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An assessment of the agricultural knowledge and innovation system in Hungary

Abstract: Knowledge flow systems are an essential component of Agricultural Knowledge and Innovation Systems (AKIS). A traditional view of a knowledge flow system would include research as a source of knowledge, extension and education as knowledge and information channels, and agricultural entrepreneurs as recipients of knowledge. More recently, this 'linear' view has been widely challenged, and in view of this the European Union is proposing a new approach to encouraging innovation in agriculture in the 2014-2020 programming period. This paper assesses the nature of knowledge flows through the AKIS in Hungary, and looks at the factors that encourage and discourage these. It concludes that to more effectively encourage innovation the functioning of the AKIS in Hungary must be improved and makes six recommendations: (a) a comprehensive review of the AKIS in Hungary should be conducted; (b) the present system of incentives for knowledge flow through the AKIS should be urgently reviewed; (c) future planning should be based on a state-of-the-art understanding of AKIS as multi-actor networks rather than simply as a unidirectional linear flow; (d) new models should be developed and tested on the basis of experience from other EU Member States; (e) monitoring of the performance of the AKIS in Hungary should be improved; and (f) an annual report on the performance of the AKIS should be prepared by the Hungarian government and submitted to Parliament.

Keywords: knowledge flows, extension services, monitoring, evaluation

Since the 1970s, official organisations such as the OECD and the FAO have introduced the concept of Agricultural Knowledge and Information Systems (AKIS) in policy discourses. This acronym has since evolved to describe Agricultural Knowledge and Innovation Systems, a concept that seeks to encompass and influence the complexity of knowledge and innovation processes in the rural sphere (Klerkx and Leeuwis, 2009). Rivera and Zijp (2002) identified four main types of actor with an interest in agricultural (and rural development) innovation: research, extension services, education and training, and support systems (all the organisations providing credit, inputs and producers' associations, etc.). In their model, all four of these sets of actors act upon the knowledge of farmers and rural actors and generate innovations.

Knowledge flow systems are the flows of knowledge through an AKIS, including producers of knowledge (the supply side), information channels, and users of knowledge (the demand side). A traditional view of a knowledge flow system would include research as a source of knowledge, extension and education as knowledge and information channels, and agricultural entrepreneurs as recipients of knowledge (Dockès et al., 2011). This 'linear' view is especially applicable to the situation in which researchers produce knowledge in terms of new technologies, such as farm machinery. Extension and education can disseminate this knowledge to the farmers, for instance by demonstration or written communication, and the farmers can apply it by using the new technology or machinery.

A number of factors have led to the erosion of the traditional concept of Agricultural Knowledge Systems (AKS) that was based on a strong integration, at national level, of public research, education and extension bodies, under the control of the Ministry of Agriculture. They include both theoretical and empirical factors:

- Research, extension and education have undergone a major restructuring. They have been transformed by the trend towards liberalisation, which has led to privatisation of service delivery or to public/private partnerships, the multiplication of extension organisations, farmers contributing towards the cost of these services, competitive bidding for research and extension contracts, and tighter evaluation procedures;
- The policy agenda has been modified by increasing concerns about the environmental impact of industrial agriculture, the quality of life of rural populations, rural employment and the need to support the positive 'externalities' (public goods) linked to agricultural production. This has led to new emphasis being placed on balancing and integrating agricultural policies with rural development;
- The 'linear' model of innovation has progressively been replaced by a 'participatory' network approach, in which innovation is 'co-produced'

through interactions between firms, researchers, intermediate actors (input providers, experts, distributors etc.) and consumers;

- The growing disconnection between farmers' knowledge and research and extension systems.

A key message of the first Standing Committee on Agricultural Research (SCAR) foresight exercise (SCAR, 2007) was that the increasing challenges facing the agri-food and rural sectors in Europe require a review of the links between the production of knowledge and its use to foster innovation. Research could play a stronger role if different actors were better integrated into actual agenda setting and became part of the research process via such actions as innovative networks. The second SCAR foresight exercise (SCAR, 2009) described the AKIS in Europe as currently unable to absorb and internalise the fundamental structural and systemic shifts that have occurred. The remaining publicly funded AKIS 'appear to be locked into old paradigms based on linear approaches and conventional assumptions' (p. 63). The report stressed the need for renewed political attention to the effectiveness, relevance and scale of Europe's AKIS and for a redefinition of AKIS.

The European Commission's (EC) proposals for the CAP after 2013 acknowledge the importance of research, knowledge transfer and innovation in addressing the challenges faced by European farmers and recognise the central role of AKIS (EC, 2011). The EC accepts that a major weakness is the inadequate information flow and missing links between different actors in the AKIS. To overcome the bottlenecks to getting research results adopted in practice, the EC proposes to reinforce the role of the Farm Advisory Service (FAS) and to create a 'European Innovation Partnership (EIP) for agricultural productivity and sustainability'. As a part of the European Network for Rural Development, the EIP will be a new instrument created to 'facilitate the information flow between research and practice'.

EIPs as a novel approach to innovation were first proposed in the Europe 2020 strategy (EC, 2010a) and further elaborated in the EC's Communication on an Innovation Union (EC, 2010b). They focus on improved governance arrangements to help speed up the adoption of research findings and to overcome the fragmentation of research activity in Europe. Through Innovation Partnerships, the European Union (EU) aims to rebuild broken links in the chain between research and bringing innovation to the market.

This paper reviews the current state of the AKIS in Hungary in the light of these recent research and policy developments. It focuses on the nature of knowledge flows through the AKIS in general and through the extension services in particular, and on the factors that encourage and discourage these, rather than on a simple description of the institutional structures. The paper concludes by making six recommendations on how the functioning of the AKIS in Hungary can be improved.

Methodology

While participating in the SCAR Collaborative Working Group on AKIS in the period from May 2010 to March 2012, the lead author carried out desk research and several informal interviews with AKIS actors in Hungary about the overall structure of the AKIS and its constituent organisations, and the incentives and monitoring of the AKIS. In 2009 the second author conducted 28 interviews with representatives of organisations that either directly or indirectly participated in the advisory system (the Ministry of Rural Development (VM), NAKVI (an institute of the VM), the Regional Advisory Centres, private consultants, the Hungarian Chamber of Agriculture, the County Chambers of Agriculture, the Chamber of customer service advisors, the HVI, the ‘Network of Village Agronomists’, and representatives of commercial companies). These interviews explored the effectiveness of the extension system. The paper presents results from the research of both authors.

The general AKIS in Hungary

The most recent study of the entire AKIS in Hungary was undertaken by Tóth (2005). Székely and Halász (2010) reviewed the institutional conditions and operational experiences of agricultural advising in Hungary. Reflecting the continuing importance of agriculture in the Hungarian economy, the four components of AKIS, research, extension services, education and training, and support systems, are all strongly represented (table 1).

Table 1. The major components of AKIS in Hungary

RESEARCH
<p>Ministry of Rural Development (VM)</p> <ul style="list-style-type: none"> • <i>Nine institutes</i> covering: Agricultural economics; Animal breeding and nutrition; Small animal breeding and nutrition; Forests; Fisheries; Food; Biotechnology; Agricultural Engineering; Geodesy, Cartography and Remote Sensing
<p>Hungarian Academy of Sciences</p> <ul style="list-style-type: none"> • <i>Six institutes</i> relevant to agricultural producers covering: Agriculture; Pest management; Soils and agrochemicals; Veterinary; Biological Research; Agricultural economics • <i>Nine institutes</i> covering: Meat market; Peppers; Vegetables; Milk economy; Fruit and ornamental plants; Grain
<p>Other state owned institutions</p> <p>Ministry of National Resources</p> <ul style="list-style-type: none"> • <i>21 institutes</i> belonging to agricultural universities and colleges
<p>Private sector</p> <ul style="list-style-type: none"> • <i>Various institutes</i>

EXTENSION

Farm Advisory System

- Set up in 2007; maintained, regulated and controlled by the VM and the NAKVI and mainly funded by the EAFRD; 643 registered active advisors in 2011; seven Regional Advisory Centres and 51 active Territorial Advisory Centres selected by tender which deliver upon-payment advice to farmers

Farm Information Service

- Set up in 2007; managed by the Hungarian Chamber of Agriculture; financed 71% by the EAFRD; provides free information to farmers about the CAP and direct payments; 205 consultants

Network of village agronomists

- The Central Agricultural Office, which is directed by the NÉBIH (Hungarian National Foodchain Safety Authority), has a long-established network of village agronomists (588 in 2009) who have public administration tasks and also provide free advice to farmers

Commercial services

- Provided by professional advisers such as input suppliers, project proposal writers; in place since before 2007

EDUCATION

Ministry of National Resources

- *Universities*: major agricultural, horticultural and veterinary teaching centres in Debrecen; Szeged; Gödöllő; Budapest (Corvinus University); Kaposvár; Keszthely (University of Veszprém); Mosonmagyaróvár (University of West-Hungary)
- *Higher education colleges*: major agricultural and horticultural centres in Gyöngyös (Károly Róbert); Szarvas (Tessedik Sámuel); Kecskemét; Nyíregyháza and Mezőtúr (Szolnok)

Ministry of Rural Development

- *Vocational schools*: 19 institutes which are run by the VM covering agriculture, horticulture, food and related topics

SUPPORT SYSTEMS

Producers' associations

- Hungarian Chamber of Agriculture (11,000 members); MOSZ and MAGOSZ

Product boards

- Covering: Poultry; Fruit and vegetables; Meat; Grain and feed etc.

Agricultural Administration Office

- Associated with the VM; the Hungarian National Foodchain Safety Authority (NÉBIH) delivers regulatory, monitoring and accreditation services through local offices
-

Agricultural and Rural Development Agency

- Supervised by the VM; the sole paying agency of EAGF and EAFRD funds and national funds

Hungarian National Rural Network

- Operates within the Rural Development, Training and Consultancy Institute (NAKVI) of the VM
-

Source: authors' compilation

Although several links between the different components can be identified, which in theory should facilitate the flow of information and knowledge within the Hungarian AKIS (table 2), previous research has shown that there is clear scope for further improvement. Tóth (2005) remarked that ‘extension ought to... start to establish and improve relations between organisations’ while Székely and Halász (2010) noted the need ‘to strengthen the relationships among the participants, to conduct research adjusted to the needs, to ensure stricter co-operation between education, research and advising’.

Table 2. Examples of linkages between the different components of AKIS in Hungary

- The Ministry of Rural Development controls the Farm Advisory System, and funds both that and the Farm Information System mainly via EU funds, and the Network of Village Agronomists from its own budget (*support systems-extension*)
 - The universities are the locations of the seven Regional Advisory Centres of the FAS and (with the colleges) are also the locations of some of the Territorial Advisory Centres (*education-extension*)
 - Some of the FAS advisors are university and college staff or teachers of agricultural vocational schools (*education-extension*)
 - The Hungarian Chamber of Agriculture manages the Farm Information System and the territorial chambers run 20 of the Territorial Advisory Centres (*support systems-extension*)
 - 21 research institutes are part of the state universities and colleges (*education-research*)
 - The Ministry of Rural Development owns nine research institutes, supervises the ARDA and HNRN and runs some of the vocational schools (*support systems-research; support systems-support systems; support systems-education*)
 - The research institutes of the Ministry of Rural Development claim to have their own extension activities (*research-extension*)
 - At some universities students can study advisory services as an optional subject for two years (*education-extension*)
-

Source: authors' compilation

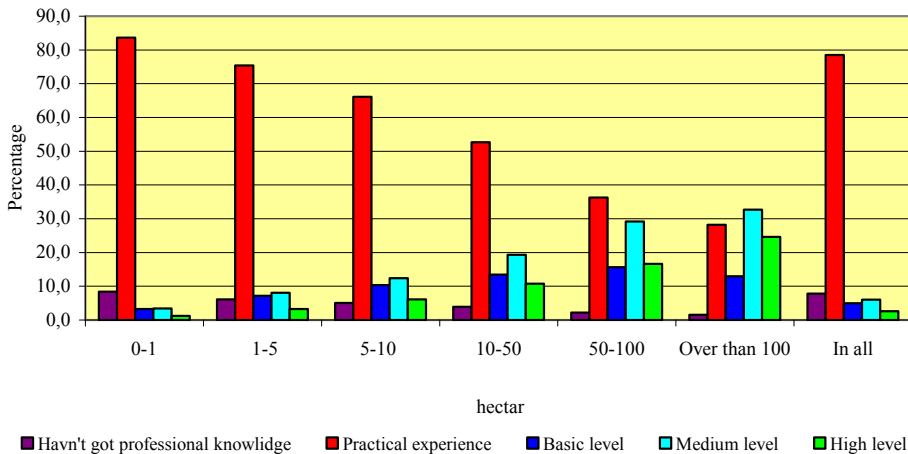


Figure 1. Educational level of Hungarian farmers according to size of farm, 2010

Source: authors' compilation from Hungarian Central Statistical Office data.

Tóth (2005) found that farmers with primary education demanded extensional help closely related to their area of agriculture, while those with secondary and university education received advice in every form of services, i.e. the knowledge flow was stronger. Managers of larger farms tended to be better educated: more than three-quarters of farmers farming 5 ha or less (this group accounts for over 90% of Hungarian farmers) have only practical experience at most (figure 1).

The reasons for this are not entirely clear, but the vocational training system in Hungary is recognised as being very complicated. There are more than 100 vocational schools, but only 19 are under the supervision of the VM. Course design is restricted by government regulations: the Ministry of National Resources regulates the length of courses and system of examinations while the VM strictly defines both the content of courses and the examination requirements. Courses tend not to be practice oriented, i.e. do not well address the demands of the farmers, and often certificates are issued for courses of inadequate length and content. Vocational schools offer a wide range of topics, and courses are often very specialised e.g. 'Equine Tour Leader'. Curricula do not include enough training on farm business management i.e. business planning etc. Some private sector adult training organisations are not up to standard even although registration is compulsory. Participants tend to be either (a) students aged 14-20, some of whom go on to be farmers but others of whom do not have a career plan and (b) farmers and forest holders who attend subsidised adult training courses.

Farm advisory services (extension) in Hungary

The extension service is the main institutional source of knowledge for farmers in Hungary. The history and present structure of the service are described by Székely and Molnár (2012). Székely and Halász (2010) analysed the

factors that discourage the use of advisory services in Hungary and provided a set of recommendations for addressing these. There are a number of key questions, or ‘dilemmas’ facing the AKIS in Hungary, specifically regarding the way in which the advisory service operates, especially in terms of its institutional structure. The fact that these are still ‘dilemmas’ is due to the fact that there are convincing reasons both in support of and against each point (see table 3 as an example):

- Should farmers, especially small farmers, pay for extension services? The take up rates of paid services are at present relatively low. Would this change encourage or discourage the take-up of advice by farmers?
- Should there be an official definition of ‘farm advising’ and should the scope of activities be defined in legislation? Is the present definition helping to restrict the information flow between the advisory services and the rest of the AKIS?
- Should parallel services be eliminated? Is this duplication actually serving to restrict information flow between the parts of the farm advisory network?
- Should farmers (and other stakeholders) be involved in planning the shape of advisory services? Would this improve trust and responsiveness to needs?

Table 3. Reasons in favour and reasons against the proposal for eliminating parallel extension services in Hungary

Reasons in favour:	Reasons against:
<ul style="list-style-type: none"> ✓ Free and ‘against payment’ services are presently offering the same types of support, to the detriment of the latter, which may provide higher quality support; ✓ Certain types of service could be designated as ‘against payment’ and others as free, as described above; ✓ A ‘core’ of full-time, specialist advisors could be established to provide business development support, whereas most advisors are presently part-time; ✓ Cooperation between the various networks that provide parallel services is presently lacking; ✓ Farmers will be presented with a clear and simple ‘offer’ and thus better understand what is available and what is their eligibility to access it. 	<ul style="list-style-type: none"> ✗ Users have a choice as to where they wish to source their advice, or in what form they receive it e.g. farm visits v. specialist publications; ✗ Parallel services could lead to higher demand responsiveness and quality, and perhaps to lower costs in a non-monopoly public sector service; ✗ Such a step is likely to need some kind of regulation which may impose constraints on the range of services that are available; ✗ It is suggested that in Hungary it is the lack of communication between networks rather than the parallel services per se which is the problem; ✗ Advertising, which may accompany competing parallel services, may promote farmer awareness of, and participation in, advisory services.

Source: authors’ compilation

Székely and Halász (2010) propose that the efficiency of the advisory activities would be improved if they were more strongly driven by the market. There is evidence to support this view from other EU Member States where the privatisation of AKIS and changing demands from the agricultural sector have induced a shift from supply-driven towards demand-driven modes of working (e.g. Rivera et al., 2002; Heemskerk et al., 2003; Rivera and Alex, 2004). Farmers become clients, sponsors and stakeholders rather than just beneficiaries (Neuchâtel Group, 1999; Katz and Barandun, 2002). For this purpose, in the short term, it would be necessary to accurately define in Hungary the services that may be provided free of charge or in return for payment. However, whilst any initiative that makes the system more responsive to needs is to be welcomed, Hungarian experience with the EU co-financed Farm Advisory System (FAS) has shown that several associated issues need to be addressed:

Firstly, the market potential for a purely commercial advisory service presently seems to be very limited. Very big farmers have their own advisors and do not use the FAS which mainly services farms between (very approximately) 30 and 200 ha in size. Very small farmers do not seek technical advice. There are very few genuinely independent commercial advisors because farmers do not like to pay for advice. They cannot see the benefit, only the cost. Specialist advisors operating through the FAS are frequently under-employed because demand for their services is low. Commercial advisors, if working for, for example, input suppliers, may give biased advice.

Secondly, if paid services are to be subsidised from Hungarian government or EU funds, the administrative procedures must be speeded up. For the current subsidised services, the Paying Agency was slow to approve applications for funding (those submitted at the end of October were not approved until the end of December). It may then take up to 18 months for the farmer to actually receive the subsidy. A lot of trust in the system was lost and the number of applicants fell from over 9000 in the first year to less than 4000 in the following year (table 4). The EU limitation on the number of times a farmer can use the FAS has now been scrapped so this constraint on take-up has been removed, but the ceiling of EUR 1500 of advice per farmer per year remains.

Table 4. Activity data for the Farm Advisory System in Hungary, 2007-2010

Year	Number of applications (persons)	Amount of aid (HUF million)	Number of contracts with decision support (persons)	Amount of support (HUF million)
2007	9,531	992.8	8,789	909.7
2008	3,821	475.7	3,277	418.1
2009	4,344	574.7	3,892	520.9
2010	2,533	338.9	n/a	n/a

Sources: Füsi (2009) and FVM-NAKVI database

Thirdly, the quality of the advice given to farmers has been inconsistent, for a number of reasons. These include the difficulty in locating the right person to give the advice (there is little possibility to get advice on technical topics such as plant protection and soil management) and the fact that the best advisors prefer not to be part of the bureaucratic public sector services. Tóth (2005) notes that methodological knowledge is not required for getting on to the Hungarian Chamber of Agriculture register of advisors. Székely and Halász (2010) state that training of the subsidised advisers providing services against payment usually covers only the explanation of regulatory changes, opportunities for grant applications and of administrative procedures. Trade-specific training is inadequate.

When the FAS was introduced, in 2007, a Ministerial Decree established the definition of ‘agricultural advising’ in Hungary. According to this Decree, only services that are part of the FAS may be considered as agricultural consulting. Székely and Halász (2010) believe that this encumbers a clear understanding of the term. The main purpose of the regulation was to provide a legal foundation for subsidised farm consulting. The Hungarian experience shows that – although required by the EU regulations – it is ill-advised to compulsorily establish the scope of activities to be covered by advisers in the legislation. It would be more favourable and would better encourage the demand for services if farmers could decide themselves when and in what matters they wish to seek advice.

Regarding the question of parallel services, Székely and Halász (2010) recommend eliminating parallel activities of the service providers participating in advising in Hungary. In EU Member States there are many different models for AKIS and advisory services, as described above. What is of particular concern is that in Hungary, in spite (or perhaps because) of the identical competences, co-operation between different parts of the advisory system, and the AKIS as a whole is only formal or is even entirely lacking (table 3). The EU-funded Farm Information Service (FIS) of the Chamber of Agriculture and the long-established ‘Network of Village Agronomists’ were meant to be responsible for awareness raising, but tend only to publicise their own services. Producers interviewed by Székely and Halász (2010) principally maintain contacts with the ‘Network of Village Agronomists’; beyond them, they most frequently consult with the input producers and distributors. A majority believed (incorrectly) that the FIS might only be used free of charge by members of the Chamber of Agriculture¹. Similarly, they have no contacts with the FAS. Most interviewees attributed the lack of contacts to their lack of knowledge of the activities of the participants of the service providers, and to the lack of trust, time and financial resources.

This lack of trust is a recurring theme. Many farmers in Hungary feel that the system is not there to help them. Several ‘top-down’ possibilities for stimu-

¹ According to law number CXXXVI enacted in 2012 farmers must be members of the Hungarian Chamber of Agriculture and have to pay for membership, so this fact will change the current system of Hungarian extension, but we do not know yet how.

lating take-up of advice have been suggested, such as requiring compulsory qualification levels for acquiring landed property or for starting farming activities, and prioritising those using advising services during evaluating support applications; However, this can introduce some inappropriate ‘drivers’ into the system. For example, young farmers applying for EU funds score an additional five points if they have an advisor. Thus it appears that some engage an advisor just for that reason. The FAS should be more responsive to the demands of farmers.

All of this evidence suggests that the present system does not adequately reflect the needs of potential users, especially as these needs evolve over time. The ‘bottom up’ approach of consulting with users (i.e. farmers) on their needs remains an important component of achieving an efficient and effective AKIS.

Incentives and monitoring of the AKIS in Hungary

There is a lack of meaningful incentives in the AKIS in Hungary. The weak motivation of many farmers to seek advice has already been described. Elsewhere, as public sector salaries are low, the opportunity to earn extra money is the biggest incentive for public sector actors in the AKIS, such as university lecturers and researchers. This extra money tends not to be ‘consolidated’ into basic salaries, but is paid either on a consultancy or on a per-project basis. Hence there is an incentive for individuals to get involved in activities that are additional to their main job, and this may have the effect of encouraging some integration between the different components of the AKIS. However, the assessment of quality of outputs is very rudimentary. Staff appraisals that take into account a wide range of criteria including qualifications, papers produced etc. are conducted only rarely (perhaps every two years). A positive appraisal rarely leads to any direct benefit (e.g. salary increase). It is very rare that an appraisal is very negative; if this does happen the person concerned might, for example, have to undertake some additional training. This means that the impact of these incentives in terms of fostering innovation is probably very low.

At institutional level, incentives to become more active in the AKIS are also limited. Universities still tend to be funded mainly on the basis of student numbers with only some funding determined by a Quality Control Board (research activities, labour market absorption of graduates etc.) Research institutes agree an annual work plan with the appropriate Ministry and although in principle if this plan is not completed some sanction could be applied, in fact this is very rare if not unknown. An official evaluation of the work of the institutes may take place but this is conducted informally and no results are published. For experimental stations the level of funding is strongly based on historical precedent. However, for all institutions, steadily decreasing public sector budgets is leading to reductions in financing and increasing pressure to seek external funding through consultancy and projects.

There is no routine formal monitoring of the AKIS in Hungary (in terms of evaluating the activity and impacts of information and knowledge flow between agricultural producers and extension, research, education and support systems), apart from recording the expenditure on the FAS. A brief analysis of data availability in terms of demand, use, value-added and impact of the farm advisory services is as follows:

- Demand indicators. Data are available from the Hungarian Central Statistical Office (KSH) on indicators such as: the number and proportion of individual farmers with agricultural training at various levels, broken down by age, type and size of farm etc., on an annual basis.
- Use indicators. VM-NAKVI collects annual data on the EU co-funded consultancy support contracts between farmers and advisors including: number of applications submitted; amount of aid requested (HUF); number of contracts approved; and the amount of assistance granted (HUF). VM-NAKVI also has access to data on the incidence of consultancy services required each year by type (the main headings are: Administrative and informational; Planning; Directly related to production; Other) but apparently does not formally collate these data (data specially requested for this study from the VM for all of Hungary, and from two Territorial Advisory Centres are presented in tables 5 and 6). There is no assessment of the level of activity in the non-subsidised farm advisory services.
- Value-added indicators. Evaluation by users, including the measurement of the usefulness of advising, of the advisory services subject to fee is entirely missing, and is missing in part also in the field of client support services (subsidised services). The client support advising evaluation methods measure rather the activity of the advisers and not the benefits derived from the service. The majority of the advisers perform their work as an auxiliary activity and the quality of their work is not assessed.
- Impact indicators. There appears to be no attempt to assess the impact of farm advisory services/AKIS on the performance of the agricultural sector but the Ministry of Rural Development states that it ‘would be ready to use any feasible and reliable method’ (personal communication).

The Hungarian government does not formally report to Parliament on the performance of the AKIS. Each year a ‘State of Hungarian Agriculture’ report is produced by the Ministry of Rural Development for the Hungarian parliament which is about 150 pages long. It includes only a few references to AKIS related issues e.g. the number of research institutes and their budget, and the budget for the FAS.

Table 5. Frequency of type of requested advice 2007-2009, per cent

Type of advice	2007	2008	2009
Administration and information	45	45	56
Contribution in management of parcel-register	15	15	19
Good Agricultural Practices	10	1	9
Application Monitoring	9	10	9
Preparing of applications for direct payments	4	7	8
Regulation issues	7	12	11
Planning	21	19	22
Planning of nutrient management plan	14	12	17
Planning of plant-protection plan	7	7	5
Related to production	8	9	8
Financial advice	3	6	5
Cultivation technology	3	2	2
Animal welfare	2	1	1
Other	27	17	13
Total	100	100	100

Source: Ministry of Rural Development data, 2008

Table 6. Frequency of type of requested advice according to Territorial Advisory Centres 2008-2010, per cent

Type of advice	2008	2009	2010
Administration and information	73.0	76.7	73.4
Electronical data service	1.3	3.2	5.0
Contribution in management of parcel-register	25.9	49.8	56.9
Preparing of direct payments' applications	9.6	7.2	4.3
Regulation issues	15.0	8.2	3.5
Good Agricultural Practices	11.7	4.0	2.0
Application Monitoring	9.5	4.3	1.7
Planning	14.5	16.7	18.9
Planning of plant-protection plan	4.9	4.3	8.3
Planning of nutrient management plan	4.4	11.0	10.6
Business planning	2.0	0.0	0.0
Preparing of applications for direct payments	2.1	1.4	0.0
Cash-flow planning	1.1	0.0	0.0
Related to production	7.9	2.8	3.7
Financial advice	4.3	2.8	3.7
Cultivation technology	3.6	0.0	0.0
Other	4.4	3.8	4.0
Total	100.0	100.0	100.0

Source: Database of the Territorial Advisory Centres of Gödöllő and Debrecen.

In comparison with the evidence in the literature (e.g. SCAR, 2012), the AKIS in Hungary appears to be functioning neither substantially better nor worse than AKIS in many other EU Member States. Nonetheless, extension must develop simply from intermediation between research and farmers whose only goal was technology transfer to the provision of a broader range of communicative functions (Coutts, 1995; van den Ban, 1998; Leeuwis and van den Ban, 2004). The definition of an (agricultural) innovation system by Hall (2006) as ‘a network of organisations, enterprises, and individuals focused on bringing new products, new processes and new forms of organisation into economic use, together with the institutions and policies that affect the way different agents interact, share, access, exchange and use knowledge’ is an appropriate starting point.

The need to develop our understanding of what constitutes the AKIS as a whole in Hungary, and on how the flow of information and knowledge through the AKIS can be improved, is more pressing than any institutional restructuring. In Hungarian universities there is a huge amount of information about agricultural topics which can be disseminated to advisors who in turn should disseminate it to farmers. But farmers rarely ask questions of advisors, so advisors are not aware of their problems and therefore cannot pass on any knowledge of ‘good practice’ they have obtained. Equally, advisors do not proactively try to identify problems a farmer may have. Farmers need to articulate their demands and co-operate and interact with research and extension providers.

Even within the advisory system itself, therefore, the flow of information is inadequate. It is necessary to both provide farmers with accurate information about what is available, and to convince them to use the available services, perhaps by providing ‘good practice’ examples of how take-up of advice has improved the performance of the farm. Experience to date casts doubt on whether any of the current major players in the advisory system are able to fulfil this role.

The ‘feedback loop’, where experience of practical problems in the field is passed back through advisors to academics, is equally important. Many ‘good practices’ exist amongst Hungarian farmers, but these are rarely disseminated to other farmers. Part of the reason is that the information is not communicated to advisors. One consequence is that the theoretical knowledge of academics lacks practical relevance and is therefore of limited value.

The EIP for agricultural productivity and sustainability is expected to address all of these points. Its purpose goes far beyond speeding up transfer from laboratory to practice through diffusion of new scientific knowledge (the ‘linear innovation model’ referred to above). Rather, the EIP will adopt the ‘interactive innovation model’ which focuses on forming partnerships – using

bottom-up approaches and linking farmers, advisors, researchers, businesses and other actors in Operational Groups. Such an approach is expected to stimulate innovation from all sides and will help to focus the research agenda, generating new ideas and insights, and including existing, sometimes tacit knowledge, into targeted solutions.

Székely and Halász (2010) concluded that the flow of knowledge and information should be monitored and proposed that a regular (monthly or quarterly) forum should be established and operated that could strengthen co-operation of the participants, including between research, education and advising. It could offer a possibility for shaping the needs of farmers and landowners and forwarding them to the research institutes. A National Advisory Commission should be set up to serve the purposes of this forum; they note that the possibility thereof exists theoretically within the Farm Advisory System.

The different components of the AKIS are governed by quite different incentives, e.g. excellence in publications for research, different types of payments for extension. SCAR (2009) recommends that science based research (a more traditional linear approach leading in the end to science driven innovation) should be distinguished from innovation-driven science, where the farming community and the food industry should be much more empowered in setting the research agenda.

There is a general lack of suitable indicators for evaluating the performance of the AKIS (SCAR, 2009). In any case, an EU-wide monitoring system would imply a common set of agricultural development objectives across the EU, which would not be appropriate for political reasons. However, it would appear that in Hungary there are some data sets available that could be more effectively used to measure the performance of the AKIS.

Policy recommendations

The new EU framework for innovation presently under development, in particular, the EIP for agricultural productivity and sustainability, could provide the context within which the changes to the AKIS in Hungary could be implemented. At present, the final shape of the post-2013 EU framework and the instruments it will incorporate are not yet known. Thus, the recommendations arising from this study are somewhat of a preliminary nature. However, it is clear that the opportunity now exists to start planning for a major refresh of the AKIS in Hungary in order to help the agricultural sector to contribute to the Europe 2020 objectives of smart, sustainable and inclusive growth. We therefore recommend the following:

- A comprehensive review of the AKIS in Hungary should be conducted which would include an inventory of the actors in the field: basic and applied agri-cultural research institutes and universities, advisory and extension services, and other actors influencing research priorities and practical

decision making on farms, e.g. co-operations, supply services, farmers' organisations and groups, etc. The interactions between all these actors would be described.

- The present system of incentives for knowledge flow through the AKIS should be urgently reviewed. How can incentives be modified to stimulate the flows of knowledge (in both directions) between researchers, extensionists and farmers? What measures (including information campaigns) can be introduced to make farmers more aware of the available sources of advice and of the value to their business of taking up this advice? Who should implement these measures?
- Once the EU proposals on the structure and operation of the EIP are finalised, planning of the implementation of the EIP in Hungary should have the aim of maximising knowledge flows in the light of the state-of-the-art understanding of the AKIS as multi-actor networks rather than simply as a unidirectional linear flow. Close attention should be paid to how to engage all stakeholders, particularly small farmers and rural women in the renewed AKIS.
- New models for creating the conditions for innovation amongst farmers in Hungary should be developed and tested on the basis of experience from other EU Member States. Examples include more opportunities for group learning and group advice, an approach for which there is significant evidence of success (see e.g. Murphy, 2012), and the possibility of providing grants or loans for small, local innovation projects developed by farmers or groups of farmers in partnership with extensionists and/or researchers. This latter possibility is presently under consideration by the cabinet of EU Commissioner Dacian Cioloş.
- Monitoring of the performance of the AKIS in Hungary should be improved in two ways. Firstly by identifying indicators and data sets currently available in Hungary that can help to measure the quality, rather than just quantity, of information flow, and to monitor these against by clear and measurable milestones and performance targets. Secondly by adopting best practice from other EU Member States, such as a CPD programme for advisors that builds on the success of initiatives such as the BASIS programme in the UK (BASIS, 2010).
- An annual report on the performance of the AKIS should be prepared by the Hungarian government and submitted to Parliament. The benefits would be those of most reports that monitor: they give the ministry and parliament an insight into the effectiveness (and perhaps efficiency) of the policies that govern the system and - if developments in society are reported too - an opportunity to discuss if the system is still robust for future developments. By linking trends in innovation, productivity and competitive position in the food sector with the performance of AKIS and the policies that govern the system. Best practices could be identified and promoted.

Acknowledgements

The lead author would like to thank the Hungarian Ministry of Rural Development for funding his participation in the AKIS-CWG on AKIS. The opinions expressed in this paper are not necessarily those of the Hungarian Ministry of Rural Development or the EU.

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