

Thematic Group on Nurturing Skills for a Thriving and Sustainable Agricultural Sector

Background paper

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Introduction

1. Agricultural production requires a range of physical tasks to be undertaken. For example, cultivating soil, sowing seeds, tending to livestock, and maintaining equipment. Such routine husbandry typically requires physical strength, stamina and dexterity but also knowledge of the appropriate timing, sequencing and intensity of actions throughout a production cycle. An ability to adapt actions to suit varying circumstances and problems is also required since no two fields, animals or years are exactly the same.
2. The nature of these tasks and the technical skills required for them change over time as new technologies are adopted and land use practices evolve. For example, mechanisation has removed much of the physical drudgery of many field operations but requires familiarity with increasingly sophisticated equipment and digital systems.
3. So-called Smart Agriculture, Agriculture 4.0¹ promises further rapid technological change, implying a need for new skills. For example, automation, drones and digital information. Equally, shifting consumer demands for particular foods plus emerging societal demands for better environmental, natural capital and animal welfare outcomes are also redefining required management practices and their underpinning skills. For example, how animals and land are managed to reduce greenhouse gas emissions and water pollution, restore biodiversity, and enhance landscapes.
4. Hence agricultural production requires a mix of practical and problem-solving skills to complete a range of physical tasks but also the skill to keep updating practical knowledge to reflect changing technologies plus evolving consumer and societal demands. This is a different sort of skill, being open to and aware of changing technical possibilities and their skills requirements.

¹ e.g. see Rose, D.C., Wheeler, R., Winter, M., Lobley, M. and Chivers, C.A., 2021. Agriculture 4.0: Making it work for people, production, and the planet. Land use policy, 100, p.104933.



5. Importantly, beyond its physical production tasks, farming also involves a range of other organisational and strategic/ entrepreneurial actions. For example, production needs to be planned in terms of allocating land, labour and capital need to be allocated between different on-farm enterprises, staff may need recruiting and training, outputs need to be marketed for sale to generate revenues, current and future regulatory and policy requirements need to be understood, financial planning is needed to manage cashflows, and risks need to be identified and managed.

6. Such tasks require qualitatively different skills to technical production abilities. For example, people (and self) management, communication, planning and life-long learning. Although perhaps less often acknowledged or practiced, these skills also matter to farm business success.

7. Moreover, a farm business is not necessarily restricted to agricultural production, it may (indeed increasingly) diversify into other enterprises. For example, timber production, renewable energy and tourism, all of which require their own specific technical skills but also organisational and strategic management. Equally, members of farm households may engage in off-farm employment in other sectors of the economy, drawing on transferable skills developed in farming but also possibly requiring additional sector-specific skills.

8. In summary, the skills required by the agricultural workforce span a dauntingly wide and evolving range. They include numerous technical and practical problem-solving skills relating to efficiency – of ‘doing things right’ - as well as broader managerial skills relating to organising and planning to be effective – to recognise and ‘do the right things’.² Table 1 lists some examples, and many others could be cited.

² Although the distinction between them can be blurred, these are sometimes presented as matrix of 2x2 pairings: efficient and effective; efficient but ineffective; inefficient yet effective; inefficient and ineffective.



Table 1: Examples of skills required in agriculture

Efficiency ←————→ Effectiveness		
Technical	Organisational	Strategic
Operating machinery	Time-management	Selecting business enterprises
Handling livestock	People management/team-working	Selecting marketing channels
Growing and harvesting crops	Communication	Financial and risk management
Pest and disease control	Adaptive flexibility	Horizon scanning
Record keeping	Adhering to regulations	Life-long learning

9. Published assessments³ of agricultural skills, including for the EU, suggest shortages of labour to fill vacancies, but also gaps in the skills of existing and new recruits to undertake specific tasks. The gaps relate to some technical skills, notably digital/automated technologies and the practicalities of natural capital management, and also more widely to the higher-order organisational and strategic skills.

10. Although not the only cause, such skills gaps constrain productivity, lowering farm incomes and increasing vulnerability to future challenges. This effect varies both within and between different farm types, sizes and countries, but is a widespread problem. For example, mean Farm Net Value Added (FNVA) per Agricultural Work Unit (AWU) in 2018 averaged €22.5k across all EU farms but was less than €10k for half of all of farms, and possibly less per actual worker given that the number of actual hours worked can often exceed the assumed standard number.⁴

³ e.g. see Ryan, M. 2023. Labour and skills shortages in the agro-food sector. OECD, Paris. https://www.oecd-ilibrary.org/agriculture-and-food/labour-and-skills-shortages-in-the-agro-food-sector_ed758aab-en

⁴ e.g. see EC. 2021. EU Farm Economics Overview. https://agriculture.ec.europa.eu/system/files/2021-11/eu-farm-econ-overview-2018_en_0.pdf and O'Donoghue et al. 2016. Farm Economic Sustainability in the EU: A Pilot Study <https://www.flint-fp7.eu/downloads/reports/D5.2g.pdf>



11. The pervasiveness of these gaps reflects some characteristics of agriculture and how skills are developed across its workforce. Addressing the gaps requires a mix of approaches and the active engagement of not only farmers but also a range of stakeholders across the industry, including advisors, supply-chain partners, academics and government: choices need to be made about priorities, targeting and methods.

The agricultural workforce and the nature of farming⁵

12. Across the European Union (EU), about 17 million people work in agriculture. The majority (81%) of these are part-time and the equivalent number of full-time workers is lower at approximately 8.6 million. Within this, the majority (86%) are family members rather than hired employees. In addition, the majority (68%) of workers are male, the age profile of farm managers is skewed with 58% being 55 years or older, and over 70% of farm managers have no formal training.

13. These averages mask variation between Member States and across different farming sectors and farm sizes. For example, over half of workers in Czechia and France are employees, and approaching half of workers in Latvia and Lithuania are female. Equally, enterprises such as soft fruits and vegetables tend to rely more on seasonal hired labour than enterprises rearing beef cattle and sheep, younger managers are more common on medium and larger size farms, and younger farm managers are almost six times more likely to have formal training than older managers.

14. Nevertheless, the averages reflect some common characteristics in terms of how and why the agricultural workforce has the skills profile that it does, with implications for how the challenge of filling skill gaps might be tackled.

⁵ See https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Farmers_and_the_agricultural_labour_force_-_statistics#Farming_remains_a_predominantly_family_activity



The nature of the farm⁶

15. The biological underpinnings for agriculture mean that production cycles are inherently seasonal. Moreover, the precise timing of specific tasks can vary due to year-on-year fluctuations in growing conditions. Hence the demand for labour is both somewhat uneven across the year but also somewhat uncertain, meaning that labour needs to be flexible: regular and predictable working hours are not the norm.

16. Family farms are able to cope with this need for flexibility through reliance on self-employment and living on-site: family members with a stake in survival of the business as a home can be called upon at short notice to work unsociable hours, even for low (or no) financial reward. The longevity of family farms is testament to the resilience of this business model.

17. However, family farm structures can also impose some constraints on formal skills development. For example, a lack of spare time due to the relentless number of tasks to be done, financial constraints due to low profitability, and lack of trust in external sources can inhibit seeking new knowledge. Equally, geographical remoteness or poor communication connectivity plus older managers sometimes being less open to change can further restrict access to knowledge.

18. This is not necessarily a problem when technical skills are relatively stable and can be passed from one generation to another. Indeed, given the tacit⁷ nature of many traditional technical skills, learning on the job through family guidance over multiple seasons can be highly effective.

⁶ A title borrowed from Allen, D.W. and Lueck, D., 2004. *The nature of the farm: contracts, risk, and organization in agriculture*. MIT press. For nice summaries of the importance of social and cultural factors in farming, see Pannell, D.J. and Vanclay, F. eds., 2011. *Changing land management: Adoption of new practices by rural landholders*. Csiro Publishing plus Burton, R.J., Forney, J., Stock, P. and Sutherland, L.A., 2020. *The good farmer: Culture and identity in food and agriculture*. Routledge.

⁷ Meaning that they are hard to describe and codify, leaning heavily on vocational judgement, experiential learning and 'a feel' for what will work. For example, being able to select good breeding animals by eye or knowing when a particular field is ready to sow from the condition of surrounding hedges. Tacit knowledge will always be important but expanding skills to also harness more precise

19. However, when traditional skills become obsolete through technological progress or changing land use, reliance solely on the continuity of family knowledge can become problematic. Moreover, the ever-pressing need to undertake the practical tasks of farming combined with unfamiliarity with the nature and relevance of more strategic skills can lead to over-prioritisation of technical skills.

20. In these situations, as currently with the rise of Agriculture 4.0 and evolving requirements to manage natural capital for multiple ecosystem services beyond simply food production, external sources of information, advice and training are required.

21. The same applies to non-family labour, including regular and seasonal employees but also third-party contractors. In these cases, additional barriers to skills development may be encountered. For example, employers' may be reluctant to invest in training (human capital) due to fears that staff will then leave for (better) jobs elsewhere whilst low pay and perceived harsher working conditions in farming may deter people with the right aptitude for skills development from taking agricultural jobs. Such barriers contribute to a low-skill, low-pay equilibrium and the agricultural skills gaps reported across the EU. Addressing the skill needs of family and hired staff may require different approaches.

information and professional understanding offers significant advantages in terms of productivity, profitability and environmental performance.



Skills development

22. Information, advice and training to support skills development can be derived from a variety of sources. Although relying solely on family sources may be too restrictive, informal networks of friends, neighbours and other farmers have a long history of helping to develop and spread innovation across agriculture.

23. Such peer networking can arise spontaneously and can also be encouraged through the provision of funding to help groups of farmers to form and share ideas. In some cases, funding may be used to provide third-party facilitation as a means of encouraging participatory groups to form and interact.

24. Skills development can also be encouraged through the provision of professional advice and training. Although private provision has always existed (including services offered by input-suppliers alongside seeds, fertiliser, machinery etc.), publicly funded farm extension services were the norm throughout much of the 20th century.

25. However, recent decades have seen a greater emphasis on private provision and a more pluralistic range of extension sources, which can lead to confusion amongst farmers as to where to seek help.⁸ This can be countered through clearer signposting of different sources, including promotion of publicly-funded sources as a starting point, and recognition of the diversity of sources.⁹

26. The actual utilisation of professional advisory services by farmers depends on a range of factors, including the perceived relevance and credibility of advice plus its accessibility.¹⁰ The latter partly depends on there being adequate transport or

⁸ e.g. see Klerkx, L., 2020. Advisory services and transformation, plurality and disruption of agriculture and food systems: towards a new research agenda for agricultural education and extension studies. *The Journal of Agricultural Education and Extension*, 26(2), pp.131-140.

⁹ e.g. see Sutherland, L.A. and Labarthe, P., 2022. Introducing 'microAKIS': a farmer-centric approach to understanding the contribution of advice to agricultural innovation. *The Journal of Agricultural Education and Extension*, 28(5), pp.525-547.

¹⁰ e.g. see Farstad, M., Melås, A.M. and Klerkx, L., 2022. Climate considerations aside: What really matters for farmers in their implementation of climate mitigation measures. *Journal of Rural Studies*, 96, pp.259-269.



communications (e.g. broadband, mobile phone signal) connectivity to allow farmers and advisors to interact in a timely manner but also on there simply being enough advisors.

27. This is not always the case, leading to poorer accessibility in some areas plus increased use of ‘one-to-many’ sessions with one adviser instructing a group of farmers rather than more personal ‘one-to-one’ sessions, plus increasing reliance on remote support through (e.g.) online events, social media and web-based information. Such delivery modes play a role but may not suit all target groups.

28. In particular, some ‘hard to reach’ groups can be systematically neglected. For example, smaller and/or more remote farms with less capacity to engage but also new entrants, women and farmers coping with poor mental health. More generally, farmers differ widely in terms of their circumstances and attitudes, as recognised by various typology exercises.¹¹ This suggests a need for greater funding of and/or a focus on clearly differentiated target groups.

29. However, even if information, advice and training are accessible, demand for them may be muted. In particular, sources need to be trusted as credible and the content needs to be perceived as relevant – the type of support wanted may not be what is actually needed objectively, and a better understanding is required of the reasons for this difference. Trust takes time to establish and advisers perceived by farmers as being credible tend to have an agricultural background. This poses a challenge to recruiting and deploying advisers from different backgrounds to address some of the emerging natural capital management imperatives, highlighting a need to also upskill existing farm advisers and improve academic linkages in relation to new ideas and innovation.¹²

¹¹ e.g. Barnes, AP., Thompson, B., & Toma, L. 2022. Finding the ecological farmer: a farmer typology to understand ecological practices within Europe. *Current Research in Environmental Sustainability*, 4; 3Labarthe, P., Sutherland, L.A., Laurent, C., Nguyen, G., Tisenkopfs, T., Triboulet, P., Bechtet, N., Bulten, E., Elzen, B., Madureira, L. and Noble, C., 2022. Who are Advisory Services Leaving Out? A Critical Reflection on ‘Hard to Reach’ Farmers. *EuroChoices*, 21(1), pp.50-55.

¹² e.g. see Ingram, J., Mills, J., Black, J.E., Chivers, C.A., Aznar-Sánchez, J.A., Elsen, A., Frac, M., López-Felices, B., Mayer-Gruner, P., Skaalsveen, K. and Stolte, J., 2022. Do Agricultural Advisory Services in Europe Have the Capacity to Support the Transition to Healthy Soils? *Land*, 11(5), p.599.



30. Convincing farmers of the relevance of information, advice and training can also be challenging. Self-perceptions of what it means to be a farmer and what counts as farming can present obstacles to the uptake of new technologies, management practices and (in particular) unfamiliar organisational and strategic skills. Ways are needed to help farmers recognise and understand why and how to change, including providing career development opportunities through earlier delegation of decision-making.

31. A lack of demand can discourage providers from investing in the development and delivery of new material. Overcoming this can be attempted through subsidised provision, but also through trying to stimulate demand in response to demonstrated need. This can be attempted through using policy messages and industry leaders or networks of other influential peers to endorse upskilling.

32. However, changing entrenched perceptions is difficult and unavoidably takes time. Recognition of this suggests that formal education (whether at school, college, university or through apprenticeships) - including vocational education and training (VET) - has a role to play in promoting life-long learning as a skill to be used alongside skills more related to specific farming tasks.

33. Yet currently only a minority of the EU agricultural workforce has formal agricultural qualifications. Addressing this shortcoming implies, again, persuading farming families and employers of the relevance of formal agricultural education, both vocational and academic. This can be attempted through designing and accrediting courses in partnership with farmers and others in the supply-chain whilst also endorsing (or indeed mandating) minimum qualifications as a pre-requisite for farming careers. Again, however, this poses questions about where and how to target support.

34. Table 2 summarises some of the challenges and opportunities identified above for skills development in agriculture. Such issues are generally well recognised, including in current EU strategies and programmes¹³ and learning from cases studies can provide insights into how skills development can be attempted.

¹³ e.g. see <https://ec.europa.eu/social/BlobServlet?docId=25257&langId=en> and https://agriculture.ec.europa.eu/farming/fas_en



Table 2: Examples of challenges to and opportunities for skills development in agriculture

Challenges	Opportunities
Under- appreciation of specific skill needs	Clear policy messages highlighting needs
Under-appreciation of life-long learning benefits	Endorsement of needs by industry leaders/peer groups
Lack of physical accessibility to advice etc.	Improved rural connectivity
Lack of financial accessibility to advice etc.	Recruitment of more networks/facilitators/advisers
Low trust in credibility/relevance of off-farm sources	Strengthening extension and innovation systems
Over-reliance on family workforce	Improve attractiveness of sector to external recruits
Low educational attainment	Promotion of formal education
Lack of career pathways	Strategic repositioning of agri-food within economy
Lack of career development	Earlier delegation of decision-making responsibilities



EU policy context and CAP support

35. The changing societal demands on agriculture and land use and the role of skills development in meeting such demands are recognised in overarching EU policies. For example, the European Green Deal and accompanying Fit for 55 initiative set out ambitions to achieve a transition to climate neutrality whilst also achieving a fair and prosperous society with a modern and competitive economy. This includes specific measures for natural resource management, encompassing agriculture and land use.¹⁴

36. The skills development needs associated with these transformational ambitions are also recognised in overarching policies. For example, the European Skills Agenda sets objectives for upskilling (improving existing skills) and reskilling (training in new skills) to pursue sustainable competitiveness, social fairness and resilience whilst the accompanying Pact for Skills offers encouragement for partnership working between public and private sectors to fill skills gaps. Indeed, 2023 is the European Year of Skills.¹⁵

37. These overarching ambitions are also reflected in more specific agricultural and rural policies. For example, the Rural Pact encourages collaborative efforts to (amongst other things) promote skills and innovation in rural areas.¹⁶ More specifically for agriculture, the Common Agricultural Policy (CAP) provides various forms of support for skills development.

38. In particular, Pillar II of the CAP explicitly seeks to foster knowledge transfer and to enhance competitiveness and farm viability whilst also improving resource efficiency and supporting the shift toward a low-carbon and climate-resilient economy. This translates into various specific measures including the mandatory provision of advisory and training services, for example, the Farm Advisory Service and the EU CAP

¹⁴ see https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

¹⁵ see https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-year-skills-2023_en

¹⁶ see https://ruralpact.rural-vision.europa.eu/rural-pact_en



Network. In addition, the most recent round of CAP reform¹⁷ built on previous encouragement for Producer Organisations, Inter-Branch Organisations (IBOs) and other collective entities (see box 1)

39. In addition, Pillar I support runs in parallel to Pillar II, continuing to underpin farm viability through income support but tied to environmental improvements through eco-schemes and other cross-compliance requirements. CAP Strategic Plans set out how pillar I and Pillar II measures combine to achieve overall policy objectives in each Member State.¹⁸

Box 1

The most recent round of CAP reform built on previous encouragement for Producer Organisations, Inter-Branch Organisations (IBOs) and other collective entities. This recognises their role in helping to improve farmers' skills through the promotion and provision of technical assistance, for example in relation to environmentally responsible management tactics and improved animal welfare.¹⁹

¹⁷ see <https://www.europarl.europa.eu/factsheets/en/sheet/110/second-pillar-of-the-cap-rural-development-policy>

¹⁸ see https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans_en

¹⁹ https://agriculture.ec.europa.eu/common-agricultural-policy/agri-food-supply-chain/producer-and-interbranch-organisations_en



Discussion points for the Thematic Group

The overview presented above suggests a number of points for further discussion about how best to characterise agricultural skills and encourage their development to meet the forthcoming challenges of climate change, nature restoration and increased food demand whilst also maintaining rural livelihoods and communities.

- For example, is it possible to define specific future skill requirements such as those related to digital technologies? Or is it sufficient to equip farmers with the skill of life-long learning to enable them to upskill as required without defining specific requirements in advance? And what is the correct balance between technical and more organisational and strategic skills?
- Moreover, even if skill requirements can be characterized objectively, do farmers perceive their needs in the same way? If not, can their demand be influenced? And how should the provision of information, advice, education and training be organised to meet demand and/or objective needs?
- Equally, given constrained availability of funding and of suitably experienced advisers, teachers and trainers, can the needs of all current and potential agricultural workers be met? If not, who should be prioritised? And how should different groups (some of whom are 'hard to reach'), including potential new entrants to the workforce, be encouraged in terms of different modes of targeted support and their content? How do such choices fit within the EU policy context and existing CAP support mechanisms?

Such questions provide ample opportunity for further debate and discussion.

Disclaimer *This document has been developed as part of the work carried out by the CAP Implementation Contact Point under the EU CAP Network to support the activities of the Thematic Group (TG) on Nurturing Skills for a Thriving and Sustainable Agricultural Sector. The information and views set out in this document do not necessarily reflect the official opinion of the European Commission.*

