The Uptake of Green Finance Tools in Agriculture – Results of a Q-methodology*

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In this period of climate change, green finance is expected to have complex consequences to address economic and environmental risks by improving the profitability of individual activities. There are clearly identifiable areas of green development in agriculture that require such funding. Our research investigates the effectiveness of green finance tools in financing the sustainable development of the pig sector, a key agricultural sub-sector. The results of a Q-methodology study carried out with actors in the product chain showed that green finance is an unknown area for them. They are uncertain and pessimistic about whether and to what extent green finance tools can contribute to the development of the sector, but all share the view that sustainable investment in the sector may require public intervention. The use of economic policy instruments may therefore be necessary to make a sector-specific green finance programme a success.

Journal of Economic Literature (JEL) codes: D25, O13, Q14

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1. Introduction

Tackling climate change and its consequences is one of the most pressing issues of our time: much of the world has already recognised that major economic and financial changes will be needed to mitigate and, where possible, reverse the negative effects of climate change. All economic actors, including financial institutions and central banks, have a role to play (*Deák 2021*). However, how and to what extent central banks should play a part is far from clear. The primary

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responsibility of the Magyar Nemzeti Bank (MNB) is to preserve price stability, and therefore central bank decisions affecting green finance should be viewed through this lens (*Kolozsi et al. 2022*). The main objective of containing inflation should not be compromised by other, in this context secondary, responsibilities. The MNB's response to environmental challenges is the Green Programme,[1] which supports the Second National Climate Change Strategy adopted by the Parliament.[2] The Green Programme takes a comprehensive approach, covering a wide range of issues including material for families, support for research and recommendations for financial institutions.

The financial market has also entered a period of adaptation to climate change, with the rise of green finance. Green finance refers to financial products specifically designed to finance environmental, sustainability and social objectives. While the range of products is gradually expanding, and the amount of capital tied up in green finance is increasing, the capital required to combat climate change is a significant burden on humanity. At the same time, green finance has a positive impact on economic development by improving the ecological environment, increasing economic efficiency and diversifying economic structure (*Yang et al. 2021*).

All sectors are facing challenges, but the extent to which they are affected varies considerably. The importance of the agricultural sector to the national economy and its exposure is well known. The agricultural sector is characterised by social, economic and environmental risks in equal measure, but at the same time, together with the food industry, it forms the basis of the real economy. In the face of climate risks and increasing demand for raw materials, understanding and monitoring trends in the profitability, sustainability and competitiveness of the sector is certainly a key issue.

In the case of agriculture, quantifying these aspects and exploring solutions is essential. Globally, the agricultural sector is responsible for about 22 per cent of all greenhouse gas emissions (*IPCC 2022*). This share is much lower in developed countries, mainly due to significant reductions in livestock numbers, the more efficient use of fertilisers and a better management of organic fertilisers (*Migliorelli 2019*). There are many examples of the 'greening' of agriculture, e.g. environmentally friendly and energy-saving techniques are used in China to control diseases and pests (*Yu et al. 2020*); but this can also include water management, organic fertiliser management, etc. However, the natural and/or technical solutions used must be supported by appropriate financing in a way that does not reduce productivity and profitability. The problem is complicated by the need to finance not only compliance with sustainability or environmental criteria, but also to take

[1] https://www.mnb.hu/letoltes/az-mnb-zold-programja.pdf
[2] https://nakfo.mbfsz.gov.hu/sites/default/files/files/N%C3%89S_Ogy%20%C3%A1ltal%20elfogadott.PDF

account of parallel market pressures or changing social needs in certain sectors (e.g. pigs).

Our research investigates the effectiveness of green finance tools in financing the sustainable development of pig production.

With strong industrial linkages on both the input and output sides, the domestic pig sector is one of the most industrialised sectors of agriculture. Due to industrial production, economies of scale play a major role in the farm structure in this sector (*Duffy 2009*; *Hsu 2015*). However, meeting sustainability requirements is also an important element in increasing productivity. The need to address and prevent environmental problems associated with nitrogen discharges from intensive livestock farming is therefore growing.

In Hungary, the pig sector has been characterised by declining herd sizes and restructuring over the last two decades. The number of pigs fell by almost 28 per cent between 2000 and 2010 and by a further 10 per cent between 2010 and 2020 (*HCSO 2022a*), even though pig production concentrated and the pig population increased in several countries over the same period, e.g. in China and the USA (*Hsu 2015*). The fall in pig numbers mainly affected individual farms, but was less characteristic of farm organisations (*Csonka et al. 2021*). As a result, pig farming in Hungary is now dominated by partnerships, which account for four fifths of the pig population (*HCSO 2021*).

In addition, of course, the farm size structure has changed significantly, with an increasing proportion of the herd concentrated in larger farms. According to agricultural censuses, the share of farms with less than 50 pigs in the Hungarian pig population decreased from 26.1 per cent in 2010 to 12.6 per cent in 2020. Meanwhile, the share of farms with more than 500 head increased from 73.8 per cent to 87.4 per cent. Within the latter, the share of pigs kept in holdings with more than 5,000 head is 68 per cent (*HCSO 2022b*). It can be concluded that Hungary is now characterised by intensive pig farming, and the decisions that will determine the future of the sector are also taken on larger farms.

From a financial and policy point of view, the question is: In view of the importance of the pig sector, can green finance be applied to this sector? Do sustainability requirements help to improve competitiveness? Will producers be motivated to change? These questions will now be discussed on the basis of a review of the literature on agricultural financing and green finance as well as the results of a Q-methodology study.

2. Specificities of agricultural financing

Modern agricultural production requires a substantial amount of capital, most of which can usually only be financed from external sources. A price collapse due to an unexpected fall in demand or, possibly, working capital requirements resulting from a sharp increase in demand can cause serious problems. In terms of revenue and profitability, production and its efficiency is a risk factor that can adversely affect producers. One characteristic feature of agricultural production is the long time span involved in the production process (for example, the life cycle of winter wheat is 10 months, that of growing cattle is 18 months and that of slaughter pigs is about 7–8 months). One of the economic effects of this is that switching to another production process during the breeding season is either impossible or very time-consuming. In addition, the entire economic programme has to be developed and defined much earlier, before the start of the production process. The third economic consequence is that the payback period for investments and current assets is significantly longer than in most industries (*Ferencz 2014*). These characteristics affect, inter alia, the maturity of loans, the level of interest rates, taxation, etc.

The relatively long production processes and the sector's exposure to weather conditions make agriculture completely vulnerable to market conditions in the short term (*Dey – Mishra 2022*). The sector plays a key role in determining the price of inputs, but it is slower to adapt to market influences affecting agricultural activity. It is not possible to speed up the production process by changing the amount of labour, nor is it possible to multiply these processes. The relatively long span of the production process in the agricultural sector leads to a focus on long-term economic objectives and sustainable operation of the enterprise (*Vo – Ngo 2021*).

Given the seasonality and the production cycle, the additional costs arising from the interruption of the continuity of income, even assuming a diversified production system, remain a concern for agricultural enterprises, and even more so for small farms (*Sipiczki et al. 2019*). In the production process, inputs (materials, wages, etc.) need to be financed (*Horváth 2019*). Obviously, if this financing is provided by external sources, interest is an additional cost and therefore financial intermediation plays an important role, as empirically demonstrated by *Fogarasi and Zubor-Nemes* (*2017*). The coordination of sectors with different production cycles, the multifunctional structure of production and the disadvantages resulting from the specific characteristics of agricultural production can be mitigated (e.g. continuous income from dairy can cover the costs of wheat production or pig fattening until their recovery).

However, this particular cyclicality has important implications for agricultural policy. Until they sell their products, farmers are not always able to cover their expenses and living costs from their cash reserves during the production period.

3. The emergence of green finance in agriculture

The study by *Wang and Zhi* (*2016*) presents innovative green financial tools related to agriculture (environmental protection), such as environmental funds and biodiversity funds, debt-for-environment swaps (SWAPs), forestry securitisations, weather derivatives, nature-linked securities and green investment funds. *Akomea-Frimpong et al.* (*2021*) compiled a list of the green financial products most commonly used by banks: green credit/loans, green long-term investment accounts, carbon finance, climate finance, green securities and bonds, green insurance and green infrastructural bonds. The success of the green transition also depends on strategic cooperation with the country's financial system. Several studies have suggested that the financial sector will have to play a central role in the 'green transformation' (e.g. *Volz 2018*; *Moxey et al. 2021*; *Carauta et al. 2021*; *Manasses et al. 2022*).

The role of the financial sector varies considerably. In Europe, the Common Agricultural Policy (CAP) continues to be central, and the support system influences farmers' behaviour and decisions (*Migliorelli 2019*). *Moxey et al.* (*2021*) present a case study of the UK to show a positive example of blended finance, where public and private funding are combined to finance green investments. In addition to the advantages, they also point out that positive externalities do not immediately translate into benefits for farmers, which can be a barrier to greening, making subsidies a priority. In Brazil, producers were encouraged by subsidised credit (*Carauta et al. 2021*), with very favourable credit conditions and an average lending rate of 5 per cent, compared with the central bank's policy rate of 12 per cent. Nevertheless, the drawdown was lower than expected by the central bank. The authors argue that this is because other types of subsidised loans were available under a similar scheme where no green targets were required. This example also shows that there is a role for incentives to encourage farmers' commitment to sustainability goals. Public financing is needed also to compensate for the higher risk-taking by farmers and the lower results they can expect (*Zhang et al. 2021*). The national or UN SDGs will not be achieved per se if farmers are placed in the worst quartile of the risk-return trade-off.

With regard to green financial products, *Sárvári* (*2022*) points out that, in addition to the classic risk-return approach, investors should also place a strong emphasis on sustainability considerations. At the same time, the main barriers in the financial sector are related to the perception of the high risks and costs of green investment, which – combined with the lack of subsidies – results in projects that do not pay off (*Liebman et al. 2019*). *Agirman and Osman* (*2019*) approach it from a slightly different perspective: Without adequate financing, green goals and policies will be ineffective, because there is no economic development in the absence of financing, and there is no sustainable development without green financing.

The simplest form of financing is the greening of existing schemes, so it is no coincidence that the most popular green financial instruments are 'green bonds' and 'green loans'. Through their regulatory oversight over the financial system, central banks are in a powerful position (*Dikau – Volz 2018*). Green bonds are gaining a prominent role in sustainable development and offer more diversification opportunities for investors (*Naeem et al. 2022*), who can thus contribute to sustainability and mitigate environmental and social risks (*Kung et al. 2022*). However, access to green bonds is difficult for small producers, partly due to high transaction costs and limited availability of the bond market. The Hungarian agricultural sector is characterised by a high proportion of small producers, although their relative weight is decreasing in all segments. Green loans appear to be a viable solution not only in Hungary, but also in Europe, where the bond market is less important than in the USA. Green loans, like green bonds, become green when a sustainability or environmental objective is attached to the project they finance (e.g. Brazilian interest subsidised loans). The long payback period and the high risk can be a limitation of green lending. Just as investors do not like such investments, banks do not want to finance uncertain projects. This problem can be overcome if the government is prepared to provide a green loan guarantee to help lenders reduce their risks (*Zhang et al. 2021*).

In Asia, green finance is associated with some form of alternative financial incentives, most commonly microfinance (*Downing et al. 2022; Yu et al. 2020*) and FinTech solutions (*Yang et al. 2021*). In China, Ant Group (China's largest FinTech company) offers farmers the opportunity to raise funds from private individuals through a mobile app (Ant Forest). Their experience shows that green finance contributes to economic development. This is essentially microcredit – called digital finance – and no collateral is required. The model of *Yu et al.* (*2020*) highlights the need to improve credit availability, promote information acquisition and enhance social trust for digital finance to spread. *Wang and Zhi* (*2016*) mention two pillars that need to be strengthened for the spread of green finance: 1) reform of policies related to green finance and 2) innovation of financial tools. Among other things, *Akomea-Frimpong et al.* (*2021*) examined the green finance of credit institutions, finding that green banking policy is influenced by environmental and climate change policies, interest rates, religion, risks, social inclusion and social justice as well as banking regulations. The acceptance or adoption of green finance varies between countries with different socio-economic cultures. *Agirman and Osman* (*2019*) conclude that there is no single formula, noting that different countries face different challenges in this area.

National and higher-level targets are most effectively implemented at the local level, and accordingly local governments, along with actors in the financial system, need to commit to greening (*Guo et al. 2022*) and play a key role in monitoring as well

as supporting farmers. The authors propose a system of rewards and sanctions to encourage farmers to produce in an environmentally friendly way.

Migliorelli's (*2019*) study identifies the following 'problems' in adapting green finance in agriculture. (1) The exact definition of green agriculture: this is a definitional issue, because until we know exactly what constitutes green or sustainable agriculture, the associated term of green finance is also in question. (2) Access to bond markets is limited: firstly, bond issuance is only a good financing strategy above a certain size (small producers are excluded), and secondly, indirect financing channels are predominant in Europe. (3) Information asymmetries: agricultural management is very different from that of other businesses, which means that the financier needs specific knowledge to price loans. (4) A precise definition of green credits: this is also a definitional issue, i.e. what exactly makes a loan green? In their paper, *Agirman and Osman* (*2019*) mention five different definitions, which are broadly similar and include terms such as 'environmental considerations', 'economic growth with reduced emissions', 'private investment in green industries', 'clean energy', 'sustainability', 'climate change' and 'adaptation' etc. These issues call for a firm definition at the EU level.

The role of Common Agricultural Policy measures and subsidies should be highlighted here for the European Union, and for Hungary, in particular. Although this is not recent data, the Research Institute of Agricultural Economics (*AKI 2019*) calculated that for the period 2009–2015, investment grants accounted for about one third of the net investment (per livestock) of pig farms. Another study by the research team looked more closely at the impacts of VP-4.1.1-5-16 'Modernisation of pig farms' tender, which was launched in 2016. The aim was to contribute to improving competitiveness by providing opportunities for technological developments where increased resource efficiency in livestock farming leads, inter alia, to a reduction in specific energy consumption. Accordingly, support was also provided for the renovation of technical building installations and for energy efficiency modernisation of livestock farm buildings, the modernisation of technologies and the acquisition of renewable energy technologies. In this respect, therefore, the grant itself is a green finance tool which, according to our findings, is very effective in encouraging (or even obliging) the greening of investments. The green component will be further strengthened in the criteria for agricultural support in this support cycle ensuring that the sector meets sustainability and green finance criteria.

4. Methodology of the Q–factor analysis

Q-methodology is a relatively new primary research tool in Hungary.

The Q-factor analyses applied by Hungarian researchers are diverse, and the closest to the topic of this paper is the survey by *Horváth et al.* (*2020*), which analysed the perception of agroforestry. *Veres and Tarján* (*2018*) used the Q-methodology in their study of consumer decision-making. *Ásványi et al.* (*2014*) used this method to explore attitudes towards sustainability, while *Ásványi* (*2014*) also used it to investigate the relationship between corporate social responsibility and the support for classical music. The methodology has been used in a variety of ways, as shown in the study by *T. Kárász et al.* (*2022*) on the evaluation of curriculum development in response to the coronavirus. Following the work of *Gulácsi et al.* (*2011*), the views of Hungarian physicians were also assessed. There are also analyses in the field of tourism (*Ásványi – Chaker 2021*; *Csapody et al. 2023*).

The methodology was described by *William Stephenson* (*1935*), who described it as a tool for the study of subjective perspectives as early as 1935 and published a book on it in 1953 (*Stephenson 1953*). The method then spread quite rapidly in Anglo-Saxon political science and psychological research, but in Hungary it became known much later, only at the beginning of the 21st century (*Hofmeister Tóth – Simon 2006*).

The essence of Q-factor analysis is that, unlike traditional R-methodology, it does not seek to identify objective correlations that can be generalised, but rather examines the (subjective) perspectives of individuals, looking for similarities and differences between them. The methodology is therefore well suited to typing the different subjective viewpoints within the professional discourse on economic issues and to identifying different perspectives. Given the basic purpose and nature of the Q-methodology, we do not aim for a large, representative sample.

The method is always used to address a limited number of 10–50 people – experts or people who are deeply involved in the topic or discourse under study (*Brown 1996*). Participants are typically asked to rank a Q-set (*Stevenson 2019*) of 40–80 statements, where the statements represent typical opinions in the discourse on the topic under study. One of the most delicate aspects of the methodology is the correct choice of statements and the number of participants. There are no major restrictions on the number of statements in the literature (apart from the '40 to 80' rule of thumb). For a long time, researchers did not impose any technical restrictions on the sample size. Examples of the more important scientific publications in the agricultural sector are summarised in *Table 1.*

Table 1
Introducing Q-methodology to agricultural research

Author(s)	Year	Purpose	Number of statements/ participants
Davies and Hodge	*2007*	Surveying farmers' attitudes and motivations towards environmental management	33/102
Davies and Hodge	*2012*	Examining changes over time in perceptions of farming (agri-environment) by repeating a 2001 Q-methodology survey in 2008	33/34
Forouzani and Karami	*2011*	Exploring farmers' and experts' attitudes to water scarcity in agriculture	54/75
Pereira et al.	*2016*	Examining the impact of beef farmers on the agricultural innovation system among farmers who consider their farms to be advanced technology-based	49/26
Raatikainen and Barron	*2017*	Examining traditional rural biotopes in a socio-ecological sense, e.g. rural depopulation or the role of subsidies	60/20
Alexander et al.	*2018*	Exploring the acceptance of the transition to intensive rice production forced by market developments – Interestingly, the statements include pictures	16/35
Hu et al.	*2018*	Impacts of the Chinese government's 'supply-side structural reform' on grain farmers	33/26
Iofrida et al.	*2018*	Identifying stakeholders' willingness to adopt innovative approaches to sustainable olive production	56/28
Taheri et al.	*2020*	Exploring farmers' views on dust as an environmental issue	48/8
Venus et al.	*2021*	A survey of stakeholder preferences for biogas development	28/22
Pinillos et al.	*2021*	Landholders' perceptions of the Brazilian Forest Law on forest conservation on private land	36/31
Ciftcioglu	*2021*	Exploring public opinion on the agro-ecosystem	48/80

One important step forward in this area was the study by *Webler et al.* (*2009*), in which they argued that the number of participants should be limited according to the number of statements. They recommended that to reduce statistical error in factor analysis and the likelihood of misinterpretation, the ratio of participants to statements to be sorted should be between 1:3 and 1:2. Our research thus follows this recommendation.

In the survey, participants express their level of agreement related to each statement with a scale, similar to a Likert scale. The valuation range has a negative and a positive endpoint (where a positive endpoint represents complete agreement and a negative endpoint represents complete disagreement), and a value of '0' in the middle of the scale represents a neutral opinion (*Shayan 2014*). The survey forces a response that is normally distributed, i.e. each value on the scale can only be associated with a fixed number of statements (fewer at the extremes and more as the scale approaches zero).

Our research applied the methodology in the structure proposed by *Churruca et al.* (*2021*), and thus the detailed results are presented accordingly.

1. step: Identify topic

Given the topic of our study, this step was fairly straightforward in our case. The Q-methodology is used to examine expert opinions on the applicability of green finance tools in pig production.

2. step: Develop the Q-set

The Q-set was developed based on the literature review presented in this paper and our previous research in this sector. Members of our research team collected and refined the statements in the Q-set in three rounds. Throughout the group work, the main considerations were to formulate the statements based on the literature (reducing subjectivity) and to relate the statements to predefined topics that were relevant to the research objective (maintaining focus). As a result, we ended up with 39 statements (*Appendix*) distributed into three topics:

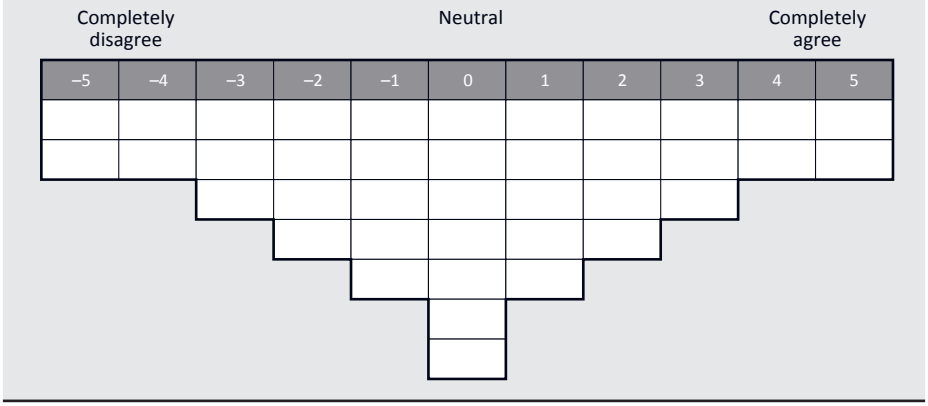
– The present and future of green and circular investments in the pig sector (18 statements),

– Views on the opportunities and constraints of agricultural finance as a whole (7 statements),

– The opportunities and importance of green finance in agriculture (14 statements).

Rating scale range: [–5;+5]. The number of statements that can be recorded for each value is shown in *Figure 1*.

Figure 1
Number of statements that can be recorded for each item of the rating scale (number)



3. step: The pilot Q-set

The Q-set and the evaluation system developed in Step 2 were tested with external experts who were later not involved in the 'live' research. The testing was carried out with three people: a consultant specialising in technological improvements on pig farms, a university researcher and an agricultural finance specialist. The testing did not result in any significant changes and the issues raised were addressed by modifying or replacing some questions.

4. step: Select participants

Experts from four professional fields were involved in the research. In compiling the list of experts, we relied heavily on the research team's network of contacts and the recommendations of the experts who helped with the testing. The number of experts involved was determined according to the aforementioned Webler recommendation (*Webler et al. 2009*). The number of statements per case was 39, so the recommended number of participants for reliable application of the method was between 13 (1:3 ratio) and 18 (1:2 ratio). Accordingly, 16 experts were involved in the research.

The number of experts per field:
– university researcher (1 person),
– agricultural finance specialists employed by banks (4 persons),
– decision-makers of pig farmers who were members of producer groups (6 persons),
– manager of a large meat company (1 person),
– central and regional managers of a national livestock breeding organisation (4 persons).

5. step: Q-sorting

The data was collected electronically, after telephone and e-mail consultation, using the web-based Q-sortware application developed for this purpose. Participants were asked for feedback on completion. The data from the survey was downloaded as a single file in csv format upon completion and the dataset was prepared in Excel for quantitative analysis.

Our decision to use Q-sortware was primarily motivated by the fact that it was free, easy to use and an effective replacement for face-to-face surveys. We had previously used this tool as PhD supervisors and in our EFOP-3.6.2-16 tender on agroforestry. The positive experience we had with the software was useful for this research, so we decided to use it.

6. step: Quantitative analysis of data (Q-factor analysis)

Quantitative analysis of the data was carried out using the STATA 15.1 statistical software, including the 'qfactor' module.[3] The suitability of the data sample for factor analysis was measured using the Kaiser-Meyer-Olkin (KMO) index. The minimum acceptable value of the KMO in social science research is 0.5. In our case, KMO=0.5712, i.e. the sample exceeded the minimum acceptable level. The number of factors was determined using the Kaiser criterion, i.e. only factors with an eigenvalue of at least one were included. Based on this criterion, five factors were selected, representing 66.32 per cent of the information contained in the original variable structure.

7. step: Qualitative interpretation of factors (opinion groups)

The quantitative analysis provided us with the key statements that distinguish each factor (i.e. opinion group) from the others, as well as the participants who fall into each opinion group. Based on this information, we made a qualitative assessment and gave each opinion group a name. The key statements that characterised each opinion group were presented in three groups: 1) The 'confirmation' zone contained the key statements of the opinion group that the group agreed with more than the other opinion groups; 2) The 'neutral' zone contained the statements that the group considered less extreme or radical than the other factors; 3). The 'rejection' zone represented the statements with which the group agreed less than the other factors.

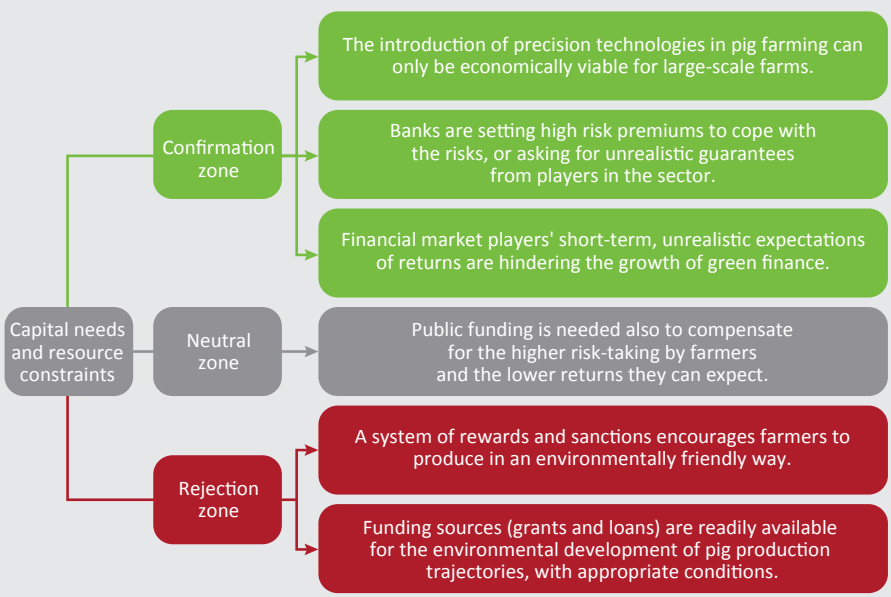
[3] Description: http://fmwww.bc.edu/RePEc/bocode/q/qfactor.sthlp

According to *Danielson et al.* (*2009*), the Q-methodology is an effective and useful tool for exploring subjectivity and divergent expert opinion on a less researched, novel topic. However, the views revealed cannot be treated as global and representative perspectives that can be extended to the whole population (in this case: the whole sector). Other methods, based on large sample surveys, are needed to identify the 'average' opinions that are representative of the sector as a whole. A large sample survey of this kind can be carried out as part of a new independent survey (*Hunter 2011*). *D'agostini et al.* (*2022*) also point out that the results of the Q-methodology cannot be generalised to the whole sector, but it is suitable for identifying previously hidden perspectives and opinions among experts. Another weakness of the method is that very complex, nuanced questions are sometimes condensed into overly simplistic statements.

5. Results and evaluation

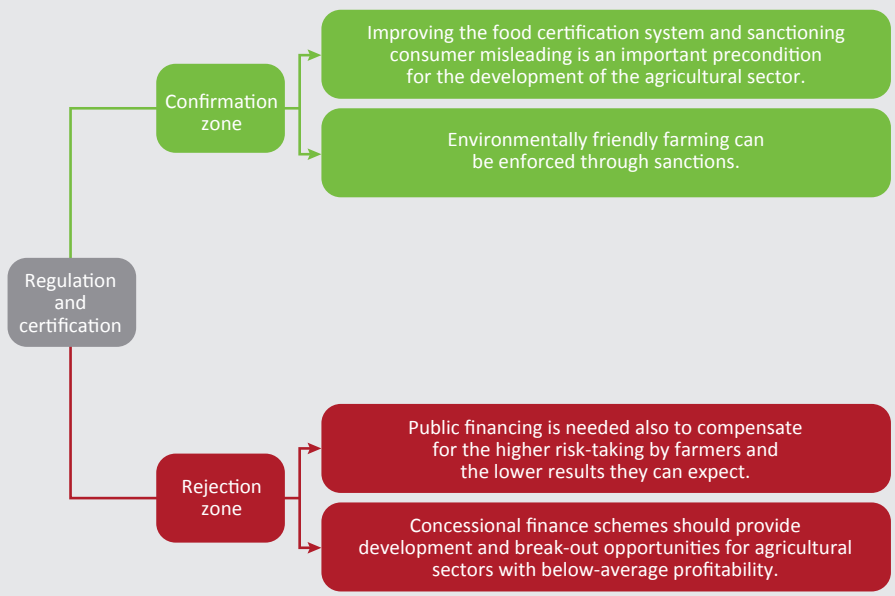
In the 5-factor analysis, 82 per cent of the participants could be categorised into one of the 5 factors. The views of the participants in the same factor were well separated from those in the other factors.

Figure 2
Key statements in the 'Capital needs and resource constraints' opinion group



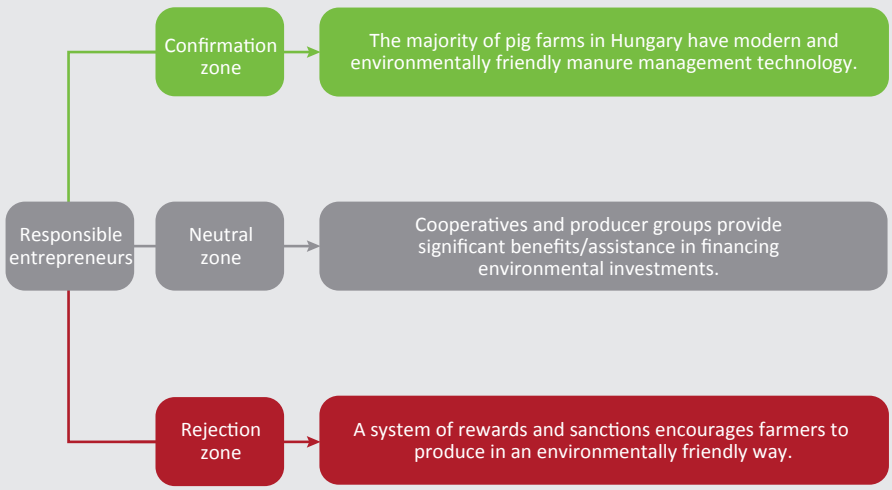
According to participants (*Figure 2*), precision technologies that increase the efficiency and effectiveness of farming can only be economically viable for large-scale farms. This idea points to the high capital needs, adding that the available funds require high collateral values, for which banks are setting excessive risk premiums. They confirm this by pointing to the lack of funding available for 'low cost' environmental improvements in pig production. Thus, participants clearly perceive a capital-intensive, but resource-poor market situation behind the sector's sustainability requirements. All the members of the group are researchers or professionals working in the pig sector.

Figure 3
Key statements in the 'Regulation and certification' opinion group



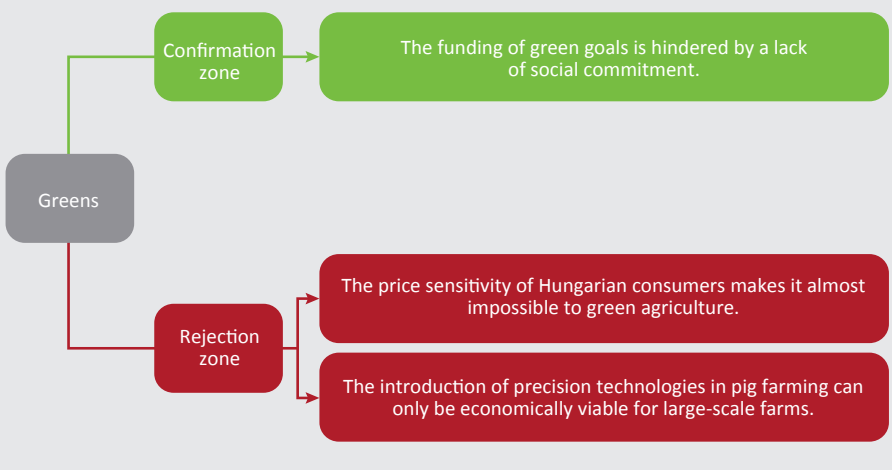
The members of the group, most of whom are involved in the financing of the agricultural sector, take a strong position on the need for regulation (*Figure 3*). They believe that the monitoring of the entire chain and consumer protection are the most important factors for the sustainability of the sector. However, they do not consider concessional finance schemes as a way of catching up, nor do they see public funding programmes as a means of managing risk and lower profitability.

Figure 4
Key statements in the 'Responsible entrepreneurs' opinion group



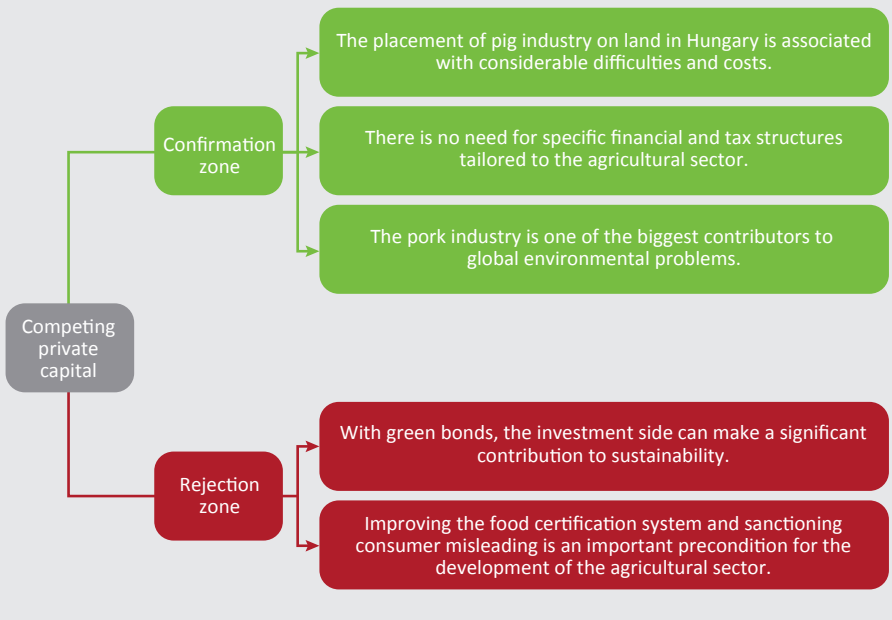
This group of participants believes that it is the responsibility of entrepreneurs to meet sustainability requirements. It is mainly the experts with practical experience in the pig industry who reject the need for public intervention and do not consider a system of rewards and sanctions to be effective. In their view, the pig farms in Hungary have modern, environmentally-friendly technology. They see the presence of producer groups and cooperatives as completely neutral on sustainability issues (*Figure 4*).

Figure 5
Key statements in the 'Greens' opinion group



The participants' environmental awareness and commitment to sustainability is most pronounced in this group (*Figure 5*). They believe that the effectiveness of green finance adapted to sustainable investment is limited due to a lack of social commitment. They confirm that it is not the price sensitivity of consumers that creates barriers to greening agriculture. They believe that the introduction of high-efficiency, precision technologies is economically viable even for smaller farms, given its positive impact on the environment.

Figure 6
Key statements in the 'Competing private capital' opinion group



This factor is strongly influenced by a belief in free markets (*Figure 6*). Compliance with environmental targets in the pig sector is seen by the group as having significant costs. As bankers, they think there is no need for sector-specific regulation or special financing arrangements. They deny that green bonds can make a significant contribution to sustainability goals and consider the sector to be the least responsible for global environmental problems.

Consistency between factors was measured for two statements. All participants were basically neutral on the positive impact of green finance on GDP and also on the banking risk of green lending.

6. Conclusions and proposals

The general conclusion that can be drawn from the Q-factor analysis is that green finance is a relatively new and unfamiliar field for the experts and actors in the product chain whom we interviewed. Most of them are uncertain, and in many cases pessimistic, about the extent to which green finance tools can contribute to the development of the sector. They all agree that green and sustainable investment in the sector requires public financing.

Based on the literature, international examples and our primary research findings, we make the following recommendations for pig production:

In addition to purely market-based green finance tools, it can play an important role in providing hybrid preferential financing complemented by public intervention. Learning from bad practices abroad, it is important that green products become more attractive in some respects than subsidised and market-based products. This advantage should be made clear to stakeholders, thereby increasing commitment to sustainability goals, especially among those who oppose them.

All opinion groups agree that, in addition to direct subsidies, indirect instruments, such as the provision of development-related tax benefits, can help achieve green objectives. The use of economic policy instruments is therefore necessary to make a sector-specific green finance programme a success.

Looking at the specific characteristics of the sector, attention should be paid to market exposure and cyclical income flows, which in parallel raise liquidity issues. Benefits at the individual and corporate level (including intermediaries) are a stronger motivator for green finance than emphasising macroeconomic and risk management benefits in communications.

Green finance should be included in sectoral development as a supportive tool to ensure the competitiveness and profitability of small and medium-sized enterprises.

Finally, we briefly summarise the limitations of our research and the conclusions that can be drawn from the results.

In line with the above, this study should be seen as a first step in a novel, specific and hitherto under-researched topic at the sectoral level. The methodology used identifies important, previously hidden expert opinions and positions, as well as conflicting views on the application of green finance tools in the product chain. Given the specificity of the Q-methodology, which does not allow us to generalise the results to the sector as a whole but rather to explore the varying views, the factors and conclusions presented here represent the specific perspectives on the use of green finance tools from a particular group of experts with a significant role

in the sector. These specific views can be an important starting point for formulating a sectoral green finance strategy, but further research may be useful to complement, refine and validate the structure of the views presented here.

References

Agirman, E. – Osman, A.B. (2019): *Green finance for sustainable development: A theoretical study*. Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi, 6(1): 243–253.

AKI (2019): *Investment data for pig farms.* Sertésinformációs Rendszer (Information System for Pig Farming). https://sertesinfo.aki.gov.hu/publikaciok/publikacio/a:711/A+sert%C3%A9start%C3%B3+gazdas%C3%A1gok+befektet%C3%A9si+adatai. Downloaded: 6 May 2023.

Akomea-Frimpong, I. – Adeabah, D. – Ofosu, D. – Tenakwah, E.J. (2021): *A review of studies on green finance of banks, research gaps and future directions*. Journal of Sustainable Finance & Investment, 12(4): 1241–1264. https://doi.org/10.1080/20430795.2020.1870202

Alexander, K.S. – Parry, L. – Thammavong, P. – Sacklokham, S. – Pasouvang, S. – Connell, J.G. – Jovanvic, T. – Moglia, M. – Larson, S. – Case, P. (2018): *Rice farming systems in Southern Lao PDR: Interpreting farmers' agricultural production decisions using Q methodology*. Agricultural Systems, 160(February): 1–10. https://doi.org/10.1016/j.agsy.2017.10.018

Ásványi, K. (2014): *A komolyzenére irányuló CSR vállalati megítélése-vállalati attitüdvizsgálat Q-módszerrel* (*Perceptions of CSR for classical music – a business attitudes survey using the Q-method*). Marketing & Menedzsment (Marketing & Management), 48(1): 37–46.

Ásványi, K. – Chaker, H. (2021): *A vendégek preferenciái a fenntartható szállodai attribútumokról* (*Guest preferences on sustainable hotel attributes*). Közép-Európai Közlemények (Central European Publications), 14(2): 83–105.

Ásványi, K. – Marjainé Szerényi, Zs. – Zsóka, Á. (2014): *A fenntartható fejlődés feltételeinek megjelenése a nagykörűi lakosság értékrendjében: egy Q-módszeres kutatás eredményei* (*The appearance of the conditions of sustainable development in the values of the population of Nagykörű: The results of a Q-methodology study*). Economica, 7(2): 68–79. https://doi.org/10.47282/ECONOMICA/2014/7/2/4333

Brown, S.R. (1996): *Q Methodology and Qualitative Research*. Qualitative Health Research, 6(4): 561–567. https://doi.org/10.1177/104973239600600408

Carauta, M. – Troost, C. – Guzman-Bustamante, I. – Hampf, A. – Libera, A. – Meurer, K. – Berger, T. (2021): *Climate-related land use policies in Brazil: How much has been achieved with economic incentives in agriculture?* Land Use Policy, 109(October): 105618. https://doi.org/10.1016/j.landusepol.2021.105618

Churruca, K. – Ludlow, K. – Wu, W. – Gibbons, K. – Nguyen, H.M. – Ellis, L.A. – Braithwaite, J. (2021): *A scoping review of Q-methodology in healthcare research*. BMC Medical Research Methodology, 21: 125. https://doi.org/10.1186/s12874-021-01309-7

Ciftcioglu, G.C. (2021): *The social valuation of agro-ecosystem services at different scales: A case study from Kyrenia (Girne) Region of Northern Cyprus*. Environmental Development, 39(September): 100645. https://doi.org/10.1016/j.envdev.2021.100645

Csapody, B. – Ásványi, K. – Jászberényi, M. (2023): *A Balaton és Budapest környéke turisztikai térségbe utazók fogyasztói preferenciáinak összehasonlító vizsgálata a helyi alapanyagok tükrében* (*Examination of consumer preferences in the light of seasonal and local ingredients at Lake Balaton and Greater Budapest region*). Észak-magyarországi Stratégiai Füzetek, 20(1): 62–72. https://doi.org/10.32976/stratfuz.2023.5

Csonka, A. – Bojnec, Š. – Fertő, I. (2021): *Spatial Transformation of the Pig Sector in Hungary and Slovenia: A Comparative Analysis*. Sustainability, 13(21): 11851. https://doi.org/10.3390/su132111851

D'agostini, E. – Jo, S. – Nam, H.-S. – Kim, Y.S. (2022): *Q-method and its application in clustering Hong Kong shippers' selection criteria of ocean carriers*. Research in Transportation Business & Management, 44(September): 100785. https://doi.org/10.1016/j.rtbm.2022.100785

Danielson, S. – Webler, T. – Tuler, S.P. (2009): *Using Q method for the formative evaluation of public participation processes*. Society & Natural Resources, 23(1), 92–96. https://doi.org/10.1080/08941920802438626

Davies, B.B. – Hodge, I.D. (2007): *Exploring environmental perspectives in lowland agriculture: A Q methodology study in East Anglia, UK*. Ecological Economics, 61(2–3): 323–333. https://doi.org/10.1016/j.ecolecon.2006.03.002

Davies, B.B. – Hodge, I.D. (2012): *Shifting environmental perspectives in agriculture: Repeated Q analysis and the stability of preference structures*. Ecological Economics, 83(November): 51–57. https://doi.org/10.1016/j.ecolecon.2012.08.013

Deák, V. (2021): *MNB's Green Programme.* Polgári Szemle (Civic Review Journal of Economic and Social Sciences), 17(4–6): 104–115. https://doi.org/10.24307/psz.2021.1208

Dey, K. – Mishra, P.K. (2022): *Mainstreaming blended finance in climate-smart agriculture: Complementarity, modality, and proximity*. Journal of Rural Studies, 92(May): 342–353. https://doi.org/10.1016/j.jrurstud.2022.04.011

Dikau, S. – Volz, U. (2018): *Central banking, climate change and green finance*. ADBI Working Paper 867, Tokyo: Asian Development Bank Institute, September. https://www.adb.org/publications/central-banking-climate-change-and-green-finance. Downloaded: 12 May 2022.

Downing, A.S. – Kumar, M. – Andersson, A. – Causevic, A. – Gustafsson, Ö. – Joshi, N.U. – Krishnamurthy, C.K.B. – Scholtens, B. – Crona, B. (2022): *Unlocking the unsustainable rice-wheat system of Indian Punjab: Assessing alternatives to crop-residue burning from a systems perspective*. Ecological Economics, 195(May): 107364. https://doi.org/10.1016/j.ecolecon.2022.107364

Duffy, M. (2009): *Economies of size in production agriculture*. Journal of Hunger & Environmental Nutrition, 4(3–4): 375–392. https://doi.org/10.1080/19320240903321292

Ferencz, Á. (2014): *A vidék munkahelyteremtő képességének lehetőségei* (*The potential of rural areas to create jobs*). GRADUS, 1(2): 133–139.

Fogarasi, J. – Zubor-Nemes, A. (2019): *A tőkeszerkezet hatása az agrárgazdasági teljesítményre* (*The impact of capital structure on agricultural performance*). Statisztikai Szemle (Hungarian Statistical Review), 95(4): 406–422. https://doi.org/10.20311/stat2017.04.hu0406

Forouzani, M. – Karami, E. (2011): *Agricultural water poverty index and sustainability*. Agronomy for Sustainable Development, 31: 415–431. https://doi.org/10.1051/agro/2010026

Gulácsi, L. – Péntek, M. – Hajdu, O. (2011): *Gyakorló orvosok egészségnyereség társadalmi elosztásával kapcsolatos attitűdje – a Q-vizsgálat* (*Practicing physicians' attitudes to the social distribution of health gains – the Q-sample*). Statisztikai Szemle (Hungarian Statistical Review), 89(9): 980–1006.

Guo, L. – Zhao, S. – Song, Y. – Tang, M. – Li, H. (2022): *Green Finance, Chemical Fertilizer Use and Carbon Emissions from Agricultural Production*. Agriculture, 12(3): 313. https://doi.org/10.3390/agriculture12030313

HCSO (2021): *4.1.1. Livestock.* Hungarian Central Statistical Office, Budapest. https://www.ksh.hu/docs/hun/xstadat/xstadat_evkozi/e_oma001.html. Downloaded: 5 May 2022.

HCSO (2022a): *19.1.1.27. Cattle, pigs, horses, sheep, buffaloes, donkeys, mules and goats [thousand head].* Hungarian Central Statistical Office, Budapest. https://www.ksh.hu/stadat_files/mez/hu/mez0027.html. Downloaded: 5 August 2022.

HCSO (2022b): *Agricultural census – Agricultural census 2020, Excel spreadsheets.* Hungarian Central Statistical Office, Budapest. https://www.ksh.hu/docs/hun/xftp/ac2020/ac2020.xlsx. Downloaded: 5 May 2023.

Hofmeister Tóth, Á. – Simon, J. (2006): *A Q-módszer elmélete és alkalmazása a marketingkutatásban* (*The theory and application of the Q-methodology in marketing research*). Vezetéstudomány-Budapest Management Review, 37(9): 16–26. https://doi.org/10.14267/VEZTUD.2006.09.02

Horváth, J. – Szerb, B. – Szente, V. (2020): *Az agrárerdészeti rendszerek megítélése az erdőgazdálkodó szakemberek szemszögéből* (*Perceptions of agroforestry systems from the perspective of forestry professionals*). Gazdálkodás: Scientific Journal on Agricultural Economics, 64(6): 505–518. https://doi.org/10.22004/ag.econ.308452

Horváth, J. (2019): *Agrárgazdaságtan és vállalatgazdaságtan* (*Agricultural economics and business economics*). University of Szeged, Szeged.

Hsu, S.L. (2015): *Scale Economies, Scale Externalities: Hog Farming and the Changing American Agricultural Industry*. FSU College of Law, Public Law Research Paper No. 745. https://doi.org/10.2139/ssrn.2584224

Hu, Y.F. – You, F. – Luo, Q.Y. (2018): *Characterizing the attitudes of the grain-planting farmers of Huaihe Basin, China*. Food Policy, 79(August): 224–234. https://doi.org/10.1016/j.foodpol.2018.07.007

Hunter, W.C. (2011): *Rukai indigenous tourism: Representations, cultural identity and Q method*. Tourism Management, 32(2): 335–348. https://doi.org/10.1016/j.tourman.2010.03.003

Iofrida, N. – De Luca, A.I. – Gulisano, G. – Strano, A. (2018): *An application of Q-methodology to Mediterranean olive production – stakeholders' understanding of sustainability issues*. Agricultural Systems, 162(May): 46–55. https://doi.org/10.1016/j.agsy.2018.01.020

IPCC (2022): *Climate Change 2022: Mitigation of Climate Change.* https://www.ipcc.ch/report/ar6/wg3/. Downloaded: 13 April 2022.

Kolozsi, P.P. – Horváth, B.I. – Csutiné Baranyai, J. – Tengely, V. (2022): *Monetary Policy and Green Transition.* Financial and Economic Review, 21(4): 7–28. https://doi.org/10.33893/FER.21.4.7

Kung, C.-C. – Lan, X. – Yang, Y. – Kung, S.-S. – Chang, M.-S. (2022): *Effects of green bonds on Taiwan's bioenergy development*. Energy, 238, Part A(January): 121567. https://doi.org/10.1016/j.energy.2021.121567

Liebman, A. – Reynolds, A. – Robertson, D. – Nolan, S. – Argyriou, M. – Sargent, B. (2019): *Green Finance in Indonesia*. In: Sachs, J. – Woo, W. – Yoshino, N. – Taghizadeh-Hesary, F. (eds.): Handbook of Green Finance. Sustainable Development. Springer, Singapore, pp. 557–586. https://doi.org/10.1007/978-981-13-0227-5_5

Manasses, G. – Paulik, É. – Tapaszti, A. (2022): *Green Bond Impact Report as an Essential Next Step in Market Development*. Financial and Economic Review, 21(4): 180–204. https://doi.org/10.33893/FER.21.4.180

Migliorelli, M. (2019): *The Development of Green Finance in EU Agriculture: Main Obstacles and Possible Ways Forward*. In: Migliorelli, M. – Dessertine, P. (eds.): The Rise of Green Finance in Europe. Palgrave Macmillan, Cham, pp. 175–206. https://doi.org/10.1007/978-3-030-22510-0_8

Moxey, A. – Smyth, M.-A. – Taylor, E. – Williams, A.P. (2021): *Barriers and opportunities facing the UK Peatland Code: A case-study of blended green finance*. Land Use Policy, 108(September): 105594. https://doi.org/10.1016/j.landusepol.2021.105594

Naeem, M.A. – Conlon, T. – Cotter, J. (2022): *Green bonds and other assets: Evidence from extreme risk transmission*. Journal of Environmental Management, 305(March): 114358. https://doi.org/10.1016/j.jenvman.2021.114358

Pereira, M.A. – Fairweather, J.R. – Woodford, K.B. – Nuthall, P.L. (2016): *Assessing the diversity of values and goals amongst Brazilian commercial-scale progressive beef farmers using Q-methodology.* Agricultural Systems, 144(May): 1–8. https://doi.org/10.1016/j.agsy.2016.01.004

Pinillos, D. – Poccard-Chapuis, R. – Bianchi, F.J. – Corbeels, M. – Timler, C.J. – Tittonell, P. – Ballester, M.V.R. – Schulte, R.P. (2021): *Landholders' perceptions on legal reserves and agricultural intensification: Diversity and implications for forest conservation in the eastern Brazilian Amazon*. Forest Policy and Economics, 129(August): 102504. https://doi.org/10.1016/j.forpol.2021.102504

Raatikainen, K.J. – Barron, E.S. (2017): *Current agri-environmental policies dismiss varied perceptions and discourses on management of traditional rural biotopes*. Land Use Policy, 69(December): 564–576. https://doi.org/10.1016/j.landusepol.2017.10.004

Sárvári, B. (2022): *Trends and Dilemmas in Green Financial Capacity Development*. Financial and Economic Review, 21(4): 205–216. https://en-hitelintezetiszemle.mnb.hu/letoltes/fer-21-4-fa1-sarvari.pdf

Shayan, F. (2014): *Doing Q-methodological research: theory, method and interpretation*. International Journal of Social Research Methodology, 17(1): 87–92. https://doi.org/10.1080/13645579.2014.861957

Sipiczki, Z. – Bareith, T. – Varga, J. (2019): *A magyarországi agrárszektor egyéni gazdaságai jövedelmezőségének alakulása 2013 és 2015 között* (*Trends in profitability of the individual farms in the Hungarian agricultural sector between 2013 and 2015*). Statisztikai Szemle (Hungarian Statistical Review), 97(1): 72–89. https://doi.org/10.20311/stat2019.1.hu0072

Stephenson, W. (1935): *Technique of Factor Analysis*. Nature, 136(September), 297. https://doi.org/10.1038/136297b0

Stephenson, W. (1953): *The Study of Behavior; Q-Technique and Its Methodology*. University of Chicago Press.

Stevenson, H. (2019): *Contemporary Discourses of Green Political Economy: A Q Method Analysis*. Journal of Environmental Policy & Planning, 21(5): 533–548. https://doi.org/10.1080/1523908X.2015.1118681

T. Kárász, J. – Nagybányai-Nagy, O. – Takács, N. – Takács, Sz. (2022): *Egy felsőoktatási e-learning tananyagfejlesztés értékelése* (*Evaluation of an e-learning curriculum development in tertiary education*). Educatio, 31(2): 303–312. https://doi.org/10.1556/2063.31.2022.2.10

Taheri, F. – Forouzani, M. – Yazdanpanah, M. – Ajili, A. (2020): *How farmers perceive the impact of dust phenomenon on agricultural production activities: A Q-methodology study*. Journal of Arid Environments, 173(February): 104028. https://doi.org/10.1016/j.jaridenv.2019.104028

Venus, T.E. – Strauss, F. – Venus, T.J. – Sauer, J. (2021): *Understanding stakeholder preferences for future biogas development in Germany*. Land Use Policy, 109(October): 105704. https://doi.org/10.1016/j.landusepol.2021.105704

Veres, Z. – Tarján, T. (2018): *Szekvenciális fogyasztói termékválasztás döntési kontinuuma* (*The decision-making continuum of sequential consumer-product choices*). Közgazdasági Szemle (Economic Review), 65(5): 525–550. https://doi.org/10.18414/Ksz.2018.5.525

Vo, P.H. – Ngo, T.Q. (2021): *The role of agricultural financing and development on sustainability: evidence from ASEAN countries.* AgBioForum, 23(1): 22–31.

Volz, U. (2018): *Fostering green finance for sustainable development in Asia*. ADBI Working Paper 814, March. http://doi.org/10.2139/ssrn.3198680

Wang, Y. – Zhi, Q. (2016): *The Role of Green Finance in Environmental Protection: Two Aspects of Market Mechanism and Policies*. Energy Procedia, 104(December): 311–316. https://doi.org/10.1016/j.egypro.2016.12.053

Webler, T. – Danielson, S. – Tuler, S. (2009): *Using Q method to reveal social perspectives in environmental research*. Greenfield MA: Social and Environmental Research Institute. www.betterevaluation.org/sites/default/files/Qprimer.pdf

Yang, Y. – Su, X. – Yao, S. (2021): *Nexus between green finance, fintech, and high-quality economic development: Empirical evidence from China*. Resources Policy, 74(December): 102445. https://doi.org/10.1016/j.resourpol.2021.102445

Yu, L. – Zhao, D. – Xue, Z. – Gao, Y. (2020): *Research on the use of digital finance and the adoption of green control techniques by family farms in China*. Technology in Society, 62(August): 101323. https://doi.org/10.1016/j.techsoc.2020.101323

Zhang, D. – Mohsin, M. – Rasheed, A.K. – Chang, Y. – Taghizadeh-Hesary, F. (2021): *Public spending and green economic growth in BRI region: Mediating role of green finance*. Energy Policy, 153(June): 112256. https://doi.org/10.1016/j.enpol.2021.112256

Annex: Statements used for Q-methodology

Circular Economy – pig sector	1	The majority of pig farms in Hungary have modern and environmentally friendly fertiliser management technology.
	2	The spreading of pig manure on land in Hungary is associated with considerable difficulties and costs.
	3	'Green' criteria (transport distance, organic production, reduced use of fertilisers, etc.) may become increasingly important in the future when purchasing feed.
	4	In Hungarian pig production, the full (re-)use of scrap cuttings (e.g. blood, fat, bones) is already established.
	5	The water management of domestic pig farms and abattoirs (water saving and efficiency, waste water treatment and recycling) can no longer be significantly improved.
	6	Environmentally friendly pork production should be based primarily on large farms and large processors.
	7	Smaller family pig farms and abattoirs are better suited to environmental concerns than large farms.
	8	Funding sources (grants and loans) are readily available for the environmental development of pig farms and abattoirs, with appropriate conditions.
	9	Farmers are primarily responsible for the environmental development of pig farms and abattoirs.
	10	Cooperatives and producer groups provide significant benefits/assistance in financing environmental investments.
	11	The introduction of precision technologies in pig farming can only be economically viable for large-scale farms.
	12	The decision-makers in the pig production do NOT have the necessary technological and financial knowledge to make decisions.
	13	Pig farms and abattoirs only engage in improving environmental efficiency if there are tangible economic benefits.
	14	The number of precision livestock farms will increase significantly over the next five years.
	15	The spreading of inadequately treated pig manure on arable land is a major risk to the environment in Hungary today.
	16	Pig farms in Hungary still have significant unused capacity to produce biogas.
	17	Pig production is one of the biggest contributors to global environmental problems.
	18	Environmentally friendly farming can be enforced through sanctions.
Agricultural finance	19	The agricultural sector is characterised by the accumulation of a considerable amount of debt.
	20	There is no need for specific financial and tax structures tailored to the agricultural sector.
	21	Banks are setting high risk premiums to cope with the risks, or asking for unrealistic guarantees from players in the sector.
	22	Agricultural subsidies make farms that are obstacles to sustainable development profitable.
	23	The environmental performance of the agricultural sector varies greatly depending on the region, so a uniform funding policy is bound to fail.
	24	Concessional financing schemes should provide development and break-out opportunities for agricultural sectors with below-average profitability.

ESG in agriculture	25	Green investments do not significantly reduce emissions.
	26	Green finance has a positive impact on GDP.
	27	Access to green investment funds is limited and difficult.
	28	Increasing green investment resources has a positive impact on the environment and business performance.
	29	Financial market players' short-term, unrealistic expectations of returns are hindering the growth of green finance.
	30	From a sustainability perspective, it is efficient for green investments to be financed by private sources, complemented by public sources.
	31	There is a need for incentives for agricultural stakeholders to commit to sustainability goals.
	32	Public financing is needed also to compensate for the higher risk-taking by farmers and the lower results they can expect.
	33	With green bonds, the investment side can make a significant contribution to sustainability.
	34	Green lending is a big risk for banks.
	35	Without public intervention, green credit programmes will fail.
	36	The funding of green goals is hindered by a lack of social commitment.
	37	A system of rewards and sanctions encourages farmers to produce in an environmentally friendly way.
	38	The price sensitivity of Hungarian consumers makes it almost impossible to green agriculture.
	39	Improving the food qualification system and sanctioning consumer misleading is an important precondition for the development of the agricultural sector.