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FARMERS' ASSOCIATIONS AS CATALYSTS FOR BIOECONOMIC INNOVATION

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Key Messages

- Farmers' Associations are an untapped resource for bioeconomy policy. They need a mandate and support to take on this role.
- Most farmers already practice bioeconomy principles without using the term. FA can bridge the gap between existing practice and new opportunity.
- Basic sustainability innovations are now mainstream; advanced bioeconomy innovations remain rare. The barriers such as weak markets, poor regulation, and scarce finance are structural, and not a lack of farmer willingness.
- The more bioeconomic innovations farmers implement, the stronger and more diverse their sustainable impacts. Raising awareness and building practical capacity are mutually reinforcing levers.
- Farmers' Associations can act as catalysts for bioeconomic change by informing members, brokering partnerships, and advocating for the policy frameworks that make advanced innovation viable.

Background

Innovations arise in the context of cooperation, interaction and joint learning, with various interest groups potentially playing a crucial role (Bugge et al., 2019). Agricultural knowledge and innovation systems are formed by several actors who shape institutions, which in turn have an influence on the actors (Hermans et al., 2012). Farmers' associations are a central player in Agricultural knowledge and innovation systems (Bokelmann et al., 2012), yet their potential role in driving a bioeconomy transition has been largely ignored in scientific and policy debates.

The FABIOS project ("Farmers' Associations in a Bioeconomy-related Innovation System") of ZEF and Forschungszentrum Jülich investigated how two contrasting associations — RLV (Rheinischer Landwirtschafts-Verband) in North-Rhine Westphalia, Germany, and AAPRESID (Asociación Argentina de Productores en Siembra Directa) in Argentina — engage with bioeconomy concepts and support their members' innovations. Germany operates a regulation-heavy, policy-driven Agricultural knowledge and innovation systems tightly integrated into EU governance (Knierim et al., 2022); Argentina a market-driven, productivity-oriented one led by private actors and the public research institute INTA (OECD, 2019). Despite these structural differences, both Farmers' Associations reveal strikingly similar patterns, and a comparable untapped potential.

Bioeconomy: Familiar Practice, Unfamiliar Concept

Figure 1
Keywords used by AAPRESID members (n=142) to describe the bioeconomy

An online-survey revealed, that two-thirds of the Rheinischer Landwirtschafts-Verband respondents (n=13) are either unfamiliar (42%) or only slightly familiar (25%) with the concept; among Asociación Argentina de Productores en Siembra Directa members (n=142), 24% are unfamiliar and 56% only moderately familiar. Yet both groups describe and implement what the term means: they use key words such as sustainability, business and economy, circular economy, value addition, natural resources, efficiency, and agricultural production, see Fig. 1, describing their agricultural practices such as crop rotation, soil improvement, reduced agrochemicals.

Interviews with leaders of RLV and AAPRESID revealed that there is no uniform understanding of the term: bioeconomy is seen as a "broad field", also as a "constructed term". Leaders describe the concept broadly — combining ecology and economy, replacing fossil inputs with renewables, creating new opportunities for agriculture — but without a shared

definition or strategic direction. As one interviewee noted, bioeconomy is “new wine in old bottles.” Neither Farmers’ Association uses the term systematically, and neither has an internal bioeconomy strategy.

This gap between practice and terminology matters. Farmers and their organizations who are unfamiliar with the concept, are less likely to seek out new opportunities, engage with bioeconomy policy, or position themselves as part of a broader transformation.

What Drives and Blocks Innovation

Farmers identify two distinct types of barriers to bioeconomic innovation: The first is related to gaps in information, weak networks, limited technical knowledge — and this is where Farmers’ Associations can and do help directly. RLV members highlight the association’s role in providing legal advice, market information, and connections to innovation networks. Members of AAPRESID value access to scientific organizations and technical support, factors the association actively provides. The second type of barrier is structural: inadequate financing, weak market incentives, insufficient local support, and poor regulatory frameworks. These are beyond what any Farmers’ Association can fix alone. Policy must address them directly. This distinction matters for the design of support. Strengthening Farmers’ Associations is necessary but not sufficient.

From Basic to Advanced Innovation: A Gap that Policy Must Close

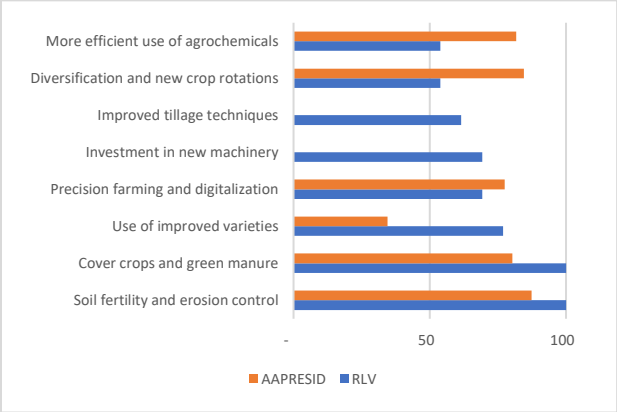

Figure 2

Main innovations implemented by AAPRESID (n=142) and RLV (n=13) respondents (in %)

Basic sustainability practices are now mainstream. All RLV members surveyed use cover crops, green manure, and soil improvement measures; most AAPRESID members use crop rotation, cover crops, and precision farming technologies (see Fig. 2). Advanced bioeconomy innovations remain rare. Biomass valorisation, on-farm processing, production for non-food industries, local biorefineries, new marketing channels, and agroforestry are barely present in either country. The gap is not a knowledge problem. It reflects the absence of market structures, value chains, and financial instruments needed to make advanced innovations viable. Closing it requires targeted policy action — not just better farmer information.

Knowledge and Innovation Systems: What Works

Bioeconomic innovation depends on networks linking farmers, researchers, extension services, input suppliers, and markets. Asociación Argentina de Productores en Siembra Directa has built a notably effective model. Farmers, technicians, and experts work together in regional and thematic groups to solve real agronomic problems, grounded in direct field experience. One group, “Chacra Bioinnova,” focuses specifically on the bioeconomy and has already generated concrete innovations, including a network for agricultural input distribution and a start-up fund. Rheinischer Landwirtschafts-Verband members draw on an institutional landscape that include input companies, the Chamber of Agriculture, cooperatives, and research institutions. They rate the Chamber and private consultants as more important than the RLV itself for innovation support. This points to an opportunity: Rheinischer Landwirtschafts-Verband could take a more active and distinctive role within this system.

The Impact of Innovation: A Clear Pattern

The data reveal a consistent pattern: the more bioeconomic innovations a farmer implements,

the stronger and more diverse the sustainable (ecological, economic, and territorial) impacts. Among Asociación Argentina de Productores en Siembra Directa members, the correlation between number of innovations and mean sustainable impact is strong and statistically significant ($r = 0.51$, $p < 0.001$). A second finding reinforces this: the more familiar farmers are with the bioeconomy concept, the more innovations they implement ($r = 0.38$, $p < 0.001$). Greater awareness drives more innovation, which drives greater impact. Both are tasks where Farmers' Associations can make a direct contribution.

Both Farmers' Associations members identify the same five most significant impacts (see Fig. 3): improved soil conditions, new knowledge generation, reduced agrochemical use, lower production risk, and enhanced biodiversity. Territorial impacts such as job creation or improved living conditions are rated lower, indicating that current innovations benefit individual farms more than the wider rural economy. This is a gap worth addressing directly.

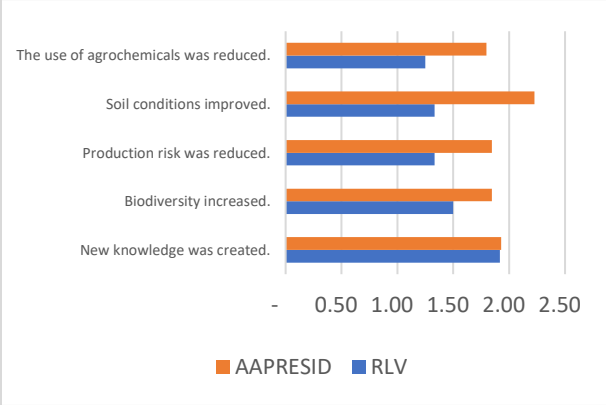

Figure 3
Most important impacts of innovations valued by AAPRESID (n=142) and RLV (n=13) respondents (Likert scale from 0 "no impact" to 3 "high impact")

Conclusions and Recommendations

FABIOS project shows that **Farmers' Associations**, within the existing AKIS of Germany and Argentina, already contribute to bioeconomic innovation, but well below their potential (Sili et al., 2026). Both Rheinischer Landwirtschafts-Verband and Asociación Argentina de Productores en Siembra Directa have the networks, reach, and member trust to go much further. Both could act as a catalyst for bioeconomic issues and advocate more strongly for the promotion of bioeconomic innovations at the political level. At the same time, bioeconomic topics could be addressed more extensively internally.

Four priorities stand out:

1. Develop a bioeconomy strategy within Farmers' Associations. Neither Rheinischer Landwirtschafts-Verband nor Asociación Argentina de Productores en Siembra Directa currently has one. Engaging members in developing a shared definition and strategic direction would raise awareness, build internal momentum, and position **Farmers' Associations** as credible voices in policy debates.

2. Use Farmers' Associations as bioeconomy brokers.
Farmers' Associations are well-placed to connect farmers to R&D organisations, extension services, new markets, and funding instruments. Asociación Argentina de Productores en Siembra Directa's group-based model, including the Chacra Bioinnova, offers a transferable template for other countries and regions.

3. Address structural barriers through policy. Finance, regulation, and market access are the binding constraints on advanced bioeconomic innovation. These require action by national and regional governments. **Farmers' Associations** should advocate explicitly for the regulatory and financial frameworks that make advanced innovation viable, and not just support members in navigating the current system.

4. Scale what works. Both **Farmers' Associations** already support knowledge dissemination and the adoption of basic innovations effectively. This capacity should be extended to more complex bioeconomy topics

through farm consultations, training, and inter-organisational projects, and evaluated systematically to build the evidence base.

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