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Diploma Thesis

Analysis of food insecurity in Mongolia

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Declaration

I declare that I have worked on my diploma thesis titled "Analysis of food insecurity in Mongolia" by myself and I have used only the sources mentioned at the end of the thesis.

In Prague on March 31st, 2015

Tereza Jadrná

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Diploma thesis assignment

Analysis of food insecurity in Mongolia

Summary

This thesis has in the centre of focus the food security in Mongolia. It specifies terms that are connected to the food security such as types of malnutrition, undernutrition and micronutrient deficiencies. An analysis of the economic and agriculture development of the country and identifies the main farming system as pastoral nomadism as well as the main trading partners and evolution of GDP and shows how it changed over time. Furthermore Millennium Development Goals analysis is included as it helps to illustrate how the country changed over time and if it is successful in meeting given goals. A detailed analysis of food security based on food security indicators that are in accordance with FAO classification. Four main dimensions of food accessibility, stability, utilization and availability are specified in detailed and compared with Eastern Asian region and lower middle income economies.

Keywords: Mongolia, food security, agriculture, poverty, nomadism

Analýza potravinové bezpečnosti v Mongolsku

Souhrn

Tato práce si klade za cíl zhodnocení potravinové bezpečnosti Mongolsk. V práci jsou definovány odborné termíny spojené s potravinovou bezpečností, jako je například podvýživa, nutriční hodnoty, či špatná výživa. Součástí práce je analýza ekonomického a zemědělského rozvoje země, která identifikuje jak typ zemědělství země, tak také vývoj obchodních partnerů a HDP v daném časovém úseku. Analýza Millenium Development Goals napomáhá ukázat, jak se země mění v daném časovém úseku a zda splňuje nebo míří ke stanoveným cílům. Detailní analýza potravinové bezpečnosti je založena na ukazatelích, které jsou užívány FAO. Čtyři hlavní oblasti potravinové bezpečnosti – dostupnost, stabilita, přístup a využití jsou detailně popsány a porovnány s regionem Východní Asie a zeměmi spadajícími do skupiny nižších středních příjmů.

Klíčová slova: Mongolsko, potravinová bezpečnost, zemědělství, chudoba, pastevectví

Content

Abbreviations

FAO – Food and Agriculture Organization

FAOSTAT – The Statistics Division of Food and Agriculture Organization

IDA – International Development Agency

MPRP – Mongolian People's Revolutionary Party

OPHI – Oxford Poverty and Human Development Initiative

PM – Prime Minister

RED – Reaching Every District

UN – United Nations

UN Comtrade - The United Nations Commodity Trade Statistics Database

USSR – The Union of Soviet Socialist Republics

VAD – Vitamin A Deficiency

1 Introduction

Food insecurity, or rather the desired goal of food security, has become a topic that today's society as well as the international organizations are interested in. Nowadays a lot of action is being taken to map the state of food security mainly in developing countries and various programs, whose aim is to improve to food security, exist. The fact that 80% of all world resources is consumed by less than 20% of the global population point to an immense inequality and shows that food security is indeed a pressing problem. The food insecurity tends to go hand in hand with the poverty, if we simplified the situation the poorest people tend to be the ones being food insecure therefore fighting the poverty and being food secure are goals that go hand in hand and one is hard to reach without fulfilling the other one.

The centre of focus of this thesis is to examine the food security in Mongolia, a vast country, known to be the nation of herders and nomads that has in the past underwent a changes that resulted in a modification of the traditional way of living under the communist regime. In more recent history, after 1990 when a transformation of economy was a necessity and the nation had to adapt to a change again. Mongolia is still a developing country however its economy is showing significant positive development, the questions is if that improvement has also an impact on the wellbeing of the nation if the levels of poverty are lowering and if the population has access to enough food not to suffer from hunger or other types of malnutrition. Moreover is the government aware of the food security and does it pay any attention to it? If so are there some actions being done to improve the wellbeing of the nation or is the food insecurity left for the more than one quarter of the nation - the poor, to fight the poverty and food insecurity themselves. Additionally what can be seen as the biggest threats to the food security? Perhaps the economic development goes hand in hand with the improvement of the food insecurity and poverty or perhaps the economic development does not reflect to a great extend on the food security and poverty leaving them behind all that is to be examined in this work.

2 Objectives and Methodology

The objective of this work is to examine the food security situation in a vast country of Mongolia. The goal is to examine the food security situation after the year 1990 when a country faced the necessity of transformation after the dissolution of USSR. One of the aims is also to discover how the country adapt to the loss of Russian influence and what effects it had on the economy, food security and poverty of its population. The main goal is to compare the development and the current state of Mongolia with the performance of the Eastern Asian region as well as lower middle income economies as Mongolia belongs to both of those groups. If some international organizations are trying to improve the wellbeing of the population or if Mongolian government itself is attacking the problem. Furthermore it should reveal how and to which extend people are exposed food insecurity and identify the most problematic dimensions. Relevant goal is also, if possible, to see the development trends through chosen indicators in comparison with benchmarking regions.

To analyse the food security multiple set of indicators have been employed. The major analysis is performed using the FAO classification, as other set of indicators have been used the Millennium Development Goals, additionally data obtained from the World Bank, IFPRI, UN Comtrade, UN Statistics Division and OPHI has been analysed.

The analysis of economic development of Mongolia has been performed with the data obtained from the World Data Bank and UN Comtrade database has been graphically represented through column and bar charts, scatter plot has been used to perform the analyses of possible linkage between the Human Development Index data obtained from UNDP and the values of GDP obtained from World Data.

As mentioned above as one set of indicators were used the Millennium Development Goals. However not all indicators that are part of the MDG were specified for Mongolia therefore this works includes only those indicators that were officially accepted by the government of Mongolia.

For the purposes of food security analysis the FAO classification has been used. FAO employs various indicators that characterise the state of food security and in its 2014 State of Food Insecurity in the World report is presented the classification of food security through four main dimensions: food availability, economic and physical access to food, food utilization and stability. The analysis is performed for the years 1990 to 2013 and the food security indicators are classified with accordance to the FAO's classification. The reasons for

choosing that time period starting in 1990s are following – firstly the data prior to 1990s may be distort so that they would be in accordance with the communist regime and therefore for example showing better result than the reality was. Secondly the lack of data was too great so that possible comparison would not be possible. The majority of the data has been obtained using FAOSTAT database additionally some data has been obtain upon request via email from FAO.

Majority of data has been analysed using visual representation. The summary analysis of Millennium Development Goals has demonstrated by using schema in which a certain meaning was assigned to colours. The analysis of food security indicators has been concluded with a visual representation displaying which dimensions are performing better than they used to and compared with benchmarking regions. As benchmarking region has been used the Eastern Asian region and lower-middle-income economies to see if Mongolia is copying similar trends as its geographical region or as the economic income level group where Mongolia is.

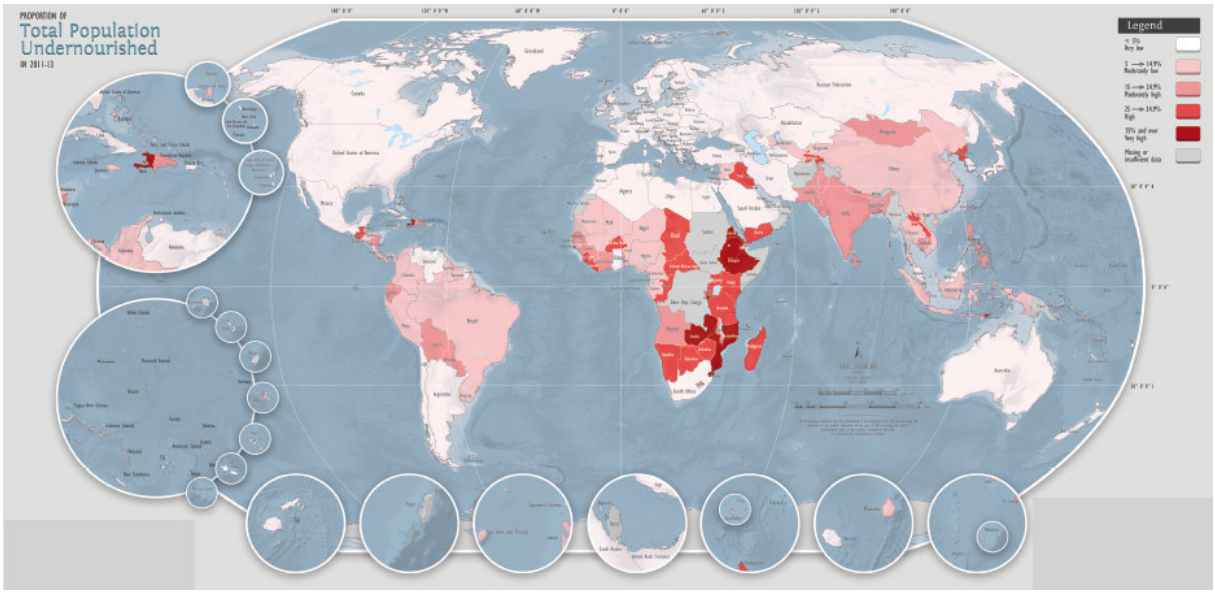
3 Literature Review

3.1 Concept of food security and malnutrition

3.1.1 Food Security

Food security appears when everyone at all times has an access to sufficient, safe and nutrition food, that is in accordance with his or her dietary needs as well as preferences for a healthy active life. A total of 842 million people in 2011-2013 (around one in eight people in the world) were estimated to be suffering from chronic hunger (FAO, 2013). The above definition of the term food security was created in 1996 during World Food Summit and is used until present days by FAO and other organizations.

Figure 1: Hunger map showing the undernourishment in the world



Source: FAO, 2014

From the FAO Hunger map 2013 which is showing the proportion of total population undernourished in years 2012-2013, it is evident that the worst situation as far as undernourishment is concerned is in Sub Saharan region, where in countries like Ethiopia, Eritrea, Mozambique, Zambia over one third of their population is suffering from caloric inadequacy. Mongolia is classified as having moderately high level of undernourishment in the period 2011-2013 with 21.2% of country's population (FAO, 2014) and by looking at the map it is clear that such result is worse in comparison with the Eastern Asian region.

The concept of food security is not a new term, but it have gained the attention of political leaders, international organizations and the public in the second half of 20th century

and still remains an important one. If we look into history as a significant milestone can be seen the Essay on the Principle of Population from 1798, written by Thomas Malthus: This essay expresses the concern that population growth will be too fast and therefore will result in the incapability of having enough food to feed the population. However the essay on food security did not come to worldwide attention until the world wars in the first half of 20th century. In 1930s a report on the Nutrition and Public Health was created by League of Nations Health Organisation. This report helped to attract the attention towards the world food problems and its liaison with nutrition and health. (Shaw, 2007) On the other hand the food security problem was not by far the only centre of attention; moreover it was believed that to meet human needs increase in production is necessary. Therefore it could project into prosperity in the agriculture sector and in the end improve the economy. The Second World War brought food insecurity even upon developed European countries. In 1946 FAO's survey revealed that roughly one third of the global population does not have sufficient energy intake which resulted in further global support of agriculture production. (Simon, 2012) The agriculture production continued to grow during 1950s and 60s which was marked by surpluses in the cereal market, which were often used as aid to developing countries.

However at the beginning of 1970s food crises occurred. Climate factors together with OPEC increasing the price of petroleum, which resulted for example in the transportation cost rise, all that led to increase in food prices, which always affect the most vulnerable ones. (IFPRI, 2010) For developing countries that are dependent on import of agriculture commodities – either in the form of food aid (almost half of the import), or in the form of commercial import, was rise of prices the most harming. Decade after the crises Amartya Sen added the dimension of accessibility of food as part of the food security problem, this dimension was officially accepted in 1996 World Food Summit, from which comes the above stated definition of food security.

In present days the concept of food security is perceived as a multidimensional one meaning there is not just one indicator, such as number of undernourished, that would be sufficient to reveal where a certain country, as far as food security is concerned, is standing. Multidimensional term of food security comprises of following dimensions: the availability of food, the access (economic as well as physical), the food utilization and least but not last the stability dimension, which factors in the stability of the three dimensions that are mentioned above over time. This four dimensions are used by FAO and despite the fact that for example in the State of Food Security 2013 report the dimensions were slightly changed – such as

shocks and vulnerability were added, the core of food security still lies on the availability, accessibility, utilization and stability dimension.

3.1.2 Dimensions of Food Security

The availability of food refers to the physical availability of food. In other words, if there is sufficient amount of food for everyone. It can be defined for national and regional level, but it can also be allocated on much smaller scale – such as the availability of food in small district, town or village. As the agriculture production is growing in theory there is enough food for everyone, therefore the question of availability is important. The physical availability of food focuses on the amount of food production, food stock, and import and food aid. (WFP, 2009)

The economic and physical access to food is the second dimension measuring the food security and it can be defined as adequate supply of food at the national level or international level (EC - FAO, 2008). This dimension was first broad to attention in the 1980s by Amartya Sen. The physical part of the accessibility dimension refers to for example a situation where sufficient amount food is being produced in one region in more than sufficient amount but because of for example lack of transportation, poor roads etc in other region of the same country people can be food insecure. Ideally in order to fulfil the physical access to food it should be available to everyone that needs it at all times. The economic access refers to whether households or individuals have enough of buying capacity, if they can effort to buy sufficient amount of food if is available to them.

The utilization dimension refers to the nutritious and safe diet. Households need to have not only the access and the availability of food but they also need to have the access to the right food that would include nutrients that would lead to healthy diet. People need know how to utilize the food that is available to them in order to achieve food security as without proper knowledge even when food is available people might be suffering from malnutrition.

The last but not least dimension of food insecurity is the stability dimension is when the access, availability and utilization dimension are stable as in order to be food secure it is important to achieve all the dimensions long term. The stability dimension can be affected by for example political stability, food supply and production variability, food price volatility etc.

3.1.3 Malnutrition

Malnutrition is a state when person does not receive enough food to meet their daily caloric intake requirements, however even if a person has sufficient caloric intake there is a question of the food composition. In other words person can be malnourished although having sufficient caloric intake, such state is caused when food does not provide the right amount of micronutrients that are needed. Moreover according to UN System Standing Committee on Nutrition malnutrition goes hand in hand with diseases, either malnutrition is the main cause of a disease or it a significant contributor. As defined above malnutrition results from wrong nutrient and/or energy intake and therefore covers not only undernutrition but also overnutrition (overweight).

Additionally there are other factors influencing malnutrition and leading to the fulfilment of healthy nutrition. Those factors are for example the accessibility to clean water, good caring practices, health care hygiene, household food security and economic development. (WFP, 2012)

Caloric intake

Based on FAO's Energy and Protein Requirements daily caloric intake of a man, that weights 65 kilograms should be 3000 calories per day. For a woman (55 kilograms) daily caloric intake is set to be 800 calories lower than for a man – 2200 calories per day. Those calorie requirements were set by FAO and WHO in 1971.

Basal metabolic rate is the amount of energy necessary for a person in order to maintain body temperature, working internal organs. This rate varies based on age, weight, gender as well as health conditions. For a man 1.8 m high, weighting 71.5 kg, aged between 30-60 years basal metabolic rate is set up to 1710 kcal per day. For a 1.6 m tall woman weighing 54 kg the basal metabolic rate is only 1300 kcal per day. (FAO – Human Nutrition in Developing Worlds, 1995)

Types of Malnutrition

Various types of malnutrition can be defined - the basic one is **protein energy malnutrition**, state in which a person does not have sufficient intake of necessary

macronutrients (protein, fat, carbohydrates). It is not measured by energy (caloric) intake per day but by body's physical measurement – stunting, wasting, and underweight. (WFP, 2014)

Undernourishment occurs when energy requirements are not met continuously. The daily caloric intake is lower than it should over a certain period of time and body suffers from undernourishment. Number of undernourished people in a country is usually indicator of country inability to gain access to food. (Nutrition at the WFP, 2012)

Chronic hunger is a state of undernourishment that lasts at least one year. It is one's inability to acquire sufficient amount of food to meet dietary energy requirements.

Micronutrient deficiency can be defined as either complete luck or a shortage of vitamins or minerals (micronutrients). Vitamins and minerals are vital for immunity system, metabolism, proper growth etc. It is also referred to as hidden hunger – sometimes the lack of minerals and vitamins has no visible warning signs but can result for example in poor health and labour productivity, mental impairment. The most vulnerable groups to hidden hunger are woman and children in developing countries. (Micronutrient Initiative, UNICEF, 2014). Three most important micronutrients are protein, fat and carbohydrates. From 10 to 35 percent of one's diet should consist of proteins, they play important role in building and maintaining body tissue, therefore play a crucial role especially when people are working manually. Fat is necessary to support the right function of internal organs, because it helps to maintain body temperature. It is also necessary to digest number of vitamins – A, D, E, K are soluble in fat only. The main energy sources for body are carbohydrates, glucose is essential for brain, central nervous system and heart.

3.1.4 Poverty and MDG

Millennium Development Goals were created by United Nations and in September 2000 all UN member states, 191 countries, committed to them. They are universal goals that should be achieve by the year 2015 and should help to fight poverty, hunger, disease, illiteracy, environmental degradation and least but not last women's discrimination (WHO, 2014).

MDG 1 is to eradicate extreme poverty and hunger, furthermore to half the number of people living under the poverty line from 1990 to 2015. World Bank defines poverty as living on less than 1.25 USD a day meaning that worldwide there is 1.2 billion people still living in

extreme poverty. Since poverty is linked with hunger this first goal also aims to half the proportion of people suffering from hunger, being undernourished.

Second UN's MDG is dedicated to education. By 2015 all children – girls as well as boys, should be able to receive a primary education. In 2010 primary school's attendance grew up to 90%, meaning only one in ten children was not attending school. Moreover since primary education needs to be accessible to both genders the gender gap in literacy is narrowing (UN, 2014).

Third goal is to promote gender equality, in all level of education, not only primary level. Even though women's situation is improving in many countries women luck the opportunity to attend secondary education and are discriminated in the field of employment.

Next development goal is devoted to child's mortality. According to UN poverty has a great influence in child's mortality – when child is born into poverty suffering family the chances that the baby will die before the age of five are doubled compare to the children born to wealthier families. This is inter-linked with maternal health improvement, which is MDG 5. UN states that between 1990 and 2013 maternal mortality has dropped by 45 per cent, specifically in Asia maternal mortality dropped down by two thirds; nevertheless the maternal mortality ration in developing countries is still much higher compare to the developed ones.

Millennium Development goal number six is to combat HIV/AIDS, which is mainly problem in sub-Saharan African region. Asia is not that heavily burden by this disease as Africa is.

Environmental issues are targeted by the seventh development goal. By 2015 number of people without access to drinking water should be halve compare to 1990 figure, however some 748 million people were in 2012 still lacking access to clean water (UN – MDG, 2014). This goal is also concerned with the environmental diversity therefore protected ecosystem are being created worldwide.

Last Millennium Development Goal is to develop global partnership for development. This should for example ease the market entry of product from developing to developed countries. Landlocked countries should also get special aid and attention, however in 2010 aid to such countries dropped.

In 2008 Mongolia created Millennium development Goals-Based Comprehensive National Development Strategy of Mongolia that should by 2021 achieve MDG and help Mongolia to become a middle-income country. This strategy should be realized in two phases and address all current Mongolia's development problems such as shortage of highly qualified labour force, high level of poverty, narrow-based structure of foreign trade etc. (MDGs Based Comprehensive national Development Strategy, 2008)

3.2 General information on Mongolia

3.2.1 Geography

Mongolia is a landlocked country of Eastern Asia neighbouring with only two countries – Russia in the north and China in the south. It covers the area of 1,566,500 square kilometres (Lonely Planet, 2006), even though this size is immense, Mongolia used to cover twice as much land as it covers today. The population is 2,796 million inhabitants (World Bank, 2012), which is making this country's density only 1.7 square kilometres.

Close to one third of the country is occupied by the Gobi, which is in the southern part of Mongolia. The very southern part of Gobi is a dessert, and towards north of Gobi the landscape is changing into semi-desert covered partly by grass-land. The rest of Mongolia is mostly mountainous with landscape changing to steppe and semi-steppe. This steppe is covering almost 20 % of the country's area. Another 25% of the landscape is covered by forest steppe. (Lonely Planet. 2006) There are three major mountain ranges: Khangai Mountains, Khentii Mountains and Altai Mountains. The highest point is in Altai Mountains – Tavanbogd reaching 4,374 metres above sea level. This mountain, permanently covered by snow is at the border of Mongolia, China and Russia. Mongolia's mountainous regions have the altitude over 2,000 meters above sea level. The national level is also very high reaching 1580 metres above sea level – Mongolia is one of the countries with the highest altitude.

The water distribution in Mongolia is unequal. The biggest water sources are lakes and rivers that are in the Northeast of the country. Ult is the biggest lake with salt water in Mongolia. It occupies the area of 3,350 square kilometres and it reaches up to the territory of Russia. (Blunden, 2008). Country's biggest freshwater lake is Hovsgol, the second oldest lake world-wide that comprises almost 70% of Mongolian freshwater reserve (Mongol Ecology Centre, 2013) and it is located in the Northwest of the country, its size is 2,760 square kilometres. Mongolia's rivers (gol) are ending either in the Pacific Ocean or in the North Sea. However there are small rivers that do not flow to the sea but they disappear in the

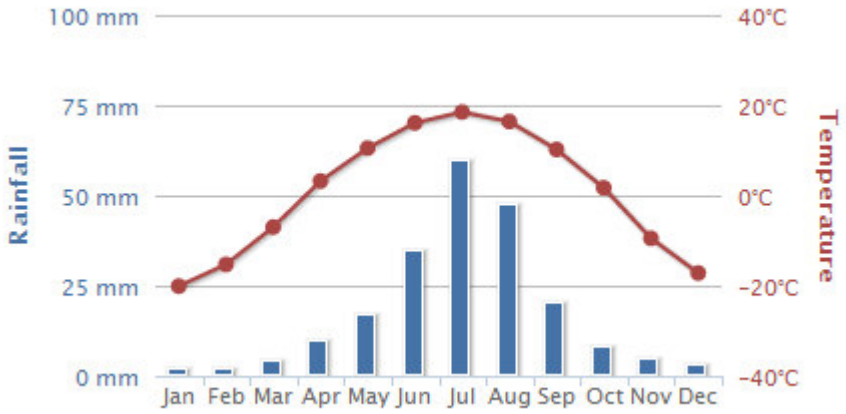
Mongolia's dry land. Furthermore the majority of rivers are situated in the Northern part of the country since the south is occupied by Gobi desert. The main rivers are HerleGol (1090 km in Mongolia, continuing to China), Onon (298 km on the territory of Mongolia), Selenge (615 km in Mongolia, continuing to Bajkal Lake and the North sea), Orhon (1124 km, flowinag to Selenge river), Dzavhan (808 km, in the Northwest flowing to Hyargas Lake). (Lonely Planet, 2006)

Ulaanbaatar (Ulan-Bator) is the biggest city as well as the capital. The population of Ulaanbaatar is 1,184 million (UN, 2011) which means that almost 2/5 of the country's population are living in its capital.

3.2.2 Climate

Mongolia's climate is characterised as continental type for which are typically enormous differences in temperatures. Additionally the country is unusually dry. Mongolia is sometimes called "The Country of Blue Sky", in the southern parts there is on average 3,200 hours of sunshine per year. Blue sky is typical for winter as well, the winters are marked with considerably cold weather however the climate remains dry. In the mountainous part the average yearly rainfall is around 500mm, in steppe it reaches only 200-300 mm and it is even less in the Gobi desert, where it is only around 150 mm. (Blunden, 2008)

Figure 2: Average monthly temperature and rainfall in Mongolia for period 1990-2009



Source: World Bank, 2014

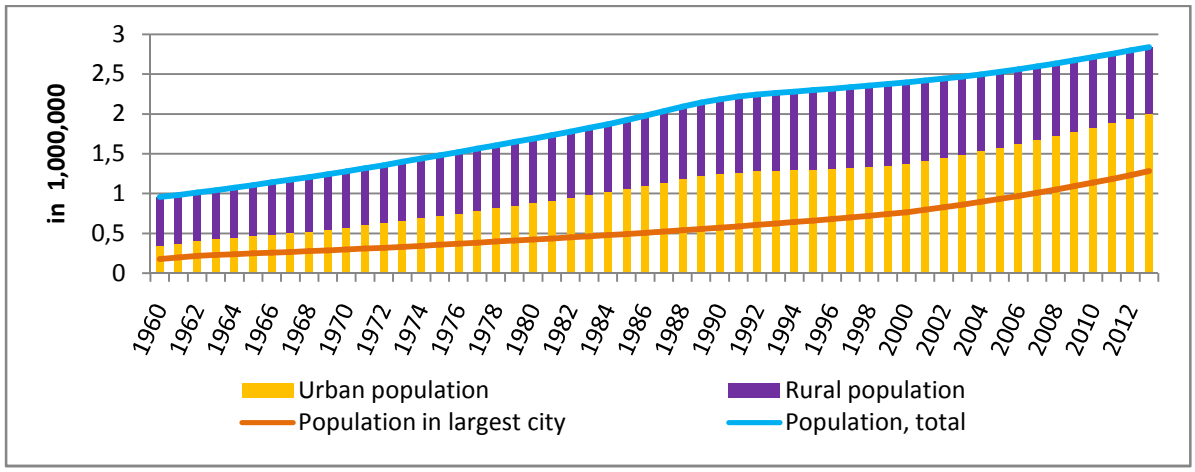
The winter is the longest period, lasting from November to March. Mongolia's winters are known for very low temperature and sunny weather. The spring is marked by very unstable and considerably cold temperatures, lasting from of April until May, as it showed in

the figure above, the average temperature in April is oscillating just above 0°C. Spring period features significant dust storm. Then summer is not very long but it is accompanied by the vegetation period, and the biggest share of rainfall – the wettest month is July with average rainfall over 60mm followed by August that close to 50 mm of rainfall. Overall the vegetation period lasts from the end of May until August. Autumn does not last very long, in October the temperature starts to drop to 0°C and remains there until March, beginning of April.

3.2.3 Demography

According to most recent data from World Bank the population of Mongolia in 2013 was in 2.839 millions. As the Figure 3 shows the total population of Mongolia has a rising tendency as it has been continuously rising since 1960. What is interesting is how the share of rural and urban population evolved over time. In 1960 the share of rural population from the total country population was 63% and the share of rural population was only 36%. In 1977 population was almost equally distributed in the urban and rural areas with 50.1% of population living in urban areas and 49.9% in rural areas. In 2013 70.4% of population lived in rural areas over 29.6%.

Figure 3: Mongolian population from 1960 to 2013, the share of urban and rural population



Data Source: World Development Indicators, 2014; author's elaboration

Out of the 70.4% of population living in urban areas 65% lives in Ulaanbaatar, which is 45% of the entire Mongolian population.

The population density is very low, taking into account Mongolia's vast area of 1 564 thousand square kilometres and population slightly over 2.7 million; the density is around 1.8 people per square kilometre.

3.2.4 History (20th century)

Independent Mongolia was proclaimed in 1911. In December 1911 Mongolian government declared the independence from Manchu dynasty, creating their own government based on Mongolian tradition. (Schwartz, 2010) In May 1915 Mongolia together with China and Russia signed an agreement granting Mongolia with autonomy. However few years later, in 1919 Chinese army invaded Mongolia and settled in its capital, Russia responded to it by sending army in 1921 which forced Chinese soldiers out of the country. However what Mongolian people first saw as help from Russia against China soon turned into another occupation.

The presence of Russian army was soon followed by the proclamation of Mongolian People's Republic that was created November 26th 1924 (Lonely Planet, 2006) this date marked the beginning of communist regime. When Stalin gained power in Russia he set his interest towards Mongolia as well and Mongolia soon became a satellite country of Soviet Union. Its minister of war – Choybalan was appointed by Prime Minister replacing Mr. Amar, who was accused of spying, tried by USSR and shot to death. Choybalan's governing was in the spirit of following orders from USSR. In following years the private enterprises ceased to exist and agriculture followed the same pattern. People working in agriculture, having herds were forced to join state co-operative farm and private farming was banned. Religion was also heavily suppressed, over 27,000 of people went missing or were executed, and out of this number over a half were monks. In this period the international relations existed only with Russia and China, and in this time railways was built to improve the infrastructure (1949-1955) (BBC, 2013). After the death of Choybalan, in 1952, relatively calm period followed, massive murders stopped and Mongolia was approved as a member of UN (1963). In 1966 Brezhnev signed a treaty in Ulaanbaatar that allowed the stationing of Soviet troops in Mongolia. In the 70s Russia and China reached disagreement in which Mongolia sides with Russia and Chinese residents are expelled from the territory of Mongolia (BBC, 2013) Economically, politically and socially speaking, Mongolia followed the model of perestroika. When the disintegration of USSR was inevitable Mongolian street protest in 1990 forced government to resign and new election to the parliament (Great Hural) took place and Mongolia turned towards democracy. However it shown how dependent Mongolia had been on the USSR and the economy declined fast and poverty is still present in the country.

There are two important dates in Mongolia's recent past: years 2000, 2001 and 2010 when severe colds killed most of Mongolia's livestock. Every time international attention was brought towards Mongolia. In 2001 UN support Mongolian herders by almost 9 million US dollars to help them after the severe colds. The same year IMP approved low-interest loans, almost 40 million US dollars, for Mongolia that were suppose to help to decrease country's poverty as well as help the economy. When extreme colds reappeared in 2010 and the so much livestock did not survive it the UN helped again and launched a programme that enabled to get rid of the dead livestock and therefore preventing to the spread of illnesses. (BBC, 2013)

3.2.5 Political Situation

After 1990 free election Mongolia started democratic path. Surprisingly the election was won by the communist party – MPRP (Mongolian People's Revolutionary Party) - that promised before the election new way of governing the country and democratic approach. The voters' turnout was very high, around 90%, and it was the support of the rural areas that allowed MPRP to win the election even after the fall of Soviet bloc. Two years after he revolution new constitution was created, putting emphasize on the human right and freedoms. (BBC, 2013). Year 1996 brought a big change for Mongolia for the first time after over 70 years of communist government MPRP did not win the election, the winner were Social and National Democrats. However despite winning the election their government was not perceived as strong, in four years four different Prime Ministers were appointed, corruption scandals were brought to public attention. In new elections (in 2000) the public showed its disappointment in the government of Social and National Democrats resulting in MPRP winning the majority in the Parliament (Great Hural). The success of MPRP winning this election was followed by another victory, when their presidential candidate Bagabandi was re-elected president in 2001. (Lonely Planet, 2006). However the result of following election to Great Hural in 2004 proved the ideology split among citizens resulting in the same amount of votes to MPRP as well as for the opposition. The only outcome of this situation was the creation of grand coalition – power sharing among all – leaving country without opposition. Prime Minister, Tsakhiagiin Elbegdorj was chosen from the Democratic Party. However only two years later the government fell apart being accused from slow economic growth and new PM was chosen from MPRP.

Mongolia's political rivalry peaked in 2008 when MPRP was to win another election. However MPRP was accused from altering the election result which caused immense protest in the streets of Ulaanbaatar. The riots were quite severe even though international observers of the election denied any alteration of the result of the election. (BBC News, 2008) One of the reasons for people going to streets was the continuing dissatisfaction with the government that was unable to boost economic growth and the poverty was getting worst. (BBC, 2013) Currently the country is being governed by Democratic Party and the president Tsakhiagiin Elbegdorj (from Democratic Party) was re-elected in 2013 for his second term.

3.3 Empirical evidence on food security and economic development in Mongolia

According to Lander's article that is based study of the anthropometry and non-fasting morning blood samples from 243 children (age 6-36 month). In total the samples were collected from eight areas – four districts in the capital, Ulaanbaatar, and four rural capitals. The study revealed that anaemia, stunting and rickets are the most common problems. This cross-sectional study revealed the deficiencies of folate, iron, vitamin A, zinc, selenium and vitamin D. All those micronutrient can contribute to the stunting and anaemia. Although the level of anaemia is lower – dropped to 25% of prevalence in children from 0.5 to 3 years of age, younger children from 0.5 to 1 year of age have higher prevalence of anaemia – 48%. Other indicator of malnutrition – stunting (low height for age) – was found in 14.5% of the children. Additionally the study shows that alarming 33% of children suffered from VAD (vitamin A deficiency) which can cause blindness and children lacking vitamin A are at high risk of severe illness (WHO, 2014). The overall result of this study showed that the majority (78%) of children were at risk of having two or more micronutrient deficiencies. The authors' suggest solution would be a programme that would supply the combination of multiple micronutrient (iron, folate, vitamin A, vitamin D, zinc, selenium) such programme should help to combat the prevalence of micronutrient deficiency among children.

Mongolia, its poverty and the livelihood of its people, whose main source of income lies in their herds, is the centre of focus of Robin Mearns's article. Mearns highlights the importance of pastoralist way of living in Mongolia. As it is stated in the article prior to 1990s the livelihood of herders was quite well secured by the state, access to education was guaranteed as well as veterinary services and transportation help. After the change of regime lots of previously state-owned enterprises had to be shut down resulting in a rose of unemployment in urban areas. At that time livestock production was seen by many as a potential employment opportunity leading to high increase in herding population between 1990 and 1997 when the number of households dependent on herding doubled. Moreover the number of livestock rose by 75%. However the standards of services, that existed prior to 1990s transformation and that were helping to nomadic pastoralist, ceased their existence and by 1995 one third of Mongolian nation lived below the poverty line. In the article Mearns argues that the well being of pastoral commons is linked with the national economic development. The government of Mongolia admitted the problem of wide spreading poverty and formed National Poverty Alleviation Programme that was presented in 1994 and included

micro-lending as well as the rehabilitation of basic education and rural health facilities. The agricultural sector (dominated by livestock) continued to rise until the end of 1990s however a lot of newly herding households lack the experience and were therefore unsuccessful in building a viable herd and remained only with a small herder. As small herders are highly vulnerable they are unlikely to face any crisis such as when a period of severe dzuds[1] and droughts occurs. As the main data source Mearns uses the Living Standards Measurement Survey from 1995. This survey was done by the National Statistical Office of Mongolia together with the World Bank and was repeated four years later in 1998 as another data source the Participatory Living Standards Assessment from 2000 was used. As a key findings Robin Mearns states that pastoralist way of living became more popular during the transition period (after 1990), however a lot of people had to base their living on livestock production as they did not have any other choice so it is likely when the economy improves there will be a decrease in the number of people living only of their livestock from current 35% to 20%. Moreover, based on the article, the source of poverty and inequality among herders is affected by growing demands on the livestock sector. Overgrazing, conflict over pasture, wells and also theft of livestock are other factors. As the article concludes "*it is certain that secure and sustainable livelihoods will not be achieved without a renewed emphasis in Mongolia's poverty reduction strategy on development of the livestock sector*" (Mearns, 2004)

Nixson and Walters' article from 2005 focuses mainly on the period of privatisation that started in 1990s, when Mongolian People's Republic ceased to exist, and its impacts on the livelihood of people. One of the aims of it is to identify to what extend the process of transition to market economy and privatization contributed to expansion of poverty and inequality. The article highlights that during communist regime, prior to 1990s, the cooperation with Former Soviet Union was great and when all the help form former allies stopped the level of poverty rose. Even though Mongolia was never a rich country, with the support from Soviet Union, all the subsidization, provision of social services such as health, education or transportation (in the agricultural sector) helped the poorest of the country and therefore prior 1990s the level of poverty and inequality was almost non-existing. Moreover, not only was Mongolia to a great extent dependent on the subsidies itself, but most of export and import was done with members of the Council for mutual Economic Assistance and with the dissolution of this council, Mongolia lost its main trading partners and the advantage of guaranteed prices which only deepened the economic fall. As Boone (1994) estimates the

[1] dzud is Mongolian term that refers to winter with high snow fall and sever cold result in high mortality of livestock. Such winter is often preceded by draught during summer.

national disposable income fell by more than 50% within four year period starting in 1989. In 1995 when the economy grew for the first time since the change of regime it was mainly thanks to the international prices of Mongolia's main export articles: copper, cashmere, gold and oil. As Nixson and Walters states the performance of Mongolia's economy was not stable despite its growth after 1994, moreover it was highly dependent on the international commodity market and the weather that affects the agriculture sector as well as the poorest people in the country. With weak and highly vulnerable economy the poverty started to spread. In 1996 the National statistical office of Mongolia (with the support of World Bank) carried our Living Standard Measurement Survey followed by another one in 1998 that aimed to identify the state of poverty in the nation. As Nixson and Walters highlight the overall poverty rose from almost non existing (pre-transition era) to 36.3%, slightly higher percentage of population below the poverty line was in urban areas (38.8%). However there is the question of data collection and their validity during the Soviet era. Above mentioned Living Standard Measurement Survey helped to provide characteristics of those living below the poverty line. As the article states the unemployment goes hand in hand with poverty as almost 60% of unemployed being below the poverty line (World Bank, 1996). As Mongolia is a nation of herders the poverty of those living in rural areas is closely linked with the performance of agricultural sector. Moreover the size of herds influences the livelihood or herding families. The smaller the herd the more likely herder's family falls into poverty. Government of Mongolia together with its National Statistical Office and the World Bank reveals that the number of poor continued to rise in the years 1995 to 2000. There are several factors that are threat to the poor, most of all it is the economic insecurity, environmental insecurity and social insecurity. Nixton and Walters argue that privatisation is also a trigger of poverty, mainly in rural areas. Negdels (collective farms) were state-operated under the influence of communist regime. Herd size and type of animals was not decided by the herder but by the government. That resulted in small difference among herders under the communist regime however when privatisation started, it meant the loss of lots of agricultural mechanisation – transportation to seasonal pastures, wells keeping, winter shelters maintaining etc. and herders became more vulnerable to the environment, especially dzuds. Firstly the herd were privatised, followed by the privatisation of wells, shelters and collective asset privatisation. According to Nixton and Walters the privatisation of livestock was more beneficial to the experienced herders whereas younger herders did not profit from it. Based on data provided in Griffin (2001) at the beginning of 90s only 5% of households had big herds with more than 200 animals (such herds ensures the well-being of family), moreover almost

half (42%) of the herders owned only small herd with less than 31 animals. In general having less than 100-150 animals is considered as insufficient to provide a livelihood of herding families. Even though in 2000 around 12% of herders had herds with more than 200 animals over 60% of herding families had less than 100 animals. The fact that most of the herding households lived below the poverty line was also cost by the fact that animal husbandry was one of the only sectors in 1990s that seems to be vital therefore it attracted new herders, which were often inexperienced. Moreover as the collective farms ceased their existence, the decline in veterinary services occurred, making herding families even more vulnerable. Additionally the herding families shifted their herd composition toward goats (cashmere) which harmed the pastures.

The problematic of livestock production, that is essential to the rural population livelihood and the Great Lakes Depression, is discussed by Maasri and Gelhaus. According to Johnson et al. (in Maasri et Gelhaus, 2011) livestock production is one of the essential parts of Mongolia's economy as for half of the population depends on livestock and around one third of the manpower are herders. However the livestock and herding management underwent significant changes after the end of Soviet era. During the times of Mongolian People's Republic the herder numbers were government regulated which drastically changed after the first democratic election in 1992 – collectives ceased their existence and most of the livestock, previously sate owned, was privatized resulting in herders taking the responsibility for their own herds without being told which pastures to use and what animals to herd. The only thing that remained non-privatized was the pastureland. In the urban areas a great increase in unemployment occurred, following privatization of businesses which resulted in the migration to rural areas and therefore increase number of livestock – by 1997 livestock numbers doubled (Maasri et Gelgahus, 2011; Mearns; 2004). However such immense expansion of herding sector resulted in grassland degradation based on UN Environmental Programme from 2002 some 70% of the grassland is depredated. Alain Maasri and John Gelhaus conducted a study in the Great Lakes area focused on the impact of livestock grazing on the watershed and stream impairment with the aim to identify the impact of the increased livestock density on the environment. The results of their study shows that the increase of livestock numbers is affecting aquatic ecosystem caused also by the uncontrolled grazing practices which can threaten the health and well being of herding households that rely on the great Lakes water for the consumption for their livestock as well as for themselves.

The access to health services is the core of Lhamsuren article - as Mongolia underwent (and is still undergoing) rapid social changes that are closely linked with the economic growth as a result to those changes socio-economic inequities and internal migration occurred. The government of Mongolia adopted Reaching Every District strategy which should enable the poor from urban areas access to health services. Percentage of people living under the poverty line is still very high – 35 % (in 2008). The poorest are usually the ones lacking the access to basic health services despite the fact that they often live in an unhealthy environment. Implementing the Reaching Every District strategy resulted in increased access to health in urban areas for the poor. In 2009 study showed that almost 70% of the population of the capital lived in poor "ger" (traditional mobile dwelling) district and based on the same study almost 20% of them just recently migrated to Ulaanbaatar therefore they were not registered for the social welfare (including health insurance benefits). The paper tries to identify the main barriers to health access for the poor together with the effects of the RED (Reaching Every District) strategy as well as its outcome for the poor. Among the most significant barriers to health access was the lack of health system for the most vulnerably – unregistered population as well as the absence of some financing strategy for the very poor. Additionally RED identified the most vulnerable among the poor and some of them were reached for immunization. Overall the RED confirmed the insufficiency in currently existing health system and pro-poor approach in the health service is needed in order to be able to replace pervious centralized system.

As vitamin D is needed for strong bone development in 2010 the Fourth National Nutrition Cross-Sectional Survey was done to determine the state of nutrition among the population and was used by Tserendolgor Uush in his paper to examine the vitamin D deficiency among Mongolian Children and women. During the survey 400 households was chosen. The findings were following: number of children with vitamin D deficiency was 21%, woman scored even higher – 30% was discovered to suffer from the deficiency. As the government is aware of the problem it supplies vitamin D supplementation as part of national strategy from year 2000 that should help the micronutrient deficiency. However the survey found, that only 27% of children under the age of two received vitamin D supplementation. Additionally almost one third of them received only one tablet instead of seven as the Mongolian Ministry of Health recommends.

In 2013 a comparative study of herders communities in Mongolia and Inner Mongolia[2] examining their climate adaptation as well as rural livelihoods. A household survey was carried out in autumn 2010 and spring of 2011 to a range of ecological settings within both Mongolia and Inner Mongolia. The study showed that Mongolian herders receive less government support than Inner Mongolia resulting also in higher vulnerability – when winter comes livestock death rates are much higher (lack of forage, decrease migration). Additionally the income source in Mongolia is not very much diverse which endangers the livelihood of herding families. Moreover the study revealed that one of the main household expenditures is the purchase of forage which is necessary for winter period.

3.3.1 International Development Agency and Mongolia

IDA operates in Mongolia since 1991 and is active in several areas. Firstly it encourages the rural development through among other programs the Index-based Livestock Insurance programme that targeted the vulnerability of herders and tried to reinforce the area of risk management as the herds are highly vulnerable to weather conditions, especially devastating dzuds that could kill considerable part of the herd. The project was approved in 2005 and it is currently active and should remain operational until 2016. The total costs are estimated to be 9.88 million USD with the commitment amount of 7.75 million USD (World Bank 2014). The program is operational in 21 places spread over the country's vast area. So far more than 15,000 herders purchased an insurance that protects them against potential weather disaster (drought, dzud) resulting in the dead of livestock. From 2006 to 2009 over 15 000 were helped by the program. Alongside with the Index-Based Livestock Insurance Program was run the Sustainable Livelihood Project which included micro-finance component that helped to distribute over 36 thousands sub-loans.

Sustainable Livelihood Project 1 (operational from 2002-2007) consisted of four parts. Firstly the pastoralist risk management aimed to reduce the vulnerability of herders though better pasture, grazing management, self-help initiatives (created by herders) together with fodder and hay enterprise development as fodder is crucial during dzud to prevent disastrous livestock mortality. Second target of the projects is the sector of micro-financing which should enable the poor of eight selected provinces – over 32 thousands of loans have been distributed under this projects from both – bank and non-bank financial sector. Moreover more than half of those loans were received by those living under the poverty line. As a third

[2] Inner Mongolia is part of the People's Republic of China and is the region that neighbours with Mongolia

pillar of the project was chosen the importance of local-initiatives which should play an important role in identifying the main issues which need and attention. Under this component pastureland management projects were created – over 800 them additionally over 3 thousands of projects connected to infrastructure were established. Least but not last the fourth component of the project was to build on already existing program management structure (World Bank: Sustainable Livelihood Project, 2010). As a result of the project close to 500 wells for the herds use was rehabilitated and roughly 150 wells for the human use were restored. This project was followed by Sustainable Livelihood 2 which was operational from 2007 to 2013 and followed similar structure as its predecessor. Currently there is an active Sustainable Livelihood Project 3 which is operational since 2014 and should remain that way until 2018. Even though the project above helped to improve the livelihood of Mongols the number of poor in the country was still too high, therefore the World Bank developed a project devoted to livestock and agriculture marketing whose aim is improve not only the food security but rural livelihood itself. This project started in 2013 and is scheduled for four years.

In the urban area of Ulaanbaatar the livelihood of the poor was targeted by the Services Improvement Projects (1997-2003) whose main objective was to improve water access in the poor areas of the city. The project was extended for another period starting 2004 and finishing in 2012. The Ministry of Finance of Mongolia was cooperating with IDA to ensure improved water supply which is stable especially for the new urban migrated inhabitants to the country's biggest city.

Moreover in order to help a developing country IDA's project target also the area of Information and communication technology, energy as well as education. Among other World Bank supported project was the one helping to gain the access for cell-phone to the district centres. As a result over 30 thousands new users were registered. Additionally the education sector whose standards decrease after the 1990s was helped by the Global Education for All. The objective of that was to ensure the access to education for everyone including rural areas, including kids from nomadic families. As part of the projects schools were equipped with books, computers. The project result was increased reading skill in the rural areas.

In summary not only the articles, but also the presence and help of IDA prove that Mongolia is need of attacking the food security problem. The biggest spread of poverty that is

unquestionably linked with the food insecurity started after the transformation from communist regime. Mongolia lost practically all the trading partners, economy was suffering and people started to be threatened by employment security that often led to the food insecurity. To prevent the food insecurity people turned back to the agriculture to have some sort of security however even the agricultural sector was hit by the transformation significantly; some parts of pastureland were being overgrazed. Overall the food insecurity and as the studies shown also various micronutrient deficiencies became a severe problem for Mongolia. Some sources suggest, that the food security problem occurred only after the disintegration of Soviet Union however just because prior the disintegration the poverty levels, number of undernourished etc. were not being brought up to the public attention, it does not necessarily meant that they did not exist. For sure starting 1990s Mongolian people started suffering from the poverty and food insecurity, after all first micronutrient deficiencies were registered at the beginning of 1990s.

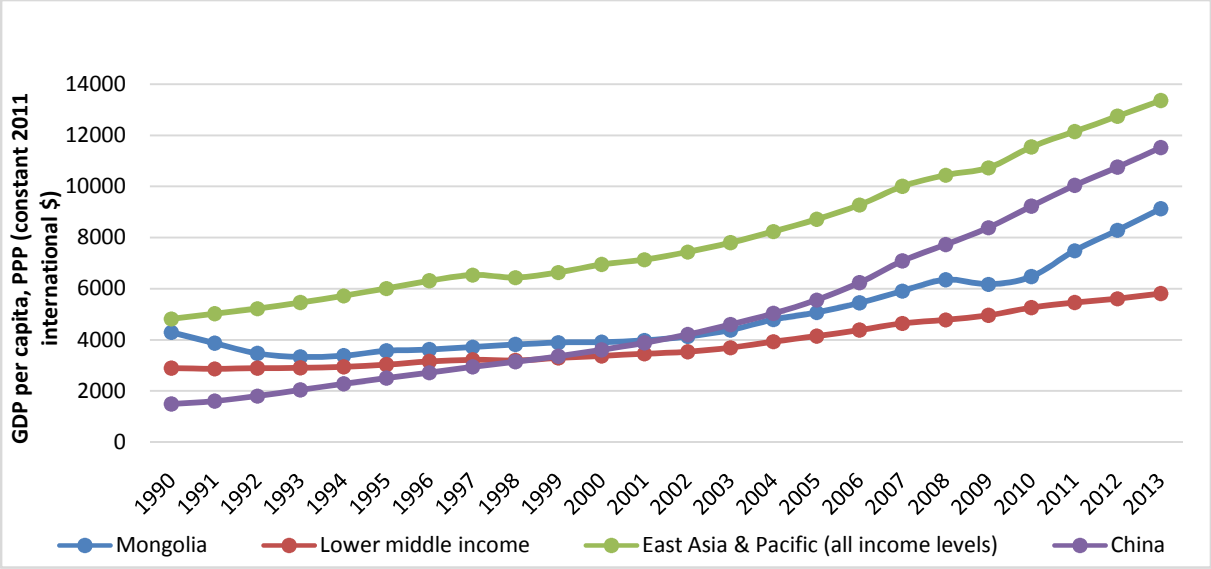
4 Analysis of food security in Mongolia

4.1 Analysis of economic development of the country

4.1.1 Economic changes in Mongolia

After the disintegration of USSR Mongolia, whose economy had been closely linked to the one of the Soviet Union, had to transform quite significantly – historically Mongolia was the country of herders and its economy was therefore linked with its agriculture performance. With a change of governmental system in the nineties the economy had to transform as well.

Figure 4: per capita, PPP (constant 2011 international $)

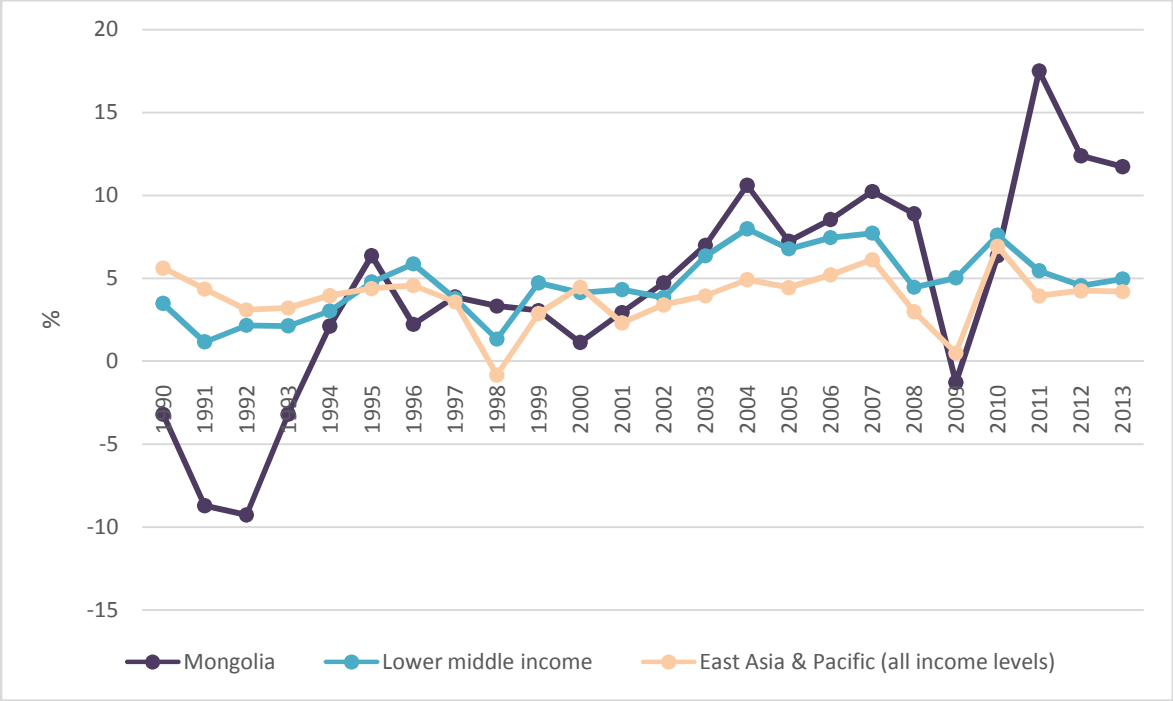


Data Source: World Data Bank, 2014; author's elaboration

As it is showed in Figure 4 country's GDP per capita – PPP has been, with few exceptions, growing since 1990. Moreover the value of GDP is above the average of lower middle income countries and since the year 2000 it has been growing much faster than the average of the lower middle income countries with the exception of year 2009 when the GDP per capita dropped. On the other hand if we compare the evolution of Mongolia with entire East Asian and Pacific region we can see that in 1990 the starting position was very similar however the region's GDP per capita rose much more significantly than the one of Mongolia, however big contributor to the growth of the region as a whole is China which GDP per capita almost tripled between the years 2000 and 2013.

By looking at Figure 5 that shows the annual percentage change of GDP in Mongolia it reveals that the economy is quite volatile. Overall GDP has a rising tendency as stated above and as Figure 5 shows after the year 2000 Mongolia's economic development resembles to the development of its geographical region of Eastern Asia and Pacific. Unfortunately Mongolia reacts much more to any external changes which causes its vulnerability.

Figure 5: GDP growth of Mongolia (annual %)



Data Source: World Data Bank, 2014; author's elaboration

That has been the case of the global financial crisis which confirmed that the economy is volatile to any external disturbances when in 2009 the annual growth reached for the first time after fifteen years negative numbers. In spite of the negative numbers in 2009 the pace of GDP growth was and still is rapid – in 2011 the annual GDP growth reached 17% and even though the following year's performance was not as high the numbers remained for three consecutive years in two digit numbers. However compared to the region's GDP change Mongolia experienced much bigger shocks in its GDP so despite the amazing growth showing double digit growth the economy does not appear to be very stable.

In Table 1 shows the coefficient of variation for the GDP per capita of Mongolia. It has been calculated based on the GDP per capita, PPP (current international USD) that are available on the the World Bank database.

The standard deviation has been calculated using following formula:

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \bar{x})^2}$$

Where σ is the standard deviation; N is the number of data in the data set (time period from 1990 to 2013); $\bar{x}$ is the arithmetic mean, that has been computed using this formula:

$$\bar{x} = \frac{1}{N}\sum_{i=1}^{N} x_i$$

The coefficient of variation has been calculated using following formula:

$$v_k = \frac{100 * \sigma}{\bar{x}}$$

The coefficient of variation shows to what extend (in %) the values vary from the arithmetic mean.

Table 1: Coefficient of variation calculated from Mongolian GDP per capita, PPP (current international USD), for time period 1990-2013

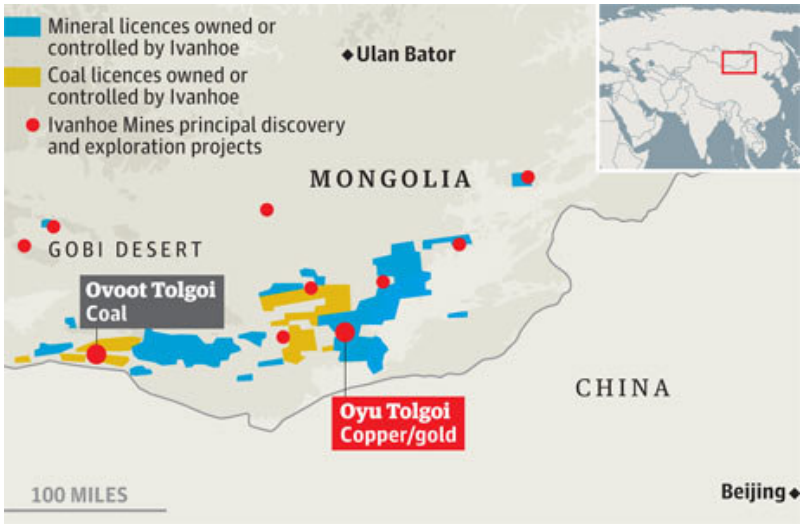
GDP per capita, PPP (current international $)	Standard deviation	Arithmetic mean (USD)	Coefficient of variation (%)	Median (USD)
Mongolia	2016.47	4291.01	46.99%	3319.67
Lower middle income	1300.98	3358.06	38.74%	2857.18
East Asia & Pacific	3171.55	7088.46	44.74%	6023.66

Data Source: World Data Bank, 2015; author's elaboration

The value of the coefficient of variation for Mongolia is 46.99% showing that the GDP values are not very stable. The entire region of East Asia and Pacific has lower values of the coefficient of variation 44.74 % which means the difference between Mongolia and the region as whole is only 2% so despite the high values of coefficient of variation Mongolian GDP shows similar trend as the rest of the region. By comparing the coefficient of Mongolia with the lower middle income countries than the gap is even bigger than when comparing

with the East Asian region. The coefficient of variation is 38.74% for the lower middle income economies which is much better result than the 46.99% of Mongolia. That shows that the performance of Mongolian economy is highly dependent on the rest of the region performance.

Figure 6: Map of Mongolian mining activities

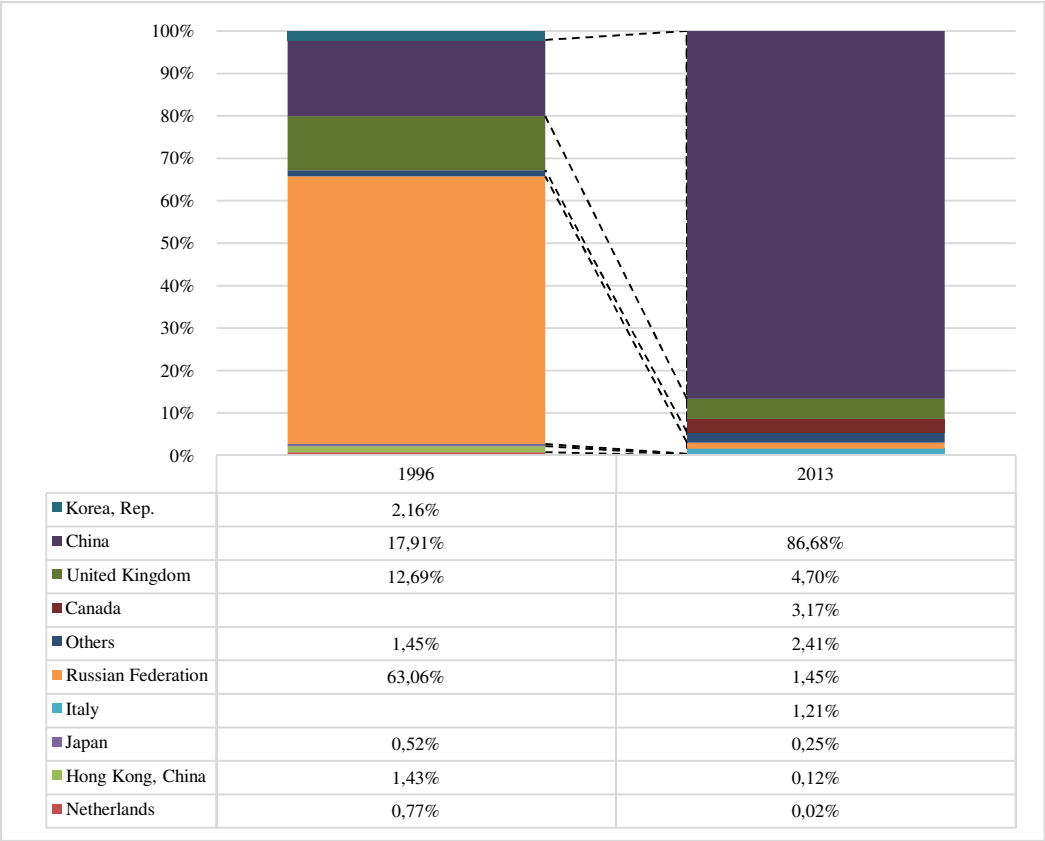


Source: guardian.co.uk, 2014

Despite the agricultural orientation in the past, Mongolia started exploiting its natural resources. Currently country's main export is composed of following products: coal briquettes, copper and iron ore, crude petroleum, gold and animal hair. Overall mineral products created the majority of exports in recent years – in 2008 it was almost 60 % and the share of mineral products in country's export peaked in 2012 when it reached around 88%. And it is the mineral export that has been driving the economy in recent years. Furthermore the IMF estimation is that by the year 2021 Oyu Tolgoi's[3] production of copper and gold might account for almost one third of the country's economy. The Figure 6 shows Mongolian mining activities.

[3] Oygu Tolgoi - a multibillion project jointly owned by Mongolia and Rio Tinto-controlled Turquoise Hill – could account for 30% of the country's economy (Tania Branigan, the Guardian, 2014)

Figure 7: Trading Partnets (Export) in 1996 and 3013)



	1996	2013
Korea, Rep.	2,16%	
China	17,91%	86,68%
United Kingdom	12,69%	4,70%
Canada		3,17%
Others	1,45%	2,41%
Russian Federation	63,06%	1,45%
Italy		1,21%
Japan	0,52%	0,25%
Hong Kong, China	1,43%	0,12%
Netherlands	0,77%	0,02%

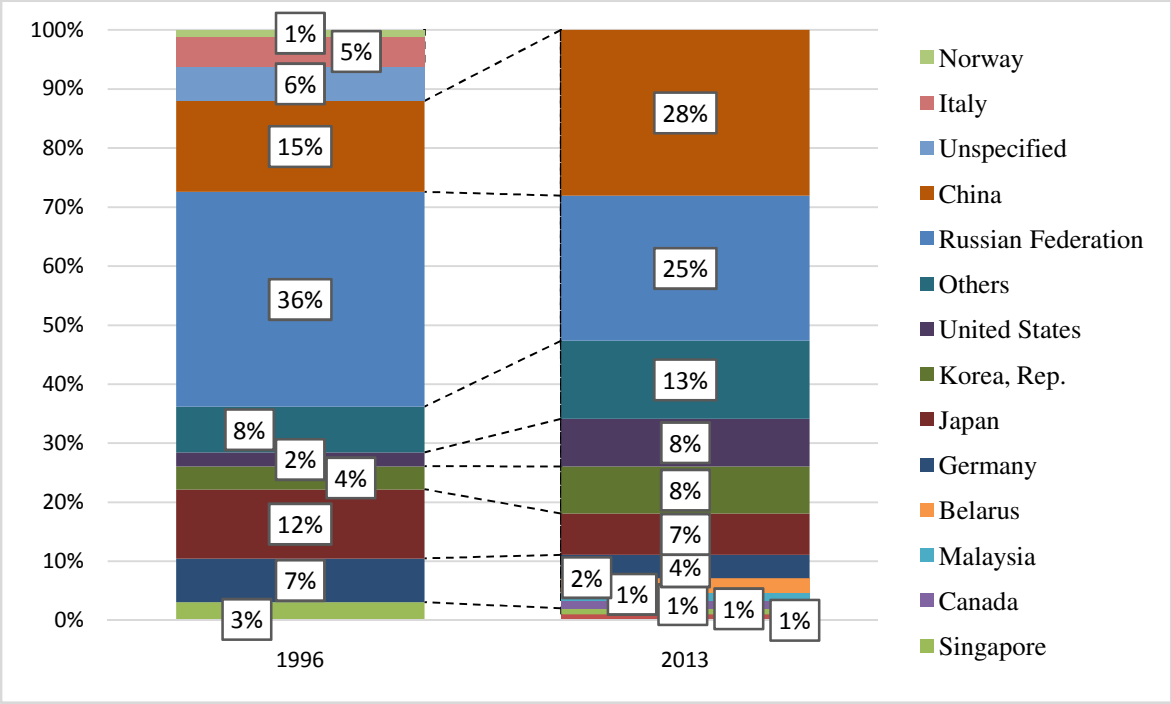
Data Source: UN Comtrade, WITS, 2015; author's elaboration

Countries biggest exporting partner is China to which in 2012 Mongolia exported goods having value of 3.46 billion USD, which was around 80 percent of all exports and in 2013 export to China represented almost 87% of the entire export of the country. Furthermore Mongolia's coal is exported almost exclusively to China and therefore closely linked with Chinese steel production where Mongolian coal is used. Figure 7 shows how exporting partners changed when comparing years 1996 with 2013. In 1996 Russian Federation was the main exporting partner with the share on export of 63% to only of 1.45% in 2013. Other exporting partners (besides China) are nowadays the UK with 4.7%, Canada with 3.17 % and other countries with less than 2% (UN Data, 2014) as Figure 7 shows. Witch China being by far the biggest exporting partner is explained, why Mongolian economic performance is linked with the one of the Easter Asian region, in particular China's.

Most recently, in 2013, Mongolia's value of export reached 4.269 billion USD whereas the import was 6.357 billion USD. Concerning the import the two biggest importers into Mongolia were in 2013 the same as in 1996 – Russian Federation and China, moreover those two countries together created more than 50% of the entire export (in 1996 as well as in

2013). They only changed their position – in 1996 number one importer was Russian Federation with 36% share on Mongol import and China accounted for 15%. In 2013 China became importer number one with share on Mongol import of 28%. Third biggest importer was South Korea having 8% share on all import in 2013. (WITS, 2015)

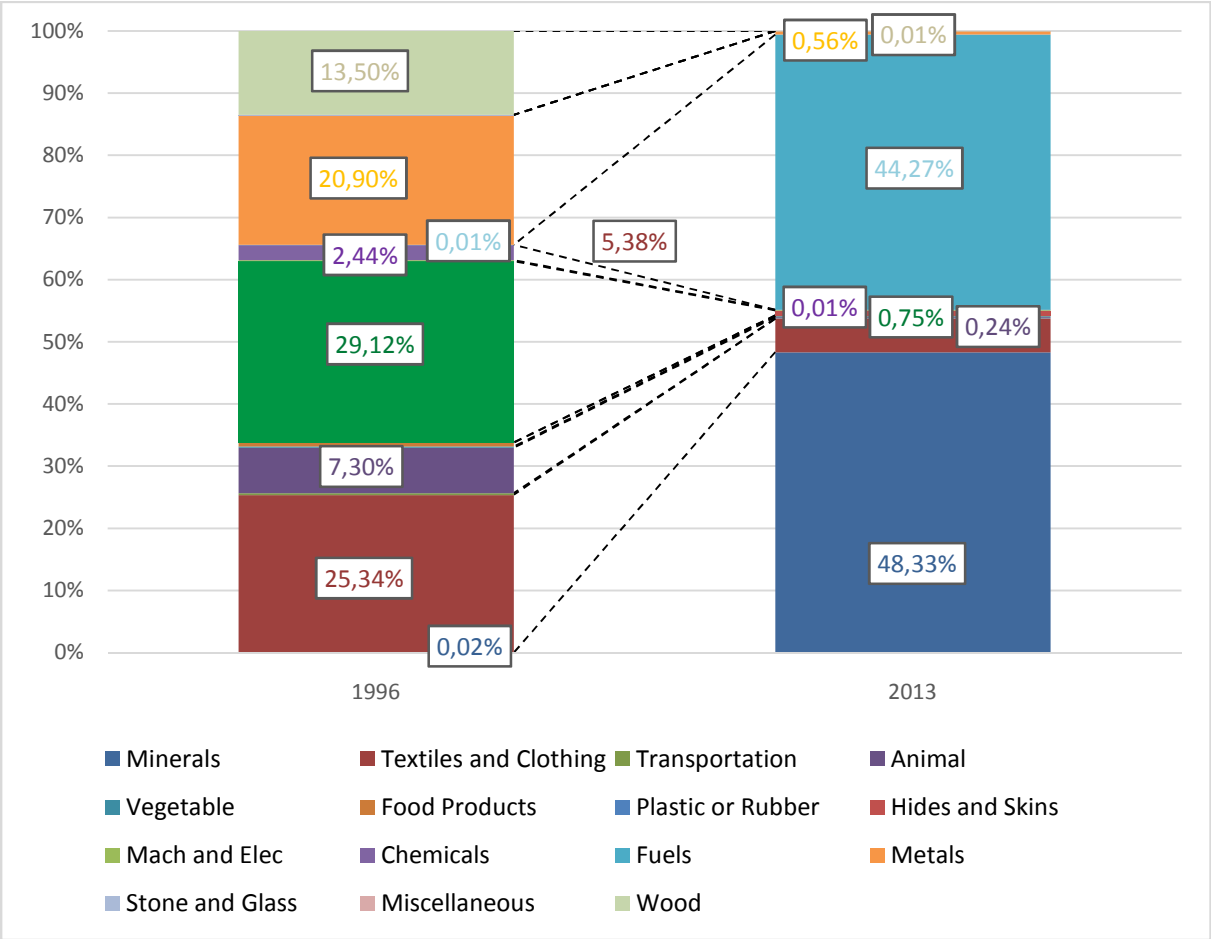
Figure 8: Trading partners (Import) in 1996 and 2013



Data Source: WITS, World Bank, 2015; author's elaboration

If we look at the composition of the export to China in 2013, when it created 86.68% of the entire export, it only confirms that the drivers of export for Mongolia are its natural resources. As Figure 8 shows minerals had in 2013 the share on export to China of 48.33% followed by the export of fuels with the share of 44.27%. If we look at what the 1996 composition of export (to all countries) minerals were still commodity number one of export – having 57.19 % share. However in 1996 second place in import were not fuels as in 2013 but textile and clothing (24.39%) followed by hides and skins (5.43%), export of metals (3.76%) and export of animals (3.33%). If we look more closely in the number one exporting commodities – minerals – in 1996 the export of minerals was worth of 242 millions USD and in 2013 it rose 1,845 millions USD resulting in very low variety in the exporting products.

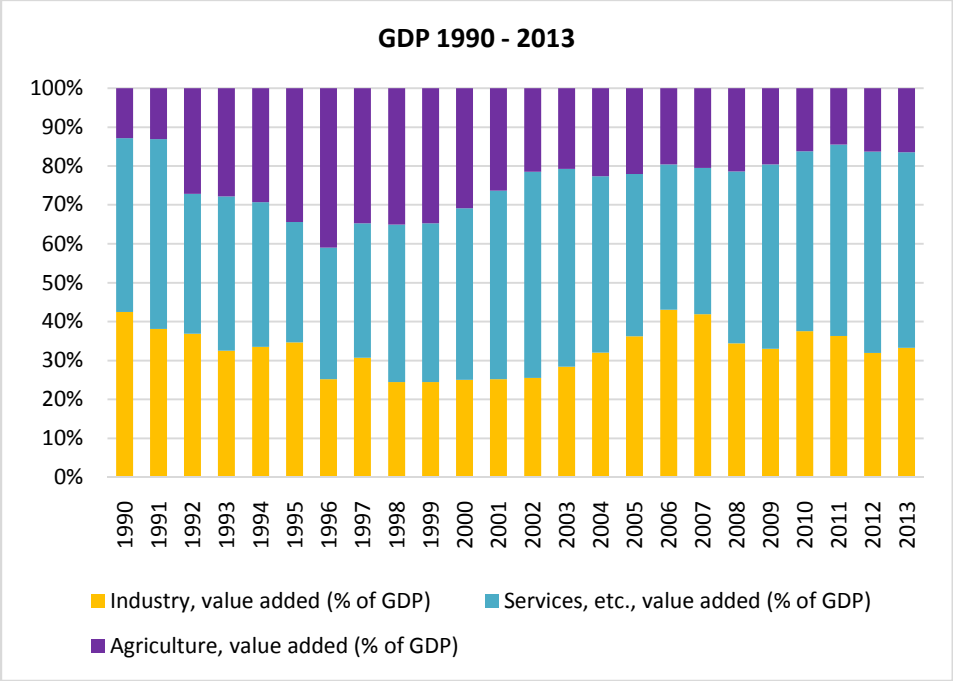
Figure 9: Structure of Mongol Export to China in 1996 and 2013



Data Source: WITS, World Bank, 2015; author's elaboration

As it is mentioned earlier in the text big contribution to Mongolia's growing GDP are its activities that are exploiting its natural resources. Owing to an enormous development in the field of coal and mineral mining GDP is showing rapid growth – in 2011 mining activities contributed to GDP growth by approximately 29%. It is Mongolia's mineral wealth that attracts foreign investors, especially from China. So far the biggest project attracting investors is Oyu Tolgoi. It is gold and copper mine located in Gobi desert. Oyu Tolgoi is by 34% owned by the state and remaining 66% belongs to Turqoise Hill Resources (international mining company) and Rio Tinto (mining group – registered in the UK and Australia). Even though OyuTolgoi is the biggest mining project in the country in is not the only one and there are some concerns towards harming the environment. Additionally in case of OyuTolgoi the project is expected to have enormous contribution to future GDP growth – by 2020 it is supposed to account for one third of GDP. (Economist, 2012).

Figure 10: The sector contribution to Mongolia GDP – evolution from 1990 to 2013



Data Source: World Data Bank – World Development Indicators, 2014; author's elaboration

Currently the share of industry in country GDP is oscillating around 30% and it was reaching similar values for past ten years. However, according to UNIDO report from 2011, the industry sector must diversify. Currently it is mainly composed from mining industries, where the output is exported, causing the dependency on international prices on mineral market, such influencer being dangerous to the volatility of the economy. Furthermore for that reason Mongolia's industrial sector needs to be diversified and the export should be composed of manufactured goods rather than exporting raw materials. Owing to Mongolia's immense herds there is a potential of manufacturing and exporting products based on yak or camel hair, cashmere etc. That would make the industry sector more diversified and less dependent on international mineral prices. (UNIDO, 2011) Additionally even though the industry's share on GDP was 36% in 2011 the employment in this sector was only 17%. Moreover even though the economy has been growing (with the exception of 2008) almost one third of the country's population is still living in poverty which is posing challenge for the government of Mongolia.

GINI Index is defined by World Bank is showing how the income distribution or consumption expenditure are differing from a perfectly equal distribution. The World Bank estimation of the index can oscillate between 0 and 100 with zero being a situation of perfect equality. Unfortunately the data for Mongolia are available only for three years: 1998, 2002

and 2008. By looking at Table 2 it is evident that the index has rising tendency when the in ideal situation it should be reversed. The GDP of Mongolia is rising quite significantly however based on the GINI index the inequality is not decreasing therefore the wealth from the national economy is not having much impact on the people living in the country.

Table 2: GINI Index (World Bank estimate)

GINI Index (World Bank estimate)			
	1998	2002	2008
Mongolia	30,27	32,84	36,52

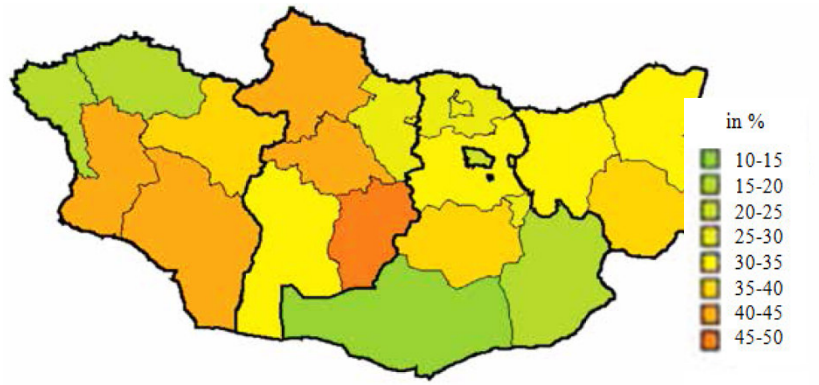
Data Source: World Bank 2015

4.1.2 Development of Mongolia

4.1.2.1 Accomplishment of Millennium Development Goals

Mongolia is actively participating it the fulfilment of Millennium Development Goals. First big step was taken by the government in 2005 when the goals were adopted by the government as a benchmark. Moreover Mongolia proved her will to fulfil the ideas of Millennium Development Goals (MDG) when the great hural (Mongol Parliament) adopted at the beginning of 2008 Comprehensive National Development Strategy. That strategy is defined for following 14 years and is aiming to promote human development in Mongolia. Furthermore it should strengthen the democratic sovereignty and help the economic stable growth. The Comprehensive National Development Strategy is divided into two phases – first one is dedicated to the achievement of MDG together with the economic development in the period 2007 to 2015, second phase is about creating knowledge-based economy in the period 2016 to 2021. (State Great Hural of Mongolia Resolution; 2008).

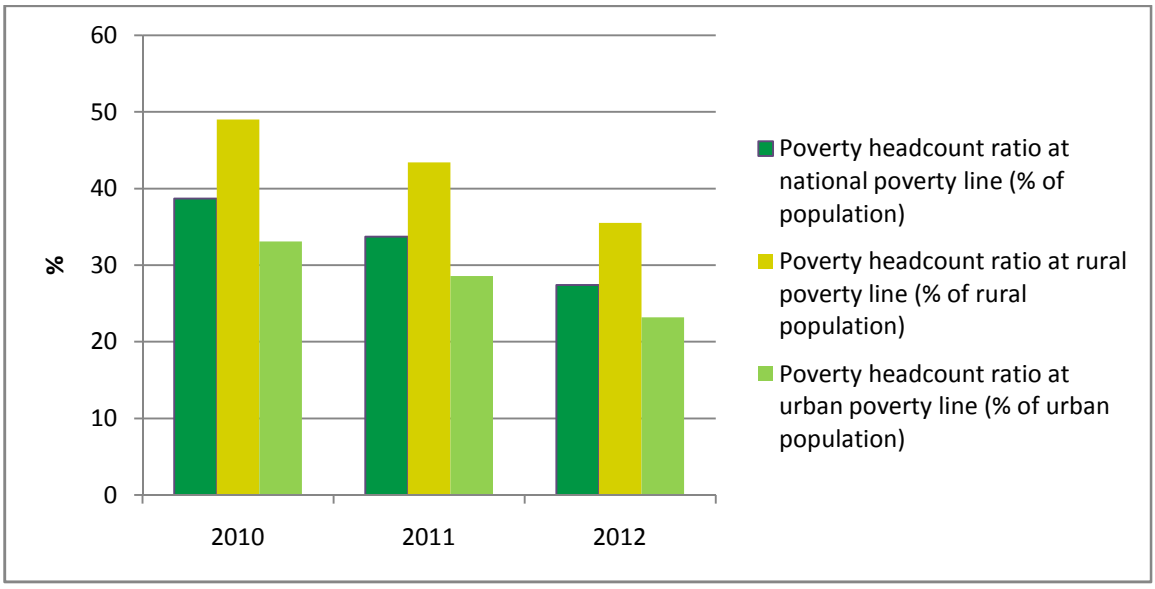
Figure 11: Poverty headcount ratio by provinces in 2011



Source: UNPD in Mongolia

The first MDG, Eradicate Extreme Hunger and Poverty, based on the National progress report published in 2013 Mongolia is having certain difficulties achieving this goal. As the report states different criteria for measuring poverty were used in the past (prior 2007) therefore the data cannot be easily compared. However by looking at the available data that are giving us the comparison of following three years it is clear that the national level of poverty is very high when 38.7 % of the population was at the national poverty line. Figure 11 is showing the distribution of poverty levels in 2011 over the Mongolian territory. Despite the positive decreasing development that was proven over three years period based on most recent data form 2012 still more than one quarter (27.4%) of Mongolia's population lives at the national poverty line as shown in Figure 12.

Figure 12: Poverty ratio in Mongolia



Data Source: The World Bank, Poverty Indicators, 2014
Note: Data availability is limited (data are available only for years 2010, 2011, 2012)

As the World Bank data proves the poverty is greater in the rural areas however based on UN Population Division the urban migration is becoming another issue that is leading to the rise of poverty levels in the capital. As the goal of the Mongolian government is to reach the poverty levels of 18% by 2015 seems to be realistic only with further effort at the site of the government.

Table 3: MDG 1 progress of given indicators

GOAL 1: Eradicate Extreme Poverty and Hunger	**1990 baseline**	**2000**	**2010**	**2011**	**2012**	**2015 target**
Target 1: Halve, between 1990 and 2015 the proportion of people whose income is less than 1.25 USD a day						
• population below national poverty line (% of total)	N/D	35.6 (in 1998)	38.7	33.7	27.4	18
• poverty gap ratio	N/D	11.7 (in 1998)	11.2	9.2	7.1	6
• share of poorest quintile in national consumption		7.7 (in 1998)	7.1 (in 2008)	7.8	7.7	11
• GDP per capita (in 1,000 MNT)	6	490.6	3072.5	3979.3	4883.3	6800
Target 2: Reduce by six times the proportion of people who suffer from malnutrition						
• Prevalence of underweight under age five	12 (in 1992)	11.6	3.3	N/D	N/D	2
• Prevalence of stunting (children under 5)	12 (in 1992)	29.9	15.3	N/D	N/D	13
• Prevalence of wasting (children under 5)	N/D	7.1	1.6	N/D	N/D	1
Target 3: Increase employment rate, reduce youth unemployment rate						
• Labour force participation rate (%)	N/D	62.9	61.6	62.5	63.5	70
• Unemployment rate of 15-24 (%)	6.5 (in 1998)	4.4	1.6	N/D	N/D	2.5

Target 4: Reduce negative effects of population concentration and migration						
• proportion of unregistered people in urban population	N/D	N/D	N/D	N/D	N/D	0

Data Source: Government of Mongolia, 2013 – Achieving the Millennium Development Goals

Second MDG target is the achievement of universal primary education. In education ratio the biggest drop was registered after the 1900s when a transition to new governmental and economic arrangement was made. Biggest drop in the school enrolment was in 2002 when only 88.9% of children were enrolled at school, most recently (in 2012) the enrolment in primary education was 97.6% with slightly higher proportion of the boy enrolment. The boy's enrolments are higher by 1 or 2 percents. The majority of children that enrols in the primary education and finishes reached 93% in 2011. However even though the primary education enrolments are over 90% in order to reach 100% an extra effort must be made (UNDP, 2013) as between 2011 and 2002 the proportion of students dropped instead of expected increase. Moreover the primary education level is problematic in the Ulaanbaatar area where the drop out ratio is higher than in other provinces.

Table 4: MDG 2 progress of given indicators

GOAL 2: Achieve universal primary **education**	**1990 baseline**	**2000**	**2010**	**2011**	**2012**	**2015 target**
Target 5: Provide primary education for all children						
• Net enrolment ration in primary education	N/D	95	94.7	94.8	95.2	100
• Proportion of pupils starting grate 1 which reach grade 5	91	83.6	92.9	93.2	94.5	100
• Literacy rate of 15-24 year old	99 (in 1989)	97.7	98.5	N/D	N/D	100

Data Source: Government of Mongolia, 2013 – Achieving the Millennium Development Goals

MDG 3 promotes gender equality and promotes the increase in women's participation in political decision-making. The gender equality as far as education is concerned seems to be quite on track as in some regions the ratio girls to boys is almost equal, however history shows a negative development as in the 1990s girls enrolments were higher than the boys and after 2000 declined appeared and the ratio decreased. As for the other part of the MDG 3 to increase participation of women in politics even though the number of woman in parliament is not very high recently a big improvement in this domain was registered when the number of woman in parliament rose in 2013 to 11 (out of 74) which is a big improvement in comparison with only 3 seats in 2012. However the goal for Mongolia was to have 30% of seats in parliament held by women by 2015 which does not seem very likely as currently

those 11 seats represent only 14.9%. Additionally to the gender equality the share of women in wage employment has recently shown a steady declining tendency with the 52% in 2009 and 2010 and only 49.9% in 2012.´ (Data from UN Statistical Division, 2014)

Table 5: MDG 3 progress of given indicators

GOAL 3: Promote gender equality and increase women's participation in political decision - making	**1990 baseline**	**2000**	**2010**	**2011**	**2012**	**2015 target**
Target 6: Achieve appropriate sex ratio in primary and secondary education						
• Primary education - ratio of girls to boys	N/D	1.01	0.96	0.95	0.95	1
• Secondary education - ratio of girls to boys	N/D	1.2	1.07	1.06	1.07	1
• Tertiary education - ratio of female to male	N/D	1.72	1.48	1.43	1.4	1
Target 7: Ensure gender equality in wage employment						
• Share of women in wage employment in non-agri sector	51.1	50.4	47.5	46.5	47.8	50
Target 8: Increase participation of women in politics and decision making						
• Proportion of seats held by women in Parliament	24.9	11.8	3.9	3.9	14.7	30
• Proportion of women candidates in Parliamentary election	7.7 (in 1992)	10.9	N/D	18.5	32	30

Data Source: Government of Mongolia, 2013 – Achieving the Millennium Development Goals

MDG 4 – to reduce child mortality four times by 2015 (from the 1990 levels) is on track with the mortality rate of 107.9 per 1000 live births in 1990 and only 31.8 deaths per 1,000 in 2013 and this indicator is showing decreasing, therefore positive tendency. (Data from UN Statistical Division, 2014)

Table 6: MDG 4 progress of given indicators

GOAL 4: Reduce child mortality	**1990 baseline**	**2000**	**2010**	**2011**	**2012**	**2015 target**
Target 9: Reduce by 4 times the under-five mortality rate						
• Under five mortality rate (per 1,000 live birth)	97.2	44.5	25.6	20.2	18.9	21
• Infant mortality rate (per 1,000 live births)	65.4	32.8	20.2	16.5	15.5	15
• Proportion of children immunization against measles	82.3 (in 1991)	92.4	96.9	98.1	98.8	99

Data Source: Government of Mongolia, 2013 – Achieving the Millennium Development Goals

The goal of reducing the maternal mortality rate to only 50 deaths per 100,000 births seems to be achievable by 2015 as the current numbers is 68 compare to the 1990 when ratio was 100 deaths. Such a positive development can be the result of the governmental maternal mortality strategy. Part of the MDG 5 is also tracking the share of births that are attended by

skilled health personnel. Based on UNICEF Multiple Indicator Cluster Survey the ratio was 98.8% in 2010 which is means that this target was already achieved.

Table 7: MDG 5 progress of given indicators

GOAL 5: Improve maternal health	1990 baseline	2000	2010	2011	2012	2015 target
Target 10: Provide access to all individuals to required RHS and reduce by 4 times the MMR						
• Maternal mortality rate (per 100,000 live births)	121.6	166.3	47.4	48.7	51.5	50
• Proportion of birth attended by skilled health personnel (%)	100	99.6	99.8	99.8	99.7	99

Data Source: Government of Mongolia, 2013 – Achieving the Millennium Development Goals

MDG 6 aims to combat diseases such as HIV/AIDS, tuberculosis, malaria and other diseases. The general goal is to achieve 0.1 or lower prevalence of HIV among pregnant woman and young (14-24 of age). As Mongolia is not severely affected by this disease this goal was already achieve without any particular strategies having to be formulated.

Table 8: MDG 6 progress of given indicators

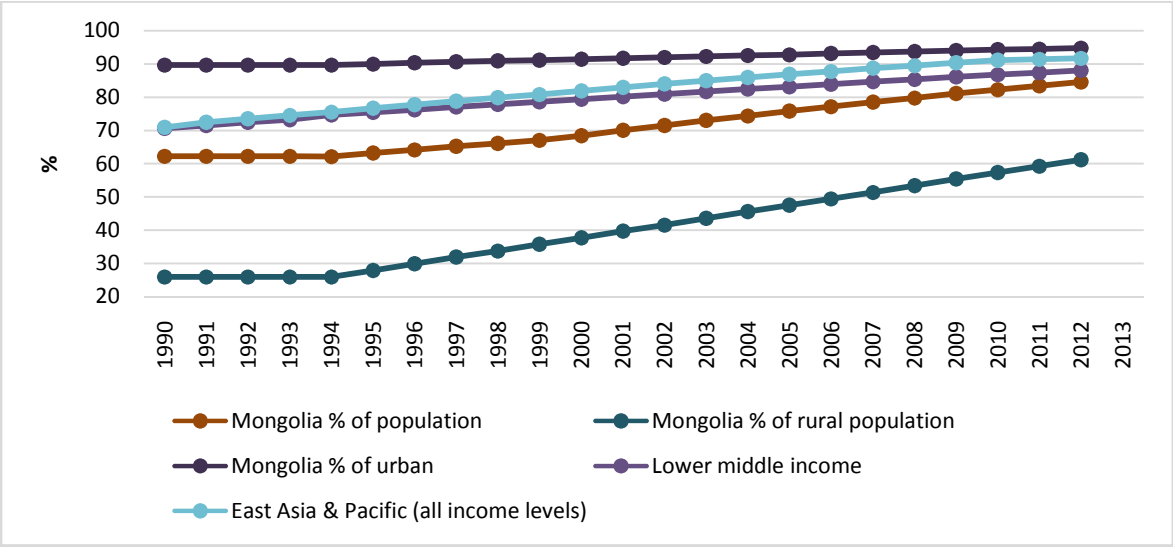
GOAL 6: Combat STIS/HIV/AIDS and TB, reverse other diseases	1990 baseline	2000	2010	2011	2012	2015 target
Target 11: Limit and prevent the spread of Human Immunodeficiency Virus HIV)						
• HIV prevalence among pregnant mothers (%)	N/D	N/D	0.003	0.004	0.002	< 0.1
• HIV prevalence among population aged 15-24 years (%)	N/D	N/D	0.0012	0.0005	0.0012	< 0.1
Target 12: Reverse the spread of tuberculosis						
• Prevalence of tuberculosis (per 100,000 population)	435	60	65	60	59	82
• Incidence rate of tuberculosis (per 100,000 population)	79	125	154	143	139	100
• Death rate associated with tuberculosis (per 100,000 population)	5	3	2	2	2	2
• Proportion on tuberculosis cases diagnostic and treated with international standard diagnostic and treatment methods	N/D	81	85	83	83	100
Target 13: Reverse the spread of caries among children						
Prevalence of caries among children of 5-6 years	N/D	80.1 (in 2004)	N/D	N/D	N/D	75

Data Source: Government of Mongolia, 2013 – Achieving the Millennium Development Goals

The environmental stability goal seems to be hard to achieve for Mongolia however the country still has around one third of the population dependent on the environment and pastoral nomad live of style. Mongolian government has improved in the domain of creation of special protected areas the goal by 2015 being to reach 30% when in 1990 it was only slightly over 3%. Moreover the number of areas under protection has increased in 2012 there was 27.69% of the country covered by either local protected areas or specially protected areas

which is status given by the parliament. Other aspect of the environment stability is the CO2. The levels of CO2 did not meet the expected levels either as they are showing continuous rise and the target of 4 tons/capita will most likely not be met as in 2012 the level was 6.64 with a rising rather than decreasing pattern as the 2010 levels were only 4.36 CO2 emissions per capita (in tons). Therefore achieving the target of 4 tons per capita seems to be unlikely. **MDG 7** covers also the aspects of water accessibility and access to sanitation. The proportion of population with an access to improved water source has increased significantly in past 20 years.

Figure 13: Rural population with access to improved water source (%)



Data source: World Bank and UN Statistics Division, MDG Indicators

The access to the improved water resources significantly improved in the rural areas where it rose from 26% to 61% and continues growing and this particular target is completed. On the other hand the access to improved sanitation facility is much lower. The share of population having access to sanitation facility was 56% in 2012 moreover over the period of previous twenty years it rose only by 9% and based on the last estimate (2012) only one third of the rural population has an access to improved sanitation. Furthermore not only the access to the improved water resource and improved sanitation facility are part of the seventh MDG but it is also targeting the improvement of housing situation. In Mongolia's rural areas only 14% of people have access to engineering service networking, the share or population in urban areas is higher – 30.5% - which is quite low. In 2007 the share of urban population living in slums was, despite certain decrease, over 57% (based on UNICEF's Indicator Cluster Survey and trend analysis). Given to only slowly improving housing situation

Mongolian government created an action plan which includes establishment of State Housing Corporation which should help to create low rent housing. (Government of Mongolia: Achieving the MDG, 2013)

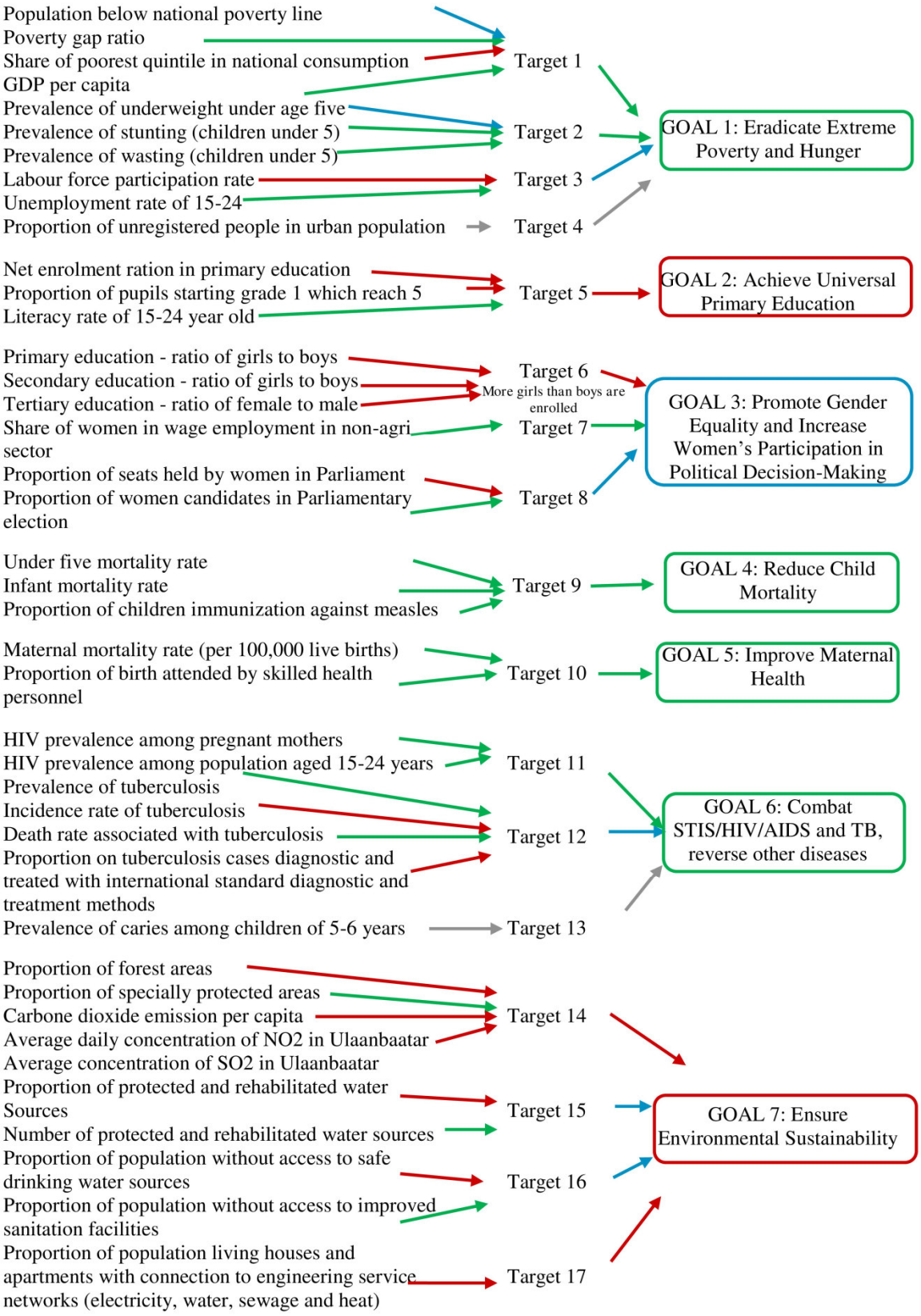
Table 9: MDG 7 progress of given indicators

GOAL 7: Ensure environmental sustainability	**1990** baseline	**2000**	**2010**	**2011**	**2012**	**2015** target
Target 14: Integrate the principles of sustainable development into policies, eliminate air pollution in urban areas						
• Proportion of forest areas	N/D	N/D	8.26	8.03	8.03	9
• Proportion of specially protected areas	N/D	13.1	14.56	16.41	27.69	30
• Carbone dioxide emission per capita (ton/person)	5.3	3.5	4.4	5.7	6.6	4
• Avg daily concentration of NO2 in Ulaanbaatar (mkg/m3)	N/D	N/D	52	77.7	77.2	30
• Avg concentration of SO2 in Ulaanbaatar (mkg(m3)	N/D	N/D	55.1	76.7	61	20
Target 15: Reduce the shrinking process of rivers and streams by protection and rehabilitating their sources						
• Proportion of protected and rehabilitated water sources	N/D	N/D	38.3	45.3	N/D	80
• Number of protected and rehabilitated water sources	N/D	N/D	631	812	1100	1000
Target 16: Reduce the proportion of people without sustainable access to safe drinking water and sanitation						
• Proportion of population without access to safe drinking water sources	45	33.8	27	N/D	N/D	80
• Proportion of population without access to improved sanitation facilities	77.4	77	76.8	N/D	N/D	60
Target 17: Improve the housing condition of population						
• Proportion of population living houses and apartments with connection to engineering service networks (electricity, water, sewage and heat)	N/D	22.7	21.2	N/D	N/D	60

Data Source: Government of Mongolia, 2013 – Achieving the Millennium Development Goals

The last goal is to develop a global partnership for development and based on the Mongolian Government's report from 2013 this goal seems to be the hardest one to achieve. The Official Development Assistance which should help to create trade capacity was set to be 10% in 2015 however in 2012 it was only 0.1% therefore it is highly unlikely that Mongolia will meet this target. On the other hand the export shows an increasing tendency over past five years whoever that increase is highly connected with the export of gold and iron ore from Oyu Tolgoi resulting in quite a narrow range of exported products. Main importers are Russia, China together creating more than half of all the imports followed by the USA with the share in import of only 8%. Next Mongolian target was to address its special needs as it is a landlocked country. Even though the country could profit from its position between Russia and China its high transport costs – result of poor road as well as rail road infrastructure are the main obstacle.

Below is a graphic representation of how the goals are being accomplished. Colourful arrows are pointing to each target and from targets to the goals each. The colours have been assigned following meaning: green represents those indicators that have been or will meet the target on time. Blue colour represents those indicators, target and goals that might be met if a special effort towards meeting the goal would be done. Red colour stands for non-fulfilment of given goal and those indicators, targets, goals will with a high certainty not meet the targeting levels. Grey colour in the schema represents those indicators that are lacking data and therefore cannot be included. Overall the schema is revealing that Mongolia is on track to meet its targets of Millennium Development goals set by the government. The area it should pay the biggest attention is to ensure the environmental stability, currently not much is being done to protect the environment. Not only the mining activities have negative effect on the environment but also despite certain effort being made for example in the area of proportion of rehabilitated water sources the country is not very close to meeting its target (despite the lack of data). Also the air pollution in the capital is not being improved with the levels of sulphur dioxide and nitrogen dioxide being much higher than the desired goal. Air pollutant sulphur dioxide has almost triple the concentration in the air then it should be and even through the result of the other air pollutant – nitrogen dioxide are slightly better its concentration is also much higher as it is double than the goal was set to be. Moreover the schema also reveals that the majority of houses are not connected to the networks – electricity, sewage, water and heat as in 2010 only 20% of the houses were connected to such networks. Of course connecting houses in vast countryside is not an easy task, but what is becoming a pressing problem is the uncontrolled growth of Ulaanbaatar of the periphery areas (gers) where majority of houses is not connected to the city network. Other Millennium Development goal that needs an improvement is the second one. Nonetheless despite not meeting the goal the enrolment ratio in primary education is quite good being around 95% unfortunately over time it is not showing much of an improvement and therefore is marked red as it is unlikely for this target to be met on time. The remaining goals are either on track (marked red) or might be achieved (blue colour) which suggest that the government is not being blind to the problems.

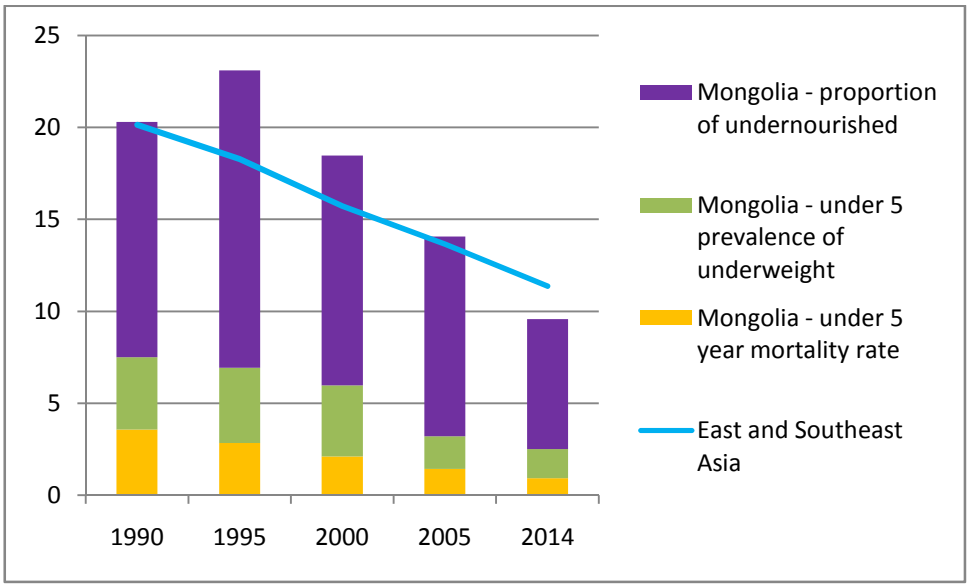


Schema has been created by the author

4.1.2.2 Global Hunger Index - IFPRI

Global Hunger Index is being used by International Food Policy Research Institute (IFPRI) and is a combination of three hunger components that are equally weighted. Those three components being: undernourishment, child mortality and underweight. The undernourishment is expressed as a proportion of population without sufficient caloric intake. Child mortality is the proportion of deaths among children under the five years of age. The last component of the index shows the share of children less than five years of age with insufficient caloric intake. Mongolia's most recent GHI (from 2014) was only 9.6 which is the lowest since 1990. Moreover 2014 score moves the country from group with serious hungry levels to moderate. However it is important to highlight that the border between serious and moderate hungry level is 9.9 therefore Mongolia is very close to the bordering score. Based on the GHI it is clear that Mongolia's biggest problem in the food security is the overall proportion of undernourished as the child mortality and underweight are not high. In the Figure 14 the composition of Mongol Global Hunger Index is shown together with the regional comparison with the regional average.

Figure 14: Global Hunger Index in Mongolia in comparison with East and Southeast Asian region



Data Source: IFPRI: GHI 2014, Trends of Hunger; author's elaboration

4.1.2.3 Multidimensional Poverty Index

The Multidimensional Poverty Index (MPI) is being used to measure acute poverty and has certain similarities with GHI – it also calculates the levels of poverty from multiple

indicators. Overall ten indicators divided into three dimensions (health, education, living standards) are being used. The MPI is being calculated by the Oxford Poverty and Human Development Initiative, which is part of the Oxford University. The calculations for Mongolia are based on the data from UNICEF's MICS (Multiple Indicator Cluster Survey). If someone is deprived in more than third out of those total 10 indicators it means that that person classifies as multidimensional poor. Additionally the extend of such poverty is based on the number of deprivation they are experiencing (Ophi.org: Global MPI, 2014). Mongolian results of MPI are following:

Mongolia – MPI results:	
Proportion of population vulnerable to poverty *	20.6%
Proportion of population in severe poverty	3.2%
Intensity of deprivation among the poor	41%
Population in multidimensional poverty	15.8%
MPI (ranking from 0 to 1)	0.065
*** experiencing 20-33.32% intensity of deprivation**	

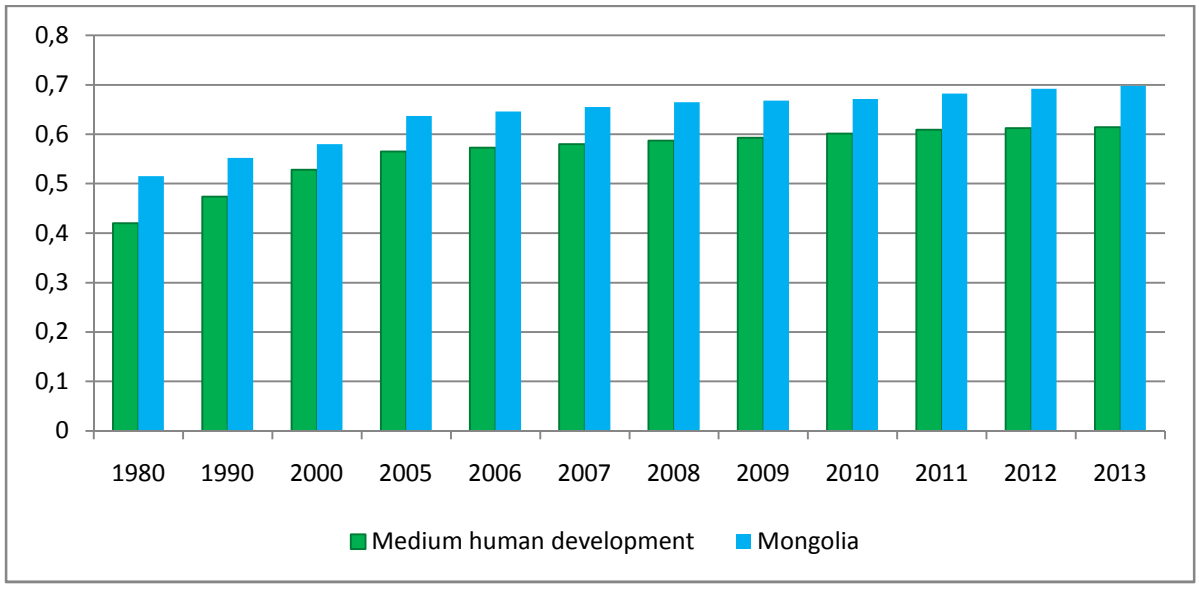
Data Source: OPHI, 2014

Based on index some 20 % of the population of Mongolia is vulnerable to poverty and 15% of people is living in multidimensional poverty, which is hard to reverse.

4.1.2.4 Human Development Index – UNDP

Human Development Index captures the achievements of country in various dimensions of human development – health dimension, education and income. The UN states that the human development index should be used to compare wellbeing of countries instead of comparing their GDP. The reason for that is that HDI focuses on the quality of life of people not simply on the economic performance as country with high economic performance can still have very low. In 2013 Mongolia reached the value of HDI 0.698 classifying Mongolia into countries with medium human development (third lowest out of total four HDI categories). As Figure 15 shows the East Asian is performing better than Mongolia with the index being 0.703 in 2013.

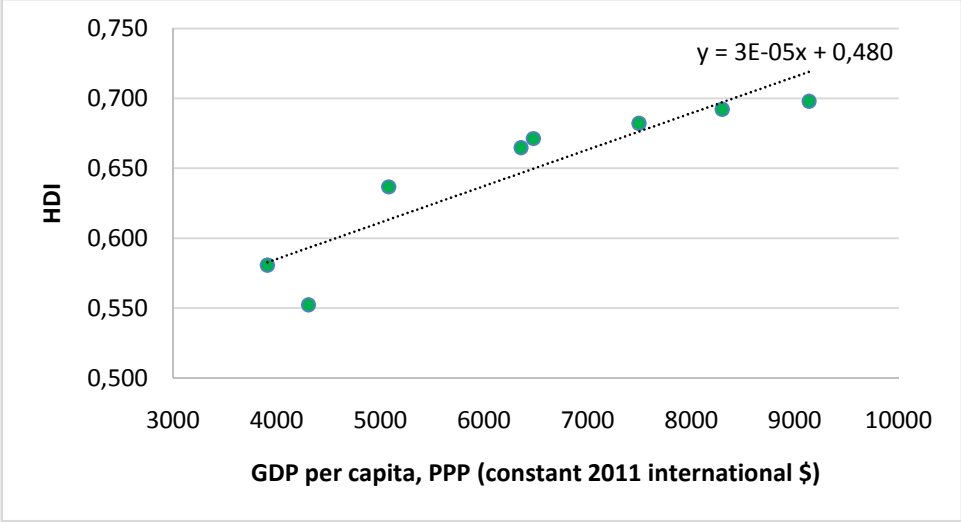
Figure 15: The evolution of HDI



Data Source: and UNDP, 2015; author's elaboration

Furthermore as stated above the Human Development Index measures different aspects of human development and unlike GDP it takes into consideration not only the wealth of country but also what are the living conditions. Figure 16 shows the relation between the rise of GDP and HDI for Mongolia from which it is clear that both have rising tendency however for years 2012 and 2013 the GDP growth exceeded the growth of HDI so the country wealth growth but the impact on the population was much smaller.

Figure 16: Relation between GDP and HDI (data for years: 1990, 2000, 2005, 2008, 2010, 2011, 2012, 2013



Data Source: UNDP, author's elaboration

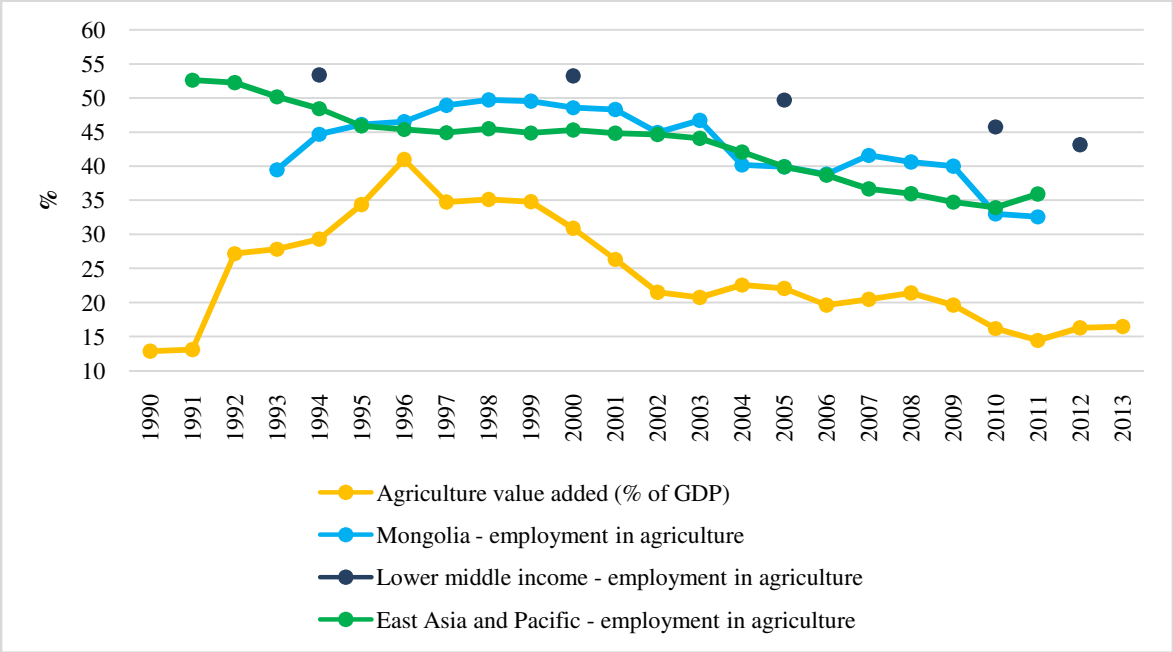
4.2 Agricultural Development of Mongolia

Mongolia's vast area occupies 156,412 thousands of hectares out of which 72.56 % are classified as agriculture area. (FAOSTAT, 2014) However Mongolia's share of arable land is very small – only 612 thousands of hectares, that is only around 1% from all agriculture area. The rest is being used mainly as permanent meadows and pastures therefore the agriculture is based on pastoralist type. Given country geographical position – plateaus that often change to mountain range, which are spread on almost 28% of country's area, large area of Mongolia is occupied by steppe (26%), desert-steppe (20%) and Gobi desert (9%). Overall, almost 72 % of the territory is grazing land which results in unfavourable conditions for growing crops.

According to Fernandez-Gimenez grassland occupies around 70% of the country's area and can be divided into three zones. First zone is the mountain-steppe, second one is the steppe and the third one is the desert-steppe. The steppe zone is one being mainly used for grazing.

Even though the share of people working in agriculture has decreasing tendency – from the period 2001 to 2011 the share of people employed in agriculture sector decreased by 15% (World Bank – World Development Indicators, 2014), as Figure 17 shows one third of the population's livelihood still depends on the agriculture sector. In the lower middle income economies, despite the lack of data, the share of people working in agriculture is even higher and so is in the East Asian region. Generally the less people are working in the agriculture the more developed country is. In developed countries the share of people working in agriculture is as low as 2% or 3%.

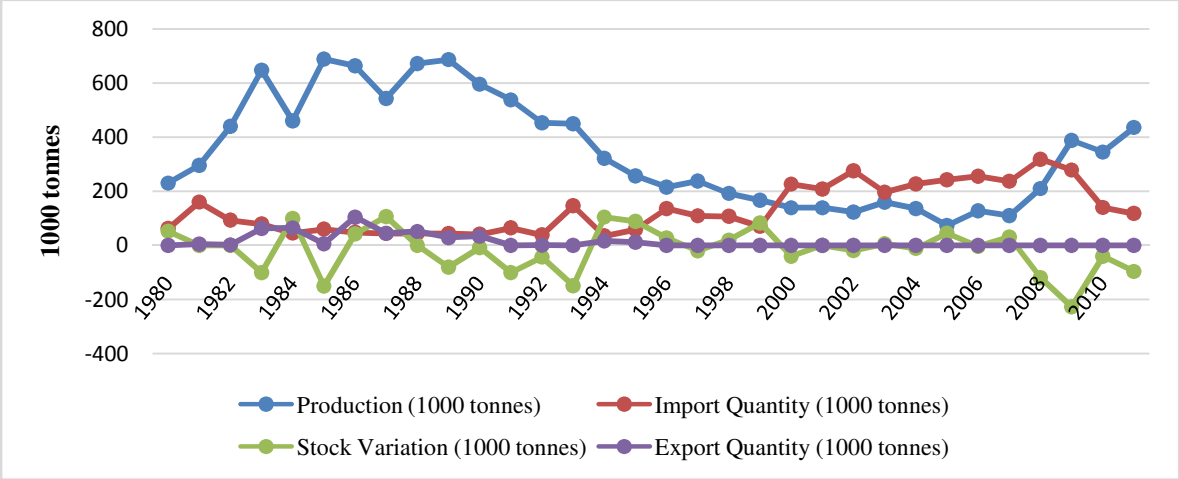
Figure 17: Employment in agriculture in Mongolia and the share of agriculture sector on the GDP



Data Source: World Data Bank, 2015; author's elaboration

In case of Mongolia for some people herding is the last resort; usually the poorest in the country are still dependent on herds and nomadic type of life. As the chart shows the share of people working in agriculture has, despite its decreasing tendency, unsteady evolution with ups and downs suggesting that people were migrating to agriculture sector after the regime changed. According to Mearns the reason for that was that companies, that some of the previously state owned companies ceased their existence and people saw an employment opportunity in the agriculture sector. However since the change of millennium in 2000 the share of people working in agriculture has decreasing tendency and the employment in service sector is increasing, that is a positive sign proving country's economic growth and development. However this is resulting in a gap between rural and urban areas as there is almost 50% people employed in services sector, which has share of GDP of 50% whereas in agriculture some one third of people finds employment but it contributes the sector's contribution to GDP was in around 16% in 2013.

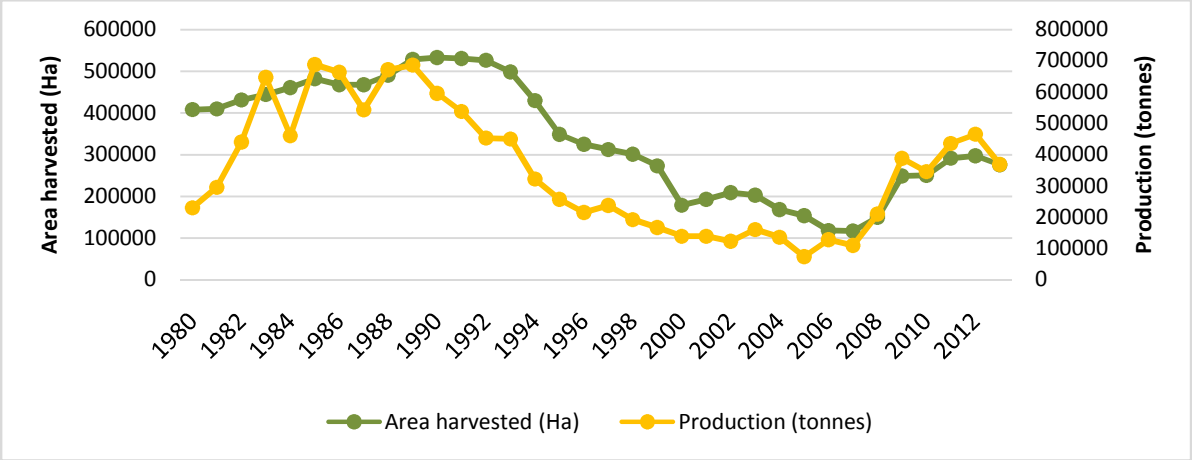
Figure 18: Wheat production in Mongolia, import and export



Data Source – FAOSTAT, 2014; author's elaboration

The country's main cereal is wheat which production has increased significantly since 2007 as shown in Figure 18. Such significant increase in wheat production was endorsed by the government, which specified in its National Crop Rehabilitation Programme aim of self reliance in the production of this cereal. In 2012 wheat ranked fifth in the country's agriculture production, first three places being taken by meat production (sheep, cattle, goat) and the fourth by milk production. (FAOSTAT, 2012). Based on the National Food Security Program higher yield in wheat production was achieved by irrigation rehabilitation and newly constructed irrigation as the irrigation system used prior to 1990 was not maintained after the transition as the ownership was not clear. As Figure 19 shows starting 2008 the wheat production and the harvest area started growing reversing more than fifteen years lasting decreasing trend.

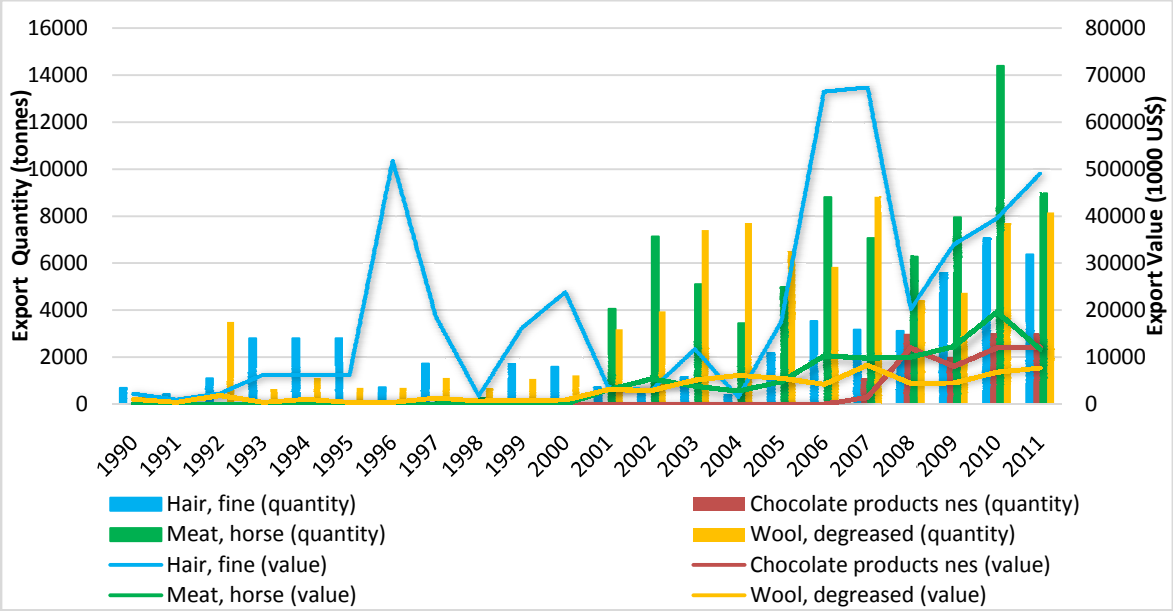
Figure 19: Wheat production and the harvested area



Data Source: FAOSTAT, 2014; author's elaboration

If we look at the trade with agricultural commodities (crop and livestock products) Figure 20 shows the main four exporting commodities taking into consideration both their export quantity and value. Following commodities: hair (fine), horse meat, chocolate products nes [4] and degreased wool were chosen as they are intersection of top five exporting commodities by value and top five exporting commodities by quantity. It is evident that livestock products are the main exporting commodities as fine hair has the highest value of export that was 48.9 million USD.

Figure 20: Mongolian Export of Agricultural Commodities



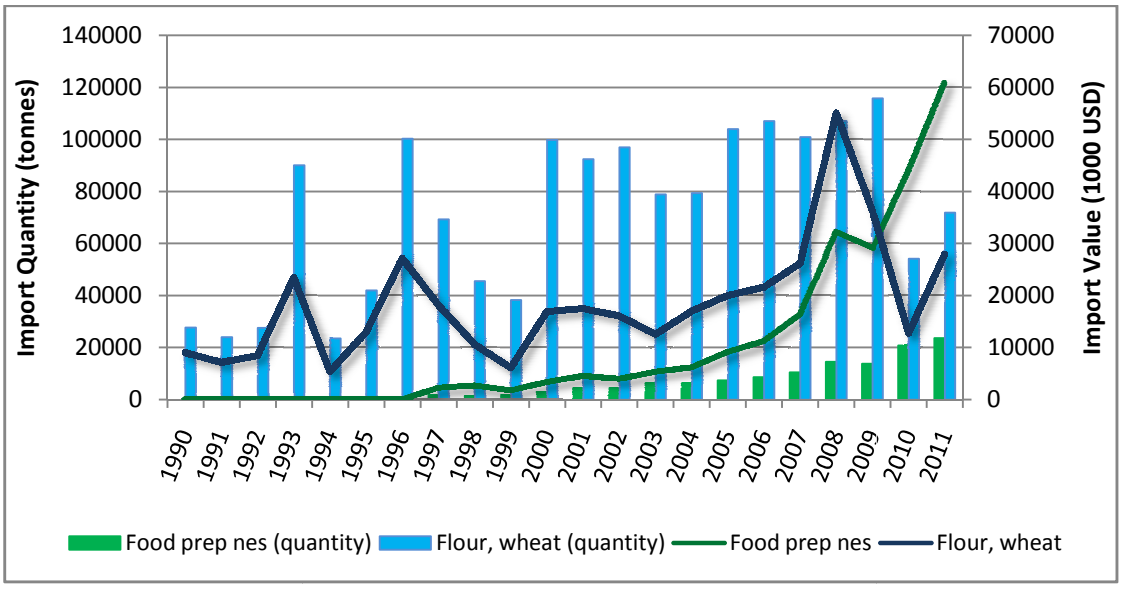
Data Source: FAOSTAT, 2014; author's elaboration

By looking at Figure 21 that shows the main importing commodities in the agricultural sector it is evident that Mongolia was in period from 2010 to 2009 dependent on the import of wheat. Wheat flour and food prep nes[5] are displayed in the chart as they are both part of top five importing commodities in both value and production. In 209 the value of import of food prep nes exceeded for the first time since 1990 the import value of wheat. As the chart below shows after 2009 the import value of wheat has been lower, which can be caused by the National Crop Rehabilitation Program.

[4] Chocolate Products Nes is a FAO category that includes: sweetened cocoa powder, chocolate and other food preparations containing cocoa, as well as sugar confectionery containing cocoa in any amount. Excludes white chocolate

[5] Food Prep Nes is a FAO category that includes: both crop and livestock products (inter alia: homogenized composite food preparations; soups and broths; ketchup and other sauces; mixed condiments and seasonings; vinegar and substitutes; yeast and baking powders; stuffed pasta, whether or not cooked; couscous; and protein concentrates)

Figure 21: Mongolian Import of Agricultural Commodities



Data Source: FAOSTAT, 2014; author's elaboration

4.2.1 Characteristics of Main Farming System

4.2.1.1 Weather Conditions - Dzuds

Mongolian agriculture is highly dependent on environment and therefore vulnerable. Overall climate is very cold, winter has very low temperature (reaching up to -40°C) with low precipitation, sometimes extreme winters – dzud appear and are devastating for the livestock. Severe dzud occurs after a drought in summer and therefore it has a devastating impact on the livestock numbers In recent years several dzuds occurred having immense impact on the number of livestock. For example dzud that appeared in the years 1999-2002 caused the death of 10 million animals (13% of country's total livestock) (USDA, 2009), which left 5% of the herders with no animals. That particular series of dzuds affected mainly the Bayankhongor province where livestock loss was on average the highest (Fernandez Gimenez et al., 2012). More recently another sever dzud occurred in 2009-2010 and was accompanied by extraordinary high levels of snow and temperatures reaching below 40°C. Such a severe condition resulted in high loss of livestock – almost 10 millions animals died, which was approximately 22 % of the livestock reported in 2009. This particular dzud affected 15 out of 21 country's province and affected almost one third of the population. (UN, 2010)

Even though overall four seasons can be defined throughout a year spring is short with highly variable weather, in this period the most important is rain so that pastures can start to grow again after winter to be able to support all the livestock. However spring also brings

strong wind, which is later in summer followed by dust storms which can also be very harmful to the livestock.

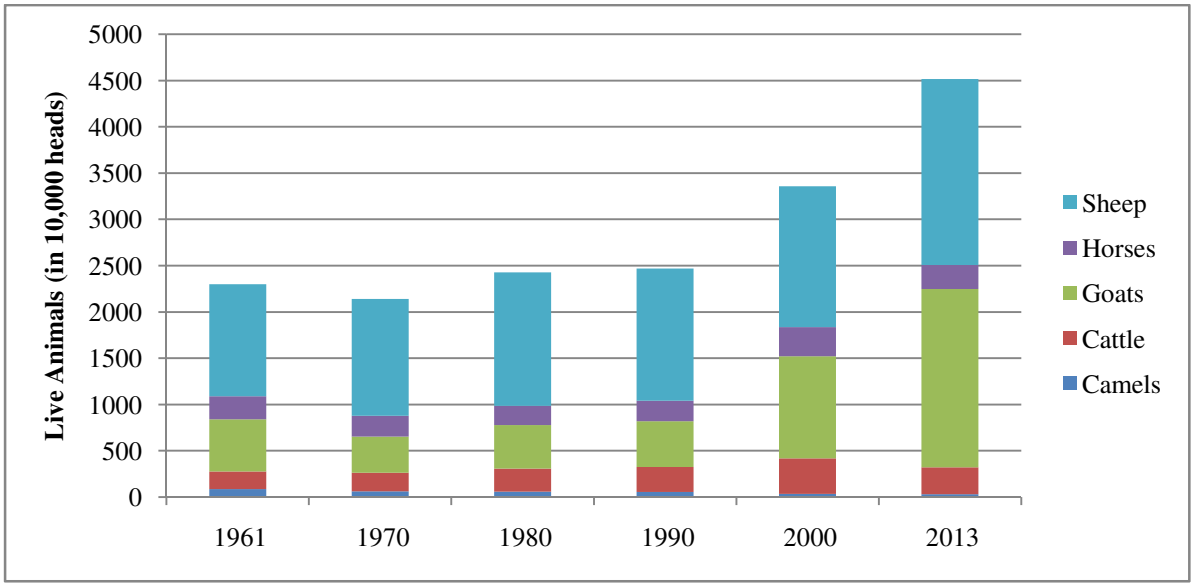
4.2.1.2 Tradition of Pastoral Nomadism

Pastoralism in Mongolia has a history of thousand years and it is dependent on five different animal kinds: sheep, cows/yaks, goats, camels and horses. There is a herding pattern when herd are being moved around four times a year, based on the season, with the key move being the one for winter. Even though pastoral nomadism is traditional for this country in has undergone few changes in the 20th century, which are linked with change of regimes. Traditionally, before 1911, all land belonged to the Manchu-Qing emperor and it has been divided to smaller areas, that usually presented herding camps and herders were gaining access to particular grazing areas on the basis of customary usage (Upton, 2008). Following the communist revolution in 1921 all land became state ownership however it did not have a significant impact on the herdsmen. Land usage continued based on a custom – winter pastures being claimed based on tradition, summer pastures being a bit more flexible. Slight change came with state collectivisation (late 50s, early 60s) when collectives were created and pasture use was strictly under their control. Even though tradition persisted to a certain extend collectives were allocating pastures to herders. Moreover single-species collectives were created. Under this political system herders were state employees receiving wage, rather than profiting from the herd itself. This era was more profit-oriented and single-species herds were introduced. Such change in the composition of herds shifted the traditional distribution of winter pastures based on the requirement of given species. Moreover to achieve desired production livestock was not dependent entirely on the pastureland bud additional forage was supplied.

The regime change in the early nineties brought modification to the lives of nomads. Herders were no longer state employees entitled to salary and privatisation took place. Winter shelters – crucial for herders, as the winter pastures is the most important one, and livestock itself were privatised. However the major component in pastoral nomadism – pastureland itself was excluded from the privatisation process and remained in state property. The main reason for such decision, criticised by the west, is that Mongolian herders are accustomed to custodial relationship with land. (Upton, 2008: Sneath, 2003). Even though Land Laws where adopted by the government in the nineties the impact was not immense as most of herders continued to use pastures they were used to using.

Based on USAID (2014), in recent years the decrease in the mobility of herders occurred. Historically herding families were changing pasture to allow the pastureland to regenerate, which was especially important for winter pasture so that it would be able to support the herds during harsh winters. However the trend nowadays has changed and the lack of mobility leads to overgrazing of pastures that are close to natural water source or well (constructed during communist regime. The end of Soviet era the supply of winter forage ended and as a result most herding relies on standing dead forage during winter however in order to have that pasture ready for winter time it should not be used during the summer so that it is able to support the livestock in the winter. Only few are able to buy additional forage for winter time and therefore the majority of herders remain highly vulnerable to the weather conditions.

Figure 22: Evolution of livestock from 1961 to 2013



Data Source: FAOSTAT, 2014; author's elaboration

As it has been specified above the main type of agriculture is transhumant pastoralism. There are five main species of which herd is composed it is: cattle, goat, horses, sheep and camels. As Figure 22 shows, since 1961 the biggest share of livestock has been created by sheep (53%) followed by goats creating 24% of all livestock, by 2012 the situation changed and goats and sheep are now almost in equity. The main reason for the increased number of goats is cashmere – thanks to cashmere production goats became easy more valuable to the herdsmen as they represent relatively guaranteed source of income. However some studies are suggesting that goats have a detrimental impact on grassland (Sternberg, 2008: Tumurjav,

2003) leaving pastureland to exhausted and therefore unable to support all the livestock in long-term.

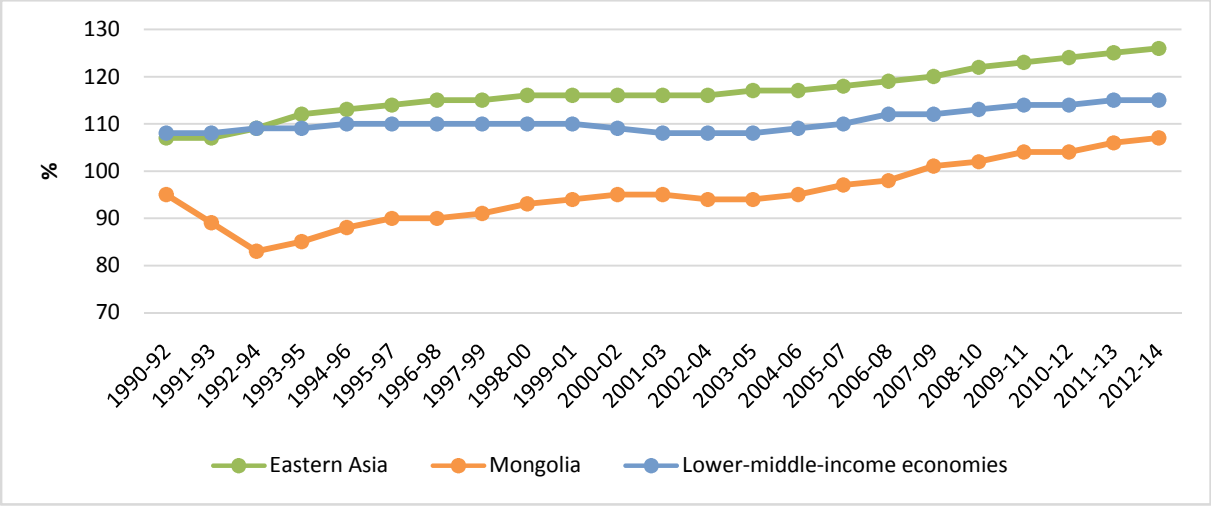
Moreover some herders fear devastating dzuds so much that in order to have sufficient amount of livestock after the winter they keep more heads in their herds than they would have and the pasture is not able to sustain such number of livestock.

4.3 Macro-level analysis of food security

4.3.1 Availability dimension of food security in Mongolia

Food availability is described through the set of five different indicators. First indicator being the average dietary energy supply adequacy that is shown in Figure 23. If we look at the development of Mongolia throughout past twenty years the tendency is without any doubt steadily increasing. However in comparison with lower middle income economies there is still place for improvement as the figure below shows. The fact that in past ten years Mongolia has always scored more than 90 % can be interpreted that majority of the nation has sufficient food supply as far as caloric intake is concerned.

Figure 23: Average dietary energy supply adequacy in Mongolia



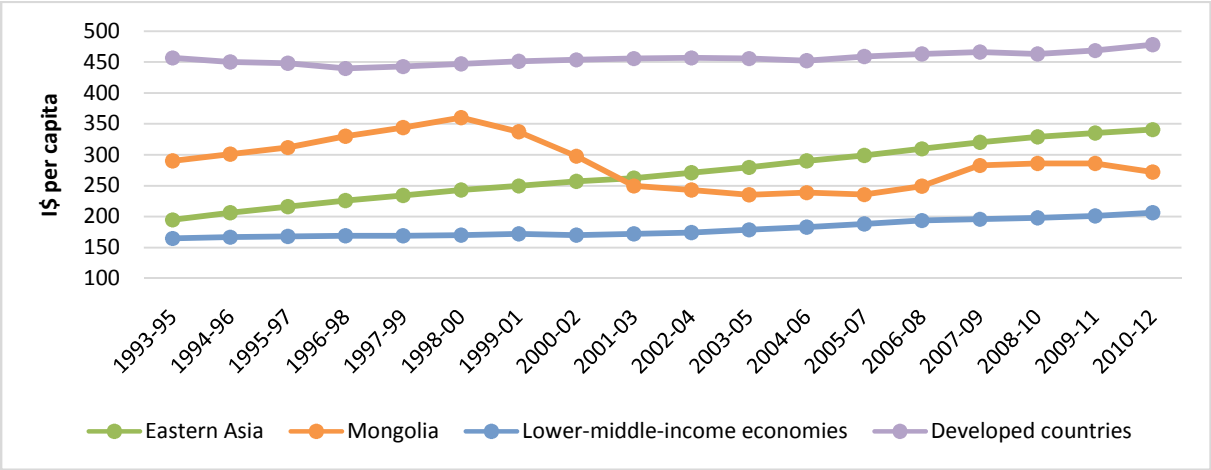
Data Source - FAOSTAT, 2014; author's elaboration

Recently, since 2009 the indicator even exceeds 100 % which means that in theory everyone should have sufficient caloric intake. However this indicator does take into consideration if the food available has enough nutrient for healthy died on the contrary it can help to identify if the problem of under nutrition is connected with the food unavailability or if there is sufficient food supply but the it is not being distributed to the ones in need. Levels around 100% in case of Mongolia are suggesting that there is sufficient food supply. However the value of the average dietary energy supply adequacy in developed countries is over 130 since 1990 up to day.

Another indicator is the average value of food production. This indicator has decreasing tendency – in 1991 it reached 386 international dollars (when the world's average was only 240 international dollars), most recent data from 2012 are reversed with the world's

average value of 303 and Mongolia's only 272. As the chart below shows it is highly unusual development as the world's trend is reversed having steady increasing tendency. Such unusual trend in the evolution of the value of food production suggest unstable development of the agricultural sector of which the value decreased immensely between 1990 and 1994 and then after rising for a while it dropped to its minimum in the periods 2004-2008.

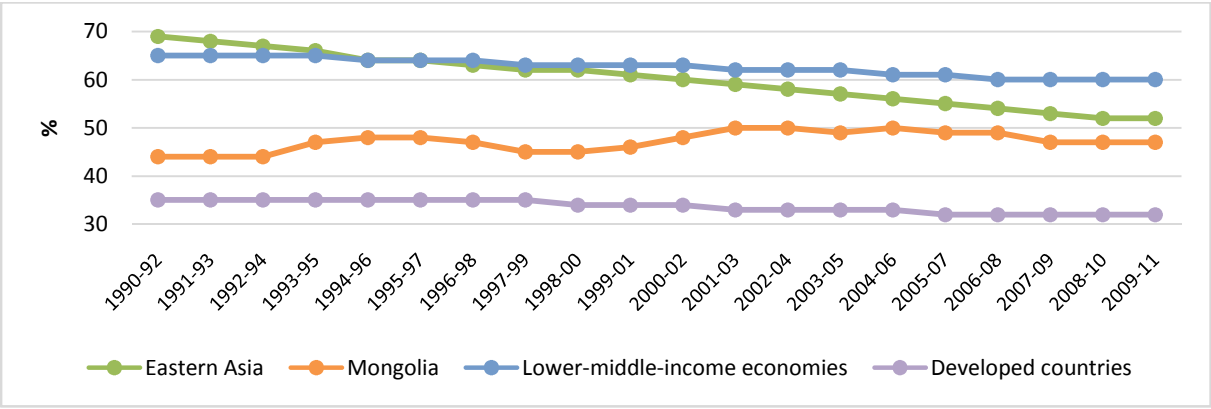
Figure 24: Average value of food production



Data Source - FAOSTAT, 2014; author's elaboration

Third indicator is connected to the dietary energy supply which is derived from cereals, roots and tubers, in other worlds the share of dietary energy supply that does not include protein. This indicator is expressed in the kcal consumption per day per capita and is estimated in percents. Mongolia oscillates for past twenty years between 47 and 50 percents. The figure 25 shows that the share of dietary energy supply tents to be higher in developing countries than in developed ones.

Figure 25: Share of dietary energy supply derived from cereals, roots and tubers

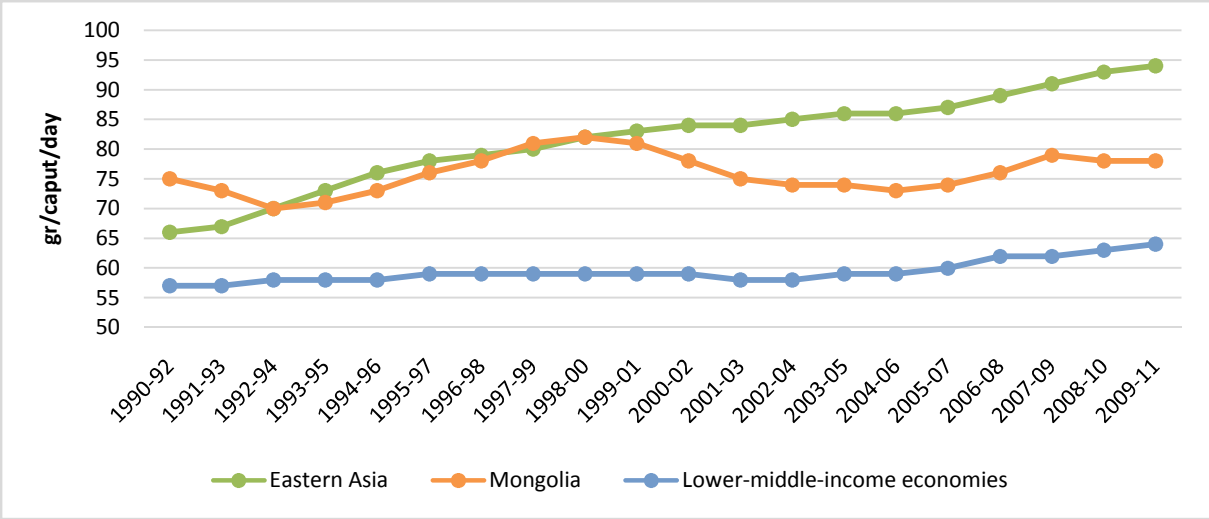


Data Source - FAOSTAT, 2014; author's elaboration

The lower middle income economies value of this indicator decreased in past twenty years from 65 % to 60 % however that number is still considerably lower in developed world where it is only 36.

Fourth indicator connected with food availability is the protein supply. In the case of Mongolia as showed in Figure 26 the protein supply, expressed in grams per capita per day consumption, remains without any significant changes for the past twenty years.

Figure 26: Average protein supply in Mongolia and lower middle income economies

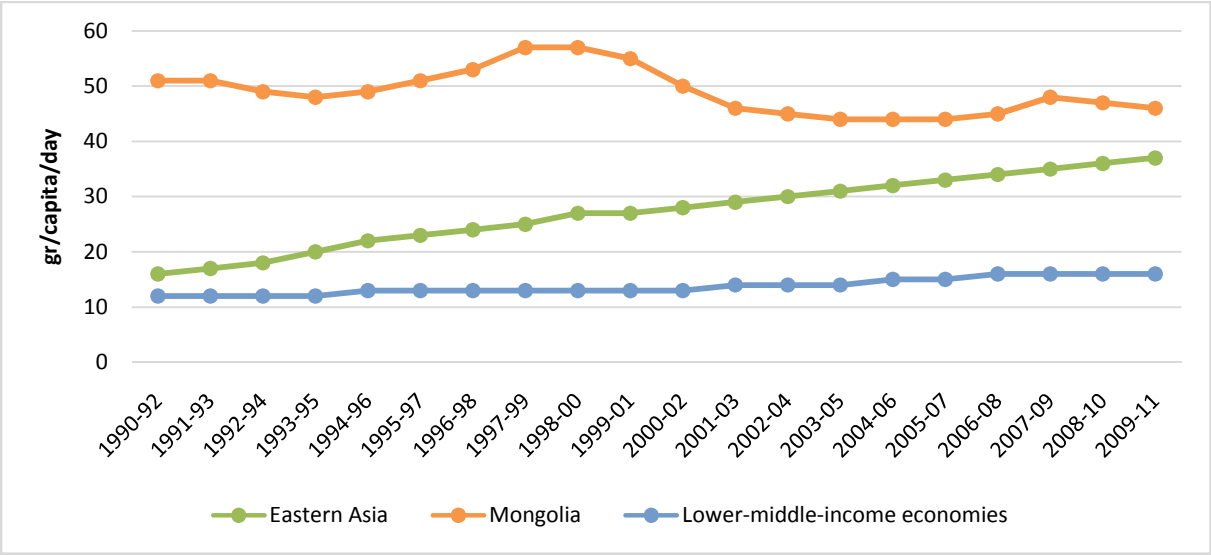


Data Source - FAOSTAT, 2014; author's elaboration

At the beginning of nineties it was 75 g/day/capita and rose up to 82 in 2001 however than it decreased back to 78. Overall the values are above the average compared to the other lower middle income countries however in opposite to the tendency of Mongolia the overall value of developing countries has a slight but steady increasing tendency when it started on only 57 in 1991 and in following twenty years rose to 64. The reason why is Mongolia doing considerably well in this indicator is due to its herds on which its farming system is build. Moreover both Mongolia and other lower middle income countries have still considerably low levels of the protein supply in comparison with the developed world – the developed countries that reached in 2011 the protein supply of 103 g/day/capita which shows that Mongolia has still a considerably big gap to fill.

Another food security indicator connected to food availability dimension is the supply of protein of animal origin. Mongolia started at 51 g/day/capita at the beginning of nineties as it is shown in Figure 27 which was at that time almost the same as the developed world where it was 58, for comparison the developing world reached only 15g/day/capita.

Figure 27: Average supply of protein of animal origin in Mongolia



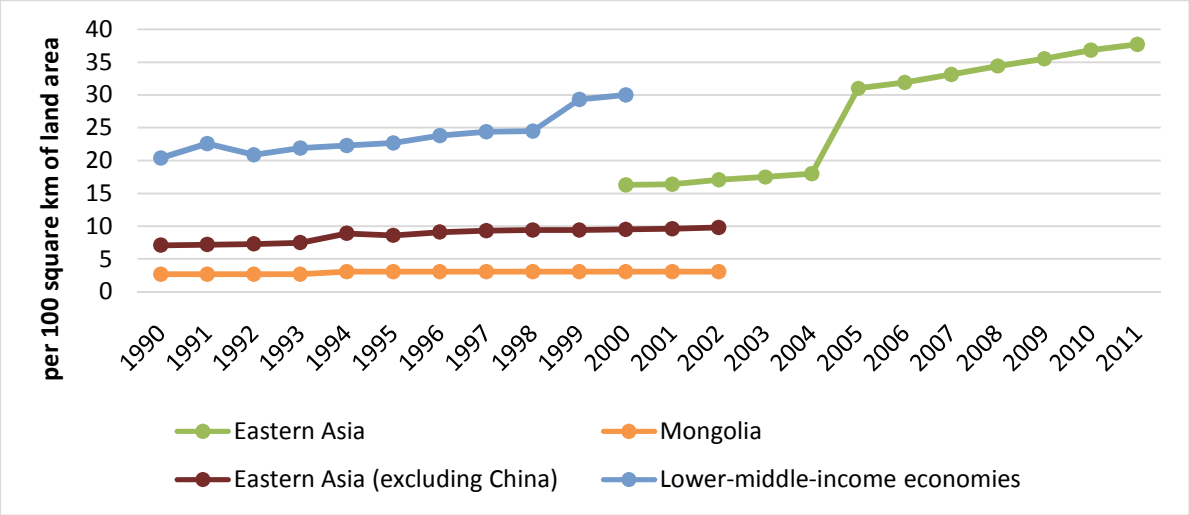
Data Source - FAOSTAT, 2014; author's elaboration

Unfortunately despite a good starting position of Mongolia the country following development was not as promising – the value dropped to 46 by 2011. However the decreasing tendency Mongolia is still highly above the average of lower middle income economies. Such above average values of the protein supply of animal origin availability can be explained by the high livestock production in Mongolia as pastoralist type of agriculture is the main part of agriculture in this country. Therefore even though the numbers are high above the average the decreasing tendency, instead of increasing one, clearly pushes the country development towards the developing world.

4.3.2 Accessibility dimension of Food security in Mongolia

Other dimension focuses on the accessibility of food. FAO uses road density as one of the food security indicators however there is a lack of data in this area. As Figure 28 shows the last recorded data are from 2002 when the road density per 100 square kilometres of land area was only 3.1. More recent data are not available on either FAOSTAT or the World Data Bank however based on previous development – in 1990 the road density was 2.7 can be estimated that no significant improvement in recent years appeared.

Figure 28: Road density



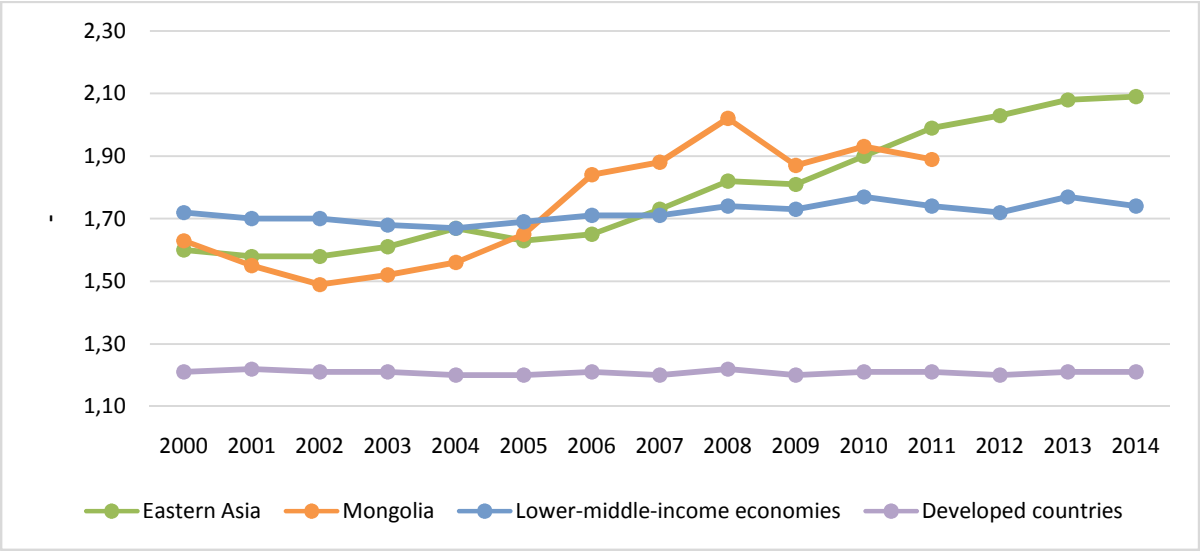
Data Source - FAOSTAT, 2014; author's elaboration

To put Mongolia's road density in perspective the average road density in East Asian region was 17.1 in 2002 which is the year of last available information on Mongolian road density whose road density was almost six times lower than the regional average. Additionally East Asian region showed rapid improvement the figure for 2012 rose to 37.7, and available resources at FAOSTAT are suggesting that it is mainly due to fast growth of China and South Korea.

As if the road density in Mongolia was not low itself other indicator – the percentage of paved road shows how poor the road infrastructure is. Again there is lack of recent and the latest data from 2002 are that only 3.5% of roads are paved which class Mongolia alongside least developed countries in Sub-Saharan Africa such as Chad. The rail lines density is also very low – 0.1 per 100 square kilometres of land area, the world average is 0.9.

The economic aspect of the access of food can be shown through the domestic food price index as it expresses the price of food in a given country with respect to consumption basket. The index for Mongolia has shown a slightly decreasing tendency in past three years which is a significant improvement especially when looking on the rapid rise from 2005 to 2008 to which severe weather conditions contributed significantly. The domestic food price index is higher in Mongolia in comparison with other lower middle income countries. Most recently (in 2010 and 2011) Mongolia reached similar values of the food price index as the Eastern Asian region is. However the chart also shows how the food price index is much higher in Mongolia and lower middle income countries compared to the values of developed world.

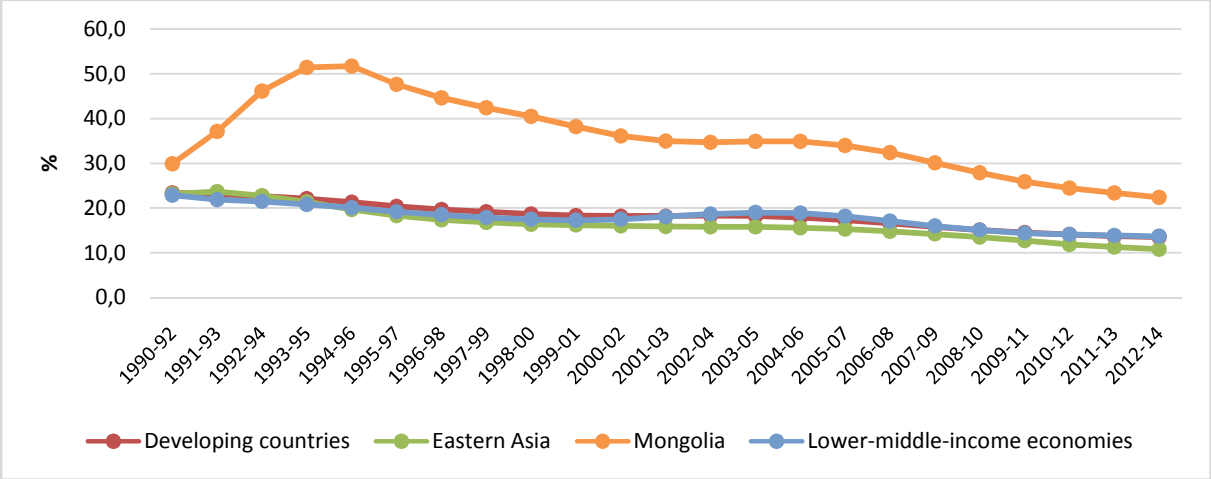
Figure 29: Domestic food price index in Mongolia and other benchmarking regions



Data Source - FAOSTAT, 2014; author's elaboration
Note: Data are not available prior to year 2000

The other indicators dealing with the food accessibility comprises of the prevalence of undernourishment, the prevalence of food inadequacy, depth of the food deficit and lastly shares of food expenditure of the poor however the last indicator is not available for Mongolia due the lack of data. Unfortunately the prevalence of undernourishment is still very high in Mongolia with some 22% of the population being undernourished meaning one fifth of the population caloric intake is not sufficient to cover the individual's energy requirements. Even though the share of undernourished population is decreasing the yearly decrease in past five years was only 1% per year meaning the country has difficulties attacking the undernourishment problem in its population as shown in Figure 30. Furthermore the levels of undernourishment are much higher in Mongolia than is both the regional average as well as the average of lower middle income countries.

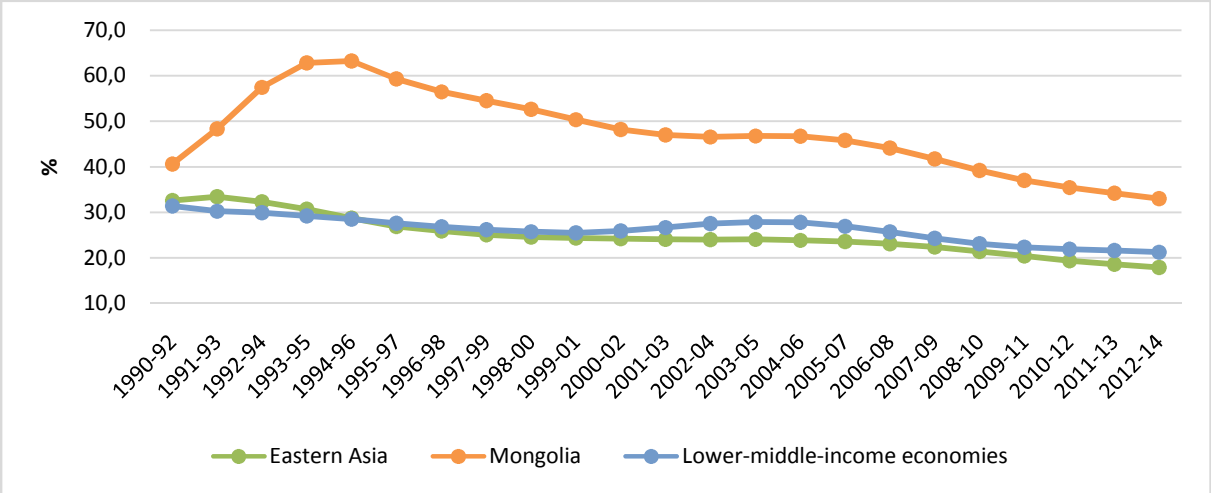
Figure 30: Prevalence of undernourishment in Mongolia and benchmarking regions



Data Source - FAOSTAT, 2014; author's elaboration

Other indicator of the food security is the prevalence of food inadequacy and despite having similarities with the prevalence of undernourishment this particular factor goes beyond estimating those whose caloric intake is not sufficient and it also includes that part of population that is at risk of not covering the caloric intake that is needed for the normal physical activity. It is important to realize that, that part of population is not chronically undernourished but their performance is affected by the insufficient caloric intake. Currently one third of population is suffering from food inadequacy which is very high number it has been steadily decreasing. In the middle of 1990s the food inadequacy level peaked reaching more than 60% and it has been decreasing tendency since then.

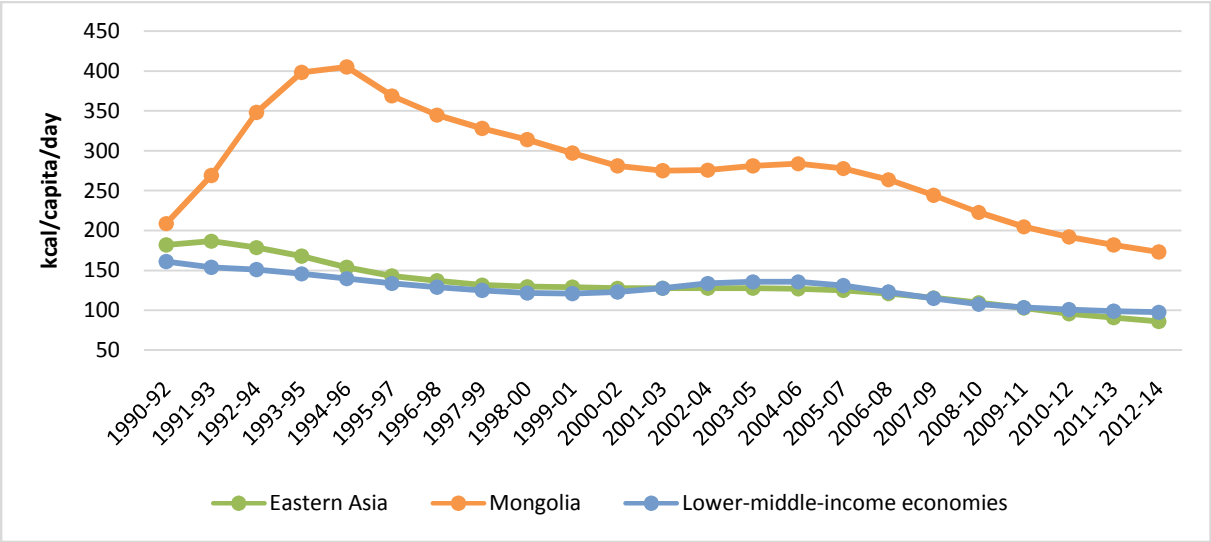
Figure 31: Prevalence of undernourishment in Mongolia and benchmarking regions



Data Source - FAOSTAT, 2014; author's elaboration

The depth of food deficit is other indicator that helps to classify the accessibility dimension. It has showed significant improvement by decreasing from the deficit close to 400 kilocalories per person per day in the mid 90s to more than its half – 173kcal/person/day as Figure 32 shows. If we compare the food deficit in Mongolia with other lower middle income economies Mongolia is not still performing worse than the average however in recent years the gap is closing.

Figure 32: Food deficit in Mongolia in comparison with lower middle income economies and Eastern Asian region



Data Source - FAOSTAT, 2014; author's elaboration

Besides all the indicators mentioned above the accessibility includes also gross domestic product per capita however that indicator has been specified in the previous chapter. Overall the positive development of GDP per capita where Mongolia is outperforming other lower middle income countries show that the economy is performing better which should affect the accessibility dimension in a positive direction.

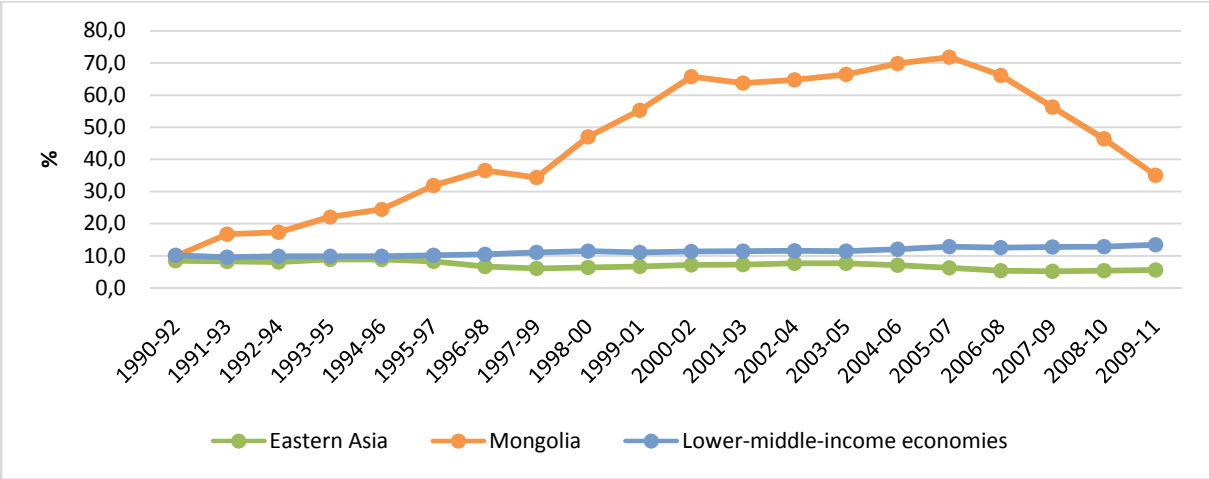
4.3.2.1 Stability dimension

The stability dimension has seven indicators total – the percentage of arable land that is equipped for irrigation, the cereal import dependency ratio, the value of food imports over total merchandise export, the political stability, price volatility on the domestic market, per capita food production variability and least but not last the per capita food supply variability

The cereal import dependency ratio was in 2009-2011 estimated by FAO to be 35.1% which is much higher than the average of lower middle income economies as well as world's average – both of them is around 16% as Figure 33 shows. However despite the high ratio by

looking at the development it is clear that the situation in Mongolia has recently showed a positive trend and decreased significantly – from the year 2000 to 2008 it was over 60% peaking in 2005/2007 with 71.8%. Such a high dependency ratio is partly caused by the geographical location. It is important to take into consideration that only 1% of the agricultural land in Mongolia is classified as arable land and therefore suitable for growing cereals. Despite the low share of arable land the government of Mongolia enhanced the country's crop production by developing the National Crop Rehabilitation Programme as part of which irrigation has been rehabilitated. The impact of this action can be seen in the smaller dependency ratio.

Figure 33: Evolution of the cereal import dependency ration in Mongolia and benchmarking regions

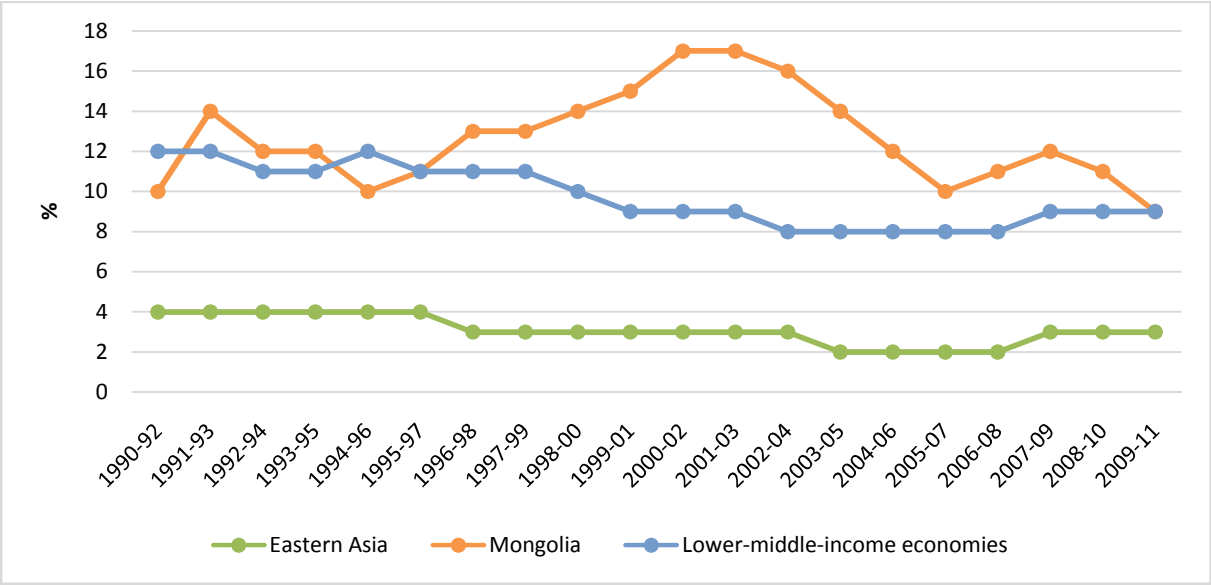


Data Source - FAOSTAT, 2014; author's elaboration

The percentage of irrigated arable land was in 2010-2012 13.5% and even though the number does not by far reach the world's standards (23.2%) it is a big improvement compared to only 6.5% of irrigated land in the period 1995-1997.

The value of food imports over total merchandise exports shown in Figure 34 shows quite unstable development of this indicator. According to the latest data Mongolia managed to reach the same level as other lower middle income countries. That is a significant improvement compare to the years 1998 to 2004 when the gap was quite big with Mongolia's value of import was doubled compare to the benchmark.

Figure 34: Evolution of the value of food import over total merchandise exports

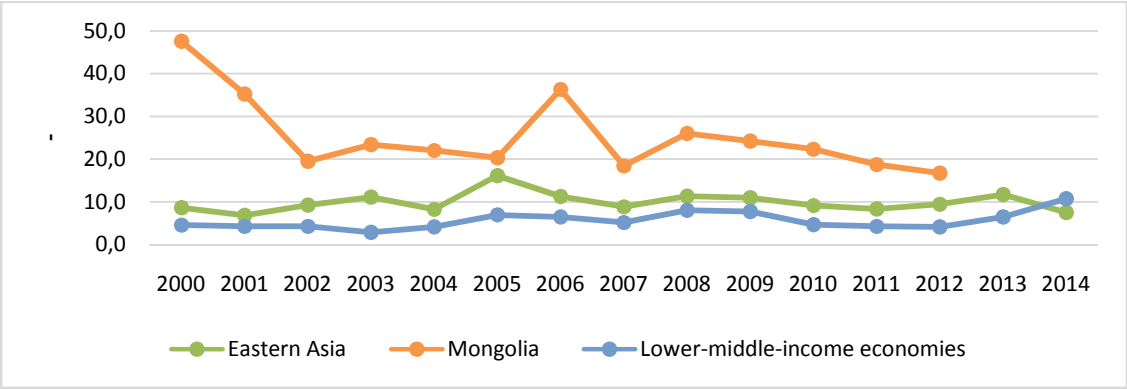


Data Source - FAOSTAT, 2014; author's elaboration

The political stability and the absence of violence is expressed through an index that tries to measure if a given government is likely to be destabilized through violence or unconstitutional means and is created from World Wide Governance Indicators. For Mongolia the index is reaching positive value of 0.45. To put the number in perspective the index can vary from negative 2.5 which mean very weak stability to positive 2.5 which means being the most stable. The value of 0.45 for a developing country is a good result, especially taking into consideration that over the past twenty years Mongolia never reached negative values. On the other hand however 0.45 is most recent estimate from 2012 and if we look at the patterns the previous 10 years 0.45 is the lowest score suggesting that Mongolia's political stability has a decreasing trend when it should be reversed.

Domestic Food Price Volatility is computed by FAO and expressed as an index derived from the purchasing power parity as well as general and food consumer price indices. First data are available from 2000 as that is when the index was developed and started being used by FAO. Generally the higher the number is the more volatile domestic food prices are. Based on the domestic food price volatility index that is shown in Figure 35 Mongolia is showing slowly decreasing pattern which is a good sign.

Figure 35: Evolution of domestic food price volatility index

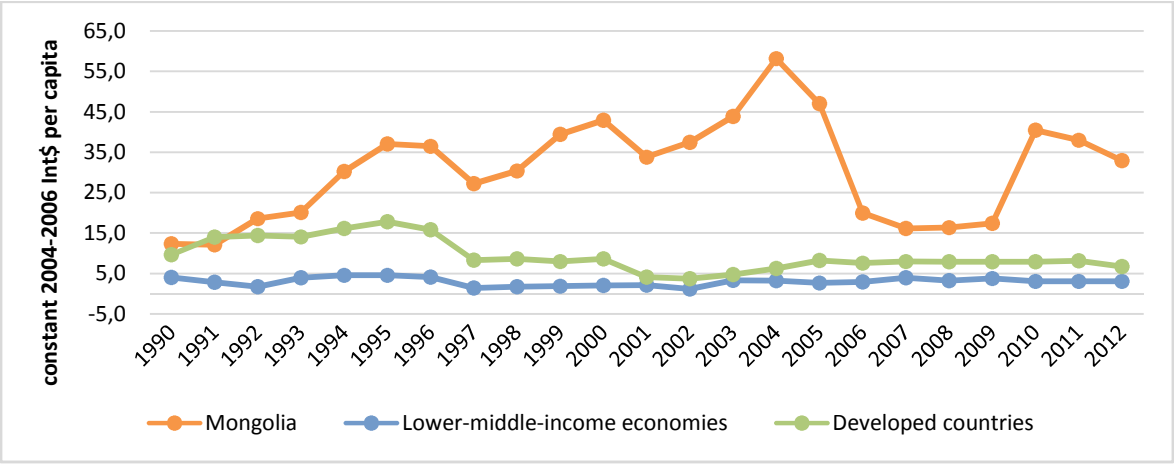


Data Source - FAOSTAT, 2014; author's elaboration

However the latest index from 2012 is 16.7 so despite the index being the lowest in ten years it is still quite high compare to other lower middle income economies and also with comparison with the Eastern Asian regions. Therefore compare to the lower middle income economies as well as the Easter Asian region Mongolia is showing much higher volatility in domestic food prices. Such high volatility can be explained by high dependency ratio and can pose a problem to the food security.

The food production per capita shows quite unbalanced development if we look at the pattern of lower middle income economies we can see there a steady development, however in case of Mongolia the evolution of this indicator is quit unbalanced as shown in Figure 36. Again this indicator only proves how volatile Mongolia is, in years from 2000 through 2002 and again 2008 and 2009 severe winders occurred which most likely contributed to the drop in the food production variability.

Figure 36: Evolution of per capita food production variability

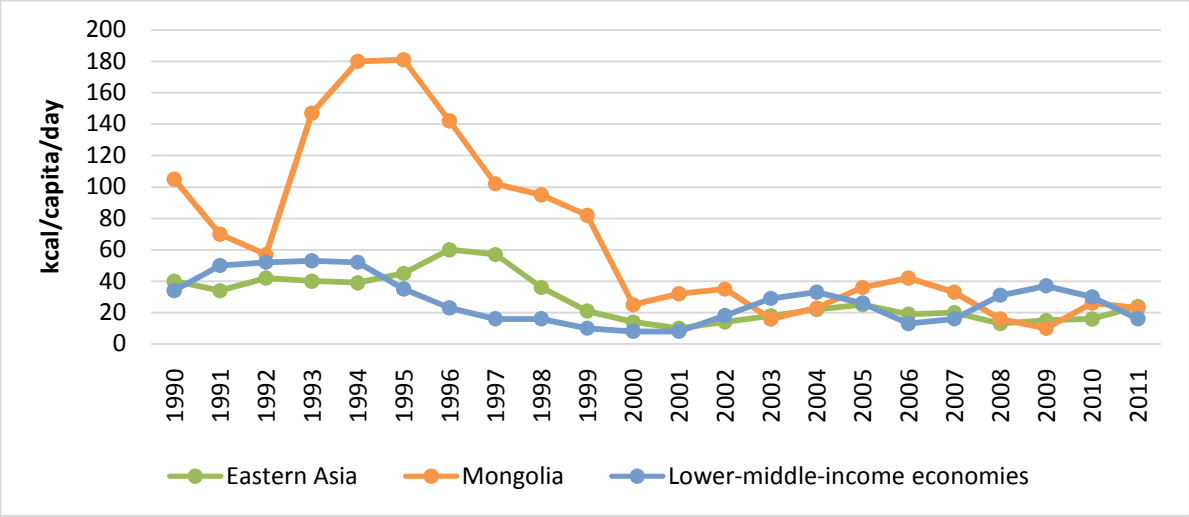


Data Source - FAOSTAT, 2014; author's elaboration

As Mongolia is vast country area wise with a low population number the number food production variability per capita (in 2004-2005 constant international dollars per capita) was 32.9 in 2012.

The food supply variability per capita is expressed through the daily caloric intake per capita and is based on the data from food balance sheet. The development of this particular indicator is unstable during the 1990s however after the year 2000 the spikes stopped and the per capita food supply variablit Figure 37.

Figure 37: The evolution of per capita food supply variability



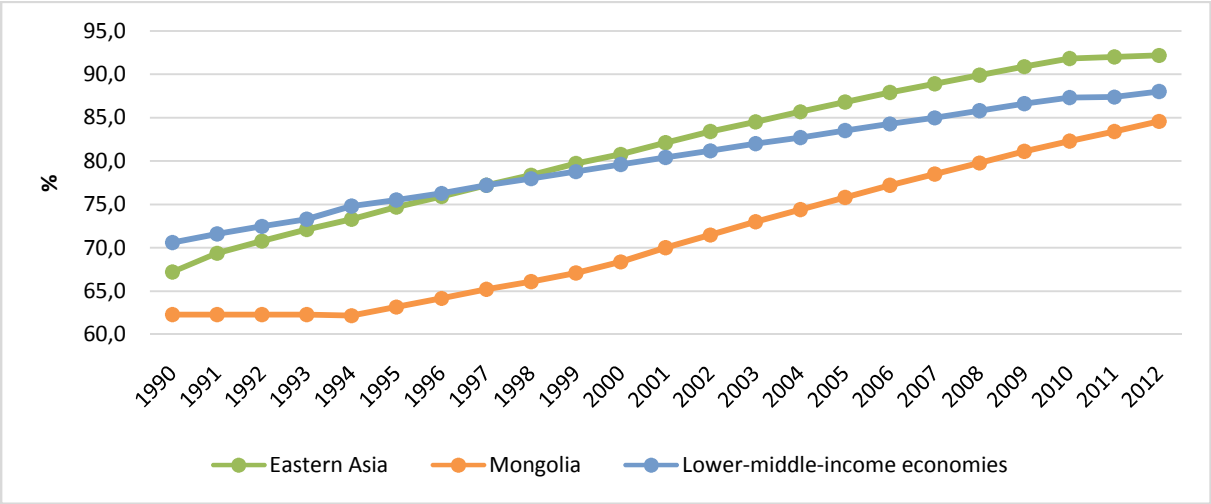
Data Source - FAOSTAT, 2014; author's elaboration

In 2012 the food supply variability per capita was estimated to be 23 kcal per person per day which corresponds also with the Eastern Asia's average which was 24 kcal/day/capita in the same year. However in the mid nineties the food supply variability was extremely high and by far exceeded other countries in the same geographical region.

4.3.3 Utilization dimension of Food Security in Mongolia

Fourth dimension in the food security indicators is the dimension of utilization that comprises from the access to improved water sources and the access to improved sanitation facilities. In both of those aspects Mongolia is showing steady improvements. The other set of indicators is connected with the wasting, stunting and underweight of Children under 5 years of age, the prevalence of anaemia among children and pregnant woman and vitamin A and iodine deficiency.

Figure 38: Percentage of population with access to improved water source

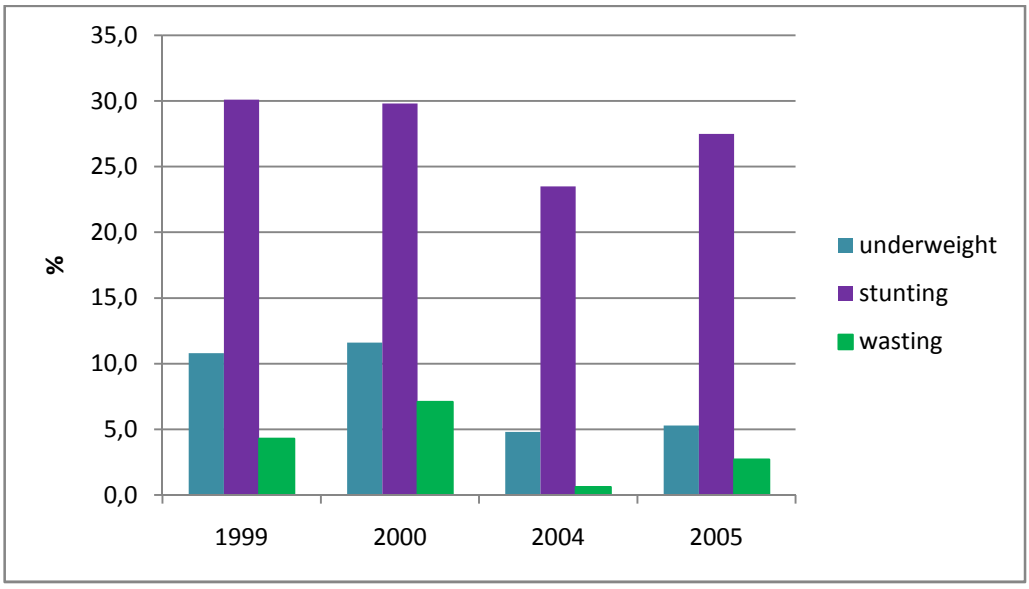


Data Source - FAOSTAT, 2014; author's elaboration

In 2012 almost 85% of the population had the access to improved water resources as Figure 38 shows, which is a significant improvement compared to some 62% twenty years back. If the indicator continuous to grow with the same pattern in some ten years the percentage of population with access to improved water source could reach 100%. As for the accessibility of sanitation facilities – 56.2 percent of country population hast currently (data from 2012) the access to a sanitation facility which is almost the same figure as for the developing countries where on average 57.4 percent of population can access sanitation facility.

The last set of indicators that characterizes the utilization dimension is also part of World Bank's development indicators. Out of three signs of malnutrition among children under the age of five (stunting, wasting, underweight) despite the lack of data by far the most children is affected by stunting as it is illustrated in Figure 39. Most recent available figure is from 2005 and shows that 27% of Mongolian children suffered from stunting (height-for-age).

Figure 39: Percentage of Mongolian children affected by underweight, stunting, wasting



Data Source - FAOSTAT, 2014; author's elaboration

Note: Data available only for year 1999,2000,2004 and 2005

There are various causes of stunting. According to WHO stunting tends to be associated with poor socio-economic conditions, inappropriate feeding practices (poor-nutrition during preconception, breast feeding, poor quality foods, poor hygiene, contaminated food and water) those are just some of the causes of stunting. Furthermore the consequences of stunting can be quite severe – higher mortality rate, lower cognitive, language development are some of the short-term consequences, from the longer point of view can be listed decrease in school performance that goes hand in hand with the learning capacity, decreased work capacity and productivity. (WHO, 2014).

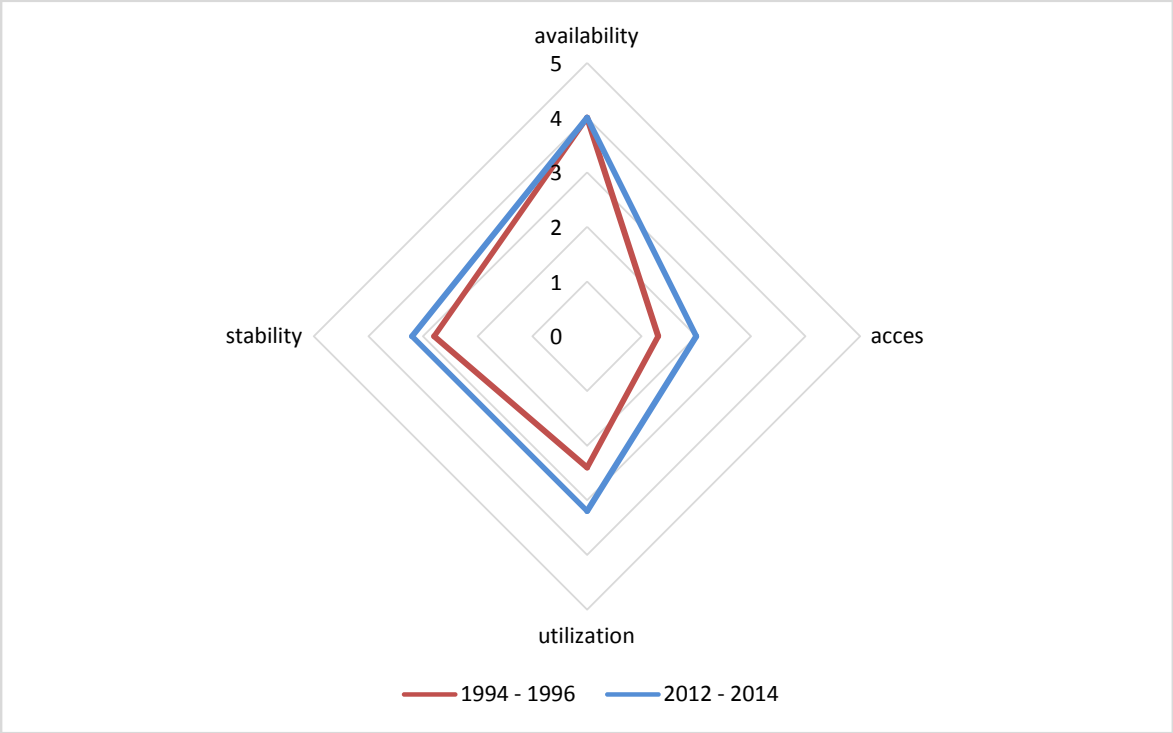
The percentage of underweight adults was in 2005 (most recent available data) almost 5% which is similar share of underweight among adults and children under the age of 5 years. Following indicator is the share of anaemia among pregnant women. According to the 2011 data only 24.9% of pregnant women suffered from anaemia. Even though the number might see as high the WHO considers levels exceeding 40% as severe public health problem and Mongolia has never in the past 20 years reached that level therefore anaemia during pregnancy is not a severe health problem for this country. Similar values as for the prevalence of anaemia among pregnant women was founded among the children less than 5 years of age – some 26% of children were diagnosed with anaemia. Vitamin A deficiency in the nation did not reach high levels either, however it is important to highlight that no records are available for past 10 years – the latest figure is from 2001 and is only 4% but due to the lack of data

prior to 2001 and following it is impossible to see a pattern in the prevalence of Vitamin A deficiency which is worldwide one of the main causes of child blindness. However by looking at the values of the last indicator – iodine deficiency in Mongolia is highly exceeding world's average. According to WHO around 35% of the world's population suffers from iodine deficiency which can among other things causes mental impairment, having iodine deficiency during pregnancy can cause brain damage of the foetus etc. Unfortunately the figures for Mongolia are alarmingly high with the prevalence of iodine deficiency and in 2006 (most recent data) over half of the nation suffered from iodine anaemia – 52.8% of population, which is more than doubled share of what is by WHO considered as public health problem. According to WHO the prevalence of iodine deficiency equal or higher than 20% is classified to be a severe public problem.

4.3.4 Summary of the analysis

As the analysis above showed there is wide set of food security indicator, the chart below is using the four main dimensions to show the progress of Mongolia in past twenty years.

Figure 40: Dimensions of food security - Mongolia

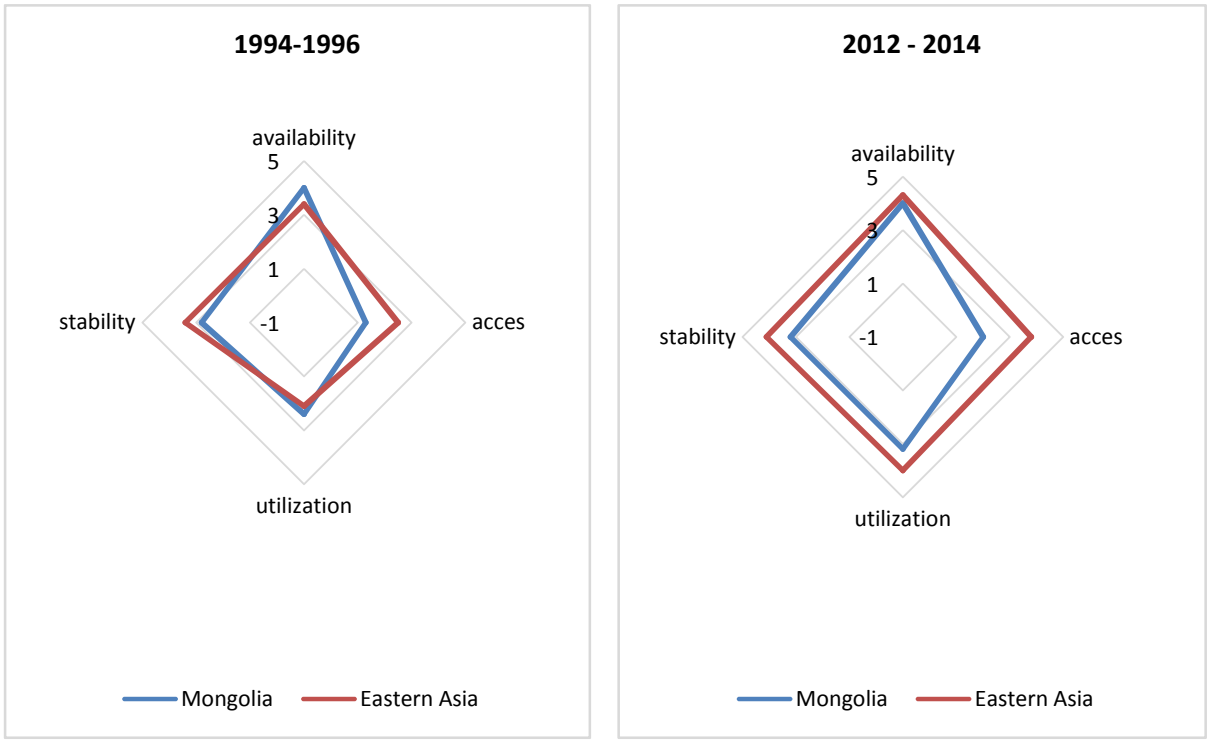


The criterion for the data analysis is the area the quadrangle, that is created by connecting the availability, stability, utilization and access dimension, occupies. The bigger its area the more food secure country is. By looking at the quadrangle it is evident that the weakest side of the

food security is the accessibility. All the dimensions are scored from 0 to 5, five being the best, so in the ideal case the quadrangle should have all four sides the same and therefore creating regular quadrangle - square. This method of displaying the dimensions of food security was developed by FAO and published in its State of Food Insecurity in the World report form 2014.

By comparing Mongolia with the entire Eastern Asian region it is evident that compare to the regional average Mongolia is currently outperforming in all four dimensions, the biggest gap being in the access dimension followed by stability and utilization. When we compare the current state of food security to the one in 1994 (1996) we can see that in the 1990s the quadrangle of Mongolia and Eastern Asia occupies similar area, again the dimension in which Mongolia was and still is performing the worse is the access. However if we compare the quadrangle for 2012-2014 Eastern Asian region it is evident that Eastern Asian region as a whole underwent a significant change and its food security is officially

Figure 41: Dimensions of food security - Mongolia vs. Eastern Asia



much better both in historical comparison as well as in comparison with Mongolia. What is important to keep in mind when comparing those data is that Eastern Asia includes China so the overall result of Eastern Asia is distort by this fact.

Despite some development Mongolia still has a lot to improve in the accessibility dimension. What is important to realize when looking at the access dimension is, that clearly

the country is trying to attack this dimension and as the scores from 2012-2014 shows it is successful by doing so. On the other hand the dimension in which the country is and as the figure shows it has always been performing the best is the availability of food where it scored 4. However as the availability dimension became without any significant changes from 1994-1996 to 2012-2014 such stagnating evolution is not the best result either.

In the access dimension are the indicators overall showing positive development, however Mongolian government should invest into the infrastructure as the road density is very low. It is true that due to the immense area that the country occupies for the low number of population building a functioning road infrastructure is not an easy task. That is possibly one of the reasons for which the people in rural areas are exposed to the food security problem and the right food is not always accessible for them. Given by the traditional agriculture of herding families dependent on agriculture usually do have a source of food however they are also highly vulnerable to weather conditions. Unfavourable weather conditions can kill a significant part of herds, resulting in lower income for the family, for which it could possibly buy other types of food (fruits and vegetables). Table 10 shows that in the access dimension both Eastern Asia and lower middle income economies are performing better in most of the indicators. By looking at the compared data in the table it is clear that the only indicator, with all the data to be compared, is the GDP per capita, PPP. On the other hand, despite a significant improvement over the past twenty years, the prevalence of undernourishment is still much higher than in the lower middle income economies or the Easter Asia. Such contrast suggest that even thought Mongolia's economy is performing well the impact on the population is not as big as it could be. Moreover obstacles in the food accessibility are not a problem only in rural areas. In the urban areas people are suffering undernourishment as well, even though for them in theory the food is more accessible physically they are lacking the economic power to access it. Moreover as the MDG analysis reveals they are living in air polluted area and often do not have access to networks such as sewage, water etc.

Stability dimension is the second worse right after the access dimension. This result is not very much surprising as the analysis above showed how volatile the country is and how it is vulnerable to any external changes. However some improvements have been made as the share of arable land that can be irrigated has been rising, which helps to increase the wheat production and therefore slowly lowers the cereal import dependency ratio.

The utilization dimension has shown a significant improvement over the twenty years. Access to improved water source has been rising constantly with the most recent data

showing that almost 85% of the population has access to the improved water source. That rise could be partially caused by the urban migration as naturally securing access to the improved water source is easier in Ulaanbaatar than in vast country side. Even though the urban migration may have helped to improve this indicator it brought other problems to the food security.

The food availability dimension had a quite good starting position (in 1992-93) however over the twenty years the development was not that significant. The share of dietary energy supply derived from cereals, roots and tubers; the average protein supply and the average supply of protein of animal origin have very similar value in 2013 and 1993. By looking at the evolution of those indicators all three of them are showing ups and downs over the examined period and in the end the value is very similar to the starting line, therefore the long-term stability is questionable. However overall the availability dimension indicators, despite not very significant improvement, are in comparison with other three dimension much better.

Table 10: Comparison of food security dimension – Mongolia vs. benchmark

	Mongolia				Eastern Asia			Lower middle income		
	1993	**2003**	**2012**	**evolution**	**1993**	**2012**		**1993**	**2012**	
AVAILABILITY										
Average dietary energy supply adequacy	85	94	104		112	124	↘	109	114	↘
Average value of food production	290	235	272		195	341	↘	165	206	↗
Share of dietary energy supply derived from cereals, roots and tubers	47	49	N/D		66	N/D	–	65	N/D	–
Average protein supply	71	74	N/D		73	N/D	–	58	N/D	–
Average supply of protein of animal origin	48	44	N/D		20	N/D	–	12	N/D	–
ACCESS										
Percent of paved roads over total roads	N/D	N/D	N/D		N/D	60.4	↘	49.4	49.8	↘
Road density	2.7	N/D	N/D		N/D	**36.8**	↘	21.9	**N/D**	–
Rail lines density	0.1	0	0.1		0.5	0.6	↘	N/D	ND/	–
Gross domestic product per capita (in purchasing power equivalent)	3331.8	4381.8	6475.4		2520.2	10165.2	↘	2898.3	5230	↗
Domestic food price index	N/D	1.52	1.93		N/D	1.90	↘	N/D	1.77	↘
Prevalence of undernourishment	51.4	34.9	24.5		21.4	11.9	↘	20.8	14.1	↘
Depth of the food deficit	398	281	192		168	96	↘	146	101	↘
Prevalence of food inadequacy	62.8	46.8	35.5		30.7	19.4	↘	29.2	21.9	↗

	1993	2003	2012	evolution	1993	2012		1993	2012	
STABILITY										
Cereal import dependency ratio	22.1	66.4	N/D		8.9	N/D	–	9.9	N/D	–
Percent of arable land equipped for irrigation	6.3	12	13.5		42.3	63.1	↘	27.2	32.6	↘
Value of food imports over total merchandise exports	12	14	0		4	N/D	–	11	N/D	–
Political stability and absence of violence/terrorism	0.00	0.96	0.59		0.00	0.00	↘	0.00	0.00	↘
Domestic food price volatility	0	23.4	22.3		0	9.1	↘	0	4.6	↘
Per capita food production variability	20.1	43.8	40.4		2.2	4	↗	3.9	3.1	↗
Per capita food supply variability	147	16	26		40	16	↗	53	30	↘
UTILIZATION										
Access to improved water sources	62.3	73	82.3		72.1	91.8	↘	73.3	87.3	↗
Access to improved sanitation facilities	47.2	50.8	55.1		32.9	66.2	↘	31.6	46.6	↘
Prevalence of anaemia among pregnant women	31.6	25.1	24.8		N/D	N/D	–	N/D	N/D	–
Prevalence of anaemia among children under 5 years of age	37.9	23.8	25.4		N/D	N/D	–	N/D	N/D	–

↗ Mongolia is performing better than benchmarking region
↘ Mongolia is performing worse than benchmarking region
– lack of data

Data source: FAOSTAT, 2014; author's elaboration

The Table above sums up the food security analysis and in shows the how is Mongolia performing in comparison with the Eastern Asian region and in comparison with the lower middle income countries. When there is an arrow symbol facing upwards it means that Mongolia is performing better than benchmarking region, when there is an arrow symbol facing down Mongolia is performing worse than benchmarking region. The table shows only those indicators that had sufficient data for Mongolia, in case of data lack in benchmarking region the arrow symbol is replace with hyphen, meaning comparison is not possible.

Graphical comparison of Mongolia and the Easter Asian region can be found above so Figure 40 shows the graphic representation of Mongolia in comparison with lower middle income economies. The chart only confirms that Mongolia is showing an improvement as most of the points (representing food security indicators) is placed above the horizontal axe showing positive growth. On the other hand the majority of points can be found in the top left quadrant which means a positive improvement of Mongolia but it also shows that Mongolia is performing worse in comparison with lower middle income economies.

Figure 42: Food security indicators of Mongolia in comparison compared with lower middle income economies

Author's elaboration

4.1 Recommendations and potential solutions to food security in Mongolia

Mongolia is facing multiple problems that are threatening its food security however what needs to be highlighted is that the government is not being blind towards the issue of poverty, undernourishment, food safety etc and takes action and cooperates with international organizations. Most of the indicators above are showing increasing tendency however a lot of them seems to fail to reach its goal over given period of time and take longer to fulfil.

Even though the population of **rural areas** is still declining, one third of the country's population still lives in the countryside. People living in rural areas are traditionally nomads, which mean their livelihood depends on their herds. High dependency on herd makes them vulnerable when dzud occurs and kills the animals it poses an immediate threat on the well being of people. After the 2000 and 2002 dzud, increase in urban migration occurred, when poorer herders lost their herds, only source of living. Even though herders are highly vulnerable group they still tend to be food sufficient. According to the Mongolian Government NFSP rural population consumes on average three times more milk and meat than people in urban areas. That is given by simple accessibility of those products. However the accessibility dimension is also the one that need improvements. From the analysis of the food security arises that the road infrastructure (part of accessibility dimension) is very weak however having a good infrastructure is crucial as it makes more accessible othe the health service or other food products, or in case of emergency aid. That is why the government should invest to road infrastructure that would ease the transportation and even therefore also possible access to other food than the one coming from the herds. That would help diversify the nutrient intake and help to fight vitamin and nutrient deficiencies.

As it has been mentioned several times in this thesis huge thread to food security for rural population are severe weather conditions together with the vast area over which Mongolia is spread over. The fact that most herders are too poor to buy forage for the animals that would help them to prevent from a catastrophic results of possible dzud together with basically no diversification of income and not sufficient food diversification are severe obstacles in the food security. Again by improving roads infrastructure in case of need forage could be easier supplied, more livestock could survive therefore people would not be threatened by poverty which result in the inability to obtain enough nutritious food. The extent to which the rural population is vulnerable was imposed in 2010/2011 dzud when over 22% of the livestock was killed. This enormous loss of livestock occurred despite the fact that

similar situation happened ten years prior to this catastrophe. No simple solution can be offered to prevent this from happening again. One possible solution is to construct better winter shelters for the livestock however the traditional nomadic pastoralist way of life does not secure the same winter pasture every year. Together with the construction of winter shelters an educational program could be carried out so that everyone is aware of how a livestock composition might affect quality of land on which they are dependent as the analysis above showed that the livestock composition underwent significant changes. Those steps should improve the livelihood of herders, decreasing the vulnerability to weather conditions and maybe even in long term stop the degradation of land. If herds would be better protected against winter, people dependent on the livestock would have more security of income, which should lower the level of poverty an increase food security moreover it could further decrease the underweight among children.

The dzud in 2010/2011 only confirmed how vulnerable herders are. Mongolian government asked for international help and FAO implemented three emergency projects to support herders – feed pellets and animal drugs were distributed. However this only shows that Mongolia cannot cope with such crisis on its own. To help securing the herders in case of crisis the Word Bank introduced a program called Index Based Livestock Insurance Program that is being supported by Japan and Swiss Agency for Development and Cooperation. This program basically insures the herders against catastrophic losses of livestock, which should again reduce the vulnerability.

People living in **urban areas** are also threatened by food insecurity however the suggestions above – such as building winter shelter, roads or livestock insurance will not help them that much as urban areas are facing different problems. Ulaanbaatar is by far the biggest urban area in the country naturally there are other bigger cities, however none of the district capitals can compare to the size of Ulaanbaatar where 45% of the entire population of Mongolia lived in 2013. Furthermore in the ten years (from 2003 to 2013) the share of Mongolian population living in Ulaanbaatar rose by 10% from 34.9% in 2003 to those above mentioned 45.1%. There are several obstacles to defeating the poverty and food insecurity in Ulaanbaatar as currently according to the Asian Foundation more than a half of the population of Ulaanbaatar lives in ger[6] areas.

[6] Ger is nowadays used to refer to unplanned settlement surrounding Ulaanbaatar where most of the population migrating from urban areas lives. Traditionally ger in Mongolian means home (round tent like dwelling)

Huge obstacle to the food security and fighting the poverty is the lack of employment opportunities. Most of the poor have some sort of income however their employment is not always an official one. The problem with employing migrants to the city is that most of them are not a qualified workforce and therefore are destined to low paid jobs that are not sufficient as a family income and help to create a sort of vicious circle. In such circle poor rural population seeks better wellbeing in the wealthy city however spending most of their saving (if they had any) during the migration process and then living in poor conditions in a ger with poor access to most of the city facilities (drainage, water, heating, public transport) having low paid job - as they are unqualified workforce. In a way living in urban areas poses bigger threats to food security as urban population cannot rely on the livestock as a last resort of food. For that reason having a stable income is crucial. A network of supplementary education should be created to help improve the skills of the poorest and allow them the get a better paid job that would help to escape the vicious circle of poverty. Generally the access to education is sufficient in the city however that is only for the youngest and does not benefit much to the adults that migrated from the rural areas.

Based on the food security analysis which showed that the food security problem is not being improved as significantly as it could (given high rise of Mongolian GDP) The government should take an action and start supervising the growth of Ulaanbaatar ensuring better living conditions, maybe construct an affordable housing for the poorest, such apartment buildings for the poor should be connected to the city network and allow people to have better living conditions. However more crucial is to have a system that would generate more skilled labour that can find a good employment with secure income as the food price index in Mongolia is quite high the food is very expensive for people and unlike the rural population the citizens of Ulaanbaatar (and other big cities) do not have any other option but to purchase the food.

As the analysis of import and export composition that is earlier chapter showed the economic growth of the country is nowadays driven by the mining activities that are not from the long term perspective sustainable so if no precautions are made it might be harder in the future improve the wellbeing of the Mongolian population.

5 Conclusion

The aim of this work was to analyze the food security problematic in Mongolia from the year 1990. As the empirical evidence together with the food security analysis revealed Mongolia is facing problems in that area. The result of the analysis of food security indicators showed that not only Mongolia is not performing as well as both Eastern Asia and lower middle income countries but also that over the studied period the country did not show any significant improvement. All four dimensions of food security (accessibility, availability, stability and dimension) are below the average of Eastern Asia. Furthermore a lot of used indicators such as: per capita food supply variability, domestic food price volatility or per capita food production variability are despite overall positive result showing very imbalance development full of fluctuation, all that showing vulnerable the country is. Overall as figure 42 shows and table 10 sums up Mongolia is showing an improving tendency. The comparison with lower middle income economies, presented in the table and chart, shows that Mongolia is in the majority of indicator indeed showing worse performance then the benchmark, however the positive discovery is that the majority of indicators is showing positive development.

Moreover even though Mongolia's economy is showing a great improvement as closer analysis of exporting partners revealed the country, over the years, became almost completely dependent on the trade with China which was surely cause by the disintegration of USSR together with the economic boom of China. However such a narrow export is what threatens the development of both, food security and the economy. Furthermore relying on only one strong trading partner, that China unquestionably is as shown in Figure 7, is not from the long term perspective favourable and Mongolia should diversify the portfolio of its trading partners.

A positive finding of the work is that Mongolian government is not being indifferent towards the food security and tries to implement programmes to improve it. For example the wheat production recently improved with the help of National Crop Rehabilitation Programme which helped to improve the food security indicator of cereal dependency ratio. Furthermore the fact that Mongolia is cooperating with International Development Association, FAO or joint the Millennium Development Goals also confirms that the government is trying to attack the problems. There are currently many projects in Mongolia that are trying to attack different dimensions of poverty and food insecurity however it was beyond the capacity of the work to somehow quantify them and compare them.

Unfortunately the analysis showed that the improvement of the food security is quite slow especially when taking into consideration the rapid growth of economy that is being driven by the mining industry therefore the government should invest more into the food security and poverty problems. For example improving the road infrastructure that would easy the access of not only food but also health care, furthermore not sufficient infrastructure is an obstacle when dzud occurs as the emergency aid is harder to distribute.

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