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Sustainable agricultural soil management in Austria: tasks, knowledge needs, challenges and barriers

Nachhaltige landwirtschaftliche Bodenbewirtschaftung in Österreich: Aufgaben, Wissensbedarf, Herausforderungen und Hindernisse

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Summary

As part of the European Joint Programme on Agricultural Soil Management (EJP Soil) Programme, an online questionnaire was used to reveal the views and opinions of different stakeholders on sustainable agricultural soil management. The results offered valuable insights into stakeholders' perspectives and highlighted the most pressing issues. The importance of knowledge exchange was emphasised, as was the need for increased financial resources to implement climate-friendly management practices and for adopting adequate laws and guidelines. The main challenges identified by all stakeholder groups were to avoid soil erosion, maintain or increase soil organic carbon, prevent soil sealing and create an optimal soil structure. However, for certain topics, the overall opinion of the stakeholder groups varied substantially due to differing knowledge, perspectives and focus among the participants (e.g. farmers focussed on productivity and economic persistence, whereas scientists were interested in the soil profile, measurements or calculations of emissions). Overall, it became clear that the enormous amount of knowledge available needs more and better dissemination. This calls for new and innovative communication approaches.

Keywords: knowledge transfer, stakeholder perception, agricultural soil management, erosion, soil organic carbon, soil sealing

Zusammenfassung

Im Rahmen des Programms EJP Soil wurden die Ansichten und Meinungen verschiedener Interessengruppen zu nachhaltigem landwirtschaftlichem Bodenmanagement mithilfe eines Online-Fragebogens erhoben. Die Ergebnisse zeigen die Sichtweisen der Interessengruppen und drängendsten Probleme auf, etwa die Bedeutung des Wissensaustauschs, der Bedarf an mehr finanziellen Mitteln für die Umsetzung klimafreundlicher Bewirtschaftungspraktiken und die Verabschiedung angemessener Gesetze und Richtlinien. Als wichtigste Herausforderungen nannten alle Interessengruppen die Vermeidung von Bodenerosion, die Erhaltung bzw. Erhöhung des organischen Kohlenstoffs im Boden, die Vermeidung von Bodenversiegelung, sowie die Schaffung einer optimalen Bodenstruktur. Bei einigen Themen gab es deutliche Unterschiede zwischen den Interessengruppen, was auf unterschiedliche Wissensstände, Perspektiven und Schwerpunkte zurückzuführen ist (z. B. lag der Fokus der Landwirte eher auf Produktivität und wirtschaftlichem Fortbestand, während sich Wissenschaftler eher für das Bodenprofil interessierten oder Emissionen zu messen oder zu berechnen). Insgesamt wurde deutlich, dass der enorme Reichtum an verfügbarem Wissen stärker und effektiver verbreitet werden muss. Dazu sind neue und innovative Kommunikationsansätze erforderlich.

Schlagwörter: Wissenstransfer, Stakeholder-Wahrnehmung, landwirtschaftliche Bodenbewirtschaftung, Erosion, organischer Bodenkohlenstoff, Bodenversiegelung

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1. Introduction

The European Council estimates that nearly 70% of all European Union (EU) soils are in poor health (Veerman et al., 2020). Besides other factors, unsustainable land management methods and the persistent adoption of high-input–high-yield farming techniques are placing increasing pressure on European soils to maintain vital ecosystem services. The majority of current management practices induce or at least facilitate a wide range of soil threats emerging, including depletion of soil carbon, erosion, pollution, compaction, sealing and biodiversity concerns (Günal et al., 2015; Vanino et al., 2023). These factors collectively impair the capacity of soils to sustainably provide ecosystem services (Schwilch et al., 2016; Tibbett et al., 2020). To address the persisting and emerging challenges and advocate for sustainable soil stewardship, it is an urgent need to expand our understanding of soil dynamics and functioning across different scales. It is equally crucial to assess the knowledge of stakeholders and to disseminate and apply the knowledge in practice (Schwilch et al., 2016; Carmen et al., 2018; Fossey et al., 2020). Within the EU, the transition to sustainable agriculture is to be facilitated through programmes such as the European Soil Strategy for 2030 and other large-scale projects and initiatives (Arias-Navarro et al., 2023). A significant contributor to this envisioned transition is the European Joint Programme on Agricultural Soil Management (EJP Soil) (Visser et al., 2019; Cornu et al., 2023). Primarily, EJP Soil is focussed on establishing an integrated, sustainable research framework across Europe and on developing and implementing a standardised approach to sustainable and climate-smart agricultural soil management.

A key objective of the EJP Soil programme was to identify the main challenges and problems in soil management, as well as the barriers to their solution. It should be noted that these issues are perceived differently in different countries (Zeiss et al., 2022) and among different stakeholder groups (Wade et al., 2021). There may also be discrepancies in the level of knowledge on sustainable agriculture or the transfer of knowledge, for instance, from researchers to practitioners. One area of focus of the EJP Soil agenda is conducting surveys among relevant stakeholders in all member countries to clarify the perspectives on the most pressing soil challenges in relation to tasks, knowledge needs, challenges and barriers for implementing sustainable soil management. The results can then be used to suggest appropriate interventions to enhance the accessibility and usability of knowledge on sustainable soil management, thereby supporting of the green transition. In this context, we present the results for Austria, with a particular focus on different perceptions between stakeholders from the scientific and agricultural sectors.

2. Material and methods

2.1. Survey design

The survey comprised four sections. The initial section requested background information from the participants, including their stakeholder designation and a self-assessment of their knowledge of agricultural soils in Austria and their home region. The second section of the survey addressed the current level of knowledge regarding sustainable soil management. Participants were asked to identify and rank the three most significant soil challenges, evaluate the tasks and actions required to enhance overall soil knowledge, determine which soil challenges require improved knowledge and indicate how the current situation has changed in the last 5 years. The third section addressed barriers to the advancement, availability and transfer of knowledge. Participants were requested to indicate the significance of removing various barriers concerning the three main soil challenges they have previously selected. The fourth section provided the opportunity to provide further comments, remarks or reflections regarding the knowledge of sustainable soil management or knowledge requirements in Austria. The questions were elaborated within the project team of the EJP Soil, which comprises scientists from several countries in the EU. The full survey template is available upon request from the authors; the wording of the questions can also be found in the figures (translated from German).

The questionnaire was set up online using the survey tool 'soSci' (www.soscisurvey.de; Leiner 2019). An invitation link was distributed to the mailing lists of the Austrian Soil Forum (bodenforum.at; $n = 300$) and registered participants of a workshop on carbon farming ($n = 228$). The survey was online from 18 February to 15 March 2024 and could be completed without the need to register or provide personal information. The language used was German.

2.2. Analysis

The participants were asked to rate the questions on a scale of 1 (disagree/not important) to 5 (highly agree/very important), with 3 representing a neutral position. In addition, participants were given the option to select 'I don't know'. The level of agreement or disagreement was calculated as the

percentage of participants who rated a question above or below 3, respectively. The arithmetic mean of all ratings (mean score) was used as an additional proxy for (dis-)agreement (for further details, see also Weninger et al., 2024). To ensure the representativeness of this visualisation approach, the results were examined for any irregularities, such as bimodality. A total of 12 stakeholder categories were available for selection. However, limited sample sizes prevented a detailed breakdown for the majority of categories. To enable us to make statements about stakeholder differences, we grouped related categories. These were 'Science' (comprising the categories 'Researchers' and 'Laboratories') and 'Agriculture' (comprising 'Farmers', 'Advisors', 'Farmers organisations' and 'Agro-industry'). Here, we not only primarily present the overall results, but also discuss differences between the subgroups 'Science' and 'Agriculture'.

Python 3.9.12 embedded in the Spyder 5.2.2 environment was used for figure generation (*matplotlib*), statistics and data handling (*pandas*, *numpy*).

3. Results

A total of 168 individuals accessed the invitation link and 124 of them completed the survey entirely. A total of 134 participants with valid answers were included in the analysis, including those who answered more than 50% of the survey. The largest single stakeholder group was 'Researchers', followed by 'Farmers', 'Advisors' and 'Administration' (Fig. 1). When grouped together, more than 46% of all responses came from the 'Agriculture' subgroup followed by 'Others' (29.9%) and 'Science' (23.9%).

The majority of participants expressed greater confidence in their understanding of agricultural soils at the regional rather than the national scale (Fig. 2). Participants from the 'Agriculture' subgroup were most confident in their understanding of regional soils, with a mean score of 4.0 (where 5.0 was the best rating possible) and an agreement rate of more than 75%. In contrast, the 'Science' subgroup exhibited only slight differences in the overview of national and

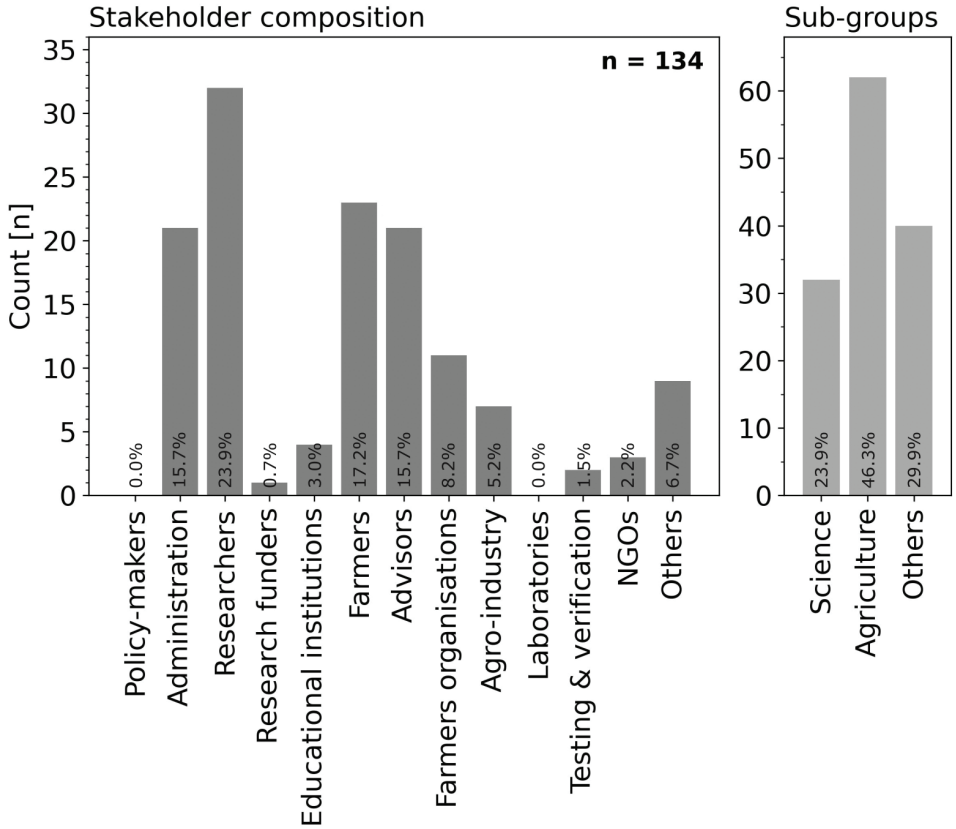

Fig. 1. Composition of the stakeholders who participated in the survey. Smaller numbers above the bars indicate relative share in percentage.
Abb. 1. Zusammensetzung der UmfrageteilnehmerInnen. Die kleineren Zahlen über den Balken geben den relativen Anteil in Prozent an.

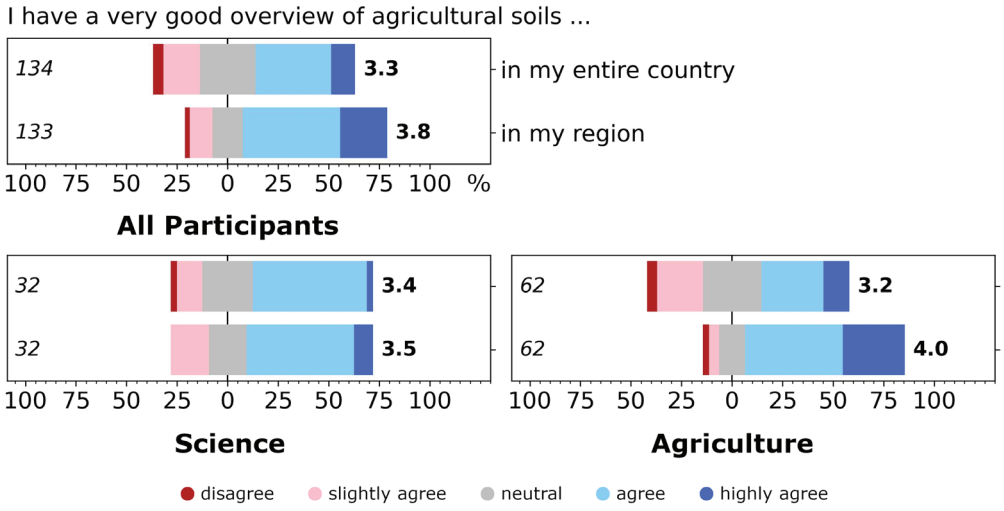

Fig. 2. Self-assessment of participants regarding their soil knowledge. Stacked bars span 100%, but are centred on the neutral value (3). Numbers in italics on the left indicate sample size (i.e. count of responses). Numbers in bold right of the bars indicate the mean score as an additional information.
Abb. 2. Selbsteinschätzung der TeilnehmerInnen bezüglich ihrer Bodenkenntnisse. Die gestapelten Balken umfassen 100%, sind aber auf den neutralen Wert (3) zentriert. Die kursiv gedruckten Zahlen auf der linken Seite geben die Stichprobengröße (d. h. die Anzahl der Antworten) an. Die fettgedruckten Zahlen rechts von den Balken geben den Mittelwert als zusätzliche Information an.

regional soils. Negative ratings (ratings of 1 or 2) were infrequent across all stakeholder groups.

Generally, all presented tasks to enhance soil knowledge were considered important, with mean scores ranging from 3.7 to 4.4 (Fig. 3). Within the 'Agriculture' subgroup, the tasks 'Improve the research infrastructure', 'Improving data collection and monitoring' and 'Producing new scientific knowledge on the prevalence of key soil challenges' received notably lower ratings with mean scores of 3.5, 3.6 and 3.8, respectively. The responses from the 'Science' subgroup were more balanced, even though the task 'Producing new scientific knowledge on the prevalence of key soil challenges' received a lower score of 3.8 compared to the other tasks, which ranged from 4.0 to 4.3.

A significant proportion of the knowledge needs surveyed were rated important or highly important. Of these, the needs to 'Avoid soil erosion' and particularly 'Avoid soil sealing' stood out with mean scores of 4.5 and 4.7, respectively. The lowest mean score of 3.6 was awarded to the knowledge need to 'Avoid salinization', which also had the highest disagreement rate of over 20% (Fig. 4). The knowledge needs to 'Avoid N_2O/CH_4 emissions' and 'Avoid peat degradation' received notably lower scores from the 'Agriculture' subgroup compared to 'Science'.

The three most important soil challenges, as identified by respondents, were 'Avoid soil sealing', 'Avoid soil erosion' and 'Maintain/increase SOC' (Fig. 5). These three challenges were considered the most important by both the 'Science' and 'Agriculture' subgroups. However, there were differences in the ranking of the challenges. The challenge considered the least important was 'Avoid salinization'.

The majority of respondents rated the perceived changes in framework conditions for sustainable soil management as neutral, with mean scores around 3 (Fig. 6). The statements 'National soil policies have been strengthened' and 'Economic support for practitioners to adopt sustainable soil management has improved' were rated below 3 on the Likert scale, indicating a higher level of disagreement than agreement. The latter statement received particularly low ratings from the 'Agriculture' subgroup, with a mean score of 2.4 and a disagreement rate of more than 47%.

4. Discussion

4.1. Stakeholder composition

Fortunately, we were able to get a strong response from the agricultural sector, including practising farmers (Fig. 1). This stakeholder group is of paramount importance, as they are the primary implementers of sustainable agricultural practices. However, this group is notoriously difficult to reach and to encourage to take part in scientific endeavours, which often results in their underrepresentation in studies (e.g. Veenstra et al., 2024; Weninger et al., 2024). The underlying reasons may include the perception that the questions asked in scientific surveys are too abstract or not easily understand-

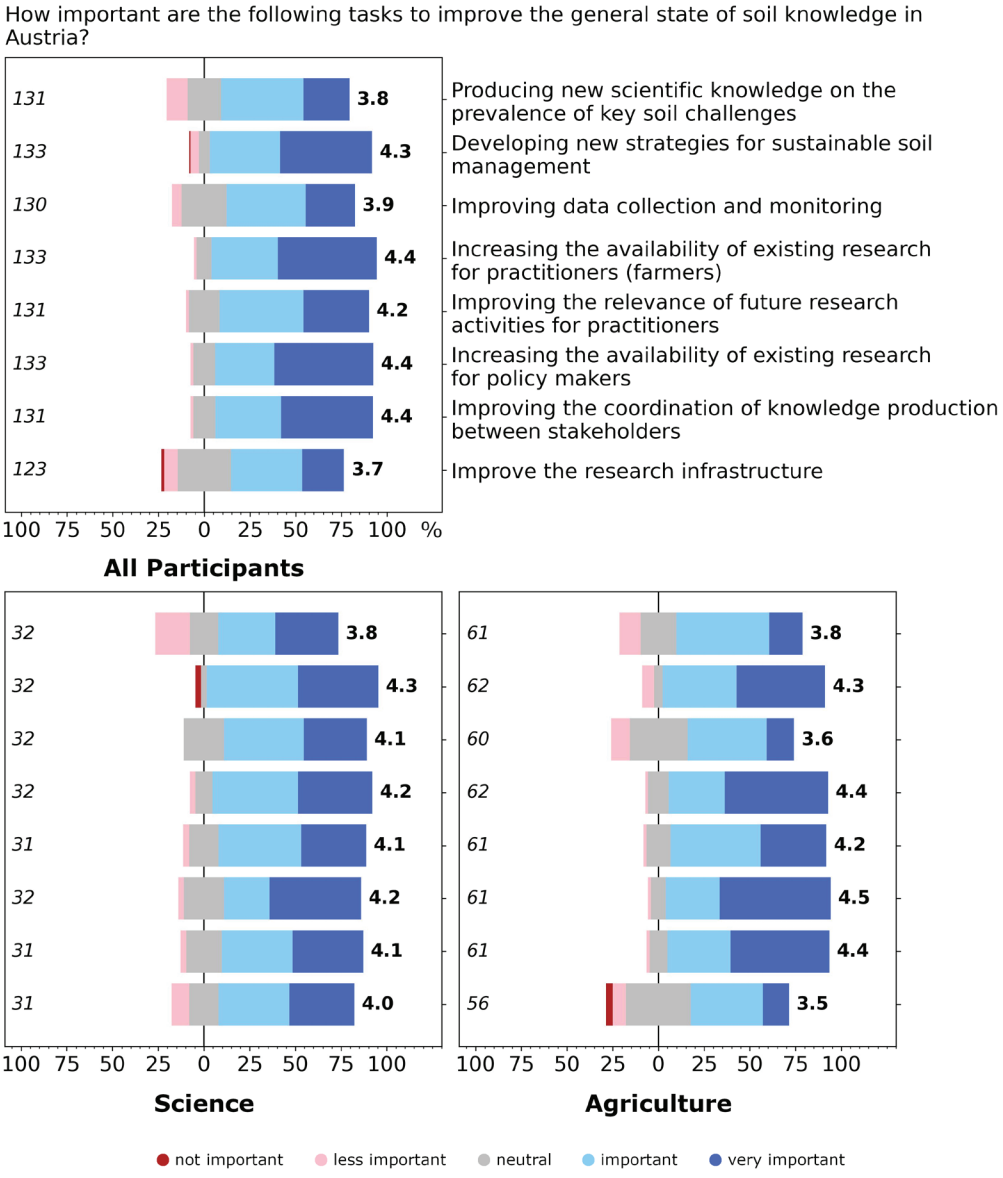

Fig. 3. Participants' assessment of their rating of the importance of different preformulated tasks to improve soil knowledge. See Fig. 2 for details of figure labelling.
Abb. 3. Einschätzung der TeilnehmerInnen hinsichtlich der Wichtigkeit der verschiedenen vorformulierten Herausforderungen zur Verbesserung der Bodenkenntnisse. Siehe Abb. 2 für Einzelheiten zur Beschriftung der Abbildungen.

able, and that the overall topics are overly complex and often not directly relevant to the everyday lives of farmers. The completion of surveys may be further hampered by different ways of entitling and formulating challenges between stakeholder groups or by lengthy questionnaires including complex scientific formulations, which can be exhausting for non-scientists unfamiliar with scientific language (Witzling et al., 2021; Wade et al. 2021). The practical relevance of the topic and of the questions for farmers and other non-scientists, as well as the brevity of the survey are presumed to have benefited our study.

4.2. Tasks, knowledge needs, challenges and barriers

All presented tasks to improve soil knowledge were considered important, as were the knowledge needs for soil challenges, both with only a very small percentage of negative ratings (Fig. 3). This may be interpreted as a request for scientists to intensify their research efforts and adopt a more proactive approach to the tasks listed. However, these also include tasks that are beyond the typical research process, such as increasing the availability of research to other stake-

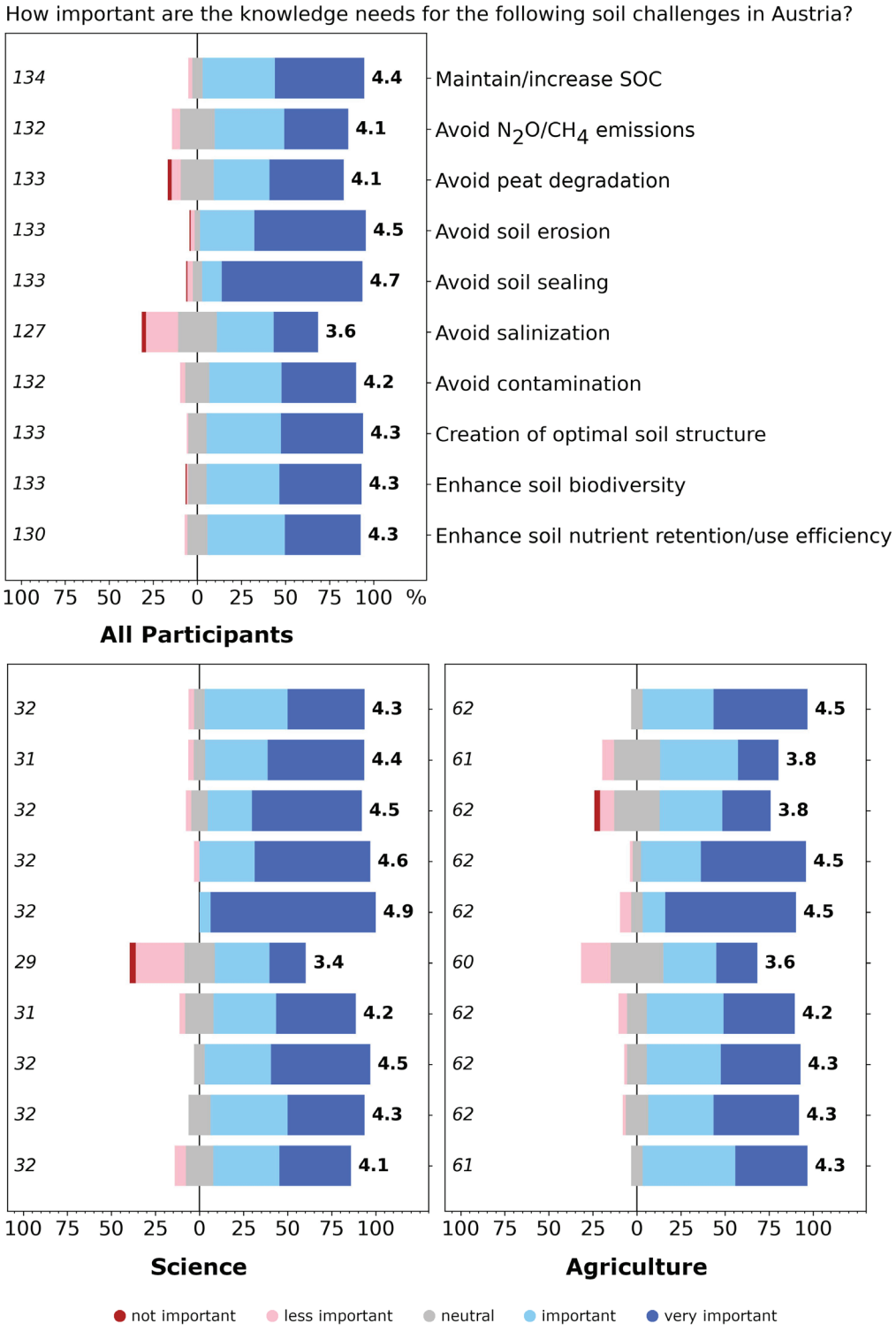

Fig. 4. Participants' assessment of their rating of the importance of knowledge needs in relation to different soil challenges. See Fig. 2 for details of figure labelling.
Abb. 4. Einschätzung der TeilnehmerInnen zur Relevanz von Wissenslücken in Bezug auf verschiedene Bodenprobleme. Siehe Abb. 2 für Einzelheiten zur Beschriftung der Abbildungen.

holders or enhancing the coordination between all parties involved in knowledge production. It is, therefore, not feasible to continue with the status quo. Instead, new approaches must be developed to facilitate the transfer and exchange of knowledge effectively (Reincke et al., 2020). Key actions include increasing the participation and earlier involvement of non-scientists, especially farmers, in the research process, potentially even at the conceptual phase.

Furthermore, it is important to communicate findings through means that are established and trusted by the relevant stakeholder group. These are unlikely to be scientific papers, but rather newspapers, practitioner journals or social media (Rust et al., 2022). Farmers, in particular, tend to obtain their knowledge from trusted peers, such as other farmers or local agricultural advisors (Wood et al., 2014; Schweinzer et al., 2019; Alexopoulos et al., 2021). Reaching this group of stakeholders would, therefore, require an entirely new approach and dissemination strategy by researchers (Reed et al., 2014; Cvitanovic et al., 2016; Mason et al., 2023). While 'Producing new knowledge on the prevalence of key soil challenges' was the only task with a mean score below 4 for the 'Science' subgroup, the 'Farmers' stakeholder group also assigned low scores for tasks related to research infrastructure and data collection and monitoring. Taken together, this suggests that stakeholders, particularly those from the agricultural sector, think that science should focus on research that has practical relevance for practitioners, and that better dissemination of existing knowledge is needed, rather than more in-depth, high-resolution analyses (Hoffmann et al., 2007).

However, the knowledge needs for virtually all the soil challenges presented were considered important by all stakeholder groups. An exception is 'Avoid salinization', which received a relatively high proportion of neutral and negative ratings. This is probably due to the fact that Austria has a low prevalence of saline soils, and that anthropogenic causes of salinisation, usually related to water logging or irrigation without proper drainage, are less of an issue (Stavi et al., 2021). 'Avoid soil sealing' was the highest rated soil challenge across all stakeholder groups, especially in the 'Science' subgroup with a mean score of 4.9 (Fig. 4). Soil sealing is caused by the overbuilding of land with roads, buildings and other infrastructure and, as such, is well defined and straightforward (Scalenghe and Marsan 2009). However, it is currently a hot topic in Austria, both socially and politically (Aust et al., 2020; WWF 2023). Pronounced disparities between the subgroups were found for 'Avoid N_2O/CH_4 emissions' and 'Avoid peat degradation', which were rated at least 0.6 points lower by the 'Agriculture' subgroup. It is not entirely clear what is driving this perception, although of the 10 soil challenges listed, these two were the ones where the current dimension, as well as the negative consequences for farmers' day-to-day business are the least tangible or even deliberately induced (e.g. conversion of peat and wetlands for arable land). Accordingly, these are issues where agriculture is in the focus of criticism (Tan et al., 2022; Fluet-Chouinard et al., 2023; Girkin et al., 2023). This, in turn, may have led to a certain weariness and disregard for the issues, which may have overshadowed the rating of the actual importance of these two knowledge needs.

Soil sealing was also most frequently rated among the three most important challenges for sustainable soil management, followed by erosion and maintaining/increasing soil organic carbon (SOC). However, within the three selected challenges, soil sealing was often ranked in third place. For the 'Science' subgroup, increasing SOC would be the most important challenge, ahead of avoiding erosion and soil sealing. Increasing biodiversity and creating an optimal soil structure also often received the highest scores from scientists. For the 'Agriculture' subgroup, avoiding soil erosion would be by far the most important challenge, followed by soil sealing, creating optimal soil structure and increasing SOC.

Considering all challenges, there was a tendency for those with a direct impact on soil fertility and productivity to be considered more important by stakeholders in the agricultural sector, while scientists also recognised the importance of environmental issues. There are many reasons for this discrepancy, but it is clear that a farmer's first priority is to produce food and other agricultural commodities rather than biodiversity, especially as most farms are under substantial economic pressure (Brennan et al., 2022; Khatri et al., 2023). However, farmers are not a homogeneous group and their attitudes towards sustainable agriculture are individual and shaped by factors such as age, education, personality, farm size or their social network (Serebrennikov et al., 2020). If ecology is to play a more important role in agriculture, more awareness, education and incentives are needed (Ahnström et al., 2009; Barnes et al., 2022). Overall, the ecosystem services provided by soils are becoming more widely recognised, not only by stakeholders but also by the general public. An important step towards recognising the vital role of soil for society is being taken by the EU through the development implementation of agri-environmental strategies, such as the EU Soil Thematic Strategy on Soil or the Biodiversity Strategy (Montanarella and Panagos 2021).

Despite this, almost all barriers were considered to be important hindrances to the challenges in question. However, there were some interesting patterns and exceptions. A lack of relevant technology and, to a lesser extent, also a lack of

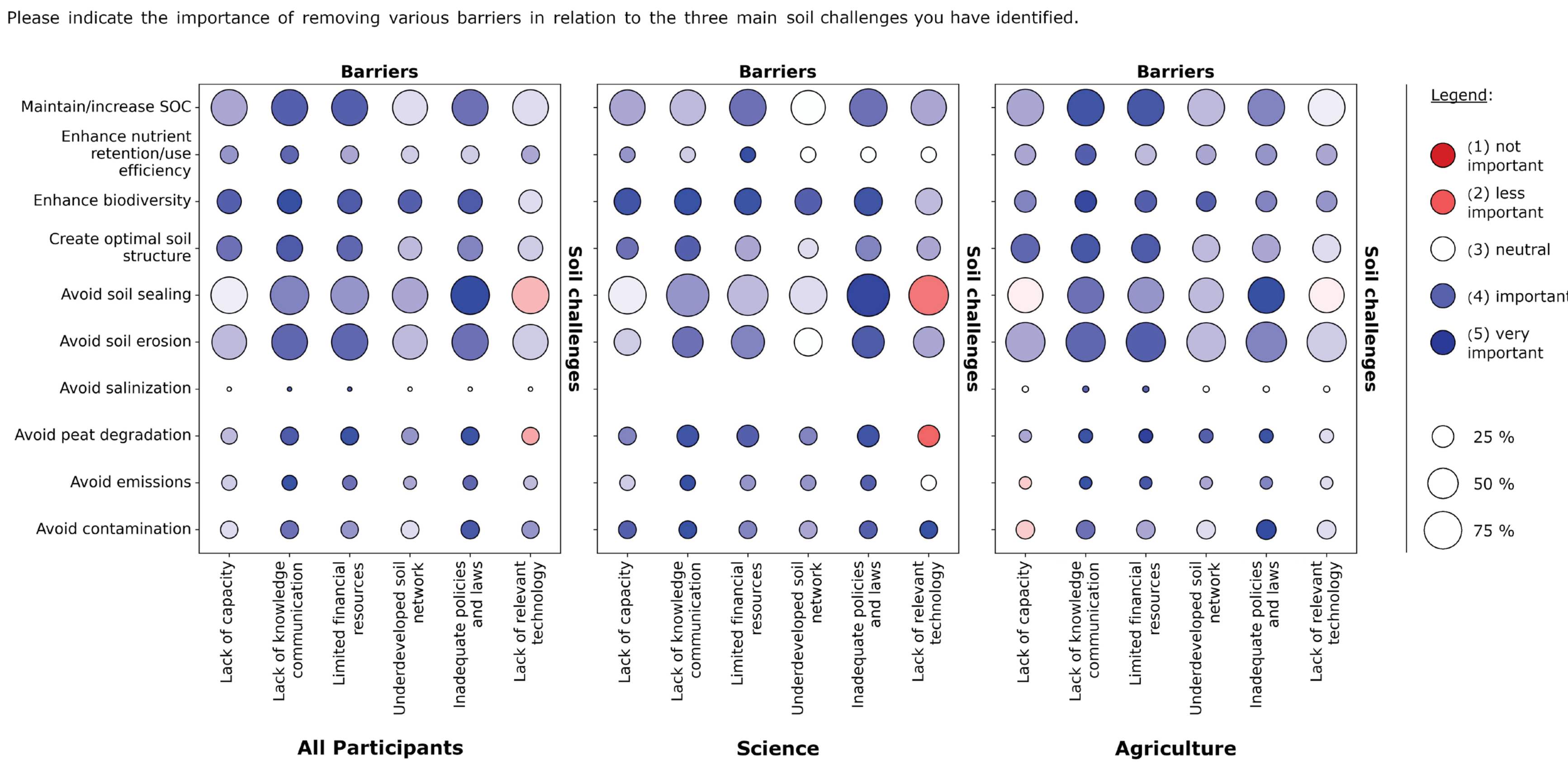

Fig. 5. Participants' perception of the most significant barriers related to the different soil challenges (cf. Fig. 4). The size of the bubbles indicates how often the respective soil challenge was considered to be among the three most important challenges; the intensity of the colour indicates how important it is that a respective barrier is removed.
Abb. 5. Die von den TeilnehmerInnen wahrgenommenen wichtigsten Hindernisse in Bezug auf die verschiedenen Bodenprobleme (vgl. Abb. 4). Die Größe der Blasen gibt an, wie oft die jeweilige Bodenherausforderung als eine der drei wichtigsten Herausforderungen angesehen wurde; die Intensität der Farbe zeigt an, wie wichtig es empfunden wird, dass ein entsprechendes Hindernis beseitigt wird.

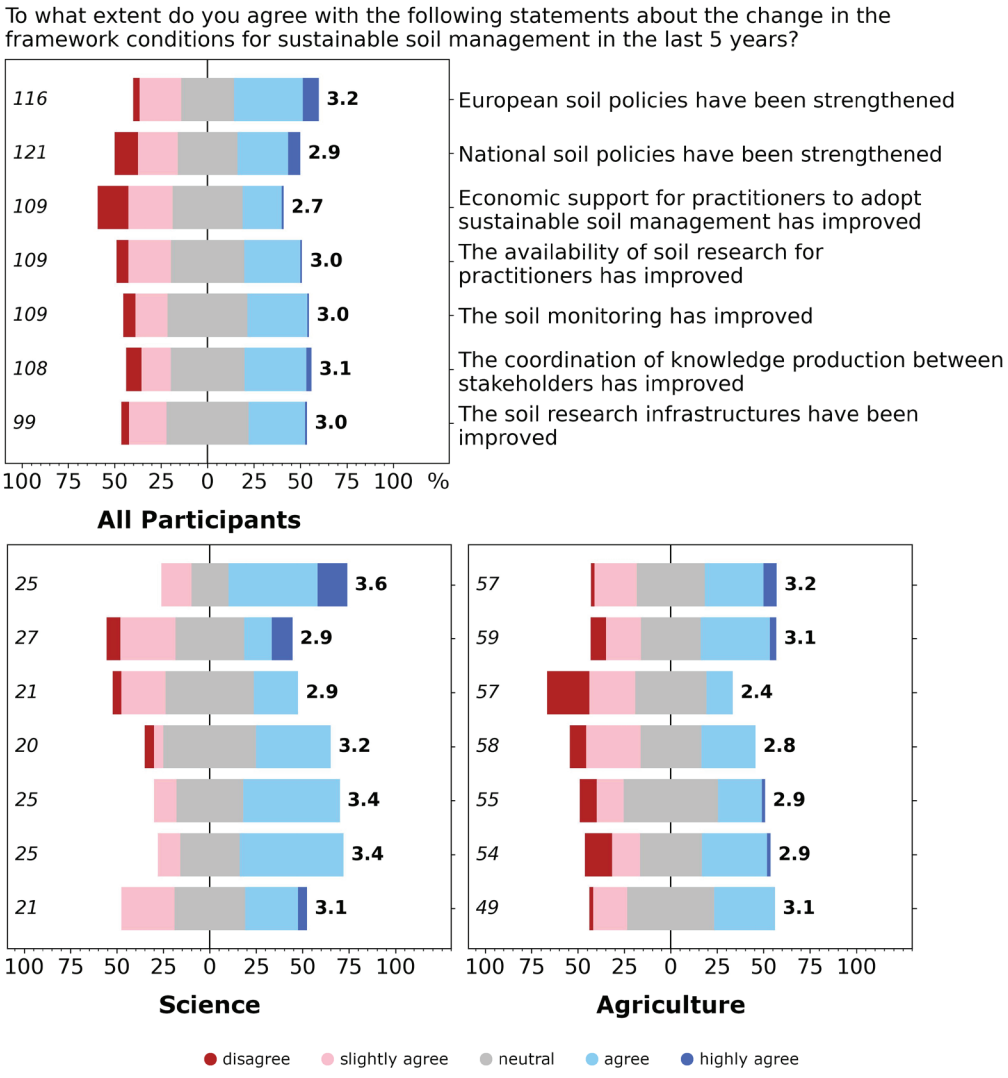

Fig. 6. Perceived changes of framework conditions for sustainable soil management during the last 5 years. See Fig. 2 for details of figure labelling. The discrepancy between the number of participants here and the other figures is due to high numbers of 'I don´t know' responses, presumably caused by the high level of involvement required in the respective topics over at least 5 years.
Abb. 6. Wahrnehmungen der TeilnehmerInnen zu Veränderungen der Rahmenbedingungen für eine nachhaltige Bodenbewirtschaftung in den letzten fünf Jahren. Siehe Abb. 2 für Details zur Beschriftung der Abbildungen. Die Diskrepanz zwischen der Anzahl der Teilnehmer hier und den anderen Abbildungen ist auf eine hohe Anzahl von „Ich weiß es nicht"-Antworten zurückzuführen, die vermutlich durch das zur Beantwortung notwendige hohe Maß an Einblicken in den jeweiligen Themen über mindestens fünf Jahre hinweg verursacht wurde.

capacity were not seen as important barriers to preventing soil sealing, but rather inadequate policies and legislation. The same applies to peat degradation. The importance of developing and implementing comprehensive and effective soil protection laws and directives has been highlighted by many authors, but they are still lacking both at national (Minixhofer et al., 2019; Jandl et al., 2024) and EU level (Peake and Robb 2021; Heuser 2022). Notwithstanding the recent developments regarding policies and legislation, this shortcoming was acknowledged by all stakeholder groups in the survey. Quite generally, a lack of technology or capacity and, to a lesser extent, the underdeveloped soil network were rated as less significant barriers than a lack of communication, financial resources and particularly inadequate policies and laws. This further reinforces the notion that it is more crucial to disseminate and implement existing knowledge than to develop new techniques or practices (see also Peake and Robb 2021; Evans et al., 2022). The overarching perspective

illustrates that all soil challenges are intertwined with a multitude of barriers that require collective action from all stakeholders to overcome them (Jordan et al., 2021).

4.3. Perceived changes during the last 5 years

Given the generally high rating of the importance of tasks, knowledge needs and removal of barriers, it is not surprising that the perceived changes in framework conditions for more sustainable soil management over the last 5 years were not overly optimistic. There were, however, some notable differences between the stakeholder groups. The 'Science' subgroup identified some improvements in the areas of soil monitoring and coordination of knowledge production, which were not perceived as such by the other stakeholder groups. The 'Science' subgroup also acknowledged that soil policies have been strengthened on a European level (with a mean score of 3.6), although this has not been the case at the national scale (mean score of 2.9; Fig. 6). On the European level, all other stakeholder groups provided substantially lower scores. This may be explained by the more pronounced scepticism towards the EU among the general public, especially within the rural population (Karner 2013; Matthews 2024). This perception is influenced by a degree of one-sided media coverage, which tends to focus on the EU's missteps rather than its achievements (de Vreese 2007; Bijsmans 2021; Praprotnik and Perlot 2023). Furthermore, an increasing number of individuals are relying on social networks for information, which also contain a considerable volume of biased or misleading postings (Fortunato and Pecoraro 2022; Rust et al., 2022). It could thus be argued that scientists and other stakeholders with a closer insight into the EU, for example, those involved in EU programmes or working in a related field of research, should make greater efforts to communicate positive developments to the public. The 'Agriculture' subgroup was more pessimistic overall and also had a higher percentage of complete disagreement (score 1) with the presented statements about changes during the last 5 years, although all mean scores were around the neutral value of 3 (Fig. 6). One notable exception was the statement 'Economic support for practitioners to adopt sustainable soil management has improved', which saw high rates of disagreement and a markedly lower mean score (2.4). While the implementation of sustainable agricultural practices may offer financial benefits to farmers, they can also result in lower yields, increased labour demands, and a substitution of routines, machinery and equipment, which may lead to economic losses (van der Ploeg et al., 2019). It is, therefore, evident that farmers and farm-related stakeholders require greater financial assistance to facilitate this transition (Piñeiro et al., 2020; Hessel et al., 2022).

4.4. Comments and remarks

The survey participants were invited to provide individual comments in the section labelled 'Other reflections'. The results of this survey were corroborated by several topics that were mentioned multiple times in different wordings, which also provided more in-depth insights. A common theme was that there is already a large amount of scientific knowledge available, but it is often processed and presented in ways that are not farmer-friendly. There is also a need for more user-oriented dissemination strategies. To achieve this, social and communication sciences should be involved as well as all soil network players, especially agricultural schools and advisors (agricultural chambers). Many participants perceived a low willingness to cease soil sealing and soil destruction, which they believe is due to a lack of political initiatives or even a deliberate blockage in the general political process. In terms of financial resources, many comments stated that programmes for subsidies and incentives need to be practically feasible. It was also suggested that greater effort should be invested in balancing the different aspects of ecology, economy and practical application when formulating such programmes. Furthermore, the establishment of a coordination centre for soil monitoring was proposed and some concerns were raised regarding soil fertility, carbon accumulation, or carbon farming and certification schemes.

5. Conclusion

The results of our study indicate that all stakeholders recognise the need to enhance the general state of soil knowledge in Austria, particularly in light of the important soil-related challenges currently facing the country. The most pressing challenges, as identified by the participating stakeholders, are soil sealing, erosion and the maintenance/increasing of SOC. These are followed by the creation of an optimal soil structure and the enhancement of biodiversity. However, the 'Agriculture' subgroup held a different view to the 'Science' subgroup, with a higher emphasis on productivity issues, rather than ecological concerns. Despite the high importance of addressing knowledge needs, the participants believe that Austria already has a solid understanding of many soil-related challenges and the necessary technology.

It is, therefore, essential that we focus on transforming the existing knowledge into effective legislation and putting it into practice. For science, this means that soil experts need to ensure a proper knowledge transfer and exchange with the other stakeholders, which requires the adoption of novel approaches and dissemination strategies. Improved or new ways of communication and education may also be necessary if we want to increase the importance of ecological aspects in agriculture or the attitude towards the EU.

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