

EXPLORING FARMERS' CHALLENGES AND NEEDS IN SELECTED VILLAGES OF DUHOK, IRAQI KURDISTAN: A QUALITATIVE STUDY

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Abstract

This qualitative study explores the challenges and unmet needs of local farmers in Duhok Governorate, Iraqi Kurdistan. Most studies on agricultural development in the local area focus on the macro-economic status of farming. Whereas lived realities of agricultural practitioners and farmers on the other hand are often overlooked. That is why this study tries to focus on such realities and provide empirical evidence on the challenges faced by local farmers around Duhok. A qualitative exploratory design is employed, in which data were collected using semi-structured interviews conducted in Bahdini Kurdish dialect with 14 current and former farmers across five different villages around Duhok city. Then, data were coded and analysed using thematic analysis. The analysis revealed an intersecting crisis driven by water scarcity, climate unpredictability, economic non-viability, and institutional neglect. Such factors interact and combine to form the reality of local farmers, and are potentially driving a move towards de-agrarianization and accelerated urbanization. Finally, the paper concludes with some targeted policy interventions, which include seasonal market protections, water infrastructure, collective procurement of inputs, and revitalization of extension services, all to ensure the sustainability of local farming.

Keywords: Rural Sociology; Agricultural Policy; De-agrarianizing; Qualitative Methods; Water Scarcity; Food Security

1. Introduction

Agriculture is an important sector in the economy and food security of Iraq and Kurdistan Region. In Duhok Governorate, rural communities have engaged in farming for generations to sustain their livelihoods and shape the village society. However, agriculture is facing substantial challenges that prevent development from taking place. This has created a complex crisis, where climate change, resource scarcity, economic non-viability, market difficulties, and institutional neglect intersect to threaten the sustainability of the local agricultural sector. Existing research has addressed these issues on a macro-economic scale, but there is a lack of qualitative literature that emphasizes the lived realities of those most significantly impacted in this specific region. Therefore, this qualitative study seeks to consider farmers' own perspectives on the specific difficulties and hurdles facing agriculture in Duhok

Governorate. By exploring these direct narratives, this research aims to provide a grounded understanding of the localized challenges and unmet needs of the farming communities in Duhok, setting the stage to inform more effective and targeted interventions.

2. Literature Review

Farming and agriculture are significantly affected by interdependent environmental, economic, and political factors that shape the daily life realities and sustainability of farming communities worldwide. To have a good understanding of the localized challenges and needs of farmers in Duhok Governorate, it is necessary to establish context of farming experiences within the broader literature globally and on the regional levels. This literature review examines existing research by progressing from global and regional perspectives to local ones. It begins with exploring global barriers facing small-scale agricultural communities, then narrows its focus into specific environmental and resource constraints defining the Middle East and North Africa (MENA) region. Finally, it examines economic and climate vulnerabilities specific to Iraq and the Kurdistan Region. In this review, funnelling of the literature from global trends to the specific realities of rural Iraqi Kurdistan is employed to reveal a critical gap: that is the necessity for qualitative research that centres around the direct voices, perceived challenges, and unmet needs of local farmers.

2.1 Global Perspectives on Farming Challenges

Global studies about farming challenges offer differing perspectives regarding barriers to sustainable agricultural production. While some challenges are universally experienced, others are heavily shaped by regional context and economic conditions. A review of global farming challenges literature shows that agricultural hurdles are diverse and multifaceted, including socioeconomic constraints, technological factors, and environmental crises. By examining literature across diverse geographic locations, a comprehensive picture emerges of the complex landscape that farmers are navigating.

Small-scale farmers in the United States face several challenges. Lynch et al. (2018) mention the high financial cost of farming, labour challenges, and inconsistent market outlets as being some widely researched challenges in the United States. Whereas in a review by Manono (2025), it is stated that farming areas in the United States are diverse, each facing distinct challenges. Manono also adds that economic uncertainty, technological advancements, climate change, and other environmental concerns often exacerbate these challenges. Additionally, Manono (2025) addresses social and sociopsychological challenges, like stress and personal issues. Furthermore, literature indicates farming challenges faced by small-scale farmers are centred around economic, climate and environmental, technological, and social/sociopsychological factors. Moreover, some papers suggest that modern era farming has its own unique challenges. A more modern era centred study by Costea et al. (2023) states that times today are characterized by rapid technological advancements, shifting consumer demands, environmental concerns, and global market dynamics, leading to unique challenges. Dhillon & Moncur (2023) see such technological advancements, like Unmanned Aerial Vehicles (UAV), automated irrigation, use of smartphone applications, and Artificial Intelligence (AI), as opportunities to improve farming life, but mention that these tools are not always within reach of smallholder farmers, because of economic unviability. Moreover, newer era problems are characterized by technology change, global markets challenges, changing consumer demands, and environment issues. Studies in some Asian countries suggest that climate change and global warming are becoming significant hurdles. In China,

it is evident that over the years, mean annual temperatures are increasing in the North China Plain (Zhang et al., 2015). Similar results are shown in another study in Cambodia (Touch et al., 2024). And although rainfall and mean annual precipitation were not reducing in both studies, the inter-annual variability was higher, leading to unpredictable rainfall and chances of extreme weather events (Touch et al., 2024; Zhang et al., 2015). In fact, climate change and extreme weather events are challenges seen globally now. Studies in Africa show some similar and some different challenges. Some of the challenges faced in some African countries include soil degradation in Ethiopia (Zerssa et al., 2021), cost of transport and availability of input in South Africa (Mpandeli & Maponya, 2014), and input availability in Zimbabwe (Makuvaro et al., 2017). Additionally, repeated themes include water supply and irrigation, and rainfall variability and extreme weather events.

In summary, global literature shows that while specific localized farming challenges are evident, the threats to agricultural sustainability are increasingly globalized. Whether farmers are facing high financial costs and sociopsychological stress in the United States, or economic barriers in front of adopting modern technologies, or battling the impacts of climate change, unpredictable rainfall, and soil degradation in Asia and Africa, the vulnerability of the agricultural sector remains a lived reality everywhere.

2.2 Constraints in the MENA Region

The MENA region is an area of political unrest and geopolitical tensions. Countries in this region that have high GDP per capita are usually dependent on natural resource extraction, whereas other densely populated areas are less developed economically and agriculturally (Bertini & Zouache, 2021). One of the most challenging problems facing this region is of an environmental nature, because of climate change and global warming (Waha et al., 2017). This is exacerbated by other pressures and a lack of resilience (Waha et al., 2017). The agricultural sector in this region is 70% rain-fed, and the population count is estimated to double by 2070, further increasing the importance of agriculture for food security of the region (Waha et al., 2017). The review by Waha et al. (2017) indicates the following: Mean temperatures in the region have been increasing consistently over the past decades and are expected to get worse by the end of the century. Moreover, water is scarce in most areas of the region, receiving less than 300 mm of annual rainfall. Because of this, crop yields are expected to decline by 30%, and up to 60% by the end of the century if climate change continues at its current pace. This has an impact on human health status, migration, and human security, with the most vulnerable populations being rural populations and poor farmers. On the other hand, in areas of Iran, Jafary & Bradley (2018) mention that the changing climate has also led to over-exploitation of groundwater, reduced water quality, and a lack of effective monitoring of groundwater extraction. This combined is threatening the sustainability of groundwater, further increasing water scarcity and endangering even irrigated agricultural areas. In conclusion, the MENA region, which includes mostly arid and semi-arid areas, is facing a changing climate and a lack of water resources, leading to expectations of reduced crop yields and impacts on human health and rural communities' migration.

2.3 Agriculture in Iraq and Kurdistan

Agriculture in Iraq plays an important role in the economy and food security. However, Al-Tulaibawi et al. (2025) state that it faces significant challenges. These include: inadequate infrastructure, prolonged insecurity and unrest, and the dumping of agricultural goods from neighbouring countries, among

others. Additionally, Iraq has seen a significant decline in agricultural production and more dependence on oil exports instead. This is shown in the decline of agricultural sector contributions to the country's GDP from 16.23% in 1968 to around 2% in 2019 (Mahmud, 2021). Exacerbating this, Iraq is considered one of the most affected countries by climate change in the Middle East (Al-Jaf et al., 2025). Water levels are declining in the Tigris and Euphrates rivers, groundwater is getting depleted, desertification is taking place at an accelerated pace, and dust storms are occurring more often (Wali & Khdiar, 2025). To conclude, Iraq and the Kurdistan Region are going through major challenges that prevent agricultural development from taking place. To take a deeper look into these challenges, this paper seeks to consider farmers' own perspectives on the specific difficulties and hurdles facing agriculture in Duhok Governorate. This approach was used to fill the lack of qualitative literature that emphasizes the lived realities of those most directly impacted.

3. Methods

3.1 Research Design

This study adopts a qualitative, exploratory research design. This research design was chosen because of the scarcity of qualitative data regarding farmers' challenges, needs and subjective experiences in Duhok Governorate. This design allowed for in-depth exploration of agriculture and its related issues from the perspective of farming practitioners themselves, contributing to a better understanding.

3.2. Study Setting and Participants

The study was conducted in five villages within Duhok Governorate, selected to represent diverse locations all around Duhok City. The sites included:

- Villages around Duhok Dam: Lenava (North-West) and Sundore (East).
- Villages around Zawita Area: Bade Village.
- Villages between Zakho/Semel: Kashe and Basitke Villages.

Convenience sampling method was initially used to identify key informants, followed by a snowball sampling technique to recruit more participants. The final sample consisted of 14 individuals (N = 14), all of whom were either currently farming or were former farmers.

3.3 Data Collection

The data were collected using in-person semi-structured interviews, in a field-based manner. The interviews took place in Nov. and Dec. 2025 (cross-sectional timeframe). The interviews were guided by pre-written open-ended interview questions designed to elicit detailed account of in-depth narratives regarding different barriers encountered and resources needed. All interviews were conducted in the local Kurdish dialect (Bahdini Kurdish) to ensure participants' comfort and accuracy of data.

3.4 Data Analysis

The interviews were conducted in villages in a field-based manner. At the time of interview conduction, interviews were recorded using a tablet. Immediately after returning home from the field, they were transcribed into a text file in the same local language (Bahdini Kurdish) on an MS Word document on a computer. At the end of all interviews, a Word document of 80 pages was the result of the transcription

process. The Word file was divided into sections, each section for a single interview, with a total of 14 sections. This made navigating between interviews easy using the Word navigation pane. Afterwards, data was read entirely a few times, then an inductive approach was used to identify codes, categories and themes. During this process, the text was highlighted in different colors according to codes and categories, then at the beginning of each highlighted sentence (or sentences), a comment was added with the specific code in English language. Sometimes, two codes were added to the same sentence (or sentences). In the end, the codes were grouped and categorized, and a codebook was made in the first two pages of the document. When implementing the actual thematic analysis, navigation between related highlighted text was done using the search feature on Word, which can be used to search comments as well (where codes were written). In the end, themes emerged from the data and were written in the final paper.

3.5 Ethical Considerations

The study adhered to research ethics and standards by providing the participants with a written consent form (or reading it to them when needed). The consent form detailed their rights to voluntary participation and ability to withdraw at any time. Verbal permission was also obtained from the farmers for audio recording. Furthermore, to ensure confidentiality, all participants' names were not mentioned during the transcription and reporting phases.

4. Results

4.1 Participant Demographics

The study sample consisted of 14 participants, all of whom were current or former male farmers. The age distribution was skewed towards older adults, with 13 participants aged over 40 and only one participant in his thirties. Geographically, the sample covered both mountainous and plain terrains across five villages in the Duhok governorate: Lenava (N = 6), Sundore (N = 2), and Bade (N = 2) represented mountainous areas, while Kashe (N = 3) and Basitke (N = 1) represented plain areas (see Figure 1 and Figure 2).

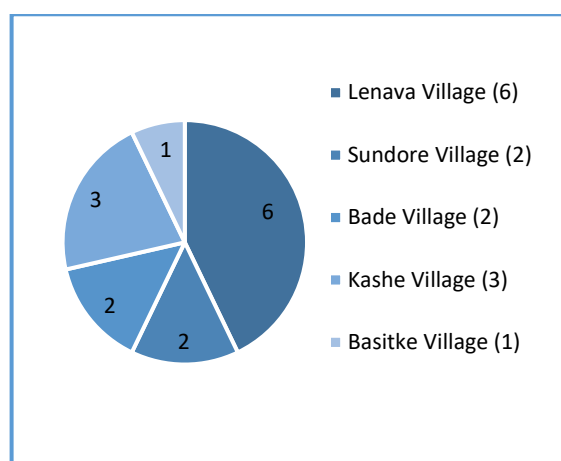


Figure 1. Participants in each village
Source: Author

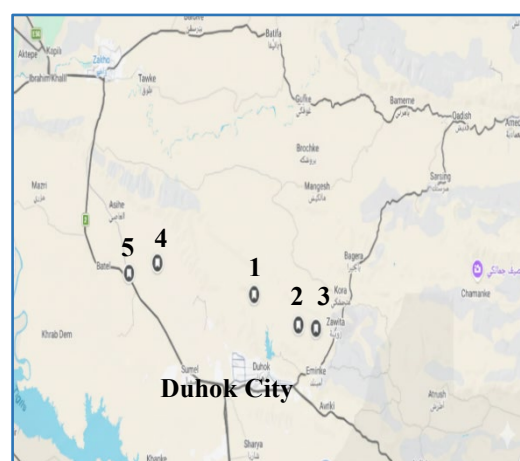


Figure 2 Location of Studied Villages (1, Lenava. 2, Sundore. 3, Bade. 4, Kashe. 5, Bastike)
Source: Author

4.2 Theme 1: Water Scarcity and Irrigation Infrastructure

Notably, insufficient water supply was an evident challenge in all five villages. Participants in both mountainous and plain areas reported a lack of a reliable irrigation source. In mountainous villages (Lenava, Sundore, Bade), reliance on artesian wells and groundwater is becoming less secure due to falling water tables and difficulties in obtaining approval for building wells (regulatory barriers). Whereas in plain areas villages (Kashe, Batiske) groundwater and artesian wells are not sufficient for the vast arable surface area available to plant, making such areas dependent on rainfall.

Participants described a crisis of availability, with one respondent from Lenava stating simply, “If we have water, we can grow anything.” However, infrastructure failure is common as well. As one farmer noted, “I had two water wells; both have dried out. Water is very scarce.” Another participant reported the loss of 400 olive and almond trees due to the drying of water sources. The situation is exacerbated by the lack of permissions to build independent infrastructure. Farmers near the Tigris River tributaries expressed frustration with bureaucracy, noting, “We want to build dams for ourselves, but we cannot get approval.”

4.3 Theme 2: Climate Change and Drought

Closely linked to water scarcity is the perceived change in climate and rainfall patterns in those areas and villages. Farmers described changing climate patterns, characterized by increasing drought occurrences and occasional extreme weather events, like floods. The reduction in rainfall has reduced wheat production in the plains. One participant described a zero-crop production, saying: “Last year we planted, and the harvester did not even enter the field. All was gone; production was zero.” The unpredictability of the weather was further highlighted by a farmer who observed, “In the past, drought would come only once in 10 years. But now... it happened two years ago, and last year it happened again.”

4.4 Theme 3: Economic Viability and Market Challenges

The economic sustainability of farming in Duhok is not promising, because of low market prices and high production costs. A recurring problem mentioned was that farming alone is no longer sufficient to support a household. One respondent remarked, “A farmer should do 9–10 jobs so that they can sustain their life.”

4.4.1 Price and Profitability

Farmers reported that market prices for their goods often fail to cover the cost of production and transportation, let alone sustain their livelihoods. Pomegranates, for example, were reported to sell for as little as 200–400 IQD per kilogram at the Alwa (wholesale vegetables and fruits market). Additionally, high transportation costs in some areas reduce profitability; one farmer detailed that a pickup truck delivering 30–40 boxes of tomatoes might generate 80,000 IQD in revenue, but transportation alone costs 30,000 IQD, making the effort economically unsustainable. This indicates that tomato production in distant areas is not profitable.

4.4.2 Competition with Imported Products

For fruit and vegetable growers, imported produce is a significant challenge as well. Participants reported that consumers prefer the uniform appearance and appealing shape of imports compared to

local produce. One farmer compared local produce to Egyptian imports: “One kg of pomegranates is 2,000 IQD for the Egyptian one, but ours is 500 IQD or even less.” Another respondent mentioned the lack of quality control on imports, suggesting closing borders in front of imported produce at times of local produce ripening. Furthermore, some said that while foreign produce looks “uniform,” it often contains unregulated chemicals, whereas local produce is perceived as safer and healthier but less visually appealing.

4.4.3 Government Purchasing Limits

Wheat and barley farmers in the plains, who plant vast surface areas face a specific challenge: the government purchasing limit. While the government buys wheat at a good rate, it sets quotas and limits on how much it receives from each area and farmer; this leaves farmers with excess stock at times of good production. One large-scale producer explained, “Two years ago, I had 300 tons of wheat, [but] they only took 50 tons.” Farmers are forced to sell the excess stock to private traders or as animal feed at a lower price.

4.5 Theme 4: Operational Costs and Machinery

High costs of inputs, specifically fertilizers, pesticides, and machinery fuel, was a frequent complaint among farmers. Smallholders mentioned that essential machinery is “out of reach,” while those with larger holdings, who had some of the needed machinery, had difficulties with maintenance costs. Advanced machinery use and mechanization are also hindered by capital constraints. For example, hiring a tractor owner cost approximately 30,000–40,000 IQD per hour, a price that is high and preventive for low-income farmers. As one of the participants summarized, “Farming does not even give much profit to have [modern machines].” Consequently, many farmers are forced to rely on old, inefficient techniques and equipment.

4.6 Theme 5: Pests, Diseases, and Pesticide Effectiveness

Farmers identified a wide range of biological threats and diseases destroying their crops. Common pests and diseases included Spider Mite (Tavinpirk), Powdery Mildew (Palatink), Leaf Curl (Chrchrok), Grasshopper/Locust (Koli), Late Blight (Shoba), Worms (Krm), Red Lily Beetle (Kezka Sor). To be more accurate, Kurdish names for these diseases are mentioned between parentheses. In mountainous areas like Lenava, wildlife predators, like jackals (Tuiri), wolves (Gorg), and wild boars (Baraz) were also causing produce loss. Whereas in plain areas where wheat is usually grown, these were mentioned: Sunn Pest (Smke), Loose Smut (Hambalk), Wheat Rust (Jang). An important sub-theme was the declining efficacy of pesticides and used medications. Participants reported that pests are becoming resistant and less responsive to medications, and that available chemical solutions and pesticides are of poor quality. One farmer noted a generational shift: “In the past, my father would only put a small amount of sulfur... Now, farming without chemical pesticides is not working anymore.” Another stated that “in 100 [pesticides], only one might be working,” leading to financial losses as crops are destroyed while farmers wait for the ineffective chemicals to work.

4.7 Theme 6: Institutional Support and Policy Barriers

The data reveals that there is a perceived reduction in governmental support compared to previous decades. Participants mentioned the discontinuation of seed and fertilizer subsidies and the absence of compensation in times of no-production or loss.

4.7.1 Systemic Barriers

Farmers described some systemic barriers that hinder development:

- Bureaucracy and institutional barriers: strict and rigid regulations that prevent farmers from digging wells or building small dams to mitigate against lack of rainfall.
- Inequitable Distribution of subsidies: Aid, when available, is perceived as being distributed unfairly or based on nepotism rather than need.
- Lack of extension services and specialist supervision: There is an apparent absence of agricultural specialists or government extension workers to provide technical guidance and supervision for farmers.

4.7.2 Political and Geopolitical Factors

While most participants reported that local conflict was not a direct barrier in the studied villages, still the geopolitical context of the Kurdistan Region affects trade and the success of local produce. Some farmers mentioned that the government is hesitant to block imports from neighboring countries due to political pressure, unlike other nations that prevent imports to protect local farmers and develop agriculture.

4.8 Farmers' Needs

Based on the challenges identified, the participants reported specific needs, which are categorized into direct support needs and policy change demands.

4.8.1 One: Direct Support Needs:

Demanded support from all farmers revolves around several key agricultural inputs. These included: Water supply, seeds, fertilizer, pesticides, tractor and machinery, oil and gas for machinery, and some asked for Information and Skills.

4.8.2 Two: Policy and Structural Change:

These included the following:

- Firstly, supporting local farmers through closing borders in front of imported produce especially during local harvest season, to stabilize market prices.
- Secondly, investing in water supply projects, dams and artesian wells, or easing regulations to give permits to farmers so that they build their own.
- Thirdly, imposing strict laws and regulations on pesticides imports, through rigid supervision to ensure their efficacy and quality.
- Fourthly, providing extension services and specialists' support and consultation, through effective implementation of educational workshops and field visits by agricultural experts
- Fifthly, guaranteeing equitable distribution of aid and subsidies, by ensuring that support committees are operating transparently and without bias.
- Finally, a more centralized or collective procurement and distribution of pesticides by governmental institutions can ensure superior quality and more competitive pricing. This model can also be used for other agricultural equipment, including drip irrigation tools, machinery, and tractors, bought and managed by agricultural institutions to serve a wider farming community. This

is especially important for smallholder farmers who face difficulties in obtaining needed machinery because of high price.

5. Discussion

The study findings reveal that farmers in Duhok Governorate, and especially in the selected villages, are going through a multidimensional crisis in agriculture: a crisis where climate change and its consequences, economic non-viability and market difficulties, and institutional inactivity and neglect intersect to threaten the sustainability of local agricultural activity. Participants showed a willingness to continue farming and contribute to society's good, but their reports show that without significant interventions, the agricultural lifestyle might be endangered and fall under the threat of discontinuation.

5.1 Intersecting Crisis

Notably the problem is not just droughts or climate change, as it includes environmental, economic, and institutional factors as well. Farming is transitioning from a mode of livelihood to a liability and economic burden, which has led some farmers to mention that "we need to do 9-10 jobs only to sustain our lives."

5.2 The Environment and Resource Scarcity

Rainfall dependency in most areas, and especially in the Kashe and Basitke plains, makes agriculture too sensitive to changes in climate. On the other hand, areas where there are some irrigated spaces are also suffering because of drying springs and a scarcity of groundwater. In fact, this coincides with findings by Wali & Khdiar (2025), Shanshoul et al. (2025), and multiple other recent studies. And these two issues happening at the same time have shown a significant vulnerability of agriculture in Duhok villages to weather changes and water resource scarcity. This kind of unpredictability and being vulnerable to weather status has a tremendous influence on farmers' sense of security, and influences the psychological and social well-being of farmers and their families.

5.3 Political Economy of Local Farming

The economic viability of agricultural activity is minimal. Because of the high costs of agricultural inputs and low market prices of crops, maintaining household expenses from agricultural activity becomes highly challenging. This is especially true for small-scale farmers, as they cannot afford developed machinery for land plowing and harvesting. This has pushed small farmers to move away from farming activity and left only those who can afford losses.

Moreover, there is some sort of failure of local farmer protectionist policy, if such policies exist. Local crops are being overwhelmed by cheap imported products, making farming less viable.

5.4 Bureaucracy and Structural Barriers

There is a breakdown in trust between the rural periphery (villages) and central governmental institutions. Farmers feel abandoned, with a lack of sufficient extension services and unfair subsidy distribution. Moreover, farmers also see institutional inactivity and a lack of sufficient engagement with them. Worsening the crisis is the status of pesticides, which many farmers perceive as ineffective. It is not just about bugs on the farms, but also about evidence of weak regulation and quality control.â

5.5 Sociological Implications

Evidence suggests a process of de-agrarianization is taking place, even if on a small scale, signalling a potential decline in the traditional farming lifestyle. Most farmers were of an older generation (mostly 40+), and if they stop farming, and the newer generation doesn't see profit in this sector, what will happen to the social structure of these villages and how will they adapt? Furthermore, if economic pressure continues, many families will start moving to cities, leaving rural life behind.

5.6 Study Limitations

Some limitations of this study are acknowledged. For example, the study sample might be small (14 participants), but it is appropriate to achieve qualitative depth. Moreover, all study participants were males; although this might show a living reality (most farmers being males), it is still seen as a weakness in the study because women might be facing different or additional challenges which this study did not capture.

This occurred because, in the visited households, males were primarily responsible for agricultural activities, so they were more knowledgeable of their work. Another limitation is data being collected in winter (November and December), so farmers could have felt differently if interviewed during the harvest season.

6. Conclusion

In conclusion, the agricultural sector in the selected villages of Duhok Governorate is facing a critical, overarching crisis. As seen in the narratives of local farmers, there is an intersection of water scarcity, climate unpredictability, economic unviability and institutional inactivity. All these factors are threatening not only crop production, but also village life and society itself. Additionally, all challenges put together, are driving a potential move towards de-agrarianization, risking the loss of rural lifestyle and accelerating rural-urban migration. Without good, comprehensive and targeted interventions, farming may be transitioning from a way of life to an unsustainable economic burden.

7. Recommendations

- Based on evidence in this paper, the following policy and structural changes are recommended:
- Implementing seasonal crop market protectionism is recommended to stabilize domestic market prices and support local farmers during harvest season.
- investing in water infrastructure and easing the approvals of such projects will ensure that some agricultural activity is sustained even during drought seasons.
- Enforcing strict pesticide quality control through rigorous supervision and strict regulatory laws on imports will give the farmers access to high-quality and effective pesticides.
- Establishing collective procurement systems will help small-scale farmers access expensive inputs and machinery, which will in turn vitalize the economy.
- Providing agricultural extension services on a better and larger scale will help spread effective and healthy agricultural knowledge, skills and techniques.
- Ensuring transparent aid distribution will help repair the lack of trust between rural peripheries and central institutions. This should include fair and just distribution of subsidies and financial compensation.

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