

TOWARDS STRONGER RAPESEED POLICY AS A CASH CROP IN MONGOLIA
FINAL REPORT

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Orgil Balgansuren

EXECUTIVE SUMMARY

This research studied policy options for rapeseed production in Mongolia and is the first research on rapeseed from smallholder point of view. Rapeseed is one of the widely spread export-oriented cash crop produced in the country. The research consisted of a literature review of relevant policy documents, questionnaires and focus group discussions among rural vegetable and crop farmers, and key stakeholders who benefit from rapeseed and interviews conducted with key sectorial informants.

Notable challenges for the rapeseed sector include the absence of seeds production system in place, lack of industry for value added production, under-developed comprehensive agricultural method and lack of knowledge among farmers of potential long-term impacts on the environment, and overall unsatisfactory implementation of the state wheat policy. Besides of these challenges, rapeseed production is prone to natural risks of drought or early snowfall.

Majority of farmers view rapeseed production as more profitable and hassle-free. However, the domination of export-oriented cash crop such as rapeseed poses a threat to national food security due to reduced production of wheat. Policy suggestions are made available from those who plant rapeseed and those who do not plant rapeseed.

Key words: Agricultural policy, Food security, Mongolia, rapeseed.

LIST OF ABBRIVATIONS

CIA	Central Intelligence Agency
CRS	Creative Research Systems
GDP	Gross Domestic Product
GMO	Genetically Modified Organism
FGD	Focus Group Discussion
MET	Ministry of Environment and Tourism of Mongolia
MoFA	Ministry of Food and Agriculture of Mongolia
MoFALI	Ministry of Food, Agriculture and Light Industry of Mongolia
NGO	Non-governmental Organization
NSO	National Statistics Office
SDV-2030	Mongolia's Sustainable Development Vision – 2030

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1. INTRODUCTION

This research paper aims to fill the existing gap in a policy-oriented study on rapeseed in Mongolia from the point of small scale vegetable and crop farmers. It explores whether and how the growing demand for land-based, export- oriented oil crops has affected food security in terms of use of arable agricultural land previously meant for pasture, production of food crops and water sources for communities, household use, livestock and irrigation needs of crops and vegetables.

The core perspective of the research was to look at how has the production of export-oriented rapeseed affected local farmers and what are policy options for achieving food security in the country. It examines whether the local small scale farmers have benefitted from the new opportunities in growing rapeseed, identifies the obstacles for them and provides policy recommendations for decision-makers, civil society and academe on the production of export-oriented cash crops in Mongolia.

Background information: Mongolia is a land-locked developing country situated between Russia in the north and China in the south. The country has 1.5 million km² of mostly dry steppe land with a sparse population of three million. Mongolia has a dry to semi-dry, continental climate, temperatures ranging from -40°C in winter to +40°C in summer (CIA, 2017). Transition from planned economy to market economy in 1990, Mongolia started trade liberalizations and privatization which deepened in 2000's. Livestock privatized but agricultural land and pasture are state owned. Agricultural land can be leased for crop production.

In 2015, there were total 859,106 households in Mongolia. Among them, 216,730 households owned livestock out of this 70.6 per cent or 153,090 households were engaged in herding livestock all year around. In crop sector, there were eight times fewer households or 18,440 households (NSO 2016). There is no segregated data on national statistics portal on size of land, production and entities involved.

Wheat is dominant of crop planted in Mongolia, for example, in 2015 wheat represented more than 90 per cent of crops which is covering 80 of total national plantations, 16 per cent technical crops (rapeseed, sugar beet, sunflower and others), 2.5 per cent potatoes and 1.5 per cent vegetables (NSO 2016). According to the National Statistics Office (2017a) the plantations of rapeseed has significantly expanded from 1,200 hectares in 2004 to 83,016 hectares in 2015. Central and Eastern region represented 97 per cent of all rapeseed plantations of Mongolia.

2. SITUATION ANALYSIS

Agriculture plays significant role in Mongolia's economy. In 2015, the sector represented 13.7 per cent of GDP and 28.5 per cent of labour force is employed (NSO, 2016:12). Livestock sector is biggest sector in agriculture and five animal species are grazed which include camel, cattle, goat, horse and sheep. According to the National Statistics Office (NSO, 2016:64) census Mongolia had 55.9 million livestock in 2015 that presents a sharp increase since 2011, which was 36.3 million. The Constitution of Mongolia (1992), Section one, Article 5.5 stipulates that "the livestock is a national wealth and shall be protected by the State" (Official Gazette of Parliament, 1992).

Majority of livestock in Mongolia are free-range herds feeding in scarce and fragile steppe pasture. Mongolian Law on Land declares in the Article 6.1.1 that 'pastureland is state owned and communal use' (Official Gazette of Parliament, 2002). Increase in livestock numbers is growing concern over pasture decrease, degradation and competition between crop fields. According to the Mongolian Academy of Science (2008) report, around 90 per cent of the country is characterised by arid to semi-arid condition, with high vulnerability to desertification, more than 78 per cent of the land is degraded and lost fertility. There is increasing competition for land between crops like rapeseeds and traditional livestock herding.

The second important agricultural sector is crops and vegetables production. In Mongolia's crop sector, wheat represents majority, over 90 per cent of crops as national strategic food crop and other crops include barley, oats, rye and buckwheat planted in small numbers. In 2016, wheat farming reached 355.3, potatoes 14.6 and vegetables 8.3, and technical crops 63.8 thousand hectares (MoFA, 2016b). Rapeseeds represent 98 per cent of technical crops. Majority of rapeseeds are exported to China as raw material. It appears that the National Statistics Office (NSO) has not collected information on the volume and incomes from export of rapeseed as there is no published statistical data on share of rapeseed exports to Mongolian economy.

While in 2017, the Government of Mongolia planned to plant 28,600 hectares of oil plant but as of May 30, 2017 total planted area has exceeded this target by 156 per cent and reached 44,500 hectares (MoFALI, 2017).

Table 1. Plantation field, total harvest and harvest from per hectare:

	Total					Agricultural entities /companies, cooperatives/				Family farming			
	2012	2013	2014	2015	2016*	2012	2013	2014	2015	2012	2013	2014	2015
Plantation (thousands of hectares)													
Crop:	306.2	293.3	315.0	390.7	377.3	267.6	265.4	284.8	356.4	38.6	27.9	30.2	34.3
- Wheat	297.3	275.6	291.2	361.2	355.3	260.1	250.5	265.0	330.8	37.2	25.1	26.2	30.4
Potatoes	16.8	15.5	13.2	12.8	14.6	5.9	4.2	3.2	3.3	10.9	11.3	10.0	9.5
Vegetables	7.9	8.3	8.7	7.7	8.3	1.6	1.1	1.4	1.6	6.3	7.2	7.3	6.1
Livestock feed	13.8	14.4	17.0	23.8	28.1	7.6	7.4	10.4	16.8	6.2	7.0	6.6	7.1
Technical crops	33.2	83.9	86.7	84.5	63.8	26.1	73.2	78.4	70.3	7.1	10.7	8.3	14.2
Total Harvest (thousand tons)													
Crop:	479.4	387.0	518.8	216.3	477.2	439.1	355.6	475.5	204.1	40.3	31.4	43.3	12.1
- Wheat	465.3	368.4	488.3	203.9	462.1	426.8	340.7	451.3	192.9	38.5	27.7	37.0	11.0
Potatoes	245.9	191.6	161.5	163.8	153.7	77.4	55.4	47.7	45.9	168.5	136.2	113.8	117.9
Vegetables	98.9	101.8	104.8	72.3	93.5	12.7	12.3	17.2	14.8	86.2	89.5	87.6	57.6
Livestock feed	46.2	42.6	44.3	49.2	50.6	22.9	20.2	25.2	29.2	23.3	22.4	19.0	19.9

Technical crops	20.9	41.7	52.1	23.1	19.6	18.6	37.7	47.4	20.7	2.3	4.0	4.7	2.4
Harvest from one hectare (tons)													
Crop:	1.57	1.32	1.65	0.55	1.38	1.64	1.34	1.67	0.57	1.04	1.13	1.43	0.35
- Wheat	1.57	1.34	1.68	0.56	1.40	1.64	1.36	1.70	0.58	1.03	1.10	1.41	0.36
Potatoes	14.64	12.36	12.23	12.75	10.51	13.12	13.19	15.1	13.90	15.46	12.05	11.33	12.36
Technical crops	1.51	2.89	3.06	0.97	0.31	2.44	5.09	4.55	1.2	0.37	0.57	0.71	0.33

NSO (2016:117), *MoFA (2016b)

Table 1 shows overall Mongolia's crop sector, wheat represents majority, over 90 per cent of crops. Technical cash crops (rapeseeds, sunflower, sugar beet...etc) has risen significantly from 2012 to 2013, however, the harvests have fluctuated during 2012-2016. It is particularly striking that harvests of family farmers per hectare remained low.

Using out-dated planting and harvesting methods and machineries causes lower harvest as significant amount of rapeseeds are spilled from wheat harvesters that most farmers use (Odonkhuu, 2016). Also this may be due to family farmers and entities may have low capacities in machineries, application of agricultural inputs and quality seeds. For example, in 2014 86.7 thousand hectares were planted and harvested 52.1 thousand tons while in 2015 84.5 thousand hectares were planted and harvested 23.1 thousand tons. This result may be explained with combination of weather and lack of agricultural methods among farmers. Unfortunately no segregated data on 2016 family farming and entities.

Table 2. Total plantation, field on percentage and type of crop

	TOTAL				Agricultural entities /companies, cooperatives/				Family farming			
					2012	2013	2014	2015	2012	2013	2014	2015
Crop	80.8	70.6	71.5	74.4	86.5	75.6	75.3	78.5	55.9	43.5	48.3	48.1
- Wheat	78.5	66.4	66.1	68.8	84.0	71.3	70.1	72.9	53.8	39.2	42.0	42.7
Potatoes	4.4	3.7	3.0	2.4	1.9	1.2	0.8	0.7	15.8	17.6	16.1	13.4
Vegetables	2.1	2.0	2.0	1.5	0.5	0.3	0.4	0.3	9.1	11.2	11.7	8.6
Livestock feed	3.6	3.5	3.9	4.5	2.5	2.1	2.7	3.7	9.0	10.9	10.6	10.0
Technical crops	8.7	20.2	19.7	16.1	8.4	20.8	20.7	15.5	10.3	16.7	13.3	19.9
Others	0.5	0.0	0.0	1.0	0.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NSO (2016:118)

Table 2 illustrates that the share of technical crops increased since 2012 and reached its highest total level in 2013, but it has decreased in 2014 and continued to decrease in 2015. There were differences between - agricultural entities that showed slight drop in 2015 from the previous year while family farmers have steady increased planting technical crops. Both categories almost doubled their plantations of technical crops since 2012. Contrary, planting wheat and vegetables has decreased.

There is a correlation between wheat and rapeseed, increase in wheat plantations as lower rapeseeds and vice versa. Also, between 2014 to 2015, proportion of vegetable plantations significantly decreased as technical crops increased among family farmers. This suggests that increase in technical crops may cause reduced food crops like wheat, potatoes and vegetables.

Table 3. Technical crop plantations, total harvest and harvest from per hectare

Technical crop production /rapeseed/						
	2012	2013	2014	2015	2016*	2017**
Planted /th.ha/	33.2	83.9	86.7	84.5	63.8	44.5
Harvested /th.ha/	31.5	72.0			46.8	
Total harvest /th.tons/	20.9	41.7	52.1	23.1	19.6	
Per hectare /th.tons/	0.62	0.49	0.60	0.27	0.30	

NSO (2016:117), *MoFA (2016b), **MoFALI (2017), as of 30 May 2017.

Table 3 presents a summary of available statistical data on technical crops of which 98 per cent are rapeseed. It is clear that in 2016, total 17 thousand hectares of rapeseeds were left unharvested due to immaturity or unfavourable climatic conditions. This is a significant amount of 26.6 per cent of total plantations that was lost. This data shows that rapeseed is a highly risky crop for farmers and agricultural businesses. In economic terms, if we see that 19.6 thousand rapeseeds harvested from 46.8 thousand hectares, one hectare harvest is 0.41 tons. Unharvested 17000 hectares would be 6.9 thousand tons or 35.5 per cent of harvest in 2016.

Comparing year of 2014 to 2015, almost same amount of rapeseeds are planted while 2015 harvest is significantly low. In 2012 and 2013 farmers was able harvest 85 to 94 per cent of planted field, while in 2016 only 73 per cent of field was harvested. Higher yields in 2012 and 2014 maybe explained that with favourable weather conditions farmers was able to grow and harvest rapeseeds. Unfortunately, there is no data on unharvest land from the National Statistical Office since 2013. Despite of lack of data on unharvested technical crop it is possible to draw a conclusion that rapeseed is a highly risky crops for farmers.

Conclusion

Increase in technical crops or cash crops like rapeseeds does negatively affect production of food crops like wheat, potatoes and vegetables. Out-dated planting and harvesting agricultural methods and machineries causes lower harvest as significant amount of rapeseeds are spilled during harvests and climatic uncertainties leaves unharvested fields.

Lack of statistics data is a gap in policy, data are often incomplete, missing and tailored data unavailable, for example, data on unharvest hectares of land is only available for 2012 and 2013 on NSO online portal. Therefore, better national statistical data and analysis are required.

3. OVERVIEW OF RELEVANT POLICIES

3.1 Policy Documents:

The government of Mongolia adopted several long-term national policy documents - Sustainable Development Vision – 2030 and Green Development Policy that set general provisions and set targets for sustainable development in social, economic and environmental fields. As the agriculture is one of key economic sectors, both documents include measures for rural development, increase in agricultural outputs, food production and supporting farmers and herders. There are also a number of other laws and policies that regulate crop production related issues.

3.1.1 Mongolia's Sustainable Development Vision-2030 (Parliament of Mongolia, 2016a)

Mongolia's Sustainable Development Vision -2030 is an over-arching national long-term policy document defining the key development priorities of Mongolia towards Sustainable Development Agenda 2030. It is significant that the Vision addresses the issues pertinent to the Agriculture sector in a separate Objective #3 where it has specific references to soil protection. In order to meet the domestic demand for grains, potato and vegetables, the Vision requires measures to increase the fertility of soil, reduce land deterioration, adopt economical and efficient advanced agro-technical and irrigation technologies to repair soil, and develop intensified farming”.

While the Objective 3 refers only to strategic food crops without mentioning production of oil crops, it is noteworthy that Phase III of the Vision (2026-2030) sets a target to “increase the use zero-tillage farming technology to 90 per cent in grain fields; adopt new and efficient irrigation technology; increase the area of irrigated arable land to 120 thousand hectares; increase the fertilizers demand to 100 per cent; raise the supply of high quality local seeds to 100 per cent; increase the fertility of farmlands; and reduce soil degradation and erosion”.

Also, the Objective #4 of the Vision defines the social aspects of sustainable development of Mongolia, particularly ensuring wellbeing and prosperity of rural marginalised population, the policy document stipulates government's support to businesses and economics of herders and herder groups, small and medium sized farmers; by providing modern techniques, technologies and electricity. Creating a financial, economic and legal environment for sustainable production will be vital to achieving this objective. The phase III (2026-2030) sets a target that herders and farmers would have a permanent business income.

3.1.2. Green Development Policy of Mongolia (Parliament of Mongolia, 2014)

The Green Development Policy of Mongolia (Parliament of Mongolia, 2014) recognises the importance of ensuring sustainable food security in the Article 3.1.5. It states that “meeting the domestic demand for grain, potatoes, and vegetables should be done through reduced land degradation due to crop production, by improving soil fertility, introducing agro-techniques for soil maintenance, efficient and advanced technologies for irrigation and by establishing forest zones”. Further, Green Development Policy of Mongolia puts a target of a share of the agriculture and processing industries in total Gross Domestic Product to reach 28 per cent in 2020 and 30 per cent in 2030. The Policy in its Strategic objective #4 emphasizes the promotion of green employment, poverty reduction and engraining/promoting green life style” that includes the introduction of payment of ecosystem services to herders in order to prevent pasture degradation and protection of watersheds and spring water. There is no specific reference to the production of oil crops or involvement of farmers and herders in oil crop cultivation, processing or exporting.

3.1.3 State Policy on Agriculture (Parliament of Mongolia, 2015)

The State Policy on Agriculture passed on 26th November 2015 aims to promote domestic production of crops in the country. Article 3.1.11. “Crop production, preparation and supply of raw produce and products” stipulates increase varieties of crops, leguminous plants and other

crops. It emphasizes the increase in wheat harvest per hectare and vegetable self-sufficiency to reach 70 per cent in 2020 and 100 per cent in 2025. It attaches importance to ensuring self-sufficiency of grain, potatoes, vegetables and oil crops production and encourages the development of export-oriented sectors.

While the policy underscores the development towards self-sufficiency and export orientation of oil crops it does not specifically mention whether oil crops should be for technical, biofuel purposes or for edible consumption nor there is an elaboration of whether it will be value added, processed product or raw export item (MoFA, 2015).

Similar to the Mongolia's Sustainable Development Vision – 2030, the State policy on agriculture 2016-2025 highlights the use of proper rotation methods, technology and machinery, creating legal and policy frameworks for protecting soil from degradation, including damage from water and wind.

3.1.4 Other policy documents related to rapeseed

The government of Mongolia currently set a rule that rapeseed must be used for rotation every three years of planting wheat and vegetables. At the same time, the rapeseed plantations must not exceed 15 per cent of total agricultural land. These requirements are included in standard Agreements signed between the Minister of Food and Agriculture and Governor of respective provinces. In case of violation of this rule, the agricultural land can be confiscated by the authorities, however, up to date there have been no reported cases of such sanction. It is worth to note that traditionally Mongolia has a strong policy for wheat, potatoes and vegetables as a staple crops, other crop were seen as secondary or auxiliary.

There are a number of laws and policies related to rapeseed. The Law on Crop Farming (Parliament of Mongolia, 2016b) protects crop fields from grazing animals and requires that livestock be kept at least 500 meters away from crop fields. However, the law omits how oil crops should be rotated or should cover how many percentage of crop field.

The Implementation Plan of the State Agricultural Policy for the initial phase of 2016 to 2020 (MoFA, 2016c) includes measures to introduce registered, drought resistant, high yielding oil crop varieties in agricultural production. Under the policy, the preference will be given to varieties with high protein content as they will be used for livestock feed. Measures will be taken to build a reliable seed stock of high quality varieties through establishing a regional seed production system. The seed stock will have a clear origin of seed and meet national standards.

3.2 Conclusion of current policies with regards to oil crops

Traditional crop policy of Mongolia has aimed to support strategic crops for food security such as wheat, potatoes and vegetables to ensure national self-sufficiency in staple foods. Current policies emphasize the improvements in agricultural production while addressing the efficient use of environmental commons including water and agricultural land. However, there are many gaps in regulating cash crops such as rapeseed. The State Policy on Agriculture contains notions of neoliberal trade in developing cash crop industry, as it attempts to ensure food security by putting the meeting of domestic demand first and the development of the sector towards export in the second place.

There is a dearth of applied researches on rapeseeds or cash crop policies that made literature review impossible. The National Agricultural University studied from the angle of agronomy point, meetings with leading academics and NGO researchers also have revealed no studies have been carried out to explore the impact of trade liberalization in agriculture on small-scale farmers, only main attention was given on liberalization and privatization of livestock. In particular,

pasture capacity and deterioration of pasture is studied from an angle of how livestock reaching historic number. Cashmere driven market influencing unhealthy proportion of goats in a herd. Increase of goat proportion in a herd having damaging impact on pasture.

4. RESEARCH METHOD

The new trend in demand of cash crops such as rapeseed may have positive or negative impact on local communities. Research examined whether crop farmers including family vegetable farmers, small cooperatives and larger entities which are engaged in production of cash crops have benefitted or not from producing rapeseed. The study is also an attempt to identify barriers and obstacles for them to gain from neoliberal economic policies as well as propose policy options that facilitate the implementation of the long-term, sustainable development agenda of Mongolia, with focus on achieving food security.

The study utilized a mixed method involving both qualitative and quantitative research. The triangulation of information was made on basis of existing relevant literature review, analysis of surveys, focus group discussions and individual interviews (Bryman 2012). Vulnerability framework proposed by Turner et al.,(2003) was applied where vulnerability of small-holders is defined by exposure to environmental hazards, their sensitivity and resilience. This theory allowed to look into coping mechanisms that affect social and bio-physical aspects.

More on research method including sampling details available at Annex 1: Methods and Annex 2: Research Instruments.

4.1 Challenges and limitations of the study

Firstly, Mongolia is a sparsely populated country with majority semi-nomadic herders. Reaching from one farmer to another was a challenge that required driving long distances through dirt roads without streetlights, passing mountains, lakes and rivers to reach human settlements. Secondly, the data collection period was during crop growing period that caused difficulties in locating and finding the potential respondents with direct experience and knowledge of issues. Majority of farmers left their fields after planting. One sub-province had one or two entities or few families farmers who are engaged in rapeseeds. However, this challenge was overcome with help of local assisting coordinators who ensured that all respondents were knowledgeable of the subject of research. Moreover, 44.4 per cent of respondents had agricultural professional training.

5. SUMMARY OF KEY FINDINGS

There is a moderate to strong interest among all farmers, from small to large-scale farmers to produce cash crops as a potential source/ opportunity. All of them viewed the rapeseed having potential for boosting their businesses. However, the limited use of proper machinery, multiple deficiencies in following the agro-technological requirements for the agricultural production were the key areas that were seen as impediment for the growth of this sector. The yield remained quite low (0.4 to 0.5 tons/hectare) due to the number of factors, including agro ecological conditions of Mongolia. Mongolia has short vegetation period and month of May and June, right after planting is very dry months for rapeseed. Other factors include quality plant protection chemicals and fertilizers are often unaffordable. Almost all crops including rapeseeds are not irrigated making it highly dependent on rain.

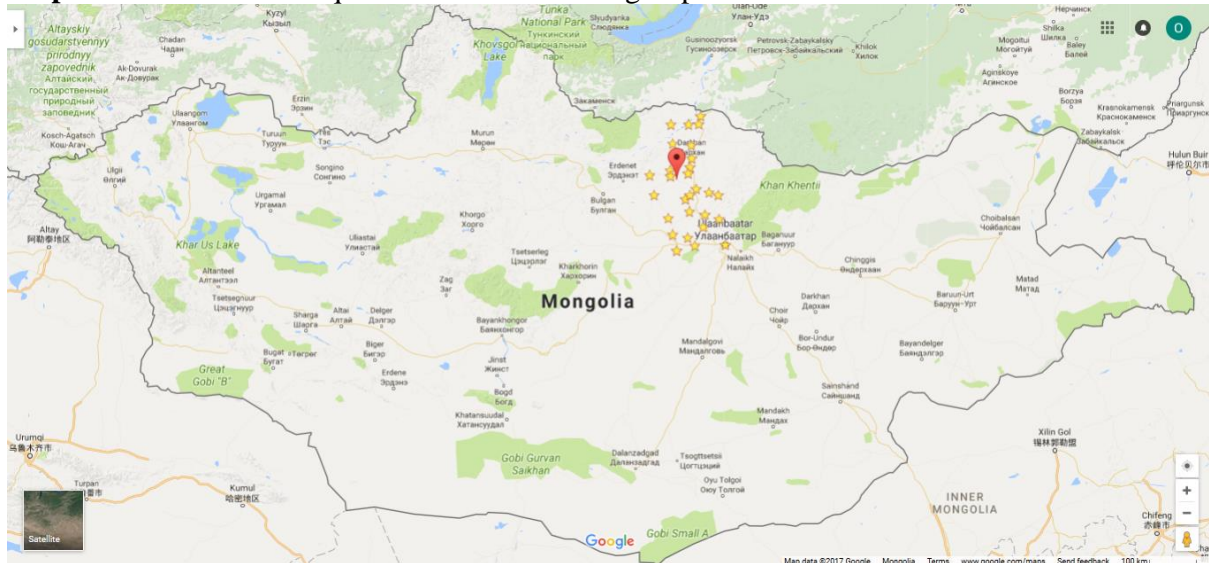
The key systemic concerns identified by farmers could be clustered as follows :

- Despite of interest of smallholder family farms and cooperatives in growing cash crops, their businesses are too small to benefit from rapeseed. Visible profits are generated by large-scale production. This is explained by the small size of agricultural land, inadequate machineries they have for rapeseed production, the low quality of rapeseed seeds and high costs of agricultural inputs.
- The use of outdated technology was an important factor for low harvest.
- Significant amount of rapeseeds is left unharvested in field. Inadequate capacities in types and number of agricultural machineries contributes to low harvest. Farmers use unsuitable wheat harvesting machineries causes significant leakage of rapeseed. These seed also leads to regrowth of the plant that damages the wheat /vegetable production for next year.
- Another important reason is the lack of rapeseed varieties in the market. Often farmers plant unknown or uncertain varieties that are not suitable for local climatic conditions. Such varieties often mature late as they may require longer vegetation period, thus, these varieties could not be harvested before the first snowfall.
- The lack of the national seed production system built for rapeseed does not allow the monitoring of imported seeds. There are two promising varieties that have not been registered in Mongolia due to the weak existing mechanism for plant registry.
- Almost all rapeseed planted in Mongolia are not irrigated. Undeveloped irrigation poses a serious risk of losing harvests from drought. Extreme weather events like heat, hails and early snow falls are seen as particularly risky for small-holder farmers/cooperatives who have limited diversification options.
- Deficient trade/business environment posed another structural or systemic problem for the development of cash crops in Mongolia. Export and import rules are unclear, cumbersome and complicated. There is a need to introduce favorable business procedures by reducing customs bureaucracy.
- Lack of evidence for policy making for rapeseed production is one of factors for weak national policy on this crop. Gaps in statistical data does not allow systematic analysis of trends. Data are often incomplete, inconsistent and does not allow comparative analysis. For instance, important data on unharvest field not available for all years. Loss of harvest needs to be analyzed and included in national statistics. In addition to national statistics, there is a need to undertake in-depth studies on rapeseed, for example, the role of foreign investment and demand from China for rapeseed; the impact of soil and water sources from rapeseeds...etc.

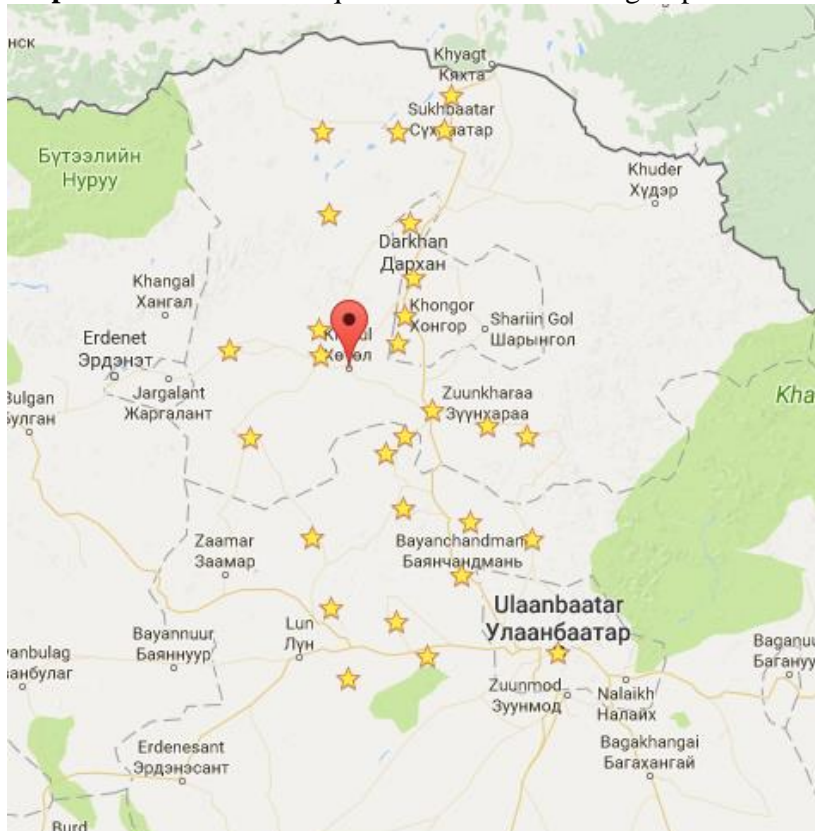
6. DATA COLLECTION

The survey was conducted in 27 sub-provinces of three central agricultural provinces, Tuv, Selenge and Darkhan-Uul. Total 365 collected. The SPSS program was used to process the data.

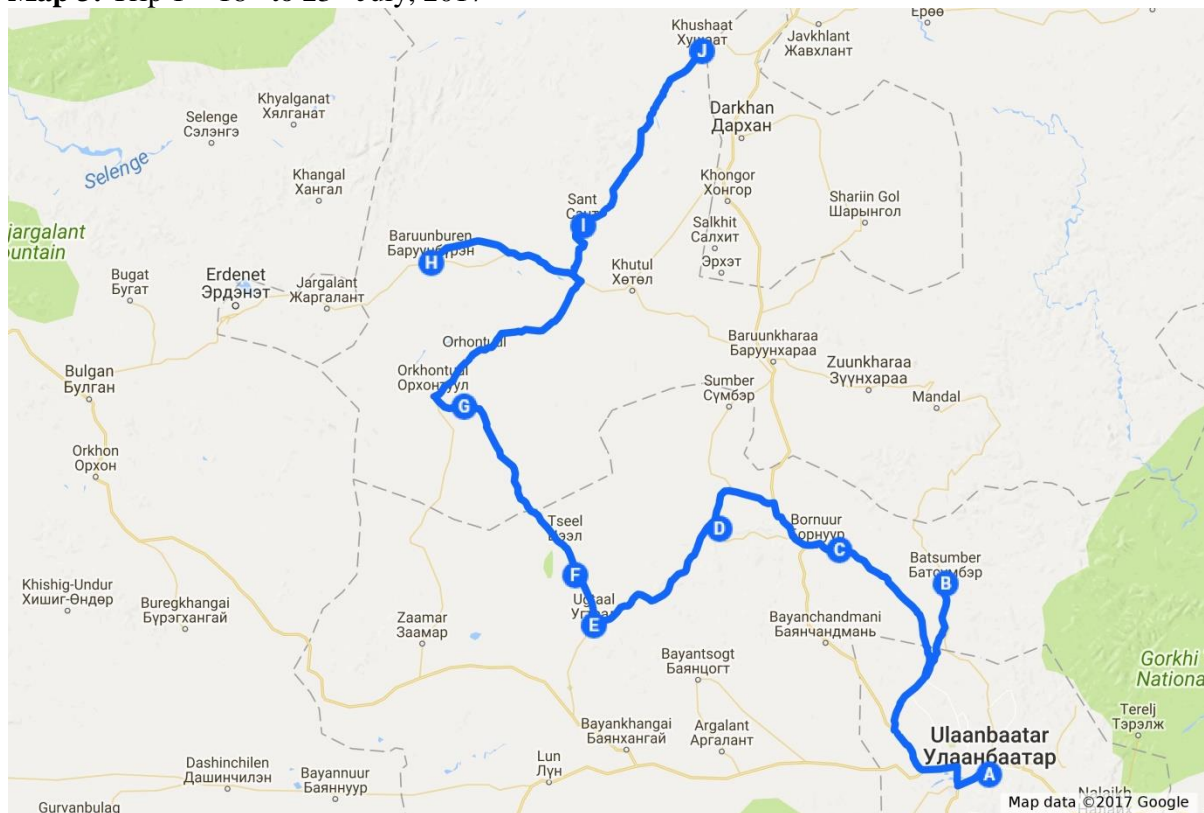
Map 1: Places visited for questionnaire and focus group data collection



Map 2: Places visited for questionnaire and focus group data collection

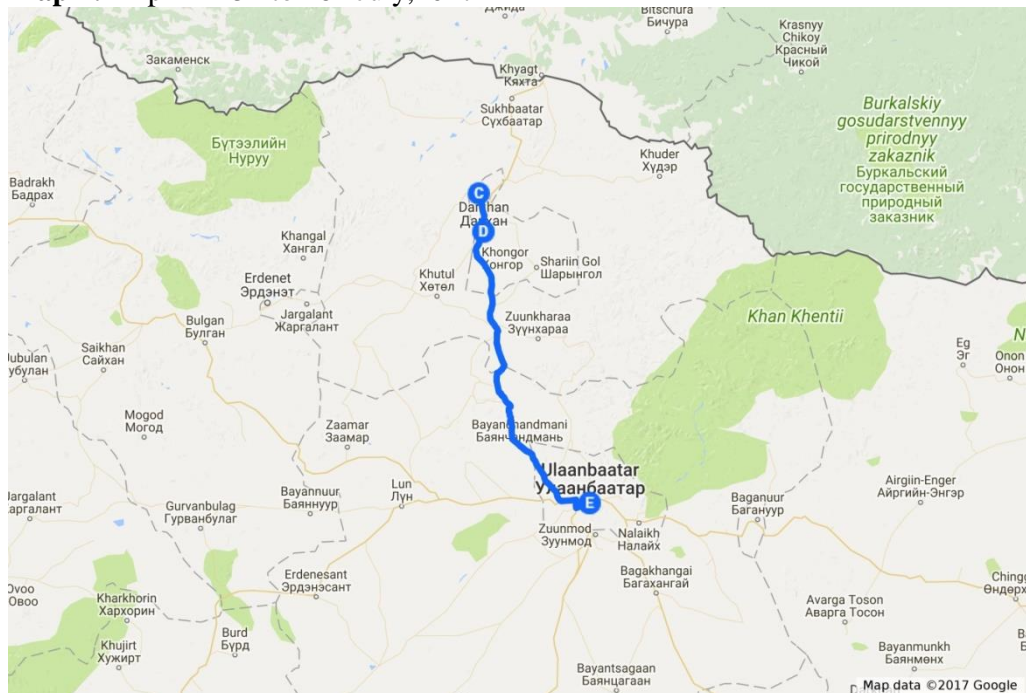


Map 3: Trip 1 – 18th to 23rd July, 2017



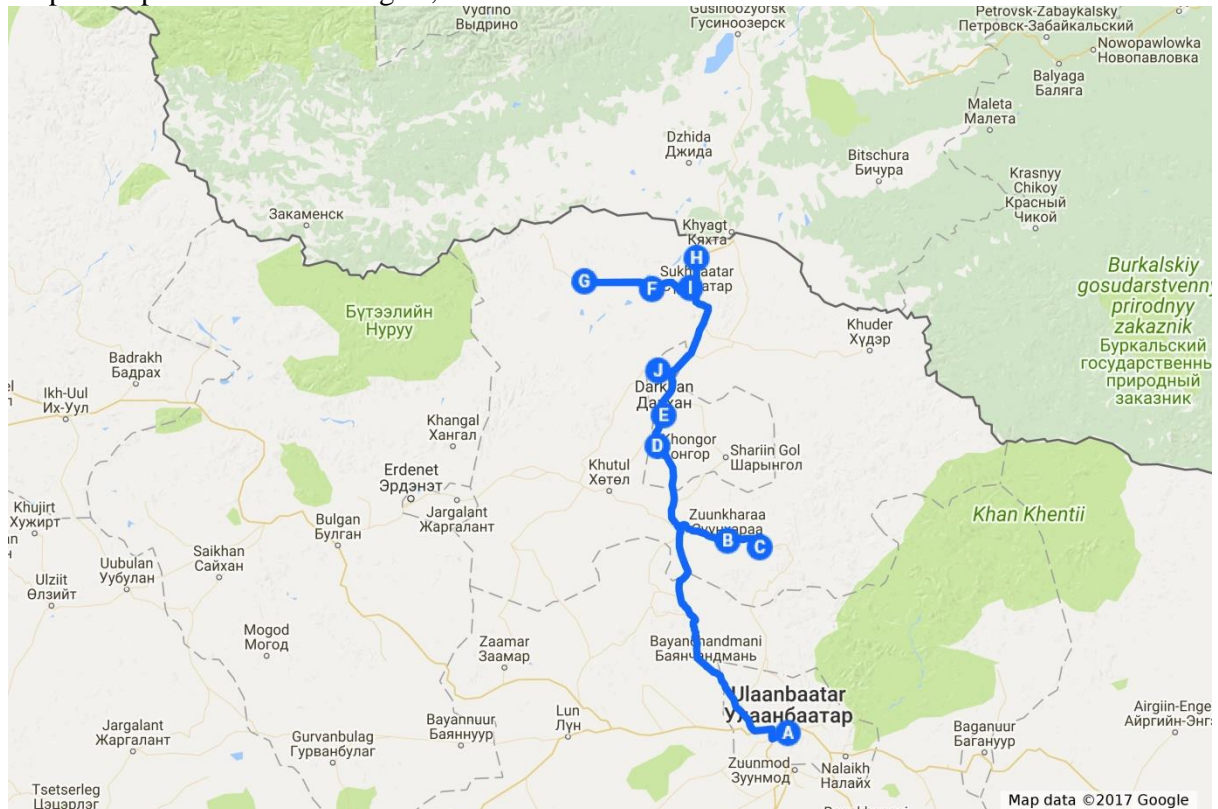
Map 3: Ulaanbaatar (A) – Batsumber, Tuv (B) – Bornuur, Tuv (C) – Jarglانت, Tuv (D) – Ughtaltsaidam, Tuv (E) – Tseel, Tuv (F) – Orkhontuul, Selenge (G) – Baruunburen, Selenge (H) – Sant, Selenge (I) – Khushaat, Selenge(J) – Darkhan city, Darkhan-Uul (No point) – Ulaanbaatar (A).

Map 4: Trip 2 – 25th to 26th July, 2017



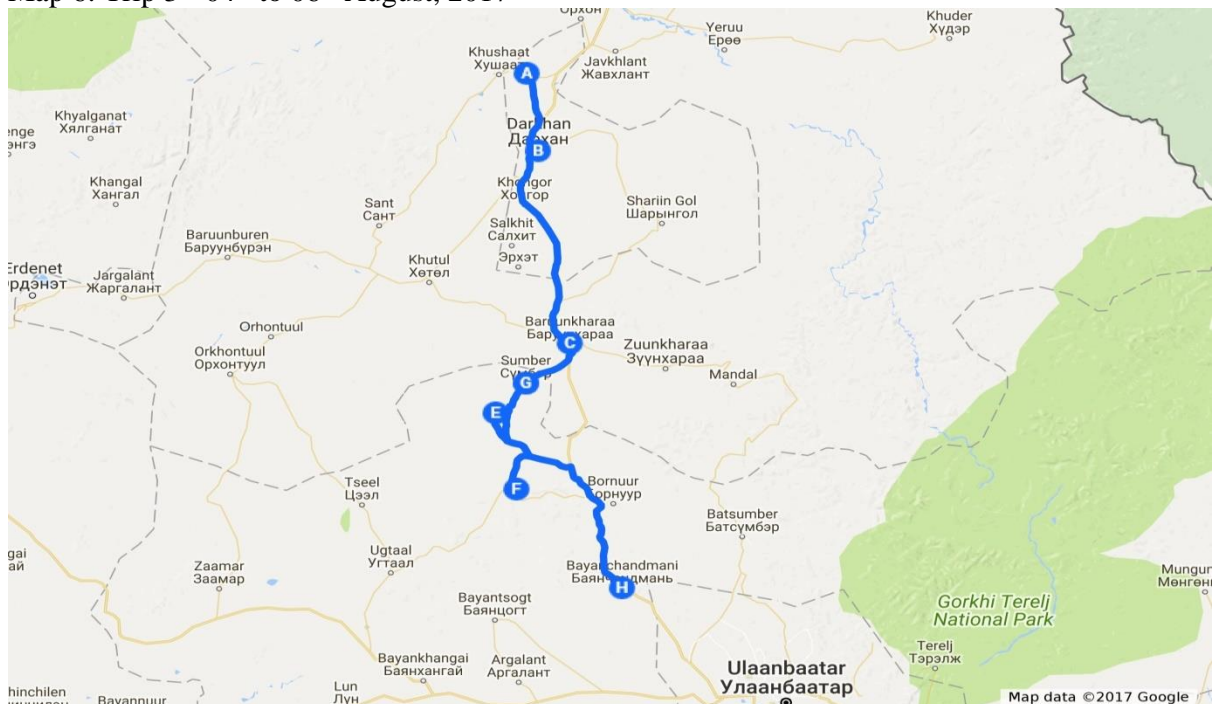
Map 4: Ulaanbaatar (A) –Darkhan, Darkhan-Uul (B), - Orkhon, Darkhan-Uul (C), - Darkhan, Darkhan-Uul (D) – Ulaanbaatar (E).

Map 5: Trip 3 - 01st to 04th August, 2017



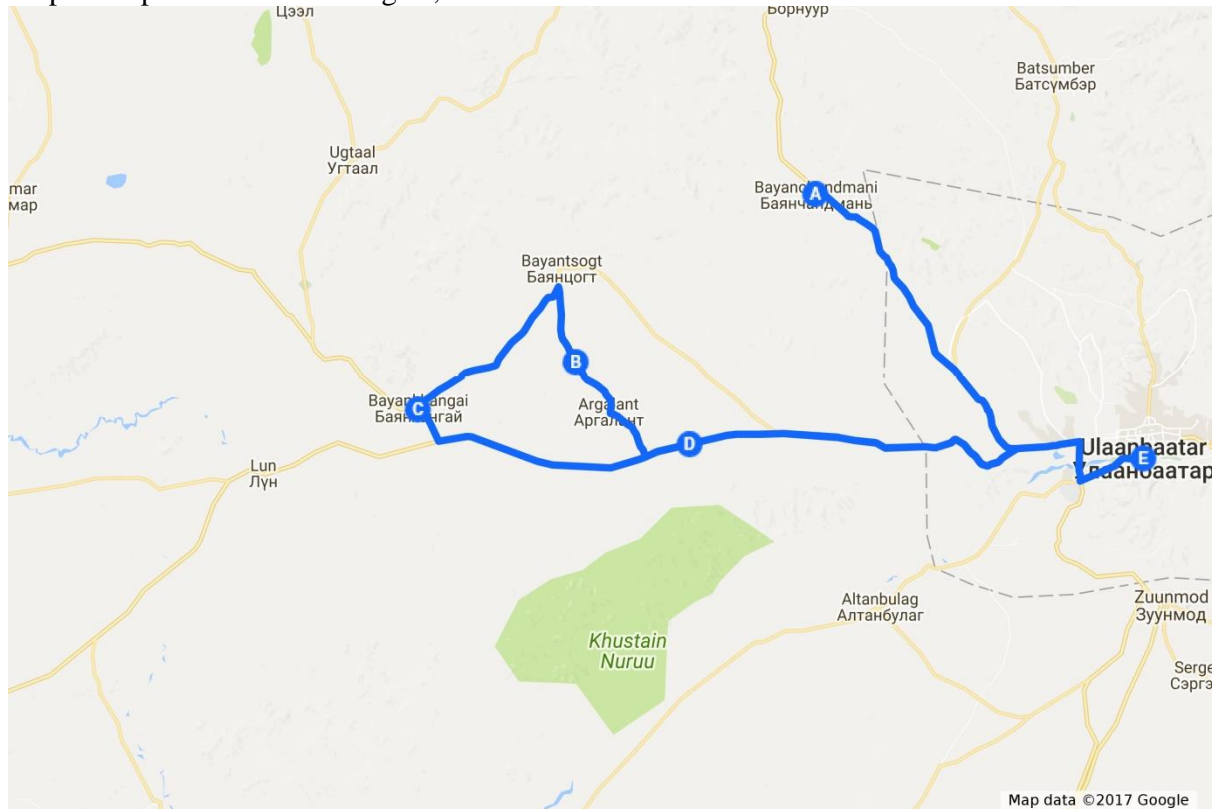
Map 5: Ulaanbaatar (A) – Zuunkharaa, Selenge (B) – Mandal, Selenge (C) – Khongor, Darkhan-uul (D) – Darkhan, Darkhan-uul (E) – Zuunburen, Selenge (F) – Tsagaannuur, Selenge (G) – Sukhbaatar, Selenge (H) – Shaamar, Selenge (I) – Orkhon, Darkhan-Uul(J).

Map 6: Trip 3 - 04th to 06th August, 2017



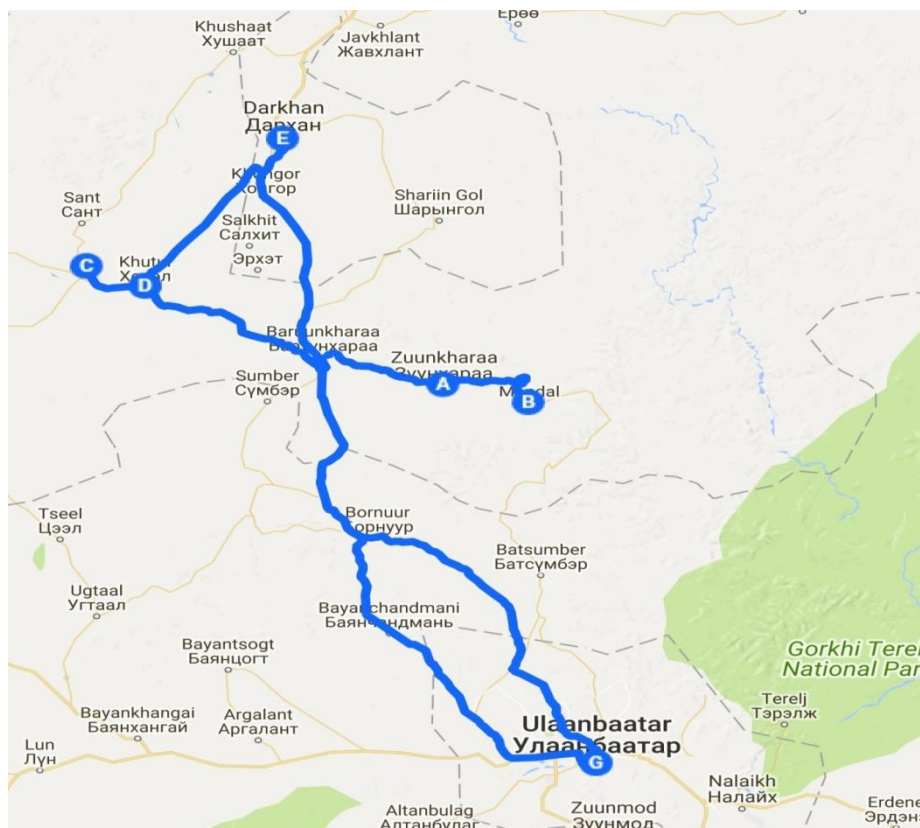
Map 6: Orkhon, Darkhan-Uul (A) – Darkhan, Darkhan-Uul (B) – Bayangol, Selenge (C) – Sumber, Tuv (D) – Zagdal, Tuv (E) – Jargalant, Tuv (F) – Bayanbulag, Tuv (not listed) - Sumber, Tuv (G) – Bayanchandmani, Tuv (H).

Map 7: Trip 3 - 07th to 08th August, 2017



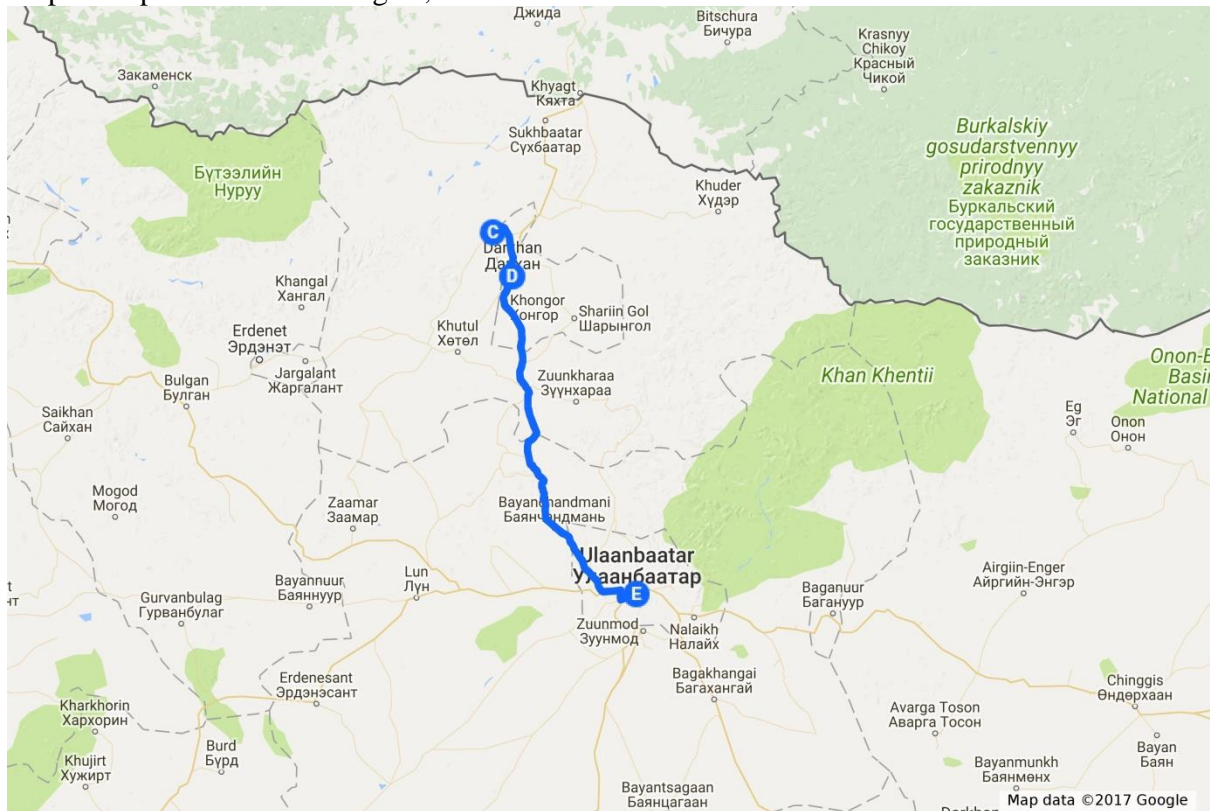
Map 7: Bayanchandmani, Tuv (A) – Gungiin Darvaa, Tuv (not listed) - Bayantsogt, Tuv (B) – Sarlag, Tuv (not listed) – Bayankhangai, Tuv (C) -Argalant, Tuv (D) – Khongor, Tuv (not listed) – Ulaanbaatar (E).

Map 8: Trip 4 - 12th to 13th August, 2017



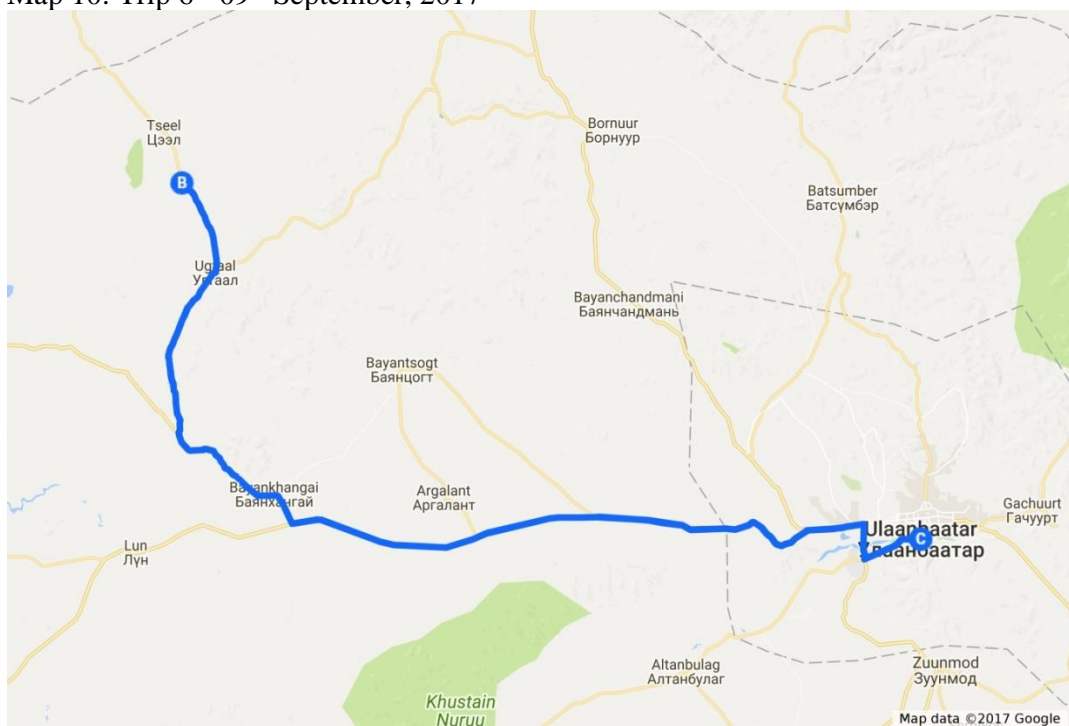
Map 8: Ulaanbaatar (G) – Khutul, Selenge (D) – Orkhon, Selenge (C) – Khutul, Selenge (D) – Nomgon, (Khutul, Selenge) (D) – Salkhit (Khongor, Darkhan-Uul) (E) – Mandal, Selenge (B) – Kherh (Mandal, Selenge) (B) – Ulaanbaatar (G)

Map 9: Trip 5- 15th to 16th August, 2017



Map 9: Ulaanbaatar (E) – Darkhan, Darkhan-Uul (D) – Khushaata, Selenge (C) – Darkhan, Darkhan-Uul (D) – Ulaanbaatar (E).

Map 10: Trip 6 - 09th September, 2017



Map 10: Ulaanbaatar (A) – Tseel, Tuv (B)– Ulaanbaatar (C).

6.1 RESULTS FROM RESPONSES TO QUESTIONNAIRES:

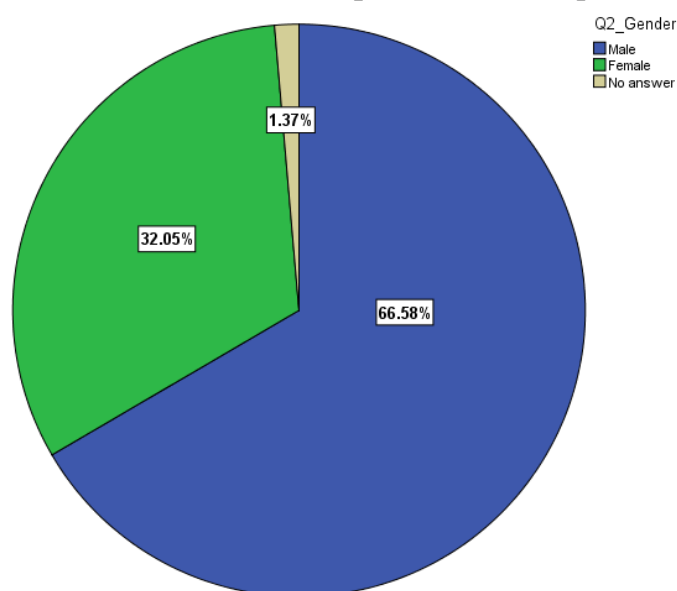
Age distribution of respondents: 16 to 24 years old group were 2.5 per cent, 25 to 34 years old group were 14.0 per cent, 35 to 44 years old group were 22.5 per cent, 45 to 54 years old group were 29.3 per cent, 55 or above age group represented 30.5 per cent.

Table 4: Age of questionnaire respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16-24	9	2.5	2.5	2.5
	25-34	51	14.0	14.0	16.4
	35-44	82	22.5	22.5	38.9
	45-54	107	29.3	29.3	68.2
	55-64	90	24.7	24.7	92.9
	65 above	21	5.8	5.8	98.6
	No answer	5	1.4	1.4	100.0
	Total	365	100.0	100.0	

Out of 365 respondents 66.5 per cent were men, 32.5 per cent were women and 1.3 per cent had not answered about their gender.

Graph 1: Gender of questionnaire respondents



In terms of education, 0.3 per cent of respondents had no education, 48.0 per cent had primary to secondary education, 7.7 per cent had technical and vocational education, whilst 38.9 per cent were university graduates.

Table 5: Education of questionnaire respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Post graduate	3	.8	.8	.8
	University graduate	139	38.1	38.1	38.9
	Technical school	24	6.6	6.6	45.5
	Vocational education	4	1.1	1.1	46.6

Secondary education	109	29.9	29.9	76.4
Low Secondary	65	17.8	17.8	94.2
Primary	1	.3	.3	94.5
No education	1	.3	.3	94.8
No answer	19	5.2	5.2	100.0
Total	365	100.0	100.0	

With regards to professional training, 162 respondent or 44.3 per cent had a profession related to agriculture, out of which 57 respondents or 15.6 per cent were agronomists, 10 respondents or 2.7 per cent were agricultural engineers and 43 respondents or 11.8 per cent were agricultural mechanics. Almost one third of respondents indicated that they were professionally trained as accountants, auto mechanics, cooks, health care specialists (medical doctors and nurses), drivers, economists, engineers, lawyers, sales people, teachers, welders, and others. 5.8 per cent of respondents stated that they had not received any professional training.

Table 6: Profession of questionnaire respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agronomist	57	15.6	15.6	15.6
	Agricultural Engineer	10	2.7	2.7	18.4
	Agricultural Mechanic	43	11.8	11.8	30.1
	Other Agricultural Profession	52	14.2	14.2	44.4
	Nonagricultural Professions	126	34.5	34.5	78.9
	No Profession	21	5.8	5.8	84.7
	No answer	56	15.3	15.3	100.0
	Total	365	100.0	100.0	

In terms of work experience in the agricultural sector, 16.7 per cent of respondents stated to having up to five years of experience, 12.3 per cent had five to ten years of experience, and 68.7 per cent had more than ten years of experience. Notably, 50 respondents or 13.7 per cent had more than 30 years of experience.

Table 7: Experience in agriculture of questionnaire respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Up to 5 years	61	16.7	16.7	16.7
	5-10 years	45	12.3	12.3	29.0
	10-15 years	102	27.9	27.9	57.0
	15-20 years	43	11.8	11.8	68.8
	20-25 years	33	9.0	9.0	77.8
	25-30 years	23	6.3	6.3	84.1
	30-35 years	16	4.4	4.4	88.5
	35-40 years	10	2.7	2.7	91.2
	40 above years	24	6.6	6.6	97.8
	No answer	8	2.2	2.2	100.0

Total	365	100.0	100.0
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Most of farmers had agricultural land up to 10 hectares. Farmers who hold under one hectare of land constituted 14.5 per cent of all respondents, those with under ten hectares were 42.2 per cent. 16.7 per cent hold larger land from ten to 100 hectares, and 12.3 per cent hold land between 100 to 300 hectares. Those with land size above 300 hectares constituted 21.1 per cent. Overall, farmers with below 300 hectares represent 71.2 per cent of all respondents. Not surprising that there were very few farms with land above 3000 hectares, with only one or two large-scale agri-businesses per sub- province.

Table 8: Size of field(in hectare) of questionnaire respondents

		Frequency	Percent	Cumulative Percent
Valid	Up to 1 hectare	53	14.5	14.5
	1.1 to 10 hectares	101	27.7	42.2
	10.1 to 50 hectares	29	7.9	50.1
	50.1-100 hectares	32	8.8	58.9
	100.1-300 hectares	45	12.3	71.2
	300.1-500 hectares	16	4.4	75.6
	500.1-1000 hectares	21	5.8	81.4
	1000.1-3000 hectares	30	8.2	89.6
	Above 3000.1 hectares	10	2.7	92.3
	No answer	28	7.7	100.0
	Total	365	100.0	

Family farms were the main form the majority or 63.0 per cent of all respondents represented family farming households; small-scale farming cooperatives were very rare and represented only 0.8 per cent, while 1.4 per cent were in agricultural companionships. On the other hand, 28.7 per cent of respondents belong to business owners, senior executives or employees of limited liability company/joint stock companies and 4.9 per cent indicated that they were state workers or civil servants.

Table 9: Type of business of questionnaire respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Family Farming	230	63.0	63.0	63.0
	Cooperative	3	.8	.8	63.8
	Companionship	5	1.4	1.4	65.2
	Limited Liability Company	99	27.1	27.1	92.3
	Stock Company	6	1.6	1.6	94.0
	State Worker	18	4.9	4.9	98.9
	No answer	4	1.1	1.1	100.0
	Total	365	100.0	100.0	

Table 10 provides a generic picture of involvement in rapeseed production by the respondents. 159 respondents or 43.6 per cent of respondents were engaged in planting rapeseed or had

experience in planting rapeseed. Other 54.8 per cent or 200 respondents are in farming but does not plant rapeseed. Limited Liability Companies and Stock Companies are more engaged to rapeseed production compared to family farmers. 75.8 per cent of respondents who represented LLCs had planted rapeseed and 24.2 have not.

Table 10: Do you plant rapeseed?

		Yes		No		No answer	
		Count	Row N %	Count	Row N %	Count	Row N %
Q12 Type of business	Family Farming	68	29.6%	159	69.1%	3	1.3%
	Cooperative	1	33.3%	2	66.7%	0	0.0%
	Companionship	5	100.0%	0	0.0%	0	0.0%
	Limited Liability Company	75	75.8%	24	24.2%	0	0.0%
	Stock Company	5	83.3%	1	16.7%	0	0.0%
	State Worker	5	27.8%	10	55.6%	3	16.7%
	No answer	0	0.0%	4	100.0%	0	0.0%
	Total	159	43.6%	200	54.8%	6	1.6%

6.2 FINDINGS FROM QUESTIONNAIRES

Is rapeseed production profitable?

Based on open-ended question, 66.7 per cent of farmers who plant or had experience planting rapeseed answered that it was profitable for them to plant, 20.8 per cent further clarified that it was only profitable if the crop had grown. It is clear that rapeseed is a profitable cash crop, however, the profit was uncertain due to risks posed.

Table 11: Is planting rapeseed profitable?

		Yes		No		Don't know		Yes if it grows		No answer		Total	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Q17 Do you plant rapeseed?	Yes	106	66.7%	9	5.7%	3	1.9%	33	20.8%	8	5.0%	159	100.0%
	No	54	27.0%	35	17.5%	20	10.0%	4	2.0%	87	43.5%	200	100.0%
	No answer	0	0.0%	0	0.0%	1	16.7%	0	0.0%	5	83.3%	6	100.0%
	Total	160	43.8%	44	12.1%	24	6.6%	37	10.1%	100	27.4%	365	100.0%

How farmers see impacts of rapeseed production?

The questionnaire asked an opinion on how rapeseed may affect farmers in four areas - on their living, the province, the local environment and the status of national food security.

1. *The impact on living of farmers:*

Almost half of all respondents 50.7 per cent felt a positive impact of rapeseed on farmers living, as it provides them with much needed cash. However, 11.0 per cent reported a negative impact, while 19.7 per cent did not answer and 11.2 per cent replied as “don’t know”. Large number of latter two hesitant types of responses (30.9 per cent) might indicate the unclear benefit to household farms. There was a division in opinion between farmers who did plant rapeseed and

those who did not. Naturally, smallholder farmers who were not engaged in rapeseed farming represented 43.9 per cent of respondents expressed that they had not seen an impact, did not know and didn't answer at all. Economic benefits of rapeseed is quite invisible in the family farming segment. Many farmers viewed rapeseeds as not suitable rotational crop with vegetables and potatoes. Those who plant rapeseed saw its benefit in the relatively low production cost compared to wheat and the easiness of selling and earning cash from field. Farmers expressed that rapeseed are mostly purchased by foreign traders (Chinese) without hassle with high price, while wheat has it's challenges. National flour companies complain about the quality and often tries to reduce price. State subsidies on wheat takes long period, often over a year after claim.

Table 12: Effect of rapeseed in your living

		Positive impact		Negative impact		No impact		Don't know		No answer		Total	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Type of business	Family Farming	96	41.7%	33	14.3%	20	8.7%	35	15.2%	46	20.0%	230	100.0%
	Cooperative	3	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	100.0%
	Companionship	5	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	5	100.0%
	Limited Liability Company	68	68.7%	5	5.1%	7	7.1%	5	5.1%	14	14.1%	99	100.0%
	Stock Company	4	66.7%	0	0.0%	0	0.0%	1	16.7%	1	16.7%	6	100.0%
	State Worker	8	44.4%	1	5.6%	0	0.0%	0	0.0%	9	50.0%	18	100.0%
	No answer	1	25.0%	1	25.0%	0	0.0%	0	0.0%	2	50.0%	4	100.0%
	Total	185	50.7%	40	11.0%	27	7.4%	41	11.2%	72	19.7%	365	100.0%

2. *The Impact on Province:*

The impact on province was assessed by respondents as follows: 23.8 per cent saw a positive impact, 19.2 per cent a negative, 21.1 per cent indicated no impact, 14.2 per cent didn't know and 21.6 per cent skipped the answer to the question at all. Farmer's responses were divided into two opposing issues. On one side, the rapeseed production was helpful in providing income/cash to farmers, on the other hand, the impact on soil fertility was viewed by them as controversial. The reason for negative answers may be explained by the widespread opinion that rapeseed was useful only as a cash crop that offers quick and easy profit to foreign investors. There is a perception that foreigners are not concerned about the host country and, thus, are not likely to support social and economic issues of local population. The hidden involvement of Chinese investors who often obtain cropland through a partnership and in names of local Mongolian residents and exports the harvest to China is generally viewed negatively.

Table 13: Effect of rapeseed in your province

		Positive impact		negative impact		No impact		Don't know		No answer		Total	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Type of business	Family Farming	49	21.3%	55	23.9%	36	15.7%	42	18.3%	48	20.9%	230	100.0%
	Cooperative	2	66.7%	0	0.0%	1	33.3%	0	0.0%	0	0.0%	3	100.0%
	Companionship	3	60.0%	0	0.0%	0	0.0%	1	20.0%	1	20.0%	5	100.0%
	Limited Liability Company	28	28.3%	12	12.1%	40	40.4%	7	7.1%	12	12.1%	99	100.0%
	Stock Company	2	33.3%	0	0.0%	0	0.0%	1	16.7%	3	50.0%	6	100.0%
	State Worker	2	11.1%	2	11.1%	0	0.0%	1	5.6%	13	72.2%	18	100.0%
	No answer	1	25.0%	1	25.0%	0	0.0%	0	0.0%	2	50.0%	4	100.0%
	Total	87	23.8%	70	19.2%	77	21.1%	52	14.2%	79	21.6%	365	100.0%

3. The impact on environment:

It is interesting that more than half of respondents or 52.3 per cent viewed negatively the impact of rapeseed on environment, while 21.6 per cent identified it as having no impact and only 6.0 per cent thought that rapeseed has a beneficial impact on environment. Further, 8.8 per cent “didn’t know”. Out of 191, 142 family farmers indicated a negative impact on environment. Their key concern was that rapeseed loosens soil and over repetitive years of planting it reduces the soil fertility. This perception by the majority was also supported by the widespread opinion that rapeseed farmers are looking for cash and, thus, do not care about the status of environment. These views are held in absence of a comprehensive policy on environmental protection in agriculture sector, and the lack of studies on impacts of rapeseed on soil. Farmers complained that no evidence-based research on rapeseed impacts were available to them and that they were not aware of any techniques for soil protection when planting cash crops.

Table 14: Effect of rapeseed on environment

		Positive impact		negative impact		No impact		Don't know		No answer		Total	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Family Farming		12	5.2%	142	61.7%	35	15.2%	21	9.1%	20	8.7%	230	100.0%
Cooperative		0	0.0%	0	0.0%	2	66.7%	1	33.3%	0	0.0%	3	100.0%
Companionship		0	0.0%	1	20.0%	3	60.0%	0	0.0%	1	20.0%	5	100.0%
Limited Liability Company		8	8.1%	41	41.4%	34	34.3%	10	10.1%	6	6.1%	99	100.0%
Stock Company		1	16.7%	1	16.7%	2	33.3%	0	0.0%	2	33.3%	6	100.0%
State Worker		1	5.6%	5	27.8%	2	11.1%	0	0.0%	10	55.6%	18	100.0%

No answer	0	0.0%	1	25.0%	1	25.0%	0	0.0%	2	50.0%	4	100.0%
Total	22	6.0%	191	52.3%	79	21.6%	32	8.8%	41	11.2%	365	100.0%

4. The Impact on National Food Security

A significant number of respondents or 39.2 per cent reported that rapeseed has a negative impact on national food security, while 17.0 per cent identified no impact and only 13.7 per cent saw a positive impact of rapeseed on food security. It is interesting that those who indicated beneficial impact cited the existence of a rapeseed cooking oil produced in Mongolia that could be a helpful product to meet domestic need for cooking oil. However, most farmers hold an opinion that over the years planting export-oriented cash crop will negatively affect the wheat production and consequently would pose a risk to national food security. Since wheat is a staple crop in Mongolia, an increase in rapeseed fields would threatens the domestic supply of flour. In contrast to small-scale farmers, 28.3 per cent of limited liability companies failed to see an impact of rapeseed on food security. This may be explained by the fact that the large-scale agri-businesses felt that their operation was not significant enough to induce a serious threat to food security at national level. Additionally, they may not be willing to acknowledge the threat from rapeseed due to their vested interest. In terms of food security, smaller farmers tend to see that their livelihoods is threatened if the soil is degraded. Unattended and unharvested premature rapeseed fields are often left, herders and farmers complained that livestock enters fields, over grazed livestock in rapeseed fields gets poisoned.

Table 15: Effect of rapeseed on national food security

	Positive impact		negative impact		No impact		Don't know		No answer		Total	
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Family Farming	28	12.2%	97	42.2%	31	13.5%	40	17.4%	34	14.8%	230	100.0%
Cooperative	0	0.0%	2	66.7%	0	0.0%	1	33.3%	0	0.0%	3	100.0%
Companionship	1	20.0%	3	60.0%	0	0.0%	0	0.0%	1	20.0%	5	100.0%
Limited Liability Company	17	17.2%	35	35.4%	28	28.3%	11	11.1%	8	8.1%	99	100.0%
Stock Company	2	33.3%	1	16.7%	1	16.7%	0	0.0%	2	33.3%	6	100.0%
State Worker	2	11.1%	4	22.2%	1	5.6%	1	5.6%	10	55.6%	18	100.0%
No answer	0	0.0%	1	25.0%	1	25.0%	0	0.0%	2	50.0%	4	100.0%
Column Total	50	13.7%	143	39.2%	62	17.0%	53	14.5%	57	15.6%	365	100.0%

5. How farmers see the risks for the rapeseed production

The overwhelming majority (74.4 per cent) of respondents identified the top three risk for the production of rapeseed that are associated with climatic uncertainties. These included drought (84.6 per cent), hail (16.5 per cent) and early snowfall (18.7 per cent) (**Table 16**). This year Mongolia had experienced a drought throughout the country that affected the major crop producing regions. Farmers complained about effects of drought and highlighted the need for mitigation measures such as support for irrigated farming and improvement in weather forecasts.

Following the climatic risks, market price fluctuations of rapeseed was seen as the next high risk. Rapeseeds doesn't have a set price as foreign traders comes and buys with cash. Price of

rapeseeds fluctuates from year to year and from early harvesting season to end of harvests. All depends on demand and supply, so no price regulations making farmers difficult to estimate cost and profit.

Also planting without sales forecasts are expressed by farmers. Farmers tend to plant what was in high demand in previous year or in spring, this cause over supply or shortage of crops thus causing price fluctuations.

Although 9.3 per cent of farmers did hold a view that climate was unsuitable for rapeseed cultivation in Mongolia, there were views expressed that perhaps, with appropriate technology the risks could be avoided. Lack of appropriate machineries and agricultural inputs poses risks of pests and uneven growth and harvest of rapeseeds. Without clear origin of seed farmers does not know the length of maturity of uncertain varieties, which may expose to early snowfall.

Farmers see that there are lack of agricultural professionals working in relevant decision making and local authorities. This poses poor assessment and implementation of agricultural issues. No comprehensive agricultural methods for rapeseed in some part perceived as lack of professionals. There are still room for new knowledge and experience to be gained from rapeseed production. It is only expanding in last decades due to increase in export demand.

Other notable risks consist of livestock entering in rapeseed fields. It is due to Mongolia's free range livestock grazing tradition and overall increase in livestock numbers putting pressure on pasture capacity.

Table 16: Key risks of rapeseed

Risks		Responses		Percent of Cases
		N	Percent	
	Q19.1 Drought	154	52.6%	84.6%
	Q19.2 Early snow fall	34	11.6%	18.7%
	Q19.3 Hail	30	10.2%	16.5%
	Q19.4 Market price	19	6.5%	10.4%
	Q19. 5 Livestock entering field	2	0.7%	1.1%
	Q19.6 Unsuitable climate	17	5.8%	9.3%
	Q19.7 No access to suitable plant protection chemicals and fertilizers	1	0.3%	0.5%
	Q19.8 No rapeseed planting experience	2	0.7%	1.1%
	Q19.9 No suitable machineries	9	3.1%	4.9%
	Q19.10 Plants without sales forecast	3	1.0%	1.6%
	Q19.11 No professionals working in the sector	2	0.7%	1.1%
	Q19.12 Pests	1	0.3%	0.5%
	Q19.13 Inappropriate planting method	9	3.1%	4.9%
	Q19.14 Uncertain seed quality	6	2.0%	3.3%
	Q19.15 No answer	4	1.4%	2.2%
Total		293	100.0%	161.0%

a. Dichotomy group tabulated at value 1.

5.1 Risk of drought

38.1 per cent of the total respondents had some sort of irrigation system, out of which the majority were family farmers (76.3 per cent) who often have small wells sufficient to irrigate only smaller lots of land for vegetable growing. It is important to note that 83 per cent of rapeseed

planting farmers or 132 respondents out of 159 respondents who plant rapeseed viewed that drought was their biggest risk.(see **Table 17**).

Table 17: Drought impacts on rapeseed production

		Do you plant rapeseed?		
		Yes	No	No answer
		Count	Count	Count
Key risks: Drought	No	27	180	4
	Drought	132	20	2

There is lack of irrigation facilities for larger fields (see **Table 18**). Only 19.4 per cent of private sector entities responded that they irrigate their fields. Irrigation poses high cost.

Table 18: Businesses with irrigation

		Machineries: Irrigation system					
		No	Irrigation system		Total		
		Count	Column N %	Count	Column N %	Count	Column N %
Type of business	Family Farming	124	54.9%	106	76.3%	230	63.0%
	Cooperative	1	0.4%	2	1.4%	3	0.8%
	Companionship	4	1.8%	1	0.7%	5	1.4%
	Limited Liability Company	77	34.1%	22	15.8%	99	27.1%
	Stock Company	4	1.8%	2	1.4%	6	1.6%
	State Worker	12	5.3%	6	4.3%	18	4.9%
	No answer	4	1.8%	0	0.0%	4	1.1%
	Total	226	100.0%	139	100.0%	365	100.0%

It is striking that only 6.8 per cent or 25 farmers who plant rapeseed answered that they irrigate their rapeseed (see **Table 19**). It means that overwhelming majority of rapeseed farmers can't irrigate and, thus, are vulnerable to heat and droughts.

Table 19: Irrigated rapeseed production

		Do you irrigate rapeseed						
		Yes	No		No answer		Total	
		Count	Row N %	Count	Row N %	Count	Count	Row N %
Type of business	Family Farming	10	4.3%	64	27.8%	156	230	100.0%
	Cooperative	0	0.0%	1	33.3%	2	3	100.0%
	Companionship	1	20.0%	4	80.0%	0	5	100.0%
	Limited Liability Company	10	10.1%	67	67.7%	22	99	100.0%
	Stock Company	2	33.3%	3	50.0%	1	6	100.0%
	State Worker	2	11.1%	2	11.1%	14	18	100.0%
	No answer	0	0.0%	0	0.0%	4	4	100.0%

Total	25	6.8%	141	38.6%	199	54.5%	365	100.0%
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This year's dry summer put at risk the majority of farmers who responded that drought was the key risk in agriculture and particularly for rapeseed. An increase in irrigated crop farming was recommended by the farmers as the essential and urgent matter.

5.2 State policy on rapeseeds

The views of farmers on the national policy on the question of "How would you rate state policy on rapeseed?" almost half or 48.8 per cent of the respondents assessed the state policy as weak or non-existent, and 17.5 per cent answered as of average quality. It is notable that only 4.4 per cent of them identified it as a strong policy. Yet, significant number of respondents or 21.1 per cent replied that they are not aware of existence of a policy nor felt confident to give a rating (see **Table 20**).

Table 20: Rating state policy on rapeseed

		Frequency	Percent	Valid Percent	Cumulative Percent
Ratings:	Weak	178	48.8	48.8	48.8
	Average	64	17.5	17.5	66.3
	Strong	16	4.4	4.4	70.7
	I don't know	77	21.1	21.1	91.8
	No answer	30	8.2	8.2	100.0
	Total	365	100.0	100.0	

Those who indicated as weak state policy further stated that there is limited information available, no financial support, limited or no environment to support small and medium enterprises, banks requiring high collateral and allowing people to plant rapeseed only for profit were the reasons. While only 4.4 per cent indicated strong rapeseed policy because they saw that state policy on recommending to limit rapeseeds as rotational purpose.

Table 21 illustrates a summary of top 15 policy suggestions ranked by all respondents and by two groups of farmers – those who grow the rapeseed and those who do not.

There are common policy areas shared by all respondents including both groups of farmers. Both groups shared the view that policy measures should promote the rapeseed as a rotational crop that requires a regulation to impose a maximum of 30 per cent limit on the land allocated for it. As all farmers were concerned about exportation of raw rapeseed, both groups supported the domestic production of value added products. It was the second top priority policy suggestion.

However, there were important differences between the two groups in their views of relevant agricultural policies.

The farmers who are engaged in the rapeseed planting have defined the improvement in the origin of seed and monitoring measures as a critical issue (29.3 per cent). It is not surprising that they also would like to get rapeseed agricultural method developed (30.6 per cent) and support the rapeseed in the similar ways as the production of wheat (22.3 per cent). They would like to see improved policies for promoting seed market, supply of appropriate machineries and introduction of specific measures for soil and plant protection. Indeed, they were interested in research, studies and information sharing that would greatly assist them in improving the production cycle of

rapeseed. The policy measures aimed at reduction, limiting and banning the rapeseed in Mongolia were not supported by this group of farmers.

In contrast, non-rapeseed farmers suggested to monitor the size of rapeseed plantations. They favored stricter regulation of rapeseed by establishing special designated zones that would separate the rapeseed fields from vegetables and potatoes fields (18.6 per cent) or reducing the overall plantation of rapeseed while planting more wheat and vegetables (12.8 per cent) and improve state monitoring of rapeseed plantations (11.6 per cent). Many vegetable farmers saw that it is invasive crop and nearby rapeseed fields are affecting their crops. Particularly, plant protection chemicals used in rapeseeds have bad effect on vegetables, rapeseeds from unharvested field or spilled from inappropriate harvesting machineries are re-growing or entering nearby fields.

Almost ten per cent of these farmers support the idea of banning rapeseed at all. The negative attitude is expressed also in their view that rapeseed is a threat to pastures therefore the pastureland should not turn into rapeseed plantations. Farmers concerned about the negative impact of rapeseeds on soil, short-term investors might degrade the soil by repetitive years of planting and moving to other fields.

Other policy suggesting were to increase collaboration between beekeepers and rapeseed producers, support agricultural innovation centers, introduce crop insurance, improve operations of agricultural fund for wheat and develop comprehensive crop law.

Table 21: Most policy suggestions received from total questionnaire respondents (total responses, those who plant and those who do not plant rapeseed)

	Policy suggestions	Total respondents	Do plant(ed) rapeseed	Do Not Plant rapeseed
1.	Regulate rapeseed only for rotational purposes and limit the land size for up to 30 per cent of the field	28.5%	32.5%	25.6%
2.	Produce value added product locally	26.7%	28.7%	25.6%
3.	Improve monitoring and origin of seeds	18.9%	29.3%	8.7%
4.	Develop agricultural method (agro technology)	18.0%	30.6%	5.8%
5.	Regulate plant rapeseed as a rotational crop only	16.5%	22.9%	10.5%
6.	Support knowledge generation and information sharing regarding rapeseed production	13.8%	16.6%	11.6%
7.	Conduct rapeseed variety tests	12.6%	21.0%	
8.	Provide same supportive policy as wheat production, e.g provide inputs or fuel as seasonal loan	12.0%	22.3%	
9.	Create rapeseed market both locally and export	11.7%	19.7%	4.7%
10.	Improve and conduct scientific researches on rapeseed	11.4%	15.3%	
11.	Supply appropriate agricultural machineries for	10.8%	20.4 %	

	rapeseed			
12.	Designate a rapeseed planting region / zone	10.5%		18.6%
13.	Undertake comprehensive policy to increase soil fertility	9.9%	6.4%	12.8%
14.	Improve state monitoring on rapeseed plantations, amount of planting.	9.0%	6.4%	11.6%
15.	Plant more wheat and vegetables, improve its policies and reduce rapeseed plantation	9.0%		12.8%
16.	Make available appropriate plant protection chemicals and fertilizers		8.3%	
17.	Support wheat sales		7.0%	4.7%
18.	Introduce alternative rotational crops suitable for national food security		7.0%	
19.	Improve supply of high quality, affordable plant protection chemicals and provide subsidies		6.4%	
20.	Introduce productive agricultural machineries with full after sales services		6.4%	
21.	Banning rapeseed			9.9%
22.	Halt turning pasture land into rapeseed plantations			8.1%
23.	Reduce rapeseed planting			8.1%
24.	Coordinate conflict resolution between farmers and herders			6.4%
25.	Reduce domination of large corporations in agriculture			4.7%

RECOMMENDATIONS:

Above table illustrates the policy suggestions for rapeseed from those farmers who plant and those who do not plant rapeseed. Following are the key recommendations from responses to the questionnaire with most responses.

1. Planting rapeseed should be **only for rotational purposes. Agricultural policy should not allow it to dominate crop fields**, preferably with limit up to 30 per cent for per crop field
2. Although farmers produced rapeseeds and exported as raw material to China, they pointed out that processing or creation of **value added product production** is necessary. Investments in creating processing factories in Mongolia are needed.
3. **Uncertain varieties** of rapeseed sold in the market put farmers at higher risk. Farmers were not able to distinguish between edible and nonedible varieties being planted as the only criteria available to them was the color of seeds, yellow and black/brown/. Improvements in defining the origin of seeds and varieties is needed.
4. Most farmers do not follow **proper planting methods** (agro-technology) during rapeseed cultivation. A comprehensive system of planting rapeseed is missing, therefore state policy should direct towards development of the rapeseed methodology that is adapted to the country's specific conditions.

5. **Limited information and knowledge about rapeseed is available to farmers.** The majority of farmers don't get any information or knowledge on rapeseed, particularly with regards to the impact on soil after repetitive planting.
6. **Lack of research on conducting variety testing** and registration of varieties that are suitable for Mongolia's agro-ecological conditions is an impediment for increasing the harvest and profitability of this cash crop
7. **Support from state on planting rapeseed is needed**, similar to what is available for wheat production. Farmers need incentives and flexible payments methods for supply of agricultural inputs
8. **Create market for raw materials**, similar to the creation of value added production. In addition policy should include supporting for trade facilitation of local and export sales.
9. **Scientific or evidence based research and studies** are lacking. Agricultural policy on rapeseeds should include a comprehensive approach on planting, variety testing, machinery, require research on the rapeseed impact on soil, plant protection chemicals and other components
10. **Introducing appropriate machineries** for rapeseed planting and harvesting is needed. The machineries that are suitable for Mongolia's conditions should be made available. The use of wheat machineries to plant and harvest rapeseeds causes spillage of seeds. This introduction will help to decrease massive losses and regrowth of rapeseed on crop fields.
11. Some farmers suggested that there should be a **designated region for planting cash crops** that would help to monitor the impact on soil fertility. Policy should require an assessment of soil and other agro-environmental concerns when selecting a region for cash crops.
12. State agricultural policy should adopt specific actions to address **comprehensive policy for protecting soil from erosion and increasing its fertility**.
13. **Improvement of monitoring is needed with regards to agricultural land**, particularly monitoring the use of the land and the share of rapeseed plantations. Land is state owned property in Mongolia when the licenses are given to entities for large-scale agricultural production. The State need to improve monitoring of use of agricultural land, what crops are being planted and potential impact on soil fertility.
14. **Support to production of wheat, vegetables and other food crops.** Buckwheat can be used for rotation incentives, taxation, flexible payments systems for agricultural inputs are proposed.
15. **State policy should focus towards reduction in rapeseed plantations.** Strengthened support should be provided for the existing mechanism for wheat sector instead of cash crops. The provision of subsidies to wheat producers must be provided on time and the flour producers should not delay payments farmers.

CONCLUSION

State policy needs to focus on creating a productive crop farming system with effective irrigation to bear the climatic risks. As a cash crop, rapeseed provides much needed cash to farmers but there is a room for improvements. Comprehensive research should be carried out with focus on development of appropriate agricultural methods, variety testing, as well as studies on the impact of rapeseed on agricultural land, on livestock and creating sustainable market for promoting value added products.

There were common policy suggestions raised by all types of farmers, however, there were differences in specific policy suggestions from those who plant rapeseed and those who do not plant rapeseed. As the majority of farmers agreed that national policy environment was weak, it is clear that different types of farmers (vegetable, wheat, rapeseed or who plant both) require tailored state interventions that should be formulated on the basis of thorough needs assessment.

7. FINDINGS FROM FOCUS GROUP DISCUSSION AND SEMI-STRUCTURED INTERVIEWS

Three Focus Group Discussions, were held at major crop farming regions, each discussion involved 6-8 participants and lasted 40 to 60 minutes. Participants were posed with directing questions (**annex 2**). In depth interviews were conducted with sectorial professionals, including senior officers from central and local public offices, leading researchers and academics in the agricultural sector, private sector and non-governmental organizations. Sample questionnaire is available (**annex 2**).

Specialists widely considered rapeseed was seen as suitable crop for Mongolia's agro-climatic condition as it matured between 90 to 100 days and had a low production cost. However, banks were hesitant to provide loans to crop farmers as they saw the sector was too risky. Farmers started growing rapeseed with no loans and financial support but mainly because they had agricultural land and generic machineries. A crucial factor for farmer's decision to cultivate rapeseed was availability of cash immediately after harvesting. It was profitable to grow rapeseed also because Chinese traders purchased directly from the field with cash, while wheat sales had challenges in selling to cash poor national and local processing /flour/ companies. The payments for wheat were always delayed that further indebted farmers and worsened their financial situation.

Farmers: Despite of the common agreement among farmers that rapeseed was a profitable crop for rotation, there are two contradicting interests among crop farmers: on one hand, they would like to continue producing wheat, on other hand, they need cash.

In addition to financial challenges, smallholders experience difficulties in accessing more fertile land, as the most agricultural land available to them is less fertile and lacks water sources for irrigation.

Gender Issues: There is a limited involvement of women farmers in the rapeseed production. Most of women farmers are smallholders engaged in vegetable sector. They run family and small cooperative farms that were heavily dependent on cash flow. Women farmers faced additional challenges. Their farms were generally smaller, had fewer machinery and heavily relied on the labour of children. As many women have more workload of domestic responsibilities they have less time for learning and obtaining information about rapeseed production, sales and export procedures. Similarly to all small-scale farmers who participated in this research, women farmers are interested in rapeseed production but with no gender sensitive support they could not benefit from this opportunity.

Farmers need trainings and evidence based information and knowledge on agricultural method of rapeseed cultivation (agro-technology). For example, field trainings should be organized for farmers that would provide them with technical advice about use of plant protection chemicals that are suitable for different varieties of rapeseed sold in the market.

There is no sustained, consistent agricultural state policy as it changes after every election cycle of four years. This brings inconsistent support to the crops, vegetables including rapeseed sector. Agricultural or food security policies towards smallholders needs to be consistent and continue the progressive examples of policies. Smallholder farmers stressed the need for a cohesive national policy with focus on creating small entities with intensive/productive agriculture in the future.

Another significant problem is the lack of public involvement in monitoring of rural and agricultural development projects and programmes implemented in Mongolia. Policymakers are not accountable to people and tend to work for personal gains. Farmers were concerned about

widespread corruption. Smallholders are not able to get irrigable land or machineries from state open tender or leasing.

Research: As Mongolia lacks evidence based policymaking, farmers and agricultural specialists emphasized the need for a sound scientific research that should inform the formulation of national and sectorial policies on rapeseed.

Existing agricultural extension centers should be supported to undertake research on rapeseed variety testing, their impact on soil with a view of developing technical guidance and policy regulations. Also, studies for production of value added products such as rapeseed cooking oil, feed and biofuels should be carried out. Farmers view that raw materials should be value added locally.

A thorough research of varieties and large scale testing should be carried out to facilitate registration of suitable varieties for Mongolia's agro-ecological conditions.

Seed: The issue of seeds is another important challenge that require urgent attention of decision makers. The lack of a set seed policy on rapeseed causes major problem as farmers don't know the origin, the name of rapeseed variety, whether the variety is tolerant to drought and the potential yield. The commonly sold seeds are imported with no certificate of origin. The selection of seeds is limited and expensive. A system for local production of seeds would benefit farmers, so cheaper, registered rapeseed varieties that are suitable for Mongolia's agro-climatic conditions will be available. In addition, a local seed production system would create seed stock of registered varieties.

A combination of many factors cited above (lack of comprehensive seed policy, improper agricultural method, including poor land cultivation, poor irrigation and lack of fertilizer application) cause low harvest and soil degradation. Violations by farmers of rules and regulations adds to the risks.

Machineries: There should be a study offering technical advice on modification of existing wheat machineries so that farmers can use in rotational planting of other crops such as rapeseed. High level of rapeseed waste in field, re-growing of spilled rapeseeds in crop fields threatens wheat production and has negative impact on National Food Security. Similarly to the Third Virgin Land (ATAR-3) from 2008 to 2010, campaign that supported farmers to renew their machineries, the agricultural policy reform should support the renovation of machineries and agro-technology to support the growing demand from the rapeseed sector. Moreover, similar national campaigns must continue with creating animal feed factories, improving soil conditions and promoting intensive farming. There should be a policy to support introduction of small-scale machineries for rapeseed with reasonable prices and credit schemes. Some agricultural machineries are not suitable for Mongolia's agro-ecological conditions. For example, Chinese machineries have low quality while Russian spare parts are cheaper, easier to obtain and more suitable for Mongolia.

Livestock and crop fields: Increased number of livestock causes pasture and soil degradation that contributes to the rapid desertification in Mongolia. In addition, the health of livestock has become a growing concern. Rapeseed, on one side, competes with pasture; on the other side, livestock gets poisoned grazing on its fields. If managed well the rapeseed sector can help to support the feed sector. Both sectors could be beneficial to each other. Therefore, a comprehensive policy for cropland and pasture, licensing of land and practical measures for soil protection can improve the quality of cropland and pasture.

However, it should be noted that there are positive developments in the newly adopted Agricultural Law with regards to pasture management. Non and Semi-pastoralist herders graze livestock at specific field away in crop fields. The legal protection of crops requires herders to keep livestock at least 500 meters away from fields. Farmers also shouldn't allow to grazing livestock in their fields (Parliament of Mongolia, 2016b).

Sectorial technical experts and key government specialists linked the issues of competition and conflict resolution between crop and livestock sectors with the strategic direction towards development of intensive farming in crop and livestock sectors of Mongolian agriculture. The policy support in this direction could start with separate zones for intensive livestock production and for crops.

Rotation: There is a need of a more supportive policy to develop rapeseed as a rotational crop. Comprehensive crop rotation plan is missing in Mongolia's agriculture sector. Current rotation cycle of fallow – wheat – fallow - potatoes is proved as not suitable. Agricultural methods should be improved by including calculations of required minerals for each type of crop taken from soil for each rotational cycle. Introduce and support planting perennial plants for livestock feed as rotational plan.

Rapeseed is seen by specialists as a suitable pre-wheat rotational crop, with strong roots that scuffles soil, collects nitrogen and brings moisture from deep soil and leaves large amount of green residue but according to the regulation, farmers must plant maximum 25 per cent of total field or set a limit of 20 to 30 per cent.

At the same time, there should be alternative policy measures other than restriction, such as improvements in monitoring during planting season or should not allow planting rapeseed in a new virgin land. Also improving incentives for wheat production, particularly provide wheat subsidies without delay. Support to smallholders is needed who have an interest in rapeseed production but facing difficulties in obtaining agricultural machineries, planting methods and know-how.

In addition, it would be helpful for Mongolia to conduct scientific research on other potential rotational crops, for example, buckwheat and provide similar support or subsidies as for wheat. Rotate crops that are suitable for national food security, for example, wheat – rapeseed - purple medic - rye. Rye is a very useful crop for health, but it does not receive state support. It is only wheat that is supported by the government. Additionally, the cultivation of leguminous plants and purple medic will be beneficial for the bee industry where some small holders also get side incomes. There is growing interest from farmers to plant these crops.

Phytosanitary and rotation requirements should be put in place. Noting the role of rapeseed in loosening soil, improving nitrogen cycle but it should not be planted repetitively for years. Specialists highlight that it should be cultivated only for rotational purpose so a rotational guide should be developed, to prescribe the preferred sequencing for rotation of rapeseed before wheat planting.

Private sector that works to make rapeseed a rotational crop faces high cost of imported seed. For crop farmers planting rapeseed is of secondary interest. Majority of farmers support planting more wheat but policies and implementation needs improvements.

Market and value added production: There is an opportunity to meet supply of domestic needs in rapeseed but there is no system for sustainable supply of raw material. Above mentioned barriers including lack of a comprehensive seed policy, under developed agricultural method and

financial challenges particularly investing in machineries for planting and harvesting rapeseed were cited by sectorial informants and focus group discussions.

The local market for rapeseed processed products is too small and requires significant investment for building a processing factory. Low demand and limited processing factories of raw rapeseeds in Mongolia causes exports to China. Therefore, sectorial policy must support national producers for value added production for domestic consumption and for export of these new products.

A competition from foreign traders who have stronger purchasing capacity causes difficulties for local producers, one or two factories currently in operation to compete. Farmers expressed that local rapeseed producers offer cheaper price compare to foreign traders who export as raw. Farmers needs support in coordination in sales of rapeseed, for example, contract with foreign traders in prior planting.

Local processors need to improve competitiveness by purchasing at reasonable prices from farmers and expanding value added production that includes building processing factories for crude extraction of rapeseed oil, producing cooking oil, or producing animal feed for chicken and pig farming in the crop production provinces. At the same time, this will require improving logistics of transporting the raw rapeseeds grown elsewhere. There is an opportunity for rural areas to develop crop farming, expand local brand and value added production to supply domestic need. This can be done with flexible no credit system and favorable investment policy in processing factories. Systematic, comprehensive policies are also needed in food production, i.e. to produce ecological, organic and healthy food.

At the moment, rapeseed's high price may offer a positive impact for business entities and much needed cash to farmers. But agricultural commodities price fluctuates based on demand and forecast. The vulnerability of farmers to market fluctuations increases with high risk of market price fluctuation. The biggest risk is that Mongolia is becoming a raw material supplier of China. There is no set price for rapeseed as foreign middlemen in autumn set their price varying year to year.

As there are no set rules and regulations on export, a study about export opportunities should be carried out. Such study should identify policy measures for facilitation of business relations between farmers and foreign buyers. The policy should provide customs incentives for importing seeds. Reducing customs taxes, free import seeds and export rapeseed products might help in development of the sector.

There are additional hindrances for producers in eastern region having to use complicated transport routes for exporting due to lack of local cargo ports with exporting capacity.

The lack of transparency of the import and export data of rapeseed can be a potential source for corruption of large scale. No systemic policy on exports, deficient customs regulations, can affect the agricultural commodities market's abilities for monitoring the sales of rapeseeds. Also, current lack of working relationships and monitoring between Customs records, State Inspection Agency and the Ministry of Food and Agriculture contribute to challenges of import/export of agricultural goods. Production of high quality product depend on the quality of seeds. Therefore seed standards should be put in place, accompanied with proper monitoring of seed standards and introduction of certificates of origin for imported seeds and genetically modified organisms (GMO) testing are required.

Risks: Climate risks are at highest during May to June period. Late spring in the month of May characterized by strong winds that reduce moisture in the upper soil to minimum, causing delay in rapeseed sprouting. This may cause immaturity in autumn and bring a risk of losing harvest in

early snowfall. The lack of irrigation combined with dependency of the yield on weather can significantly reduce the profit.

To protect farmers from risks, wheat and rapeseed production needs insurance from unfavorable weather conditions such as drought or hail. There are some insurance products available however, they have not attracted most farmers. To gain public trust insurance companies must pay indemnities. There should be a crop insurance with flexible payment options and designed based on a thorough research. Since the precipitation rates are uneven in a given region the design of weather-based insurance scheme should look into various aspects. Agriculture sector increasingly becoming vulnerable to risks as weather has become unpredictable and majority of farmers have no irrigation and insurance. Climate-smart agriculture must be developed, particularly on use of water, harvesting rainwater during dry periods, support irrigated agriculture in river diversification or building water reservoirs.

Rules and regulations, laws: There are certain rules and regulations concerning rapeseed in place. The Minister of Food and Agriculture signed an agreement with provincial governors to limit rapeseed production to 15 per cent of entity's and individuals' field which means nationally an area of 70,000 to 80,000 hectares. The Ministry of Food and Agriculture recognized the high risk of rapeseed and introduced this limit in attempt to minimize or avoid possible massive scale loss to the agricultural sector. Another goal is to restrict the proliferation of rapeseed as a cash crop in Mongolia and to promote wheat production.

Contrary to farmers, the key informants from the public sector held an opinion that sectorial policy does support the rapeseed planting at certain degree, but a comprehensive agricultural method and machineries suitable for Mongolia's agro-ecological conditions and skills training to farmers were lacking. The Ministry has provided recommendations to farmers, and around ten varieties have been currently in the state variety testing, however, again, due to the lack of a comprehensive agricultural method in place, the harvest remains low.

The priority should be given to supplying domestic needs while the export should be better controlled. The Law on Crop Farming does not restrict planting rapeseed as a rotational crop. However, a tendency for increase in rapeseed plantations, the state should remove licenses of those who violate the 15 per cent limit. There are no known cases of land confiscation.

Further, planting rapeseed to more than 20 per cent may lead to reduction in wheat production. At the provincial level there is a limit of 13 per cent but sub-provinces with large agricultural land set limit up to 20 per cent. In order to monitor the cash crop plantations, the implementation of laws and policies at all stages was important.

There were significant gaps in awareness of laws and policies by farmers and informants. Some respondents knew about existing rules and regulations, for example, the Law on Crop Farming and the State Policy for Agriculture for 2016 – 2025 and other document, while others did not know about them. This gap in knowledge can be explained by incoherent and confusing policies, or by poor access to information.

The private sector expressed the need for laws regulating the cultivation of rapeseed as a rotational crop. Specific supportive measures should be introduced. The Land Usage Law should specifically address the planting method, seed standard, fertilizer usage and export details of rapeseed. Also, it will be important to address measures for preventing potential conflict between pastoralist herders and crop farmers over pasture and water sources.

Overall, there is a fear that rapeseed production over 40 per cent of total fields will threaten food security in Mongolia. A number of key recommendations were proposed by the participants of the study, as following:

- State should restrict rapeseed for rotational purpose only, issue licenses and permits and provide guidance for planting rapeseed.
- A comprehensive soil protection policy should require all crop farmers to implement mandatory soil management measures to restore the soil nutrients after rapeseed. There should be a robust monitoring of soil management by farmers.
- There should be supportive measures for the planting and sales of rapeseed, including support in provision of affordable machineries for farmers.
- At the same time, all respondents and key informants stressed the importance of improvements in the implementation of the wheat policy, particularly; the supply of agricultural inputs and wheat payments should not be delayed. An independent laboratories recognized by both farmers and flour companies are needed to undertake quality control. Progress in wheat policy implementation would be a crucial to turn farmers to the wheat production and put rapeseed as the rotational crop only.
- On contrary, private and non-governmental sector was critical of current policies that do not provide adequate support to the production of rapeseed. The governmental regulation restricting the size of fields for rapeseed also leaves no room to develop a business. They also raised the lack of monitoring of seed quality imported from China.
- The governance reform is crucial. Government investment, foreign funding and aid, projects and programmes should be transparent and be spent wisely.
- Strengthening the accountability and monitoring in the sector were identified as the urgent need.
- Reduce corruption and close monitoring of the decisions made in the sector are needed. Public involvement in planning, implementation and monitoring are needed.
- The Food and Agriculture Ministry should employ experienced agricultural professionals and involve experienced older generation in policymaking. There should be a policy for retaining agricultural professionals working in the sector. This explains the high turnover of technical staff of the agricultural departments in government units.

Employment: Rapeseed production will not create a significant number of new jobs as crop farmers/entities have their regular workers. However, there is an opportunity for unemployed people to perform seasonal work such as packing, cleaning, processing or protecting rapeseed fields from livestock entering.

8. CONCLUSIONS

This research looked into policies on rapeseed production in Mongolia. It looked into policy options from farmers. Majority respondents were concerned with lack of a coherent national policy as there was a mixed understanding whether state promotes or restricts the rapeseed production. Without wide distribution of policy information there are confusions among farmers. If the state aims to promote it as a rotational crop there should be more specific supportive policies.

There is lack of research on impacts of rapeseed on soil as well as on agro-technology including varieties testing, planting/harvesting method, use of plant protection chemicals and fertilizers on rapeseed and appropriate agricultural machinery for rapeseed production. Besides of exporting raw rapeseed, supportive policies towards developing value added production and support in creating market for rapeseed oil products is essential.

Rapeseed is a profitable to plant in large-scale with a little opportunity for small-scale farmers to participate in its production. Majority of vegetable farmers were concerned about negative impacts of rapeseed on soil. Additionally, there is a growing conflict between livestock herders and farmers, particularly on issues of competing pasture and cropland.

Indeed, there is a room for improvements in the implementation of the existing national policy on strategic food crops particularly regulations for wheat subsidies including agricultural inputs, payments and quality control. Farmers were not satisfied with operation of wheat support mechanisms, which forced them to plant more cash crops like rapeseed.

9. RECOMMENDATIONS

Following are the key recommendations that were derived from the survey of farmers in rapeseed planting regions and key informants.

1. Growing rapeseed should be only for rotational purposes. A policy should not allow it to dominate crop fields, preferably with limit up to 30 per cent for per crop field
2. Domestic processing of rapeseed value added products should be developed and investments in creating processing factories are needed.
3. National seed system should be created that would ensure supply of high quality, high yield, tolerant to harsh climatic conditions of Mongolia.
4. Appropriate planting methods (agro-technology) for rapeseed cultivation should be developed and introduced to farmers.
5. Sufficient technical information and knowledge should be made available to farmers. They should be trained on technology, machinery, plant and soil protection
6. In depth research on rapeseed variety testing and registration of varieties that are suitable for Mongolia's agro-ecological conditions should be carried out.
7. Government support for rapeseed cultivation should be formulated and implemented, similar to subsidies, flexible payment schemes for agricultural inputs incentives provided for the wheat production.
8. Create market for raw rapeseed materials, similar to the creation of value added production. In addition, specific policy measures should include support for trade, facilitation of local and export sales of rapeseed.
9. Scientific research and studies should be undertaken to ensure evidence based policymaking. Agricultural policy on rapeseeds need to include comprehensive approach on planting, variety testing, machineries, impacts on soil, plant protection chemicals and other relevant components, for example, the role of foreign investment and demand from China for rapeseed; the impact of soil and water sources from rapeseeds...etc.
10. Introduction of appropriate machineries for rapeseed planting and harvesting are needed. The machineries must be suitable for Mongolia's conditions and be affordable to farmers.

11. Develop viable monitoring and assessment systems for soil, water and other agro-environmental concerns in cash crop plantations. Study the need for a designated region for planting cash crops.
12. National agriculture policy should include specific measures to increase soil fertility and protect the soil fertility.
13. Improve the state regulatory and monitoring mechanism with regards to agricultural land, particularly the monitoring the share of rapeseed plantations.
14. Support for planting more wheat, vegetables and other food crops, for rotational system through incentives, taxation, and flexible payment schemes for agricultural inputs.

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11. ANNEX I: RESEARCH METHOD

The new trend in demand of cash crops such as rapeseed may have positive or negative impact on local communities. Research looks at crops farmers including family vegetable farmers, small cooperatives and larger entities who are interested in production of cash crops. Policy research looks in to long-term, sustainable development agenda whether and how it will contribute to national economy.

Key Research Questions:

- How has the production of export-oriented rapeseed affected local farmers in Mongolia?
- What are policy options for achieving food security in country?

Sampling

Mongolia has twenty-one provinces, with three key crop production provinces, Selenge, Tuv and Darkhan-Uul. All are centrally located. Total 364 farmers were interviewed in three key crop production provinces, Selenge, Tuv and Darkhan-Uul (*Annex 2*).

Table 22: Farmer households in respective provinces

Province	Number farmer households
Darkhan	957
Selenge	4022
Tuv	1850
TOTAL	6829

*there were total 6829 farmer households at selected provinces in 2016 (NSO, 2017b), with 95 per cent confidence level, five per cent confidence interval, the sample size is 364 (CRS, 2017). These were registered farmers, with now no official statistical data on migrant or non-resident farmers, Ulaanbaatar city's residents may run farming business in nearby provinces.

- I. **Focus group discussion** were held with groups of farmers (*Annex 2*). One focus group discussion was held in each province, a total of three focus group discussions. Each focus group interview consisted of randomly selected small-scale farmers of six to eight participants. Thus, a total of 18 to 24 informants participated in the three focus group discussions.

This focus groups discussion aimed to identify the effects of rapeseed production on community of farmers and provide a depth of information/data to complement the survey. FGDs included both women and men farmers, gender ratio was as equal as possible. Women and men have different household tasks in a traditional household setting, where women are likely to spend more hours in household chores and may lack ability to attend the FGD. Thus interviews were scheduled and organized in close locations to ensure women's participation. FGDs were moderated to allow equal participation for all to express their views and reduce possible domination by anyone (Bryman 2012).

- I. **An individual interviews in a semi-structured** design were conducted with ten sectorial experts on agriculture. These interviews allowed collection of qualitative data that took into account specifics of each context and check the consistency of general questionnaire responses, focus group discussions. They also provided a valuable insights into influencing factors. A set of guiding open-ended questions was prepared (*Annex 2*). Open-ended questions were posed, and based on responses, further elaboration was sought as needed.

Ethical considerations

All contributions are kept confidential and anonymous. All participants were informed about confidentiality and consent was taken prior to all interviews/focus group discussions. Focus-group discussion and semi-structured interview participants were informed of audio recording for research purposes and assured that materials will not be shared with others.

12. ANNEX II: RESEARCH INSTRUMENTS

Sample questionnaires /draft/ for farmers. Approximately 364 crop, vegetable farmers.

1.1 Sample Questionnaires

Thank you for your participation in this short questionnaire. This questionnaire is part of a study on policy-oriented research on small-scale holders in relation to rapeseed production in Mongolia.

Personal data for reference:

- 1) Age:
- 2) Gender:
- 3) Head of the household:
 - 3.1) If not what is your relationship:
- 4) Education / profession:
- 5) Province:
- 6) Sub-province:
- 7) Bagh/District:
- 8) Family size:
- 9) What is your main (50% or above income) type of business:
 - 1.3 Wheat farming
 - 1.4 Potato farming
 - 1.5 Vegetable farming
 - 1.6 Rapeseed /oil crops/
 - 1.7 Herding
 - 1.8 Other.....
- 10) Do you have formal employment?

- 11.1) If not the household head, what is the employment status of the household head?

Please tick appropriate line for your response:

- 11) What is your farming experience?
 - ☐ New (less than 5 years)
 - ☐ Average (5 to 10 years)
 - ☐ Experienced (more than 10 years)
- 12) What is the size of your cultivated land?
- 13) What technologies available for you to cultivate?
 - ☐ Irrigation
 - ☐ Pesticides
 - ☐ Fertilizers
 - ☐ Machineries
 - ☐ Other, please specify
- 14) Do you irrigate rapeseed?
 - ☐ Yes
 - ☐ No
- 15) What are the risks that you are faced with?
 - ☐ Drought
 - ☐ Market price

- ☐ Hail
 - ☐ Early snow
 - ☐ Other, please specify _____
- 16) What is your land rented term?
- ☐ 5 years,
 - ☐ 10 years,
 - ☐ renting other peoples'
- 17) What makes rapeseed production attractive to you?
- ☐ Subsidies,
 - ☐ Ease to sell,
 - ☐ Availability of seeds,
 - ☐ Technical matters,
 - ☐ Difficulty of sales of other crops,
 - ☐ Other, please specify: _____
 - ☐ NA
- 18) Do you sell locally or export internationally?
To where? _____
- 19) What are the major constraints in selling the produce?
- 20) How do you rate state policy on agricultural rapeseed production particularly towards smallholders?
- ☐ Weak,
 - ☐ Average,
 - ☐ Strong,
 - ☐ I Don't know, Why? _____
- 21) If you ticked weak, what were the reasons? (you may tick more than one item)
- ☐ limited funding,
 - ☐ limited legal environment for small holders,
 - ☐ limited access to information,
 - ☐ large collateral requirements,
 - ☐ Others (specify) _____
- 22) If you agree with the policy, what were the reasons?
- ☐ Funding seemed adequate, I was able to receive it,
 - ☐ Legal environment for small holders is supportive,
 - ☐ There were adequate information available to me / community,
 - ☐ Reasonable collateral requirements for loans,
 - ☐ Others (specify) _____
- 23) Whether rapeseed production was beneficial for the farmer and their households?
- 24) In your opinion, how rapeseed has influenced 1) your livelihood 2) your community, 3) the environment in your community, 4) general food security of country?
- 25) Do you rate the impact of rapeseed positively or negatively or ...? Explain your answer.
- 26) What policy options are needed for production of Rapeseed in Mongolia?
- 27) Please state if you have any other thoughts and suggestions about issue.

THANK YOU FOR YOUR PARTICIPATION

1.2 Tentative Focus Group Discussion schedule /draft/

Number of meeting: three focus group interviews at selected sub-provinces (one each at Darkhan-uul, Selenge and Tuv provinces)

Participants: randomly selected vegetable and crop farmers. Each meeting will have six to eight participants.

Planned order of the focus group discussion:

Order of conducting FGD	Comments
Welcome	
Present the purpose of the discussion	
Introduction of discussion participants	
Confidentiality and ethical issues explained (including audio recording)	
Ground rules	
Questions: <ol style="list-style-type: none"> 1. Do you own your agricultural land? How long have you been in the agriculture? 2. What do you think about current agricultural regulations and laws? 3. What do you think of rapeseed production – whether and how was it beneficial or not. 4. How do you rate a rapeseed policy in a scale to 1 to 10 and why? 5. What were the main flaws in the state policy? 6. What were the progressive effects of the rapeseed policy? 7. What is needed in the future? 	
Closing, and wrap-up on findings.	

1.3 Tentative semi-structured interviews /draft/

Interviews: At least ten interviews (one representatives of academe, CSO, public sector, vegetable farmer and agribusiness person).

Stage	Question	Answers
Organisation:		
Occupation:		
Introduction	How many years have you been working in your sector?	
What is in the	Question 1: What is your opinion on	

context	sectorial policy on rapeseed? Are there any rules and regulations?	
	Question 2: Are sectorial policies promoting or not promoting production of rapeseed?	
	Question 3: What do you think are the policy measures that should be taken?	
	Question 4: What are the barriers & opportunities for Rapeseed production?	
	Question 5: What are the risks of planting rapeseed? Are there agricultural insurance available?	
	Question 6: Are there employment opportunities in rural areas or Promoting employment in rural areas?	
If relevant	Question 7: How would you rate the challenges of selling and exportation, customs regulations, role of middlemen? Availability of services in this area? Chinese regulatory requirements that are suitable for MGL exports? Any hindrances ? (i.e. corruption)	