



GIEWS Update

The Democratic People’s Republic of Korea

Food Supply and Demand Outlook in 2020/21 (November/October)

Highlights

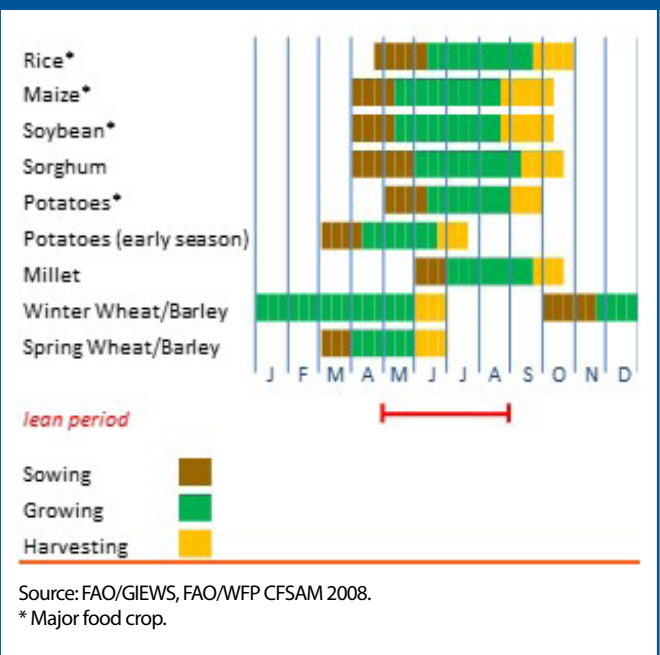
- The production of the 2020 main season crops benefitted from expanded planting, which mostly offset yield losses due to floods and storms.
- Production prospects for the 2020/21 minor early season winter/spring crops, for harvest in June, are generally favourable.
- The 2020/21 aggregate food crop production is forecast at a near-average level of 5.6 million tonnes.
- Cereal import requirements in the 2020/21 marketing year (November/October) are estimated at about 1.1 million tonnes, close to the five-year average.
- With commercial imports officially planned at 205 000 tonnes, the uncovered food gap is estimated at about 860 000 tonnes, equivalent to approximately 2.3 months of food use.

This note reports on the official estimates of the 2020 main season crop production and analyzes the estimates using remote sensing data on weather and vegetation conditions during the entire growing period. It also includes a conservative forecast for the production of the 2020/21 minor early season winter/spring crops, to be harvested by June 2021 and presents the national food balance sheet showing a forecast for food import requirements (in cereal equivalent) for the 2020/21 marketing year (November/October).

Climatic conditions during the 2020 main cropping season

As shown in the Crop calendar (Figure 1), the 2020 main cropping season started in April and, with the arrival of the spring rains and the increase in temperatures, the harvest took place between September and October.

Figure 1: Democratic People’s Republic of Korea - Crop calendar

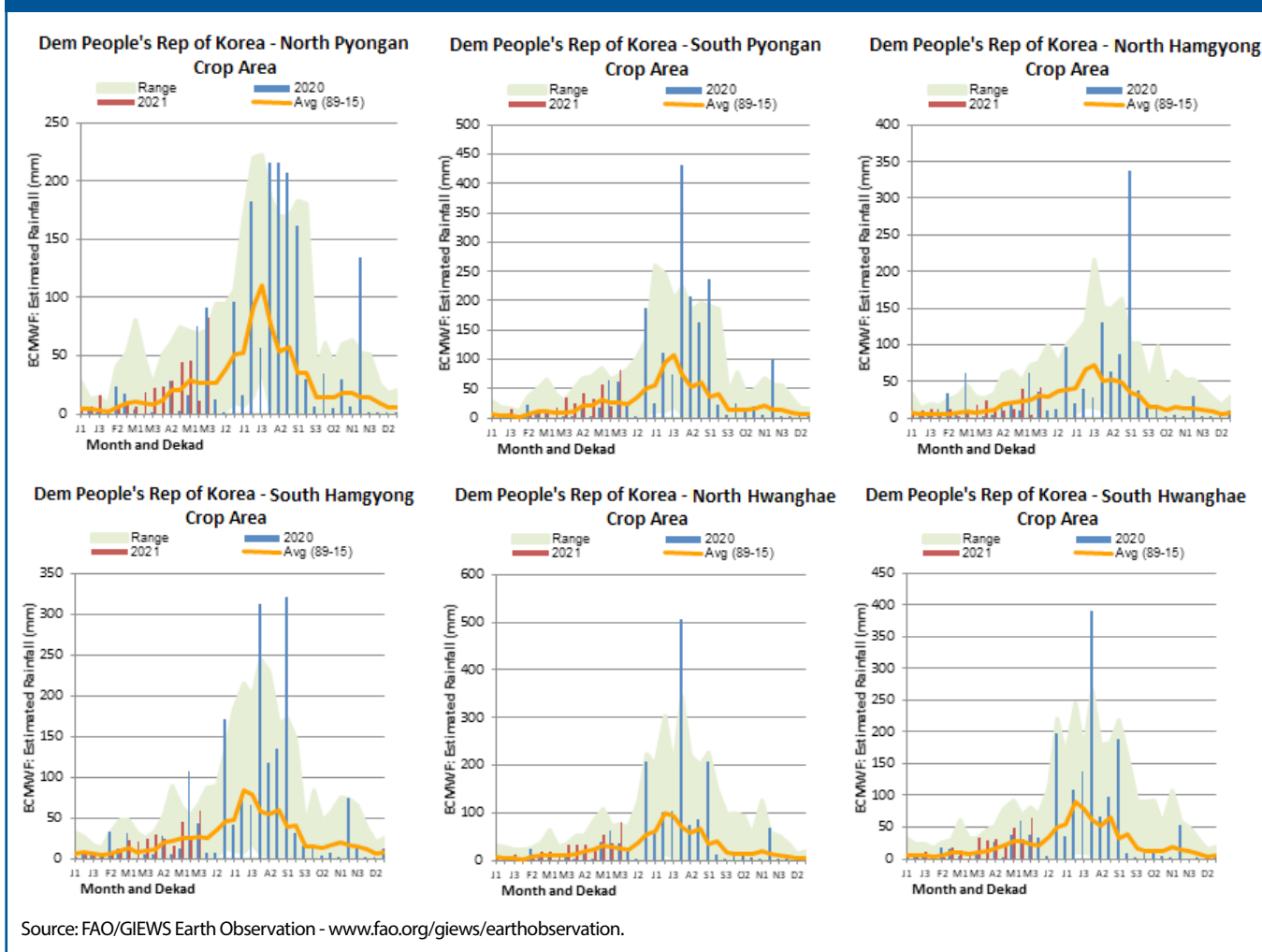


During the season, weather conditions have been generally unfavourable.¹ Between April and early May 2020, rainfall amounts were below average in the main cereal producing areas, causing some delays in planting activities for the early-planted crops. Rains improved from mid-May and precipitation amounts were adequate and well distributed until July, supporting planting activities and benefitting germination of crops in most parts of the country. Subsequently, a succession of typhoons and heavy rains from early August to early September 2020 (Figure 2), triggered localized flooding, excess soil moisture and waterlogging which affected standing crops at the final stages of development. According to remote sensing data, the levels of surface soil moisture in August were close to the 30-year

maximum in the western key cereal producing areas, including the provinces of North and South Hwanghae as well as North and South Pyongan. From mid-September until the end of October, rains were average to slightly below average, reducing the excess of soil moisture and allowing farmers to harvest.

The 2020/21 minor early season winter/spring crops, mostly wheat and barley, were sown last October–November and are expected to be harvested in June 2021. After the near-average precipitation amounts in October, drier-than-average weather conditions were registered until mid-January over most cropping areas in the southern main crop producing areas, below-average precipitations persisted until mid-February. Precipitation amounts

Figure 2: Democratic People's Republic of Korea - Rainfall amounts compared with Long Term Average (LTA)
(January 2020–April 2021)



¹ The weather conditions analysis is based FAO's data on Remote Sensing Rainfall Estimates (RFEs) and Vegetation Health Index (VHI) as well as satellite images and information elaborated by the Joint Research Centre (JRC) of the European Commission.

were adequate and well distributed from mid-February, when seeds started breaking dormancy, until mid-April, benefitting crop germination and early development.

Harvested area

Based on official data provided by the Ministry of Agriculture (MoA), the total harvested area with the 2020 main crops is officially estimated at 1.3 million hectares, about 5 percent above the five-year average (Table 1). Area increases were registered for all main season crops, with the exception of rice and potatoes. The area planted with rice in 2020 is estimated at 470 000 tonnes, close to the five-year average. Since 2015, the acreage with rice has gradually decreased as farmers opted for other crops with relatively lower water requirements, including soybeans, sorghum and millet. The area harvested with maize is estimated at 583 000 tonnes, 10 percent higher than the five-year average, while planting of soybeans continued to increase for the third consecutive year reaching

a record level of 164 000 hectares. Overall, the acreage with protein-rich soybeans has been on an increasing trend since 2013 reflecting government efforts to enhance nutrition security and diet diversity. Similarly, the area harvested with drought-tolerant cereals, like sorghum, buckwheat and millet is estimated well above the five-year average (Table 4), continuing the increasing trend that started in 2015.

Based on the area harvested during the last five years, FAO tentatively estimates the acreage of the early season crops (wheat, barley and potatoes) for the 2020/21 minor early season winter/spring crops close to the near-average level.

Crop yields

Yields are officially estimated at particularly low levels for most crops of the 2020 main cropping season. According to rainfall data and remote sensing information, the main drivers justifying the low yields were excessive

Table 1: Democratic People's Republic of Korea - Main season rice, maize and soybeans area harvested by province in 2020/21 (000 hectares)

Province	Rice			Maize			Soybeans		
	2020/21	Five-year average (2015/16-2019/20)	2020/21 as % of five-year average	2020/21	Five-year average (2015/16-2019/20)	2020/21 as % of five-year average	2020/21	Five-year average (2015/16-2019/20)	2020/21 as % of five-year average
Pyeongyang	12.9	11.7	10	5.5	4.6	19	2.0	1.5	35
South Pyongan	70.2	69.0	2	63.5	59.8	6	16.7	19.5	-14
North Pyongan	99.4	100.6	-1	94.9	84.2	13	26.2	21.4	22
Chagang	5.8	6.1	-5	39.0	34.0	15	13.6	9.9	38
South Hwanghae	130.9	129.8	1	113.1	103.4	9	21.2	23.0	-8
North Hwanghae	32.8	31.3	5	86.3	81.7	6	17.5	16.8	4
Kangwon	15.6	17.7	-12	31.0	34.1	-9	11.0	12.0	-8
South Hamgyong	53.4	54.5	-2	57.8	50.5	14	20.9	16.7	25
North Hamgyong	24.5	25.9	-6	69.9	62.9	11	20.0	16.5	21
Ryanggang	1.4	1.4	0	10.7	10.2	5	10.0	7.9	26
Nampo City	23.4	21.4	9	11.5	9.7	19	4.5	3.8	21
TOTAL	470.3	469.3	0	583.3	528.3	10	163.7	148.8	10

Source: MoA, 2021.

Table 2: Democratic People's Republic of Korea - Main season rice, maize and soybeans yields by province in 2020/21 (tonnes/hectare)

Province	Rice (paddy terms)			Maize			Soybeans		
	2020/21	Five-year average (2015/16-2019/20)	2020/21 as % of five-year average	2020/21	Five-year average (2015/16-2019/20)	2020/21 as % of five-year average	2020/21	Five-year average (2015/16-2019/20)	2020/21 as % of five-year average
Pyongyang	5.8	6.5	-11	3.8	5.3	-28	1.6	1.6	1
South Pyongan	4.4	5.8	-24	3.5	4.2	-17	1.7	1.4	17
North Pyongan	5.8	5.1	13	5.0	4.7	6	1.8	1.7	10
Chagang	5.3	5.1	3	3.2	4.1	-21	1.7	1.5	9
South Hwanghae	3.9	4.8	-20	3.6	3.9	-6	1.2	1.4	-15
North Hwanghae	3.8	4.7	-19	3.2	3.7	-12	1.3	2.2	-42
Kangwon	2.7	4.2	-36	2.7	4.3	-38	0.7	1.4	-49
South Hamgyong	4.3	4.8	-11	3.6	4.9	-26	1.3	1.7	-25
North Hamgyong	3.9	4.2	-8	3.5	3.8	-7	1.3	1.3	-1
Rygang	3.8	3.2	17	3.4	2.5	37	1.2	0.8	57
Nampo City	4.9	5.1	-4	4.6	4.9	-6	1.7	1.7	0
TOTAL	4.4	4.9	-10	3.8	4.2	-9	1.4	1.5	-6

Source: MoA, 2021.

soil moisture and waterlogging. Standing crops at maturity stage, just one month before the harvest, have also been affected by localized flooding due to the passage of several typhoons and heavy rainfall from early August to mid-September 2020. During the same period, the increased cloud cover has most likely reduced the photosynthesis process with a negative impact on crop development and grain filling stages. The key producing provinces of South and North Hwanghae, South Pyongan as well as South and North Hamgyong, collectively known as the country's "Cereal Bowl", registered yields well below the five-year average.

The average yield of rice in 2020 is set at 4.4 tonnes/hectare, about 10 percent lower than the five-year average (Table 2). Most provinces registered rice yield reductions, except for North Pyongan, Chagang and Rygang which were less affected by the heavy rains and

above-average rains boosted yields. A similar decline is reported for the average yield of the 2020 maize crop which is estimated at 3.8 tonnes/hectare compared to the average level of 4.2 tonnes/hectare. Yields of soybeans and other cereal crops (including sorghum, millet and buckwheat) are estimated at 1.4 and 2.5 tonnes/hectare, respectively, 6 and 13 percent below the average of the previous five years.

Regarding the 2020/21 minor early season winter/spring crops, yields are forecast by FAO at an above-average level as weather conditions have been generally favourable from October 2020 to April 2021.

Cereal production

The 2020 main season crop production is officially estimated at a near-average level of 5.1 million tonnes, in cereal equivalent and paddy terms (Table 3). For most crops, the 2020 main season output was average to

Table 3: Democratic People's Republic of Korea - Main season production of rice, maize and soybeans by province in 2020/21 (000 tonnes)

Province	Rice (paddy terms)			Maize			Soybeans		
	2020/21	Five-year average (2015/16-2019/20)	2020/21 as % of five-year average	2020/21	Five-year average (2015/16-2019/20)	2020/21 as % of five-year average	2020/21	Five-year average (2015/16-2019/20)	2020/21 as % of five-year average
Pyongyang	75.4	76.5	-1	21.2	25.3	-16	3.2	2.3	36
South Pyongan	311.9	400.0	-22	223.2	253.6	-12	27.7	27.7	0
North Pyongan	576.1	533.7	8	472.2	396.3	19	48.0	36.0	33
Chagang	30.2	30.2	0	183.0	139.3	31	22.6	14.8	53
South Hwanghae	504.6	618.4	-18	412.2	404.0	2	25.2	32.5	-22
North Hwanghae	126.6	141.8	-11	274.9	303.9	-10	22.0	30.2	-27
Kangwon	42.8	73.5	-42	83.4	147.7	-44	8.1	17.3	-53
South Hamgyong	229.3	259.7	-12	209.7	246.0	-15	27.8	28.9	-4
North Hamgyong	95.8	105.8	-9	245.7	237.2	4	25.4	22.3	14
Rygang	5.2	4.5	17	35.7	24.9	43	12.2	6.3	92
Nampo City	115.1	107.3	7	52.8	46.9	13	7.7	6.4	21
TOTAL	2 113.0	2 351.4	-10	2 214.0	2 225.1	0	229.9	224.9	2

Source: MoA, 2021.

above average as large plantings compensated for the reduction in yields. Rice production is estimated at 2.1 million tonnes (in paddy terms), 10 percent below the five-year average, essentially driven by a reduction of yields. The sharpest output declines are recorded in South Pyongan, South and North Hwanghae, North and South Hamgyong provinces, which together account for about 60 percent of the total rice output. The output of the main season maize crop is estimated at 2.2 million tonnes, close to the five-year average, while production of soybeans is slightly above average at 230 000 tonnes. Production of potatoes is estimated well above the five-year average, mostly driven by area expansions, while the output of other minor crops declined reflecting yield reductions.

The output of the 2020/21 early season crops is forecast at an above-average level of 466 000 tonnes (Table 4).

Food crop supply/demand balance

The national food crop supply/demand balance for marketing year 2020/21 (November/October) is summarized in Table 5. It considers rice (in milled terms), maize, wheat, barley, other minor cereals, plus soybeans and potatoes (both in cereal equivalent) and is based on the following assumptions:

- Total food production (rice in milled terms, soybeans and potatoes in cereal equivalent) is estimated at about 4.9 million tonnes, including a preliminary forecast of 466 000 tonnes for the 2020/21 early crops (wheat, barley and potatoes) to be harvested by mid-June 2021.
- Food use is estimated at 4.5 million tonnes, using the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) projected 2021 mid-year population of 25.9 million and a per capita average

Table 4: Democratic People's Republic of Korea - Comparison between 2020/21 and five-year average of national area harvested, yields and production disaggregated by main and early season food crops

	2020/21			Five-year average (2015/16-2019/20)			Change 2020/21 vs. five-year average (2015/16-2019/20)		
	Area	Yields	Production	Area	Yields	Production	Area (%)	Yields (%)	Production (%)
Main season	1 317	3.9	5 095	1 250	4.2	5 216	5	-7	-2
Rice (paddy terms)	470	4.5	2 113	469	5.0	2 351	0	-10	-10
Maize	583	3.8	2 214	535	4.2	2 225	9	-9	0
Other cereals	65	2.5	161	61	2.8	171	6	-13	-6
Potatoes ^{1/}	34	11.0	377	35	7.0	244	-2	57	54
Soybeans	164	1.4	230	149	1.5	225	10	-6	2
Minor early season^{2/} (winter/spring wheat, barley and potatoes)	186	2.5	466	182	2.2	396	3	15	18
TOTAL NATIONAL	1 504	3.7	5 561	1 432	3.9	5 612	5	-6	-1

Source: MoA, 2021.

Note: Area in 000 hectares, yields in tonnes/hectare and production in 000 tonnes.

^{1/} Potatoes in cereal equivalent at 25 percent conversion rate.

^{2/} Including a small amount of the main wheat and barley crops grown mainly in North and South Hamgyong, and Ryanggang provinces.

consumption of about 175 kg of cereals, potatoes and soybeans. The adopted consumption rate corresponds to an average daily intake of about 480 gr/capita and is consistent with the apparent per capita national consumption of the previous five years based on data from the cereal balance sheets maintained by the Global Information and Early Warning System on Food and Agriculture (GIEWS). The adopted consumption rate represents about 1 700 kcal/pp/day, which may vary slightly depending on the diversity of the crop intake and it assumes that the remaining energy and other nutrient needs are derived from vegetables, fish, eggs, meat, milk, etc. Consumption rates by crop have been then adjusted in order to match with the estimated commodity availability during the current marketing year and to maintain a zero balance for the non-traded commodities such as other cereals and potatoes. Per capita consumption comprises 62 kg of rice (milled), 75.5 kg of maize, 8 kg of wheat/barley, 4.8 kg of other cereals, plus 16.1 kg of potatoes and 9.2 kg of soybeans (both in cereal equivalent).

- No changes in the food stock levels are foreseen during the 2020/21 marketing year (November/October).
- Feed use is forecast at a conservative level of 175 000 tonnes, including 137 000 tonnes of maize and 38 000 tonnes of potatoes, similar to the previous years' levels.
- Seed requirements for the 2020/21 seasons are estimated at about 213 000 tonnes on the basis of the recommended seed rates used. The following seed rates have been used: 97.5 kg/hectare for paddy, 51 kg/hectare for maize, 200 kg/hectare for wheat, barley and other cereals, 500 kg/hectare for potatoes and 60 kg/hectare for soybeans.
- Post-harvest losses, from harvesting to processing and during storage, are estimated at about 1 million tonnes, with rates ranging from 20–22 percent for cereals, 30 percent for potatoes and 10 percent for soybeans. These rates have already been used in the 2019 FAO/WFP Rapid Food Security Assessment Mission.

As in previous years, the total utilization exceeds the domestic availability of cereals, soybeans and potatoes and the total import requirements (in cereal equivalent) are estimated at about 1.1 million tonnes for the 2020/21 marketing year (November/October). With commercial imports officially planned at 205 000 tonnes,

the uncovered food gap is estimated at about 860 000 tonnes, equivalent to approximately 2.3 months of food use. If this gap is not adequately covered through commercial imports and/or food aid, households could experience an harsh lean period between August and October 2021.

Table 5: Democratic People's Republic of Korea - Food balance sheet for 2020/21 marketing year, November/October (000 tonnes)

	Rice (milled) ^{1/}	Maize	Wheat and barley	Other cereals	Potatoes ^{2/}	Soybeans ^{3/}	TOTAL
Domestic availability	1 395	2 214	146	161	697	276	4 889
Main season production	1 395	2 214	-	161	377	276	4 423
Winter/spring production	-	-	146	-	320	-	466
Total utilization	1 930	2 636	252	161	697	276	5 952
Food use	1 605	1 954	207	124	413	238	4 541
Feed use	-	137	-	-	38	-	175
Seed requirements	46	58	14	13	72	10	213
Post-harvest losses	279	487	31	24	174	28	1 023
Stock build-up	0	0	0	0	0	0	0
Import requirements	535	407	106	0	0	0	1 063
Anticipated commercial imports	-	-	-	-	-	-	205
Uncovered deficit	-	-	-	-	-	-	858

Source: MoA, 2021.

Note: Figures may not add up due to rounding.

^{1/} Paddy to rice milling rate of 66 percent.

^{2/} Potatoes in cereal equivalent at 0.25 percent conversion rate.

^{3/} Soybeans in cereal equivalent at 1.2 percent conversion rate.

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