S P E C I A L R E P O R T

FAO/WFP CROP AND FOOD SUPPLY ASSESSMENT MISSION TO THE DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

22 November 2004

Mission Highlights

- DPR Korea's food production in 2004/05 is estimated to show a slight increase of about 3 percent over last year's revised harvest, thus continuing the trend of recovery witnessed since 2001.
- Generally favourable weather, relatively pest- and disease-free cropping season, application of fertilizer (although slightly reduced from last year) provided through international assistance, improved irrigation facilities in the main Cereal Bowl region of the country due to completion of the Kechan-Taesong Lake canal funded by the OPEC, were responsible for this year's relatively good harvest.
- Cereal production in 2004/05, including potatoes in cereal equivalent and production from household gardens and sloping lands, is forecast at 4.235 million tonnes (with milled rice or 5.064 million tonnes with paddy), the best harvest over the last ten years.
- Despite the recovery, domestic production still falls well below the minimum food needs and the country will again have to depend on external assistance as its capacity to import commercially remains highly constrained.
- The cereal deficit in 2004/05 marketing year (November/October) is estimated at 897 000 tonnes. With commercial imports estimated at 100 000 tonnes, and anticipated concessional imports at 300 000 tonnes from the Republic of Korea, there remains a cereal deficit of 497 000 tonnes, of which, 170 000 tonnes are either pledged or on hand at the time of the Mission in early October 2004.
- The Public Distribution System (PDS), the main source of staple food for 70 percent of the population, continues to fall far short of its target, and manages to deliver only 50 percent of people's daily minimum energy requirements. Over the recent years, the Government has relaxed its approach towards the informal and semi-formal private sale of produce from private kitchen gardens and other market-oriented activities. However, the ability for low-income families to obtain food from the market is severely restricted due to their deteriorating purchasing power affected by under- or unemployment and sharp rises in food prices in the market.
- A balanced diet is out of reach for all PDS-dependent households but a few. The situation remains particularly precarious for children in kindergartens, nurseries, orphanages and primary schools, pregnant and nursing women, and elderly people. The WFP Country Office and the Mission recommend that assistance to elderly should be expanded. It is also recommended to continue the pilot project to low-income urban PDS-dependent families for another year to gain more insight into the food security situation of these groups before expanding the pilot project.
- The Mission estimates that some 6.44 million vulnerable people would require food assistance of approximately 400 000 tonnes of cereals and additional 100 000 tonnes of non-cereals for the calendar year 2005.
- To deal with this chronic food shortage and structural food deficit, it is recommended that in addition to providing urgently needed food aid, the International Community enter with the Government into a policy dialogue to set an enabling framework to mobilize the economic, financial and other assistance needed to promote sustainable food production and overall food security. In this respect the Mission recommends examination of investment projects on soil fertility improvement (such as the application of lime in vastly acidic soils, organic matter, crop rotations involving leguminous crops, etc.) and enhancement of farm machinery capacity (such as access to tractors, harvesters, threshers, trucks, farm equipment, spare parts, tyres, etc.) to improve productivity and allow further expansion of the country's double-cropped area.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME

WORLD FOOD PROGRAMME, ROME

1. OVERVIEW

An FAO/WFP Crop and Food Supply Assessment Mission visited DPR Korea from 28 September to 9 October to assess the 2004 main-crop harvest, forecast 2005 production of winter and spring crops (wheat, barley and potatoes) and estimate cereal import requirements for the 2004/05 marketing year (November/October), including food-aid needs.

The Mission, which was accompanied by an EU observer, interviewed government and cooperative-farm officials, and observed standing and harvested crops still in the field to assess yields. The Mission also visited schools, nurseries, hospitals, Public Food Distribution Centres, and the homes of rural and urban families. Out of the country's 12 provinces, the FAO members of the Mission visited the eight that generally account for about 90 percent of the nation's cereal and potato production. These provinces include North Pyongan, South Pyongan, North Hwanghae, South Hwanghae, North Hamgyong, South Hamgyong, Ryanggang, and Kangwon. The WFP members of the Mission visited the provinces in the north and north-eastern part of the country (North and South Hamgyong and Ryanggang), where household food insecurity was long assumed to be more acute than in other provinces. Discussions were held with staff of UN agencies, NGOs, resident diplomatic missions, and government officials at the national, provincial and county levels. For its assessment of vegetation and crop growing conditions, the Mission assessed the Spot-4 satellite images, NOAA Climate Prediction Centre charts and data, and FAO Artemis GIEWS dekadal vegetation indices as well as the local rainfall and temperature data.

Year 2004 was unremarkable for crop production. Rainfall was moderate at the beginning of the season and nursery preparation, transplanting and sowing were all timely. Heavy rains arrived in the second half of June and continued into August. These rains had an adverse effect on the winter wheat, which had not yet been harvested when they started, and also depressed potato yields. However, they contributed to the satisfactory growth of the main-season crops. Drier and sunny conditions, facilitating timely harvest, prevailed after mid-August and into October. Crops this year were relatively free of pests and diseases.

Irrigation was adequate throughout the season, the result of better electricity supplies and good rainfall. Construction of the Kechan-Taesong Lake canal funded by the OPEC completed last year improving gravity irrigation facilities in the main Cereal Bowl region of the country. The mechanisation situation, however, showed no improvement, and it appears that the limit of double-cropping, which is highly dependent on tractor power, may have been reached. Fertilizer use was slightly lower than last year.

As a combined effect of the above factors, total production for the year 2004/05 is expected to be slightly higher than that of 2003/04, with paddy showing an increase of about 5.6 percent. Maize production is similar to last year, and main-crop potato production is down more than 9 percent. The excessive wet conditions prevailing early in the season were beneficial for paddy but affected negatively other crops to a varying degree. The national farm total this year is forecast at 4.959 million tonnes (using the figure for paddy rather than milled rice). A further 50 000 tonnes has been added for household garden production and 55 000 tonnes for sloping-land production. This brings the overall national total to 5.064 million tonnes (or 4.235 million tonnes in milled rice terms), an increase of 2.9 percent on last year's revised harvest. It should, however, be noted that the national food-availability estimates for the coming year include forecasts for winter and spring-sown crops which will not be harvested until the second quarter of 2005. The contribution of these crops to the national total is about 10 percent. The production estimate would need to be revised once the harvest outcome of these crops is known.

Despite the good outcome, the 2004 cereal and potato production still remains well below the total consumption and other needs of the country estimated at 5.132 million tonnes (including milled rice) for 2004/05 marketing year (Nov./Oct.). This would result in an import requirement of 897 000 tonnes. Commercial imports are estimated at only 100 000 tonnes due to low import capacity of the country, while concessional imports are estimated at 300 000 tonnes. This leaves a cereal deficit of 497 000 tonnes, of which, 170 000 tonnes are either pledged or on hand already.

Over the past 1-2 years, the WFP Country Office has been able to gather a considerable amount of data on household food security in DPRK and excerpts from its analysis of that data are presented in this report. The Mission relied on this analysis for its assessment, together with its own observations.

Since the introduction of economic policy adjustments implemented in mid-2002, both informal and semi-formal markets have mushroomed dramatically, providing produce from private plots and other goods and services, and thus opportunities to obtain food commodities outside of PDS and State Shops have also increased. On the other hand, food prices in the market have sky rocketed and many urban workers are

suffering a reduction in their already meager household income as a result of the downward trend in industrial productivity. After spending two thirds of their income on food, and adopting a wide range of coping strategies, a large segment of PDS-dependent households are still not able to cover their basic energy requirements, let alone their nutrient requirements.

In earlier years, the considerable shortage in the national availability of cereals due to natural disasters was used as reference point for estimating the need for external food assistance. The continuing national shortage is still a problem and therefore external food aid is in part seen within the context of overall domestic availability. However, given that the lack of access to basic and nutritious food because of declining purchasing power is increasingly becoming the most critical problem for poor households, assistance to the food-insecure population of DPRK should now be determined more by their household food gap than the national food gap in cereal production.

2. OVERALL ECONOMIC SETTING AND AGRICULTURE IN DPR KOREA

2.1 Macroeconomy [1]

The economic recovery that began in 1999 continued for the fifth year in a row with an estimated GDP growth rate of 1.8 percent in 2003 following a growth of 1.2 percent the year before (see table 1). With a steady growth in the economy the country has just reached the per capita income level of US$ 811 achieved in 1997. The population suffered from a decline in per capita income of nearly 30 percent in 1998 compared to the year before. The DPR Korea had experienced a severe economic decline since early 1990s with unfavourable changes in trade with its traditional partners in the former USSR and Eastern Europe combined with major natural disasters affecting agricultural output in 1996, 1997 and 2000.

Total trade deficit increased from a low level of US$ 448 million in 1997 to a record high of US$ 1.02 billion in 2001 with a sharp improvement in 2002 and 2003 million (see Table 1). Trade with the Republic of Korea (ROK) has increased substantially over the years (for example, about US$ 724 million in 2003; not included in Table 1). ROK is now the North's number two overall trade partner (after China) and a top export destination. However, these and other positive developments such as improvement in the nutritional levels of children as outlined in the results of the Nutrition Assessment 2002 are not enough to tackle the chronic food insecurity problems for the general population.

Table 1: DPR Korea – Key Economic Indicators, 1997-2003 1/

	1997	1998	1999	2000	2001	2002	2003
Estimated Gross Domestic Product Growth Rate (% real change)	-6.3	-1.1	6.2	1.3	3.7	1.2	1.8
Agriculture, forestry & fishing : GDP Growth Rate (% real change)	-3.8	4.1	9.2	-1.9	6.8	4.2	1.7
GDP per head (US$)	811	573	714	757	706	762	818
Total Merchandise Exports (US$ m)	1 025	644	597	708	826	735	800
Total Merchandise Imports (US$ m)	1 473	1 170	1 212	1 686	1 847	1 525	1 600
Total Trade Deficit (US$ m)	448	526	615	978	1 021	790	800

1/ Excluding inter-Korea trade.
Source: Bank of Korea, Seoul and Korea Trade-Investment Promotion Agency, Seoul (as cited in the Economists Intelligence Unit, 2004 Country Report).

2.2 Agricultural sector

Agriculture, including forestry and fisheries, contributes about 30 percent of GDP. The performance of this sector has been erratic with negative growth rates in 1997 and in 2000. Over the past several years, natural disasters such as droughts, floods, tidal surges, hail storms, typhoons and extremely cold winters have affected agriculture with varying degree of severity, with consequent adverse impacts on food production. Also the precarious foreign exchange situation has not allowed significant commercial imports of much needed agricultural inputs such as fertilizer, pesticides, plastic sheeting, spare parts for machinery, tyres for tractors and trucks, fuel, etc. Over the years domestic production of fertilizer has declined to a level of about 10 percent of total requirement, increasing reliance on fertilizer donations. Much needed lime application to improve fertility of acidic soils is severely constrained by lack of transport facilities and fuel availability. Yields

[1] Based on EIU; and Bank of Korea, Seoul publications.

of the main crop (paddy) used to be around 7 or 8 tonnes per ha during the 1980s, but now they are about half of that due to lack of agricultural inputs. In order to increase total food production in the country, every possible piece of cultivable land including plots with extremely high slopes in the mountainous areas is being brought under production. However, cultivation of marginal lands has had unintended consequences of soil erosion and further reduction in overall land productivity. The total food gap in the last 10 years has ranged from just under one million tonnes this year to just over two million tonnes in 2000/01. Thus productivity improvement is desperately needed. Double cropping of wheat and barley after rice and maize (cereal after cereal) on already exhausted soils is non-sustainable and has already reached its limits. Introduction of leguminous crops in the crop rotation is vital. It is therefore recommended that comprehensive soil fertility management program including use of fertilizer, lime, farm yard manure, green manuring crops and rotations involving leguminous crops be undertaken.

Mechanization on the farms perhaps represents the biggest challenge and biggest potential in DPRK. Not only the number of tractors is declining but about 50 percent of tractors are non-operational due to shortage of spare parts, tyres and fuel. The obsolete and decaying farm machinery need rehabilitating or systematic replacing. Judging from the area planted in last few years the double cropping seems to have reached its maximum level exacerbated by lack of farm power. Vast improvement in farm machinery capacity, perhaps with the help of joint ventures, may provide solution to eliminating the structural food deficit in the country.

2.3 Economic policy adjustment

In July 2002 the Government announced substantial increases in wages, prices and currency exchange rate from previously highly subsidised or artificially low levels[2]. Agricultural commodities were also affected by this economic policy adjustment. Accordingly, rice and maize prices in the public distribution centres were raised to 46 won and 24 won per kg, respectively, compared to about 0.9 and 0.7 won/kg before July 2002. Farm gate prices after the adjustment are 29 won/kg for paddy (or 42 won for rice) and 20 won/kg for maize. Prices of various inputs such as seed, fertilizer, pesticides, fuel, electricity, etc. went up but generally seem to have resulted in better overall economic incentives to farmers. Cash crops such as tobacco and cotton provide relatively greater profitability than the usual staple crops; however, their cultivation is restricted until the targets for staple cereals are met.

There has been an important market reform since June 2003 as farmers' markets for the first time were officially recognised in the country. In addition to vegetables, potatoes and green maize from kitchen gardens, a variety of consumer goods are sold in these markets. Cooperative farms, however, do not have direct access to these markets to sell their staple food commodities (over and above their grain allocation for home consumption) because these have to be sold to the government procurement agency. Starting last year several consumer markets, where food and non-food items of all sorts are freely marketed, are opened in Pyongyang city. Maize and rice prices in one such market were 270 and 650 won/kg, respectively, on 8 October 2004. If allowed, farmers' markets throughout the country can play an important role in this new incentive-based system. It is recommended that in addition to providing urgently needed food aid, the Government and the International Community enter into a policy dialogue to set an enabling framework to mobilize the economic, financial and other assistance needed to promote sustainable food production and overall food security.

In addition, the DPR Korea has implemented a policy of controlled economic liberalization on a limited scale in three selected special administrative zones in the country. These are Sinuiiju in the north-west bordering China as a free economic area, Mt. Kumgang in the south-east as tourist resort, and Kaesong in the south-west as an industrial zone. Transportation is being improved with re-connection of road and rail links to Seoul in the Republic of Korea. These special administrative zones are expected to generate economic growth. However, presently these are in their infancy and only time will tell what impact they will have, if any, on the economy.

3. FOOD CROP PRODUCTION IN 2003/04 (REVISION)

The figures presented in the report of the FAO/WFP Crop and Food Supply Assessment Mission of 2003 included production forecasts for the winter and spring crops that would be harvested in 2004. These figures were based on planned cropping areas and average yields from the previous five years. The actual production figures for these winter and spring crops, which have now been reported by the Ministry of Agriculture, show a 10.5 percent reduction of approximately 51 000 tonnes from a forecast 482 000 tonnes to 431 000 tonnes (see Appendix A, Table A1). In the CFSAM report of 2003, a double-counting error was

[2] As part of this policy, wages were also increased by about 20 fold depending on the type of work, and the exchange rate was increased from 2.15 won per USD to 151 won per USD.

introduced for Kaesong; an extra 10 000 hectares of paddy were attributed to Kaesong which had already been counted with South Hwanghae. Total annual production for 2003/04, which had been forecast at 4.156 million tonnes (rice as milled rice as opposed to paddy), is therefore revised to 4.079 million tonnes. The revised total production is 4.920 million tonnes including paddy and 50 000 tonnes of cereal production from household gardens and 55 000 tonnes on slopes.

The planned area of 201 000 ha of winter and spring crops for 2003/04 was planted, and with favourable weather conditions in the early months of 2004 it was anticipated that at least average yields would be achieved. However, heavy rains in many parts of the country in the third dekad of June interfered with the harvesting of winter wheat; there was considerable grain loss, with extensive germination on the wet soils of the field and some germination on the head. Production of winter wheat was consequently down by 15 000 tonnes (9 percent) compared to expectations, with South Hwanghae being worst affected. Potatoes, which tend to be harvested slightly later, were also hit by the wet conditions and showed a production 35 000 tonnes (14 percent) below that which had been forecast. The harvest of spring barley, however, was mostly completed before the onset of the heavy rains, and production was close to expectations.

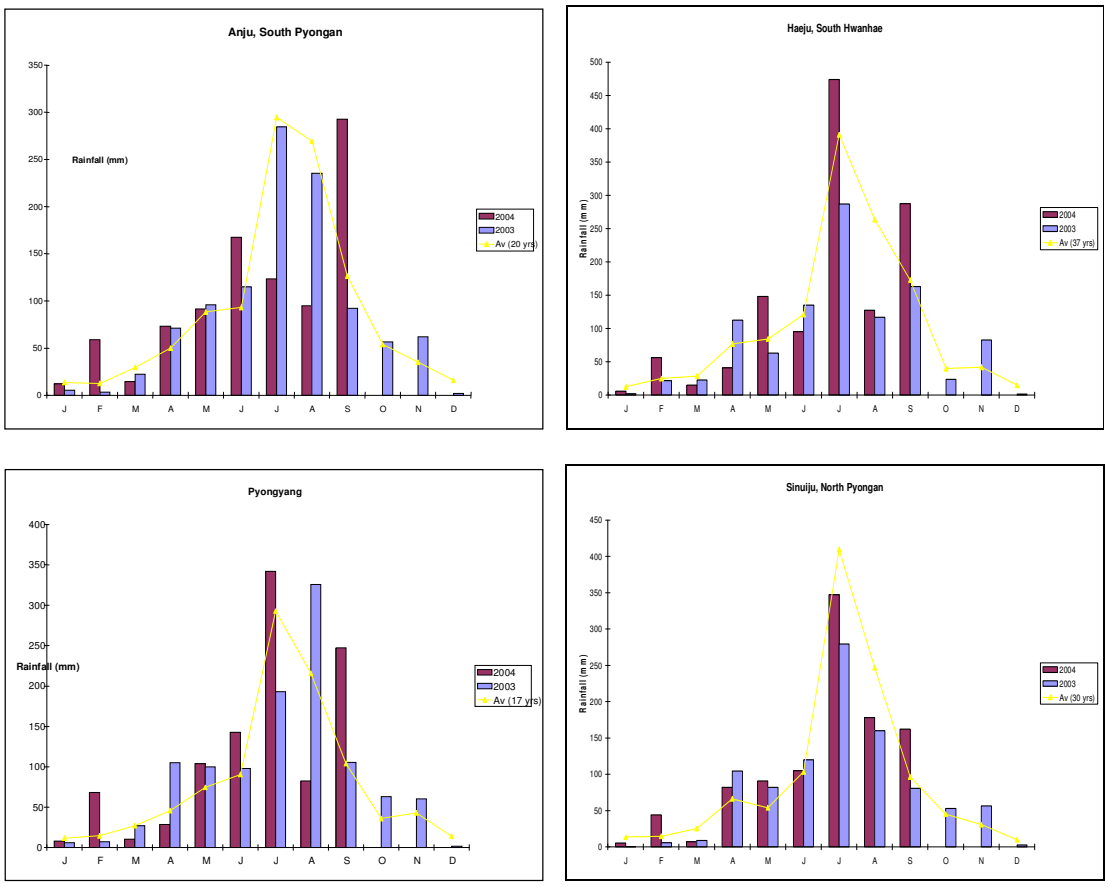
4. FOOD CROP PRODUCTION IN 2004/05

4.1 Climate

The Korean peninsula has a continental climate. Average temperatures in DPR Korea vary from -19°C in winter (Ryanggang in January, the coldest month) to 25°C in summer (South Hwanghae in August, the hottest month). The frost-free period ranges from 160 to 190 days, depending on altitude and latitude, and determines the length of the cropping season and choice of crops. Average annual rainfall varies from 600-980 mm in the north and north-east (Jagang, Ryanggang, North and South Hamgyong Provinces) to 880-1300 mm in the centre, south-west and south-east (North and South Pyongan, Pyongyang, North and South Hwanghae, Kaesong and Kangwon Provinces). About 85 percent of all precipitation occurs during the spring-summer months, while 60 percent is distributed in June-September. Typhoons are a regular occurrence, the effects of which are usually felt at least once per growing season, usually in late summer or early autumn.

Rainfall in 2004 was generally satisfactory over most of the country (see Figure 1). February was slightly wetter than usual, but this was followed by a relatively dry spell in March and most of April. Conditions were then very promising until late June; precipitation was about average, rice nurseries had been established and spring crops planted in a timely manner, and winter wheat was maturing well. Then at the end of June, heavy rains fell, reducing winter-wheat and early-potato yields in many parts of the country. However, damage was largely limited to these two crops, and main-season crops mostly benefited from the continuation of good rainfall till early August. From mid-August, drier weather and clear skies favoured crop maturation and problem-free harvesting.

Figure 1: Monthly rainfall in four provinces of DPR Korea, 2003, 2004 and long-term averages



Although several typhoons passed close to DPR Korea during 2004, the country was fortunate enough to escape any significant damage.

4.2 Area planted

Total land area in DPR Korea amounts to 122 543 sq km, of which the total cultivated land area is estimated at 17-18 percent, or slightly in excess of 2 million hectares. Approximately 1.4 million hectares are considered suitable for cereal cultivation, 300 000 hectares are under vegetable crops, some 160 000 hectares under fruit orchards and a considerable area is allocated to various other food and industrial crops such as mulberry, ginseng and tobacco. There is very limited scope for expanding cultivable areas. The Government has investigated the possibility of reclaiming some 300 000 hectares of tidal lands and another 200 000 hectares by terracing of mountainous areas, but due to the high cost involved, little progress has so far been made. However, the ongoing land re-alignment exercise has increased the paddy production area by about 2 per cent over the last six years.

Paddy

Paddy is now the most important crop of DPR Korea in terms of both area cultivated and production (though milled rice production is second to that of maize). Paddy is grown mainly in the central, south-western and south-eastern parts of the country (the lowland parts of North and South Pyongan, North and South Hwanghae, Pyongyang and Kaesong, collectively known as the "Cereal Bowl") and the narrow east coastal strip comprising parts of Kangwon, and North and South Hamgyong Provinces. Smaller areas are also cultivated in Jagang and Ryanggang Provinces.

Paddy is cultivated in the alluvial plains or on graded terraces equipped with irrigation control systems. Paddy fields vary in shape and size. However, a province-by-province realignment operation has been under

way during the past six seasons in order to improve the layout of paddies. In many of the plains in North and South Pyongan, Pyongyang, Kangwon and South Hwanghae Provinces, smaller plots, generally varying in size between 0.25 and 0.5 hectares, have been transformed and re-aligned into well laid-out regular plots with uniform depth. According to the Ministry of Agriculture, land realignment has so far increased the overall paddy production area by about 60 000 hectares.

In 2004, the area under paddy was reported as 583 390 ha, the same as in 2003[3]. In periods of severe water shortages, the paddy area may be reduced and subsequently planted with soya, or more drought-resistant crops such as sorghum and millet. However, this year, with good rainfall and adequate electricity supply for irrigation pumping stations, the whole area was utilised.

Maize

Maize, which is mainly produced under rainfed conditions, is more universally distributed than paddy. Until 1998, the area under maize amounted to some 630 000 hectares. Since then, however, the government has set lower maize planting targets in order to avoid expansion into lands with low potential. On such marginal lands, less moisture-demanding cereal crops and pulses have substituted maize, while on lands with higher potential, vegetables and main-season potato have entered into the crop rotations. This year's maize area of 495 026 ha was virtually the same as that of last year.

Potato

Potatoes are grown as a spring (double) crop in the Cereal Bowl region, and as a summer crop in the cooler northern highlands (Jagang, Ryanggang), where a shorter growing season is experienced. As a double crop, potato is sown in March-April and harvested in June, while as a main crop it is sown in May-June and harvested in August-September. In response to the reduced productivity of the main cereals in the late 1990s, and in an attempt to boost carbohydrate production, the land under potato was increased in all the major agricultural areas. 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, which can be particularly severe especially in the north of the country. Losses in storage run at a minimum of 10 percent and may be considerably higher. Potato blight regularly affects crops in some areas, as does aphid infestation. The maximum cultivable area of spring and main season crops under present conditions is around 190 000 hectares. The areas under spring and main-season potato this year were 98 180 hectares and 88 988 hectares respectively. An area of 99 150 ha under spring potatoes is planned for 2005.

Winter wheat and spring barley

Winter wheat and spring barley are produced in all provinces except Ryanggang and North Hamgyong. They were the main cereals in the Double-Cropping programme initiated in 1996 jointly by FAO and UNDP as part of the Government framework for agricultural recovery. The programme is considered, under present conditions, to be an effective strategy for enhancing food production. The aim of the programme is to utilise part of the agricultural land between October and June for winter and early cereal and potato crops which are then followed by maize and paddy from June to September. Efforts to increase the use of double-cropping led to an expansion of the double-cropped area under winter wheat, spring barley and spring potato from 38 000 hectares in 1997 to more than 201 000 hectares in 2002/03 (an increase of almost 530 percent). However, no further expansion has been reported this year and it would appear that, with the country's current static or deteriorating mechanisation situation, a limit has been reached. Further increases in the extent of double-cropping will depend on an improvement in the country's capacity to mechanise basic field operations.

Winter wheat is sown from the end of September to mid-October, immediately after the harvesting of the main-season crops. Factors influencing the area under winter wheat include autumn rainfall, timely availability of seed, and the availability of adequate farm power and labour at a time when the demand for labour is high for various other operations, especially the harvesting of paddy. Spring barley is sown in March. Both winter wheat and spring barley are harvested in the second half of June. Areas of 70 080 ha of winter wheat and 31 500 ha of spring barley are planned for 2004/05, compared with achieved areas of 68 575 ha and 34 289 ha respectively in 2003/04. This represents a decline in planned area of more than one percent.

[3] A total paddy area of 593 390 ha was reported last year by the CFSAM. This was an error due to double-counting of 10 000 ha in Kaesong, which had already been included by the Ministry of Agriculture in North Hwanghae province.

Other crops

Other important crops produced in DPR Korea include summer wheat and barley, sorghum, millet, soybean, buckwheat, vegetables (mainly cabbage, spinach, radish, cucumber, eggplant and tomato) and fruit (mainly pears, peaches, apricots, apples and persimmons). Many farms also have sizeable mulberry plantations. The short agricultural growing season limits crop rotations and favours cereal mono-culture.

Summer wheat is grown in the higher-altitude parts of Jagang, Ryanggang, and North and South Hamgyong, where the growing season is relatively short.

At about 60 000 ha, the area under minor cereals and grains such as sorghum, various types of millet and summer wheat and barley is similar to that of last year.

Household gardens

Each cooperative farm household is entitled to a private garden of 30 *pyong*: this equates to about 100 square metres or 0.01 ha. There are approximately 1.67 million such households in the country. In addition, a significant proportion of urban dwellers also have access to garden plots, albeit usually smaller than those cultivated by farm households. In the absence of more reliable quantitative data, it is therefore assumed that the country's total household-garden area amounts to about 25 000 hectares. A typical pattern of cultivation in these gardens is an early crop of potatoes and green maize, followed by vegetables such as cabbage, peppers, radish and garlic. The contribution of kitchen gardens to the total in terms of cereal equivalent is relatively small and their importance is more likely to be in the area of nutrition and household income than in that of bulk. However, crops in kitchen gardens are usually well cared for and yields of maize and potato may be expected to be higher than those achieved in the field. Assuming yields of 4 t/ha for maize and potato on half of the country's kitchen garden area, production from this source would result in an extra 50 000 tonnes. Recognizing the fact there is great deal of uncertainty associated with this figure, for the time being, the Mission considers this a reasonable approximation of production to be added to the total farm production.

Crop production on sloping land

In recent years, crop and food-supply assessment missions have discussed, with government officials, the contribution that cropping on land with a slope in excess of 15 degrees may make to overall national food production. Such cultivation is technically illegal, but the authorities turned a blind eye to it in the late 1990s when domestic food production was especially low and families faced severe hardship. The practice is said to have been diminishing for the last four years, and Government is carrying out a vigorous campaign of reforestation through the Ministry of Lands and Environmental Protection (MoLEP). Nevertheless, slope cultivation is still very evident in many parts of the country. In recognition of this fact, and in anticipation of a gradual phasing-out of the practice, MoLEP has apparently drawn up a register of users, most of whom are said to be from the non-farming population.

There are considerable difficulties in estimating crop production from sloping land in DPR Korea, but the issue is starting to be addressed by a group of interested people from international organisations, known as the Green Table, in discussions with MoLEP. A tentative figure of between 600 000 and one million hectares under sloping-land cultivation has been initially suggested, but this estimate, the equivalent of between 50 and 80 percent of the total area of cultivated flat land, strikes the current mission as being excessive. One of the problems associated with the estimation of sloping-land cultivation is its highly visible nature, which tends to exaggerate its extent. Not only is the contrast between naturally vegetated hillside and cultivated patch very stark, but a slope presents a wider angle of view to an observer on the ground than does a similar area of flat land. Additionally, in terms of productivity (though not of environmental damage), a slope with cultivated patches can present a misleading picture since not all the visible patches may have been productive within the last twelve months. Again with respect to productivity, many factors conspire to suggest very low yield expectations; most sloping-land soils may be assumed to be shallow, of low fertility and subject to severe erosion, and planting material and other inputs to be of poor quality; and since most cultivators are not from agricultural backgrounds, husbandry may be expected to be of a low standard.

Individual estimates, based purely on observation in North Hamgyong and Ryanggang provinces by resident aid workers, suggest that slope cultivation should add about 30 percent and 20 percent respectively to the officially recorded cultivated areas of these provinces. If half of the cultivated sloping land was planted to maize and potatoes, then the area under these two crops in these two provinces would be equivalent to about 12.5 percent of their combined farm land. Since Ryanggang and North Hamgyong almost certainly have a larger proportion of sloping-land to flat-land cultivation than most other provinces, the figure of 12.5

percent should probably be further reduced to about 6 percent if it is to be applied nationally. However, yields (of maize and potatoes) on the slopes are thought to be as low as 25 percent of those achieved on the flat land of the cooperative farms. Applying a yield of 25 percent to an area of 6 percent results in a production figure equivalent to approximately 1.5 percent of the production achieved on farms nationally during the main season. This argument is admittedly based on a number of assumptions, but in the absence of more reliable data, the approximate figure of 1.5 percent, which this year equates to an additional 55 000 tonnes, is used. Establishing a range to connote uncertainty of this number would be even more difficult.

Livestock

Livestock numbers in DPR Korea have remained fairly static over the last 12 months apart from in the area of poultry where significant expansion is evident (see Appendix Table A2). With a slight drop (2 percent) in the number of draught cattle, one would have hoped to see a corresponding increase in the number of operational tractors, but this has not been the case (see 'Farm power' below). Despite an expressed policy of reducing numbers of pigs because they make demands on grain supplies, the pig population has increased marginally. Since most farms visited by the mission reported a reduction in pig numbers, it must be assumed that the national increase reflects increased numbers of pigs in private ownership. Numbers of ducks and geese are reported to have increased by 12 and 27 percent respectively during the past year, again mostly in private ownership.

4.3 Means of production and inputs

Planting material

In DPR Korea, a certain amount of suitable paddy and hybrid maize seed, produced by specialised cooperative or state farms, is provided on credit each year to producer cooperative farms through the Government's distribution system. This year, seed was available on time, and correct sowing dates were observed. However, the opportunity to acquire new seed is limited by finances and availability, and most cooperative farms use a high proportion of home-produced seed.

Paddy is typically planted in nurseries at the beginning of April and transplanted in late May or early June. Seed rates are high at 150 kg/ha, purportedly to compensate for low soil fertility. The availability of plastic sheeting to protect nursery seedlings from low temperatures and desiccating winds was similar to that of last year. Rainfall and temperatures were favourable this year for nurseries and transplanting, the only reported constraint being some localised attacks of water weevil. Varieties are selected to complement the conditions of the soil in which they will be grown. Consequently in recent years varieties of rather lower yield potential have been grown, reflecting the below-optimum fertility status of most soils and the possibility that they may have to contend with adverse soil-moisture conditions during the growing season.

Hybrid maize is planted at between 40 and 50 kg/ha, giving a plant population of 35 000 - 50 000 per hectare.

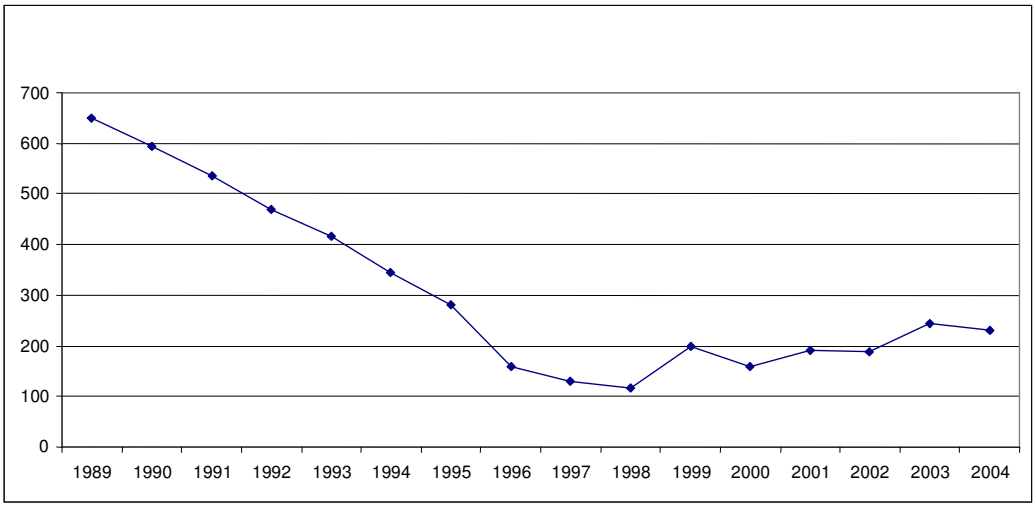
Potato planting material in DPR Korea is often of poor quality and seeding rates are lower than recommended because of supply shortages. The practice of cutting tubers into four pieces for seed not only depresses yield but also encourages disease infestation (see 'Pest and disease control' below). These shortcomings are reflected in the low yields obtained - usually about 10 t/ha fresh weight nationally for the spring crop and 12 t/ha fresh weight for the main crop.

Sufficient seed for planting the planned area of winter wheat is said to be available. The nationally recommended seed rate for both wheat and barley is 150 kg/ha.

Fertilizer and soil fertility

According to the Ministry of Agriculture, 230 173 nutrient tonnes of fertilizer were used in DPR Korea during 2004, compared with 244 512 in the previous year - a 6 percent reduction (see Figure 2). Of the total 72 percent (165 810 tonnes) was provided as humanitarian assistance by the Republic of Korea (137 220 tonnes), the European Union (21 362 tonnes), FAO and various NGOs. Domestic production amounted to 56 524 nutrient tonnes, a 75 percent increase on last year. This was reflected in a substantial reduction in commercial imports (8 161 tonnes as opposed to 37 706 tonnes last year). Of the total used, 67 percent was nitrogen, mostly in the form of urea; 16 percent was phosphorus; and 17 percent was potassium.

Figure 2: DPR Korea. Consumption of NPK, 1989-2004 ('000 nutrient tonnes)



All farms visited by the mission reported using slightly less fertilizer this year than last, reflecting the country's slightly reduced total consumption. Typical fertilizer application rates this year in the Cereal Bowl provinces ranged from 360 to 450 kg ammonium sulphate equivalent per hectare of paddy (about 155 to 195 kg per hectare of urea, the most commonly used product), with similar, or slightly lower, rates for maize.

The policy of the Government regarding fertilizer distribution is based on two main principles. It should be equitably distributed, and, within the constraints of availability, it should be allocated according to each area's production potential. If, therefore, fertilizer is given by a donor for use in a particular province, the Government will adjust that province's allocation from the national pool according to its guiding principles. The use of fertilizer by province during 2004 is shown in Appendix Table A3.

Considering the amount of fertilizer that is applied to rice and maize, especially in the Cereal Bowl, yields remain low. The mission suspects that the acidity of the soils may be a contributory factor. Farm soil analyses are carried out every three years, and several farm chairmen cited soil pHs of between 4.5 and 5.5. Chairmen are generally well aware that such low pHs represent a severe constraint to crop production, and attempt to remedy it by applying lime. However, most are limited, by lack of transport, to applying about half a tonne of lime per hectare every three years, which they acknowledge is insufficient. In a highly acid soil environment, nutrient elements are immobilised and made unavailable to the plant with the result that applied fertilizer has minimal effect; in the case of urea, applications may even increase the acidity of the soil. The Mission recommends that this issue be investigated and that consideration be given to facilitating the application of lime, chiefly through provision of transport from quarry to farm, in order to ensure that applied fertilizer is effectively utilised.

Pest and disease control

The year 2004 was, according to farm management, relatively free of crop pests and diseases. Some farms in North and South Hamgyong reported heavier-than-usual outbreaks of water weevil in paddy early in the season, but they were satisfactorily controlled either by the use of deltamethrin or by draining the fields. Armyworm was reported on maize and wheat in North Hwanghae before the heavy rains, but the outbreaks were controlled. Rice stemborers were reported in South Pyongan, but infestation levels were below normal. The mission observed open smut in the standing crop of paddy in many parts of the country, but the incidence was always low. Low levels of general fungal disease on maize leaves were reported, but were said to have had no significant effect on yield.

The potato crop had all been harvested by the time the mission visited the country. Despite the contention that the crop was relatively disease-free, the mission considers that the very low yields obtained may suggest otherwise. The highest average yield (in Ryanggang) is less than 14 t/ha fresh weight. Two practices are conducive to infection; very small chits are used as planting material and these are usually untreated; and the crop is routinely planted on the same piece of land every two years despite the recommendation to observe a four-year rotation. These issues deserve further investigation.

Farm power

The availability of tractors and haulage vehicles has remained virtually static over the last twelve months. Last year, the country had 64 225 tractors, of which 57 percent (36 608) were operational. This year the total number has fallen slightly to 64 062, of which 57.5 percent (36 836) are operational. However, since most functioning tractors are old and run inefficiently, about half of the land in the Cereal Bowl is still prepared using draught cattle and human labour. This has a very significant impact on double cropping which requires a rapid turn-around between the harvest of the main crop and the planting of winter wheat. So great is this constraint that the country appears to have reached a double-cropping limit beyond which it cannot go under the prevailing mechanisation conditions. Major problems associated with maintaining tractors operational include a lack of spare parts and tyres and a shortage of fuel. Recent studies carried out by an NGO suggest that those tractors that are operational spend only about half of their working hours carrying out tillage or other land operations; the other half is spent in haulage.

Electricity supplies have again improved this year. Main-season crop production has, however, been helped by the heavy rains of July and August which minimised farms' pumping requirements, and by the expanding network of gravity-fed irrigation canals. All farms are satisfied that the provision of electricity for threshing the rice crop will be adequate.

Irrigation

The proportion of gravity-fed irrigation systems continues to increase gradually as a result of the new waterways completed in recent years. These include the 148-km Pyong Nam and the 154-km Lake Taesong-Kaechun waterways in North and South Pyongan. The Pakma-Cholsam waterway, also in North Pyongan, is due to be completed soon. However, most systems still depend on electrically powered pumping stations. Some farms depend for their irrigation on series of ten or more pumping-stations and are consequently very vulnerable to water shortages. This year, the power supply was better than it had been for several years, and the irrigation situation was satisfactory. In addition, heavy rainfall in July and early August reduced farms' irrigation requirements. Water levels in the country's reservoirs have been very satisfactory; by September 2004, levels were at 79 percent of capacity, which is significantly higher than they have been in recent years (see Figure A1 in the Appendix).

4.4 Yields and production

Production parameters of food crops produced on farms in DPR Korea for 2004/05 are presented in Tables 2 and 3. Estimates for the main season crops (rice, maize, potato, and other cereals including summer wheat, sorghum and millet) in 2004, shown in Table 2, are based on a combination of Government estimates, on-farm discussions, field observation, and discussions with other agencies involved in crop production. Winter and spring crop forecasts for 2004/05 (to be harvested in 2005) (Table 3) are based on a combination of Government target crop areas, on-farm discussions and recent reported yields. Table 4 gives the sum of area and production of main crops, and winter and spring crops, by province. The global total in this table includes the Mission's estimates of household garden production and production from hillside plots (see above). Table 5 compares area, yield and production of cereals and potatoes (in cereal-equivalents) for 2004/05 with those of 2003/04.

Table 2: DPR Korea. Main-season crop production, 2004 (Area in '000 ha, yield in t/ha, and production in '000 tonnes)

Province 1/	Paddy			Maize			Potato 2/			Other cereals			Total		
	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.	Area	Prod. 3/	Prod. 4/
Pyongyang	27	4.0	106	14	3.9	55	0.8	2.7	2	0.6	1.7	1	42	165	127
South Pyongan	114	4.2	478	68	3.9	266	9	2.6	24	2	1.5	3	193	772	604
North Pyongan	103	4.1	423	87	3.9	339	11	2.7	30	5	1.6	8	206	800	652
Jagang	7	3.6	25	37	3.4	123	2	2.9	4	5	1.9	10	51	163	154
South Hwanghae	150	4.5	677	80	4.2	336	16	2.9	45	5	2.4	13	251	1 071	834
North Hwanghae	54	3.9	212	72	3.3	238	6	2.6	15	3	2.4	8	136	474	400
Kangwon	36	3.4	122	37	2.7	99	3	2.3	6	3	1.4	4	78	231	188
South Hamgyong	60	3.6	216	48	2.8	134	7	2.7	20	9	2.0	18	125	389	313
North Hamgyong	25	3.4	85	47	2.6	122	12	2.8	33	3.7	1.9	7	87	247	217
Ryanggang	2	2.7	5	3	2.3	8	23	3.4	77	22	2.1	46	50	136	134
Kaesong	5	3.9	21	2	3.4	6	0.2	3.1	1	0.2	1.6	0	8	28	21
Total	**583**	**4.1**	**2 370**	**495**	**3.5**	**1 727**	**89**	**2.9**	**258**	**60**	**2.0**	**119**	**1 227**	**4 475**	**3 645**

1/ Area and production in Nampo has recently been included in South Pyongan.
2/ Potato production is given in terms of cereal equivalent; 1 tonne potato ≡ 0.25 tonne cereal.
3/ Production including rice as paddy.
4/ Production including rice as milled rice (65% of paddy). Yield is 2.64 t/ha and production 1.541 million tonnes in rice terms.
* Figures may not add-up exactly due to rounding.

Table 3: DPR Korea. Forecast of winter and spring double-crop production, 2004/05 (Area in '000 ha, yield in t/ha, and production in '000 tonnes)

Province	Winter wheat			Spring barley			Spring potato 1/			Total	
	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.	Area	Prod.
Pyongyang	3	2.5	8	1	2.1	2	1	2.7	3	5	13
South Pyongan	14	2.5	35	7	2.1	14	20	2.7	54	41	103
North Pyongan	13	2.4	32	9	2.1	19	18	2.6	47	40	98
Jagang	0.5	2.1	1	0.2	1.7	0.3	1	2.3	2	2	4
South Hwanghae	19	2.5	48	8	2.1	17	20	2.8	55	47	119
North Hwanghae	9	2.2	20	4	1.9	7	11	2.4	26	24	53
Kangwon	5	2.1	10	1	1.8	2	7	2.3	16	13	28
South Hamgyong	5	2.0	10	2	1.7	3	14	2.4	34	21	46
North Hamgyong	0.5	2.0	1	0.2	1.7	0.3	3	2.2	7	4	8
Kaesong	0.9	2.2	2	0.3	1.9	1	5	2.3	12	6	14
Total	**70**	**2.4**	**166**	**32**	**2.0**	**64**	**100**	**2.6**	**255**	**201**	**485**

1/ Potato production is given in terms of cereal equivalent; 1 tonne potato ≡ 0.25 tonne cereal. * Figures may not add-up exactly due to rounding.

Table 4: Total food crop production forecast for 2004/05, including household garden and sloping-land. (Area in 000 ha, production in 000 t)

Province 1/	Total area (including double cropping)	Total production	
		Including paddy	Including milled rice 2/
Pyongyang	47	177	140
South Pyongan	234	874	707
North Pyongan	247	897	749
Jagang	52	167	158
South Hwanghae	298	1 190	953
North Hwanghae	159	527	452
Kangwon	91	259	216
South Hamgyong	145	435	360
North Hamgyong	91	255	225
Ryanggang	50	136	134
Kaesong	14	42	35
Farm total	**1 428**	**4 959**	**4 130**
National household garden production3/	25	50	50
National sloping-land production4/	75	55	55
National total	**1 528**	**5 064**	**4 235**

1/ Area and production from Nampo has recently been included in South Pyongan.
2/ Converted from paddy with a milling rate of 65%.
3/ Includes only cereal production; for details see Household gardens section in the text.
4/ Includes only cereal production; for details see Crop production on sloping land section in the text.
* Figures may not add-up exactly due to rounding.

Table 5: DPR Korea. Area (000 ha), yield (t/ha) and production (000 t), 2004/05 compared to 2003/04

	2004/05			2003/04			% change, 2004/05 over 2003/04		
	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.
Main season crops									
Paddy 1/	583	4.06	2 370	584	3.84	2 244	-0.1	5.7	5.6
Maize	495	3.49	1 727	495	3.48	1 725	0.0	0.1	0.1
Other cereals	60	1.99	119	60	2.20	129	0.0	-9.5	-7.4
Potatoes 2/	89	2.90	258	89	3.20	285	0.0	-9.3	-9.4
Total, main-season crops	**1 227**	**3.65**	**4 475**	**1 228**	**3.54**	**4 384**	**-0.08**	**3.0**	**2.1**
Winter/spring crops									
Wheat	70	2.37	166	69	2.13	146	2.2	11.2	13.6
Barley	32	2.04	64	34	2.01	69	-8.1	1.3	-7.0
Potatoes 2/	100	2.56	255	98	2.20	216	1.3	16.4	17.9
Total, winter/spring crops	**201**	**2.41**	**485**	**201**	**2.14**	**431**	**0.04**	**12.4**	**12.5**
National farm total	1 428	3.47	4 959	1 429	3.35	4 815	-0.04	3.7	3.0
Total incl. gardens and slopes			**5 064**			**4 920**			**2.9**

1/ In milled rice terms the yield and production estimates this year are 2.64 t/ha, and 1.541 million tonnes respectively, as compared to 2.50 t/ha and 1.459 million tonnes last year.
2/ Potatoes in cereal equivalent with 25% conversion rate.
* Figures may not add-up exactly due to rounding.

Paddy

This year's national paddy yield, at about 4.06 tonnes per hectare, showed a 5.7 percent improvement on last year's 3.84 tonnes per hectare. Positive factors affecting yield included timely transplanting, good rainfall, a lack of pest and disease problems, and favourable harvesting conditions. This year's production of 2.37 million tonnes shows an increase of 5.6 percent over that reported for last year. Assuming a milling ratio of 65 percent, this year's production equates to 1.54 million tonnes of rice.

Maize

Average maize yields this year were 3.49 tonnes per hectare showed a marginal increase on last year's 3.48 tonnes per hectare. Factors contributing to a satisfactory crop included timely planting, good rainfall during the early part of the season, low incidence of pests and diseases, and favourable harvesting conditions. Harvesting began as early as the end of August and by the end of September nearly all the crop had been harvested. National maize production this year, at 1.727 million tonnes, is similar to that of 2003.

Potatoes

Main-crop potato yields were about 9 percent lower this year than last at 2.9 tonnes cereal equivalent per hectare (about 11.6 tonnes fresh weight per hectare). The generally low level of productivity of potatoes in DPR Korea may be attributable to poor-quality seed and excessively short rotations (see 'Pest and disease control' above), but this year it was probably exacerbated by the wet conditions prevailing early in the season. This year's national farm production of main-crop potatoes in cereal equivalent is estimated to be 258 000 tonnes.

5. FOOD SUPPLY/DEMAND OUTLOOK, 2004/05 (NOV. –OCT.)

5.1 Cereal supply/demand balance, 2004/05

A national cereal supply/demand balance sheet, including potatoes in cereal equivalent terms, from November 2004 to October 2005 is presented in Table 6. In preparing the balance sheet, the following assumptions were made:

- The FAO/WFP Missions in recent years have been using a base level population of 22.963 million as of 1 November 2001 as provided with details by the Government. A growth rate of 1 percent was applied to it until last year. Thus the estimated population during 2003/04 marketing year is 23.542 million[4]. This year Government's Statistical office announced a new growth rate of 0.7 percent. Hence, a population of 23.706 million as of 1 May 2005, the mid-point of 2004/05 marketing year, is obtained by applying this new annual growth rate.
- As in the past, an annual consumption rate of 167 kg/caput of cereals (including potato in cereal equivalent), which represents about 1 600 Kcal, or roughly 75 percent of the average person's daily energy requirement of 2 130 Kcal is used. This matches favourably with the apparent per capita consumption in 2003/04.
- Normal year seed requirement of 230 000 tonnes, based on the seed rates used in DPR Korea and the intended area to be sown in 2004/05 are:
    - Rice: 97.5 kg/ha of rice (or 150 kg of paddy) on 583 000 ha
    - Maize: 45 kg/ha on 495 000 ha
    - Wheat, barley and other cereals: 200 kg/ha on 163 000 ha
    - Potato: 625 kg/ha in cereal equivalent (or 2.5 t/ha fresh weight) on 187 000 ha.
- Post-harvest losses of 15 percent. The level of post-harvest crop loss in DPR Korea has been a contentious issue in recent years, with estimates ranging from 3 percent to more than 30 percent. Unfortunately, no systematic investigations have been undertaken to clarify the issue. There are many stages at which significant loss can occur. In the case of paddy, if the harvest is delayed there may be some shattering in the field. Immediately after harvest, crops are left to dry in the field; if the paddy field has not been sufficiently drained or if there is substantial rainfall following the harvest, the crop may be left lying in damp conditions which are conducive to rotting and

[4] This is a revised population figure; a calculation error had occurred in last year's report.

further grain loss. Delayed collection of the crop from the field leaves it susceptible to rodent and insect damage. Losses may occur while the crop is being transported from the field to the thresher. Old or inefficiently set threshers may cause loss. Delays in threshing (which are very common as a result of power shortages) can cause losses in the paddy stored on the stalk. Finally, after threshing and bagging, losses may occur in storage.

It appears, however, that a great deal of care is taken of the crop at all stages and that losses are minimised insofar as circumstances allow. For instance, work gangs glean for dropped grain in the field after the crop has been removed, the harvest is placed carefully on trailers for transport to the threshers, and sheaves may be put through the thresher several times to ensure that all the grain has been removed. Nevertheless, there are several uncontrollable variables such as rainfall and power supply which can thwart farmers' best efforts, and, without the implementation of effective control measures - as appears mostly to be the case - rodents may make significant inroads into stored grain. The Mission once again recommends that a study be undertaken to quantify losses at each vulnerable stage. In the absence of any better estimate, but suspecting that the level of post-harvest crop losses may, in fact, be rather lower, the Mission continues to use the figure of 15 percent as in previous years.

- Other uses at 3 percent of the total availability.
- A feed-grain requirement of 181 000 tonnes, as provided by the Ministry of Agriculture.
- A paddy-to-rice milling ratio of 65 percent.
- Information received from the major exporting countries on "export by destination" shows that the total annual cereal exports to DPRK for 2001/02, 2002/03 and 2003/04 were 130, 253 and 294 thousand tonnes, respectively. The Mission has been using a lower figure of 100 000 tonnes as a commercial import capacity over the past several years. Given that the annual merchandise exports of the country have not drastically changed over the last five years, for 2004/05, the same import capacity is assumed. However, if the current food import trend continues, the anticipated commercial imports need to be revised next year.

Table 6: DPR Korea - Cereal (and cereal-equivalent) 1/ balance sheet for 2004/05 (Nov/Oct) in '000 tonnes.

	2004/05
DOMESTIC AVAILABILITY	**4 235**
Stock drawdown	0
Domestic production 1/	4 235
- Main-season production 2/	3 750
- Winter/spring production	485
TOTAL UTILIZATION	**5 132**
Food use	3 959
Feed use	181
Seed requirement	230
Other uses and post harvest losses	762
IMPORT REQUIREMENT	**897**
Anticipated commercial import	100
Concessional imports 3/	300
Uncovered Deficit 4/	**497**
Of which, food aid on hand or pledged	170

1/ Including potatoes in cereal equivalent at 25 percent conversion rate.
2/ Including household garden production (50 000 tonnes) and production on slopes (55 000 tonnes).
3/ Anticipated cereal imports on loan from the Republic of Korea, subject to possible changes.
4/ This includes 120 000 tonnes already pledged/resourced through WFP and an estimated 50 000 tonnes of bilateral aid from China.
* Figures may not add-up exactly due to rounding.

The total cereal import requirement in 2004/05 is estimated at 897 000 tonnes, slightly lower than last year's revised 949 000 tonnes. During the past seven years (1995/96 to 2001/02) the cereal import requirement (i.e. the national food deficit), has been in excess of 1 million tonnes, reaching over 2 million tonnes in 2000/01, the year of the worst harvest. Over the last four years the gap is narrowing, but it is still close to a million tonne mark. In anticipation of another offer of rice on loan by the Republic of Korea as in previous years, the table lists 300 000 tonnes as concessional imports for the

coming marketing year. Food aid in stock or expected to arrive after 1 November 2004, is estimated at 170 000 tonnes of cereals.

6. VULNERABILITY/EMERGENCY FOOD NEEDS ASSESSMENT (WFP)

6.1 Food security background

Background of current crisis

Despite the recent improvements in agricultural production, the country still does not have sufficient food to provide an adequate quantity of basic cereals to its population. The Government's Public Distribution System (PDS), through which basic cereals rations are provided to households, continues to fall far short of its target, and manages to deliver only 50 percent of people's daily energy requirements. Poor households face a severe lack of access to the required, additional, basic and more nutritious food items due to a continuing deterioration in their purchasing power as a result of ever increasing market prices for food. After spending two thirds of their income on food, and adopting a wide range of coping strategies that help them overcome part of their food gap, the 70 percent of the households that depend on the PDS as their main source of staple cereals are still not able to cover their basic energy requirements.

Relevant government policies and actions regarding food insecurity and food aid

The Government divides the population into two broad categories in terms of food allocations: cooperative farmers and workers. The cooperative farmers constitute about 30 percent of the population, a total of seven million people. They are allocated a ration of about 600 grams of cereals per person per day from their farm. The workers (which include officials, factory and state farm workers), about 16 million people, purchase a ration of about 300 grams per person per day through the PDS at heavily subsidized prices. Although the Public Distribution System (PDS) is able to provide people only with half of their energy requirements, it does serve as a safety net that prevents them from falling into abject poverty and starvation. The Government has accepted international food aid since 1995 to assist in the provision of basic cereals and nutritious food to groups defined as especially vulnerable.

Over recent years the Government has relaxed its approach towards the informal and semi-formal private sale of produce from private kitchen gardens and other market-oriented activities. The most recent new development is the establishment of private semi-formal mini-cooperatives, a process overseen by the Government, aimed at improving people's incomes. All these activities have increased greatly over the past 12 months.

Previous emergency assistance

WFP has assisted DPRK with emergency food aid since 1995, and has committed a total of 3 968 473 tonnes of food at a total cost of US$ 1.3 billion. However, especially during the past two to three years, delays in donor pledges have caused serious breaks in the food supply line, which compelled WFP to suspend assistance to several millions of vulnerable beneficiaries. At the time of the Mission, large contributions from several donors had just arrived or were about to arrive, which enabled WFP for the first time in two years to feed all target beneficiaries with planned rations. However, supply breaks in cereals and oil are likely to occur again as early as January 2005 for some beneficiary groups.

6.2 Methodology of assessment

Assessment approach and tools

The Mission relied heavily on the household food security analysis prepared by the WFP Country Office, based on the information it has gathered over the past 1-2 years. From primary and secondary data, collected through some 2 600 household interviews, discussions with county officials and Focus Groups, and the use of county-level statistics, the Country Office was able to collect information on incomes, prices, family size, and other required data. The Mission greatly appreciates the Government's greater openness to allow WFP to gather such information, especially during the past 12 months, but at the same time expressed its concern to the Authorities about recent developments that indicate a return to a more limited access to such information (i.e. a planned reduction in

monitoring activities, and restrictions regarding the type of questions that international food aid monitors are allowed to ask).

As recommended by the 2003 CFSAM, WFP's 2004 Emergency Operation provides, on a pilot basis, assistance to PDS-dependent households whose food security had deteriorated as an initial consequence of the (much needed) process of economic adjustment in mid 2002, and who are not assisted by WFP under any other component of its emergency operation. Much less is known about these households than the more "traditional" vulnerable segments of the population assisted by WFP (such as pregnant women and children in nurseries), because the situation of each individual household is different and depends very much on the number of income earners, the level of their income(s), the number and age of their dependents, whether or not they have access to kitchen gardens etc. The Mission therefore focused in particular on their food security situation. And as their situation was believed to be more serious in the mainly industrial northern and north-eastern provinces, the WFP members of the Mission visited those provinces only.

Although limited by time constraints, the Mission was able to form an impression of the household food security situation through interviews with families, people collecting their PDS rations, staff of assisted institutes, and Government authorities, which confirm the analysis and conclusions of above-mentioned WFP Country Office studies.

At the time of the Mission, a nutrition survey was underway. The final results are not expected before the beginning of 2005, but its conclusions may help further fine tune the Mission's recommendations at the end of this report regarding future assistance.

Limitations and constraints of assessment

In spite of the greater freedom in information gathering witnessed over the past 12 months, data collection in DPRK continues to face constraints. Random sampling of households is not possible; visits are mainly permitted to groups already targeted by WFP; and within these groups families not receiving WFP food are seldom permitted to be visited. However, the Mission was allowed to visit such non-WFP-assisted, PDS- dependent households, and expressed its appreciation to the Government for these opportunities, which were often arranged at very short notice.

Although random sampling is not feasible, it is WFP's impression that it visits all strata of society in the course of routine monitoring visits. Further, there is a relatively high degree of geographic homogeneity in people's access to food, mainly because of standardized rations and salaries, and the limited access to land faced by everybody. Finally, as findings of monitoring visits throughout the year are intensively cross-checked, WFP is confident that its analysis and conclusions are essentially valid.

6.3 Vulnerability and coping mechanisms

The Mission's impressions confirm the general conclusion of the WFP Country Office that PDS-dependent families, notably those with only one income and several dependents, continue to be among the most food insecure in the country. The situation remains particularly serious for household members such as very young children, pregnant and nursing women and the elderly, as the ability of their families to cover their special food needs are extremely constrained.

Availability of basic cereals

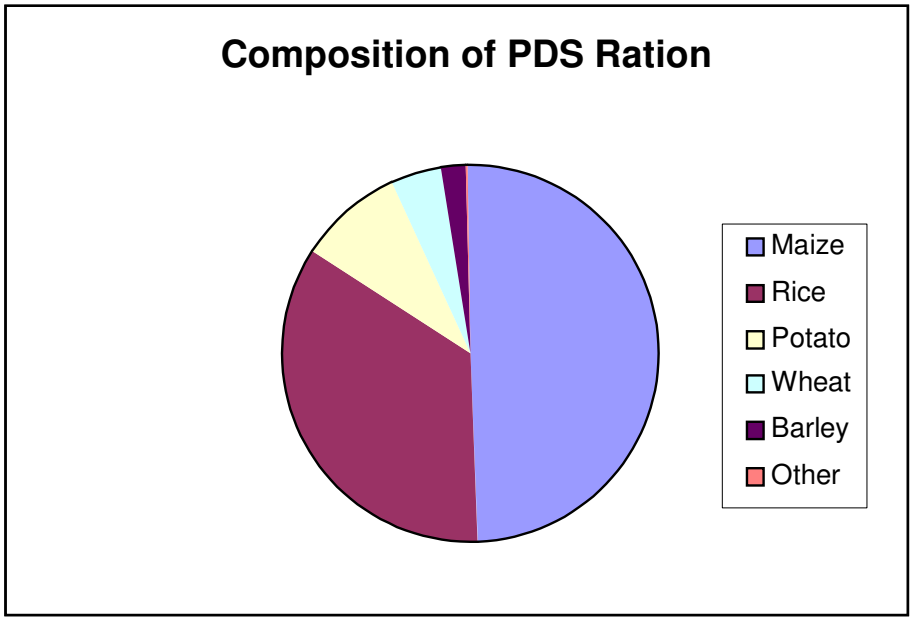
Farmers: After allocation of food to each farmer household (219 kg/year equivalent to 600 grams per person per day), the rest of the farm's production is sold to the Government, who allocates it through the Public Distribution System (PDS) to the remaining 70 percent of the population consisting of workers, state farmers, professionals and Government officials. Thanks to farmers' relatively high rations, better access to kitchen gardens and hill side plantations, as well as their individual share of the farm's income resulting from the sale of surplus food to the Government or on the local markets, their food situation is far better than that of PDS dependent households. Therefore no direct assistance to farmer households is envisaged.

PDS dependents: Workers' households depend on the PDS for their supply of staple cereals. The PDS aims at providing the full, individual energy requirements. As in previous years, however, the PDS allocation of basic cereals fell far short of the all-time goal of 575 grams per person per day.

During the period November 2003 through October 2004, the average actual allocation through the PDS was about 305 grams, which provides only half of a person's daily energy needs.

Due to the efficient transfers of food from surplus to deficit counties, the level of the rations is relatively consistent throughout the country. However, the composition of the ration may vary from county to county. The composition of the PDS ration is mainly maize, followed by rice, potato, wheat, and barley (see Figure 3). The proportion of rice in the ration is a fair indication of the degree of (household) food security of the respective county: cities and rice-producing counties are usually prioritized in the distribution of rice, while households in mountainous counties mainly receive maize and potatoes. Rice is the preferred cereal amongst Koreans and supplies are limited, its market price is therefore much higher than that of other cereals. Poor households in counties with a large proportion of rice in the PDS ration can therefore barter or sell the rice purchased from the PDS and buy a cheaper cereal. The barter ratio maize/rice is usually 2/1. PDS prices have remained unchanged at 44, 24 and 27 Won/kg for rice, maize and wheat, respectively, since July 2002, the time of the economic policy adjustments when these new prices were introduced, to the present.

Figure 3: Average Composition of PDS Ration October 2003 - September 2004



Vulnerability of PDS-dependent households

Despite the low PDS prices, PDS-dependent households spend on average one-third of their monthly income on PDS food alone. As it provides only 50 percent of their calorie requirements, other sources of food have to be found to complement their needs. Their ability to obtain additional food is however heavily limited by their low incomes and the high food prices on the market:

- Incomes

The income data collected by the WFP Country Office over the past 12 months more or less confirms what was collected in 2002/03 (refer to the 2003 CFSAM report), and is based on a much larger sample of interviews. Most types of low-paid workers earn between 1 700 and 2 500 Won per month, with an average of about 2 100. Low-level professional jobs such as clerks and teachers at nursery and primary level earn between 1 400 and 2 000 Won per month[5]. The average pension is just 900 Won/month; women, in particular housewives, sometimes get pensions as low as 300-400 Won/month. The income of cooperative farmers from the annual crop sales to the Government varies

[5] Workers in prioritized industries such as mining and power plants earn much higher salaries, ranging between 5 200 up to 12 000 Won/month. Professionals in the higher categories such as doctors, engineers, managers and higher level teachers earn salaries between 3 200 and 4 500 with an average of 3 600. Officials' salaries are in the order of 2 900 Won.

greatly from one farm to another, resulting in monthly incomes per person ranging from 500 - 4000 Won.

The official exchange rate of the national currency is 170 Won/Euro, however the informal market rate has increased rapidly over the past year, from about 1 000 Won/ Euro in October 2003 to about 2 200 in August 2004. It was going down to 1 600 at the time of the Mission. This has repercussions on the food prices on the market, whose steep increases rapidly erode the purchasing power of workers' salaries.

The already extremely low incomes of workers' households continue to be further affected by the downward trend in industrial productivity and income caused by a limited domestic and international demand, a shortage of raw materials, spare parts, machinery, power supplies and foreign currency; and the process of economic adjustment that started in mid-2002 requiring factories to make profits. Facing these requirements, and having subsidies removed, factories were forced to close or run at reduced capacity, and workers were either re-deployed or laid off - or had their working hours reduced.

The result, according to interviews with Government officials and information gathered throughout the year by the WFP Country Office, is that some 30 percent of the workers are either permanently or temporarily under- or unemployed. Whereas most continue to receive their salaries, many have seen them reduced as a result of their factories' lack of profit. Women seem to be harder hit by un/under-employment than men. An indicator of the magnitude of female unemployment may be that the term "housewife", used for unemployed women, has become culturally more acceptable. A couple of years ago the term "housewife" was almost unheard of in DPRK, and the country had one of the highest rates of working women in the world at 89 percent; this percentage has steadily decreased over the past few years.

Households' access to non-PDS food

A family of four with an average worker's salary of 2 100 Won would spend 864 Won on PDS food alone, (assuming a daily ration of 300 grams of maize per person), representing some 40 percent of its income. This ration provides for only half of a person's energy requirements. The situation is worse for families with reduced incomes, and/or more dependents. The problem that many of these families face is that after purchasing their PDS ration and paying for their essential non-food requirements (rent, clothing, heating), they don't have enough money left to buy the food they need, due to the lack of basic food commodities in the State shops, and the high and rising prices of food on the market.

State shops: While the PDS system aims to cover the population's cereal needs, the state shops should ideally provide all other basic food and non-food items, at subsidized prices. In reality, however, food available in the state shops is currently mainly limited to condiments and vegetables. As opposed to the PDS, the availability of food in the state shops depends on county-level agricultural and industrial production, and there are therefore much larger variations between counties.

The items most commonly purchased by households in state shops are bean paste, soy sauce and salt. Purchase of vegetables is also common throughout the year, with a large distribution of radish and cabbage in November for the preparation of winter Kimchi (fermented cabbage and radish). The average ration per family is 275 kg. The availability of other items is very limited. Meat and eggs are available mainly in the state shops in the south, particularly in Pyongyang, and in Ryanggang in the north. However, these items are very strictly rationed.

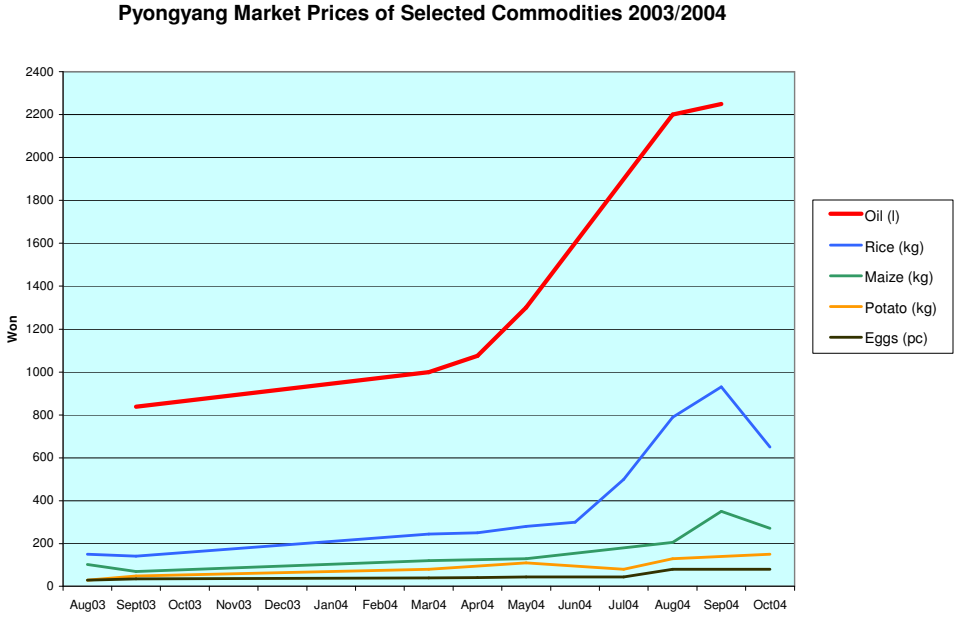
Markets: The ability of low income households to obtain food from the market to complement their food needs is severely restricted by the high food prices, and the steep increases over the past 12 months (see Figure 4). After spending one-third of its monthly salary of 2 100 Won on PDS food and another one-third on essential non-food expenditures, an average worker's household has just enough money left to buy 2.5 to 5 kg of maize for the entire family for the month:

- According to information gathered by the WFP Country Office, in 2003 the average price of rice outside Pyongyang was 120 Won/ kg. In June 2004 it had risen to 270 Won/kg, and around the time of the Mission it had soared to 500 - 600 Won/kg (i.e. 11 to 14 times the PDS price).

- The price of maize, the poor people's staple, has followed a similar development. In 2003 it peaked at 110, and rose to 150 Won/kg around mid 2004. At the time of the Mission it had reached a high of 320 Won/kg (i.e. 11 times the PDS price).

- The Mission visited a market in Pyongyang and checked the prices of some of the offered basic cereals. The price of rice varied between 450 and 600 Won/kg depending on the quality and the price of maize was 270 Won/kg.

Figure 4: Price Developments 2003 - 2004



Coping mechanisms

Due to the inability of the PDS and the state shops to cover all the food needs of the population, and the steep food prices on the market, people resort to a number of other strategies to obtain food. Although the nature and importance of many of these activities is seen as a sensitive issue and data is therefore hard to obtain, the general impression from family and county interviews, in addition to observations, is that a large majority of the population have identified additional sources of food and income to cope with their shortages, and their importance as a proportion of the household's income is rapidly increasing.

- Support from relatives: One of the most important coping strategies applied by households is to receive food from relatives (40 percent of interviewed households). Rural households transfer food to their relatives in urban areas, mainly cereals and vegetables, either through bartering or as gifts. Especially vulnerable people, such as pregnant and nursing women are given gifts.

- Wild food collection: It is estimated that about 60 percent to 80 percent of PDS dependents and 65 percent of coop-farmers gather wild foods. Around 90 percent of the food is consumed. Some of the wild foods are a source of important micro-nutrients. Wild food is also used to "stretch" the PDS ration in the absence of more cereals.

- Kitchen garden production is mainly for household consumption. 57 percent of the PDS-dependent population have kitchen gardens with an average size of 53 m^2 (16 Pyongs), and nearly all co-op farmers have a kitchen garden [6], with an average size of 79 m^2 (24 Pyongs). The

[6] About 5 percent of coop-farmers interviewed in the course of the year have hillside-gardens as well. These are larger than kitchen gardens with an average size of 110 m^2 (33 pyongs), but yields are lower. The plots are particularly common in the northern parts of the country; In hillside plots maize and potatoes are grown.

main items produced in kitchen gardens are maize, potatoes, cabbage, cucumber, eggplant, spinach, pumpkin, soy beans, chilli, onions and garlic.

Although each individual mechanism only adds marginally to a household's access to food, a mixture of several of these mechanisms provides an important contribution to household food security. In this respect, the considerable number of PDS-dependent households without access to a kitchen garden are particularly vulnerable. This is because a garden is a source of a mixture of food which is within the full control of the household concerned.

Market-oriented activities

- Individual sellers.

There are two types of markets where people sell: informal ones set up by vendors, and formal ones run by the state where one pays a stall fee of 30-40 Won/day. Over the past year many counties have built the latter type of market, and there is now usually a minimum of one per city, open three times a month (1st, 11th and 21st) across the country. The county authorities determines who can sell in these markets; for instance unemployed women are sometimes given preferential access. There are also small, informal market places sprouting up in narrow streets and alongside main roads. Moreover, extensive selling and bartering also takes place amongst neighbors and between rural and urban populations.

These activities have visibly increased over the past year. For instance, the WFP Country Office has observed that the number of women selling agricultural products at road junctions, county borders etc. has multiplied many times over the past 12 months (20-50 women now where there were 1-3 women before). The urban population rarely sells the produce from kitchen gardens and collected wild food, except some small quantities sold by the elderly and, in the case of wild food, unemployed women. The selling of produce from hillside farming, on the other hand, is for some unemployed workers a new source of income. For co-op farmers, sales from kitchen gardens make up nearly 10 percent of their incomes. Keeping livestock and poultry is most important as a source of income due to the high prices obtained for meat in the markets, on average 700 Won/kg.

- Petty trade and services

In addition to an increased number of the above-mentioned types of markets and selling points for agricultural produce that have already been in existence for a few years, more advanced forms of petty trade and services have been developed recently. The most important of these are small co-operatives, groups of often just a few people, whom the county authorities have authorized (after screening their applications for economic viability) to start small market-oriented economic activities such as the sale of handicrafts, snacks, and the like (the majority of cases), and the provision of services such as shoe or bicycle repairs. Co-operatives were initially mainly authorized for unemployed women, but lately unemployed men and the elderly are also forming these groups.

The scale of both these informal and semi-formal initiatives has skyrocketed over the past year, across the country, to the point where the appearance of public spaces has visibly changed. On previously empty pavements and road-junctions there are today a mixture of constructed kiosks, small vendors with a few agricultural items or a box of ice-cream, bicycle repair men etc. Although this change is nationwide, it is more important in the larger cities.

Although it is difficult to quantify, these market activities are assumed to provide an important extra source of food and income for the involved households, thus contributing to reducing their food gap.

6.4 Health and Nutritional Status

Food consumption and changes in dietary patterns

The daily diet is limited and rather similar from day to day. People's main source of cereals is the ration they receive through the PDS or from the farm they work for. The preferred commodity, rice, is seldom consumed at 100 percent but is either mixed with maize or wild foods, or bartered for cheaper cereals. There is normally a shortage of the most common cereals, i.e. rice and maize, in the spring as the stocks from the autumn harvest deplete and the PDS rations are reduced. Fresh vegetables and fruits are often only available during June, July, August and September (during the winter months the only available vegetable is Kimchi, which is based on coloured vegetables such as cabbage and white radish, which heavily reduces the vitamin-A intake during winter months). Families can buy oil at the state shop but the quantities are limited, sometimes as little as 300ml/ family/ month. Oil at the market is very expensive and a litre may cost a worker's monthly salary. Wild food is an important source of extra food for the families and contributes to the micro-nutrient intake. The main source of protein is vegetarian, mainly from pulses and maize.

General nutrition status

Anthropometric surveys carried out in recent years (1998 and 2002) show an improvement in the nutritional status of children in DPRK. But despite these improvements the situation is still precarious and stunting is regarded as a severe public health problem. 40 percent of the children in DPRK were stunted in 2002 (height for age), 20 percent were underweight (weight for age) and 8 percent were wasted (weight for height). A third of all mothers included in the 2002 survey had a mid-upper-arm circumference (MUAC) below 22.5 which denotes a high risk of having a low-birthweight baby. Another third of the mothers who took part in the haemoglobin test were anaemic. A new survey is being carried out in October 2004, which will further evaluate the nutritional situation of the population.

A number of "24 hours recalls" (which seeks information on household food consumption of the last 24 hours) of during household visits in the lean season (May –August) 2004, showed that pregnant PDS-dependent women, a group that was prioritized during WFP pipeline breaks and received all the commodities, still covered only 75 percent of their energy requirements. Their protein and fat intake were at levels considered safe during emergencies, but that was only due to the fact that all WFP commodities were available to them. The intake of iron was only 62 percent of needs and folic acid, potassium and calcium were also below recommended daily intake. Pregnant women living and working on cooperative farms receive the same WFP ration but without cereals as it is believed that they have enough due to their own production and the farmers rations being larger. Except for a lower energy intake (during the lean season), their intake of protein and micro–nutrients was adequate, thanks to their better access to more nutritious food. Nursing mothers (PDS-dependent as well as those on farms) covered only 67 percent of their energy needs, and 80 percent of protein and fat. The protein intake of women living on farms is better

6.5 Estimation of Population in Need and Emergency Food Assistance Requirements

Geographic targeting

In previous years it was widely assumed that households in the northern part of the country were more vulnerable to food insecurity than those in the south; and that mountainous, remote regions were more vulnerable than the lowlands. The WFP Country Office household food security analysis, however, concluded that geographic differences are much smaller and more complex than previously perceived. Trends found in socio-economic differences in vulnerability were much clearer and stronger. A better understanding of this can be gained as WFP gradually obtains more data. At the moment, however, it is suggested that one should be cautious in placing substantial weight on geographic targeting.

Targeted beneficiary groups

- The food security of young children in nurseries and orphanages, primary school children and pregnant and nursing women remains precarious, and assistance to these categories of beneficiaries should continue in order to avoid a further deterioration in their nutrition status.

- Elderly people without other means of support are very vulnerable, and assistance to this category of beneficiaries should also be continued. The elderly have not received food assistance in a long time due to pipeline breaks, in which cases they are the first group to whom food assistance is suspended. During the period May-August this target group did receive some maize and wheat but no pulses or oil. Even with WFP food being available to them, they still covered only 70 percent of their energy requirements and only 60 percent of safe intake levels of fat. Visits to this beneficiary group has shown that the percentage of elderly falling below the minimum requirements is far bigger than previously assumed, this is also due to higher prices of food on the market. WFP is therefore proposing to increase the percentage of elderly to be supported from currently 50 percent to 65 percent (of all elderlies dependant on the PDS system) In addition, the ration should be diversified with the addition of a daily ration of oil.

At the same time, the Mission recommends a continuation of the pilot project providing assistance to vulnerable PDS- dependent households, notably those with just one income, and with a high dependency rate and without access to a kitchen garden (and without any WFP assistance under one of the other components of the emergency operation). During 2004, WFP has however not been able to provide continuous support to this group due to recurrent resourcing shortfalls. The WFP Country Office's analysis shows that low-income, PDS- dependent households with no, or limited, additional means of income and food, are extremely food-insecure. This was confirmed to the Mission by Government officials at all levels; and also the Mission's own observations confirm that there is a continued need to target this population group with relief assistance. The current EMOP covers 15 percent of PDS-dependent households in the 17 counties that have an industrialization rate of at least 90 percent. It is recommended to continue this programme and gain further experience before it could be expanded to all 161 accessible counties.

The Government has introduced criteria to select the beneficiaries under this pilot component, with which the Mission and the WFP Country Office agree: low income; number of dependents; no access to a kitchen garden; and no or little help from relatives on cooperative farms. In order to improve WFP's knowledge of this large population group, with the aim of identifying types of households that are particularly vulnerable, the WFP Country Office requires an improved access to households within this group, including those that are not assisted under the operation. The Mission recommends expanding this component only in tandem with improved access to such households.

Table 7: DPR Korea - Estimated number of food aid beneficiaries and total commodity[1/] requirements for 2005

	Beneficiaries	Approx. Total Requirement ('000 tonnes)
Orphanages - Children	10 000	2
Pregnant/Nursing Women	300 000	46
Nurseries - Children (6 months-4 years)	985 000	102
Kindergartens - Children (5-6 years)	505 000	55
Primary Schools - Children (7-10 years)	1 145 000	93
Paediatric Hospitals/Wards - Children (6 months to 16 yrs) 66 911* - Accompanying mothers	22 000	1
Elderly Persons	925 000	93
Most food insecure urban PDS dependents	370 000	34
Food-for-Work - Participants - Dependants	725 000 1 450 000	26 39
Conversion to processed foods, contingency		9
TOTAL	**6 437 000**	**500**

1/ Cereals, processed foods and non-cereal commodities.
* Recipients of additional rations through the PDS and children in hospitals are not included in the total as the figure is accounted for under the respective groups (nurseries, kindergartens, schools)

The total food assistance needs for the above categories and numbers of beneficiaries are approximately estimated at 500 000 tonnes for calendar year 2005, of which 400 000 tonnes are cereals. These estimates are based on beneficiary categories, numbers of beneficiaries in each category, and the rations that were allocated to them in WFP's previous emergency operations.

The recommended programme will continue to direct some 50 percent of all resources to children from 6 months to 10 years old in nurseries, kindergartens and primary schools, or in institutions such as orphanages and hospitals. Another 10 percent is directed at pregnant and nursing women; and some 40 percent to the elderly, the most food insecure urban households and food-for-work projects.

Relationship between estimated national food deficit and estimations of food aid emergency needs

In earlier years, the considerable shortage in the national availability of cereals due to natural disasters was used as reference point for estimating the need for external food assistance. The continuing national shortage is still a problem and therefore external food aid is in part seen within the context of overall domestic availability. However, given that the lack of access to basic and nutritious food because of declining purchasing power is increasingly becoming the most critical problem for poor households, assistance to the food-insecure population of DPRK should now be determined more by their household food gap than the national food gap in cereal production.

Monitoring

With five sub-offices in the country (Sinuiju, Wonsan, Hamhung, Chongjin and Hyesan), supported by the main office in Pyongyang, a total of 42 international staff, and access to 161 of the 203 counties (85 percent of the total population), the WFP Country Office continues to have the broadest coverage of all international organizations working in the DPRK.

Some issues are still a matter of concern:

- WFP has no information about the food situation of people living in the non-accessible counties, thus there is a concern that some very vulnerable people are left without assistance;
- The Government still has not provided a comprehensive list of all institutions that benefit from WFP's assistance, despite repeated requests;
- WFP staff is not allowed to select interviewees at random;
- WFP has very limited access to consumer markets (only one market accessible in Pyongyang) and state shops, which is very important to obtain complete information for its household food economy analyses; and
- The Government still refuses to grant visas for WFP staff to be assigned to DPRK if they are nationals of Japan, the ROK or the USA (1 visa to a U.S. citizen has been granted).
- The Government announced in September 2004 that monitoring should be reduced but did not specify how the reduction is to be done and by how much. The issue is currently under discussion with the Government.

The above restrictions reduce the scope for monitoring and hence affect donors' confidence, with serious risks for future funding of the programme.

However, there are some positive and promising trends:

The most significant development in the past year is the greater accessibility by WFP staff to information required to better assess household food security as a basis for programme improvement. A start was already made in 2002, and in the course of 2003 and 2004 more Focus Groups Discussions and individual family interviews have been permitted. In 2004, a new questionnaire for use during family visits was approved by the Government, enabling collection of qualitative and quantitative data on all key aspects of household food security issues. These advances have provided WFP with better structured and standardized information on issues such as income from wages, salaries and pensions, the prices households pay for food through various channels, and supplementary sources of food such as kitchen gardens and help from relatives. WFP is also for the first time able to collect quantitative information on beneficiaries' food intake, through a 24 hour recall method when visiting families. This analysis has enabled WFP to better tailor next year's rations according to defined nutritional deficiencies. In 2004, county officials have shown more flexibility in

allowing the Emergency Officers to choose the beneficiary institutions they want to visit. The analyses carried out so far confirm that WFP's food assistance is targeted at the most vulnerable groups.

A monthly average of 466 monitoring visits were carried out between January and August 2004. Although this is slightly less than the 485 monthly average during the corresponding period in 2003, the cancellation rate for previously-agreed monitoring visits has continued to be less than 1 percent, as it was in 2003.

It is hoped that these positive trends will serve as basis to further strengthen the collection of quantitative and qualitative information and the integration of this mechanism in WFP's routine monitoring activities.

APPENDIX A: Background Tables and Figures.

Table A1: Revised – Actual production of winter and spring crops 2003/04 (area in 000 ha, yield in t/ha, and production in 000 t)

Province	Winter wheat			Spring barley			Spring potato			Total	
	Area	Yield	Prod.	Area	Yield	Prod.	Area	Yield	Prod.	Area	Prod.
Pyongyang	3	2.3	7	1	2.1	2	0.8	2.1	2	5	11
South Pyongan	14	2.1	29	7	2.0	14	21	2.4	52	42	95
North Pyongan	13	2.2	29	9	2.0	19	19	2.0	39	42	86
Jagang	0.7	2.6	2	0.3	1.8	0.5	1	2.1	3	2	5
South Hwanghae	19	2.0	37	9	2.2	18	19	2.4	46	46	102
North Hwanghae	9	2.0	17	4	1.9	8	11	2.1	23	24	48
Kangwon	4	2.4	10	1	1.9	2	7	2.0	13	12	25
South Hamgyong	5	2.4	12	2	2.0	4	15	2.1	31	22	47
North Hamgyong	0.5	2.3	1.1	0.2	1.7	0.4	4	2.0	7	4	9
Kaesong	0.9	2.0	2	0.3	2.0	0.7	0.6	2.0	1	2	4
Total	**69**	**2.1**	**146**	**34**	**2.0**	**69**	**98**	**2.2**	**216**	**201**	**431**

1/ Production in Nampo has recently been included in South Pyongan.
* Figures may not add-up exactly due to rounding.

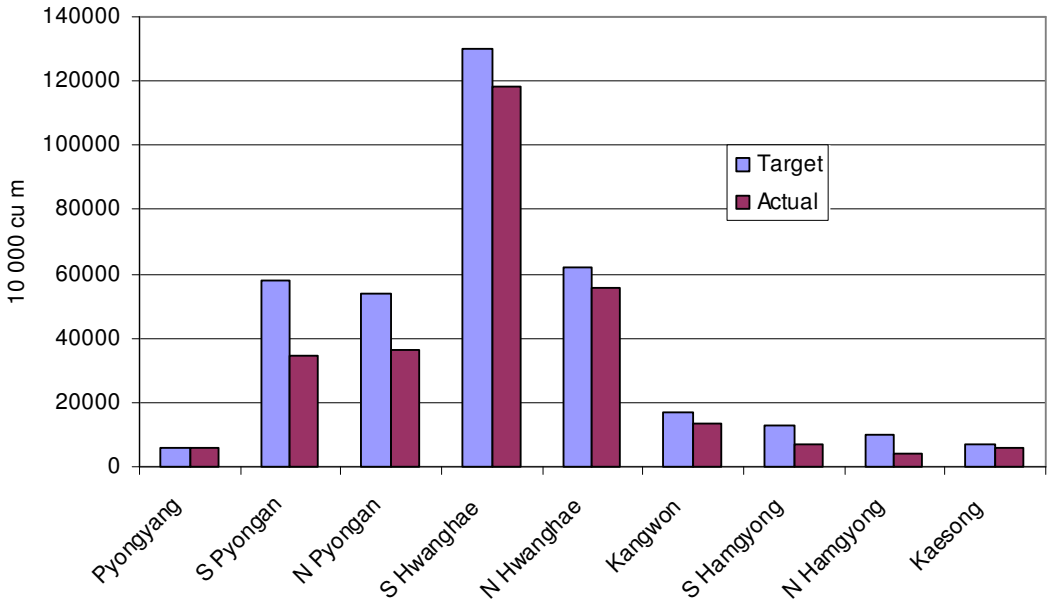
Table A2: Livestock population, DPRK 1996-2004 ('000 head)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	% change	
										2004 to 1996	2004 to 2003
Draught cattle	615	545	565	577	579	570	575	576	566	-8	-2
Pigs	2 674	1 859	2 475	2 970	3 120	3 137	3 152	3 178	3 194	+19	+<1
Sheep	248	160	165	185	185	189	170	171	171	-31	0
Goats	712	1 077	1 508	1 900	2 276	2 566	2 693	2 717	2 736	+284	+<1
Rabbits	3 056	2 740	2 795	5 202	11 475	19 455	19 482	19 576	19 677	+544	+<1
Chickens	8 871	7 547	8 965	1 0371	14 844	15 804	17 259	18 711	18 729	+111	+<1
Ducks	1 098	822	1 372	1 624	2 078	3 158	4 189	4 613	5 189	+373	+12
Geese	554	357	462	829	889	1 090	1 247	1 247	1 580	+185	+27

Table A3: DPR Korea. Use of fertilizer (nutrient tonnes) by province, 2004

Province	N	P	K
Pyongyang	5 109	1 466	1 496
South Pyongan	27 858	6 602	6 556
North Pyongan	28 075	6 510	7 144
Jagang	5 947	1 421	1 439
South Hwanghae	35 348	8 418	8 565
North Hwanghae	16 383	4 033	4 279
Kangwon	8 068	2 298	2 326
South Hamgyong	13 216	3 549	3 577
North Hamgyong	7 769	1 846	2 466
Ryanggang	4 744	1 048	1 148
Kaesong	1 007	230	232
Total	**153 524**	**37 421**	**39 228**

Figure A1: Irrigation reservoir levels, 20 September 2004



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