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POLICY BRIEF

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DEUTSCH-MONGOLISCHES KOOPERATIONSPROJEKT NACHHALTIGE LANDWIRTSCHAFT

GFA CONSULTING GROUP

Key Recommendations

- Develop of a long-term agricultural innovation strategy, which takes into account long-term challenges such as climate change and, and define mid-term goals and strategies
- Establish a multi-stakeholder platform to facilitate participatory planning of agricultural research and collaboration between AIS actors
- Secure additional funding through a levy scheme and establish an Agricultural Innovation Fund, to which the MES may also contribute
- Co-fund innovation initiatives of the private sector, preferably involving multiple value chain actors and research organizations, through grants, soft loans and innovation vouchers
- Establish multiple specialized RDCs under MOFALI and provide policy support to further RDCs
- Provide regular budget to the RDC and aimag and soum governments for consistent delivery of extension services
- Provide project funds to farmer organizations for delivery of extension services in connection innovation projects, which are particularly important and for which the need for extension services is clearly recognized

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Improving the institutional framework of the agricultural innovation system

The need to improve agricultural research and make innovation more accessible for farmers and other value chain actors is well recognised in the State Policy on Food and Agriculture and the State Policy on Science and Technology. The acknowledgement of the relevance of agriculture for the country's development is reflected by the fact that the agricultural sector receives the highest volume of public funds for research and innovation projects on an annual basis.

However, project funding alone is not sufficient to secure the long-term effectiveness of agricultural research. There are several systemic constraints that need to be addressed. First, due to the division between agriculture and science sectors, MOFALI's role in agricultural research has been very limited in relation to the relevance of research and innovation to the mandate and functions of the ministry. Secondly, the technology transfer structure is very weak. According to Munkhbat (2021), about 350 innovation products that have resulted from government-funded research are waiting to be put in economic use. Neither the Research and Development Centre (RDC) of MOFALI nor Mongolian University of Life Sciences (MULS) has been able to connect researchers with farmers, herders and agri-food enterprises in order to function as a national agricultural innovation hub. At Aimag Departments of Food and Agriculture (ADFAs), the officer responsible for extension services underperforms this function due to lack of funds and guidance, and more urgent duties. Another systemic struggle is the lack of participation of non-academic value chain actors in research and innovation. The benefits of participatory approaches are generally recognized, but decisive actions are yet to be taken.

Sustainable change of a system needs to be guided by a conceptual framework. For this purpose, we strongly urge MOFALI to adopt the agricultural innovation system (AIS) perspective, which was formally introduced in 2007 but has not been integrated into concrete policies and actions yet. *An innovation system is 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 their behaviour and performance* (World Bank, 2006; Figure 1).

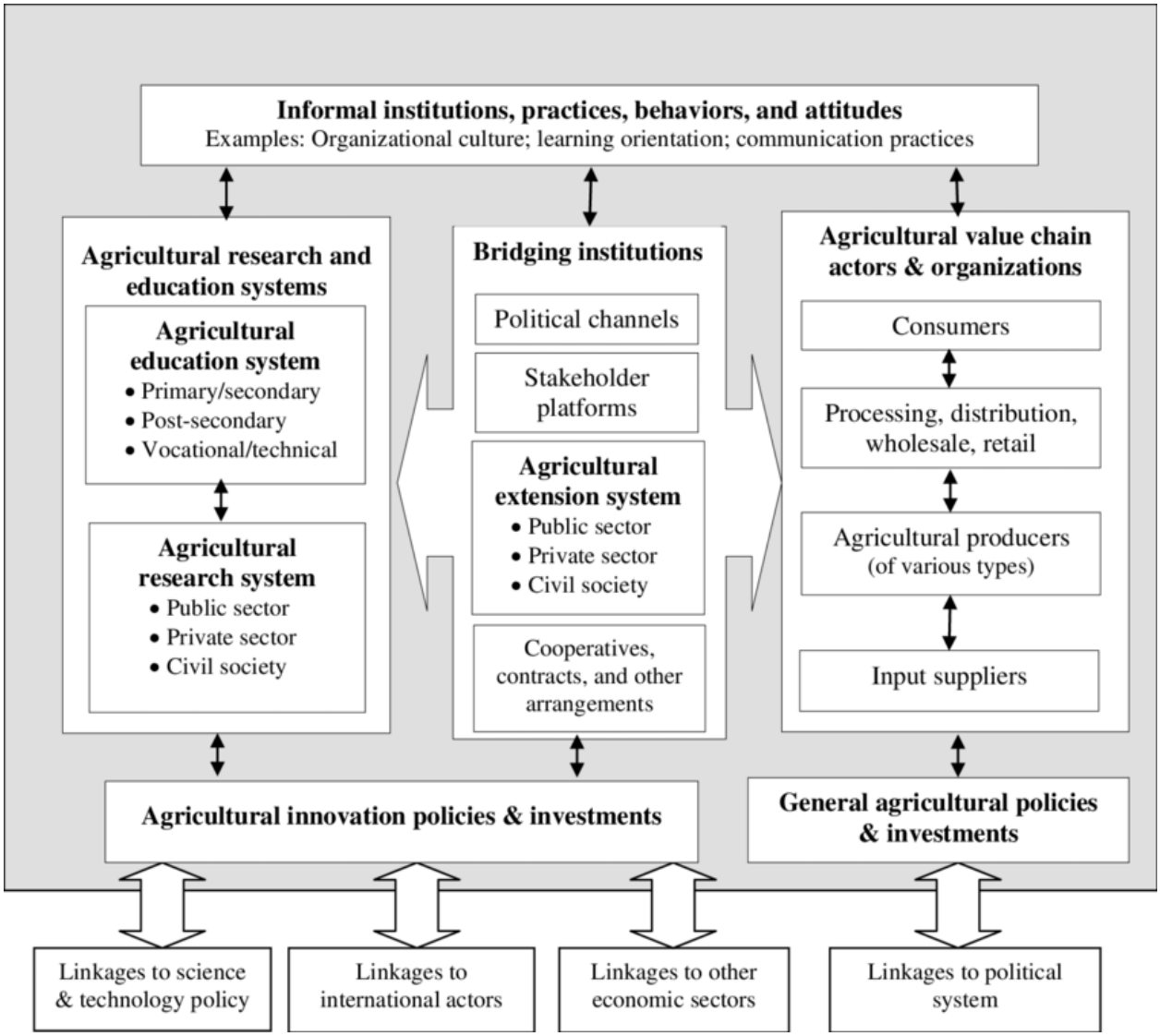

Figure 1. A conceptual diagram of an agricultural innovation system

Source: Spielman and Birner (2008), adapted from Arnold and Bell (2001)

The AIS perspective focuses on the organisation and management of multi-actor innovation processes, whereby the main role of the government lies in facilitation of those processes (Klerkx, 2020). Application of this concept will lead to combining of the forces of all relevant stakeholders towards the common goal of ensuring consistent delivery of new products, approaches and technologies that meet the various needs for innovation in the food and agriculture sector.

What concrete changes are needed for the national AIS of Mongolia to become more effective and internationally competitive? To answer this question, we should look at international experiences. A comprehensive overview is found in the Organisation for Economic Co-Operation and Development (OECD) publication "Innovation, Productivity and Sustainability in Food and Agriculture: Main Findings from Country Reviews and Policy Lessons", which is a summary of country reviews from 15 countries (Argentina, Australia, Brazil, Canada, China, Colombia, Estonia, Japan, Korea, Latvia, the Netherlands, Turkey, Sweden, Switzerland and the USA) that were undertaken between 2015 and 2019. The reviews resulted in numerous recommendations addressing different issues of the AIS. While it is not our intention to copy those recommendations, they can provide an orientation in designing context-specific policies and actions to improve the Mongolian AIS. This policy brief focuses on institutional aspects. Options for improving the institutional framework of the AIS of Mongolia are identified and discussed below as a basis for a multi-stakeholder dialogue on this subject.

Establish long- and mid-term strategies for agricultural innovation

In all countries reviewed by OECD, a national agricultural innovation strategy, formulated as a mid-term (5 to 7 years) strategic plan for food and agriculture research, was developed by the government in consultation with research organisations and other relevant stakeholders. The strategic plan guides policies supporting agricultural innovation and provides research organisations with a framework, within which they develop their own objectives. In Mongolia, an "Innovation Program for the Development of the Food and Agriculture Sector" was approved by MOFALI for the period 2016-2020. Unfortunately, no information is available on how much policy support was channelled through this program and what outcomes were achieved by the end of 2020. Nevertheless, the intention of having an agricultural innovation strategy should be built on. Due to the increasing threat of climate change, which requires long-term adaptation strategies, MOFALI should facilitate the development of an agricultural innovation strategy for a period of 10 to 15 years, within which mid-term goals and actions should be defined.

Establish a multi-stakeholder platform for agricultural innovation

While top-down structure of agricultural research is not unique for Mongolia many other countries have created multi-stakeholder platforms to bring together value chain actors with researchers and policy makers. Such platforms have proven to promote demand-driven innovation and facilitate private sector investment in agricultural research. Examples include the Value Chain Round Tables (VCRTs) in Canada and the Field for Knowledge Integration and Innovation (FKII) in Japan. The VCRTs bring together industry leaders from across the value chain with policy makers for identifying sector strengths and weaknesses, capitalising on market opportunities, sharing information and building trust across commodity sectors, identifying research, policy, regulatory and technical requirements, creating shared visions and co-operative long-term strategies, and responding to crises. The FKII in Japan consists 3064 members (as of March 2019) representing producers, private companies, universities and research organisations, and structured in three layers:

1. The Council of Industry-Academia-Government Collaboration that provides members with the opportunity to network and exchange ideas for possible collaboration,

2. R&D platforms, in which members with common interests discuss R&D targets and design collaborative projects, and
3. R&D consortia that implement the projects designed in the R&D platforms.

In Mongolia, both the Board of Science and Technology at MOFALI and the Board of Agricultural Sciences at MULS are focused on research, which is only one component of the AIS. Therefore, a new platform, preferably named as the "Board of Agricultural Innovation", which shall involve all relevant actors of the AIS needs to be established. The initial function of the platform may be to provide the members with exchange and networking opportunities. In the mid-term, however, this Board should be used to involve farmers and other value chain actors in the planning of research projects and, vice versa, engage researchers in the innovation initiatives of non-academic value chain actors. Other possible functions include provision of policy advice, conducting of M&E of research projects and facilitation of partnerships and co-funding arrangements.

Establish an Agricultural Innovation Fund

The AIS perspective makes clear that research funding provided by the Ministry of Education and Science (MES) alone does not guarantee success of the whole system. There is need for a stronger involvement of MOFALI in the AIS, not only as a coordinator but also as an investor. In a broad sense, core research conducted by research organizations should remain to be funded by MES while MOFALI should fund application-oriented innovation projects that are initiated by the private sector and/or that involve the collaboration of different stakeholders. For this purpose, we recommend the establishment of an Agricultural Innovation Fund (AIF) at MOFALI.

In order to generate a source for the suggested AIF, MOFALI should facilitate a new legislation that, similarly to the levy scheme in countries such as Australia and New Zealand, channels a part of the taxes collected at processing and/or marketing stages of agricultural products back to MOFALI. The ministry should, however, acknowledge the fact that the funds collected are actually paid by the producers, and include producers in the Board of the AIF that makes funding decisions.

Although managed by MOFALI the fund will also contribute to the MES's goal of improving research and making innovation more accessible. Hence, the possibility of co-funding by MES should be examined. By combining forces, both ministries will have a much better capacity to facilitate agricultural innovation.

Depending on the type and strategic importance of each project, funds can be allocated either as a grant or a soft loan. An essential requirement for support through the AIF must be private sector co-funding. The types of projects and activities that should be funded by the AIF are described below.

Stimulate private sector investment in innovation

Internationally, the most common instrument to encourage private investment in innovation is tax incentive. However, the OECD country reviews have found out that tax incentives tend to favour large companies while the food and agriculture sector includes a high number of SMEs. For the latter, direct support channelled as soft loans, project grants (often paid as matching funds) and procurement is more useful. A rather unique instrument is the innovation and development voucher in Estonia.

Grant funding and the innovation voucher scheme have already been piloted in Mongolia. Mercy Corps piloted innovation vouchers in 2012, providing selected rural SMEs with a voucher worth MNT 5 million that they used to introduce product or service innovation through collaboration with a research organisation, an expert team or an individual expert. The Livestock Commercialisation Project of the World Bank is currently introducing a matching fund scheme for service innovations in the livestock sector. Selected SMEs will receive a grant of up to USD 100 thousand on top of their own contribution.

Using the above examples, the suggested Agricultural Innovation Fund should stimulate private sector initiatives through a combination of grants, innovation vouchers and soft loans. Grants should be used to co-finance projects that are strategically important but involve high risks. Innovation vouchers would allow SMEs to innovate with the help of individual experts or professional organizations, which is otherwise not affordable. Soft loan is a versatile instrument that can serve various purposes.

Support collaborative innovation projects

The “classical” innovation is a one-way process channeling new things from the innovator to the users. Meanwhile, there is an overwhelming agreement that this linear model should be replaced by, or at least combined with, a more open and collaborative approach (Lee et al., 2012; Bitzer and Bijman, 2015; Saragih and Tan, 2018). The new trend is known as co-innovation, which is defined as an iterative process that brings together knowledge from many stakeholders, to support changes in technology, markets, regulations and other practices that support the commercialization and implementation of the knowledge to improve production, exports, profits and/or the environment (Vereijssen et al., 2017). In practical terms, it is collaboration of two or more value chain actors with the goal of innovating.

There are plenty of examples of co-innovation in the food and agriculture sector worldwide. The FKII in Japan facilitates a number of co-innovation projects. The “Smart dairy farm” project, for example, is implemented by a consortium consisting of two agricultural universities and three companies specialized in manufacturing of ICT applications for the livestock industry such as motion sensors, milking robotics, automatic barn cleaners and automatic feeders. In the Netherlands, the Top Sector Policy subjects the granting of public funds through a matching fund scheme to participation in Public-Private-Partnerships with the top sectors (which include agriculture). In each top sector, Top Consortia of entrepreneurs and researchers work together to identify priority areas of research and investment, and prepare action plans. The plans are implemented by Top Teams consisting of researchers, entrepreneurs and government officials. In Australia, the levy-funded agricultural Research and Development Corporations (RDCs) channel a significant share of government spending on agricultural R&D to co-innovation projects.

In Mongolia, co-innovation is not entirely unknown. Various development projects have facilitated collaboration between researchers and farmers for finding novel solutions to practical problems. At the policy level, however, this perspective has found little attention so far. The dominating paradigm is still the linear technology transfer model with clear separation between the “innovator” and the “users”. Without interfering with MES’s policies to support research conducted by research organizations, we recommend MOFALI to introduce support for co-innovation projects, preferably through the suggested Agricultural Innovation Fund. Each co-innovation project should be proposed and implemented by a

consortium consisting of one or several private companies or entrepreneurs, research organizations and other relevant value chain actors including input suppliers, processors, supermarkets or semi-government organizations such as the Agricultural Commodity Exchange or the Agriculture Support Fund.

Establish a network of RDCs both within and outside the MOFALI's structure

The establishment of an RDC for Food, Agriculture and Light Industry through a merger of the former National Agricultural Extension Centre and the former Corporation for Research, Production and Business in Light Industry in 2020 reflected MOFALI's intention to co-facilitate innovation in food, agriculture and light industry sectors besides MES. In fact, this policy decision brought MOFALI one step closer to agricultural ministries in most developed countries, which maintain a large network of research organisations under their umbrella. In Germany, for example, the Federal Ministry of Food and Agriculture coordinates 10 research institutes in addition to several agencies that also conduct research.

In the case of the RDC in Mongolia, however, the concept was misinterpreted. An RDC is an organisation or an organisational unit that is specialized in R&D activities on a certain subject. For example, Syngenta operates 17 RDCs pursuing different research objectives such as "corn and soybean breeding", "oilseed rape and barley breeding" or "flowers breeding". Hence, if it is MOFALI's intention to facilitate R&D in food, agriculture and light industry sectors using the RDC model, then there should be several RDCs, each specialised on a certain topic. There can be, for example, an RDC for animal breeding, an RDC for plant breeding and another one for development of functional foods. A justified question in this regard is how effective it is for MOFALI to coordinate many different RDCs, some of which should be located in rural areas. Considering the capacity of the current RDC, our recommendations to MOFALI are:

- To divide the current RDC into two units – an RDC for hide and skin processing, and an RDC for horticulture;
- Establish a limited number of RDCs under MOFALI on selected subjects of strategic importance (discussion concerning further RDCs needed is beyond the scope of this policy brief),
- Encourage the establishment of RDCs by other organisations such as MULS, agri-food enterprises and producer associations through grants, soft loans and/or other policy instruments.

Establish a pluralistic agricultural extension system

The OECD review concludes that "*farm advisory systems have had an important role in the transfer and successful adoption of innovation, in particular at early stages of development*". A wide diversity of systems, public and private providers and funding mechanisms were found in the reviewed countries (Table 1). While there are no blueprint approaches of preferred models for farm advisory services, OECD's key recommendation is to encourage a diverse supply of relevant advice from diverse public and private suppliers (OECD, 2019).

In Mongolia, extension is mainly provided by agricultural officers at aimag and soum governments. The main problems are that there is no regular government funding for extension and the agricultural officers have many other duties. Other non-regular providers of extension services include farmer organizations,

input suppliers, MULS, the agricultural research institutes and development projects. In fact, a pluralistic extension system has been emerging but a long-term perspective is missing.

Table 1. Examples of advisory services

	Main institutions	**Source of funds**	**Countries**
State-run	Public organizations at regional and national levels	Wholly financed from public funds	Brazil (for small farms), Colombia, Japan, Korea, Sweden, Turkey, USA
Public-private service	Increasingly provided by private consultant firms	Farmers partly or wholly pay for services; centralized and decentralized	Canada, China, Estonia, Australia, USA
Farmers' organizations	Farmers' organizations	Membership fees and payments by farmers	Australia, Canada, Colombia, Japan, USA
Commercial	Commercial firms or private individuals	Payment through project implementation or grants	Netherlands, Brazil (commercial farms), Turkey, USA

Source: OECD (2019)

A part of the agricultural innovation policy of Mongolia must be extension policy, in which the goals, funding mechanisms and roles and responsibilities of the public and private actors should be defined. Leaving fee-for-service and extension-for-marketing schemes to the private sector, the national extension policy should be mainly implemented through the government system and farmer organizations. The main funding schemes should be provision of a regular budget and project grants.

The government extension system under MOFALI should be coordinated by the RDC at the national level and the ADFAs at the aimag level. Services shall be delivered by soum governments and bag governors in collaboration with *demonstration farms* and *herder and farmer advisers*. MOFALI should provide regular budget, and channel a part of public funds for agricultural R&D and donor funds for development projects to the system (Erdenebolor, 2020).

Farmer organizations such as the Mongolian National Crop Farmers Association and the Federation of Milk Producers already provide training and advice to their members. However, the advantages of farmer organizations such as cost-effectiveness and the ability to reach thousands of producers with information and advice should be further utilized for the benefit of the national AIS. Our recommendation to MOFALI is to provide project funds to farmer organizations for delivery of extension services in connection with innovation projects supported through the suggested Agricultural Innovation Fund, which are deemed particularly important for the food and agriculture sector and for which the need for extension services is clearly recognized.

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