

SPECIAL REPORT

**WFP/ FAO / UNICEF
RAPID FOOD SECURITY ASSESSMENT MISSION
TO THE DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA**

24 MARCH 2011



WORLD FOOD PROGRAMME



FOOD AND AGRICULTURE ORGANIZATION



UNICEF

This report has been prepared by Michael Sheinkman, Arif Husain, Elliot Vhurumuku, Cheng Fang and Andrea Berardo (WFP); Liliana Balbi and Belay Gaga (FAO); and Sawsan Rawas and France Begin (UNICEF) with information from official and other sources. The authors wish to acknowledge valuable contributions from Dageng Liu, Uma Thapa, Abdurrahim Siddiqui, Ruangdech Pongprom, and Rita Bhatia (WFP).

Please contact the undersigned for further information.

*Kenro Oshidari
Regional Director, WFP*

*Liliana Balbi
Senior Economist, GIEWS, FAO*

*Anupama Rao Singh
Regional Director,,
UNICEF*

Fax: 0066-2655-4413

Fax: 0039-06-5705-4495

Fax: 0066-2280-3563

E-mail: kenro.oshidari@wfp.org

E-mail: giews1@fao.org

Email: eapro@unicef.org

*Please note that this Special Report is available on the Internet at the following URL addresses
<http://www.wfp.org/food-security/> and <http://www.fao.org/giews/>*

TABLE OF CONTENTS

	<u>Page</u>
Mission Highlights	4
1. MISSION DETAILS	5
2. MAIN SHOCKS	6
2.1 Heavy rainfall in August/September	6
2.2 Cold and Prolonged Winter in 2010/11	7
2.3 Impact of Shocks on Agricultural Production.....	7
2.4 Foot and Mouth Disease	8
3. OVERALL ECONOMIC SITUATION	10
3.1 Cereal Commercial Import Capacity	10
3.2 DPRK Fuel Consumption and Prices	12
3.3 Trade Balance	13
4. FOOD SUPPLY/DEMAND BALANCE AND FOOD GAP IN 2010/11	14
4.1 Food Transfers from Surplus to Deficit Areas	17
5. HOUSEHOLD FOOD SECURITY AND VULNERABILITY ANALYSIS	18
5.1 Household Food Access	18
5.2 Markets	20
5.3 Household Food Consumption	22
5.4 Strategies for Coping with Food Insecurity	23
6 NUTRITIONAL STATUS	26
7 CURRENT FOOD ASSISTANCE PROGRAMMES	28
8. FOOD ASSISTANCE REQUIREMENTS	29
9. RECOMMENDATIONS:	30
9.1 Food Assistance Requirements and Response Options	30
9.2 Nutrition and Health interventions	33
9.3 Agriculture interventions	34
 Table 1: Monthly Average Temperature in December and January in Last Three Years.....	 7
Table 2: DPRK - Key Economic Indicators, 2003-2009	10
Table 3: DPRK Commercial Cereal Imports 2005/06 to 2010/11	10
Table 4: Bilateral Food Assistance to DPRK (2006-2010).....	11
Table 5: DPRK Average Petroleum Consumption and Expenditures (2005-2010)	12
Table 6: DPRK - Food Balance Sheet, revised - 2010/11 (November/October), '000 MT.....	16
Table 7: PDS Ration levels, by age group, in grams per person per day	19
Table 8: Planned PDS Rations, Consumption and Balance 2010/11	20
Table 9: Food Insecure Population Groups across Provinces	29
Table 10. Cereal Requirements by Province for 5 Months in MT	30
Table 11. Fortified Blended Food Requirements by Province for 5 Months in MT	31
 Figure 1: DPRK-2010 monthly and Long-Term Average Precipitation (mm) in four selected provinces.....	 6
Figure 2: PDS Surplus and Deficit Counties	17
Figure 3: Food Consumption Patterns.	23
Figure 4: Percentage of Households receiving support from Relatives/Friends	24
Figure 5: Percentage of Households Gathering Wild Food	24
Figure 6: DPRK Nutrition Status by Province	26

Mission Highlights

- DPRK has suffered a series of shocks in recent months, leaving the country highly vulnerable to a food crisis. The Public Distribution System (PDS) will run out of food at the beginning of the lean season – May, June, July. This will substantially increase the risk of malnutrition and other diseases, particularly in food deficit counties.
- More than six million vulnerable people are in urgent need of international food assistance, due to a substantial reduction of agricultural production and commercial imports, as well as a decrease or curtailment of bilateral assistance.
- Most vulnerable to food insecurity are: children; pregnant and lactating women; elderly; large families with a high dependency ratio (i.e. few income earners, but many children and elderly dependants); people unable to work because of prolonged or chronic illnesses, particularly those with tuberculosis (TB); and people with disabilities.
- The mission recommends provision of a total of 297,000 MT of cereals and 137,000 MT of fortified blended food to 6,100,000 vulnerable people. First priority is to assist vulnerable people living in the five most food-insecure northern and eastern provinces. Second priority is to assist vulnerable people living in the food deficit counties of the other provinces.
- The PDS currently provides an average of 381 gm of rice and maize, equivalent to only 1314 kcal, which is about one-half the minimum daily energy requirement for DPRK.
- PDS dependants are currently coping with reduced rations by relying on relatives living in rural areas; reducing the number of meals consumed in a day, decreasing the portion size; and increasing utilization of wild vegetables.
- The total 2010/11 staple food production is approximately 4,252,000 MT. This figure is 232,000 MT below that reported by the 2010 CFSAM, mainly due to prolonged cold winter which will reduce the harvest of winter wheat, spring barley, and potato.
- A higher than normal proportion of potato seed in winter storage has been damaged. The Mission estimates that the 2011 spring season production will be 60 percent of planned.
- Production of pickled vegetables (kimchi) has been reduced due to the heavy rains in August and early September. Kimchi comprises an important food component of the diet, particularly in the winter months.
- There is a cereal import requirement of 1,086,000 MT for the 2010/11 marketing year, which is 219,000 MT higher than the 867,000 MT anticipated by the CFSAM 2010.
- The commercial import capacity of DPRK in 2010/11 has been reduced as a result of reductions in export earnings, as well as higher international food and fuel prices. The government currently plans to import 200,000 MT of cereals, a reduction of 125,000 MT from the 325,000 MT that was informed to the CFSAM mission in October 2010. As of end-January, the government had imported only 40,000 MT out of 200,000 MT in their revised plan.
- The reduction of bilateral food assistance in recent years has had a substantial impact on food and nutrition security.
- A package of health and nutrition interventions is needed for mothers and children in order to improve nutrition security.
- Improved water supply and sanitation are needed in all baby homes, orphanages, primary and secondary boarding schools, as well as hospitals, nurseries, primary schools, hospitals, and rural clinics.
- Agricultural interventions are needed to improve food security in the short and medium term, including potato storage and grain drying, as well as measures to address the Foot and Mouth Disease outbreak
- Improved monitoring and reporting will be critical to ensure the effectiveness and efficiency of support provided.

1. MISSION DETAILS

In response to a request from the Government of DPRK for food assistance, WFP, FAO, and UNICEF organized a Rapid Food Security Assessment Mission (RFSA). The assessment commenced in early February with WFP Country Office staff assessing the situation in several counties where WFP operates. Between 14 and 21 February WFP staff assessed five counties where WFP does not currently have operations. From 21 February through 11 March, an interagency UN mission made of WFP, FAO and UNICEF staff visited DPRK to: forecast the 2011 production of winter and spring crops; update the assessment of the cereal import capacity and requirements for the 2010/11 marketing year (November/October) made by the FAO/WFP Crop and Food Security Assessment Mission (CFSAM) in October 2010; and estimate the food assistance needs. UN staff was joined by experts from the US NGOs and donors. Team members represented a wide variety of skills and perspectives on food and nutrition security.

The Mission visited 40 counties in nine (9) of the eleven (11) provinces and municipalities of DPRK, including 20 counties where WFP does not currently have operations. The mission did not conduct field visits in the two municipalities of Pyongyang nor Nampho City. Provinces and Counties visited, include:

Ryongyang:	Paekam, Samjiyon, and Pochon counties.
North Hamgyong:	Musan, Yonsa, Puryong, Kyongsong, Myonggan, and Myongchon counties; Chongjin City.
South Hamgyong:	Jangjin, Sinhung, Riwon, and Hamju counties.
Kangwon:	Anbyon, Pangyo, Pobdong, and Sepo counties; Munchen City; and Wonsan City.
Jagang:	Songwon and Tongsin counties; Huichon City.
North Pyongan:	Hyangsan, Uiju, Unjon, counties; Jongju City and Sinuiju City.
South Pyongan:	Jongju and Pyongsong counties; Tokchon City
North Hwanghae:	Sariwon, Unpha, Jangpung, Kumchon, Koksan, and Sinpyong counties; Kaesong City
South Hwanghae:	Ongjin, Kanryong, Chongdan, and Taetan counties; Haeju City

Counties were selected on the basis of the shocks experienced, including those in mountainous regions and in provinces with high malnutrition rates. The mission was divided into four (4) teams to allow adequate time in each province, given the large geographic area visited during the 14 days in the field.

The Mission visited and interviewed the staff of nurseries, hospital paediatric wards, orphanages, Public Distribution Centres (PDCs), county grain storage facilities, and cooperative farms. The Mission interviewed representatives of Government at various levels, including national, province, county, cooperative farm, and urban Peoples' Neighbourhood Units. One hundred twenty-two (122) households were interviewed in both rural (Ri) and urban (Up and Dong) areas. Due to constraints of time typical of a rapid assessment, the selection of households for interview was not based upon a statistically random sample. While the results can be considered as indicative of conditions found in households within DPRK, they are not statistically representative of the entire population.

The Mission received unprecedented access to state shops, daily markets in Province centres, and 10 day farmer markets in County centres. Mission members also visited a TB sanatorium. The Mission conducted field observations at cooperative-farms, including visits to fields of winter wheat and potato storage facilities. Discussions were held with staff of UN agencies, EU Project Support Units, resident diplomatic missions, NGOs, and Government officials at national, province, and county levels.

The Government provided the Mission with official data, including: crop production, demographic groups, bilateral food assistance, cereal imports, PDS food transfers, PDS ration levels, meteorological records, and other relevant information.

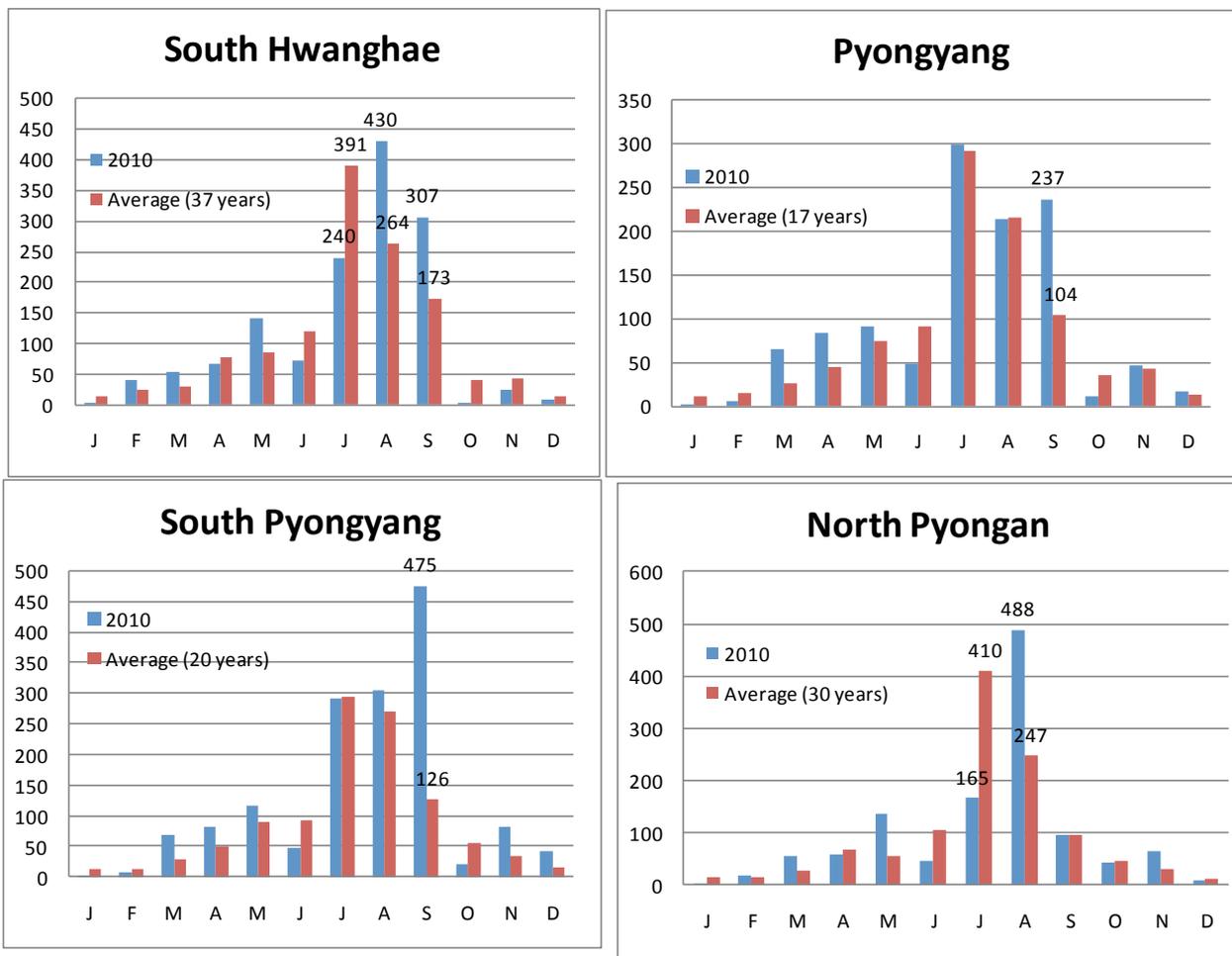
2. MAIN SHOCKS

2.1. Heavy rainfall in August/September

The main season for rice and maize is from May to September. Extremely heavy rains during the last stage of crop development and harvesting had a negative impact on the quality and yield of paddy and maize. For paddy, the milling rate (from paddy to milled rice) was lower than usual due to empty husks and low quality grains. For maize, the moisture content was higher than usual.

Monthly rainfalls in September 2010 were much higher compared to the long-term average in South Hwanghae (78%), Pyongyang (128%), and South Pyongan (277%). In August, rainfall was also higher in South Hwanghae (63%) and North Pyongan (98%). A comparison of monthly rainfall data for 2010 with long-term average in four selected provinces is shown in Figure 1.

Figure 1: DPRK-2010 monthly and Long-Term Average Precipitation (mm) in four selected provinces



2.2. Cold and Prolonged Winter in 2010/11

The winter of 2010/11 was colder and more prolonged than usual. Monthly average temperatures in nearly all provinces during December 2010 - January 2011 were below those of the two previous years. In December 2010, the average temperature was two degrees colder. In January 2011, the difference was greater, with the average temperature in North Pyongan, South Pyongan, and North Hwanghae provinces colder by more than five degrees (Table 1).

Table 1: Monthly Average Temperature (□) in December and January, Last Three Years

Province	December				January			
	2008	2009	2010	Difference between 2010 and 2008	2009	2010	2011	Difference between 2011 and 2009
Pyongyang	-1.8	-3.2	-3.8	-2	-4.7	-4.5	-9.1	-4.4
South Pyongan	-1.9	-3.3	-4.6	-2.7	-4.6	-4.5	-9.6	-5
North Pyongan	-3.8	-6	-5.9	-2.1	-5.1	-6.7	-10.3	-5.2
Jagang	-7.9	-9.2	-10.6	-2.7	-11.4	-12.8	-15.9	-4.5
South Hwanghae	0.5	-1.2	-1.7	-2.2	-2.4	-2.8	0.5	2.9
North Hwanghae	-1.3	-3.1	-3.5	-2.2	-4.6	-4.4	-9.8	-5.2
Kangwon	1	-0.4	-0.8	-1.8	-2.1	-3.9	-5.1	-3
South Hamgyong	-1.4	-1.4	-2.7	-1.3	-3.5	-2.2	-6.6	-3.1
North Hamgyong	-1.8	-3	-3.9	-2.1	-4.3	-3.8	-6.9	-2.6
Rygang	-13.2	-3.2	-13.8	-0.6	-15.5	-10.7	-19.2	-3.7

Source: Government of DPRK

Analysis done by the European Commission's Joint Research Centre (JRC), shows that the temperatures of the period November 2010 – February 2011 compared to the last 15 years average (1989-2007) had strong negative anomalies (up to- 4 degrees) both on average and minimum values in the southern regions of Kangwon, Kaesong, North Hwanghae, South Hwanghae, and Pyongyang. The areas most affected are those along the border with Republic of Korea (ROK). In addition, January 2011 average temperatures were several degrees colder than in 2010, in most parts of the country, particularly in North and South Pyongan.

2.3. Impact of Shocks on Agricultural Production

Winter wheat

Survival of the 2010/11 winter wheat has been negatively affected by a combination of weather events, including: - Unusually wet conditions during September and October resulted in a late planting of winter wheat and also affected germination of the seed; Insufficient snowfall from November to February reducing insulation against cold; and the extremely low temperatures for a prolonged period in December and January (up to 40 consecutive days). This combination of events has reduced the germination of winter wheat seedlings. Mission specialists and national agronomists estimated an average survival rate of 50 percent that is likely to result in a decline of 25 percent in this year's harvest, comparing to a normal year.

Winter wheat is produced in all provinces except Rygang and North Hamgyong. However, the low survival rate of winter wheat during severe winters, especially those of the last two years, has

prompted farmers to place increased emphasis on early potatoes. Winter wheat is harvested in the second half of June.

Potato

The prolonged low temperatures and lack of snowfall resulted in damage to seed potato stored for the 2011 spring and main cropping seasons. This affected potato buried underground, in traditional storage facilities of the co-op farms, as well as those in household storage rooms. A substantial proportion of potato seed in winter storage has been damaged. The Mission estimates that the 2011 spring season production will only be 60 percent of planned.

Greater emphasis has recently been placed on early potato in view of the frequently poor yields of winter wheat. The availability of planting material is the single most important limiting factor to the expansion of the area under potato, as seed must be stored during the winter months. FAO has recently provided some eleven over-wintering stores in major potato-producing areas.

Vegetables

As a result of heavy rains during August and early September, cabbage and radish seedbeds were washed away and had to be replanted several times, negatively affecting the 2010 harvest. Vegetable production was officially reported at 2,325,000 MT in 2010, a reduction of 44 percent from the 4,140,000 MT harvested in 2009 and a 34 percent reduction from the 3,630,000 MT reported for 2008. Annual vegetable production in 2010 is estimated at 95 kg per capita, compared to 170 kg per capita in 2009. The Government calculates that the 2010 vegetable production can meet only 43 percent of the consumption requirements.

In 2010, most of the vegetables produced by Cooperative farms were allocated to the Public Distribution System (PDS), leaving farm households entirely dependent upon their household gardens for home consumption as well as income. The poor 2010 harvest has resulted in a reduced supply of pickled vegetables (kimchi), which comprises an important food component of the diet, particularly in the winter months.

Every co-operative farm allocates a permanent area for vegetable production. Vegetables are grown in spring, summer, autumn, and occasionally in winter, in greenhouses. Among the most common vegetables are cabbage and radish, which are produced in the autumn main crop season. Napa/Chinese cabbage is the principle ingredient of kimchi. It is the country's most important processed food product. Although technically considered a side dish, for the population it is an essential commodity to be consumed at nearly every meal.

2.4. Foot and Mouth Disease (FMD)

On 7 February 2011, FAO received an official communication from DPRK reporting an outbreak of Foot and Mouth Disease (FMD) in the country. Between 28 February 2011 and 8 March 2011, the FAO Crisis Management Centre – Animal Health (CMC-AH) and the World Organization for Animal Health (OIE) fielded a Rapid Deployment Team to undertake an assessment of the FMD outbreak and provide advice on containing the epidemic. The disease was first recognised in December 2010. By that time, a total of 135 farms in 41 cities and counties in 8 provinces were found to be FMD-positive.

The spreading FMD outbreak poses a serious threat to food security in DPRK. The ploughing season is approaching and infected draught cattle will be unable to work the land, putting agricultural production at risk. FMD is also producing a high mortality rate in piglets (80%) and reducing meat and dairy milk production and thus availability.

The response to the FMD outbreak has not been sufficient to confront an FMD epidemic of the scale observed by the Rapid Deployment Team. Technical and financial resources and capacities

at both central and local levels are lacking. To bring the FMD epidemic under control, and to prevent further risks for food security the CMC-AH team recommended the implementation of an emergency action plan, through the following steps: 1) FMD surveillance to locate and map disease clusters; 2) Protecting unaffected farms through movement controls; 3) Improving bio-security measures to prevent further spread of the disease; 4) Adequate sampling in order to correctly identify the virus strain or strains involved; 5) The strategic use of the appropriate vaccines to contain and isolate disease clusters.

3. OVERALL ECONOMIC SITUATION

The economy of DPRK has grown by about 7 percent between 2003 and 2009 (Table 2). Per capita real GDP growth has been literally stagnant given the population growth rate of about 0.6 per annum. Volatility in agricultural production is a major challenge for improving living standards for the population since it is the largest contributor to the national income.

Table 2: DPRK - Key Economic Indicators, 2003-2009

	2003	2004	2005	2006	2007	2008	2009
Real GDP growth (%)	1.8	2.2	3.8	(-1.1)	-2.3	3.7	(-0.9)
Real GDP Index (2002=100)	102	104	108	107	104	108	107
Exports (USD million)	1,066	1,278	1,338	1,467	1,685	2,045	2,000
Growth in exports (%)	--	19.9	4.7	9.6	14.9	21.4	-2.2
Imports (USD million)	2,049	2,279	2,713	2,879	3,083	3,578	3,100
Growth in imports (%)	--	11.2	19.0	6.1	7.1	16.1	-13.4
Trade deficit (USD million)	983	1,001	1,375	1,412	1,398	1,533	1,100

Source: Economist Intelligence Unit, August 2010 Country Report and earlier issues.

3.1. Cereal Commercial Import Capacity

The commercial import capacity of the country has been reduced, due to three main reasons: 1) high international food and fuel prices; 2) reduced export earning due to the political fallout with ROK—previously the largest trading partner; and 3) devaluation of the DPRK currency (KPW) curtailing the ability of the provinces to import.

High international food and fuel prices are likely to negatively impact the commercial import capacity of the country. The CFSAM 2010 had estimated that DPRK could commercially import 325,000 MT of cereals. However, the Government has now revised this target downwards to 200,000 MT of which 40,000 MT has been imported by end January 2011. This revision is in line with the mission estimates based on the analysis of imports during the last five marketing years (Table 3).

Table 3: DPRK Commercial Cereal Imports 2005/06 to 2010/11 (November/October)

Marketing Year	Average Weighted Price	Quantity (MT)	Total Amount (USD)
2005/06	207	130,000	26,904,418
2006/07	207	170,000	35,182,700
2007/08	303	203,508	61,581,280
2008/09	355	175,937	62,440,925
2009/10	417	281,963	117,589,640
2010/11*	455	40,357	18,348,110
Average		192,282	60,739,793

Source: Government of DPRK and Mission Calculations

* Imports until January 2011

Cereal imports over the last five years have consisted of rice, maize, wheat flour and soya-bean. On average about 56 percent of the imports were maize, 33 percent rice, 6 percent wheat flour and

5 percent soya-bean and other cereals. Even though rice is the preferred commodity, priority is given to maize, the cheapest cereal on the international market, despite the fact that international prices in March 2011 averaged 84 percent higher than a year ago.

The role of bilateral assistance, particularly from ROK and People's Republic of China has been significant in ensuring that DPRK has adequate access to critical food and non food commodities. The suspension of assistance from ROK over the last couple of years has had a substantial negative impact on the food security situation of the country. ROK had provided over 400,000 MT of rice in years prior to 2008. Bilateral assistance was reduced by about 70 percent to 116,000 MT in 2008 and then was suspended (Table 4). Other countries, including Russia, Myanmar, Vietnam, and India, have provided cereals or cereal flour to DPRK, but not in sufficient quantities to make up the loss of ROK food assistance. China contributes more than 20,000 MT of soybeans each year, on average, as well as critical non-food assistance, including fuel and agricultural support.

Table 4: Bilateral Food Assistance to DPRK (2006-2010)

Marketing Year	Country	Commodity	Quantity (MT)
2005/06	Republic of Korea	Rice	403,500
	India	Rice	2,000
	China	Soya Bean	33,695
	Total, all countries		439,195
2006/07	Republic of Korea	Rice	400,000
	China	Soya Bean	23,610
	Total, all countries		423,610
2007/08	Republic of Korea	Rice	115,650
	China	Soya Bean	17,450
	Total, all countries		133,100
2008/09	Myanmar	Rice	8,500
	Canada	Soya Bean	200
	China	Soya Bean	22,336
	Total, all countries		31,036
2009/10	China	Rice	690
	Myanmar	Rice	1,500
	Vietnam	Rice	3,000
	Canada	Soya Bean	260
	China	Soya Bean	21,082
	China	Wheat Flour	100
	Russia	Wheat Flour	9,982
	Total, all countries		36,614

Source: Government of DPRK

During the marketing years 2005/06 and 2006/07 cereal availability was very good due to high domestic cereal production and more than 400,000 MT of bilateral food assistance received from ROK. Relatively low international cereal prices allowed the country to import about 130,000 MT in 2005/06 and 170,000 MT in 2006/07.

In 2007, massive flooding devastated domestic cereal production. In addition, bilateral assistance from ROK declined substantially to 116,000 MT in 2007/08. DPRK responded by nearly doubling its expenditures on cereal imports to USD 62 million. However, the quantity imported increased by only 30,000 MT compared to the previous year, due to higher international cereal prices. Assistance from the United States through World Food Programme helped to mitigate some of the negative consequences.

In 2008/09, production improved somewhat, though remained below the 2005/06 levels. US food assistance was suspended and DPRK received no bilateral assistance from ROK. The overall level of bilateral food assistance declined to about 31,000 MT. Furthermore, high food and fuel prices curtailed the ability of DPRK to make up the difference through commercial imports. Almost 176,000 MT of cereals were imported at a cost of about USD 62 million, 28,000 MT less than the previous year.

In 2009/10, the bilateral food assistance which had been provided by ROK and the United States has not been replaced. As a consequence, DPRK expended more than USD 117 million to import 282,000 MT of cereals, nearly double the outlay of the previous year. The relatively low international fuel price during 2009/10 helps to explain how DPRK was able to manage this substantial increase in cereal imports.

3.2. DPRK Fuel Consumption and Prices

Recent increases in international fuel prices have had a significant impact on the commercial import capacity of the country. The total petroleum consumption of DPRK has averaged about 16,000 barrels/day over the last five years. In 2008 the import bill for petroleum products rose to more than USD 500 million, a 34 percent increase from the previous year (Table 5). If the current prices prevail, it is likely that the DPRK import bill for 2011 will be closer to 2008 levels. However, the key difference between 2008 and 2011 may be the strained economic and political relations with ROK and its potential impact on trade.

Table 5: DPRK Average Petroleum Consumption and Expenditures (2005-2010)

Year	Avg. China Daqing Spot Price FOB (USD)	Total Petroleum Consumption (Thousand Barrels Per Day)	Total Cost/Year (USD)	Percent Change (year on year)
2005	53	19	357,767,732	
2006	63	14	329,405,454	(-8%)
2007	71	17	433,778,612	32%
2008	97	16	580,407,165	34%
2009	59	16	345,516,862	(-40%)
2010	78	16	457,608,075	32%
2011	99	16	578,620,711	26%

Source: US Energy Information Statistics

3.3. Trade Balance

Formal exports of DPRK are estimated at around USD 2 billion per year. The primary destinations for DPRK exports are ROK (47 percent) and China (40 percent). Exports have included minerals, metallurgical products, manufactures, textiles and agricultural and fishery products. Any tension in the relationship with ROK that results in a reduction of exports is likely to negatively affect the foreign exchange earning capacity of DPRK.

The import bill for DPRK has been more than USD 3 billion over the last couple of years. The primary source of DPRK imports are China (61 percent) and ROK (24 percent). Imports have included: petroleum, coking coal, machinery and equipment, textiles and food commodities, including cereals.

The trade deficit of the country went from a low of USD 983 million in 2003 to an estimated record high of USD 1.53 billion in 2008¹. The main driving factor was high fuel prices. In 2011, the likely scenario will be a significant drop in export earnings, coupled with a rising import bill largely due to higher fuel prices. This is one of the key reasons why DPRK will not be able to import significant quantities of cereals to meet the expected food shortages.

¹ Economist Intelligence Unit (www.eiu.com)

4. FOOD SUPPLY/DEMAND BALANCE AND FOOD GAP IN 2010/11

A revised national food supply/demand balance sheet from November 2010 to October 2011, including potatoes (in cereal equivalent), milled rice, and soybeans, is presented in Table 6. In preparing the balance sheet, the following assumptions were made:

- **Potato seed damage and forecast production reduction** – a substantial proportion of the potato seeds have been damaged and the available seeds will result in a significant reduction in the area planted. Production is forecast to be only 60 percent of the normal level, according to mission specialists and national agronomists.
- **Winter wheat/barley forecast production reduction** – an average 50 percent winter wheat killing, higher than average, is estimated by the mission after the prolonged cold winter coupled with insufficient snowfall. As a result, the output of winter wheat/barley is forecast to be some 25 percent lower than the normal level assumed by the 2010 CFSAM.
- **Post-harvest losses** - estimated at 15 percent for rice and maize; 10 percent for wheat/barley, other cereals, and soybeans; and 4 percent for potato. Lower losses for potato crop have been estimated than the CFSAM 2010, because the anticipated reduction in spring production. The level of post-harvest crop loss in DPRK has been a contentious issue in recent years, with estimates ranging from 3 percent to more than 30 percent. Unfortunately, no research has yet been undertaken to clarify the issue.
- **Population** - The Mission estimated the mid-marketing year population for November 2010 to October 2011 as 24,427,000, the same as the CFSAM 2010. The total national population was 24,052,231 in October 2008, according to the Population Census national report.² The Central Bureau of Statistics estimates an annual rate of growth of 0.6 percent.
- **Per capita food consumption** - an annual per capita consumption rate of 174 kg of basic food has been used consisting of 168 kg of cereals (including potato in cereal equivalent and milled rice), plus an additional 6 kg of soybeans, the same as the CFSAM 2010. This level of consumption is equivalent to 1,640 kcal per day per person, on average. Households also consume limited quantities of fish, poultry and meat, sweet potatoes, vegetables, fruits and wild vegetables.
- **Seed requirements** – 219,000 MT in total, the same as the CFSAM 2010. This is based on the seed rates used in DPRK in a normal year and the intended area to be sown in 2010/11.
 - Rice: 97.5 kg/ha of rice (or 150 kg of paddy) on 570,000 hectares.
 - Maize: 45 kg/ha on 503,000 hectares.
 - Wheat, barley and other cereals: 200 kg/ha on 103,000 hectares.
 - Potato: 625 kg/ha in cereal equivalent (or 2.5 t/ha fresh weight) on 181,000 hectares.
- **Feed requirement** is estimated at 150,000 MT, the same as the CFSAM 2010. An estimate of 180,000 MT was used in 2008. The reduction is consistent with reports from County and Province level officials that the total number of grain fed animal has been reduced in favour of grass fed animals.
- **Milling ratio** (paddy-to-rice) – 65 percent has been used, the same as the CFSAM 2010. This rate is consistent with the previous CFSAM reports which used a normal/standardized paddy-to-rice milling ratio. Although Government agricultural officials reported lower than usual milling rates due to empty paddy and immature grains caused by the heavy rainfall in September during the final stages of development and harvesting, the normal/standardized paddy-rice

²http://unstats.un.org/unsd/demographic/sources/census/2010_PHC/North_Korea/Final%20national%20census%20report.pdf

milling ratio used for this calculation as the negative impact of the excessive precipitation was already factored in lower paddy yields estimates. Grains other than rice are expressed in whole grain form as they are not converted to milled form prior to consumption.

- **Maize production** – is estimated at 1,683,000 MT, the same as the CFSAM 2010. Consistent with the CFSAM findings, government agricultural officials did report that maize quality was affected by the floods in September and prolonged cloud-cover in August, resulting in higher moisture content in the maize grains after harvest.
- **Soybean production** – is estimated at 154,000 MT, the same as the CFSAM 2010. Soybeans has been included in the food balance sheet for the first time in the 2010 CFSAM report, as soybeans are the principal source of protein in DPRK. Although the calorie content of soybean is about 20 percent higher than that of cereals³, the Mission has not converted soybean production to cereal equivalent since the total quantity of soybean production is very small in the total food grain production in DPRK and because Ministry of Agriculture statistics aggregate soybeans in total grain production.
- **Commercial imports** – is estimated at 200,000 MT of cereal imports. This is based upon official Government statements to the mission. This quantity is consistent with prior years' cereal imports after taking into account the recent increase in international cereal prices. The exact proportion of rice and maize is not yet known, so food consumption and total utilization shown by commodity in the food balance sheet may vary.
- **Ending stock** – a stock build-up equivalent to two week national food requirements has been assumed, the same as the CFSAM 2010. This estimate is based upon the PDS stocks reported by county officials and the limited quantities of grain observed in county warehouses. The existence of strategic stocks was acknowledged by Government officials. The mission requested, but did not receive, information on its current stock levels.

³ Calorie content of soybeans varies from 335 kcal to 470 kcal per 100 g depending on the oil content of the beans.

Table 6: DPRK - Food Balance Sheet, revised - 2010/11 (November/October), '000 MT

	Rice (milled)	Maize	Wheat and barley	Other cereals	Potato (cereal equiv.)	Soybeans	Total	Diff from CFSAM
Domestic availability	1,577	1,683	180	19	414	154	4,252	(-232)
Domestic production	1,577	1,683	180	19	414	154	4,252	(-232)
- Main-season	1,577	1,683		19	158	154	3,591	0
- Winter/spring season			180		256		436	(-231)
- Garden and slope							225	0
Total utilization	1,858	2,680	180	19	414	186	5,338	(-13)
- Food use	1,466	2,253	141	15	230	147	4,250	0
- Feed use	0	75	0	0	55	20	150	0
- Seed requirement	56	23	21	3	113	5	219	0
- Post harvest losses	237	252	18	2	17	15	541	(-13)
- Stock build-up	100	77	0	0	0	0	177	0
Import requirement	281	997	12	0	0	32	1,086	219
Anticipated commercial imports	66	110	12			12	200	(-125)
Uncovered deficit							886	344
Of which, food aid assistance on hand or pledged							44	23

The revised total cereal import requirement in 2010/11 is estimated at 1,086,000 MT, which is 219,000 above the 2010 CFSAM report. The difference reflects the impact of shocks following the CFSAM mission conducted in early October 2010. Based on the expected/estimated commercial import capacity, the uncovered food deficit is estimated at 886,000 MT, equivalent to 21 percent of the national food consumption requirement. This estimate is an increase of 344,000 MT above that of the 2010 CFSAM.

An uncovered deficit of 886,000 MT is equivalent to 3.68 months of PDS rations for the entire nation. If this uncovered deficit can not be filled by commercial imports or food assistance, the national average per capita food consumption (including cereal, potato, and soybean) will have to be reduced from 174 kg/year to 138 kg/year.

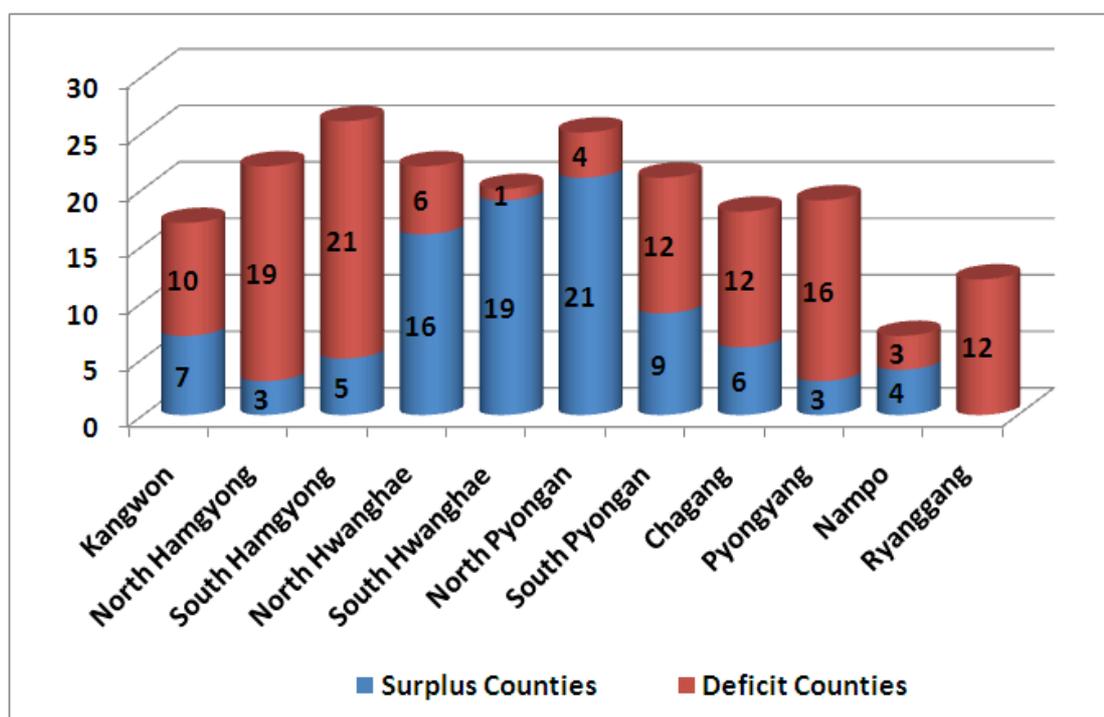
4.1. Food Transfers from Surplus to Deficit Areas

The mandate of the Ministry of Food Administration is to ensure that food is available to the population of all provinces and counties. Fuel and transportation resources are allocated to move cereals from surplus to deficit areas. Food transfers across counties are determined by the central authorities after receiving production data from the counties. They also decide which surplus county/province will provide cereals to which deficit county/province.

For transfers within the same province, counties have the responsibility of collecting cereals allotted to them by the Provincial Peoples' Committee (PPC). However due to transport bottlenecks, transfers between counties within the province and across provinces are frequently delayed, affecting the food availability for PDS dependants. The mission learned that imports of cereals can also be contracted by the PPC, after receiving authorization from central authorities.

The counties that are food deficit are primarily located in the northern and eastern provinces of the country (Figure 2). Other deficit counties are those with large urban populations. However, given the Government redistribution of cereals from surplus to deficit areas, even surplus counties could become deficit.

Figure 2: PDS Surplus and Deficit Counties



5. HOUSEHOLD FOOD SECURITY AND VULNERABILITY ANALYSIS

This section of the report is based on discussions with key Government officials at the national, county and provincial levels, the international community and households. It relies on review of secondary data from recent food security assessments, previous CFSAMs and national data sets. Visits were made to the agricultural cooperatives, public distribution centres, warehouses, kindergarten, orphanages, schools and hospitals. The Mission selected households to be interviewed from both rural (Ri) and urban (Up and Dong) areas.

5.1 Household Food Access

DPRK has a centrally-controlled food distribution system. Food allocation for the entire population of 24 million is determined by the National Peoples' Committee (NPC). The major consumer groups are Cooperative farmer households (30 percent) and PDS dependants (70 percent)

Cooperative Farmers

Following the main harvest, cooperative farmers receive an annual allocation of 219 kg per person per year or 600 grams per person per day. The farmer allocation depends on the age distribution of his/her household and the work norms including number of hours/days worked. Most cooperative farmers also maintain a household garden, ranging from 20 to 30 pyongs (65 to 100 square meters).

Public Administration, defence, and compulsory social security workers

There were 724,178 people (439,586 male and 284,592 female) listed in the major industry group of "public administration, defense, and compulsory social security" as of October 2008, according to the Population Census 2008 National Report. Government authorities informed the mission that this group receives a cereal ration of 700 grams per day. Based upon the Census 2008 figures and the reported ration, the mission estimates that 185,000 MT of food has been allocated in 2010/11 to this industry group, which includes the military.

Mining and Quarrying workers

There were 718,195 people (458,484 male and 259,711 female) listed in the major industry group of "mining and quarrying" as of October 2008, according to the Population Census 2008 National Report. Government authorities informed the mission that this group receives a cereal ration of 700 grams per day. Based upon the Census 2008 figures and the reported ration, the mission estimates that 183,500 MT of food has been allocated in 2010/11 to this industry group.

Construction workers

There were 367,650 people (285,941 male and 81,709 female) listed in the major industry group of "construction" as of October 2008, according to the Population Census 2008 National Report. Government authorities informed the mission that this group receives a cereal ration of 700 grams per day. Based upon the Census 2008 figures and the reported ration, the mission estimates that 94,000 MT of food has been allocated in 2010/11 to this industry group.

The Public Distribution System (PDS), Rations, Stocks, and Food Requirements

After these allocations, the balance of cereals and soya-bean is reserved for the worker households and institutions through the Public Distribution System (PDS). Working and retired population in this group receives a cash income and are allowed to purchase cereals from a Public Distribution Centre (PDC) at subsidized prices, according to the ration level established by central authorities. Each Cooperative Farm operates a PDC providing rations to farm residents considered PDS-dependants, such as managerial and technical staff.

The amount of cereals distributed through the PDS varies with the level of national cereal availability (agricultural production plus cereal imports) in a given year and is carefully planned in September/October at the time of harvest. In theory, the cereal ration for PDS dependants is an average of 573 grams per person per day, amounting to about 209 kg/person per year. In practice, the PDS ration is adjusted from month to month depending on availability and other factors (Table 7). The PDS ration size for 2010/11 was planned at 386 grams per person per day, on average. This represents an increase from 334 grams per person per day in 2008/09 and 376 grams per person per day in 2009/10.

Table 7: PDS Ration levels, by age group, in grams per person per day

Ages (in years)	Normal Ration	1 Step	2 Step	3 Step	4 Step	5 Step	6 Step
< 1	100	67	65	63	62	61	60
1 - 4	200	135	130	128	126	125	120
5 - 6	300	200	195	192	190	185	180
7 - 10	400	270	265	256	253	250	240
11 - 16	500	340	330	320	315	310	300
17 - 59	700	475	460	450	440	435	425
+60'	600	400	395	385	380	375	365
Average, All ages	573	400	390	380	375	370	360

Source: Government of DPRK

From October 2010 to April 2011, the ration sizes have been maintained above the 2009/10 levels. Since December 2010 the average ration size has been 400 grams per person per day. The increase in the ration size in 2010/11 has been explained by the following: 1) the need to meet food requirements during what has been described as one of the coldest winters in 60 years; 2) the drastic reduction in availability of vegetables, which constitute a substantial proportion of the diet; 3) and the belief that the harvest had actually increased by three percent compared to 2009/10.

In principle, all regions receive the same ration across the country. However, the types of staple commodities households receive vary by county and province depending on the main cereal grown/available in the area. In general, the PDS ration consists of rice, maize, barley, wheat, soybeans and potatoes. Rice is the preferred commodity, but not all households receive the same quantity. The rice producing regions receive a higher proportion of rice in their ration than the predominantly maize growing regions. The Mission observed rations consisting of 10 percent to 50 percent rice, with the remaining provided as maize.

In addition to PDS rations, household food security depends on their ability to collect wild food and fish, and access to a household garden. There is a general limitation to these other sources of food, as there are restrictions on movement from county to county. Households located far from the mountains or coastal areas cannot freely access wild food, fish and/or sea weed. Many urban residents do not have access to a household garden or only one of limited size.

The current PDS plan is to maintain average ration levels at the current 400 grams per person per day through April; reduce the ration level to 390 grams per person per day for May and June; further reduce the ration level to 380 grams per person per day for July; further reduce the ration level to 375 grams per person per day for August; and further reduce the ration level to 370 grams per person per day for September. Over the next five months, PDS-dependants will receive an average of 381 grams per person per day of rice and maize. This quantity is equivalent to 1314 kcal, which is 54 percent of the minimum daily energy requirement of 2450 kcal established for DPRK.

Even with a gradual reduction in rations and inputs from early crops, the PDS will require 838,000 MT of cereals to meet requirements from May to September 2011. The amount for each of the coming months will be, approximately: 196,100 MT for May; 189,800 for June; 191,100 MT in July; 188,500 MT in August; and 186,000 MT in September (Table 8). The harvest of winter wheat, spring barley, and early potato (in cereal equivalent) is expected to contribute approximately 100,000 MT to the PDS beginning July 2011, leaving an overall requirement of 838,000 MT.

The PDS stocks will be exhausted by the start of the lean season, May to July (Table 8). This situation is extremely worrisome as 16 million people depend on this system for the bulk of their staple food requirements. Provincial Peoples Committees have already informed households of the need to conserve food stocks, as PDS supplies are dwindling. However, households are not able to cover a gap of this magnitude and duration.

A combination of commercial imports, international food assistance and the early crop of potatoes, wheat and barley are needed to meet the PDS food requirements. Commercial import of the remaining 160,000 MT planned by the Government is needed immediately. In addition, as much as 678,000 MT of bilateral and/or multi-lateral food assistance is needed between now and September.

Table 8: Planned PDS Rations, Consumption and Balance 2010/11

Months	Planned 2010/11		
	Ration Size (grams)	Total Consumption (MT)	Stock Balance (MT)
Oct	360	181,001	1,179,252
Nov	370	186,029	993,224
Dec	400	201,112	792,111
Jan	400	201,112	590,999
Feb	400	181,650	409,350
Mar	400	201,112	208,238
Apr	400	194,625	13,613
May	390	196,084	(- 182,471)
Jun	390	189,759	(- 372,230)
Jul	380	191,056	(- 563,286)
Aug	375	188,543	(- 751,829)
Sep	370	186,029	(- 937,858)

Source: Government of DPRK

5.2. Markets

The mission had unprecedented access to markets in the country. All teams spent a considerable amount of time surveying different markets and their attributes. In DPRK there are three main types of markets where people can buy food and non-food stuff: 1) State Shops; 2) Farmer's Markets; and 3) City Markets.

State Shops

State Shops are open seven days a week to provide families with such essentials like the soya-bean sauce, soya-bean paste, and cooking oil at discounted prices. Each household is assigned to a state shop and, for certain commodities, is entitled to a monthly quota that is set by the Ministry of Commerce. Essential food items include: soya-bean sauce (50 grams /person/day); soya-bean paste (30 grams/person/day); and cooking oil (20 grams/person/day).

Whether households can purchase their full allocation primarily depends on availability. For example, many households reported that soya-bean oil has not been available since early February. Others households informed that meat is only available on special occasions like the New Year or the birthdays of Kim Il Sung (15 April) and Kim Jong Il (16 February).

The Peoples Neighborhood Unit (PNU) announces when new supplies arrive and informs the household's entitlement. Payment is collected from the households and tokens are issued, specifying items and quantities that can be collected from the state shops.

The variety and quantity of food and non-food commodities varies from county to county. Some shops were observed to have other food items for sale, such as wild vegetables, biscuits and salt. The mission observed that State Shops in rural areas have fewer commodities available than those in large urban centres.

The mission also observed non-food commodities in State Shops, including: school supplies, clothes, shoes, blankets, kitchen utensils, ceramics, cigarettes, beer, rice wine, children's toys, and single-band radios.

Farmers Markets

The Farmers' Markets occur every ten days or three times each month. Sellers bring their food and non-food produce to the market where they pay a fee of KPW10 to secure a two meter stall for the day. The sale of cereals is officially prohibited. The mission did not observe any cereals being sold. The main food items observed in these markets were vegetables, potatoes, fruits, eggs, meat, fish, lentils and spices. Non-food items included basic farming equipment, woven baskets, school supplies, clothes, knitted socks and gloves.

Any exchange of cereals between households is privately done through barter trade or households who are PDS dependants get cereals as gifts from relatives and friends in Cooperative farms. The surplus cereal produced by the farmers over and above their grain allocation for home consumption has to be sold to the State Food Procurement Agency.

Some sellers were able to quote terms of barter trade including: two kilograms of maize can be exchanged for one kilogram of rice; one kilogram of fish can be exchanged for one kilogram of rice; one-half kilogram of pork meat can be exchanged for one kilogram of rice; and five eggs can be exchanged for one kilogram of rice. Sellers were hesitant to quote rice and maize prices in KPW other than what is paid through the PDS.

Interestingly sellers only brought commodities in small quantities despite the fact that these markets happen only three times a month. The number of sellers out numbered the buyers but that could be the mission effect as people were wary of foreigners asking questions, particularly outside Pyongyang. The difference in the prices paid in these rural markets compared to Tongil market in Pyongyang was astounding. A bundle of spinach that cost KPW 20 in rural market was being sold for KPW 1000 in Tongil market—50 times more. However, this may not be of concern to ordinary citizens as Tongil caters more to the foreigners and DPRK elite.

City Markets

City markets are held daily in cities and often in the same structures as the farmers markets. Mission members did not observe any cereals for sale in the market. Food items observed were potato, vegetables, pulses, wild vegetables, seafood, fish, eggs, and meat, including rabbit, chicken, and duck. Non-food items included farming tools, baskets, brooms, school supplies, clothing, and other household items. Commodities were available in small quantities speaking to the size of the market. The prices in these markets were competitive and the produce similar to the farmers market.

Exchange Rate

Currently the official exchange rate is about USD1=KPW100 yet the market rate is closer to USD1=KPW3000. In other words, the redenomination of the national currency that occurred in November 2009 is all but neutralized. The effects of this policy on ordinary citizens appear to be mixed where people with over KPW 100,000 lost their savings. The purpose of such a policy was to control inflation by reducing money supply and to curb the growth in private enterprise. Worker salaries remained the same, but prices were reduced significantly.

The PDS prices were revised downwards in the wake of the currency revaluation making it even more affordable, at least in principle. For example, PDS prices of rice declined from KPW 44 to KPW 24 per kg and maize declined from KPW 24 to KPW 14. At these low prices the issue is the lack of commodities in the market, rather than consumers lacking money to purchase them.

An average worker makes around KPW 3,000 to KPW 4,000 per month. This translates into a dollar per month which only works in DPRK because everything is heavily subsidized and ordinary citizens do not rely on direct purchases of imported commodities. If PDS were to run out of cereals at the end April, people would not have the means to purchase cereals on the black market, where prices are KPW2000 per kilogram of rice and about KPW 1000 for maize. It is highly doubtful that the barter system which is the backbone of this informal economy will be able to withstand a shock of this magnitude over more than a couple of weeks. A humanitarian crisis is the likely outcome of such a series of events.

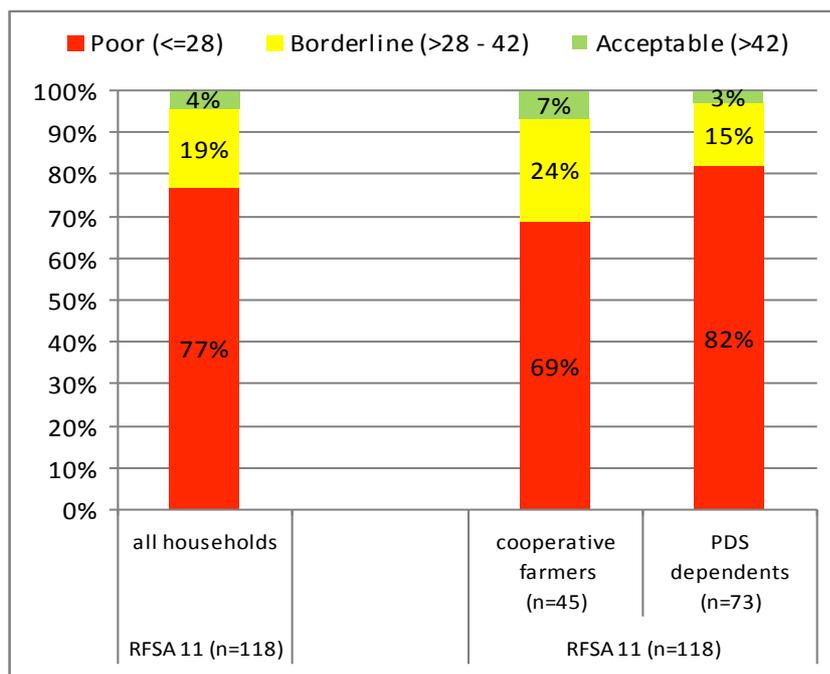
5.3. Household Food Consumption

The mission interviewed one hundred twenty-two (122) households in both rural (Ri) and urban (Up and Dong) areas. Due to constraints of time typical of a rapid assessment, the selection of households for interview was not based upon a statistically random sample. While the results can be considered as indicative of conditions found in households within DPRK, they are not statistically representative of the entire population.

A substantial number of households interviewed survive on a carbohydrate based diet, lacking in diversity, and with exceptionally low protein, fat, and micro-nutrient content. Households were asked to list the foods they consumed in the past 24 hours, as well as the last seven days. For each day, points are tallied for each food item consumed. Points are assigned, as follows: cereals = 2; tubers = 2; pulses = 3; vegetables = 1; fruit = 1; meat or fish = 4; and oils and sugar = 0.5. Only four percent (4%) of households interviewed had an acceptable food consumption score (greater than 42 points). Seventy-seven percent (77%) of households were found to have poor food consumption (less than or equal to 28 points), while the remaining nineteen percent (19%) were considered borderline (greater than 28 and less than or equal to 42). PDS dependants had poorer food consumption patterns than coop-farm households (Figure 3).

While all households reported consuming cereals or tubers and vegetables (including wild plants) on a daily basis in the week before the assessment, households with poor food consumption were able to add only oil to their diet for an average of 2 days per week. Borderline diet included consumption of oil (3 days per week), pulses (1 day per week) or animal-protein rich food (eggs, meat or fish, 2 days per week), and sugar or sweets (1 day per week). The very few households found with acceptable food consumption were able to consume animal-protein rich food more frequently (avg. 3 days per week), some dairy products (1 day per week), sugar or sweets (2 days per week), and oil almost every day (5 days per week).

Figure 3: Food Consumption Patterns.



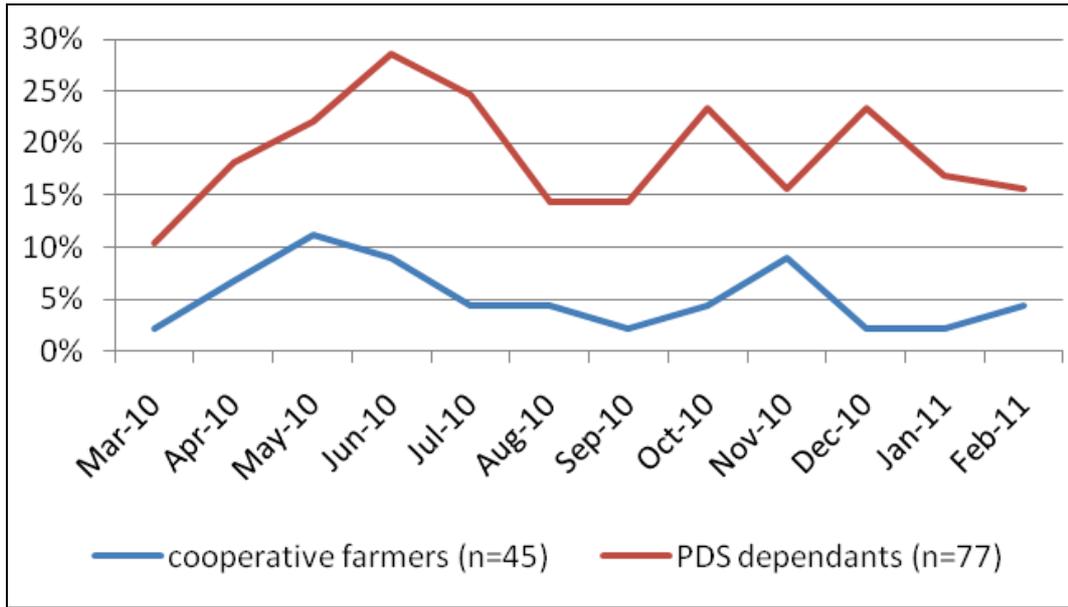
5.4. Strategies for Coping with Food Insecurity

Reduce portion size– Nearly two-thirds of households interviewed reported reducing portion size at mealtime at least once in the week prior to the interview. Nearly one-quarter of households reduced portion size on a daily basis. About 40% of households reported they added more water to increase the volume of the food on a daily basis. 75 % of those interviewed reported engaging in this practice one or more times per week.

Reducing the number of meals - about half of the interviewed households reported skipping one or more meals in the week prior to the interview, in order to cope with the shortage of food.

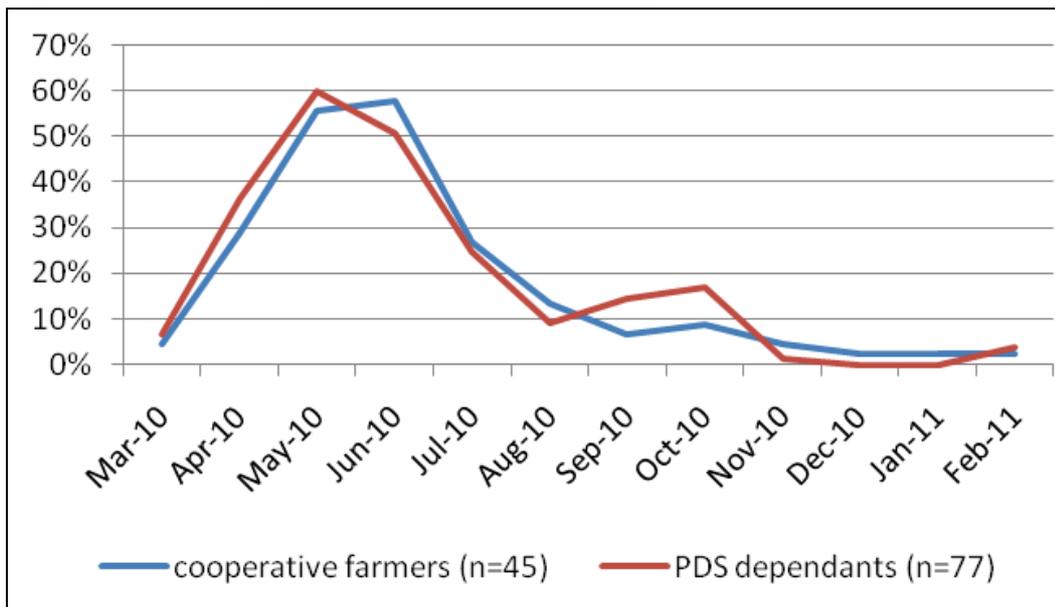
Relying on relatives living in farmer cooperatives – One of the most important safety net for PDS-dependant households is having relatives and friends in the cooperative farms who can provide additional food from their grain allocation or from their household garden and livestock. About 60% of urban households reported receiving such support in the past 12 months. Such support is usually provided twice a year, around May-July and October-December, following the early crop and the main harvest (Figure 4). The mission observed that farmers are less able to assist their relatives at this time, with only 20% of households reported consuming foods from relatives or friends in the week before the assessment.

Figure 4: Percentage of Households receiving support from Relatives/Friends



Wild foods – While consumption of wild foods (edible grasses, acorns, pine nuts, wild berries, mushrooms, bell flower roots, and along the coastal areas, sea weeds etc.) is a common practice in the diet of Korean people, an effort was made during the data collection to distinguish this practice from an unusual gathering and consumption of wild vegetables carried out to cope with shortages of other foods. It was found that the majority of the interviewed households (62%) did gather unusual amount of wild food. Two collection seasons can be identified: spring and autumn. In spring wild vegetables are collected, while wild fruits are collected in autumn. The best season to collect wild food - in terms of the number of items available - is from April to June, when majority of items can be collected (Figure 5).

Figure 5: Percentage of Households Gathering Wild Food



In a few of the visited counties, officials had mobilised people to collect wild vegetables to be distributed to their PDS population through state shops. The mission did observe these wild vegetables in the State Shops. Other county authorities reported only having encouraged people

to collect as much wild vegetables as possible to supplement the lower PDC rations, but that no action was organized at county level. Some factories, institutions and even co-operative farms mobilised their workers or granted them some time off for collecting wild vegetables.

Seaweed collection was organised in several coastal counties. The peak season for seaweed harvest generally goes from June to August. However, authorities in some visited counties reported to have considered anticipating the collection time. This could imply an earlier availability of such food, but an overall lower harvested quantity. Seaweeds are to be distributed to people through state shops.

Availability of wild foods was reported to be good and not changed during past few years. However, the use of wild grasses for consumption as side dishes and alternative food mixed with cereals was reported to have become more regular and common, whereas earlier many items were mainly collected and used as herbal medicine.

6 NUTRITIONAL STATUS

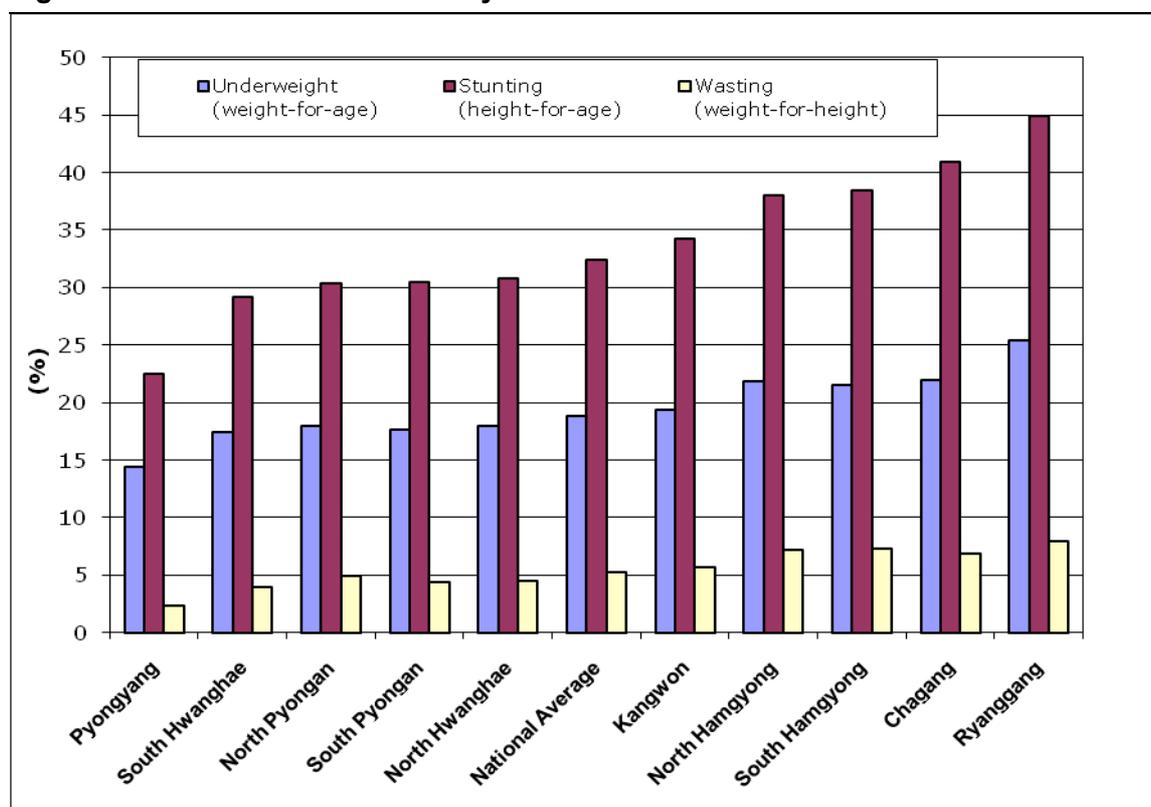
Chronic under-nutrition

There is chronic under-nutrition in DPRK, as in other developing countries in Asia. Although there has been steady improvement over the past few years, maternal and child under-nutrition remains a serious problem. There is a high prevalence of anaemia among women of reproductive age. There are high prevalence rates of stunted (low height-for-age) and under-weight (low weight-for-age) children. The high stunting rates indicate chronic malnutrition, as a result of: inadequate nutrition over a long period of time, limited energy intake, limited dietary diversity, and recurrent or chronic diseases.

Nutrition surveys have been carried out since 1998 by the DPRK government in collaboration with UNICEF and WFP. The last Multiple Indicator Cluster Survey (MICS)⁴, which provides the most updated statistics on the nutrition status of women and children, was carried out in October 2009 by the Central Bureau of Statistics (CBS) with technical and financial support from UNICEF. Results show 32 percent stunting, 18 percent underweight and 5 percent wasting. Chronic under-nutrition, although improved compared to previous data, still remains high and is of particular concern. About one-quarter of women in reproductive age (15-49 year old) are undernourished (as indicated by MUAC less than 225 mm).

There are large regional disparities in stunting among the provinces, ranging from 22 to 45 percent (Figure 6). The highest prevalence of stunting is in the northern and eastern provinces, including: Ryanggang (45 percent), Chagang (41 percent), South Hamgyong (39 percent) North Hamgyong (38 percent), and Kangwon (34 percent).

Figure 6: DPRK Nutrition Status by Province



Source: CFSAM 2010 Report

⁴ http://www.childinfo.org/files/MICS_DPRK_2009.pdf

Current Situation

The nutrition situation, as assessed during the mission, appears to be relatively stable. The mission gathered some nutrition and health information during the field work. Key informant interviews were carried out with nursery and baby home managers; and with health managers and paediatric and maternal ward doctors in hospitals. In both types of institution, visual screening was done on nutritional status of young children.

In the second week of the assessment, the mission was granted the opportunity to conduct mid-upper arm circumference (MUAC) measurements of 272 children under five years of age attending nurseries. Because the sample of children was not randomly selected, the results cannot be interpreted as statistically representative of the entire country. All children are usually measured using weight-for-age in the nurseries and baby homes. Although the two measures of MUAC and weight for age are not comparable, overall, MUAC measurements confirmed the assessments on children's malnutrition status carried out by nursery staff, with only a few cases of under-reporting.

Baby homes support the most disadvantaged vulnerable and orphan children. Skin diseases have been reported at baby homes due to crowded conditions, lack of hygiene, and inadequate water supply. Staff in these institutions requested treatment and prevention for skin diseases.

During hospital visits, health authorities reported increases in low-birth-weight (LBW) babies and attributed this to the compromised nutritional status of pregnant women. It was difficult to confirm this information, as records from birth registries were shared with some of the mission teams only and data were available for a few months only. Health authorities also reported that the only measure taken to improve the quality of diet for the most vulnerable groups of children, pregnant and lactating women is provision of WFP fortified food and UNICEF multi-micro nutrient supplements and micronutrient powder (MNP).

The mission did not receive any reports of disease outbreak from Peoples' committees nor from public health authorities. However, acute respiratory infections (ARI), diarrhoea, and malnutrition cases were reported to be on the rise due to harsh winter conditions. In addition, there were reports of mal-digestion which was attributed to change in diet, with increased consumption of wild plants with high fibre.

Potential Future Scenario

There is increased risk of malnutrition and infectious diseases (including tuberculosis) due to the lean season (May-July), possible reductions in PDS ration, and other public health issues. At risk is the health and nutrition status of children under five and pregnant and lactating women. A substantial number of households currently subsist on a carbohydrate-based diet which lacks in diversity and nutrients (protein, fat, vitamins and minerals). Given this current precarious nutrition and food security situation, the likelihood of a deterioration of acute malnutrition (wasting) must be considered high. In this context, children who are now mild to moderately malnourished can rapidly become severely malnourished and decrease their chance of survival or full development potential while pregnant women increase their risk of delivering low birth weight infants.

In addition to supplementary feeding, preventive and curative measures need to be rapidly put in place and should include a minimum package of health and nutrition interventions including: provision of multiple micronutrients for pregnant and lactating women; micronutrient powders (sprinkles) and/or lipid nutrient supplements for children in 6-24 months in nurseries and baby homes to improve the quality of complementary feeding; therapeutic food stocks; and low osmolarity Oral Rehydration Solution (ORS) and zinc tablets for management of diarrhoea. Promotion of healthy family and community-based care practices such as appropriate breast-feeding and complementary feeding practices, hand washing with soap safe water, and sanitation need also to be part of the measures to safeguard the health and nutrition status of the most vulnerable.

7 CURRENT FOOD ASSISTANCE PROGRAMMES

Since July 2010, WFP has implemented a Protracted Relief and Recovery Operation (PRRO) with emphasis on nutritional support for women and children. Eleven factories are supported where WFP imported food assistance is processed into nutritious foods such as corn-milk blend (CMB), corn-soya milk blend (CSM), rice-milk blend (RMB) and biscuits made from fortified maize and wheat flour. These fortified products are distributed to pregnant and lactating women, children and accompanying mothers in paediatric hospitals/wards, orphanage children (baby homes, children centres and boarding schools), and children attending child institutions (nurseries, kindergartens and primary schools).

WFP is presently distributing food assistance in 65 counties/districts in seven (7) provinces (North Hamgyong, South Hamgyong, Kangwon, North Pyongan, South Pyongan, North Hwanghae, and South Hwanghae,).

North Hamgyong:	Kilju, Myonggan, Orang, Kyongsong, Puryong, Myongchon, Kim Chaek City Phohang District, Sunam District, Ranam District, and Chongam District.
South Hamgyong:	Hamju, Yonggwang, Pujon, Jongphyong, Kumya, Hongwon, Pukchong, Tokchong, Riwon, Songchonggang District, Tonghungsan District, Hoesang District, Sapho District, Haean District, Hungnam District, Sinpho City, and Tanchon City
Kangwon:	Chonnae, Anbyon, Kosan, Thongchon, Munchon City, and Wonsan City.
North Pyongan:	Phihyon, Yomju, Tongrim, Unjon, Kujang, Hyangsan, and Sinuiju City.
South Pyongan:	Pukchang, Pyongsong City, Kaechon City,
North Hwanghae:	Pongsan, Sohung, Suan, Yonsan, Sinphyong, Sinkye, Kumchon, Thosan, Jangphung, Songrim City, and Kaesong City.
South Hwanghae:	Jangyon, Samchon, Unryul, Sinchon, Jaerong, Sinwon, Pongchon, Paechon, Yonan, and Haeju City.

In 2010, WFP received only 20 percent of the resources needed to implement its PRRO. As a result of these funding constraints, many vulnerable groups are no longer receiving food assistance. Of those still receiving food, many receive food fewer days each month. Total food assistance distributed in DPRK in 2010 amounted to only 44,318 MT of cereals, a small fraction of what is needed.

In addition to food and nutrition support, WFP had planned to implement Food for Community Development (FFCD) activities to support food insecure/vulnerable households with temporary employment opportunities, particularly during the agricultural lean period. FFCD activities have been suspended due to lack of resources.

UNICEF has severe funding constraints, as well, having received only 30 percent of the resources needed to implement its humanitarian assistance programmes in DPRK. Insufficient funding for nutrition, health, and water and sanitation activities, severely limits its capacity to protect vulnerable populations from malnutrition.

8. FOOD ASSISTANCE REQUIREMENTS

Provinces with higher vulnerability – food deficit and higher prevalence of malnutrition

The northern and eastern provinces of Ryanggang, Chagang, North Hamgyong, South Hamgyong, and Kangwon have the greatest number of food deficit counties. The MICS 2009 results show these provinces also have prevalence rates for underweight children at or above the WHO threshold of twenty percent. Based upon these two established measures of food insecurity, these five (5) provinces should be considered the most vulnerable to food and nutrition security. North Pyongan, South Pyongan, North Hwanghae and South Hwanghae, and Nampo city, each have only a few counties that are food deficit. These five provinces all have underweight prevalence rates below twenty percent. Pyongyang municipality is the most food secure as it has low prevalence of malnutrition and is a major beneficiary of food transfers from surplus counties.

Vulnerable Populations

Certain household members are more vulnerable to food insecurity, including: i) children; ii) pregnant and lactating women (PLW); iii) the elderly living alone; iv) large households with a high dependency ratio; v) People with a prolonged illness; and vi) People with disabilities. People in these demographic categories may not be able to work, collect the wild vegetables and foods in the steep mountains or fish.

There are an estimated 6,100,000 vulnerable people of which 4,029,000 reside in the five most food insecure northern and eastern provinces, where malnutrition rates are highest. An additional 1,971,000 people reside in the four southern and western provinces, where malnutrition rates are lower and fewer counties are food deficit. There are approximately 100,000 other highly vulnerable people in need of food assistance, including: 12,000 children living in orphanages; 52,000 TB patients; 22,000 people with disabilities; and 14,000 patients in paediatric wards (Table 9).

Table 9: Food Insecure Population Groups across Provinces

	Pregnant / Lactating Women	Children Under 5 Years	Children in Kinder-garden (5 to 6 Years)	Children in Primary School, (7 to 10 Years)	Children in Secondary School, (11 to 16 Years)	Elderly over 60 Years	Total Vulnerable Population
All Counties Considered							
Ryanggang	31,000	52,000	23,000	49,000	79,000	100,000	334,000
North Hamgyong	103,000	170,000	69,000	151,000	237,000	315,000	1,045,000
South Hamgyong	135,000	227,000	92,000	199,000	311,000	426,000	1,390,000
Kangwon	66,000	109,000	42,000	95,000	166,000	187,000	665,000
Jagang	56,000	95,000	40,000	83,000	130,000	191,000	595,000
Total 1st Priority	391,000	653,000	266,000	577,000	923,000	1,219,000	4,029,000
Vulnerable Counties Only							
South Pyongan	33,000	54,000	21,000	46,000	73,000	98,000	325,000
North Pyongan	49,000	81,000	34,000	69,000	118,000	159,000	510,000
South Hwanghae	55,000	92,000	40,000	88,000	145,000	193,000	613,000
North Hwanghae	53,000	85,000	34,000	76,000	123,000	152,000	523,000
Total 2nd Priority	190,000	312,000	129,000	279,000	459,000	602,000	1,971,000
Orphanages							12,000
TB patients							52,000
People with Disabilities							22,000
Paediatric Wards							14,000
Total Population	581,000	965,000	395,000	856,000	1,382,000	1,821,000	6,100,000

9. RECOMMENDATIONS:

9.1 Food Assistance Requirements and Response Options

Cereals

The mission recommends provision of a total of 297,000 MT of cereals to 6,100,000 vulnerable people for five months, using the following criteria:

- 195,700 MT of cereals to 4,029,000 vulnerable people in all counties of the five most food insecure provinces, with the highest rates of malnutrition, including: Ryanggang; North Hamgyong; South Hamgyong; Jagang; and Kangwon.
- 95,900 MT of cereals to 1,971,000 vulnerable people in food-deficit counties of the four more food secure provinces of North and South Pyongan, and North and South Hwanghae.
- 5,800 MT of cereals to 100,000 other vulnerable people (Table 10)

For Pregnant and Lactating Women (PLW) and the Elderly, a ration size of 400 grams of cereals per day per person provides just over one-half of the minimum daily dietary energy requirement established for DPRK. For Children 5 to 16 years of age the minimum recommended ration size is 300 grams per person per day. For Children under 5 years, the minimum recommended ration size is 200 grams per person per day.

The cereal requirements by province and by vulnerable group using these ration levels has been listed in Table 10.

Table 10. Cereal Requirements by Province for 5 Months in MT

	Pregnant and Lactating Women	Children Under 5 Years	Children in Kindergarten, (5 to 6 Years)	Children in Primary School, (7 to 10 Years)	Children in Secondary School, (11 to 16 Years)	Elderly over 60 Years	Total Vulnerable Population
Ration Size (grams/person/day)	400	200	300	300	300	400	
1st Priority, All Counties Considered							
Ryanggang	1,860	1,560	1,035	2,205	3,555	6,000	16,215
North Hamgyong	6,180	5,100	3,105	6,795	10,665	18,900	50,745
South Hamgyong	8,100	6,810	4,140	8,955	13,995	25,560	67,560
Kangwon	3,960	3,270	1,890	4,275	7,470	11,220	32,085
Jagang	3,360	2,850	1,800	3,735	5,850	11,460	29,055
Total 1st Priority	23,460	19,590	11,970	25,965	41,535	73,140	195,660
2nd Priority							
South Pyongan	1,980	1,620	945	2,070	3,285	5,880	15,780
North Pyongan	2,940	2,430	1,530	3,105	5,310	9,540	24,855
South Hwanghae	3,300	2,760	1,800	3,960	6,525	11,580	29,925
North Hwanghae	3,180	2,550	1,530	3,420	5,535	9,120	25,335
Total 2nd Priority	11,400	9,360	5,805	12,555	20,655	36,120	95,895
Orphanages							540
TB patients							3,120
People with Disabilities							1,320
Paediatric Wards							840
Total Cereals	34,860	28,950	17,775	38,520	62,190	109,260	297,375

- **Soya-beans** – There is a need to address the lack of protein in the diet. Soya-bean products are the principle source of protein for most of the population. Consideration should be given to substituting soya beans or other pulses for a portion of the cereals. However, distribution of high value commodities through the PDS should be approached with caution and only be undertaken when sufficient monitoring is permitted to assure that designated beneficiaries receive their ration in full.

Fortified Blended Food

The mission recommends provision of a total of 137,000 MT of fortified blended food to 6,100,000 vulnerable people for five months, using the following criteria:

- 90,700 MT of fortified blended food to 4,029,000 vulnerable people in all counties of the five most food insecure provinces, with the highest rates of malnutrition, including: Ryanggang; North Hamgyong; South Hamgyong; Jagang; and Kangwon.
- 44,300 MT of fortified blended food to 1,971,000 vulnerable people in the four more food secure provinces of North and South Pyongan, and North and South Hwanghae.
- 2,300 MT of fortified blended food to 100,000 other vulnerable people (Table 11)

Fortified blended food requirements by province and by vulnerable group are listed in Table 11.

Table 11. Fortified Blended Food Requirements by Province for 5 Months in MT

	Pregnant and Lactating Women	Children Under 5 Years	Children in Kindergarten, (5 to 6 Years)	Children in Primary School, (7 to 10 Years)	Children in Secondary School, (11 to 16 Years)	Elderly over 60 Years	Total Vulnerable Population
Ration Size (grams/person/day)	150	150	150	150	150	150	
1st Priority, All Counties Considered							
Ryanggang	698	1,170	518	1,103	1,778	2,250	7,515
North Hamgyong	2,318	3,825	1,553	3,398	5,333	7,088	23,513
South Hamgyong	3,038	5,108	2,070	4,478	6,998	9,585	31,275
Kangwon	1,485	2,453	945	2,138	3,735	4,208	14,963
Jagang	1,260	2,138	900	1,868	2,925	4,298	13,388
Total Fortified Blended Food (MT)	8,798	14,693	5,985	12,983	20,768	27,428	90,653
2nd Priority							
South Pyongan	743	1,215	473	1,035	1,643	2,205	7,313
North Pyongan	1,103	1,823	765	1,553	2,655	3,578	11,475
South Hwanghae	1,238	2,070	900	1,980	3,263	4,343	13,793
North Hwanghae	1,193	1,913	765	1,710	2,768	3,420	11,768
Total 2nd Priority (MT)	4,275	7,020	2,903	6,278	10,328	13,545	44,348
Orphanages							270
TB patients							1,170
People with Disabilities							495
Paediatric Wards							315
Total (MT)	13,073	21,713	8,888	19,260	31,095	40,973	137,250

Response Options

Different response options should be considered in order to reach those identified as vulnerable to food and nutrition insecurity. The section below describes some response options. For both PDS-dependants and residents of cooperative farms, food assistance can be provided through the Public Distribution Centre (PDC). Each cooperative farm operates a PDC providing rations to those residents who are considered PDS-dependants, such as managerial and technical staff.

- **Pregnant and Lactating Women (PLW)** – To support both maternal and child nutrition all PLW, both PDS-dependants and Cooperative farmer residents, should be provided with macro- and micro-nutrient balanced blended foods throughout the full pregnancy and lactating period (the first 1000 days). Cereals and blended food can be distributed to PLW through their PDC or their cooperative farm's PDC.
- **Children under five years of age** - Due to their special nutritional requirements, children from 6 months to 5 years of age should be provided with macro and micro-nutrient balanced protein-rich blended foods.
 - **Nurseries, kindergartens, and those being cared for at home** – Given the high enrolment rate in the DPRK as reported by Census 2008 and MICS 2009, distribution of food through educational institutions is an effective method to reach children in the selected age categories. However, the mission did interview a larger than expected number of households with children being cared for at home by a relative, usually a grandparent. Children cared for at home by a parent or relative should also be eligible to receive blended food.
- **Children attending primary and secondary school** – Provision of fortified biscuits to primary school children is an effective method of enhancing the protein and micro-nutrient content of their diet. Fortified biscuits can be substituted for all or part of the blended food for primary and secondary school children.
- **Children in institutions** -
 - **Orphanages** – Both cereals and blended food should be provided to children residing in orphanages (baby homes, child centres and boarding schools).
 - **Paediatric wards/hospitals** – Assistance to paediatric wards/hospitals is needed to support children who are ill. These children are in need of extra nutrients to facilitate rapid and full recovery. Assistance is also needed for mothers/caretakers who stay in wards/hospitals to accompany the children.
- **Elderly** - During the assessment, elderly were one of the groups identified as in need of assistance. Cereals and blended food can be distributed to elderly dependants their PDC or their cooperative farm's PDC
- **Large families** - During the assessment, large families were one of the groups identified as in need of assistance. Families with high dependency ratio, i.e. with high number of children and/or elderly compared to working/income earner people, face difficulties in sustaining their food security. Large families can be assisted through providing food to their children and elderly dependants.
- **People with limited/reduced working capacity** – Food assistance is needed for people whose capacity for work has been affected by prolonged or chronic illness or by a physical/mental disability. This category could include, but is not limited to, people suffering a chronic or prolonged illness. People undergoing DOTS treatment for tuberculosis can be identified and reached through their sanatorium or through the outpatient clinics. People with disabilities can be reached through their PDC or the PDC at their cooperative farm.

- **Contingency for Disaster Response** – given the recent history of severe damages from flooding, consideration should be given to establishing a contingency for responding to natural disasters, especially floods.
- **Food for Seed** - Damage to potato due to usual cold winter has been identified as one of the main shocks this year. The feasibility of a food-for-seeds intervention should be explored, with a goal of providing cereals in exchange for potato that can be used as seed.
- **Vouchers for soya bean products** – There is a need to address the lack of protein and edible oil in the diet. Soya-bean products are the principle source of protein for most of the population. State shops are the established mechanism for distributing soya-bean products, including bean-curd, soya-bean paste, and edible oil. The mission recommends exploring the feasibility of using vouchers to facilitate distribution of soya-bean oil and high-protein soya-bean products to vulnerable households and individuals.

9.2 Nutrition and Health interventions

The mission recommends the following nutrition and health interventions in order to improve nutrition security:

- Implement regular screening in nurseries, baby homes, and rural (Ri) clinics to ensure child under-nutrition is identified early, before complications develop. Staff of these institutions should be provided with MUAC tapes and training in their proper use.
- Ensure timely provision of therapeutic foods (RUTF and F-100) for treatment of severe malnutrition in all the hospitals. Expand community-based management of acute malnutrition to 25 vulnerable counties from the current 4 counties.
- Provide safe drinking water, access to soap, hygiene promotion, and health education on benefits of exclusive breastfeeding for children under six months of age; continued breastfeeding until 2 years of age; and appropriate complementary feeding practices in the baby homes and nurseries.
- Expand the project which provides sprinkles supplementation of three (3) repeated doses of sixty (60) sachets each, for children 6 months to 24 months of age in vulnerable counties where WFP will be working. The project is currently operating in fourteen (14) baby homes nationwide and eight (8) UNICEF focus counties. Use of lipid nutrient supplements in these institutions should also be considered.
- Continue provision of multiple micronutrient supplements to pregnant and lactating women nationwide.
- Improve water supply and sanitation in all the baby homes, needy nurseries and selected hospitals and rural (Ri) clinics.
- Provide the low osmolarity Oral Rehydration Solution (ORS) and zinc tablets to county hospitals for the management of diarrhea combined with IEC materials on prevention and management of diarrhea. UNICEF can assist the Department of Public Health to distribute the WHO-UNICEF recommended guidelines on the “Clinical Management of Acute Diarrhoea” to all health facilities.
- Disseminate a clear, concise, complete message on ARI prevention to all service providers, followed by a communication campaign to create awareness on prevention and treatment of ARI among the population.

- The mission recommends that improved water supply and sanitation are provided in all 14 baby homes, 14 orphanages, 14 primary and secondary boarding schools, as well as nurseries, primary schools, hospitals and rural (Ri) clinics. Soap needs to be available for appropriate hygiene practices, which ensure that food and nutrition interventions are effective.
- Increase supervision and monitoring in all counties where nutrition support is provided.

9.3 Agriculture interventions

The CFSAM 2010 mission considered a number of recommendations related to the improvement of agricultural production. This follow-up mission found these recommendations still relevant as it relates to: Improving on storage facilities of seed potato; Assisting in grain drying system; Supporting increased legume crop production; Supporting aquaculture and household gardens; Conducting a study on post-harvest losses at each stage of the supply chain; and Provision of fertilizer, plastic sheeting and high yielding crop and vegetable seeds to increase agriculture production in the country.

- **Address Foot and Mouth Disease outbreak:** An investment of at least USD 1 million is urgently needed for training, supplies, infrastructure, vaccine acquisition and to set up monitoring, reporting and response systems.
- **Improved Storage for Potato Seeds:** High potato seed losses of nearly 25 percent have been incurred yearly, with even larger losses of up to 70 percent reported during the 2010/11 severe and prolonged cold winter. Traditionally, potatoes have been stored from the end of one season to the beginning of the next in underground bunkers, some of which have a capacity of up to 100 MT. In recognition of this very significant production constraint, FAO and other agricultural agencies have focused in recent years on improved storage methods and structures. In a 2008/09 project funded by the Netherlands, FAO, in collaboration with the Ministry of Agriculture and the Academy of Agricultural Sciences, provided eleven cooperative farms in five provinces with improved storage structures. In view of the fact that these have been very successful and greatly appreciated, it is recommended that they and other similar structures of proven utility be replicated in other potato-growing areas, especially the north and eastern provinces where potatoes contribute significantly to food security.
- **Improved Grain Drying Systems:** The high moisture content of cereals at harvest time has been experienced, and contributes to the high post harvest losses in DPRK. In late September 2010, grain was being delivered to the county warehouses with moisture content in excess of 20 percent. Already some of the grain had deteriorated to the extent of not being usable for human consumption and it is likely that, in the absence of drying facilities, more losses could occur. Many of the Cooperative farms rely on air drying with grain laid out on flat surfaces such as roads to dry, and in cribs that have been constructed to allow a flow of air. Investigations should, therefore, be carried out into the economics and sustainability of assisted grain-drying.
- **Increased Legume Production:** The diet of both rural and urban households is low in protein and fat. The follow-up mission observed low quantities of soya bean paste and soya sauce and unavailability of cooking oil in the state shops attributed to a low production of soybeans and other pulses. For this reason, the rapid increase in production (both area and yields) of pulse crops is urgently needed, hence national and international support should be given to increasing production of legumes such as soybeans, peas, chickpeas, other beans and lentils, or facilitate imports in the short run.
- **Increased Aquaculture:** Fish can increase the dietary diversity and protein content of households in DPRK whose diet is mostly carbohydrates. Most Cooperative farms around the country have an ability to produce fish. Farm fish ponds are already reported to yield very well, producing up to 5 t/ha of fish per annum. On some farms, fish are raised in paddy ponds. The

Mission recommends national and international support to increase the area under fish ponds significantly.

- **Improved Household Gardens:** household gardens provide substantial amount of vegetables, pulses and supplement cereals for most of the Cooperative farmers. The produce from these household benefits not only the producers themselves but also finds its way to urban-dwelling relatives. Improvements in productivity could therefore result in increased food security of the population. The mission therefore recommends immediate support in the provision of quality seeds, plastic sheeting, fertilizer, pesticides, and technical training so as to increase agricultural production from the household gardens and Cooperative farms.
- **Quantify Post-Harvest Losses:** Conduct a study to quantify post-harvest losses at each stage of the supply chain.
- **Increased availability of Agricultural Inputs:** Provision of fertilizer, plastic sheeting and high yielding crop and vegetable seeds are needed to increase agriculture production in the country.