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AGRICULTURE & INNOVATION



EIP-AGRI Focus Group

Mixed farming systems: livestock/cash crops

MINIPAPER 4: Adding value to agricultural products from mixed farming.

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1. Introduction

The focus of this Minipaper is on the potential gains of Mixed Farming Systems (MFS) through the development of quality product differentiation and branding as a strategy for marketing and for maintenance or reintroduction of MFS procedures to European farms.

Communication with (and between) consumers and farmers should clarify that locally resourced, low input, mixed farms do exist and that the main driver behind MFS is a real and functional integration between livestock and crop cultivation. Describing the environmental, economic and social benefits of MFS to the farmers, consumers and society at large is a key element to achieve higher acceptance towards MFS products. In this, the incorporation of novel quality specifications to mixed farming products and the improvement of existing labels can contribute to the attractiveness of MFS products in particular.

At the same time, farmers need to be encouraged to maintain or re-establish MFS by giving solid examples of successful business stories and other marketing benefits arising from MFS practices. A dual strategy comprising increased farmer revenues through development of added-value products, and agri-environmental policies targeting the delivery of ecosystem services (public goods) to society, can encourage the adoption or maintenance of MFS. The actual biological, economic, and social benefits of MFS to farmers are considered in other Minipapers. Young starting farmers could be a specific target group to be encouraged towards MFS.

2. Gains of Inputs Use, Locality and Origin Combined with Communication: State of play

Knowing the origin of the product and the characteristics of the production system, for example the use of inputs, could be of interest for citizens/consumers. Many consumers are likely to look at low prices and the fact that the products are easy-to-use. However, the origin of the product (or group of products) and the way they are produced are increasingly relevant for certain segments of consumers, and this constitutes an opportunity for producers to add value to MFS production.

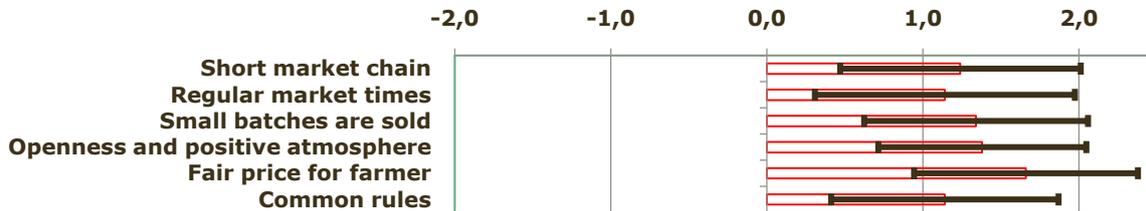
Self-sufficiency of Mixed Farming System

Integrated mixed systems at the farm scale are less dependent of external inputs and can contribute to farmers being more autonomous and in control of their businesses. In the CanTogether project it was shown that according to FADN data, fully specialised or partially mixed farms produce higher levels of output through greater use of external inputs and ultimately make more profit than MFS. Nevertheless, in fully or semi-integrated mixed farms ("true" mixed farms) productivity is lower because of greater demand for labour, but crude measures of environmental performance (e.g. crop diversity) are better. A change in the design of agri-environmental subsidies ("greening" of the Basic Payment Scheme) in the future may offset the dominance of specialization and scale economies, reduce the dependency on off-farm inputs, and better support self-sufficiency schemes of MFS (Moakes *et al.* 2015). To achieve this, indicators to show the level of self-sufficiency in MFS are needed.

Short local marketing chains

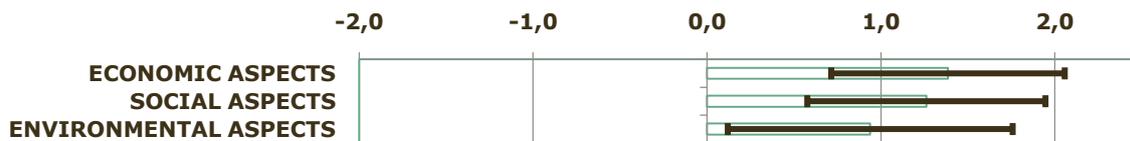
In a recent study, consumers ($n=50$) were asked to reveal the reasons to join local marketing groups (REKO rings) in Finland. The most positive feature was that farmers gain a fair price for their product, followed by openness of the production system, as in REKO rings farmers are obligated to tell customers about their management systems (*Figure 1*). Consumers claim that leaving the supermarket (or other retailers) out of the picture will eventually be an economic alternative to themselves, too. Thus, local short marketing chains mean that a) more of the final value goes to the farmer, and b) the money stays in local circulation.

Figure 1. The negative (-2=very negative; -1=negative), neutral (0) or positive (1=positive; 2= very positive) significance of economic aspects for consumers to join local marketing groups in Finland.



Farmers or bakery producers ($n=23$) said that selling in REKO ring is profitable. Especially small batches of products or seasonal products are easy and safe to sell in REKO rings. However, farmers found some regulatory issues as obstacles to expand their selling in REKO rings; especially this was a concern with raw milk and some meat products. Farmers consider that the social aspects of REKO rings are more positive; in contrast, consumers consider that the environmental effects are more positive (Figure 2).

Figure 2. The negative (-2=very negative; -1=negative), neutral (0) or positive (1=positive; 2= very positive) significance of different features for farmers and other producers to join local marketing groups in Finland.



Farmers could enhance the attractiveness of their products by realizing the environmental benefits of their own farming system, describing them in a clear manner, and demonstrating the effect of their production strategy on the economics of the local society. Arguments for biological and environmental superiority and/or local circulation of MFS schemes could work well in this situation (Mäkinen *et al.*, 2016).

Quality and origin schemes and local sourcing

In France, there are numerous quality and origin schemes for livestock territory products like terroir cheese. Some adapted their specifications (contract specifications) to guarantee feed transparency and local sourcing.

La Dauphinoise is a cooperative that support the creation of a local non-GM soya chain for feed. It relies on an innovative technological process: crushing the soya cake (in partnership with a crushing factory) for cake and oil. Logistic (organization of exchanges) and organisational innovations (contracts to prevent volatility of soya price) between specialised livestock farms and specialised arable crop farms motivated to diversify their rotations with protein crops (to benefit nitrogen input), and a local branding.

The quality and origin scheme (AOP) *Chaource* adapted their specifications to guarantee feed transparency and local sourcing. They moved towards more autonomy at farm level and local origin of off-farm fodder. These changes in the specifications led to the emergence of a local chain of sainfoin and innovative practices such as granulation/pelletizing of sainfoin. The need to renew alfalfa dehydration infrastructure in the Champagne region and to diversify sources of protein among farmers originated the project.

Sainfoin production is a good diversification strategy but hay harvest is delicate; dehydration is effective to keep the tannins in the leaves. The use of sainfoin pellets for animal feed has positive impacts on animal nutrition and health. Cropping must be on a large scale to provide consistent batches, and harvesting and processing need qualified management. A cooperative (*Sainfolia*) was established to structure the sector and manage this multi-stakeholders project. Currently 500 hectares of sainfoin are located in chalky Champagne.

Another possibility to show the origin and specific features of MFS products is through existing quality denomination labels, which could require tracking the origin of the raw materials and usually involves traditional production procedures. For example, the Bonlatte Oppio Farm in Italy operates with another dairy farm (Il Castello) and keeps a cheese factory running that turns milk into Parmigiano-Reggiano PDO (Protected Designation of Origin). The farm is importing feed concentrates from neighbouring crop farms, which is quite original in the area. They have around 1 cow per hectare, which is enough to achieve self-sufficiency in fodder but not in concentrates. From the territorial point of view, integration is improved through the exchanges of crops with other farms in the area to favour local self-sufficiency. Existing quality denominations based on origin and tradition could enhance the communication with consumers if additional information on mixed production procedures and their advantages was included.

Communication and education of consumers on the specific advantages on combining crops and livestock

Nowadays, there are many brands and labels in the market. This can be confusing for consumers and makes branding less effective. There is a need for truthful and effective communication of the differences between MFS and specialized farming systems, and the benefits of MFS to consumers and society. People need to understand what is behind MFS, the specificities of the production system and the marketing chain. Finding ways to exchange information and improve mutual understanding between farmers and consumers is central.

Animals as “sales representatives”

In Finland, MFS farmers have had success in communicating and educating consumers through a web site (www.avoinmaaseutu.fi). The customers buy products face-to-face through short-chain marketing rings or from their retail vans/buses, and farmers commit to inform them openly about their farm and production system, either directly in the farm or via social media. Some customers can even take part in farming activities; animals are raised on the farm as usual, but they are owned by customers and they are allowed to come and see the animal at the farm or to read about its life in the social media.

During farm visits, especially on Open Doors Days, the customers (especially those with children) are attracted to the farm via their “star” animals, horseback riding, farm “zoo” with a diversity of animals, or simply just the possibility to see grazing animals. A drawback is the need to prevent the spreading of diseases and to keep the farm environment extra safe and tidy.

Footprint measures – a way to make numbers speak

There are customers who are interested in the environmental footprints of food and other products they use. Water, carbon dioxide and other environmental footprints can be calculated. At present, models can incorporate, for example, the effect of land use, type of animal, or the use of manure instead of mineral fertilizers, which explain key differences between MFS and specialized crop/animal systems. However, specific indicators should be developed to evaluate the environmental benefits of MFS, and explain them to society at large and consumers in particular, e.g. nutrient balances, energy analyses (analysis of the origin and renewability of the energy embodied in products), ecological footprints etc. could help to communicate on the sustainability of MFS in comparison to specialised systems.

For example, in 2008 in Finland, an oat meal brand (*Elovena*) was the first to release a consumer package with CO₂ and water footprint labels on it. After this, release footprint labels have become more common. The work to create software applications with a uniform basis for calculating different footprints is ongoing.

However, when calculating the environmental impact of food production, the positive outcomes (ecosystem services) should also be considered. However, they are difficult to quantify and therefore are normally not considered in policy design, or communicated to consumers and citizens. For example, multifunctionality of Mediterranean extensive mixed sheep-cereal systems can be incorporated into the calculation of the carbon footprint of lamb meat. By doing this, the widely known relationship between higher intensity of production and lower carbon footprint is reversed, with mixed sheep-crop farming systems having lower carbon footprint than the industrial or zero-grazing ones (Ripoll-Bosch *et al.*, 2013).

Further, studies have shown that important ecosystems services (nonmarket goods such as agricultural landscape, biodiversity conservation, or provision of quality products linked to the territory) provided by mixed

sheep-crops systems, often located in high nature value farmland areas, have a very large socio-cultural and economic value for society. Despite the fact that these values are often ignored by policy, the willingness to pay of society for the provision of these ES clearly exceeds the current level of economic support by the CAP (Bernués et al, 2014). In this study, the prevention of forest fires ($\approx 50\%$ of total willingness to pay) was valued by the population as a key ecosystem service delivered by mountain MFS, followed by the production of specific quality products linked to the territory ($\approx 20\%$), biodiversity ($\approx 20\%$) and cultural landscapes ($\approx 10\%$). The authors conclude that there is a large underestimation of the socio-cultural and economic values of ecosystem services of MFS, and defend the need of a fair compensation to farmers for their delivery.

3. Innovation process and fail factors

Problems to address

1. The need for easy-to-understand indicators for self-sufficiency in MFS.
2. Communication challenges in outlining the specificities and benefits of MFS to customers/citizens.
3. The integration of multiple footprints/ ecosystem services in assessment of environmental impacts may be difficult. Results should not be directly extrapolated across regions/farming systems.
4. The cost of making product-specific footprints available for MFS farmers may be high.

Possibilities to address

1. Adaptive capacity (resilience) of farmers to face uncertain market and environmental constraints.
2. More stable farm income along time (avoidance of risks). Productivity of MFS may be lower, but production should be more regular in the medium or long term.
3. Potential to minimize the regulatory issues (licensing, certificates etc.) on small- or medium-size mixed farms (vs. big operators), and to use specific labeling schemes.
4. Contribution to local circulation of resources, to rural development and vitality.
5. Optimization of labor due to more regular demand between seasons.

4. Needs for research

Education of and communication with consumers is key to capitalize the gains of MFS. To raise consumer awareness on the benefits of MFS, new or existing indicators or quality labels may be used, but they have to be clear and understandable. The challenge is how to widespread information of best practices all over Europe. As farmers and consumers are losing a "common language", first-hand live experiences of MFS in practise should be added into current marketing strategies.

There is a need for research on marketing and labelling strategies for MFS products. New research should include existing and novel added-value chains and labels adapted to the specificities of MFS, analyse the potential of "multifunctional food baskets" and the "bundles of services" provided by MFS, and develop communication strategies to communicate and (re)attract people around MFS.

Efforts to make MFS attractive to consumers require that farmers themselves see MFS as a profitable alternative, or as a solution to the societal demands for more sustainable agricultural production. Mixed farming would also be more interesting if the potential for risk reduction is realized by farmers and cooperatives. Thus, the effect of integration on adaptive capacity and farm resilience (e.g. dependency on external inputs, impact of market volatility) should be quantified. A number of indicators such as alternative measurements of efficiency of resource use (input/output), sensitivity to the price of inputs, or rates of diversification, could be used for measuring integration and self-sufficiency. The same indicators could serve to regulate new agri-environmental policies specifically addressing mixed agriculture at farm and regional levels.

Another positive effect of MFS is its contribution to the local economy and rural vitality. Some indicators could be rather straightforward, such as job creation or income generation, which could be compared to national averages. Others, such as the standard of living, or the farmer and his/her family "quality of life", are more

subjective and might be evaluated through personal perspectives using surveys. Still, these indicators could be used when promoting MFS among farmers and in local or regional development projects.

5. Recommendations for how to ensure a broader take up

Multifunctional Food Basket

An increasing proportion of consumers hold “ethical” concerns about how food is produced and the way agri-food chains operate. Among the “extrinsic” quality attributes of agricultural products (those that depend on the system of production), the environmental footprint is key. The increasing distance between producers and consumers and the accumulation of power by few big operators along the chain are often perceived negatively by citizen groups. MFS is multifunctional; apart from producing food products, it can also produce nonmarket goods such as cultural landscapes, conservation of biodiversity, or carbon sequestration through better soil management.

A Operational Group on “*Multifunctional Food Baskets*” could explore the possibilities of consumer-led development, marketing and integration in innovative food chains for groups of products coming from MFS, either at the farm or the territory levels. Tools to depict the effect of MFS would include existing and possible labels (for origin, production system, footprints, optimization of energy use or nutrient cycles). Labels that identify, qualify and promote the use of locally or domestically (in contrast to imported) produced feed could be introduced.

Mixed Farming Stars (New Farmers)

Starting farmers usually are more open to consider new manners for running their (family) farm. They may be more concerned with the societal acceptance of their choice of work or entrepreneurship. MFS could be regarded as an alternative with higher sustainability, independency and “in-my-own-hands” business opportunities. An Operational Group on “*Mixed Farming Stars*” would help in succession planning, empower new farmers, identify their own drivers for MFS development, and overcome barriers related to MFS practices, such as:

- New marketing possibilities through societal acceptance, chain transparency and labelling.
- Optimization of labour by better match of seasonal requirements and resources.
- Underpinning of factors that can improve the resilience (environmental, economic) on the farm.
- Broadening of “know-how” and skills.

6. Epilogue

The prominent pressure for product traceability and openness about the procedures of agricultural production, and the effects on the environment and on local economies, can be turned into a competitive advantage. This requires that the production system is more sustainable and is correctly understood by consumers and the society at large. This might be the case on mixed farms, especially on those that are fully integrated, operate on low external inputs or depend on local resources.

In this Minipaper, we have discussed about adding value to agricultural products coming from mixed farms and about potential gains of communication with consumers about inputs use, locality and other features of the production systems. We argued that a better education of consumers on the advantages of mixed farming and its capability to deliver ecosystem services may boost the acceptance and marketing opportunities of mixed farming products.

The first step could be to identify mixed farmers, and to help them realizing the uniqueness of their production system. Then, some marketing measures are rather straightforward: the real farm environment that includes different crops and animals can be used to attract customers or in the quality specifications regarding the origin of the product or the way it is produced. Other marketing strategies, like footprint labelling, need refinement and costly calculations that might be too expensive for small farms. The possibilities of social media, QR coding, dissemination through flyers, or face-to-face information may constitute

inexpensive tools in communicating the benefits of mixed farming systems in neo-traditional agricultural production.

7. List of relevant research projects

- CanTogether (7th Framework Programme)

8. References

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The European Innovation Partnership 'Agricultural Productivity and Sustainability' (EIP-AGRI) is one of five EIPs launched by the European Commission in a bid to promote rapid modernisation by stepping up innovation efforts.

The **EIP-AGRI** aims to catalyse the innovation process in the **agricultural and forestry sectors** by bringing **research and practice closer together** – in research and innovation projects as well as *through* the EIP-AGRI network.

EIPs aim to streamline, simplify and better coordinate existing instruments and initiatives and complement them with actions where necessary. Two specific funding sources are particularly important for the EIP-AGRI:

- the EU Research and Innovation framework, Horizon 2020,
- the EU Rural Development Policy.

An EIP-AGRI Focus Group* is one of several different building blocks of the EIP-AGRI network, which is funded under the EU Rural Development policy. Working on a narrowly defined issue, Focus Groups temporarily bring together 20 experts (such as farmers, advisers, researchers, up- and downstream businesses and NGOs) to map and develop solutions within their field.

The concrete objectives of a Focus Group are:

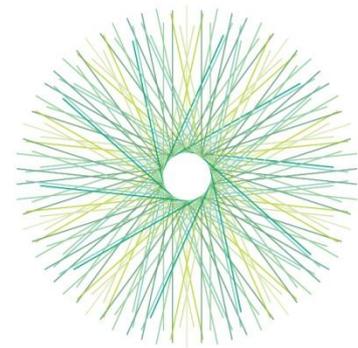
- to take stock of the state of art of practice and research in its field, listing problems and opportunities;
- to identify needs from practice and propose directions for further research;
- to propose priorities for innovative actions by suggesting potential projects for Operational Groups working under Rural Development or other project formats to test solutions and opportunities, including ways to disseminate the practical knowledge gathered.

Results are normally published in a report within 12-18 months of the launch of a given Focus Group.

Experts are selected based on an open call for interest. Each expert is appointed based on his or her personal knowledge and experience in the particular field and therefore does not represent an organisation or a Member State.

*More details on EIP-AGRI Focus Group aims and process are given in its charter on:

http://ec.europa.eu/agriculture/eip/focus-groups/charter_en.pdf



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