

Review, Estimation and Analysis of Agricultural Subsidies in Mongolia

Kisan Gunjal and Charles Annor-Frempong



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Foreword

The use of indiscriminate agricultural subsidies can lead to high financial and welfare costs, economic inefficiency, skewed resource allocation, trade distortions, and reduced competitiveness. On the other hand, used as judicious strategic policy instruments, smart subsidies can lead to desired socio-economic, food security, and developmental impacts for both targeted groups and for society at large. In Mongolia, direct government budgetary transfers to the agriculture sector have increased significantly over time, primarily through the Crop Protection Fund, Livestock Conservation Fund, and Small and Medium Enterprises Development Fund. However, there is a lack of reliable figures of total producer support estimates (PSE) that take into account the direct transfers to primary agriculture plus indirect support (or taxation) by way of the implicit market price support.

This study was undertaken to develop a source of reliable information with which to monitor public expenditures on agricultural subsidies in Mongolia and to inform a strategy for improving the effectiveness of these subsidies. It was carried out by the World Bank in collaboration with partners in the Mongolian Government, primarily the Strategy Planning and Policy Department of the Ministry of Industry and Agriculture, as well as the Ministry of Finance, the National Statistics Office, and a number of other Government agencies.

Following the global food prices crisis in 2008/09, and a sustained decline in agricultural production from the mid-1980s to 2007, especially that of wheat, the Government of Mongolia undertook some major food security and agriculture-livestock development policy initiatives. In September 2011, the Bank was invited to a workshop by the Ministry of Food, Agriculture and Light Industries to discuss global agricultural trends, policies, and impacts of high food prices. The Policy and Strategy Department then requested the Bank's help in analysing the country's current policy framework, in particular, the agricultural subsidy programs. The work led to this report, which the reader should find useful for reflection, research, and program design.

The results of this study show that even though the government budgetary transfers to primary agriculture have increased over the selected five year period (2008 to 2012), total producer support has not. This indicates that the budgetary support, especially during 2011 and 2012, basically went to compensate farmers for the lower domestic market prices vis-à-vis international prices. The main message of the study is that given the variety of subsidy programs in place, it is extremely important that the total support to agriculture sector be accurately estimated and its economic, environmental, and fiscal impacts monitored on a regular basis.

Bert Hofman
Country Director
China, Mongolia and Korea

Jurgen Voegelé
Senior Director
Global Practice, Agriculture

MONGOLIA

Review, Estimation and Analysis of Agricultural Subsidies

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ABBREVIATIONS AND ACRONYMS

ARD	Agriculture and Rural Development
ASDS	Agriculture Sector Development Strategy
BoM	Bank of Mongolia
CPF	Crop Protection Fund
DPs	Development Partners
ESW	Economic and Sector Work
FAOSTAT	Food and Agriculture Organization Statistics
GDP	Gross Domestic Product
GoM	Government of Mongolia
IFC	International Finance Corporation
LCF	Livestock Conservation Fund
MCT	Multiple Commodity Transfers
MDG	Millennium Development Goals
MES	Ministry of Education and Science
MIA	Ministry of Industry and Agriculture
MNLP	Mongolian National Livestock Program
MOFALI	Ministry of Food, Agriculture and Light Industries
MoF	Ministry of Finance
MoL	Ministry of Labor
MPS	Market Price Support
MNT ¹	Mongolian currency, Tugrik
NGO	Non-governmental Organization
NLS	National Livestock Strategy
NPC	Nominal Protection Coefficient
NPFS	National Program for Food Security
NRP	Nominal Rate of Protection
NSO	National Statistical Office
NPFS	National Program for Food Security
OECD	Organization for Economic Cooperation and Development
O&M	Operations and Maintenance
PSE	Producer Support Estimate/Producer Subsidy Equivalent
PRSP	Poverty Reduction Strategy Paper
R&D	Research and Development
SCT	Single Commodity Transfers
SFPSP	Staple Food Price Stabilization Program
SME	Small and Medium Enterprises
WB	World Bank
WTO	World Trade Organization
UN	United Nations

¹ The average exchange rate for 2012 was 1357 MNT for one USD and at the end of October 2013 it was 1678.

EXECUTIVE SUMMARY

With global food crises and food price volatility in recent years, agricultural subsidies have once again gained prominence as a policy instrument in many developing countries. In Mongolia too, subsidies to the agriculture sector mainly through government budgetary transfers, have increased over time. These gained prominence in 2008 when a global, regional (the drought in Russia, and Kazakhstan, the two main suppliers to Mongolia), and the national food production shortfall sent domestic wheat prices soaring to record levels. Wheat production had reached an all-time low during the years 2005 to 2007. Consequently, subsidies to crop, livestock, and agro-processing sectors have increased since 2008, and now represent a complex set of programs, sometimes with conflicting and overlapping goals and intended beneficiaries. A recent MIA assessment found that the working capital amount and the scope and demand for subsidy fund activities are increasing over time.

The main types of crop subsidies in Mongolia, implemented under the **Crop Protection Fund** and aimed at increasing domestic food production, are in the form of wheat price support and subsidized soft loans for the purchase of machinery, fuel, seeds, and plant protection chemicals. Even bigger subsidies are provided to the livestock sector, mainly through the statutory² **Livestock Conservation Fund**, which was established in 2001 mainly to provide support for the protection of livestock herders from droughts and the severe winter weather events known as “*dzuds*”. Over the years, the Fund has been reformed several times. The latest such reform, the **National Mongolian Livestock Program** (MNLP), approved in 2010, was introduced to support development of livestock production for the 2010-2015 period by providing support to herders, and preferential loans to livestock breeding cooperatives and intensive livestock production entities.

In addition to these two prominent funds, a number of other support programs have been implemented. These include the **Small and Medium Enterprises (SME) Development Fund** (covering crops, livestock and agro-processing activities among other SMEs), the **Pasture Management Program** (for irrigation of pastures, rodent/pest control), the **Veterinary Program** (for services and medicines), and subsidized loan programs for agro-processors (such as wheat flour mills and cashmere, wool, and meat processors). Credit subsidies have been widely used. The most common subsidized credit program involves a partial or full five-year loan at a seven percent annual interest rate, as opposed to the commercial bank loan rate of about 20 percent. Soft loans to agro-processors and commercial farmers are aimed at modernizing the processing facilities to build capacity to generate value added products locally, and to create growth and employment.

It is very difficult to find accurate data from the public accounts, except for those which are clearly defined as “subsidies,” and refer to direct payments to herders and farmers. Furthermore, it is important to estimate a total subsidy equivalent by considering the implicit support/taxation by way of the market price support (MPS) to wheat and wool, the two most traded commodities. Therefore, using the standard OECD methodology, the total producer support estimates (PSE)³

² In Mongolia there is a constitutional commitment to support livestock sector and herders. With a majority of the elected representatives having roots to farming and rural constituencies there is a political support for public budgetary transfers to the sector.

³ Producer support estimates (PSE) is used synonymously with producer subsidy equivalent in this study and includes the Government budgetary support and the implicit market price support (MPS) which can be positive or

are calculated. The results show that the total subsidies (the government budgetary transfers) paid out to the primary agriculture sector, in nominal terms⁴, ranged from 22 billion MNT (USD 15 Million) in 2009 to 91 billion MNT (USD 67 Million) in 2012. Subsidies to the livestock sector average double those to the crop sector. Crop sector subsidies, however, grew almost three times faster during the five year period between 2008 and 2012. The livestock sector generates about four times the level of GDP of the crop production sector. Counting only direct government subsidies, the crop sector is therefore proportionately more subsidized as a percentage of its GDP than the livestock sector.

One of the main conclusions of this study is that even though the government subsidies (budgetary transfers) to primary agriculture have increased over the five year period, considering the MPS, the total PSE for the primary agriculture has not increased. This implies that budgetary support basically compensated farmers for the lower domestic market prices, while the international prices (and import prices) remained high. The PSE for the crop sector (predominantly wheat), as a percentage of the total value of crop production, remained fairly high at 13 to 17 percent during 2008-2010, but came down drastically in the subsequent years reaching below one percent. In contrast, the PSE coefficients for the primary livestock production sector were much lower and, excluding 2008, have steadily gone up.

Thus in aggregate, the PSE for primary agriculture shows a general decline, especially over the three years ending in 2012 when they reached 2.4 percent. For comparison with other countries in the region for which OECD estimates exist, it can be concluded that the overall level of subsidy (including direct and indirect payments) support to primary agriculture in Mongolia was fairly small and much lower than other states such as OECD countries (18.6%), China (16.8%), Kazakhstan (14.6%) and Russia (13.5%) in 2012. Only Ukraine at 1.3% and Turkey at -7.3% were lower than Mongolia.

In terms of the potential impact of subsidies, the wheat subsidies seem to have achieved their goal of helping to increase production as the yield per hectare of the subsidized crop. Wheat yields increased more than threefold, and the area sown more than doubled between 2007 and 2012. Similarly, the number of sheep, the main subsidized livestock category, increased faster than any other type of livestock between 2011 and 2012. Because the carrying capacity of the land in a number of *aimags* has been reached and in some instances exceeded, this increase in number of sheep has generated adverse environmental impacts.

The results of the study point to a number of issues with important policy implications, and to recommendations for improving the effectiveness and efficacy of agriculture subsidies in Mongolia. These include the following.

- **Rationalize agricultural subsidy programs** to help resolve inconsistent and overlapping objectives, and to reduce the costs of delivering and implementing the programs. The

negative. Although the MPS is calculated only for the selected two commodities (wheat and wool), direct subsidies paid to the primary producers of all other commodities such as meat, dairy, vegetables and others are included in the total subsidy transfers. The OECD category of General Services Support Estimates (GSSEs) for research and development, education and training, inspection and health services, were not included in the PSEs.

⁴ The subsidy amounts (in fact all values) are in nominal terms. The annual average inflation rates in Mongolia from 2008 to 2012 were: 25.1, 6.3, 10.1, 9.5, 15.0 percent, respectively. However, for ease of understanding and discussion with the Government officials, the nominal values and nominal budgets are used. The estimates are compared to nominal GDP and agricultural output values and public expenditure. Key subsidy values are shown in USD terms.

negative values of market price support (MPS) to wheat and wool during the five year period covered by the study suggests that part of the government budgetary transfers were simply used to compensate producers for the implicit taxation. In the absence of domestic market price reduction policies, a negative MPS arises mainly as the result of a lack of competitive market structure and a rise in the international price of the commodity without domestic price transmission. Therefore, a study on the **market structure and market performance** and roles of various intermediaries and their margins in the marketing channel is recommended to help design policies to improve market efficiency and to reduce the need for direct subsidies.

- **Investments in general services support (GSS)**, including research and development, education and training, infrastructure improvement, inspection and health services, are recommended as more effective options than subsidies to increase production. This is particularly important in the case of Mongolia, given that the subsidy outlays are more than double the MIA's investment budget and nearly nine times higher than expenditures on agricultural R&D. A dollar spent on R&D investment is likely to yield significantly higher returns than a dollar spent on subsidy according to most literature on agricultural economics, suggesting that a reallocation of funds towards research is likely to increase returns and reduce costs for Mongolia's limited government financial resources. Alternatives to subsidizing fertilizer, for example, investing in road infrastructure, eliminating bureaucratic hurdles and augmenting performance of financial institutions are also recommended (Banful, 2011) and are applicable in Mongolia.
- **Subsidy programs for the livestock sector in Mongolia generally provide short term financial support to herders, but do not contribute to improved long term food security or economic efficiency.** Livestock subsidies may very well be attributable for increasing the number of livestock heads to unsustainable levels, and with serious environmental consequences. Current literature suggests that subsidies do not necessarily bring about any permanent structural or technological change, and therefore may not be at all useful in improving the economic efficiency of production (Jayne and Rashid; Dorward). Although the newly reformed Mongolian National Livestock Program aims to improve the quality of livestock commodities, modernize production systems, and promote adoption of improved technologies, the Program is not fully funded and implementation is incomplete. The recommendation for the Government is to remain mindful of the adverse environmental impacts its support to the livestock sector can have and follow the provisions of the MNLP rather than the ad-hoc payments to the sector.
- In 2008, production shocks, low levels of food stocks, high food prices, and critical food security situations persuaded policy makers in a number of countries that **smart subsidies** were an attractive alternative. Smart subsidies typically involve objectives relating to pro-poor economic growth, the development of local markets, and the promotion of competition in input supply, the pursuit of regional integration and clarity of an exit strategy, and other purposes. These may also include innovative financing, voucher systems, warehouse receipt schemes, etc. intended to reduce input delivery costs and improve targeting to promote private input markets, poor farmers' adoption of new technologies, increased output, and ultimately poverty reduction. Therefore, **it is recommended that a smart subsidy strategy, to the extent possible, be followed with adequate public investment.**

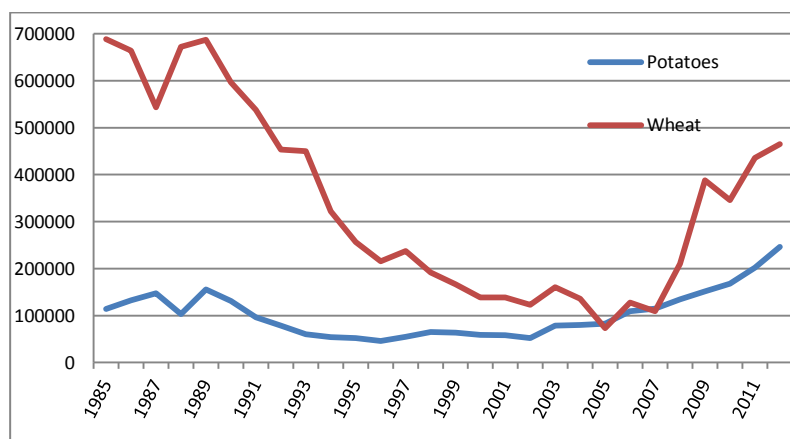
1 INTRODUCTION

1.1 Agriculture in the Mongolian economy

The agriculture sector contributes significantly to the Mongolian economy and is critical to achieving sustained economic growth and poverty reduction. Agriculture provides an estimated 43 percent of employment with 7 out of 10 jobs in the sector coming from livestock activities. The majority of rural residents dependent on agriculture for income and sustenance, and the sector's performance has a profound impact on livelihoods throughout Mongolia. According to the 2007/08 household survey, the poverty rate in rural areas was at 43 percent compared to 30 percent in the urban areas. At the national level, a 2012 World Bank estimate of poverty headcount was 27.4 percent, down from 38.7 percent in 2010. Mongolia is a landlocked country with difficult logistics throughout much of its area. Reducing the overall incidence of poverty will necessarily entail doing more to improve the conditions of the country's rural population.

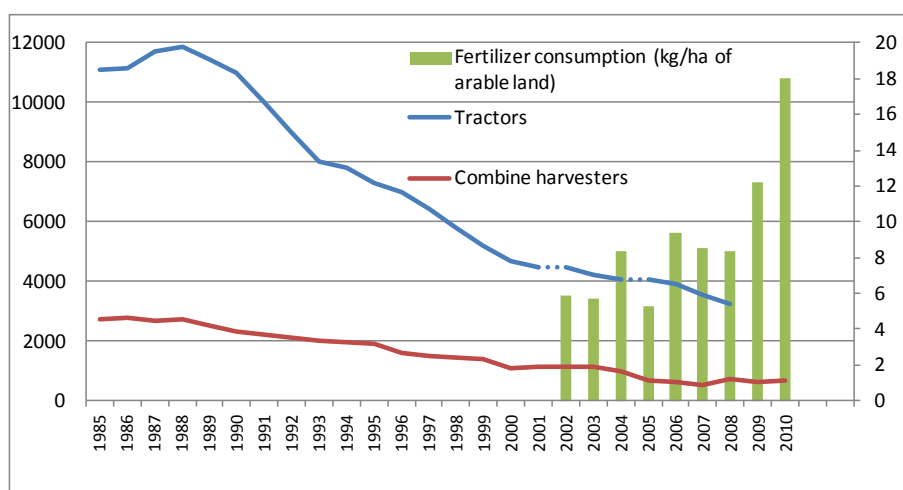
The performance of the agriculture sector has been uneven and is particularly affected by periodic weather related natural disasters. Given the severe water constraints and extremely harsh environment, crop cultivation is highly limited. Nonetheless, with the relatively low opportunity cost of land, wheat is the main cereal produced. Its land productivity, however, is very low in comparison to other countries. Wheat production dropped significantly from about 680,000 tonnes in the mid-1980s to a low of 73,400 tonnes in 2005 (see Figure 1), while the country went from an exportable surplus situation to imports of 350,000 tonnes in 2007/08 with rise in imports from Russia and Kazakhstan. Droughts in 2005 and 2007 lowered wheat production still further. Production has rebounded since, reaching 465,300 tonnes in 2012, but still remains below the national requirement. The drastic decline in agricultural production is attributed partly to the transition from a socialist to a market economy in the 1990s, and is accompanied by the decline in the use of farm machinery (see Figure 2) and other modern inputs such as fertilizer.

Figure 1: Wheat and Potato Production in Mongolia (tonnes), 1985-2012



Source: FAOSTAT database (FAO) and National Statistics Office (NSO)

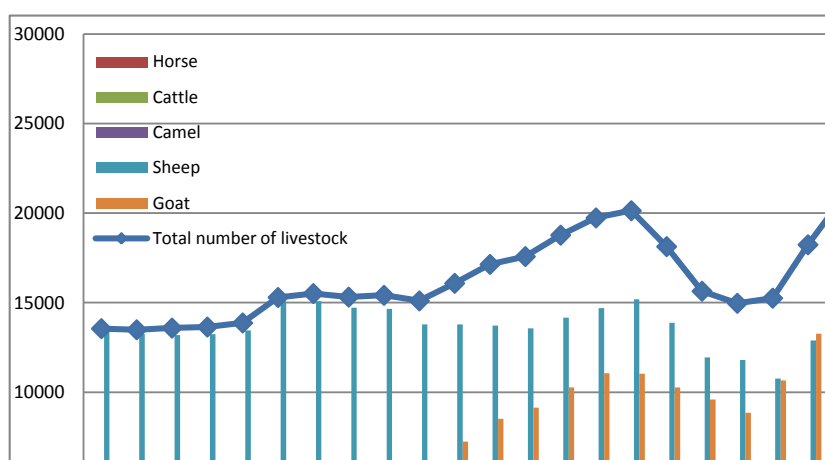
Figure 2: Number of tractors and combine harvesters (left axis), and fertilizer use kg/ha (right axis)



Source: **FAOSTAT database** (FAO) based on official data reported on FAO Questionnaires from countries and **World Bank database** (World Development Indicators: Agricultural & Rural Development)

The livestock sector in Mongolia accounts for about 80 percent of agricultural output and supports about 210,000 rural households. The situation was aggravated by the severe *dzuds* of 1999, 2000 and 2001, when about 11 million heads of livestock died. More recently, in 2009 and 2010, a *dzud* killed another 11 million animals, reducing livestock numbers from 44 million to 32.7 million. However, in recent years the number of livestock has been building back up with the latest estimate for 2012 at 41 million, the majority of which are sheep, goats and cattle. Livelihoods and food security among the affected half million rural people is slowly being restored. However, the lingering effects of the livestock losses still weigh heavily on the livelihoods of those affected and will require a sustained effort to overcome. There are also questions about the environmental sustainability of the peak stocking numbers in recent times, and whether this contributes to the high mortality rates during *dzuds* and therefore to stock number volatility.

Figure 3: Number of livestock, total and different categories ('000 heads), 1985- 2012



Source: FAOSTAT database (FAO) and National Statistics Office (NSO) of Mongolia.

1.2 Agricultural policy and subsidies overview

The overall agricultural policy objective, implemented through legislative decrees and laws, is to ensure national food security by providing “the entire nation with stable supplies of accessible, nutritious and safe food to create healthy livelihoods and high labor productivity.” Furthermore, livestock production constitutes the largest agricultural sector and according to the 1992 Constitution, “Livestock is the national wealth of the country and subject to state protection.” Support to agriculture is therefore embedded in national policy. Increasing agricultural competitiveness, improving the quality of food products, and environmental sustainability and natural resources management are all guiding principles of the current agricultural policy. The policy is intended make government support to agriculture more rational.

To reverse the declining trend in agricultural production, the Government of Mongolia (GoM) has, in recent years, adopted two key programs and the MDG targets to put agriculture back on track as a lead sector of the economy, to address constraints to agricultural development, and to improve national food security by adopting the Mongolian National Program for Food Security (NPFS) 2009-2016 and the Mongolian National Livestock Program (MNLP) 2010. The NPFS aims to provide the entire country with secure supplies of accessible, nutritious, and safe food to enable healthy livelihoods and high labor productivity founded on the participation of the people, government, as well as the public and private sectors. The overall objective of the MNLP is to modernize the country’s livestock sector so that it is adaptable to the changing climatic and social conditions and create an environment where the sector is economically viable and competitive in the market economy.

Despite the important initiatives outlined in these policy documents, a thorough and comprehensive review of the performance of the sector has not been undertaken. For example, the National Livestock Strategy (NLS) was approved by the Parliament in 2010 and sets out an ambitious agenda for modernizing the sector. Public expenditure in the sector has increased significantly and the NLS comes with a “guaranteed” contribution from the state budget. Most of these increased expenditures are believed to have gone to agricultural price and credit subsidies. Many of the recent policy initiatives, including the subsidy programs and the Agricultural Commodities Exchange Law, are insufficiently analyzed to afford us a full understanding of the country’s current policy framework, in particular, the impact of the subsidy programs no being implemented.

Agricultural subsidy programs such as price supports for farm inputs and outputs, and direct or indirect payments, are used in many countries, both developing and industrialized. In developing countries the primary aim is to increase local food production and thereby increase domestic food availability and national food security. In Mongolia, both livestock and crop sectors have received rising public support. Yet no proper estimation of the actual amount of direct and indirect subsidies to agriculture, and no proper assessment of their effectiveness, efficiency, or impacts has been carried out.

1.3 Objectives of the study

The main objective of this study is to understand the role of subsidies as a form of direct government intervention. The specific objectives are:

1. To review the current agricultural subsidy programs and policies.

2. To estimate the amount of subsidies to crop production, livestock production, and agro-processing. The official statistics under “subsidies and transfers” omits many subsidies that go to producers and processors through soft loans and other support programs. Nor do official statistics include the indirect subsidization (or taxation) of the sector arising from government policies and/or market failure. The study therefore seeks to estimate the direct subsidies to the primary agriculture sector and such indirect subsidies as market price support to wheat and wool, two of the most important, most subsidized, and most internationally traded commodities.⁵
3. To examine the production/supply, terms of trade and fiscal impact of these subsidies and discuss some of the policy recommendations to make them more effective.

2 APPROACH AND METHODOLOGY

The methodology used in this study basically followed two steps, first the review of programs involving subsidy elements to agriculture and second, the calculation of total subsidy equivalent estimates.

The review. The first step included a review of all the programs and policies related to agricultural subsidies in the country including extensive discussions and structured interviews with all stakeholders during a three week World Bank mission in the country. The key informants included technical and managerial staff of Government units within MIA, MoF, and MoL, and of farm organizations, selected private companies and organizations who are involved in delivering agriculture subsidies or subsidized inputs and outputs.

Methodology of producer support estimates. The second step deals with analyzing raw data on subsidy funds and various other transfer outlays and converting them into proper subsidy estimates, direct and indirect, using a simplified OECD PSE methodology.⁶ The OECD manual states that the producer subsidy (or support) equivalent (PSE) includes all direct or indirect payments for outputs and inputs (A detailed list of support categories is shown in Appendix 1). An important item in the direct payments category in the case of Mongolia, from the methodology point of view, is the conversion of soft loans into actual credit subsidy, i.e. the interest concessions. The majority of the soft loans are of medium term five year loans. Working capital loans are more often shorter term, one year loans, some with a grace period. Most capital loans have different down payment terms but typically have a five-year repayment term, and generally have an interest rate of 7 percent as opposed to a typical commercial bank loan rate of around 20 percent. Accordingly, the concession on interest rates is equal to the difference

⁵ The MPS analysis of only two commodities is because of the time and resources constraints for this study.

⁶ In this study a modified/simplified OECD PSE methodology is followed since the market price support (MPS) component is calculated only for two selected commodities, wheat and wool, as opposed to all commodities in the other OECD studies.

between the annual commercial bank five year loan interest rate and 7 percent. To simplify the total interest concession calculations these assumptions were made for all loans.

In addition to the direct payments for agricultural outputs and inputs, the OECD methodology also includes indirect support (or taxation) of agricultural production in the total producer support/subsidy equivalent (PSE). The indirect support/taxation consists primarily of government policy interventions called “Market Price Support” (MPS). According to the OECD MPS represents “the transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of an agricultural commodity, measured at the farm gate level.” Thus the methodology⁷ calls for calculating the difference between the farm gate price and the equivalent comparable international reference price (usually the border import price plus allowances for transport, handling, minimal processing and margins). As discussed in the objectives of this study, only wheat and wool were chosen for the MPS analysis. Finally, the PSEs are expressed as a percentage of the total value of the sector.

The Producer Nominal Protection Coefficient (NPC). Another way of looking at the total support to a specific commodity is calculating the NPC,⁸ which is defined as “the ratio between the average price received by producers at the farm gate (including payments per tonne of current output), and the border price, measured at the farm gate. The NPCs are generally calculated based on the level of subsidization at each selected specific commodity level, the Single Commodity Transfer (SCT). The SCT is a ratio of total subsidies specifically designated for the commodity including the MPS and are linked to the SCT so that NPC is equal to $1/(1 - \text{percent SCT})$.

In the case of Mongolia, wheat production dominates crop farming, with roughly 50 percent of crop GDP coming from the value of wheat. Since most of the other crop sector subsidies, machinery and other input loans are also accessible to wheat farmers, a 50 percent share of other multiple commodity transfers (MCT) are assumed for wheat. Thus NPC for wheat is calculated in two ways – 1) with the SCT and 2) with sum of the SCT and the share of the MCT.

3 AGRICULTURAL SUBSIDY PROGRAMS IN MONGOLIA

3.1 Agricultural subsidy funds and programs

Mongolian Government agriculture subsidies were high during the Soviet period and then declined sharply during the 1990s. After the 2008 global food price crisis, these subsidies increased again. Government support to Mongolian agriculture consists mainly of core programs that provide output-based payments primarily to wheat, wool, cashmere and meat producers. It also consists of technical support mainly through subsidized soft loans to buy machinery, purchase inputs, and adopt technologies to increase productivity and build capacity. The

⁷ Details are provided in Chapter 4 of the OECD’s “The PSE Manual”, 2010.

Government also supports the livestock sector through the provision of subsidized veterinary medicines and services.

Wheat is the main crop in the country and wheat flour is the major food staple, covering approximately 55 percent of the daily caloric intake. Wheat production was controlled and heavily supported during the socialist period up to the 1990s, allowing the country to be self-sufficient and occasionally a net exporter. Following the breakup of the Soviet Union, Mongolian agriculture's input service system collapsed, and wheat production reached its lowest points between 2005 and 2007. The Government responded by implementing a policy to support domestic production, assure adequate food availability and higher levels of self-sufficiency. The policy included major increases in wheat subsidies, including output-based payments and technical assistance to wheat farmers, for example through grants and loans. Furthermore, a seasonal 5 percent tariff on imported wheat flour from August to April was increased to 15 percent to protect farmers from competition.

Meat is a staple food in Mongolia. The livestock industry consists mainly of sheep, goats, horses, cattle, and camels, and engages a large proportion of the workforce. Similar to the other agricultural subsectors, Government intervention in livestock production diminished in 1991 with a broad reduction of subsidies. However, the number of animals increased during the 1990s, mainly due to higher mobility of herds and more people reverting to livestock activities after the breakup of the Soviet Union. Yet, the livestock sector is under higher risk due to frequent disease outbreaks, and unusually harsh *dzuds* and droughts, which substantially reduced livestock numbers in recent years. Over the years, the Government has implemented several programs, with the objective of supporting primary producers, as well as assisting secondary processes, thereby raising the value added domestically especially for wool, cashmere and meat. The Government has also employed in recent years high taxes on exports of raw and washed cashmere, and wool. This has led to some 50 percent of the raw cashmere being smuggled into China to avoid duty taxes (WTO, 2005).



The livestock industry consists mainly of sheep, goats, horses, cattle, and camels, and engages a large proportion of the workforce.

Some of the long standing historical subsidy programs include the Crop Protection Fund, the Livestock Conservation Fund, the Small and Medium Enterprise Fund, the Fund for Wool and Cashmere Processors, the Meat Stabilization Fund, Veterinary Services/Vaccines Subsidization Program, Tax Concessions to Herders and Farmers, and the proposed Staple Food Price Stabilization Program. Some salient features, purpose/objectives, operational modalities, administering units, and the size and timeframe of these programs are given in Table 1.

The Crop Protection Fund, one of the long-standing subsidy programs, was established in 1997 to intensify implementation of the policy to support crop production activities and crop producers. A further Government Resolution was passed in 1999 to provide “Procedure to

establish and disburse Wheat Fund.” Funding of the program has become more systematic and regularized since 2008 and includes subsidies in the form of wheat price support and technical support to the crop sector in the form of subsidized soft loans for machinery and equipment, fuel, seeds, plant protection chemicals, fertilizer, and the cultivation of sea buckthorn berries. As shown in Table 2, the size of the fund (amounts for loans and the direct payments) has fluctuated but grew, in nominal terms, from 24.3 billion MNT in 2008 to 44.2 billion MNT in 2009, came down in 2010 but rose steadily since reaching 44.9 billion in 2012.⁹

Table 1: Subsidy Funds/Programs for Herders, Farmers and Agro-Processors in Mongolia

Name of Fund/Subsidy	Nature and Purpose	Subsector/Commodities covered	Responsible/Administrative Unit(s)	Period and size of fund
Livestock Conservation Fund	Output-based payments for wool and cashmere; Technical assistance (grants and loans): pastureland irrigation, feed purchases, etc. The goals of the newly reformed Mongolia National Livestock Program (MNLP, 2010) is to provide State support to the livestock sector to modernize in the areas of institutions, marketing and technology adoption.	Primary (herders) and intensive agriculture; In 2013 these payments will include skin, hide and meat milk of all animals except camels.	Unit for Livestock Conservation Fund Ministry of Industry and Agriculture.	Established in 2001; In 2012 - 30 billion MNT. Funds for ad-hoc programs raised through issuance of Government bonds. Most of the provisions of MNLP remain unfunded.
Crop Protection Fund	Output-based payments for wheat; Technical assistance to wheat farmers (grants and soft loans); Primary goal to increase domestic production and improve national food security.	Primary agriculture (wheat farmers, sea buckthorn, some vegetable producers)	Unit for Crop Protection Fund Ministry of Industry and Agriculture	Established in 1997; Cash payments started since 2009. In 2012 some 30 billion MNT of which 11 billion MNT in form of cash payments
Fund for wool and cashmere processors	Subsidized credit to promote domestic processing and raise domestic value added production and raise competitiveness of local firms.	Agricultural products and processing Industry	Department of Coordination for Light Industry (MIA)	Established in 2011; Total loans in 2011 – MNT 97.8 billion (USD 66.3 million) for wool processing companies, and MNT 28.7 billion (USD 19.5 million) for cashmere processing
Meat Supply Stabilization Program	Subsidized credit granted to support the development of cattle, horse, sheep, pig and poultry meat, increase the slaughtering weight, increase the share of dam in overall pasture livestock herd and the number of offspring's	Meat Processing Industry (Meat)	Department of Coordination for Food Industry (Ministry of Industry and Agriculture)	Established in 2005; Not clear if it will continue
Small and Medium Enterprises Development Fund	Subsidized credit granted to support small and medium enterprises, increase employment and expand production	Processing Industry, Primary Agriculture and Intensive Agriculture	SME Fund Unit (Ministry of Labor)	Established in 1992; 2012 – MNT 28.9 billion made subsidized by SME with 40% for agriculture
Staple Food Price Stabilization Program	Subsidized credit granted to build meat warehouse capacity, milling capacity and encourage intensive livestock production	Food Processing Industry (meat and milling) and Intensive Agriculture	Department of Coordination for Food Industry (Ministry of Industry and Agriculture)	Approved in November 2012; Estimated budget for 2013: Meat Processors MNT 87 billion (USD 57.9 million); Intensive Livestock farming MNT 100 billion (USD 66.6 million)

⁹ Various values are presented in nominal terms. The inflation in Mongolia has been fairly high, for example, 12.5 percent in 2013. However, the Government officials could relate to the nominal values and nominal budgets better. These are compared to nominal values of GDP and agricultural output values and nominal expenditure. Key subsidy values will be shown in USD terms.

				million) over next 3 years; Wheat flour millers MNT 63 billion (USD 42 million)
Subsidies/grants to deal with hazards/risks in livestock sector (part of Mongolian National Livestock Program)	Subsidizes and grants to protect livestock producers from <i>dzuds</i> , involves increased emergency fodder reserves, irrigate pasture land, rodent/pest control of pastures and better management and coordination of activities between the central and regional governments.	Primary agriculture (herders), and intensive agriculture.	Unit for Livestock Conservation Fund (Ministry of Industry and Agriculture).	Established in 2012; Irrigation MNT 6.5 billion (USD 4.3 million); Rodent control 1.8 billion (USD 1.2 million); Feed MNT 1.5 billion (USD 1 million). Estimated budget for 2013 is MNT 7 billion (USD 4.66 million), MNT 1.7 billion (USD 1.13 million) and MNT 1.5 billion (USD 1 million).
Tax concessions	Herders full tax exemption Other farmers pay 50 percent tax on taxable income	All herders and farmers	Ministry of Finance	Long standing program. There are no estimates of the total tax forgone; the MoF is working on such estimates.

Source: Information derived from the interviews with Ministries, including Ministry of Industry and Agriculture (MIA), National Agricultural Extension Center (NAEC).

Provision for the protection of livestock and herders is made in the Mongolian constitution. A number of programs have been introduced for this purpose. The most important of these is the **Livestock Conservation Fund**, which was established in 2001, mainly to support for the protection of livestock herders from droughts and *dzuds*. Since then, the Fund has been reformed under various policies, programs, and corresponding Government decrees. The latest one is the “National Mongolian Livestock Program” (MNLP),¹⁰ formulated in 2010 to support the development of livestock production for the years 2010-2015 by providing preferential loan support to livestock breeding cooperatives and intensified livestock production.

The available credit under the Livestock Conservation Fund is intended to help farmers acquire machinery, ease working capital constraint and to adopt new technology. Since 2011, the Fund operates independently. The total size of the fund, with an income from the state budget transfers and the repayments of loans, has grown from about half a billion in 2009 to over 32 billion MNT in 2012. This fund included some 30.5 billion MNT worth of subsidy in 2008 to herders for cashmere, 9.8 billion MNT in 2011 and 29.3 billion MNT in 2012 to herders for sheep and camel wool. The remaining amount was disbursed as loans. According to the MIA, the loan repayment rate as of 2012 has been about 90 percent. The MIA assessment also states that the working capital amount, scope and need, and demand for the Fund activities, are increasing overtime.

In addition to the Crop Protection Fund and the Livestock Conservation Fund, a number of other programs have been implemented, including the **Small and Medium Enterprises Development Fund** (covering crops, livestock and agro-processing activities), the **Pasture Management Program** (for irrigation of pastures, rodent/pest control), the **Veterinary Program** (for services

¹⁰ According to the official document (MIA 2010) the main goals and objectives of MNLP are as follows:

1. To provide great attention from the State to livestock sector as the one of the economic pillars of country, to create a favorable legal, economic and institutional environment, to maintain sustainable development and to develop a good governance to livestock sector.
2. To improve livestock breeding service according to social need, to increase productivity and production of high quality, to produce qualified bio-clean livestock product and to increase competitiveness in the market.
3. To raise veterinary service standard to international levels and to protect public health through securing livestock health.
4. To develop livestock sector that is adaptable in ecological change and able to persist risk.
5. To develop markets specialized for livestock and livestock products, to create processing and selling networks and to accelerate feedback of economy through incentive system.

and medicines), and subsidized loan programs for agro-processors such as cashmere processors, wool processors, meat processors, and programs to support wheat flour mills.

Table 2: Funds to support primary agriculture and agro-processing sectors (in Million MNT)

	2008	2009	2010	2011	2012	2008-12 (Avg)
Size of funds supporting primary agriculture and agro-processing sector	71,780	72,261	61,890	300,063	126,886	126,576
I. Primary agriculture	69,153	60,028	49,190	117,498	103,240	79,822
I.1. Crop production programs	24,458	47,810	38,017	68,496	48,979	45,552
A. Crop Production Fund	24,309	42,074	30,764	39,241	44,854	36,248
A1. Wheat subsidies	11,164	8,665	10,906	14,471	27,830	14,607
A2. Fertilizer subsidy	614	230	0	0	0	169
A3. Crop loans 1/	12,531	33,180	19,858	24,770	17,024	21,472
B. SME Fund Crops (Loans)	149	5,736	7,253	29,255	4,125	9,304
I.2. Livestock Production programs	44,695	12,217	11,173	49,002	54,261	34,270
A. Livestock Conservation Fund	30,560	0	0	17,806	31,510	15,975
A1. Herders -Sheep and camel Wool subsidies	0	0	0	9,827	29,436	7,853
A2. Herders -cashmere subsidies	30,500	0	0	0	0	6,100
A3. Tech support loans 2/	60	0	0	7,979	2,074	2,023
B. Pasture management (irrigate pastures, pest control)	11,500	5,228	5,815	3,170	5,823	6,307
B1. Grants	10,550	4,848	5,415	3,035	5,423	5,854
B2. Loans	950	380	400	135	400	453
C. Vet. Services - vaccines, services (Subsidy)	2,526	844	2,954	8,754	13,392	5,694
D. SME Fund Livestock (Loans)	109	6,146	2,404	19,272	3,536	6,293
II. Agro-processing industry	2,628	12,233	12,701	182,565	23,646	46,754
A. Meat Stabilization Fund (Subsidies)	2,400	2,400	1,400	8,000	10,800	5,000
B. SME Fund Food processing (Loans)	228	9,833	11,301	48,065	5,746	15,034
C. Wool Processors (Loans)	0	0	0	28,700	4,700	6,680
D. Cashmere Processors (Loans)	0	0	0	97,800	2,400	20,040

Source: Calculations based on data from NSO, MIA.

1/ Including soft loans for machinery, equipment, fuel, seed, chemicals, fertilizer and production/promotion of sea buckthorn.

2/ Including support to intensified livestock production, animal health and livestock market project, renovation of technology and hay, fodder planting and machinery.

3.2 Institutional structure of subsidy programs

At least nine subsidy programs are currently in operation in Mongolia (Table 1). Most of these, including wheat price subsidy and crop and livestock technical support programs, are operated by the MIA. In general the primary agriculture programs are administered by special units within the agriculture side of MIA. For example, as shown in column 4 of Table 1 – Responsible/Administrative Unit – the crop protection fund and the livestock conservation fund are managed by special units by these names. The Livestock Production Department also operates the veterinary program subsidies and a primary implementer of grants and subsidies under the Mongolia National Livestock Program. The Department of Coordination for the Light Industry side of the MIA is responsible for administering and providing technical guidance to wool and cashmere processors' subsidy programs and to meat supply stabilization loans to meat processors/suppliers. Small and medium enterprise (SME) units under the Ministry of Labor also manage soft/subsidized loans to commercial crop and livestock producers and agro-processors.

The funding of most of the ad-hoc subsidy programs comes from extra-budgetary allocations with parliamentary decrees either through special bond offerings or from Ministry of Finance allocations. Funds for soft loans by the SME units are provided through the selected commercial banks that administer the subsidized loans. Most of the soft loan funds are intended to be revolving funds in the sense that the loan recoveries of past loans will provide capital for new loans. However, most of these are in their initial years and do not yet appear to have sufficient rates of recovery.

Some verification or control mechanisms exist. For example, when a herder delivers wool to a local delivery point of a wool processing company he/she deposits the transaction paper with the local *Soum* administration office. This transaction information is then transmitted from the *Soum* office to the *Aimag* office, and then to the national office. In parallel the record of purchase travels from a local processor to national processors' association office and further to the national Government office. When the two records reconcile, the herder receives the due payment. This is meant to eliminate potential fraud in the process.

The Ministry of Industry and Agriculture, the Ministry of Labor, and the Ministry of Finance and Commercial Banks are each involved in agriculture subsidy programs in Mongolia. Some of the funds and programs overlap in terms of their goals and the beneficiaries they cover. Examples of this include, SME funds dealing with crop, livestock and agro-processing soft loans, the **Staple Food Price Stabilization Program** dealing with meat processors, intensive agriculture, wheat millers, etc. There is



Meat is a staple food in Mongolia.

a need to examine these administrative structures in order to harmonize the various subsidy programs to improve institutional, operational and financial management of all subsidy programs to streamline and make them more efficient.

3.3 Subsidy programs – direct payments and technical support

All support programs are combined into three broad groups in Table 2 and summarized as subsidy payments and subsidized loans in Table 3 and Figure 4. The broad categories are crop production support programs, livestock production support programs and agro-processing industry support programs. They include the size of funds distributed as direct payments (price support), grants for specific purposes, loans for short term and long term investments and other subsidy schemes. These amounts are not actual subsidies *per se*, but rather funds used to provide subsidies. For example, loans themselves are not subsidies; the interest on these loans given up under the program would be actual subsidies. These are calculated and described later in this paper.

Over the last five years (2008 to 2012), two forms of support have typically been used by the Government: direct payments in the form of price subsidies/grants, and soft loans with varying terms of concession. The livestock production support funds dominate the total support budget

amounting to 127.5 billion MNT (or 56 percent) of subsidy payments and 43.8 billion MNT (or 11 percent) of loans. Support to this sector is also more in the form of subsidies (ranging from 5.7 billion MNT in 2009 to 48.3 billion MNT in 2012) than loans. On the other hand, in relative terms, agro-processors have been supported mostly with soft loans, whereas, crop sector has been supported with direct subsidies and with loans in significant amounts.

Table 3: Annual subsidy payments and subsidized loans^{1/} to agriculture sectors (Mill. MNT)

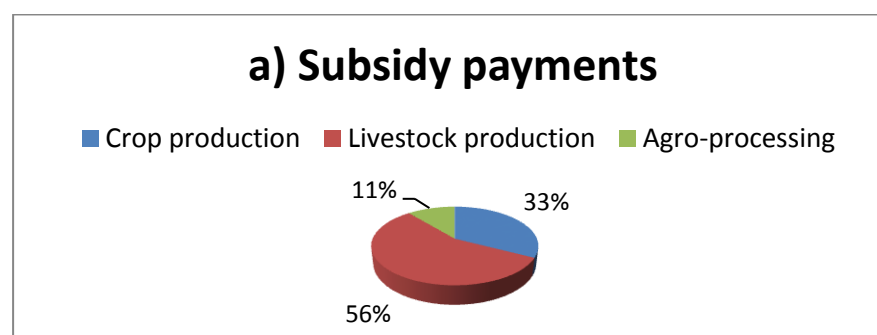
	2008	2009	2010	2011	2012	Total	2008-12 (Avg)
Crop production programs							
Subsidies	11,778	8,895	10,906	14,471	27,830	73,880	14,776
Subsidized Loans	12,680	38,916	27,111	54,025	21,149	153,880	30,776
Livestock production programs							
Subsidies	43,576	5,691	8,369	21,616	48,251	127,503	25,501
Subsidized Loans	1,119	6,526	2,804	27,386	6,010	43,845	8,769
Agro-processing industry							
Subsidies	2,400	2,400	1,400	8,000	10,800	25,000	5,000
Subsidized Loans	228	9,833	11,301	174,565	12,846	208,772	41,754
Total support to primary agriculture and agro-processing sectors							
Subsidies	57,754	16,986	20,675	44,088	86,880	226,383	45,277
Subsidized Loans	14,026	55,275	41,215	255,975	40,005	406,497	81,299

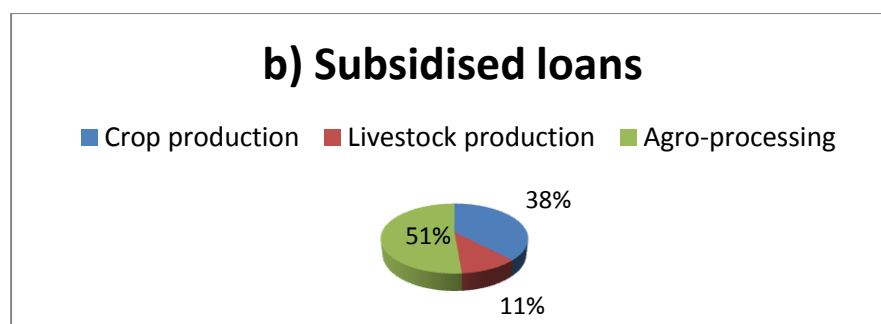
Source: Calculations based on data from NSO, MIA.

1/ All figures are in nominal terms. New loan amounts made available to beneficiaries.

Although not part of the analysis of this report, new subsidies already started in 2013 include the new fund for Staple Food Price Stabilization aimed at building warehouse capacity of meat processors, all intensive agriculture, and wheat millers. There are also other subsidies planned, such as subsidies for milk producers, vegetable producers, intensive farming of poultry, piggery, beef, etc. Similarly, some of the international donor support to agriculture in general is classified as grants/subsidies (e.g. projects by IFAD, EU, ADB, etc.), however, it is relatively small, not easy to isolate as subsidies and is mostly channeled through the Government. Hence it is not included in the calculations of this study.

Figure 4: Relative size of funds, 2008-2012 – a) subsidy payments and b) subsidized loans





Source: Calculations based on data from NSO and MIA.

4 SUBSIDY CALCULATIONS AND ANALYSIS

The amounts that are available for the purpose of subsidies under the different funds and programs need to be converted into the actual subsidy or equivalent amounts. The total subsidy to a sector, using the OECD definition of the producer support/subsidy equivalent (PSE), is a gross transfer to agriculture from consumers and taxpayers. In addition to budgetary expenditures, support includes other estimated transfers which do not require actual monetary disbursements. Therefore, all direct or indirect payments for outputs and inputs are estimated and analyzed below.

4.1 Payments based on outputs, inputs and other support

Direct payments to crop sector include mainly wheat price support to the quantities either sold to the participating millers and/or trading companies or to Government procurement centers. Not all production is subsidized. For example, only about 60 percent of wheat produced, on average during 2008-2012, received a price subsidy. Limitations are applied in terms of quality control, the timing of deliveries (purchased before 1st of December). Wheat sold as feed and to breweries does not receive a subsidy. The subsidy in 2012 was 100,000 MNT per tonne for the actual quantity of wheat subsidized however, given that only 60 percent of the production received this subsidy, the effective wheat subsidy amounts to 60,000 MNT per tonne (about US\$44) when the subsidy is distributed over total production.

Wheat subsidy payments increased steadily over the five year period from 11.16 billion MNT in 2008 to 27.83 billion MNT in 2012, an increase of about 2.5 times (Table 4 and Figure 5). The other major component of subsidy, the interest concessions to wheat, vegetables and other crops, is comparatively smaller but grew by more than 7 fold during these five years. The bottom part of Table 4 shows conversion of subsidy support with and without MPs in US dollar equivalents using the annual average exchange rates.



Given the severe water constraints and extremely harsh environment, crop cultivation is highly limited.

According to the official data fertilizer subsidies were offered only during 2008 and 2009. The total crop sector subsidies grew from 13.57 billion MNT in 2008 to 40.67 billion MNT in 2012 or by three fold in the five year period, with an average amount of 22.64 billion MNT per year.

As far as livestock is concerned, the ad-hoc payments of large amounts, such as the 30.5 billion MNT in 2008 to cashmere herders and 9.83 billion MNT and 29.44 billion MNT during 2011 and 2012, respectively, to sheep and camel wool herders were delivered (see Figure 6). Veterinary subsidies in the form of the vaccination of animals and veterinary services to farmers and herders based on the actual expenditure for agriculture are included under this category. Given the importance of the livestock sector in Mongolia, the veterinary support expenditures, have increased from 2.53 billion MNT in 2008 to 13.39 billion MNT in 2012, more than fivefold. Interest concessions are the smallest component of livestock subsidies in an absolute amount but have grown the most, especially in 2011 and 2012. Total subsidies to the primary livestock production sector amounted to about 50 billion MNT as opposed to 40 billion for crop production, with an annual average spending of 26.35 billion, some 3.7 billion MNT or 16 percent higher than for crop production. The livestock GDP in general is about four times that of the crop production GDP.

Table 4: Estimated subsidies for crop and livestock sectors, 2008-2012 (Mill. MNT)

Primary Agriculture	2008	2009	2010	2011	2012	2008-12 (Avg)	Ratio of 2012/2008
	(In Million MNT)						
Crop production sector							
Wheat subsidies	11,164	8,665	10,906	14,471	27,830	14,607	2.49
Fertilizer subsidy	614	230	0	0	0	169	0.00
Interest concession on crop loans (credit subsidy)	1,788	7,224	7,452	10,014	12,836	7,863	7.18
Market Price Support (MPS) for wheat before subsidy	8,939	12,283	22,387	-8,839	-39,511	-948	-4.42
Total subsidy to crop sector excluding market price support	13,566	16,119	18,359	24,485	40,665	22,639	3.00
Total subsidy to crop sector including market price support	22,505	28,401	40,746	15,646	1,155	21,690	0.05
Livestock production sector							
Wool subsidies	0	0	0	9,827	29,436	7,853	
Cashmere subsidies	30,500	0	0	0	0	6,100	
Pasture Management Grants	10,550	4,848	5,415	3,035	5,423	5,854	0.51
Veterinary subsidies	2,526	844	2,954	8,754	13,392	5,694	5.30
Interest concession on livestock loans (credit subsidy)	158	204	178	1,482	2,211	846	14.02
Market Price Support (MPS) for wool before subsidy	-2,594	-3,441	-368	2,439	-1,988	-1,191	0.77
Total subsidy to livestock sector excluding market price support	43,734	5,895	8,546	23,098	50,462	26,347	1.15
Total subsidy to livestock sector including market price support	41,139	2,454	8,178	25,537	48,474	25,157	1.18
Total primary agriculture sector							
Total subsidies to Primary Agriculture excluding MPS for wheat and wool	57,300	22,014	26,905	47,583	91,128	48,986	1.59
Total subsidies to Primary Agriculture including MPS for wheat and wool	63,644	30,856	48,924	41,183	49,628	46,847	0.78
	(In Million USD)						
Average exchange rate MNT/USD	1166	1438	1357	1266	1357	1317	1.16
Total subsidies to Primary Agriculture excluding MPS for wheat and wool (Million USD @annual average exchange	49	15	20	38	67	38	1.37
Total subsidies to Primary Agriculture including MPS for wheat and wool (Million USD @annual average exchange	55	21	36	33	37	36	0.67
Source: Subsidies - Author's calculations.							
Source for exchange rate:				Monthly Bulletin of Statistics of Mongolia			

Figure 5: PSE Components: MPS and budget transfers – Crop Production, Million MNT

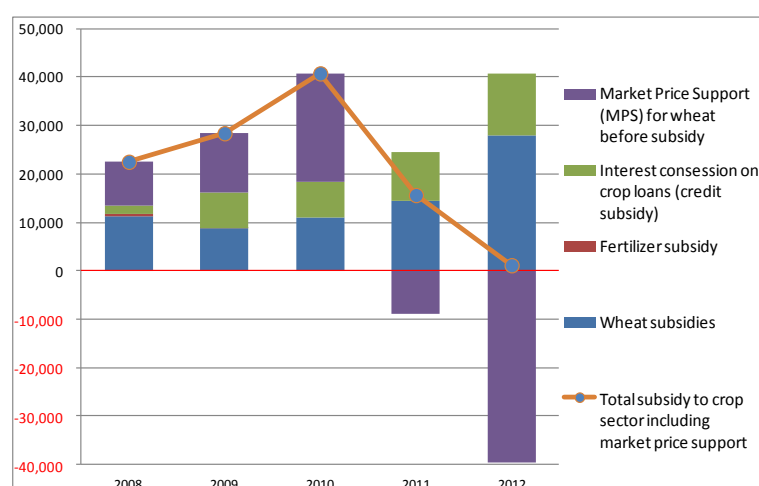


Figure 6: PSE Components: MPS and budget transfers – Livestock Production, Million MNT

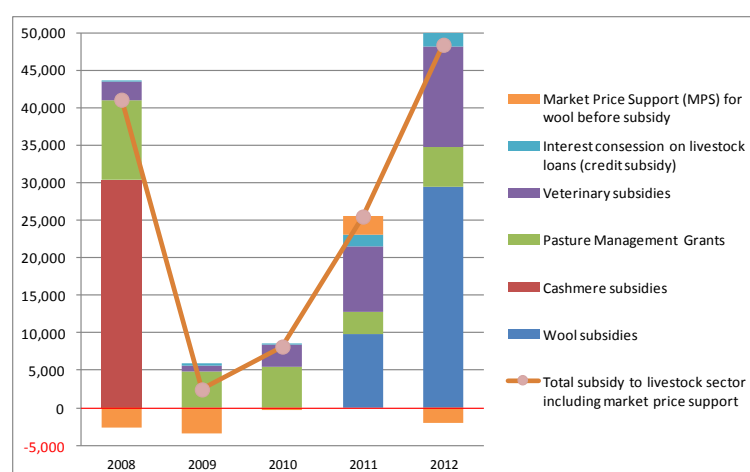
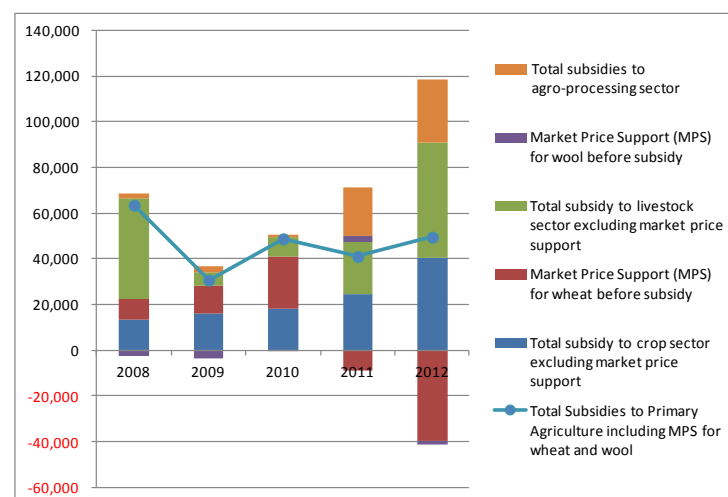


Figure 7: PSE Components: MPS & budget transfers – Primary Ag. and Agro-processing, Mill. MNT



4.2 Market Price Support for wheat and wool



Most of the Government policies in Mongolia in recent years have been aimed at raising the price of wheat and wool.

The indirect support (or taxation) of agricultural production, is estimated by calculating Market Price Support (MPS), which measures the difference between domestic market price and the corresponding international reference price (usually the border import price plus allowances for transport and processing and margin) measured at the farm gate of a specific agricultural commodity.

The MPS estimation is necessary when there is government policy intervention, such as import tariffs, other trade restrictions, export subsidies, and so on. These affect the market price. Low levels of tariff in Mongolia mean that there is likely to be fewer distortions in the market price resulting from policy intervention. However, besides the policy interventions, deviations in prices received by farmers compared to the true competitive reference price could also be due to the inherent market structure, conduct, and performance problems. A particularly relevant question in the case of Mongolia is what generates negative MPS for wheat and for wool. Obviously, negative MPS arises when the farm gate price is lower than the equivalent competitive international price of wheat (an imported commodity) and of wool (an exported commodity). In theory, there could be three possible reasons for the negative MPS in Mongolia:

1. the existence of policies to reduce the domestic price (and thereby the farm gate price),
2. imperfect competition in that commodity market, and/or
3. high oscillation (especially increases) in international price, with low transmission to local market and farm gate prices.

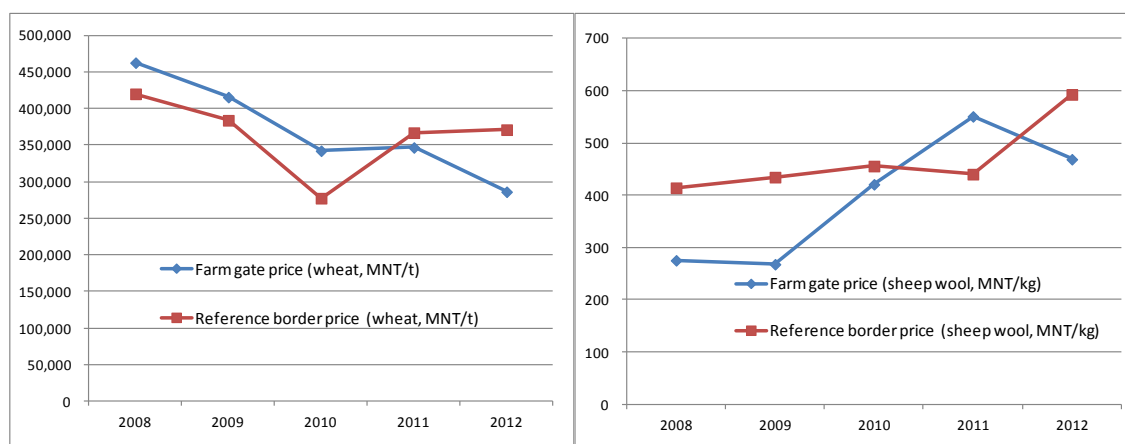
Most of the Government policies in Mongolia in recent years have been aimed at raising the price of wheat and wool. The likely reasons for negative MPS could therefore be the lack of market competition as well as an inability on the part of the domestic market to adjust quickly to the increases in international market as happened in 2011 and 2012 in case of wheat (Figure 8).

Normally, the MPS should be calculated for all agricultural commodities, but owing to certain constraints, it was agreed to cover only the two selected commodities, wheat and wool. The tariff on wheat imports is 15 percent except during the off-season of July to April when it is 5 percent (a complete list of official import tariffs currently in place since 1 July 1999 is shown in Appendix 2). Farmers may benefit from the wheat import tariff, but they lose on the fertilizer tariff, which is also 5 percent. For livestock, the tariff on the import of live animals is 5 percent with other veterinary non-tariff restrictions. There is no tariff for breeding animal imports, while the tariff for eggs and vegetables is 15 percent.

The MPS calculated for wheat and sheep wool is presented in Table 4 and the total subsidy amounts shown with and without MPS. The results are interesting as the MPS for these two commodities is positive in some years and negative in others. Wheat farmers, for example received a huge implicit subsidy (MPS) during 2010 (about 22 billion MNT) due to the lowest

import price of the commodity (see Figure 5). In 2011 and 2012 however, Mongolian wheat farmers bore an implicit tax as international prices shot up and consequently the equivalent reference prices remained higher than the farm gate prices including the price subsidy received by farmers. The farm gate price (before adding the subsidy) of wheat has been declining over the years and especially in 2012, giving rise to a much larger implicit tax (of about 39.5 billion MNT), wiping out the subsidies provided by the Government almost entirely. So, including MPS, the total subsidy amounts to the crop sector show a peak in 2010 but a decline in the next two years.

Figure 8: Comparison of farm gate price and equivalent border price- wheat and sheep wool



By contrast, the MPS for wool has been much smaller, indicating less distortion and a small difference in international export price and the price paid to farmers. Even though the farm gate domestic price for sheep wool (before subsidy) has been rising in general, the wool herders also faced an implicit tax during the 2008-2012 period, except in 2011 when the price received by herders exceeded the relatively low international price for wool.¹¹ Thus ignoring the MPS due to possible market distortions in all other livestock primary production sector commodities, the total subsidy to the sector, excluding the one-time subsidy payment to the cashmere herders in 2008, shows an increasing trend, going from about 2.45 billion MNT in 2009 to 48.47 billion MNT in 2012, with an annual average subsidy over 2008-2012 period of about 25 billion MNT, slightly higher than the 22.64 billion MNT to the crop sector.

The total subsidy to the primary agriculture including the MPS for only wheat and wool was 64 billion MNT in 2008, dropping to 31 billion in 2009, and gradually reaching a high of about 50 billion MNT in 2012.

It should be noted that, these estimates of subsidy with MPS do not cover all commodities. However, MPS to other commodities could be positive or negative. The overall effect of their exclusion is therefore ambiguous on total MPS. Furthermore, not included in the study is the estimate of total tax concessions to herders and farmers. The data required for computation were not available. Exclusion of this underestimates the total support to the agriculture sector.

¹¹ The MPS calculations are made using the adjusted average per unit export value of total wool quantity exported as a proxy for international reference price. Several simplifying assumptions were necessary as the quality differences and international prices are very complex. Also, MPS for all other commodities is not calculated, which could change the conclusions about subsidies to the primary agriculture sector. A full study of PSE estimation is, therefore, required.

Similarly, lack of available data on arrears on soft loans also underestimates the total subsidy support.

4.3 Subsidies to agro-processing sector

In addition to subsidies for primary agriculture, Government support is provided to agro-processing firms as an incentive to modernize processing technology and increase the capacity to take advantage of economies of scale to increase the competitiveness of domestic firms, and to generate employment in the larger economy. The purpose of soft subsidized loans for wool and cashmere processors is to protect them from foreign competition, mainly from China. The main beneficiaries of the soft loans include meat processing plants, wool and cashmere processors, and various other small and medium enterprises, with the meat stabilization program and cashmere processing firms receiving the lion's share. Subsidies to the agro-processing industry were fairly low, under 2.5 billion MNT in the beginning, but became particularly significant during 2011 and 2012, reaching a peak at 27.4 billion in 2012, and averaging about 11 billion MNT (Table 5). Given the average annual inflation rate of about



13 percent during the period between 2008 and 2012, this represents a real increase.

The purpose of soft subsidized loans for wool and cashmere processors is to protect them from foreign competition.

Table 5: Estimated subsidies for agro-processing industry, 2008-2012 (Mill. MNT)

	2008	2009	2010	2011	2012	2008-12 (Avg)
Meat Reserve stabilization subsidies	2,400	2,400	1,400	8,000	10,800	5,000
Interest concession on loans to wool Processors	-	-	-	2,760	3,596	1,271
Interest concession on loans to cashmere processors	-	-	-	9,405	10,483	3,978
Interest concession on SME Food processing loans	32	60	62	985	2,527	733
Total subsidies to agro-processing sector	2,432	2,460	1,462	21,150	27,406	10,982

Source: Calculations based on data from NSO, MIA.

4.4 Producer Subsidy Equivalent (PSE) Estimates

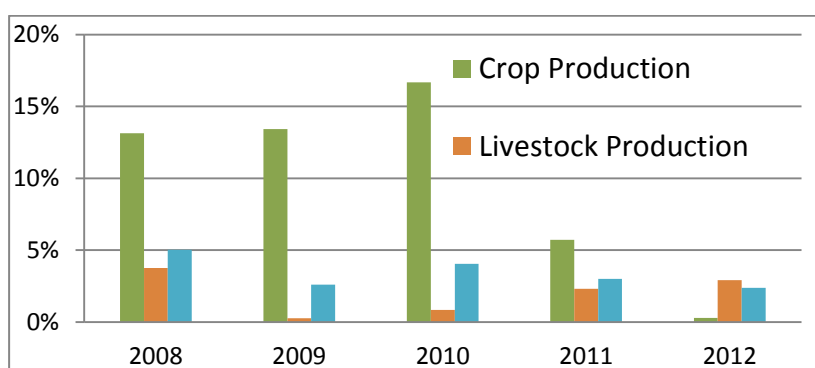
The total PSE figures (producer support/subsidy equivalent, including the MPS for wheat and wool), for primary agriculture are presented in relation to the total value of each sector (see Table 6 and Figures 9). More specifically, $PSE\% = \text{PSE including the MPS} / \text{total value (income) received by farmers (which is equal to the value of production at the farm gate price plus the PSE excluding MPS)}$ (OECD 2010).

Table 6: Estimated PSE (in Mill. MNT & %) to primary agriculture, 2008-2012

	2008	2009	2010	2011	2012	2008-12 (Avg)
Crop Production						
Producer Subsidy Equivalent	22,505	28,401	40,746	15,646	1,155	21,690
Total Production Value	171,526	211,581	244,529	273,321	415,987	263,389
PSE (%)	13.12	13.42	16.66	5.72	0.28	8.24
Livestock Production						
Producer Subsidy Equivalent	41,139	2,454	8,178	25,537	48,474	25,157
Total Production Value	1,096,197	972,579	964,191	1,103,763	1,668,150	1,160,976
PSE (%)	3.75	0.25	0.85	2.31	2.91	2.17
Total primary agriculture output						
Producer Subsidy Equivalent	63,644	30,856	48,924	41,183	49,628	46,847
Total Production Value	1,267,722	1,184,160	1,208,720	1,377,084	2,084,138	1,424,365
PSE (%)	5.02	2.61	4.05	2.99	2.38	3.29

Source: Author's calculations

Figure 9: Estimated producer subsidy equivalent (PSE, %) to primary ag. sector, 2008-2012



Source: Author's calculations

The results show that the PSE for the crop production sector, as a percentage of the total value of crop production, remained fairly high at 13 to 17 percent during 2008-2010 but declined dramatically in subsequent years, reaching a low of 0.28 percent in 2012. This was largely the result of rapid global grain price changes without corresponding changes in domestic farm gate prices. The PSE coefficients for the primary livestock production sector were lower compared to the crop sector but, excluding 2008, they steadily increased from 0.25 percent in 2009 to 2.9 percent in 2012. When the two are combined (the total support to agriculture) the PSE numbers show some fluctuation in the relative measure but a general decline from more than 5 percent in 2008 to less than 2.4 percent in 2012, with a five-year average remaining at 3.3 percent.

4.5 Nominal Protection Coefficient (NCP) for Wheat and Wool

In order to see the level of subsidization for each commodity, the Single Commodity Transfer (SCT) and the Producer Nominal Protection Coefficient (NPC) are calculated. The NPC is the ratio between the average price received by producers at the farm gate and the border price, measured at the farm gate. However, in the case of Mongolia, wheat production dominates crop farming, with roughly 50 percent of the crop GDP coming from the value of wheat. Since most of the other crop sector subsidies, machinery and other input loans are also accessible by wheat

farmers, a 50 percent share of other multiple commodity transfers (MCT) are assumed for wheat. Thus the NPC for wheat is calculated with and without share of MCT.

The full producer NPC for wheat, shown in Table 7 and Figure 10, implies that during 2010 about 35 percent higher payments were received over and above the relevant border price (assumed international competitive price). Thus the level of subsidy equivalent protection to farmers was 35 percent in 2010. Whereas, during 2012, the worst year, wheat producers paid an implicit tax of 3 percent on the wheat they sold. The estimated NPC ratio with the SCT for wheat in Mongolia is estimated to be 0.93 in 2012, implying the farmers received



In Mongolia, wheat production dominates crop farming.

only 93 cents for each tugrik they should have received based on the international prices. This ratio goes up slightly to 0.97 if we consider additional subsidies potentially acquired by wheat producers through the MCT. During the last five years, wheat producers have gone from receiving a moderate level of positive protection to a moderate level of negative protection.

Table 7: Estimated nominal protection coefficients (NPC) for wheat and wool farmers, 2008-2012

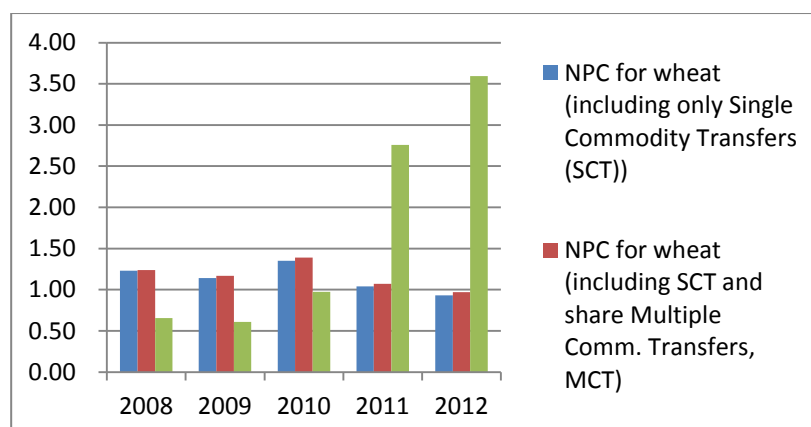
	2008	2009	2010	2011	2012
<i>NPC for wheat (including only Single Commodity Transfers (SCT))</i>	1.23	1.14	1.35	1.04	0.93
<i>NPC for wheat (including SCT and share of Multiple Commodity Transfers, MCT)) 1/</i>	1.24	1.17	1.39	1.07	0.97
<i>NPC for wool (including SCT)</i>	0.70	0.65	0.97	2.56	3.51

Source: Author's calculations

1/ Assuming wheat share of MCT is proportionate to its share of the total value of all crop production (on average approximately 50 percent).

Conversely, the NPC ratio of 3.51 for wool producers in 2012 implies that the price received by wool herders (sheep and camel) was more than three times the equivalent border price due to a high level of government payments during this particular year. This is consistent with the overall value of the commodity. For example, in 2012 the total value of wool production at farm gate prices was under 9 billion MNT, while the total subsidy paid to wool herders was over 29 billion MNT. Thus the NPC analysis, consistent with the PSE estimates, shows that wool herders were taxed heavily in 2008 and 2009 but were heavily subsidized during 2011 and 2012.

Figure 10: Nominal Protection Coefficients (NPC) for wheat and wool farmers, 2008-2012



Source: Author's calculations

4.6 International comparisons

The PSEs for the primary agriculture sector in Mongolia are compared to similar estimates available from different OECD studies (Table 8 and Figure 11). The overall level of subsidy support to primary agriculture in Mongolia has been fairly small (2.4% in 2012), much lower than OECD countries (18.6%), China (16.8%), Kazakhstan (14.6%) and Russia (13.5%) in the same year. Only Ukraine at 1.3% and Turkey at -7.3% were lower than Mongolia. Most countries, including Mongolia, show a generally declining trend. Thus, it can be concluded that the overall level of subsidy (both the direct and indirect levels) support to primary agriculture in Mongolia is fairly small, much lower than other countries in the region and has been declining over the last five years (2008 to 2012).

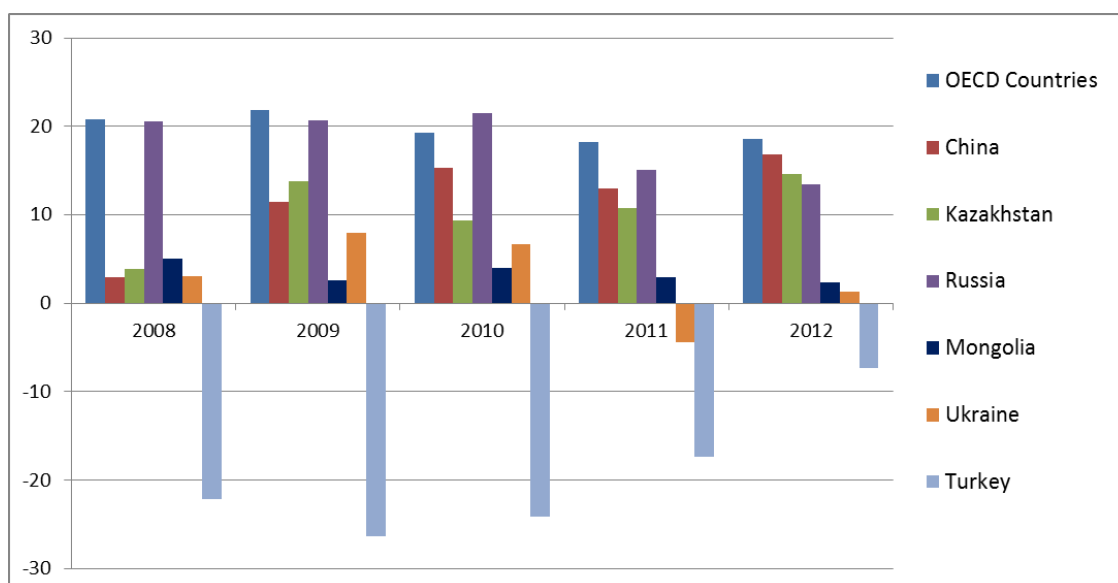
Table 8: Mongolia agricultural PSEs in comparison with other selected countries (%)¹²

	2008	2009	2010	2011	2012
OECD Countries	20.75	21.9	19.23	18.26	18.56
China	2.91	11.51	15.35	12.94	16.81
Kazakhstan	3.88	13.78	9.39	10.80	14.61
Russia	20.52	20.74	21.52	15.08	13.47
Mongolia	5.02	2.61	4.05	2.99	2.38
Ukraine	3.05	7.94	6.67	-4.37	1.32
Turkey	-22.14	-26.36	-24.15	-17.33	-7.32

Source: Mongolia - WB Mission calculations; Other countries - OECD calculations
(http://stats.oecd.org/Index.aspx?DataSetCode=MON2012PSCT_EE#)

Figure 11: Mongolia primary agriculture PSEs in comparison with other countries, %

¹² In order to make a fair comparison, MPS for other commodities such as meat, dairy and vegetables, which are traded commodities but in smaller quantities in Mongolia, need to be calculated. These are included in other countries' PSEs, for example of Russia and Ukraine.



Source: Mongolia - Author's calculations; Other countries - OECD calculations
http://stats.oecd.org/Index.aspx?DataSetCode=MON2012PSCT_EE#

5 ANALYSIS OF POTENTIAL IMPACT OF AGRICULTURAL SUBSIDY

Agricultural producer subsidies can have varied impacts on production, trade, incomes, market prices, and overall economic growth and welfare through possible distortions and stimuli. As indicated by subsidy experts, the sustained long term use of subsidies has a distortionary impact on markets, prices and resource allocation. However, smart subsidies¹³ may bring about desired results in the early stages of agricultural development by correcting for market failures and promoting the adoption of new technologies (Kaur and Sharma, 2012 and Fan, 2008). Analyses of economic, social, and environmental impacts require a great deal of long-term data, and time

¹³ Ten features of smart subsidies by Morris et al. 2007 (The World Bank publication) are: 1. Promoting fertilizer as part of a wider strategy, 2. Favoring market based solutions in input supply, 3. Promoting competition in input supply, 4. Paying attention to demand, 5. Insisting on economic efficiency, 6. Empowering farmers, 7. Involving an exit strategy, 8. Pursuing regional integration, 9. Ensuring sustainability, and 10. Promoting pro-poor economic growth.

Alternatively, according to the literature review carried out by Meyer (2011) for the World Bank, the guidelines for “smart” or “market-friendly” subsidies include: “subsidize the institution but not the borrowers to reduce distortions; avoid subsidies to institutions that undermine competition; subsidize the creation of public goods that benefit the entire financial sector; subsidize individual financial institutions where there is natural spillover to nonsubsidized institutions; identify quantitative performance measures so subsidies to financial institutions do not dull incentives for high performance; conduct comparative cost-benefit studies to identify subsidies that generate the greatest payoff; require grant recipients to demonstrate commitment through matching contributions; and design grants to financial institutions so recipients clearly understand the difference between grants and loans.”

and financial resources. The scope of this study is limited to five years. Longer time series and/or full panel household survey data would enable analyses to better capture equity and economic welfare impacts. The analysis here is limited and is carried out to improve impacts of different programs based on the lessons learned from international experience and establish an empirical basis for future assessments of links between farm support and agricultural growth in Mongolia.

5.1 Impact of subsidies on production/supply

In the crop production sector only wheat is offered direct price support. There is some secondary support across the board, including to wheat farmers, but in less significant amounts. To see the impact of wheat subsidization, changes in the area planted and yields over the five-year period are calculated. Significant direct cash subsidies were provided to wheat farming from 2008 to 2012. The benefits of these subsidies were however negated by implicit taxation when compared to the border reference prices, especially during 2011 and 2012. Although the area cultivated with other crops is much smaller than the wheat area, the relative changes over time are important. The area planted with wheat grew at more than double and yields increased more than three times the rate of other, non-subsidized crops (Table 9 and Figure 12). While fertilizer use in Mongolia remains low compared to industrialized countries, it doubled from 8.6 kg/ha of arable land to 18 kg/ha between 2007 and 2010. And although other factors may be attributable for these changes, it is highly likely that direct subsidies to wheat played a significant role in increasing wheat productivity. On the negative side, it also means that the subsidies have promoted further mono-cropping of wheat in the country, going against the desirable production and diet diversity objectives as well as the allocation of resources in favor of this one crop.

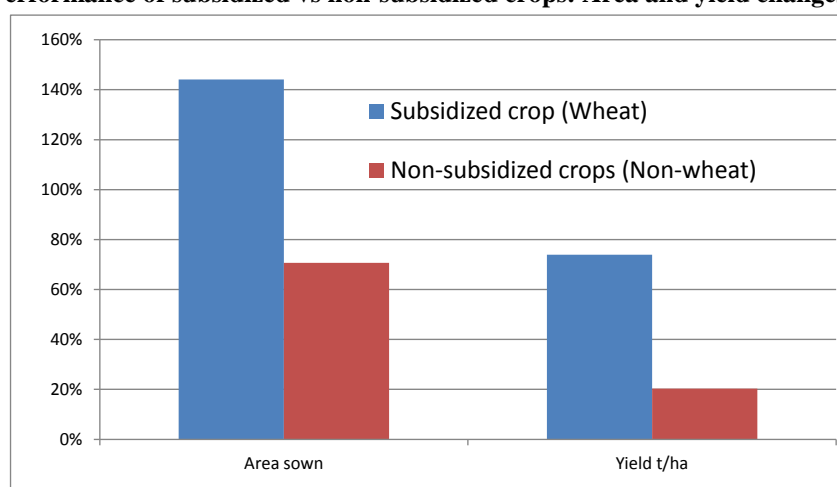
Table 9: Performance of subsidized vs non-subsidized crops: Area and yield changes-2007 to 2012

Crops grown	Area sown 2007 (000 ha)	Yield/ha 2007 (t/ha)	Area sown 2012 (000 ha)	Yield/ha 2012 (t/ha)	Area sown 2012/2007 % change	Yield/ha 2012/2007 % change
Subsidized crop (Wheat)	122	0.9	297	1.565	144%	74%
Non-subsidized crops (Non-wheat) 1/	23	-	38	-	71%	20%

Source: Calculations based on data from NSO. Compiled by author.

1/ Calculated from production of potatoes, vegetables and fodder crops weighted by their respective proportion of area sown.

Figure 12: Performance of subsidized vs non-subsidized crops: Area and yield changes-2007 to 2012



Source: Calculations based on data from NSO.

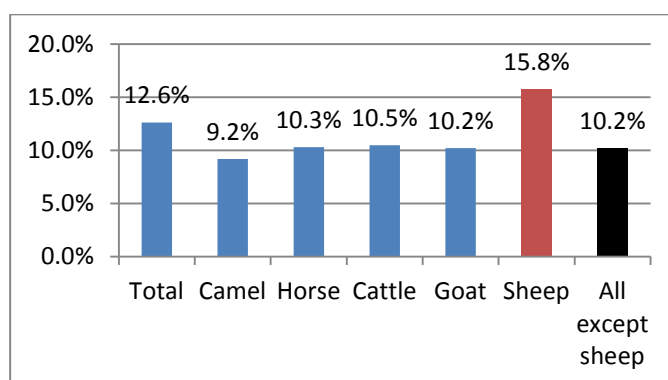
In the livestock sector, the total number of animals reached a historical high of 44.0 million heads in 2009, which was brought down to 32.7 million in 2010 by the severe *dzud* in the 2009/10 winter. The number of animals increased again to 40.9 million in 2012. In 2011 and 2012, livestock subsidies were directed exclusively at wool production, mainly sheep and to a lesser extent to camel wool. Although the data series were not long enough to draw any definite conclusions, the rate of increase in numbers of sheep far exceeds that of any other type of livestock (Figure 13). Again, it is difficult to establish that subsidies were responsible, but they could be one of the factors. If so, this would be an unintended effect of the subsidy policies as the official goal is not to increase livestock numbers because they have already reached or exceeded the ecological carrying capacity of the land. According to the Mongolian National Livestock Program document the average carrying capacity of 100 hectares of pasture land is 60 sheep equivalent animals. The number of animals have already exceeded by up to 9 times this limit in some *aimags*.



The total number of animals was brought down to 32.7 million by “dzuds” – severe winter weather events.

Some of the livestock subsidies, such as the direct payments for raw wool and cashmere, may be responsible for increasing the already unsustainable number of livestock heads, and therefore instrumental in raising the overall environmental costs. Subsidies to the livestock sector should take into account environmental consequences, including ecological carrying capacity and the long term sustainability of pasture resources. As shown in literature, the economic efficiency of production may not improve because the subsidies do not bring about any permanent structural or technological changes. And while the newly reformed Mongolian National Livestock Program aims to improve the quality of livestock commodities, modernize production systems, and promote the adoption of improved technologies, the Program is not yet fully funded and implemented.

Figure 13: Percent change in number of animals, 2012 over 2011



Source: Calculations based on data from NSO.

The primary goal of the subsidy to wool herders is to increase their welfare and to encourage them to sell to the local wool processors. Although both goals are achieved with nearly 100

percent procurement by local processors, the overall consistency with the national sector development program objectives needs to be addressed.

5.2 Impact on terms of trade

The terms of trade of the two major commodities traded internationally (i.e. wheat and wool), which are also subject to subsidization, are calculated and presented in Table 10. Wheat and wool are both exported. Other commodities, for example, raw cashmere, are traded but not supported at the farm level by direct subsidy policies at least during the period covered by the study. As seen from the price ratio of the domestic price received by farmers to the international price (or by the NPC already discussed earlier), wheat protection eroded over the years reaching more or less a parity level in 2011 and 2012. Thus, the direct subsidy to this commodity in last two years has reduced trade distortions. Given that the wheat imports currently are relatively small (under 100,000 tonnes in 2012 coming down from 350,000 in 2007) the direct trade distortion effects of wheat policies may be minimal. However, this may change if global wheat prices decline and the subsidies remain the same.

Table 10: Terms of trade for wheat and wool during 2008 to 2012

	2008	2009	2010	2011	2012
WHEAT					
Effective price received by producers (000 MNT/t) 1/	522	448	385	391	360
International import reference price (000 MNT/t)	420	384	277	367	371
Terms of trade (Price ratio =domestic price received/international price)	1.24	1.17	1.39	1.07	0.97
WOOL					
Effective price received by producers (000 MNT/t) 2/	275	268	421	1,077	2,010
International export reference price (000 MNT/t)	394	415	436	420	573
Terms of trade (Price ratio =domestic price received/international price)	0.70	0.65	0.97	2.56	3.51

Source: Calculations based on data from NSO, Ministry of Finance (MOF), Global Trade Information Services (GTI).

1/ Including SCT and MCT subsidies per unit for wheat farmers

2/ Including only SCT subsidy per unit for sheep and camel wool herders

Support to wool, a major export commodity, on the other hand, has turned from hugely negative to hugely positive, and thus subsidies have changed the terms of trade. However, this also may have had no trade distorting effect because the processors purchase the wool from herders and export at competitive prices in international market. Thus, in Mongolia, subsidies paid to sheep herders during 2011 and 2012 are likely to act more as a welfare transfer to herders.

5.3 Fiscal impact

To perform an analysis of their potential fiscal impact, agricultural subsidies (only primary sectors of crop and livestock production, not including agro-processing sector) are compared to the total income and Government spending in other key productive areas. The analysis includes the relative magnitude in each year during the selected five year period and also the possible discernible trends, if any. Agricultural subsidies as direct payments for output and/or inputs are calculated while those of other sector subsidies, for energy,



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transportation, and others, are as reported in the official Government expenditure. Thus, ignoring methodological differences, the total estimated primary agricultural subsidies on average form a substantial part of the total government subsidies. Agricultural subsidies on average were about 38 percent of total direct subsidy payments with a steady downward trend from 47 percent in 2008 to 27 percent in 2011 (see Table 11). This, however, is primarily due to relatively higher growth in non-agriculture subsidies including those for energy, transport and other sectors. This trend was reversed to 45 percent in 2012 with a big increase in wheat and wool subsidies. A similar magnitude and trend can be found when the agricultural subsidies are compared to the MIA's expenditure including the annual outlay of various subsidy funds for crop and livestock. Agricultural subsidies grew at an average annual rate of 15 percent, while total MIA's agriculture investment expenditures grew by 7 percent and R&D expenditure by 16 percent between 2008 and 2012.

Table 11: Subsidies as compared to Government expenditures and revenues

	2008	2009	2010	2011	2012	2008-12 (Avg)
Subsidy as a ratio with expenditure:						
Ag. Subsidies (crop and livestock)/Total Subsidies (energy, agriculture, transport, others) 2/ 3/	0.47	0.40	0.28	0.27	0.45	0.38
Ag Subsidies (crop and livestock)/Total Ag Expenditure 4/	0.58	0.47	0.25	0.20	0.41	0.34
Ag Subsidies (crop and livestock)/Total Ag Investment Budget	2.49	1.27	2.46	2.01	3.14	2.36
Ag Subsidies (crop and livestock)/Agriculture R&D Expenditure 5/	12.35	4.54	6.42	7.68	11.93	8.90
Subsidy as percentage of income:						
Crop subsidies/Crop GDP	8.02	7.90	7.74	9.30	10.09	8.87
Livestock subsidies/Livestock GDP	4.04	0.61	0.89	2.12	3.06	2.29
Ag Subsidies (crop and Livestock)/Crop and livestock GDP	4.58	1.88	2.26	3.51	4.44	3.49
Total Subsidies (energy, agriculture, transport, others)/Total GDP	1.87	0.84	1.14	1.58	1.45	1.40
1/ 2008 to 2011 are actual expenditures and 2012 is planned budget.						
2/ Estimated subsidies in this study; These do not include the implicit subsidies calculated as the Market Price Support for wheat and wool, i.e. by comparing price received by farmers in relation to the international price.						
3/ Including Government estimates of energy, transport, enterprises, and other subsidies; however, ag and agro-processing industry subsidies are as estimated in this in this study.						
4/ Ministry of Industry and Agriculture (MIA) expenditure plus livestock fund for wool and cashmere subsidies, and agriculture subsidy part of the SME loans. Wheat subsidies are already included in the normal MIA budget.						
5/ This includes R&D budgets reported by MIA, plus the agr research expenditure through the Science and Technology Fund under the Ministry of Education and Science.						

These subsidy outlays are more than double the investment budget handled by the MIA, which seems to fluctuate from year to year. There is a very little spent on R&D through the MIA as well as through the Science and Technology Fund under the Ministry of Education. As a result, if the data obtained are reliable, agricultural subsidies in Mongolia were on average nearly 9 times higher than the R&D expenditure during the five year period. If one assumes that a dollar spent on R&D investment is likely to have much higher return than a dollar spent on subsidy, then these figures imply a significant scope for reallocating government funds in order to increase the total return on the limited government financial resources.

Another commonly considered indicator of fiscal impact is the size of subsidy in relation to the total income of the sector. This is shown in the bottom half of Table 11. The estimated crop subsidies (only direct output and input payments, not considering the MPS) have been fairly stable at around 8 to 10 percent of total crop GDP, with a slight increase in 2012, and averaging around 9 percent. On the contrary, the livestock subsidies were much less, ranging from 1 to 3 percent and generally rising from 2009 to 2012. Thus the combined ratio for the primary agriculture subsidies (crop and livestock) to its corresponding GDP ranged from 2 to 4 percent from 2009 to 2012. The value in 2008 was relatively high due to the one time large payment to Cashmere goat herders. The final indicator, subsidies to GDP ratio, shows that the total subsidy



The livestock GDP in general is about four times that of the crop production GDP.

payments for agriculture and non-agriculture programs ranged from 0.8 percent of national GDP in 2009 to 1.6 percent in 2011, with an overall average of 1.4 percent from 2008 to 2012. The relative size of subsidies seems small but their ratios (2009-2012) to the GDP, which itself is growing at very high rate, is also increasing. Furthermore, the rising share of subsidies suggests likely squeezing out of other productive investments and R&D and allocations to agriculture sector.

6 CONCLUSIONS AND POLICY RECOMMENDATIONS

The issues discussed in the preceding chapters have a number of important policy implications, and point to a similar number of recommendations for improving the efficiency and effectiveness of agriculture subsidies in Mongolia.

- 1. Rationalize agricultural subsidy programs.** By 2012, there were seven direct payments or grants programs and seven loan programs with varied terms and conditions for herders, farmers, and processors covering crops, livestock, and agro-processing companies. A number of these funds, grants, and soft loan schemes overlap in mandate and in intended beneficiaries, for instance the SME Fund operated by the Ministry of Labor also covers soft loans for primary agriculture that overlap with MIA's programs targeting the very same beneficiaries. Subsidy schemes are authorized under parliamentary decrees, while funds typically come from the Government as ad-hoc extra-budgetary allocations to the concerned ministries. No clear or transparent method for determining the level of subsidies appears to be in place. Therefore, **it is recommended that the streamlining and rationalization of agricultural subsidy programs be carried out to help resolve the inconsistencies and overlapping of objectives and beneficiaries and to improve the overall structure, implementation costs and efficiency.**
- 2. Eliminate negative Market Price Support (MPS) and address problems of market structure.** According to the findings of this study, market price support (MPS) was negative for both wheat and wool during some years of the five year period. This implies that part of the government budgetary transfers went only to compensate for implicit taxation. In the absence of domestic market price reduction policies, the negative MPS arises mainly due to the lack of competitive market structure and a rise in the international price of the commodity without domestic price transmission. To understand why the farm gate and the local market prices are lower than the equivalent competitive market prices **a study of market structure and performance, and of the roles of various intermediaries and their margins in the marketing channel should be undertaken to inform policy that reduces the need for further subsidies by improving market efficiency.**
- 3. Develop alternative strategies for investing in agriculture other than subsidies.** If the main objective of a subsidy is to increase production, it is recommended that more efficient options, particularly investments in the General Services Support (GSS) through research and development, education and training, infrastructure improvements, inspection and health services, among others, be followed. This is particularly important in the case of Mongolia, given that the subsidy outlays are more than double the MIA's investment budget and nearly nine times higher than expenditures on agricultural R&D. The common conclusion from the

literature is that a dollar spent on R&D investment is likely to yield much higher return than a dollar spent on subsidy. If this is true then the reallocation of funds can increase the total returns to the limited government financial resources. The literature suggests that investing in road infrastructure, eliminating bureaucratic hurdles and augmenting the performance of financial institutions is preferable to subsidizing fertilizer, for example (Banful, 2011). Rather than providing blanket subsidies, funds can be provided more selectively to support productivity and profitability enhancing measures. Examples of such highly productive activities mentioned by some of the stakeholders include - facilities for on-farm storage of crops, fencing of fields as animal herds can destroy farmers' field crops, assistance for minimal grain processing (cleaning, sorting, grading), establishment and improved access to centralize grain marketing system, among others.

4. **Subsidies to the livestock sector should take into account environmental consequences, including ecological carrying capacity, and the long term sustainability of pasture resources.** Direct subsidies to specific groups of livestock herders are fairly controversial given their potential to promote bigger herd sizes. According to the MIA's own estimates the current levels of animals have surpassed ecological limits by as much as nine times in some *aimags*. Subsidy programs for the livestock sector in Mongolia generally provide short term financial support to herders and do not greatly contribute to improved long term food security or improved economic efficiency. They may be even be responsible for increasing the number of head of livestock already at the unsustainable levels and thus raise overall environmental costs. As shown in the literature, the economic efficiency of production may not improve if the subsidies do not bring about any permanent structural or technological change (Jayne and Rashid; Dorward). It is noted, however, that the newly reformed Mongolian National Livestock Program aims to improve the quality of livestock commodities, modernize production systems and help adopt improved technologies but it is not yet fully funded or implemented for lack of financial resources. Therefore, it is recommended that the support to the livestock sector remain mindful of the environmental implications and follow the provisions of MNLP rather than the ad-hoc payments to the sector.
5. **Adopting a smart subsidies strategy.** The so-called smart subsidies described in the literature can play an important role in a successful agricultural and broader socio-economic development, especially when effectively applied to overcome market failures constraining productive use of modern inputs and technology. Smart subsidies typically involve an objective of pro-poor economic growth, the development of local markets, and the promotion of competition in input supply, the pursuit of regional integration and clarity of an exit strategy, among other desirable goals. The market smart subsidies also include innovative financing, voucher systems, warehouse receipt schemes, etc. intended to reduce input delivery costs and improve targeting to promote private input markets, the adoption of new technologies by poor farmers, increased output, and ultimately poverty reduction. **Therefore, it is recommended that smart subsidy options, to the extent possible, be considered as a policy intervention when designing safety net programs that are economically productive and socially equitable.**
6. **Subsidies to the agro-processing industry.** In addition to the primary agriculture sector, subsidies are also provided to a variety of agro-processors, including wool and cashmere processors, flour mills, and meat processors. The primary objective of this support has been to help the overall competitiveness of the local processing companies vis-à-vis foreign ones, by helping them to modernize and acquire economies of scale Subsidies to this sector are

also justified under the objective of growth and employment creation. For example, subsidies to wool and cashmere processors have forced them to organize themselves into associations, which may have implications for the export of raw wool and cashmere material. On the other hand, the national association of processors decides the overall maximum price level and where local companies operate exclusively in designated areas, thus reducing competition. Herders may have reduced bargaining power in the process. Similarly, there may be unintended consequences of wheat price subsidies, such as mills having the added bargaining power over farmers in accepting their deliveries of wheat especially when the deadline of the price subsidy period approaches. Subsidies to the agro-industry were beyond the scope of this study but it is very important to **analyze the impact of the payments to agro-processing firms so that future interventions are guided by the experience and effectiveness of these subsidies.**

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8 APPENDICES

Appendix 1: PSE calculation categories

Table A1. PSE Calculations - Market support and budget transfers in PSE according to OECD methodology)

Categories	Sources of data/information
<i>A. Support based on commodity output</i>	
A.1. Market Price Support	
A.2. Payments based on output	
<i>B. Payments based on input use</i>	
B.1. Variable input use	
B.2. Fixed capital formation	
B.3. On-farm services	
<i>C. Payments based on current A (Area)/An (Animal number)/R (Receipts)/I (Income), production required</i>	
C.1 Based on current receipts/income	
C.2 Based on current area/animal number	
<i>D. Payments based on non-current (historical or fixed) A (Area)/An (Animal number)/R (Receipts)/I (Income), production required</i>	
<i>E. Payments based on non-current A (Area)/An (Animal number)/ R (Receipts)/I (Income), production not required</i>	
E.1. Variable rates (vary with respect to levels of current output or input prices, or production/yields and/or area)	
E.2. Fixed rates	
<i>F. Payments based on non-commodity criteria</i>	
F.1. Long-term resource retirement	

F.2. Specific non-commodity output	
F.3 Other non-commodity criteria	
<i>G. Miscellaneous payments</i>	
Labels	
-- With/without L (current commodity production limits and/or limits to payments)	
-- With V/F rates (variable or fixed payment rates)	
-- With/without C (input constraints).	
-- With/without E (commodity exceptions).	
-- Based on A/An/R/I (Area/Animal number/Receipts/ Income).	
-- Based on SC/GC/AC (a single commodity, a group of commodities or all commodities).	

Source: OECD 2010

Appendix 2: Import Tariffs on selected commodities

Table A2. Official import tariffs currently in place since 1 July 1999

Commodity/description	Custom duty rate %
Wheat imported in Bayan Ulgii, Tsagaan nuur, Khovd Yarant, Uvs aimag Borshoo, Zavkhan aimag Artssuuri, Gobi-altai aimag Burgastai ports	15
Wheat imported between 1 April and 1 July	15
Wheat imported between 1 July and 1 April	5
Wheat flour imported between 1 August and 1 April	15
Grain, flour, starch, dairy mixture, flour produce	5
Vegetables namely onions, cabbage, carrots and turnip cabbage	15
Other vegetables, fruit, nut or mixture of plant parts	5
Cotton wool	5
Chicken eggs	15
Livestock, animal	5
Meat sub products	5
Dairy products, honey, meat	5
Wool, animal fine and crude hair, fleece, horse fine yarn, woven fabric	5

*Source: Annex to Resolution No. 27; Parliament of Mongolia dated 03 June 1999, Ulaanbaatar city

Appendix 3: MPS and SCT Tables for Wheat and Wool

Table A.3.1: Wheat Market Price Support and Consumer Support Estimate

		Units	2008	2009	2010	2011	2012
I. Level of production	data	000t	210	388	345	436	465
II. Farmgate price	data	MNT/t	462,797	415,695	342,292	346,807	286,272
III. Value of production (at farm gate)	data or [(I) * (II)/1000]	MNT Mill	97,109	161,340	118,247	151,169	133,200
IV. Level of consumption	data	000t	558	643	498	533	536
V. Consumption price (at farm gate)	$(II) - ((IX.1) + (X.1)) / (I) * 1000 + ((IX.1) + (IX.2)) / (IV) * 1000$	MNT/t	462,797	415,695	342,292	346,807	286,272
VI. Value of consumption (at farm gate)	$(IV) * (V) / 1000$	MNT Mill	258,188	267,459	170,589	184,963	153,449
VII. Reference price (at farm gate)	$(VII.1) * (VII.3) * (VII.4) + (VII.2)$	MNT/t	420,197	384,048	277,488	367,086	371,187
1. Border reference price (average import price)	data	USD/t	331	240	181	265	249
2. transportation costs	data	USD/t	25	25	25	25	25
3. Quality adjustment	data	ratio	1	1	1	1	1
4. Official exchange rate	data	MNT/USD	1,182	1,451	1,346	1,268	1,355
VIII. Market price differential	$(II) - (VII)$	MNT/t	42,600	31,647	64,804	-20,279	-84,916
IX. Market transfers	$(IX.1) + (IX.2) - (IX.3)$	MNT Mill	8,939	12,283	22,387	-8,839	-39,511
1. Transfers to producers from consumers	$= IF((IV) > (I), 0, ((IV) - (I)) * (VIII) / 1000, (VIII) * (IV) / 1000)$	MNT Bill	8,939	12,283	22,387	-8,839	-39,511
2. Other transfers from consumers	$= IF((IV) < (I), 0, ((IV) - (I)) * (VIII) / 1000)$	MNT Mill	0	0	0	0	0
3. Excess feed cost	$= IF((I) < (I), 0, (I) * (VIII) / 1000, (I) * (VIII) / 1000)$	MNT Mill	0	0	0	0	0
X. Budgetary transfers	$(X.1) + (X.2) + (X.3)$	MNT Mill	0	0	0	0	0
1. Transfers to producers from taxpayers	$= IF((IV) > (I), 0, ((I) - (IV)) * (VIII) / 1000)$	MNT Mill	0	0	0	0	0
2. Transfers to consumers from taxpayers	data	MNT Mill	0	0	0	0	0
3. Price levies (-)	data	MNT Mill	0	0	0	0	0
XI. Market Price Support (MPS)	$(IX.1) + (X.1) + (X.3)$	MNT Mill	8,939	12,283	22,387	-8,839	-39,511
XII. Producer NPC	$1 / [100 - (IX.1 + X.1 + XII.1) / ((III + XII.1) * 100)] * 100$	ratio	1.23	1.14	1.35	1.04	0.93
1. Payments on output total	data	MNT Mill	11,164	8,665	10,906	14,471	27,830
2. Payments on output per tonne	$(XII.1) / (I) * 1000$	MNT/t	53,205	22,324	31,571	33,199	59,811
XIII. Consumer Single Commodity Transfers (CSC T)	$(X.2) - ((IX.1) + (IX.2) + (IX.3))$	MNT Mill	-8,939	-12,283	-22,387	8,839	39,511
XIV. Consumer NPC	$1 / [100 - (IX.1 + IX.2) / VI * 100] * 100$	ratio	1.04	1.05	1.15	0.95	0.80

Source: Author's calculations based on official NSO data (farm gate prices, production, trade volumes and values), Ministry of Finance, supplemented by stakeholder interviews (e.g. transport costs, quality adjustment);

Table A.3.2: Sheep Wool Market Price Support and Consumer Support Estimate

		Units	2008	2009	2010	2011	2012
I. Level of production	data	t	21,818	23,444	24,534	18,685	19,100
II. Producer price (at farm gate)	data	MNT/kg	275	268	421	551	469
III. Value of production (at farm gate)	data or [(I) * (II)/1000]	MNT Mill	6,011	6,283	10,329	10,295	8,958
IV. Level of consumption	data	t	12,510	17,704	16,585	10,257	14,606
V. Consumption price (at farm gate)	$(II) - ((IX.1) + (X.1)) / (I) * 1000 + ((IX.1) + (IX.2)) / (IV) * 1000$	MNT/kg	275	268	421	551	469
VI. Value of consumption (at farm gate)	$(IV) * (V) / 1000$	MNT Mill	3,446	4,745	6,982	5,652	6,850
VII. Reference price (at farm gate)	$(VII.1) * (VII.3) * (VII.4) + (VII.2)$	MNT/kg	394	415	436	420	573
1. Border reference price (f.o.b. or c.i.f.)	data	USD/t	1,004	853	958	987	1,205
2. Transportation, handling and processing costs	data	MNT/kg	80	80	80	80	80
3. Quality adjustment	Only 40% is usable, rest is waste.	ratio	0.40	0.40	0.40	0.40	0.40
4. Official exchange rate	data	MNT/USD	1,182	1,451	1,346	1,268	1,355
VIII. Market price differential	$(II) - (VII)$	MNT/kg	-119	-147	-15	131	-104
IX. Market transfers	$(IX.1) + (IX.2) - (IX.3)$	MNT Mill	-1,488	-2,598	-249		
1. Transfers to producers from consumers	$= IF((IV) > (I), (VIII) * (I) / 1000, (VIII) * (IV) / 1000)$	MNT Mill	-1,488	-2,598	-249	1,339	-1,521
2. Other transfers from consumers	$= IF((IV) < (I), 0, ((IV) - (I)) * (VIII.) / 1000)$	MNT Mill	0	0	0	0	0
3. Excess feed cost	$= IF((I) < (I), (I) * (VIII.) / 1000, (I) * (VIII.) / 1000)$	MNT Mill	0	0	0	0	0
X. Budgetary transfers	$(X.1) + (X.2) + (X.3)$	MNT Mill	-1,107	-842	-119	1,100	-468
1. Transfers to producers from taxpayers	$= IF((IV) > (I), 0, ((I) - (IV)) * (VIII.) / 1000)$	MNT Mill	-1,107	-842	-119	1,100	-468
2. Transfers to consumers from taxpayers	data	MNT Mill	0	0			
3. Price levies (-)	data	MNT Mill	0	0			
XI. Market Price Support (MPS)	$(IX.1) + (X.1) + (X.3)$	MNT Mill	-2,594	-3,441	-368	2,439	-1,988
XII. Producer NPC	$1 / [100 - (IX.1 + X.1 + XII.1) / (III. + XII.1) * 100] * 100$	ratio	0.70	0.65	0.97	2.56	3.51
1. Payments on output total	data	MNT Mill	0	0	0	9,827	29,436
2. Payments on output per tonne	$(XII.1) / (I) * 1000$	MNT/kg	0	0	0	526	1,541
XIII. Consumer Single Commodity Transfers (CSCT)	$(X.2) - ((IX.1) + (IX.2) + (IX.3))$	MNT Mill	1,488	2,598	249	-1,339	1,521
XIV. Consumer NPC	$1 / [100 - (IX.1 + IX.2) / VI. * 100] * 100$	ratio	0.70	0.65	0.97	1.31	0.82

Source: Author's calculations based on official NSO data (farm gate prices, production, trade volumes and values), supplemented by stakeholder interviews (e.g. transport costs, quality adjustment);

Table A.3.3: Wheat Single Commodity Transfers

	units	2008	2009	2010	2011	2012
I. Level of production ¹	000t	210	388	345	436	465
II. Value of production (at farm gate) ¹	Mill MNT	97,109	161,340	118,247	151,169	133,200
III. Producer Single Commodity Transfers²	Mill MNT	20103	20947	33294	5632	-11681
A. Support based on commodity outputs	Mill MNT	20103	20947	33294	5632	-11681
<i>A1. Market Price Support^{3, 5}</i>	Mill MNT	8,939	12,283	22,387	-8,839	-39,511
<i>A2. Payments based on output^{3, 6}</i>	Mill MNT	11,164	8,665	10,906	14,471	27,830
B. Payments based on input use	Mill MNT	0	0	0	0	0
<i>B1. Variable input use^{3, 6}</i>	Mill MNT	0	0	0	0	0
<i>B2. Fixed capital formation^{3, 6}</i>	Mill MNT	0	0	0	0	0
<i>B3. On-farm services^{3, 6}</i>	Mill MNT	0	0	0	0	0
C. Payments based on current A/An/R/I, production required, single commodity^{3, 6}	Mill MNT	0	0	0	0	0
D. Payments based on non-current A/An/R/I, production required^{3, 6}	Mill MNT	0	0	0	0	0
IV. % SCT^{*4, 7}	%	18.57	12.32	25.78	3.40	-7.25

Source: Author's calculations

Formulas involved in the calculation for each row above are given in the footnotes below:

¹MPS table

²PSCTWT = AWT + BWT + CWT + DWT

³TOTAL table

⁴%SCTWT = 100* SCTWT / ((PPWT*QPWT) + A.2WT + BWT + CWT + DWT)

*This is underestimation as it includes only "wheat specific programs". Most other crop production programs, although not specified as wheat programs, do provide benefits to wheat producers.

⁵Wheat specific MPS

⁶Wheat specific programs

⁷Wheat specific transfers / value of receipts from wheat production

Table A.3.4: Sheep Wool Single Commodity Transfers

	units	2008	2009	2010	2011	2012
I. Level of production ¹	t	21,818	23,444	24,534	18,685	19,100
II. Value of production (at farm gate) ¹	Mill MNT	6,011	6,283	10,329	10,295	8,958
III. Producer Single Commodity Transfers²	Mill MNT	-3031	-3910	-859	11892	27066
<i>A. Support based on commodity outputs</i>	Mill MNT	-3031	-3910	-859	11892	27066
<i>A1. Market Price Support^{3, 5}</i>	Mill MNT	-3031	-3910	-859	2065	-2370
<i>A2. Payments based on output^{3, 6}</i>	Mill MNT	0	0	0	9,827	29,436
<i>B. Payments based on input use</i>	Mill MNT	0	0	0	0	0
<i>B1. Variable input use^{3, 6}</i>	Mill MNT	0	0	0	0	0
<i>B2. Fixed capital formation^{3, 6}</i>	Mill MNT	0	0	0	0	0
<i>B3. On-farm services^{3, 6}</i>	Mill MNT	0	0	0	0	0
<i>C. Payments based on current A/An/R/I, production required, single commodity^{3, 6}</i>	Mill MNT	0	0	0	0	0
<i>D. Payments based on non-current A/An/R/I, production required^{3, 6}</i>	Mill MNT	0	0	0	0	0
IV. % SCT^{4, 7}	%	-50.42	-62.23	-8.31	59.10	70.49

Source: Author's calculations

Formulas involved in the calculation for each row above are given in the footnotes below:

¹ MPS table

² PSCTWL = AWL + BWL + CWL + DWL

³ TOTAL table

⁴ %SCTWL = 100* SCTWL / ((PPWL*QPWL) + A.2WL + BWL + CWL + DWL)

⁵ Wool specific MPS

⁶ Wool specific programs

⁷ Wool specific transfers / value of receipts from wheat production

Appendix 4: Fiscal Impact Indicators

Table A.4.1 Subsidies compared to Government expenditure and revenues (Million MNT)

	2008	2009	2010	2011	2012	2008-12 (Avg)
Total Ag Expenditures (MIA) 2/	98,803	46,648	106,175	238,968	223,033	142,725
<i>% Change year-on-year</i>	-	-53	128	125	-7	31
Total Ag Investment Budget (MIA)	23,000	17,300	10,917	23,670	29,031	20,784
<i>% Change year-on-year</i>	-	-25	-37	117	23	7
Agriculture R&D Expenditure 3/	4,639	4,851	4,189	6,192	7,636	5,502
<i>% Change year-on-year</i>	-	5	-14	48	23	16
Subsidies:						
Total Ag Subsidies (crop and livestock) 4/	57,300	22,014	26,905	47,583	91,128	48,986
<i>% Change year-on-year</i>	-	-62	22	77	92	15
Crop Sector	13,566	16,119	18,359	24,485	40,665	22,639
<i>% Change year-on-year</i>	-	19	14	33	66	50
Wheat Price subsidy	11,164	8,665	10,906	14,471	27,830	14,607
<i>% Change year-on-year</i>	-	-22	26	33	92	37
Livestock Sector	43,734	5,895	8,546	23,098	50,462	26,347
<i>% Change year-on-year</i>	-	-87	45	170	118	4
Agro-processing industry subsidies 4/	2,432	2,460	1,462	21,150	27,406	10,982
<i>% Change year-on-year</i>	-	1	-41	1347	30	257
Total Government subsidies 5/	122,865	55,441	96,226	175,449	202,842	130,564
<i>% Change year-on-year</i>	-	-55	74	82	16	16
Ag subsidies (crop and livestock) as percent of total subsidies	47	40	28	27	45	38
Ag and agro-processing industry subsidies as percent of total subsidies	49	44	29	39	58	46

Source: Calculation based on data from MIA, compiled by author.

1/ 2008 to 2011 are actual expenditures and 2012 is planned budget.

2/ Ministry of Industry and Agriculture (MIA) expenditure plus livestock fund for wool and cashmere subsidies, and agriculture subsidy part of the SME loans. Wheat subsidies are already included in the normal MIA budget.

3/ This includes R&D budgets reported by MIA, plus the agri research expenditure through the Science and Technology Fund under the Ministry of Education and Science.

4/ Estimated subsidies in this study; These do not include the implicit subsidies calculated as the Market Price Support for wheat and wool, i.e. by comparing price received by farmers in relation to the international price.

5/ Including Government estimates of energy, transport, enterprises, and other subsidies; however, ag and agro-processing industry subsidies are as estimated in this in this study.