce some scientific management expertise to farmers. We will hold some classes and communication activities by inviting some experts from Agricultural University and professional agricultural organizations to teach farmers.”*

Prompted to attend these school training activities by the government, some farmers join in and are exposed to scientific knowledge. In this way, farmers gain a new understanding of the nature in which they have lived for decades [57]. During the interviews, the farmers often mentioned the chemical composition of tea leaves and how to protect their tea trees from an expert viewpoint.

In addition, some people are skillful at indigenous practices and have become famous as tea plantations and tea processing professionals. Local people often called them “the pioneer.” They systematize their knowledge and help local farmers improve their production. Skilled farmer FH08 said, “I was 18 years old when I became a tea maker. During the busy seasons, the neighbors sometimes failed to solve the problems of processing tea. They would come to invite me to help them. I ran to their home at night to help many times.” Farmers place great trust in these high skilled colleagues [5]. Farmer FH13 showed his admiration as follows:

*“I really admire him. He truly loves this place and commits himself to this place. There is no salary, no pay. It is just his hobby to help others.”*

As a result, tea farmers trust the knowledge that these experienced farmers spread. Pioneer farmers often work with scientific platforms by participating in government-organized tea lectures and acting as teachers in training sessions organized by institutions [43]. In this way, sustainable scientific knowledge can be transmitted to tea farmers in such a way that farmers are ready to accept it.

In sum, local knowledge is useful and protective in small household production. It provides perfect contextual choices to farmers to protect the land. However, due to the stability and individualism of local practice, it showed some disadvantages resulting from modern dramatic changes. Governments and agricultural institutions assist in knowledge transfer and exchange in this process. Tea farmers subjectively assimilate the scientific knowledge appropriate to their environment and then generate new forms of knowledge—a mixture of scientific and local assets [8,28]. Local knowledge, as a prominent manifestation of rural endogeneity, provides a strong foundation for preserving their farms, while the scientific approach provides farmers with advanced and standard cultivation knowledge so they can better help restore the environment [15].

## 6.2. Local Knowledge and Market Promotion

In the above analysis, we focus on how tacit practices can be used to achieve sustainable agricultural production by promoting its own strengths while absorbing external resources. However, environmental problems are not only detrimental to agricultural production but also lead to food quality and safety crises. Modern consumers are anxious about food safety, while Fenghuang’s environmental problems have undoubtedly affected



tea trees' growth and tea quality. It enables consumers to question tea's safety and lowers their willingness to buy tea. As a result, tea sales started to decrease. When faced with this shock, farmers activated their cultural knowledge and strengthen their integration with expert knowledge. It creates a new path to ease food crises and promote rural resilience.

After the 1980s, farmers, as small businessmen, began to pay attention to how to sell tea better. In this context, farmers learned to taste tea rather than drink tea. The tasting process involves using various vocabularies to describe the flavors of tea to help satisfy trends. When we tasted tea with farmer FH18, he introduced the various tea aromas to us:

*"In our high-mountain tea, you can feel the 'youxiang' (悠香) instead of 'piaoxiang' (飘香). 'Youxiang' means the aroma will not be high-profile; only after drinking several cups of tea can you feel it. It has an aftertaste. Unlike high-mountain tea, the aroma of low-mountain tea is transient and evaporates into the air; that is called 'piaoxiang'."*

Additionally, farmers often use the words "Shanyun (山韵)" or "Congwei (丛味)" to describe the flavor of tea. "Congwei", the unique taste of a tree, is considered to be the most original aroma. It was mentioned that "Congwei" will not disappear even after the stresses of several production procedures, emphasizing the preciousness of this aroma. "Shanyun" is the charm and rhythm of tea mountain. Farmer FH13 stated the following to describe "Shanyun":

*"What we admire is the 'shanyun', which is found only in high-mountain trees. It has a little mossy flavor. You can sense it slowly; it is unique to this place."*

Farmers' descriptions of tea strengthen the connection among place, tea trees and tea drinkers, creating a world in which nature and the tea drinker interact through the tea, which accords with current consumers' imagination of "yuanshengtai (原生态)" and the desire to have a closer relationship with nature [10]. It guarantees the sales of Dancong tea.

Furthermore, the pure handmade style of "single plant picking, single plant processing" is the production tradition of Fenghuang and the main characteristic of local skills. This nonmechanized production is in line with recent popular concepts of rural areas, that is, "organic" and "authentic". Such descriptions reduce consumers' insecurities about commodities that are not visible [10]. In other words, Fenghuang's unique identity has been reshaped through sensual knowledge as a green and refreshed village, rather than as a barren and dead space, which is heterogeneously based on its local socio-historical background.

Moreover, farmers repeatedly mentioned the goodness of this place, emphasizing that only the soil in Fenghuang can grow the ideal Dancong tea. This specific place identity is a reinterpretation of the local area. When local farmers feel and accept this interpretation, they rediscover their own local uniqueness and freed their previously repressed "natural" identities [52]. Consequently, they strengthen their sense of belonging to Fenghuang and make good use of the place image from the perspectives of their inner identities to promote the tea market, which shows that place attachment can contribute to resilience potentially by emphasizing the land's identity [11,45].

From a scientific perspective, given the ongoing developments in science and technology, scientists have conducted chemical tests on Dancong tea and found that it contains higher concentrations of amino acids and ether extracts than do other teas, which explains why Dancong tea has a pleasing aroma and sweet taste. Expert knowledge was gradually transferred to tea farmers through lectures and seminars [57]. Farmers have absorbed this information and used it to form strategies to improve tea sales:

*"In the past, foreigners did not adapt to drinking Dancong because they thought this tea was too refreshing, which caused them to fail to fall asleep at night. However, if you get used to drinking it, you will realize the goodness of Dangcong. This cup of tea is full of amino acids, and the polyphenol content of the tea is very high."*

Farmer FH15 stated the following with pride:

*"You can't underestimate it. It contains many beneficial elements. They are inside. After baking, some elements may be turned into others, because the aroma is different. However, all the chemical elements that are good for your health are still in the tea."*

They believe that their tea would sell better if they were to ease consumers' worries about food safety. Scientific reports are one of the most credible sources of knowledge and can enhance consumers' confidence. Consequently, farmers voluntarily acquire scientific knowledge and use it to construct business strategies that improve the Dancong brand over the long run.

As a result of this branding, from a tea drinkers' perspective, the "place" is not only a geographical site but also a mysterious village that grows healthy plants with a charming aroma [77]. The farmers' description of tea and tea mountains well matches consumer conceptions of ideal commodity production areas. In this way, the "place" was commodified and used directly in the marketing field. The tea derived from this locality has become very popular in the market because of its deep connection with the tea mountains.

Overall, the farmers fused local and foreign knowledge to form a special way of tasting tea, which corresponds to Lowe et al. [50]'s definition of "vernacular expertise." It is a creative combination of scientific objective knowledge and local subjective knowledge. This dynamic knowledge has reshaped the concept of natural identity attached to the place and enhanced the farmers' sense of belonging, which enhances resilience [45,66]. Simultaneously, the output of their tasting knowledge fosters a "natural," "ecological" and "healthy" tea production place in the eyes of consumers, which caters to consumers' motivations for buying the product and effectively counteracts the barriers to marketing tea products that may arise due to environmental degradation, further promoting the resilience of the rural tea industry.

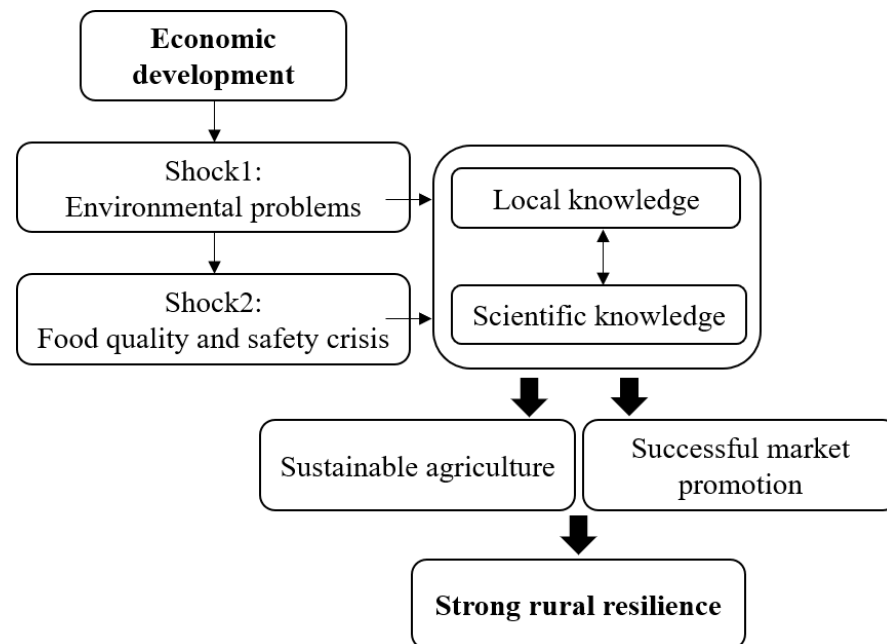
## 7. Conclusions and Discussions

The development of the tea industry enables tea farmers to avoid hard times and has taken Fenghuang from poverty to prosperity, finally achieving thriving economic vitality. As many studies have indicated, top-down drivers issued by the government are important [10]. In Fenghuang's case, it led to economic development. However, as Gkartzios and Scott [13] stated, rural area development cannot be achieved without the combined efforts of diverse actors, especially when environmental problems come. Thus, it is important to determine how indigenous farmers play crucial roles as participants in rural resilient and sustainable development and how they interact with experts to form new types of knowledge in the face of "slow burn" challenges. This paper explored the process of local farmer knowledge production through the lens of rural revitalization in China (Figure 4).

Our study identified tea farmers' local knowledge as applied knowledge that has been accumulated over time and passed down through generations. Moreover, their knowledge is dynamic. Farmers are able to learn new forms of knowledge and apply them to their businesses, which is in line with Šūmane et al. [7]'s finding that combinations of diverse sources of knowledge contribute to resilient agriculture and their intimate interactions with the land. Additionally, as Yin et al. [78] (p. 145) mentioned, "nature is not only compatible with development but can even be a source of development." The enchantment of nature and its connection with humanity is so powerful that it enables farmers to seek more sustainable ways of living with nature [73]. The government should pay attention to the important role farmers play in local knowledge production, strengthen ties with local farmers, and cooperate with them for rural development.

In addition to the contextual knowledge from farmers' experience, local knowledge also changes in a multi-actor network [7]. In line with Li [65]'s emphasis on the role of local stakeholders in rural revitalization, in our study, pioneer farmers were significant in helping other farmers improve their knowledge and cooperate with the government and institutions through lectures that promote appropriate knowledge. In this way, farmers are able to acquire more advanced information and better prepare for natural or manufactured crises. In line with Glover [47]'s argument, our research manifests the evolutionary path of resilience; that is, resilience is not just a return to the original state; instead, continuous learning is necessary. The government, as a link between the local community and the out-

side world, must tighten the connections among the government, universities, institutions, and farmers and establish a wider cooperation platform in which farmers can participate. While many cases have revealed the inequality between scientific knowledge and local knowledge, it is necessary to emphasize the significant position of local participants [31,33], which in turn narrows the gap between the local and the external and contributes to a fair dialog that democratizes knowledge [5].



**Figure 4.** The theoretical framework shows how knowledge production contributes to strong rural resilience.

Additionally, Farmers' dynamic cultural knowledge reshapes the meaning of nature and strengthens the farmers' sense of belonging, enabling them to build new and more meaningful towns and communities [45]. These actions have created a solid brand for Fenghuang that helps it successfully enter national markets. Highly localized products make "the places where they are produced become unique" [79] (p. 319). This case study shows the role that activating cultural knowledge plays in enhancing rural resilience. Previous studies have focused on the economic value of agriculture and the economic resilience of rural areas while neglecting the contribution of culture, identity, and emotion to rural resilience, which are often flexible and widespread forces that need attention. In addition, the government should give weight to farmers' emotional belonging and identity and activate endogenous attributes.

Even though several attempts have been made to highlight the significance of local knowledge, methods to motivate local people need to be better explored since local residents are the most significant stakeholders in rural areas, but are often ignored in political, economic, and social contexts [61]. The constitution of knowledge is complex, and the boundaries between local knowledge and scientific knowledge often appear to be blurred. Future case studies can be expected to determine whether these two forms of knowledge can be translated into each other and what roles different actors play in improving the rural resilience process.

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