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FUTURE RESILIENCE OF THE GRAIN FARMING SYSTEM IN NORTH-EAST BULGARIA – ALTERNATIVES AND STRATEGIES FOR ADAPTATION

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Abstract

Grain farming is a well-established sub-sector in North-East Bulgaria that tenures most of the arable land in the region and contributes for substantial shares of the grain outputs of the country. This paper takes a system view of grain farming and examines how the farming system would change in response to perturbations. It employs participatory qualitative research methods to explore future alternative systems and possible strategies to achieve them. Envisaged future alternatives range from change of the farms through technological innovation and crop diversification to creating a new enterprise in processing or undertaking farming in a different region. They can be realised through predominantly self-reliant strategies while key relationships between actors in the farming system can be strengthened to ensure successful outcomes.

Key words: grain farming, Bulgaria, farming system, resilience, participatory research

JEL: Q10, Q18

Introduction

This research considers the grain farming in North-East Bulgaria as a socio-ecological system where grain farmers have a focal role (Meuwissen et al., 2019; Walker et al., 2004). The sector has been of key importance for the region as 40.6% of the arable land in the country is located there (МЗХГ, 2020). Furthermore, the region contributes by 45.5% of the areas with cereals and 36.7% with oilseeds (МЗХГ, 2020). This production profile of the region has been shaped because of the prevailing natural conditions and historical development (Peneva and Valchovska, 2019).

A wider research project examined the changes in the past, present, and future of the farming system (see Sponsorship). This paper is focused on the future changes. It investigates the alternatives to the current system that farmers and stakeholders in North-East Bulgaria are able to foresee and the possible ways to achieve them.

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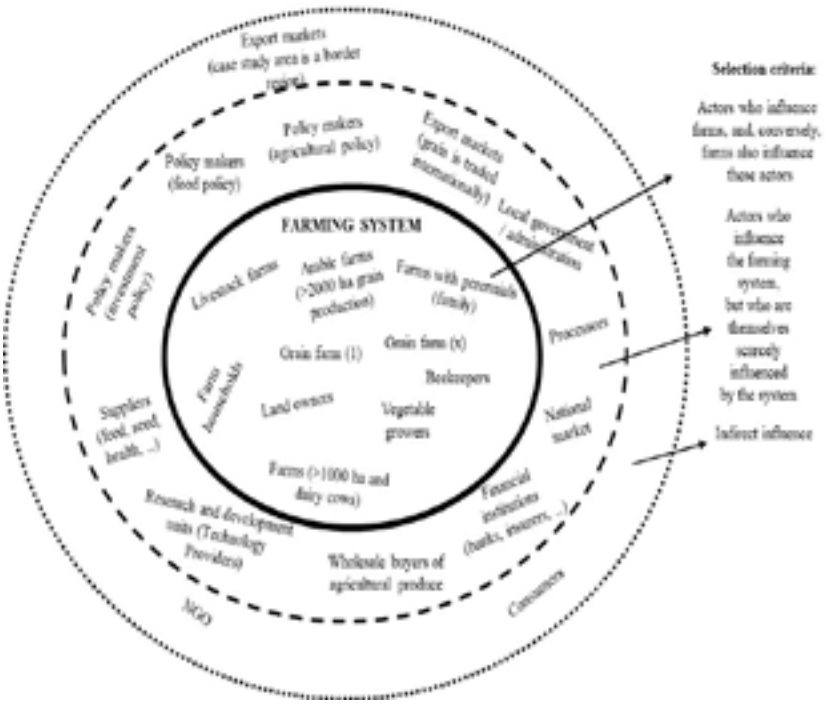
The farming system and its resilience capacity

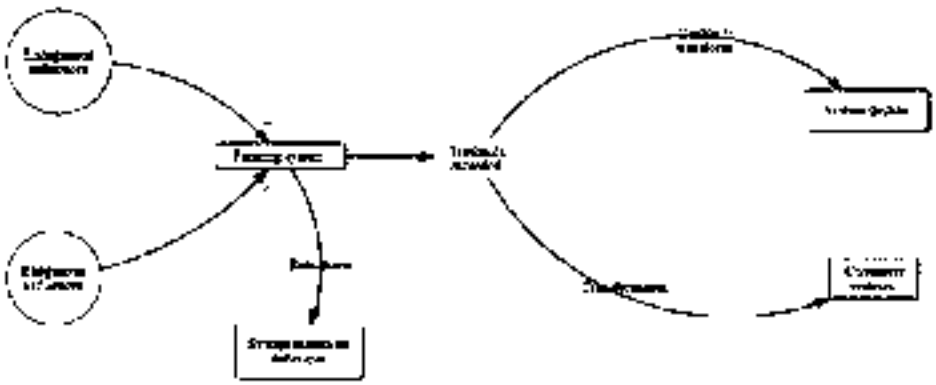
The farming system for grain farmers has been defined through a theoretical framework (Meuwissen et al., 2019) and stakeholder input (Peneva and Valchovska, 2019) and is illustrated on Figure 1. It considers the main actors affecting grain farmers according to the extent of influence they have on farmers as well as the ability of the farmers to influence these actors.



Source: Peneva and Valchovska (2019).

Figure 1: The farming system of grain farmers in North-East Bulgaria

Resilience capacity of the farming system has been formulated at three levels – robustness, adaptability, and transformability (Meuwissen et al., 2019). Robustness means that the system reacts to challenges while remaining largely unchanged, while adaptability includes some changes, but the core functions of the system remain the same. Transformability captures relatively large changes and reflects that the system and its functions have moved to a new state of equilibrium. Inevitably, the system faces challenges to a various extent coming from endogenous and exogenous influences (Figure 2).



Source: Based on Meuwissen et al. (2019).

Figure 2: Framework of system change

In line with that framework of resilience, while facing future challenges, the farming system can be expected to maintain the status quo (remain the same), decline, or transform (Paas and Reidsma, 2020). Transformational change leading to alternative systems is expected after one or more critical thresholds are exceeded (Kinzig et al., 2006). Threshold indicators like crop productivity, farm income, soil nutrient balance, and legislation changes have been considered during the research process. Detailed explanations of the theoretical framework and its operationalisation have been provided in Paas and Reidsma (2020) and Reidsma et al. (2018). Detailed results from the empirical analysis have been presented in Peneva and Valchovska (2020, 2019). This paper is focused on the results representing what alternatives to grain farming are anticipated by actors in the farming system.

Methodology

Exploration through participatory methods has been employed to examine the future resilience of the grain farming system (Paas et al., 2021; Paas and Reidsma, 2020). Such an approach ensured that the results from the analysis are based not only on past experiences and behaviours, but also on stakeholders' knowledge and perceptions about the future (Bergold and Thomas, 2012). Data were collected in a workshop setting implemented in January 2020. A total of 19 representatives of system actors attended the workshop. They included employees of the agriculture advisory service (3) as well as the regional directorate of the Ministry of Agriculture, Food, and Forestry (MAFF) (3), and representatives from

the offices of the MAFF at the municipal level (2). Other participants included farmers (8), representatives of food producers (1), as well as consultancy (2).

Challenges and their critical thresholds were evaluated by the participating stakeholders of the farming system. They considered under what conditions the farming system could remain the same, decline, or transform. This facilitated identification of six alternative systems that it could transform into as well as the strategies for achieving them. These are discussed in the next section.

Alternative systems

Innovation and technology improvement

This alternative encompasses various dimensions of change in the employed technology. They ranged from the more general 'adoption of innovations' to the more specific suggestion for adoption of new technology that leads to cost reduction. Another specific suggestion was the change in tilling technology that could simultaneously preserve soil quality and provide a satisfactory level of productivity. Further prompts revealed that participants meant adoption of innovations in terms of technology, as well as crops, fertilisers, and chemicals.

Given the extensive focus on adoption of advanced technologies, participants were asked if they considered precision agriculture among the alternatives. It turned out that some of them were not aware of the term and needed further explanation. After being given more detail, participants agreed that precision agriculture was an alternative. Similarly, they agreed that no till technologies were among the alternatives in overcoming future pressures for change. Some of these technologies still needed to be adapted to the local conditions and natural capital which was part of the grain farming system resilience.

Processing and increasing value added

The discussion with all participants confirmed this as an opportunity for farmers from the region. Participants' views again varied from a quite general perspective towards 'increasing of processing' to a more specific one provided by a grain farmer representing a diversified farm business involving trade in addition to grain production. He formulated it as an alternative of 'increasing value added through processing of output'.

During the discussion, participants revealed that they related processing with the current outputs from the system into food products for the end consumer. When prompted with the perspective for biofuel production, they agreed that it was an alternative. Participants were aware that their main outputs, like maize, were among the inputs in the production of biofuels and demonstrated knowledge of existing practices internationally as well as in Bulgaria. However, they

considered biofuel production as an alternative market for their outputs rather than as an alternative business that they could initiate.

The participants also pointed out that the processing needed to be related with a market-driven identification of appropriate new product, i.e. it had to consider the needs of consumers to ensure that there was demand for the processed products. They were aware that by undertaking such step, they would face different, and maybe, fiercer competition than within their current activities. Some participants expected legislation changes that would give Bulgarian products an advantage over imported analogues. They also discussed the need for more targeted policy efforts for strengthening the image of Bulgarian products among consumers in the country. Consumer trust in nationally produced food was eroded by the low quality offered by already existing producers. This alternative system was also recognised to create wider positive effects on the local economy in terms of upstream and downstream economic linkages and transactions.

Crop diversification

This alternative system was identified in general with respect to the common crops grown by grain farmers. While considering the growing of new crops, the participating farmers identified several areas where the alternative would require innovation in their practices. These included: use of new machines due to differences in tilling practices required by the new crops; and acquisition of new knowledge that would help them grow the new crops. The main issue that the participating farmers saw with the adoption of new crops was the initial planning for the new production. As they had no prior experience with the crop, it was unfamiliar, and they could not anticipate all relevant issues that could arise. Thus, planning the production of the new crop could be inaccurate.

In addition, one participant specified that diversification towards crops and varieties that are more suitable for a drier climate were a possible future solution. There was wide agreement from the rest of the participants on the perspective. The anticipated changes would follow the changes in the environment that were inevitable. Such solution would be in line with the local conditions and natural resources.

Exit farming / change of sector

Workshop participants proposed an alternative state that involved exit from farming and moving to a different sector of the economy without specifying which one. One participant suggested a change from farming to tourism by selling all farming assets and buying a hotel by the sea. This was an easily identifiable alternative with the proximity of the seaside to the region. In addition, tourism was commonly identified as an employment alternative to agriculture. The opinion

of another participant was that emigration was a possible alternative. Overall, exiting farming by changing the business sector, or a different occupation, or emigrating from the country for economic reasons was not a desirable alternative. Emigration as an alternative may have been pointed out as an extreme solution. Nevertheless, examples were common as the reduced availability of labour was attributed to increased emigration from the region to countries with better economic opportunities.

Collaboration

This alternative was mentioned in general as well as an opportunity for collaboration with another farmer for achieving lower production costs and utilising the economies of scale. The discussion revealed that participants were pessimistic about the likelihood for collaboration. They shared a common perception that people (everyone in society) did not tend to take part in collaborative relationships for business purposes. This happened even when there were obvious benefits from collaboration, like opportunities to increase revenues by accessing a different market or achieving a higher price of output. Some participants supported their words with examples from personal experience of trying to organise a collaborative initiative with other producers of similar output.

Moving the farm to a different region

Participating grain farmers gave examples with farmers moving to the South-East of the country. Other regions had lower competition for the farmland, which made access to land easier and at a lower rental price. In this alternative system, the farmer could continue doing the same, but in a different location. This change would happen at the farm level for some farms in the region, which would affect the farming system as a whole moderately.

The consideration of moving farming to a different region reveals a situation where the system would change but not by too much from the perspective of the farmers. This solution could let them produce the crops they already knew well in ways they were already knowledgeable of, but in a different area. Furthermore, they would be able to use the same agricultural machines in the new location. This alternative could help adaptation to reduced policy support or even reduced availability of labour at the regional level if other regions were not affected by similar trends. However, it is not a useful solution in case of factors that would affect the whole country, like climate change, for example.

Strategies for achieving future alternatives

A variety of strategies were discussed as possible ways towards the alternative systems. The first three systems: ‘Innovation and technology improvement’;

'Processing and increasing value added'; and 'Crop diversification' got associated with similar strategies. The main strategies for achieving these alternative systems were knowledge acquisition and business planning / development. The latter may be at the level of the whole farm, as well as only in relation to the new elements. Respectively, interaction with the innovation infrastructure represented by educational and research institutions was the most important strategy for this alternative state. While it was at a level that needed development, farmers suggested that their own, individual capacity for adoption of innovations could help them move towards that alternative.

The stakeholders, representing advisory services, considered the existing infrastructure for innovations as a weak point for achieving these alternatives. They pointed out that the connection between farmers and the institutions developing innovations through research was relatively weak. It was revealed that there was lack of communication between the institutions and the farmers regarding ongoing innovation efforts. The farmers had no way of finding out what the current research activities of the institutions were, because the latter did not announce them publicly in any suitable way. The institutions also did not tend to disseminate the results from their research work. This hindered the spread of the innovations among the farmers. It was also noted that such future systems would have a strong positive influence on the development of the infrastructure for innovation.

Respectively, innovation took place at the farm level and was mostly driven by the farmer. Examples included when the farmer was purchasing more advanced machines or started using new varieties of crops. In addition, there was low preparedness of the farmers to adopt and implement the innovations resulting from the work of the institutions. Participants also identified a low level of trust of the farmers towards the research institutions. The latter were more inclined to trust their own experience resulting from trials and errors. Participating farmers argued that this experience was more closely related to the specific characteristics of the farm than the work done by research organisations. The findings of the research institutions could not be easily related to the specific farm, which made them harder to utilise.

Another obstacle to the adoption of innovations was the lack of successful examples. A grain farmer pointed out that they would not like to be the first to try out how and if some innovation worked in practice. The farmer would feel more confident if other farmers had already tried and demonstrated that the innovation worked well. Thus, the farmers' network was of crucial importance to acquire new knowledge and to have access to new ideas.

The three alternative systems involved investment as well as adjustment of the organisation to accommodate the new elements of technology and innovation.

Thus, finance availability was of crucial importance and relevant opportunities were pointed out. These included operational programs, the rural development program, as well as banks and other credit institutions. Participants also identified own finance among the possible solutions.

The 'Exit farming / change of sector' alternative suggested that a new business will replace the main farming activity. In this respect, it was similar to the 'Processing and increasing value added'. Both implied new business undertaking and respectively, a strategy involving entrepreneurship and business development. This future system also required new knowledge, access to know-how, and a higher level of risk acceptance by the farmer. In some cases, co-operation was considered such as farmers' organisations where processing facilities could be utilised better while the risk was shared.

Conclusion

The analysis of alternative systems suggested that participants anticipated farmers maintaining largely the same production by adding crops, machines, or processing. Radical changes were considered at an abstract level, but not translated in alternative systems (except for the exit of farming). Nevertheless, with respect to resilience, the analysis suggested that when change was inevitable, the grain farming system had the capacity to adapt or transform by undertaking and building on these incremental changes.

The existing overlap between 'Innovation and technology improvement', 'Processing and increasing value added', and 'Crop diversification' suggests that the first three alternative systems are complementary and could be considered as a future possible vision of farming system development in the region. Furthermore, the selection of strategies depended on achieving a common vision about the future of the farming system in the region as well as the place and importance of grain production. The participatory investigation suggested that a shared common vision may strengthen trust among the actors involved (farmers and governance, especially) and would facilitate co-operation among them in achieving the alternatives. Working together during the discussion showed that when participants agreed upon a certain element, each one of them was ready to contribute to its implementation.

The analysis also showed that in order for the alternatives to become feasible to those who are interested, there is need for appropriate business support and showcasing of successful examples. This would facilitate the adoption of innovation at different levels. While the participating farmers showed a tendency to be self-reliant with respect to gaining knowledge and decision-making, they would benefit from improved access to relevant information and knowledge.

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