



## Key messages

- Partial public funding of public higher education institutions and TVET schools for a certain period;
- Legislation of the exclusive right of specialised higher education institutions and TVETs to offer degree programs for crop sector personnel;
- Specific policy support for higher education institutions in rural areas;
- Funding of degree programs of essential importance for food security such as agronomy and agricultural engineering through government scholarships;
- Learning and adoption of good practices from countries with highly developed education systems for qualification of crop sector personnel;
- Improving the availability and adequacy of training premises, libraries and internship venues;
- Enhancing the conditions of admissions and taking relevant measures for increasing new enrolments;
- Increasing new enrolments through introduction of different options for reducing the tuition fee.

## Improving the higher and vocational education systems for qualification of specialists and skilled workers in the crop sector

In Mongolia, universities, institutes, colleges and Technical and Vocational Education and Training (TVET) schools provide tertiary education. Out of 96 higher education institutions holding the special permit for higher education, 18.7% are public institutions, 78% are non-public institutions, 3.1% are branches of foreign higher education institutions, respectively. Also, 36.4% of them are universities, 54.1% are institutes and the remaining 6.2% are colleges. Higher education is focused on bachelor's programs, with 84% of total students at 67 accredited universities and institutes enrolled in programs leading to a bachelor degree.

There are 84 TVET schools (including 51 public schools and 33 non-public schools) with a total 39 thousand students enrolled in over 230 vocational education programs from 16 sectors. Annually, more than 20 thousand students graduate from TVET schools, with approx. 60% of them finding employment. Structured by sector, 28.2% of the students of all TVET schools pursue a profession in the industry sector, 19.4% in construction, 12% in transportation, 7% in mining, 5.9% in services, respectively, and the remaining students pursue professions in other sectors. These statistics reveal that vocational education in agriculture is nearly non-existent. Furthermore, there is a decreasing trend in the number of new enrolments at TVET schools due to the predominating preference of higher education among high school graduates.

Implemented by



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interactions and funding arrangements in the envisioned national agricultural extension system under MOFALI's coordination.

### Current situation of the higher education system for qualification of crop sector personnel

Higher education in crop sector professions is conducted at bachelor's, master's and PhD levels by the School of Agroecology of Mongolian University of Life Sciences (MULS) in Ulaanbaatar and the School of Agroecology and Business at the Institute of Plant and Agricultural Sciences (IPAS), which is also coordinated by MULS, in Darkhan-Uul aimag. The following degree programs are offered.

At the School of Agroecology of MULS:

- Agronomy
- Plant protection and quarantine control
- Soil science and agrochemistry
- Farming specialised in crop production
- Management of crop production
- Agronomy / Horticulture specialised in fruits and vegetables

At the School of Agroecology and Business of IPAS:

- Agronomy
- Agronomy / Horticulture specialised in fruits and vegetables
- Soil science and agrochemistry
- Technology of crop farming

These degree programs have been graduated by 4502 students since 1955. The majority of the graduates (69.84%) majored in agronomy, followed by graduates in plant protection and quarantine control (13.83%).

Table 1. Graduations of higher education programs for qualification of crop sector personnel

No	Degree programs	Year of the program start	Number of graduates
School of Agroecology of MULS			
1	Agronomy	1955	2728
2	Agronomy specialised in fruits and vegetables	1963	139
3	Management of crop production	1997	337
4	Plant protection and quarantine control	1997	623
5	Farming specialised in crop production	1999	115
6	Soil sciences and agrochemistry	2001	86
School of Agroecology and Business of IPAS			
1	Agronomy	1993	416
2	Technology of crop farming		44
3	Soil science and agrochemistry		14

The last six years saw a massive decline in new enrolments in degree programs related to crop farming. For instance, no enrolment has been registered at all for the degree program "Agronomy specialised in fruits and vegetables" since 2014. The decline of new enrolments has enormous consequences for the stability of higher education since all public and non-public higher education institutions are financially fully dependent

on tuition fees. The situation is worse for the School of Agroecology and Business in Darkhan-Uul aimag. At a total capacity of 1500 students and a housing capacity for 300 students, stable operation of the school requires 1400 students. In the academic year 2018/19, however, the school only had 700 students. Furthermore, while the school is the only academic institution offering higher education in meteorology new enrolments for this degree program have also been declining during the recent years.

The main reason for declining enrolments is the shift of secondary education from a 10-year system to the 12-year system, resulting in a reduction of the total number of high school graduates. Moreover, the preference for studying in Ulaanbaatar affects the decline in enrolments at higher education institutions located elsewhere.

Table 2. Number of new enrolments at the School of Agroecology of MULS

No	Degree programs	2015- 2016	2016- 2017	2017- 2018	2018- 2019	2019- 2020
1	Agronomy	40	70	49	26	8
2	Management of crop production	5	5	9	-	-
3	Soil sciences and agrochemistry	-	-	-	7	-
4	Agronomy specialised in fruits and vegetables	-	-	-	-	-
5	Distance learning course in agronomy: 2.5 or 4.5 years	16	25	19	31	16
Total number		61	100	77	64	24

### Vocational education for qualification of crop sector personnel

Besides higher education institutions, TVET schools have played an important role in qualification of personnel for the crop sector. Until the 1990s, agricultural TVET schools Selenge, Tuv, Arkhangai and Darkhan-Uul aimags qualified hundreds of skilled workers specialised in areas such as crop farming, operation of agricultural machinery and irrigation technology. Unfortunately, the TVET system in the crop sector destabilised after 1990, and the reduction in the demand for skilled workers in the crop sector that resulted from, among other reasons, dissolution of the former kolkhozes, led to closing down of several TVET schools while some other TVET schools shifted to non-agricultural sectors. Moreover, the increased access to higher education (with many private institutions easily admitting students through the payment of tuition fees) caused a drastic increase in the number of students and graduates of higher education institutions.

During the recent years, the TVET system is recovering with government support. Several TVET schools located in Khovd, Uvs, Zavkhan, Selenge, Tuv and Uvurkhangaig aimags have started conducting vocational education in subjects related to agriculture, such as vegetable farming, operation of agricultural machinery, integrated crop and livestock farming, greenhouse farming.

### Legal environment for qualification of crop sector personnel

The legislation of the crop and education sectors is constituted by the Law on Education, the Law on Higher Education, the Law on Vocational Education, the Law on Special Permits for Commercial Operations, the "State Policy on Education 2014-2024", the "State Policy on Food and Agriculture 2015-2025", the Law on Crop



Production and related legal acts and policy documents. While there is no legal act that specifically regulates the qualification of crop sector personnel the prioritisation of “development of crop and livestock production and infrastructure” in the “Mongolia Sustainable Development Vision 2030” relates to this issue, and the Law on Crop Production specifies that a crop production entity shall be employing a qualified agronomist and a qualified agricultural engineer.

### **Assessment of the higher education for qualification of crop sector personnel, and problems identified**

For assessing the quality of higher education for qualification of crop sector personnel, and as an attempt to identify the underlying issues of declining enrolments as to increase future enrolments, a representative sample of 355 graduates of the School of Agroecology from the period 1980 to 2016 were surveyed. As the main reason for their enrolment in an agronomic degree program, 15.2% of the respondents stated that the profession of agronomy was highly demanded during their period of study while 55.5% of the respondents apparently followed their interests in agronomy, 17.7% were advised by others to choose this degree program and the remaining 8.5% wished to pursue an academic education. Sixty-four percent of the respondents currently have an employment that matches their profession. The reasons of the remaining respondents for not having an employment that matches their profession included lack of employment opportunities for 74.2% of the respondents, lack of interest for 8.9%, low salary for 2.4% and lack of qualification for 3.2% of the respondents, respectively. For improving the quality of education, the respondents identified balanced delivery of theoretical and practical knowledge (48%) and improvement of learning conditions and material base (29%) as the main challenges.

Another survey was carried out with new enrollees of the agronomic degree programs at the School of Agroecology in 2015 and 2016. The factors that played a decisive role for their enrolment included the score obtained in the entrance exam (for 44-45% of the respondents), information and promotion of the program (for 16-25%), the reputation of the school (for 11-17%), affordability (3-4%), and other factors (for 25-30% of the respondents). The professional skills of the lecturers were assessed as good by 88.4% of the respondents, moderate by 22.1%, and as inadequate by 3.9% of the respondents, respectively. The capacity and adequacy of the training premises were assessed as sufficient by 21.5% of the respondents, moderate by 28.3% and as insufficient by 43.3-50.1% of the respondents. The adequacy of the labs for the learning needs of the students was assessed as sufficient by 28% of the respondents, moderate by 29.8-32.8% and as insufficient by 36.7-39.3% of the respondents. The availability of professional literature was assessed as sufficient by 23.1-31.4%, moderate by 32.1-36%, and as insufficient by 32.3-44.8% of the respondents. Finally, the adequacy of the library for their learning needs was assessed as good by 29.4-36.3%, moderate by 29.9-37.5% and as insufficient by 40.6-21.1% of the respondents, respectively.

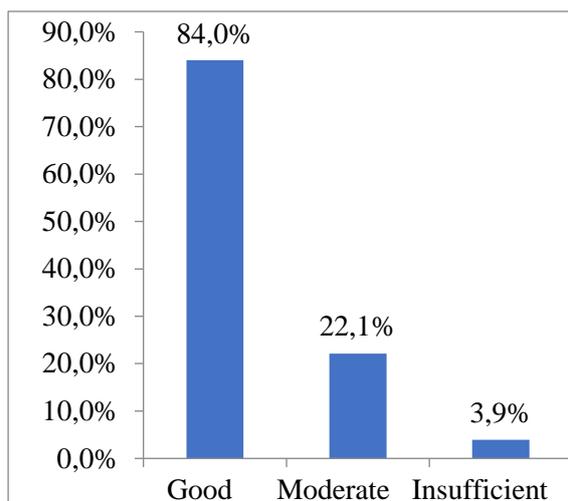


Figure 1: Professional skills of lecturers

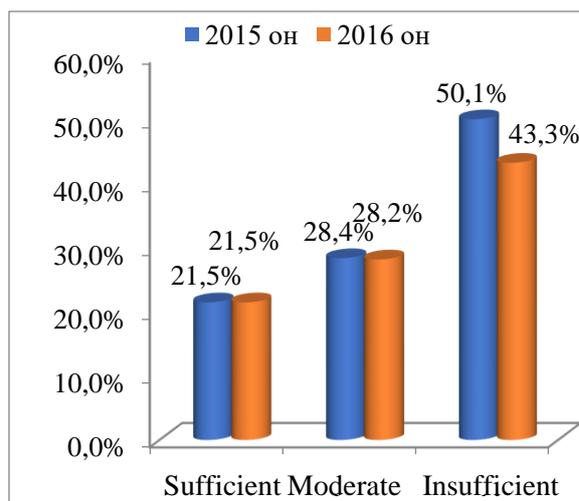


Figure 2: Availability and adequacy of training premises

Furthermore, a survey with 56 public and private sector organisations that employ qualified crop sector personnel reveals that 18.7% of these employers assess the qualification of the graduates of agronomic degree programs as very good and 69.6% assess as good while 8% and 3.5% of the employers assess their qualification as moderate and insufficient, respectively.

### Actions required for improving the qualification of crop sector personnel

#### Policy actions required:

- Partial public funding of public universities, institutes and TVET schools for a certain period as to provide them with the possibility to stand on their own feet in economic terms;
- Legislation of the exclusive right of specialised higher education institutions and TVET schools to qualify crop sector personnel i.e. discontinuation of admissions in agronomic degree programs or vocational education programs at educational institutions that are not specialised in agronomy;
- Provision of specific policy support to higher education institutions in rural areas, incl. limitation of admissions in agricultural degree programs in Ulaanbaatar and shifting of these degree programs to higher education institutions in rural areas;
- Scholarship support of degree programs that are of particular importance for food security, such as agronomy, animal husbandry and agricultural engineering;
- Increasing the salaries and benefits of lecturers, and scholarships of students;
- Tax exemption of private investments in student internships and vocational training of skilled labour;
- Learning and adoption of good practices from countries with highly developed systems of qualifying crop sector personnel such as Germany and France.

#### Challenges to be addressed by educational institutions

- Enhancing the conditions of admissions and taking relevant measures for increasing the number of new enrolments, incl. upscaling of the online education system and improving the standards.
- Improving the sufficiency and adequacy of training premises, and furnishing of labs with modern research equipment and applications, chemicals, and suitable premises.
- Increasing the opportunities for research and practical internships of students, incl. establishment of specific internship venues with conditions close to the reality.



- Improving the furniture and equipment of the reading halls in libraries, availability and quality of professional literature, and variety of services offered to students, and establishment of a digital library.
- Increasing the number of new enrolments through introduction of different options for reduction of the tuition fee.
- Organising lectures and internships of students in agronomic degree programs during the vegetation period.
- Further training of graduates every 3 to 5 years, and awarding of a diploma or a certificate as a proof of the credit-hours completed, whereas the diploma or certificate must entitle its holder to certain benefits such as privileged participation in tenders or projects, or a bonus to the salary if the person is employed in the public or private sector.

Creating and increasing opportunities for involvement of lecturers and students in domestic and international projects and programs implemented in the crop sector.

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**Disclaimer:** This policy brief is published under the responsibility of the German-Mongolian Cooperation Project Sustainable Agriculture (MNG 19-01), which is funded by the German Federal Ministry of Food and Agriculture (BMEL). All views and results, conclusions, proposals or recommendations stated therein are the property of the authors and do not necessarily reflect the opinion of the BMEL.

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