

## **The Landscape of Creation and Facilitation of Dairy Sheep-Farmers' Discussion Groups in Stables in Karditsa, Greece**

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**Abstract:** This study explores the landscape of the formation and facilitation of dairy sheep farmers' Discussion Groups in Stables (DGiS) in Karditsa Prefecture, Greece, revealing aspects of their specific context and needs. The study concerns an action research project employing grounded inferences and triangulation of multiple data sources to ensure validity. The data were collected during a two-year period through interviews, discussions and 17 DGiS meetings with farmers and the local AKIS actors. The study indicates that the DGiS contribute to the exchange of ideas and practices among farmers, while also strengthening their interaction with the local AKIS actors. Moreover, the study highlights the necessity of basic agricultural education and reliable knowledge for improving livestock farming. Furthermore, it points out institutional shortcomings and learning resistance that hinder efficient livestock farming and AKIS actors from playing a constructive role in the creation of a learning environment, especially in view of the implementation of the European framework for cooperation.

**Key words:** sheep-dairy farming, social experiential learning, networking, cooperation, Greece

### **Introduction**

According to Van den Ban & Hawkins (1988), farmers' education can be delivered either by directly showing them the solution to specific problems or by taking them through the process of problem solving. The second way has been selected to be studied in this piece of work addressing the introduction of experiential learning principles in groups of dairy sheep farmers in Greece.

The research concerns the establishment of Discussion Groups in Stables (DGiS) involving sheep livestock farmers in participatory approaches and experiential learning processes. DGiS draw methods and tools from farmers Discussion Groups (DGs) and Farmer Field Schools (FFSs), in order to promote changes that derive, on the one hand, from the participants' specific conditions of production and, on the other hand, from their need to be integrated within a wider knowledge network and develop interactions that enhance the sustainability of the farm family. Though DGs and FFSs have been developed independently from each other, they share considerable common ground at a theoretical and practical level, as both concern facilitated processes whereby dialogue and reflection take place.

DGs concern a participatory, bottom-up approach applying peer-to-peer learning for promoting new technologies and best practices among farmers (Hennessy & Heanue 2012). Adult learning and social learning theories (Bandura 1977) constitute the theoretical framework of DGs, giving emphasis on interpersonal relationships which enable learning by interacting and affecting behavior. Having started in New Zealand in the 1950's, DGs are a common practice in Australia, the UK and Ireland.

FFSs concern a widespread and well-established methodology, which is differentiated from the dominant trend in extension services by facilitating learning rather than teaching and by encouraging local innovation processes rather than the transfer of new technology and know-how (Duveskog 2013). There is a significant number of publications indicating the positive

impact of FFSs on the farmers' decision-making capacity on pesticide management, animal farming, environmental issues, overall resulting in poverty reduction and farmers' empowerment and well-being (Vaarst et al. 2007, Mancini et al. 2008, Davis et al., 2012, Friis-Hansen & Duveskog 2011, Van den Berg & Jiggins 2007, Duveskong 2013). In FFSs the interaction among participants is based primarily on discovery-based learning exercises, group experiments and agroecosystem analysis (Davis et al., 2012). FFSs are based on adult learning and experiential, transformative learning theories.

Experiential learning or learning-by-doing is defined as a process whereby learners' experience is transformed into knowledge (Torkington 1996). It is "practical in nature" and "involves sharing of experiences and resources"; it therefore enhances critical thinking and helps participants make sound decisions while encouraging collaboration and engagement in common activities (Cranton 1994, Percy 2005).

In the Greek livestock farming context, such traits and attitudes are essential for farm sustainability and the development of the sector, as livestock farmers operate under adverse conditions. Among them, the most significant refer to farm structures, with small size farm holdings dominating the sector, in parallel with the absence of a structured extension system (Koutsouris, 2014), and the existence of weak cooperatives, many of which have collapsed in recent years. The reason for such a collapse of cooperatives lies in the "market- and incentive-distorting government interventions, along with organizational failures ignited by the rent-seeking behavior of cooperative leaders" (Iliopoulos and Valentinov 2012).

In this framework, stimulating farmers' learning by using social experiential learning methods, i.e. methods whereby knowledge and skills are developed by interacting and sharing experiences (Bonesso, 2015), is meaningful insofar as it goes beyond the farm and engages actors – either individuals or organizations – that constitute the dairy farmers' local professional network. Such involvement aims at strengthening farmers by establishing better understanding and higher-level coordination, while dealing with financial and also environmental and social sustainability issues emerging but not limited to farm level. Thus, learning interventions, though rooted in farms, can only be realized at the social level by helping farmers extend their strategic space (Geerling-Eiff et al. 2013) and create conditions conducive to future cooperation and synergies.

Furthermore, this approach accords with the systemic view of innovation emerging from extended networks as a result of interactive and evolving processes among actors (Smits and Kuhlmann, 2004), which produce multiple changes at a technical, financial, organizational and social level (Lamprinopoulou et al. 2012, Klerkx et al. 2012). This concept also applies to the European Innovation Partnership (EIP) approach aiming at the establishment of Operational Groups in order to bridge the gap between the actors of the Agricultural Innovation System (Österle et al. 2016) and generate innovations by combining diverse sources of knowledge. Within such a framework, knowledge, as the outcome of learning processes, triggers the development of critical thinking and allows for tailor-made solutions addressing specific needs.

Illeris (2009) defines learning as every process resulting in a permanent change of perceptions of living organisms that cannot be attributed to maturity, emphasizing their dependence on a combination of inner functions – related to learning content management and motivations – and external interactions inextricably connected with existing conditions. Consequently, there are two perspectives through which learning should be seen, "from individual to external objectification culture and vice versa" (Jarvis, in Illeris 2009). However, there are two major barriers to learning, stemming from defense mechanisms pre-existing to learning processes and resistance mechanisms. Defense mechanisms are connected with the complexities of

modern life and failures with regard to the management of a huge amount of information, which finally relegate knowledge to the information status (Davenport et al. 2005). Resistance refers to an active reaction to the learning process resulting from experiences that hinder individuals from goal achievement and understanding of the reasons of failure at the same time. It includes the rejection of a broadly acceptable practice that can lead to a dynamic cognitive mobilization and thus involves a strong transformative learning potential.

The purpose of this piece of work is to explore the process of creation and implementation of a DGiS. A DGiS, starting from the challenges farmers confront, and their needs, aims, on the one hand, at facilitating decision making and encouraging the development of a common understanding of their problems and, on the other hand, at functioning as an interaction platform stimulating meaningful exchanges and synergies among farmers and the actors of the local Agricultural Knowledge and Innovation System (AKIS). Moreover, consideration is given to the cognitive needs of farmers and the flow of information and knowledge that potentially renders their farms viable, as well as the institutional aspects of the livestock farming context, targeted in boosting their competitiveness, as perceived during the group initiation and discussions.

## **Study Design**

### ***The research area***

The Prefecture of Karditsa is a half mountainous-half plain area located in Central Greece. Its primary sector is organized around small and medium-sized farms. The cultivation of cotton covers 45.5% of the cultivated areas, with wheat, corn, tobacco and vegetables complementing its primary plant production profile. The contribution of stock farming is low with an average of 70 sheep per sheep-farm holding<sup>1</sup>.

The selection of Karditsa for this research was made on the basis that other research projects were under way in the area, which could facilitate communication with livestock farmers and other actors in the sector and provide insights on their interactions.

### ***Methodology***

The research is set in the context of action-research, which is formed in the conjunction of action, research and participation (Greenwood and Levin 2007). Its foundation lies on the General Theory of Systems and the pragmatic philosophy of Dewey, which argues that scientific thinking is an ability that all humans share and that societies can benefit from the enhancement of such capacities (Greenwood & Levin 2007). Action-research is realized in subsequent learning circles with each of them including strategic planning, implementation of the plan, observation and (self) assessment of the outcome, which finally guides the planning of the following learning circle (Cohen 2008).

Action-research aims at the “increasing ability of the involved community or organization members to control their own destinies more effectively and to keep improving their capacity to do so within a more sustainable and just environment” (Greenwood & Levin 2007). It rejects the dichotomy between theory and action, insisting on the attainment of justified opinions and knowledge contributing thus to understanding societal challenges and changing conditions. Sources of knowledge are practical considerations that can be tested through active participation in subsequent actions. Consequently, action-research allows for the exploration of persistent problems within their context by establishing equal and democratic

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<sup>1</sup> <http://www.statistics.gr/el/statistics/-/publication/SPK12/2013>

relationships among the researchers, who are the “outsider” aiming at facilitating the process and contributing to both problem solving and the scientific field, and the “insiders” who are actually the owners of the problem. Essential elements of this reciprocal learning process are the involved parts, who jointly define the problematic situation (Greenwood & Levin 2007), and create room for establishing communication channels, that is a “space of trust”, where participants feel able to traverse without fearing the pitfalls of the learning process. Such spaces facilitate the learning process by providing opportunities for reflection and allowing the co-creation of knowledge.

### ***The facilitator***

The facilitator is an Animal Production agronomist engaged in DGiS in the framework of her dissertation on experiential learning in AUA. Before the initiation of DGiS she attended a 3-month-training in Agricultural Extension for Farm Innovation and Strategic communications and a 2-day facilitation training course in UCD, Ireland. At the same time, she participated in visits to sheep, beef and dairy discussion groups and meetings with Teagasc advisory staff in Ireland.

### ***Data collection***

Action-research draws techniques and methods from the social sciences’ tool-box in order to create learning spaces and learning processes and reinforce conceptual development resulting from taking action. This paper is based on elements gathered during the “negotiations” with national and local actors – aiming at facilitating the first contact with farmers and the “recruitment” of farmers in groups – as well as, later on, during the group building and group facilitation processes, covering a period that extends from March 2015 to nowadays. Apart from individual conversations with representatives of organizations related to livestock farming, data have also been collected during DGiS meetings, starting in September 2015, and informal conversations with each of the farmers participating in the DGiS group.

Validity in action-research has been a debated topic. Greenwood & Levin (2007) distinguish among internal and external credibility measuring the first one according to workability, i.e. to what extent action-research helps participants in problem solving and/or empowers them. In this research, we tried to overcome action-research limitations connected with external validity by employing grounded inferences based on observation and triangulation of multiple data sources to ensure that the research is valid and rigorous.

## **Results**

### ***Initiating the creation of DGiS***

Although the research area had been considered relevant for implementing such interventions, contacting and recruiting an appropriate number of livestock farmers, who volunteered to form a group, took time.

The first attempt to communicate the intervention took place in July 2014 and targeted farmers accessed through the Young Farmers Program, in collaboration with the Hellenic Agricultural Organization “ELGO Demeter” – which is the Organization responsible for farmers’ agricultural education and lifelong training. The most significant outcome of that meeting came from a young farmer who, although not interested himself in participating, declared that “such interactions are more to my uncle’s liking”. This resulted in contacting an opinion leader who played a decisive role in the creation of DGiS.

More intensive efforts were made during the period from March to August 2015, in which a number of organizations active in the area – apart from ELGO Demeter – were contacted.

These were a local dairy farmers' cooperative, a local dairy farmers club, the Center for Genetic Improvement of Livestock in Karditsa, the local Development Agency of Karditsa (AN.KA. S.A.) as well as the University of Thessaly, which have been involved in projects supporting local livestock farming and thus have access to livestock farmers. The request to these organizations was to put the researcher in contact with farmers they were collaborating with, but in most cases, after several discussions no specific action was realized.

Following, in August 2015, an information meeting was organized with all the concerned organizations clearly agreeing to communicate the date of the event to the farmers they collaborated with. During the meeting, it was explained to farmers that the group to be formed relies on the principles of dialogue and respect towards all participants. The formation of the group aims to serve their goal of keeping their farms sustainable and profitable, thus they should feel free to set specific targets and to this end form subgroups. The means towards such an aim derives from their collective knowledge and practices and also the knowledge that external actors can bring to the group. Thirteen farmers participated in the meeting, at the end of which eleven of them agreed on the formation and initiation of a DGiS. Half of the farmers who formed the group were accessed through the Young Farmers Program, while the rest concern two teams of friends and relatives - one connected with the Centre for Genetic Improvement of Livestock and the other with the abovementioned local opinion leader who actively supported this effort.

Furthermore, at the initiation of this experiment the researcher-facilitator contacted several departments of the Ministry of Rural Development and Food as well as relevant laboratories of the Agricultural University of Athens (AUA) in order to gain knowledge on certain technical and regulatory matters. In certain cases, these efforts bore fruits; there has thus been a constant flow of information and collaboration since then. In other cases though, respondents stated that they could only work with clear-cut cases related to their specific subject-matter and they were not able or willing to orient the researcher. Moreover, in one case help was denied, on the grounds that the freelancer scientists of the sector have to make their living out of this kind of information/advice and farmers should ask them for solutions. Overall, these discussions resulted in gaining a broader view of the opinions that other related professionals have about livestock farmers and their professional conditions.

It is worth noting that at the initiation of the project almost all organizations/experts/academics felt it was necessary to draw the researcher's attention to the farmers' low education level to which the limited understanding of problems and rough manners are attributed.

### ***The participating farmers and local actors***

The farmers who participate in the DGiS run farms that differ significantly between them regarding the structure of the farming system, i.e. the herd size, breed, daily management routines and goals of the farmer. They are sheep breeders, coming mainly from families without professional livestock farming background. Nevertheless, their parental families used to breed a small number of sheep to cover the family needs for meat and dairy products.

In the meetings that took place until March 2017 a total of 33 farmers, aged from 23 to 55 years, participated at least in one meeting with a core of nine of them participating either in almost all the meetings from the initiation of the group (five farmers) or in more than half of them (four farmers). Five of them employ immigrants, while the rest run their farms either alone or with the help of their family. Four of them collaborate with nutritionists that pay for monthly visits to their farms, while the rest of the farmers either produce the feed concentrate on their farms with advice from feed suppliers or purchase feed concentrates from feed

industries. All the farmers run their farms in the plain area of the Prefecture and none of them has had agricultural education or has received any training in livestock farming. Four of the farmers are members of the local cooperative (two of them are also members of the Board), and two others became members after the initiation of the DGiS, while members of the group participated in an initiative for the establishment of a new farmers' association.

From the formation of the group several actors, most of them involved in cooperatives/farmers clubs or dealing with groups of livestock farmers, have expressed interest to participate in some of the meetings. Some of them preferred only to observe, others tried to impose their agenda, while others contributed considerably to discussions.

The intervention attracted interest; that was obvious in the very first meeting, which was attended by 5 non-farmer actors, i.e. almost 1/3 of the participants. The purpose of that specific meeting was for the members of the group (i.e. the farmers) to reveal their agenda and set a common goal and this had been explained to all participants. The role of other, non-farmer actors was to observe and familiarize themselves with the methodology of the intervention, becoming more willing to contribute their knowledge and opinion and thus co-creating a space of trust with the farmers. Nevertheless, as one of them said, they were more interested in ideas for building groups and helping the farmers they already collaborated with. Indeed, the DGiS helped a project-team based in the University of Thessaly to expand its network of farmers who keep local sheep breeds.

In many of the subsequent meetings the Head and the veterinarian of the Center for Genetic Improvement (six and two times respectively), private sector veterinarians who collaborate with the group farmers and personnel and members of the Board of the local cooperative participated as well.

Concerning interactions among the abovementioned local AKIS actors only ANKA S.A. and the University of Thessaly collaborate with each other and also with a sheep-farmers' club, which has recently been turned into a cooperative.

### ***The meetings- Exchange of experiences***

The meetings have been taking place approximately once per month mainly in the participants' farms – with a different farmer hosting the group meeting each time. Other group activities until March 2017 concerned visits to the establishments of local AKIS actors, such as ELGO Demeter, the Center for Genetic Improvement and a local cooperative for discussing issues relevant to their mandate and the participation of the group in an in-class lecture-and-discussion.

The general design has been that each on-the-farm meeting takes approximately 2 hours and consists of two parts: it starts with a short introduction of the agenda by the facilitator; then the host farmer shows other participants around (the herd, the stable, the milking parlor, pastures etc.); and the process continues with discussion among participants. During the on-farm guided tour, visitors can ask the host questions, who provides short clarifications. Participants have the freedom to elaborate on their observations and explanations and to provide suggestions to the host during the discussion. However, this plan was not strictly followed in the first meetings, which were less structured and farmers did not easily comply with the principles of dialogue. This can be attributed to several reasons – shortcomings in the design of the learning process is one them – that will be dealt with on another occasion.

During the discussions, considerable attention has been given to allow all the farmers' opinions to be freely expressed and clearly heard. For this reason, the facilitator encourages group members to express their opinion either by addressing open questions to all members

(such as if they wish to add a comment, if someone has a different opinion, etc.) or by addressing specific members who she knows have certain experience and knowledge on the topic discussed. The facilitator keeps the time, puts notes in a whiteboard, thus creating a rough map of the discussion, summarizes the main points and keeps records of the meetings.

It is worth mentioning that, in practice, the meetings rarely finish when farmers depart from the visited farms; discussions continue with most – if not all – participants in local taverns. There, the conversation is punctuated with examples and situations which are described in more detail. It is noted that none of non-farmer actors who have occasionally participated in the meetings have followed the group in after-farm-visit get-togethers so far.

During the reflection meetings, as well as in private discussions, main evaluation questions addressed to farmers concern their satisfaction from their participation in the DGiS, the benefits they gain, and what changes they would like to see in next meetings and, in particular, the facilitation process. Thus far farmers agree that participating in meetings has been beneficial because they have learned about stable equipment functionality and practices in real conditions and have taken ideas that they can put into practice in their farms. The farmers have been very keen to and satisfied from visiting farms and exchanging opinions with their colleagues, especially in the cases of modern holdings using technologically advanced practices.

A crucial question that has emerged among the core farmers, however, concerns the choice to abandon the group's openness and become a closed group as this would enhance group functionality and trust, allowing each member utilizes more efficiently other members' suggestions. Nevertheless, farmers have agreed that exchanging experiences is of paramount importance and only asked for external scientific input, i.e. bringing them in contact with knowledgeable AKIS actors, especially academics. Moreover, the idea of organizing excursions and visits in other areas was brought forward. Concerning the facilitation process, farmers noted continuous improvement.

### ***Main themes being discussed***

The main themes being discussed during on-farm visits concern technical issues and best practices (Table 1) in relation to the herd productive cycle. In the visits that did not take place on farms, the themes concerned mainly farm strategies (such as herd genetic improvement and PDO products) and policy instruments, legislation and available financial means that potentially improve farmers' professionalism and their farming conditions. Such issues concern modernization schemes related to the improvement of stable facilities, cooperation schemes, etc. Another much-discussed issue refers to sheep breeds in relation to the farms' production systems, revealing the farmers' habit to keep and experiment with more than one sheep breeds on farms. An additional point concerns the fact that farmers do not keep detailed records on farm financial and zootechnical issues.

All themes discussed in each meeting are suggested by the host farmer and/or the group members, since before meetings a conversation between the facilitator and the host farmer has been taking place on the issues that the farmer would prefer to be discussed. In certain cases, farmers do not express any preference and issues are specified in accordance with the farm conditions and the phase of the productive circle of the specific livestock flock. Moreover, during the meetings unexpected issues emerged, which were either discussed promptly or addressed at a next meeting. Therefore, the topics developed in each meeting can be either independent or – more rarely – developed in a sequence of meetings.

In the after-farm get-togethers several issues that came up in discussions at farms were highlighted with experiences and elements from the farmers' personal stories. Some of them concern:

- Farmers' interaction with public services, especially those related to authorizing and licensing stable facilities and modernization schemes. Cases were reported in which, in the past, public servants required money for access to programs and approval of business plans.
- The supply of certified live animals for herd reproduction. The lack of certified local breeds sheep in combination with the lack of knowledge on the part of the farmers make them vulnerable and easy to be deceived by suppliers.
- The considerable cost for feeds and veterinary services and, in general, overpriced services.
- Farmers' purchases of non-standardized products – of unknown composition – during the reproduction season, with their suppliers (private sector agronomists and veterinarians) promising outstanding results.
- The fact that many farmers are in debt and/or operate under severe liquidity restrictions that almost eliminates their capacity to take advantage of programs/projects such as modernization schemes. Moreover, the new taxation policy will have a harsh impact on farm viability.
- Milk prices and the need for credible cooperatives to intervene between milk producers and cheese dairies.

The last issue has been of major importance and was discussed a lot by the farmers of the group in the last months, with most of them not trusting cooperatives. Nevertheless, in autumn 2016, some of them had actively been involved in an attempt to create a new cooperative adapted to the specific needs of its membership. This was actually a reaction to some cheese-dairies practice of reducing milk prices using as a pretext the fat and protein content of milk. Unfortunately this attempt did not bear fruits because cheese dairies managed to reach an agreement among them to offer the prospective members of the cooperative a lower price than the price farmers obtained individually. Another reason concerns the involvement and claim of a prominent role of certain individuals with a negative reputation, that is people who had been actively involved in failed cooperative schemes in the past.

To sum up, a comment of participants in the last group meeting underlines the importance of the issues discussed in the meetings on farmers' learning process: "our concerns on all important livestock issues (herd nutrition, reproduction, management) remain open, even for farmers who have run livestock holdings for several years who are still not able to reach a conclusion on a number of basic practices ... to support further decision making".

**Table 1: Participation and main topics discussed in DGiS**

<b>Meeting</b>	<b>Number of Farmers</b>	<b>Total number of Participants</b>	<b>Main Topic discussed and Visits to non-group members</b>
Information meeting August 2015	11	15	Provision of information and decision making on the DGiS formation
Meeting1, Sept. 2015	11	17	General discussion on prominent farm issues– Getting acquainted with each other
Meeting 2, Oct. 2015	9	11	Livestock facilities – holdings hygiene. Questions on Modernization Plans,

			Financing
Meeting 3, Nov. 2015	9	9	Sheep balanced diets
Meeting 4, Dec. 2015	16	19	Sheep precision farming – Sheep breeds. Visit to a neighboring intensive production farm
Meeting 5, Jan. 2016	13	17	Farm productivity, milk prices – Visit to the establishments of a dairy-livestock cooperative
Meeting 6, Feb. 2016	17	19	Sheep breeds and Protected Designation of Origin. Visit to the Center for Genetic Improvement of Livestock
Meeting 7, Mar. 2016	12	13	Lamb breeding, weaning. Farm data records
Meeting 8 May 2016	8	8	Mastitis - Entertainment farming, agri-tourism
Meeting 9, Jun. 2016	7	9	Herd preparation for reproduction; artificial insemination
Meeting 10, Jul. 2016	10	10	Oestrus synchronization – Method demonstration
Meeting 11, Jul. 2016	13	13	Reflection meeting. Milk prices, milk quality control
Meeting 12, Sept., 2016	9	9	Modernization Plans – cooperative schemes – Visit and discussion at the facilities of ELGO Demeter
Meeting 13, Oct. 2016	10	11	New stable facilities – feed supplementation to grazing herds, sheep body score
Meeting 14, Dec. 2016	14	19	Stable expansion-reconstruction, milking parlors-feeding equipment. Feeding, birth-lactation period. Organic breeding.
Meeting 15, Jan. 2017	8	10	Reflection meeting
Meeting 16, Feb. 2017	8	25	Livestock Nutrition, in-doors lecture and discussion, ELGO Demeter facilities
Meeting 17, Mar. 2017	13	16	Reproduction management – Feed cost

### Discussion – Conclusions

This paper focuses on the processes of the formation of a discussion group and the creation of a learning environment within it. The researcher – facilitator of the DGiS has been the driving force of this effort. Starting from the local actors and individual farmers, and utilizing their professional networks, she encouraged the formation of the group and thereafter tried to stimulate exchanges within their broader network acting in a twofold role: as facilitator of the group discussions and as an (additional) link reinforcing existing and encouraging new links in the local AKIS network.

The main difficulty at the initiation of this endeavor had to do with attracting a critical mass of farmers despite the fact that most of the farmers and all the AKIS actors expressed interest

in contributing to the formation of the DGiS. In this respect, most farmers showed unwillingness to give high priority to the formation of the group and thus, on the grounds of heavy workload, to agree on a date for an initial meeting. On the part of certain local actors this can be attributed either to a lack of genuine interest at that time, their reluctance to share their access (and influence) to farmers or their lack of access to them.

Concerning farmers' participation, three main reasons weighted in their decision to join: a) the opportunity to visit other farms and have a look on the other farmers' everyday reality and practice, b) the opportunity to share their concerns with their colleagues, and last but not least, c) the opportunity to keep in touch with the scientific community and gain access to scientific knowledge as a sound basis to build their decision making.

The contribution of the AKIS actors to this initiative varies. Most departments of national organizations and central services contributed to the DGiS with information and knowledge. Contribution was denied in one case because of sectoral interests. Some local AKIS actors have been well-integrated in the group and contribute substantially in its functioning. Yet others, although they initially seemed to be attracted by the opportunity to learn new methods of contacting and influencing farmers their interest eventually wore off.

Concerning the benefits that the farmers who regularly participate in the DGiS have gained, they themselves focus on the exchange of ideas and practices and their implementation in their own farms. Nevertheless, there are indications that more benefits may exist.

First, there is an increasing ability of farmers in clearly expressing their needs and requesting the discussion of specific issues during the meetings.

Second, they increasingly appreciate the importance of building their aspirations for profitable farming upon a sound knowledge basis that will allow them to act in a flexible and reasonable way. Participating farmers have great respect for scientific knowledge. Nevertheless, they are not able to utilize it as they do not have reliable access to it and, when they have access, they do not understand it or do not know how to apply it. This points, on the one hand, to the lack of communication channels with research institutes/universities, due to the collapse of the public extension system as well as to the failure of the private sector to provide reliable services to farmers and, on the other hand, on the failure of the educational system to meet farmers' needs. Therefore, farmers try to operate in a demanding and technologically advanced field and produce valuable products and services from a financial, social and environmental point of view, without support. Inevitably, farmers depend on the private sector vets, agronomists and suppliers to provide them with supplies and advice. Thus, farmers are left to deal with a torrent of fragmented information coming from different sources and leading their efforts to dubious results.

Third, although it cannot be attributed to the DGiS but rather to the critical financial situation that farmers encounter, during the research period an attempt for collective action took place and members of the group were actively involved in it. The attempt failed but many discussions took place and, finally, some members decided to join the existing local cooperative. It has to be noted that farmers, due to the wide diversity of their holdings are reluctant to join heterogeneous associations and prefer to join in processes through which groups with common characteristics, vision and interests may emerge. The experience of DGiSs may show the way towards the establishment of collective processes, which with the involvement of all AKIS actors may lead to Operational Groups (EIP-AGRI) and the co-generation and spreading of innovations.

Furthermore, the study indicates institutional shortcomings concerning the function of public control mechanisms in relation to the livestock sector allowing public and private actors to misuse their position power.

Concerning the interactions among the local AKIS actors, these are weak and often depend on the personal relationships of their representatives, who most times do not perceive collaboration as a task originating from their institutional role. Most representatives of AKIS, although often refer to the necessity for livestock farmers to undertake meaningful collective action, they themselves avoid taking initiatives for collaboration with other actors at the AKIS level. This can be attributed to their bureaucratic inertia, the lack of reflection, resistance towards learning and the maintenance of the status quo as well as to the 'convenient' prejudice according to which the responsibility for improvements lies with farmers and/or policy makers.

To conclude, DGiS help the participating farmers to exchange ideas and practices, while they enhance their networks and increase their interaction within the local AKIS. Moreover, their participation helps them to start realizing their knowledge gaps, to delineate their problematic situations and articulate their demand for the provision of more specific, practice-oriented knowledge. The study indicates the necessity to provide livestock farmers with basic agricultural education and a continuing flow of reliable knowledge in order to be able to improve their everyday farming practices. Moreover, it underlines the institutional shortcomings and resistance to learning, which prevent efficient livestock farming and AKIS actors from playing a constructive role in the creation of a learning environment that contributes to the sustainability of livestock farming.

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