Islamic Republic of Afghanistan

National Statistics and Information Authority (NSIA)

Geo-Spatial Information Management General Deputy Directorate

AGRICULTURAL PROSPECTIVE REPORT

June 2019

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Summary:

Wheat is one of the important agricultural crops and the main source of nutrition for the people of our country. That is why wheat is widely grown by famers throughout Afghanistan. Wheat cultivation and production, especially in rainfed areas, is directly dependent upon adequate and timely precipitation. In order to collect data and information about these crops, an agricultural survey was conducted jointly between the National Statistics and Information Authority and Ministry of Agriculture, Irrigation and Livestock in coordination with implementing partners. Two fundamental methods were employed in implementation of this survey.

- ✓ Crop Area Estimation using Remote Sensing technology
- ✓ Conducting field survey and GPS data collection from various crops.

Wheat production during the current year is a high yield year both in Afghanistan and the region. For this year, global agriculture oversight group has estimated the world wheat production at 777.49 million metric tons showing a 50 million metric tons of surplus compared to last year.

During the current year, the agriculture field (irrigated and rainfed) and wheat cultivation area has increased and the total wheat production for Afghanistan is estimated above 5.1 million metric tons showing 1.52 million metric tons increase compared to last year. This is the highest production point for the country in the last 13 years.

It is estimated that the demand for wheat in Afghanistan will be around 6 million metric tons for this year. Based on these figures, we can say that the country will be facing a wheat deficit of around 1 million metric ton for the year.

Wheat wastage of the current year is estimated to be around 0.7 million metric tons comprising 15% of total production. This amount of wastage in wheat production is massive and concerning.

Data suggest that rangeland areas will be in good condition from a quantitative point of view in the country, which will also have a direct positive impact on livestock prices in the provinces. It is worth mentioning that livestock prices will increase in the run up to Eid-ul-Adha.

Comparison of Cultivated Areas and Production between the Years 2018 and 2019

No.	Crop	2018		2019		Percentage of changes in cultivated areas between 2018 and 2019	
		Area (thousand hectares)	Production (thousand hectares)	Area (thousand hectares)	Production (thousand hectares)	Area	Production
1	Total cultivated area	2277		3300		449	
2	Irrigated area	1906		2201		15.5	
3	Rainfed area	368		1100		198.9	
4	Irrigated wheat cultivation area	1342	3440	1619.76	4233.84	20.7	23.1
5	Rainfed wheat cultivation area	293	172	1086.73	901.44	270.9	424.1
6	Total wheat cultivation area	1635	3613	2706.49	5135.28	65.5	42.1

Preamble:

Based on the presidential decree #628 dated 30/4/1397 which called for further coordination between National Statistics and Information Authority and Ministry of Agriculture, Irrigation and Livestock in presenting data and information as well as in data collection and reporting methods, a memorandum of understanding was signed between the two agencies based on which joint surveys, from designing phase all the way to reporting phase, were conducted by the two aforementioned Authoritys especially on wheat, the results of which are presented hereunder.

It is worth mentioning that in the past parallel surveys would be conducted by our international counterparts (with a lower degree of coordination); however, during the current year, the same was coordinated by, and performed under the stewardship of, National Statistics and Information Authority which led to stronger coordination, preventing wastage of financial and human resource, and presentation of unified and precise statistics in the relevant field. WFP, FAO and FEWSNET are to thank for coordination and joint efforts directed toward implementation of this survey. Some of the important resources utilized in developing this report include the following:

1. Interpretation of satellite imagery with resolution of 0.5 m and 10 m.
2. Conducting land surveys and noting the coordinate points of cultivated areas of wheat and other crops.
3. Interview with provincial agriculture agencies.
4. Interview with community councils and farmers.

Goals

The goal of this report is to present a comprehensive picture of agriculture throughout the country during the year 1398. Specifically, this report includes the following:

- An estimate of irrigated and rainfed cultivated areas by province;
- Estimating total wheat production at provincial and district levels;
- The country's wheat balance sheet;
- An overall picture of the increase and/or decrease of wheat production in the country;
- Information about natural disasters which have destroyed agricultural fields;

- The impact of the recent precipitation (to include snow and rain) on the status of agriculture; and
- The effects of the prevailing circumstances on the prices of livestock and rangeland areas around the country.

Methodology:

Two methods, i.e. data collection and interpretation of satellite imagery using GIS and remote sensing, as well as field surveys, were used to gather the data required, a snapshot of which is provided below:

1. Using European Union's satellite (Sentinel-2) imagery to estimate the cultivated areas

This method uses satellite imagery to constantly monitor surveillance of cultivated areas (from cultivation to harvesting phase) where assessment and analysis is done based on NDVI differences (figure 2).

2. Using high resolution satellite imagery to distinguish wheat fields from other crops

In order to differentiate between wheat cultivated areas and other crops existing in the area, high resolution satellite images (50 cm) were used in line with the provisions of a memorandum of understanding signed between UNODC and National Statistics and Information Authority (figure 1).

Figure 1: An image of mixed wheat, poppy, fodder cultivation area and gardens

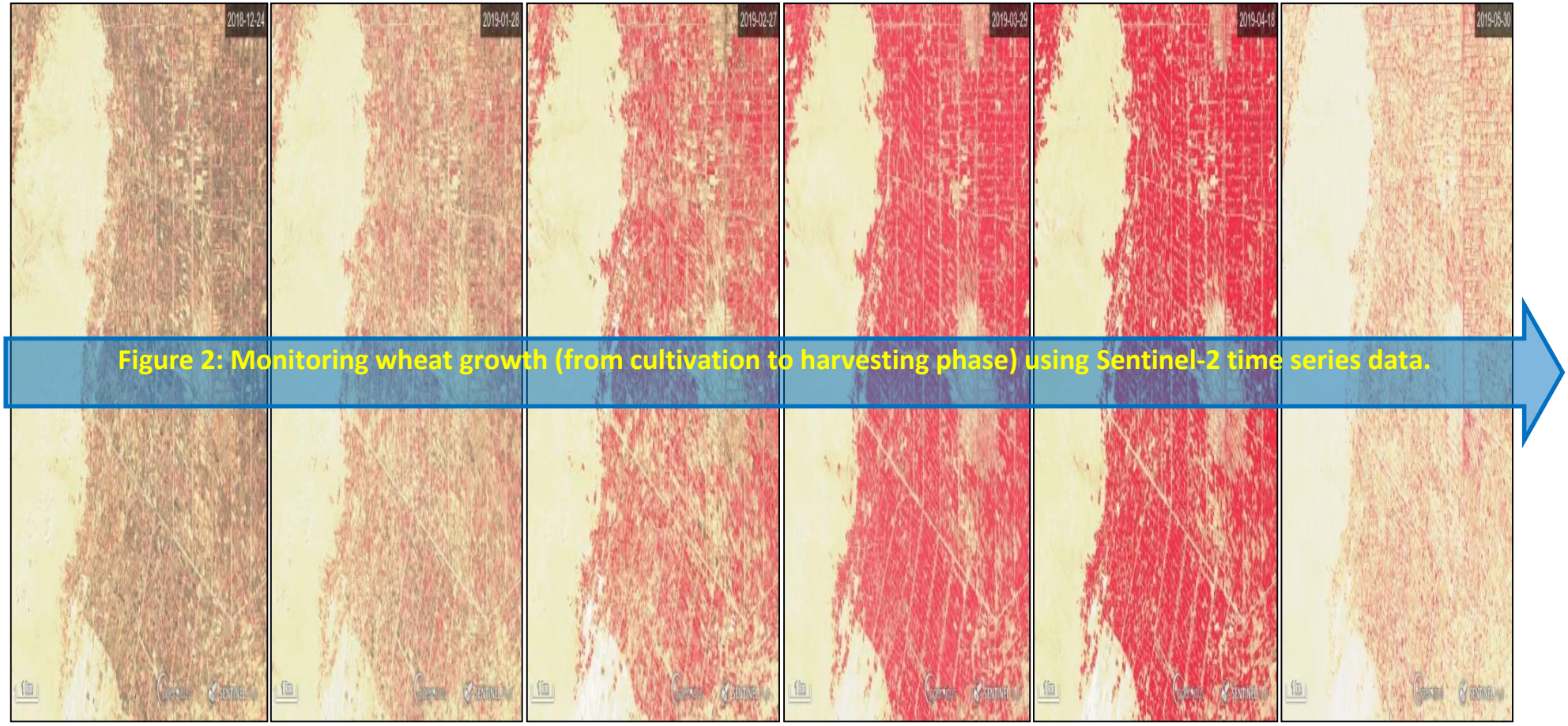


Figure 2: Monitoring wheat growth (from cultivation to harvesting phase) using Sentinel-2 time series data.

1. Collecting coordinate points in order to determine and verify wheat cultivated areas

In order to determine and verify agricultural fields cultivated with wheat, around 1,530 coordinate points were collected from areas cultivated with wheat and other seasonal crops at 32 provinces, and used for identifying wheat fields.

2. Conducting survey in order to collect statistical data from farmers and community councils.

Preharvest survey was conducted jointly by National Statistics and Information Authority and Ministry of Agriculture, Irrigation and Livestock in 32 provinces and 187 districts, aimed at collecting information from farmers and community councils.

The sampling work of this survey was done using the enumeration method which, fortunately, was updated in 2019 by geographical information managment unit of National Statistics and Information Authority taking into account the new satellite imagery and topographical maps.

In order to perform the mentioned agricultural survey in the best possible manner in the area, as a first step the sample agricultural framework was developed and then, based on stratified, two-stage cluster method, sampling points with farms on them were singled out and thus samples were chosen in each province. It is worth mentioning that a total of 23,060 sampling points were chosen in rural areas. Also, there are a total of 74,213 farmlands around the country based on NDVI data which covers all the irrigated and rainfed farmlands in the country. Of these a total of 1,991farmlands were chosen on a random basis which encompass 4,342 communities. The goal involved interviewing five farmers separately as well as an interview with the head of the community council in every community.

An Overview of the Agro-Meteorological State of the Country

Precipitation

Based on NOAA`s satellite data, the mean cumulative precipitation over the past six months averaged around 334 mm in Afghanistan. Most of the precipitation took place in central provinces where the precipitation totals averaged at 600 mm. Similarly, the lowest amount of precipitation took place at Nimroz, Farah, Helmand, Kandahar and Ghazni provinces with 100 mm total (figure 3).

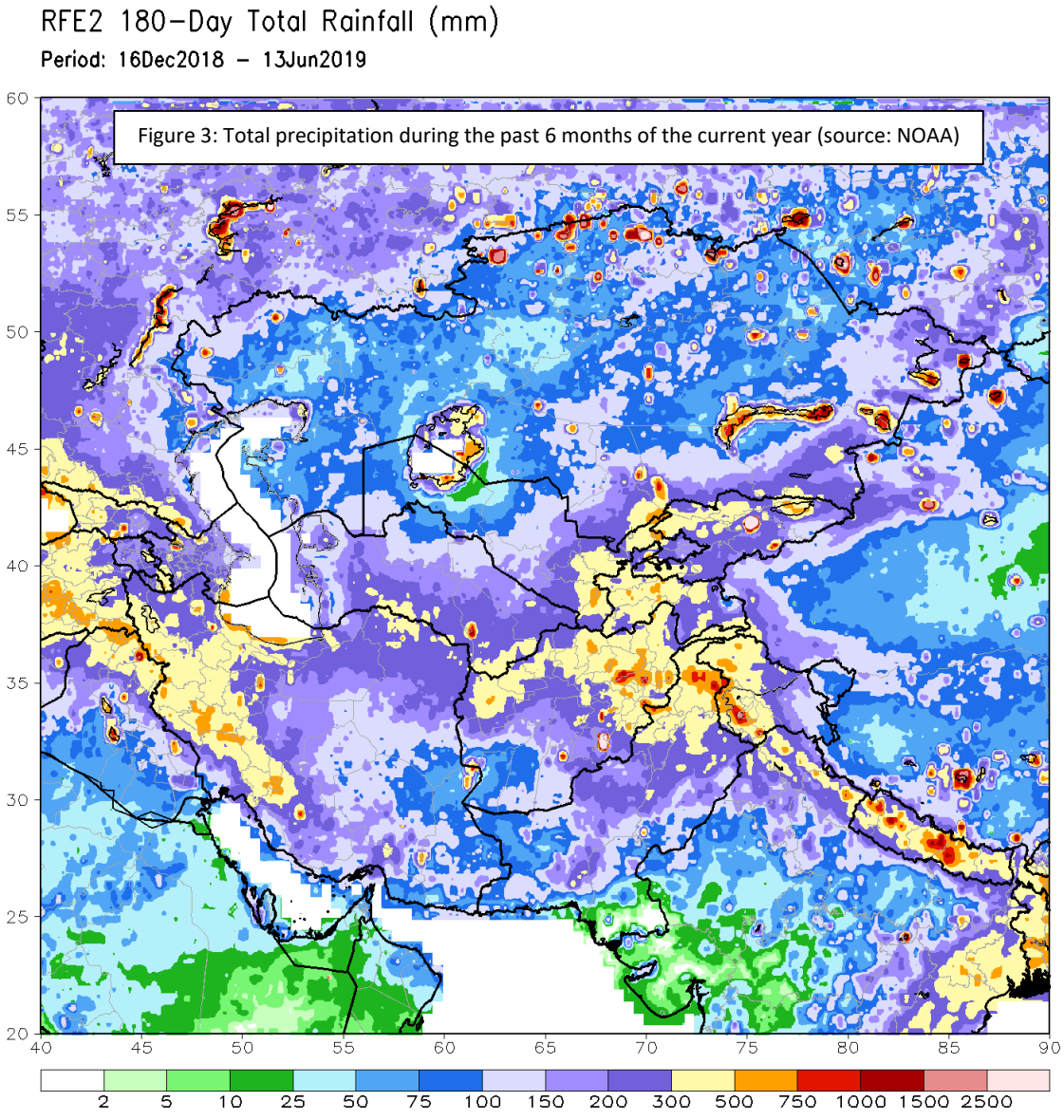


Figure 3: Total precipitation during the past 6 months of the current year (source: NOAA)

Temperature:

According to the FEWSNET data, overall the mean daily temperature, over a three month period all over the country, was lower compared to the relevant short term average (2004 – 2008) except in the northern provinces of Baghlan, Balkh, Jawzjan, Kunduz, Samangan, Sar-e-Pol and Takhar. Figure 4 gives more details.

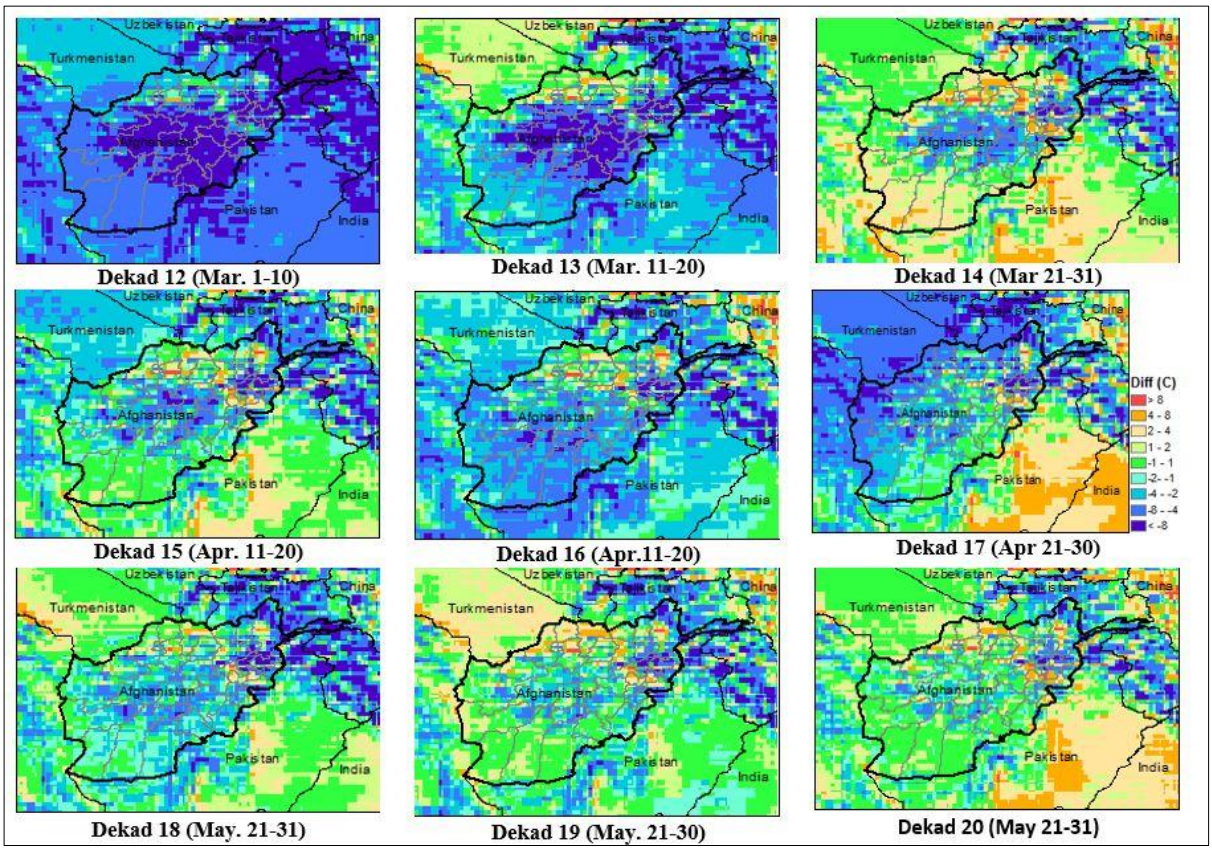


Figure 4: Comparison of temperature over the past three months against the average of 2004 - 2008

In order to gauge the effect of precipitation and temperature on the country's agricultural status, and with a view to compare current year's NDVI (irrigated, rainfed farms and rangeland areas) with last year, MODIS satellite imagery was utlizied. In conclusion, it is inferred that seasonal precipitation caused the NDVI to increase considerably in all parts of the country especially in Takhar, Kunduz, Baghlan, Samangan, Balkh, Jawzjan, Faryab, Sar-e-Pol, Badghis, and Herat provinces. The relevant statistics are illustrated in the following figures.

The State of Irrigated and Rainfed Lands and Rangelands:

Satellite images received from USGS, which enable us to calculate the NDVI in irrigated and rainfed lands and rangeland areas during the first ten days of each month, shows outstanding coverage for Kunduz, Baghlan, Balkgh, Samangan, Jawzjan, Faryab, Badghis, Herat, Sar-e-Pol, Ghor and Badakhshan provinces (Figures 5, 6 and 7).

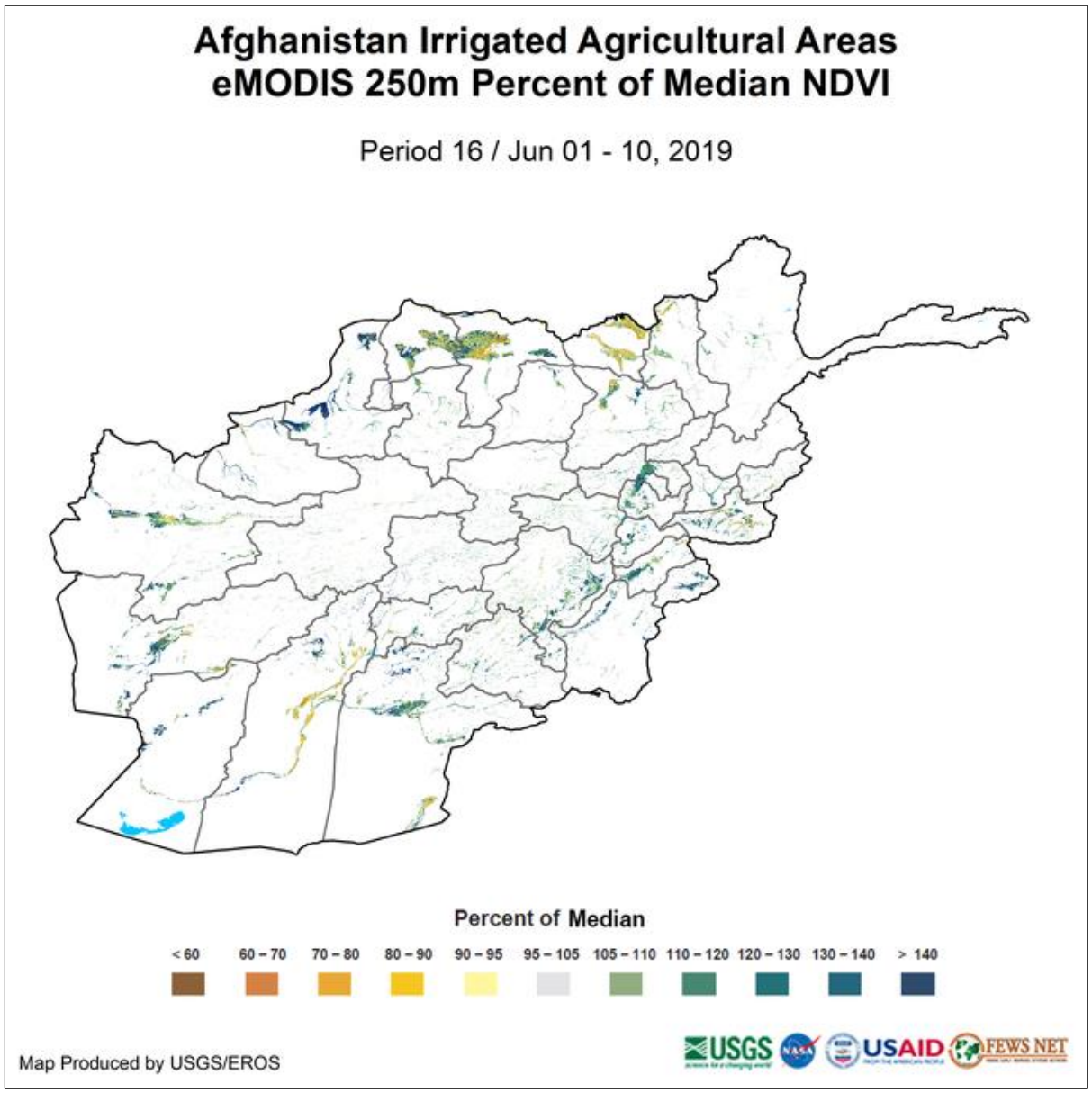


Figure 5: NDVI for irrigated land in Afghanistan during June 2019

Rainfed agriculture follows the irrigated agriculture pattern in the country. That is why most of these areas showed above normal conditions from March through June during this year. The northern and central parts of Afghanistan (Faryab and Jawzjan) which saw a remarkably mid-level delayed

precipitation during the first part season (April), were an exception to above. However, during the peak growth phase (early May), all those areas had above normal conditions.

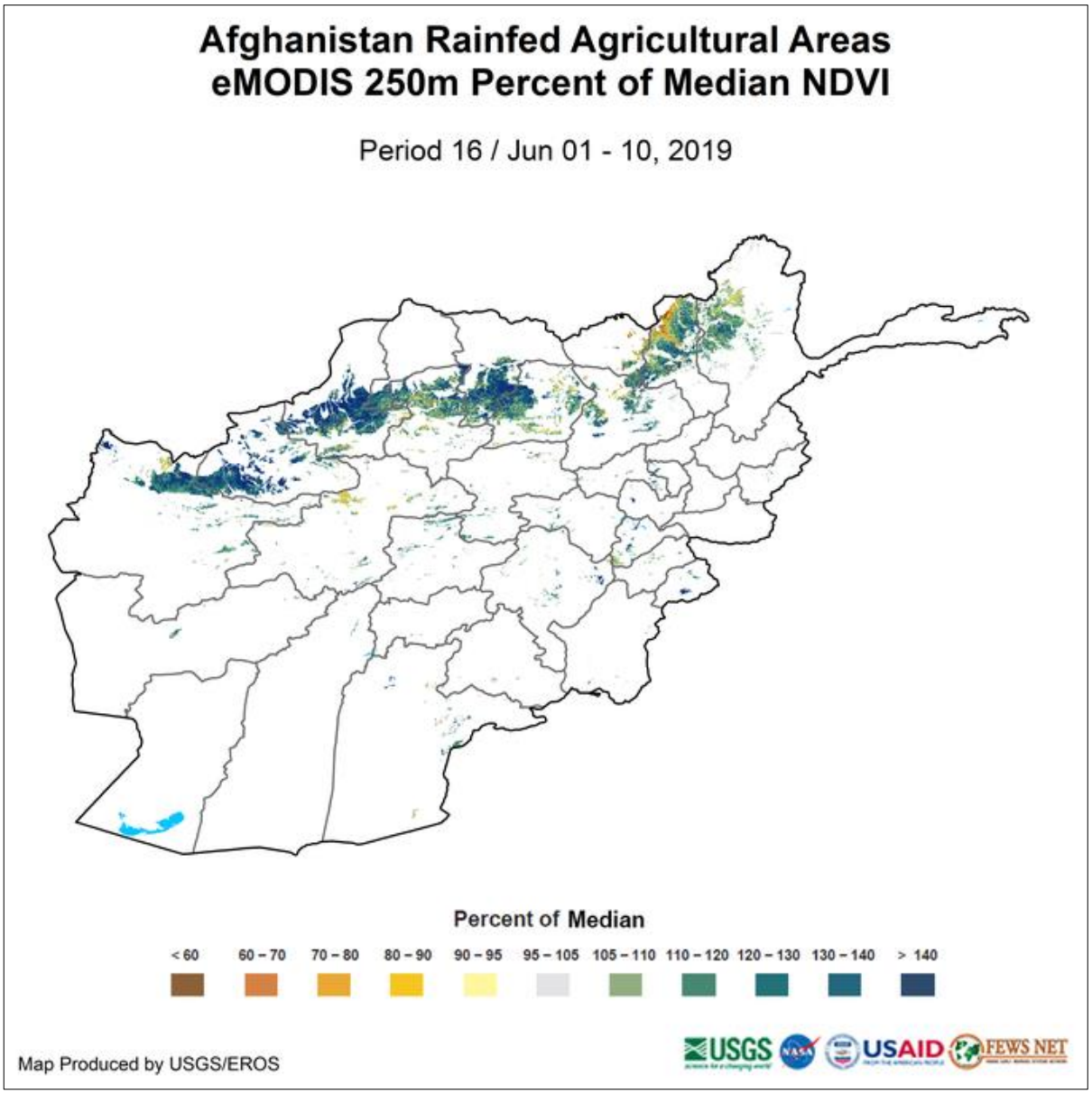


Figure 6: Rainfed agricultural areas' NDVI in Afghanistan during May 2019

Rangeland areas showed similar conditions all over the country with a growth delay only during March. However, from April onwards things took a turn for better with the conditions reaching above normal afterwards. As we know, precipitation in the beginning of the season was not a limiting factor for vegetation growth in rangeland areas because at that time adequate and widespread precipitation was in place. An analysis of temperature anomalies during the month of March shows that temperature was below normal during that period. Below average

temperature on one hand and above average snow cover until early April on the other hand might be the factors that could explain the relative delay in the growth of vegetation in rangeland areas. Abundant humidity and increased temperature in early Spring caused the botanic growth in rangeland areas to soar to exceptional levels in early June (Figure 9).

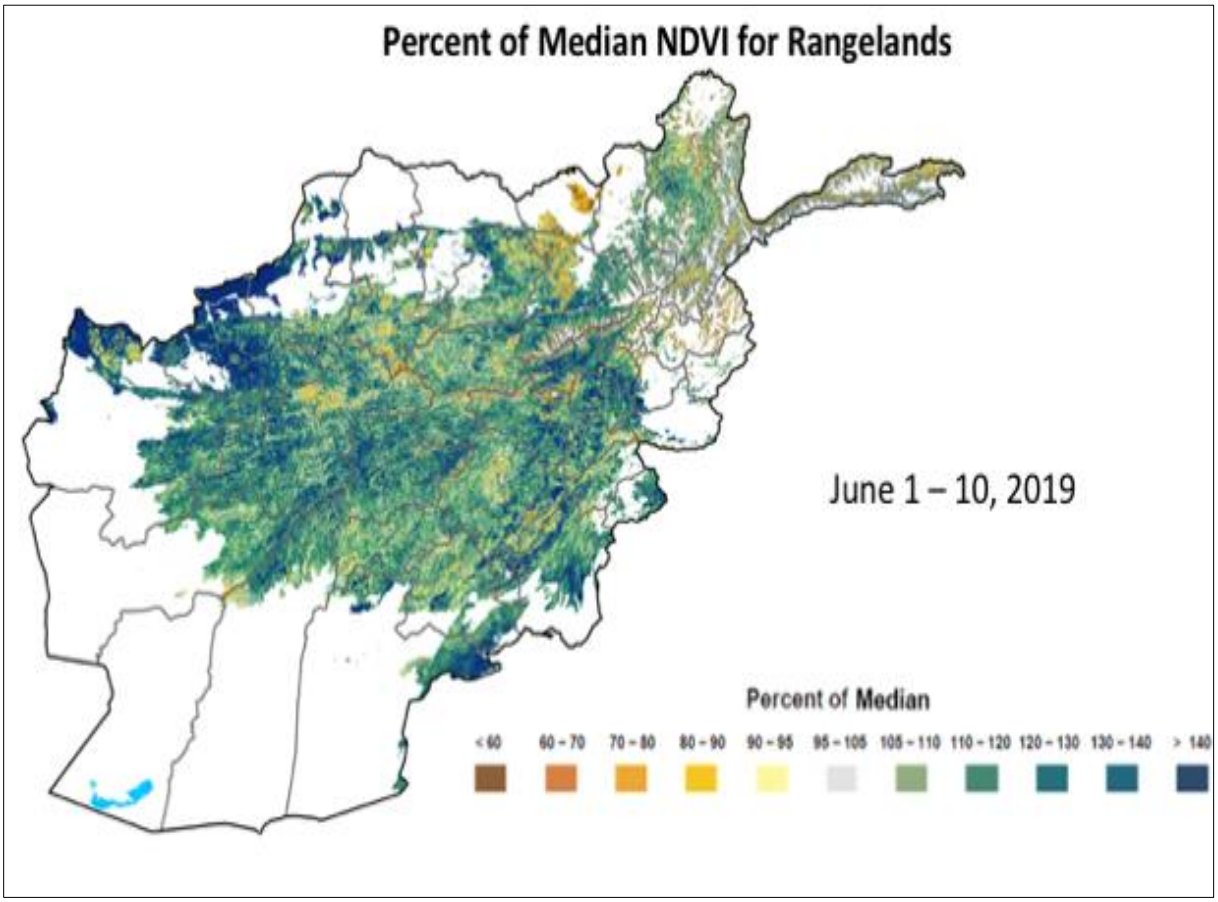
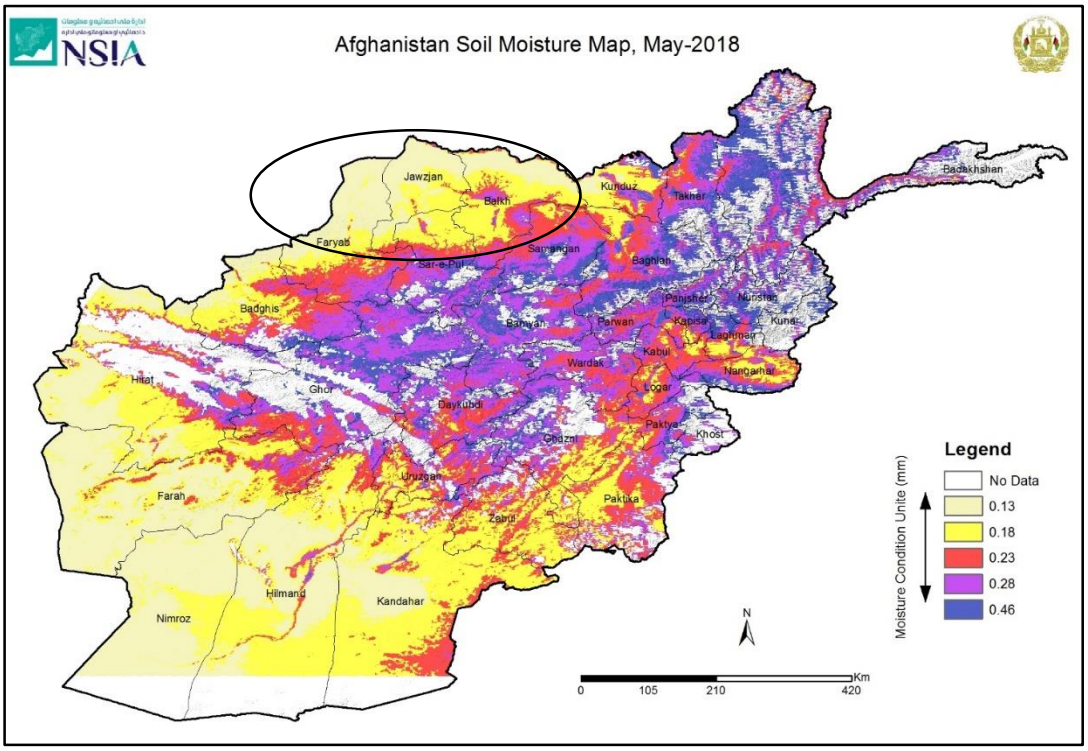
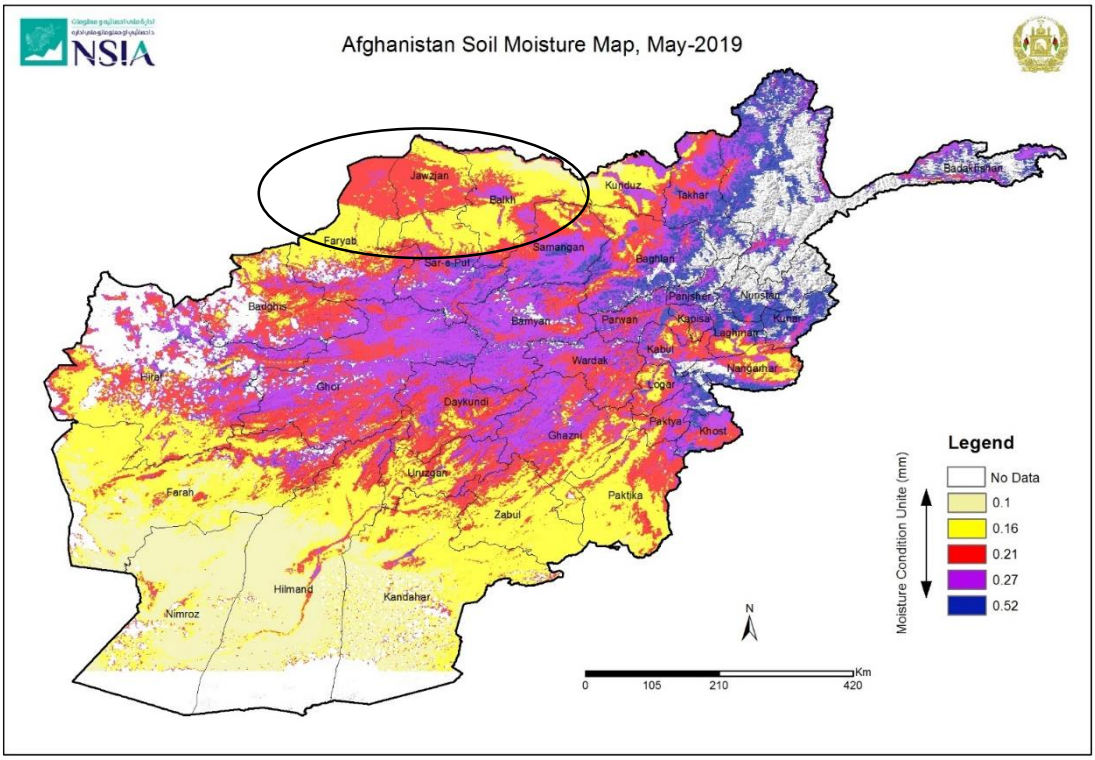


Figure 9: Extensive rangeland areas show 120% or more of median NDVI. The slight negative areas in Kunduz are at the end of the growth period and therefore very minor deficits result in negative percent anomalies.

Soil moisture:

In terms of moisture, agricultural land was highly saturated (more than 21 mm) during the current year, while last year the soil humidity index was less than 13 mm in rainfed areas in the same month. High humidity this year has contributed to better growth of rainfed wheat (figures 7 and 8).



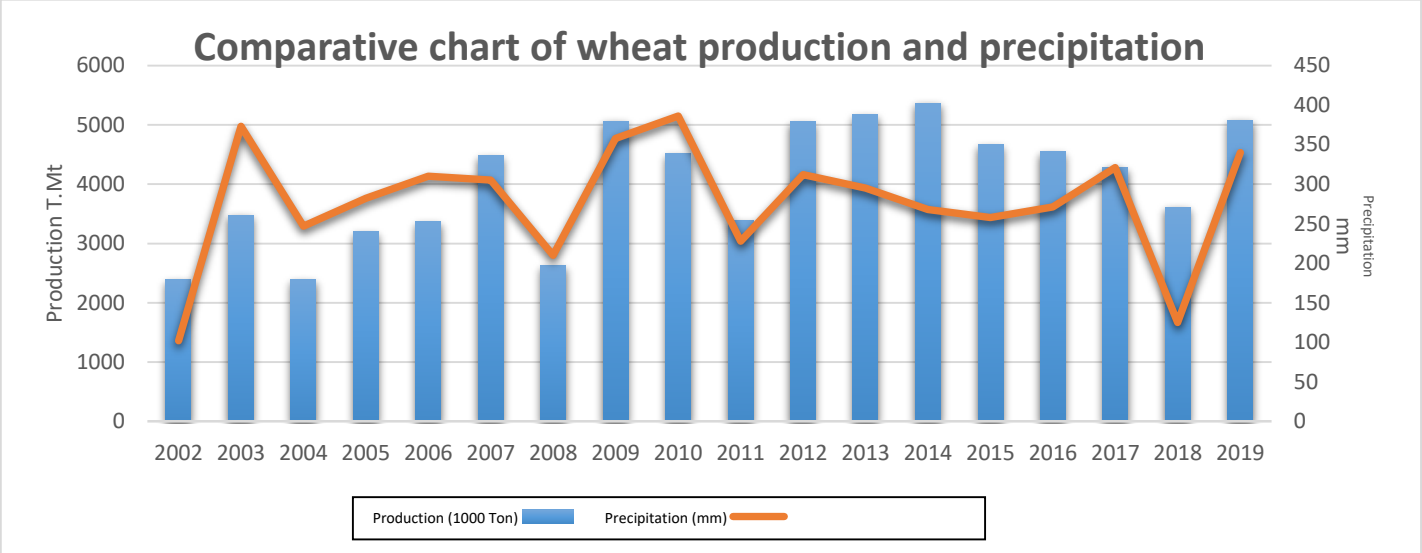


Figures 7 and 8: soil moisture index in May 2018 and 2019

Outcomes:

Wheat Production:

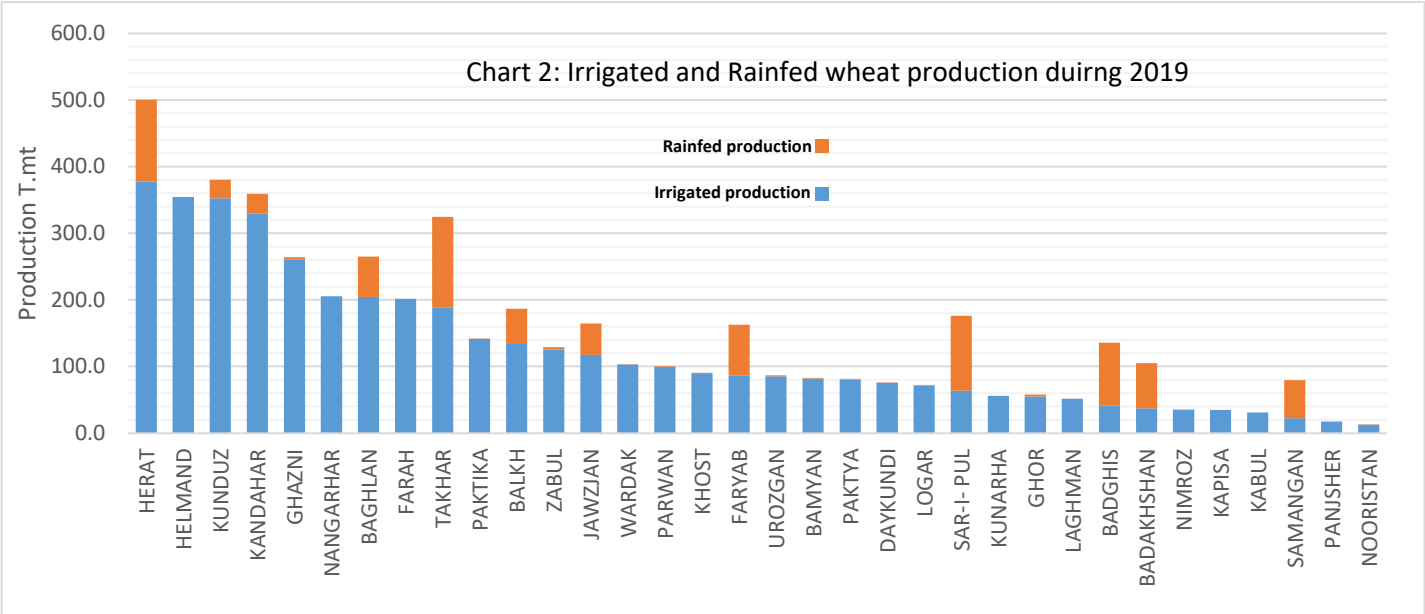
Cultivated area and wheat production in particular, especially in rainfed areas, has a direct correlation with adequate and timely precipitation. The amount, timing and scale of precipitation have provided ample conditions for cultivation and growth of growth during the current year.



(Source: Ministry of Agriculture, Irrigation and Livestock)

Based on population estimates of 2019, wheat demand in the country for the current year is calculated to be around 6 million metric tons, while wheat deficit of the country is expected to be around 1 million metric tons.

Total cultivated area (including irrigated and rainfed) is around 3.3. million hectares this year, a 1.1 million hectares increase compared to last year. The total area consists of irrigated and rainfed areas. The total area of irrigated land is 2.2. million hectares this year which shows a 350 thousand hectare increase from last year. Similarly, rainfed cultivated areas amount to 1.1 million hectares this year showing 0.8 million hectare compared to last year, while the total cultivated area during last year was an estimated 2.2 million hectares (chart 1).



During the current year, the total wheat production is estimated to top 5.1 million metric tons – a 1.52 million metric tons increase compared to last year and the biggest wheat harvest in the past 13 years.

Wheat Suplus and Deficit in Provinces

The following map classifies the provinces based on their wheat production excess or deficit. A total of 12 provinces show production excess.

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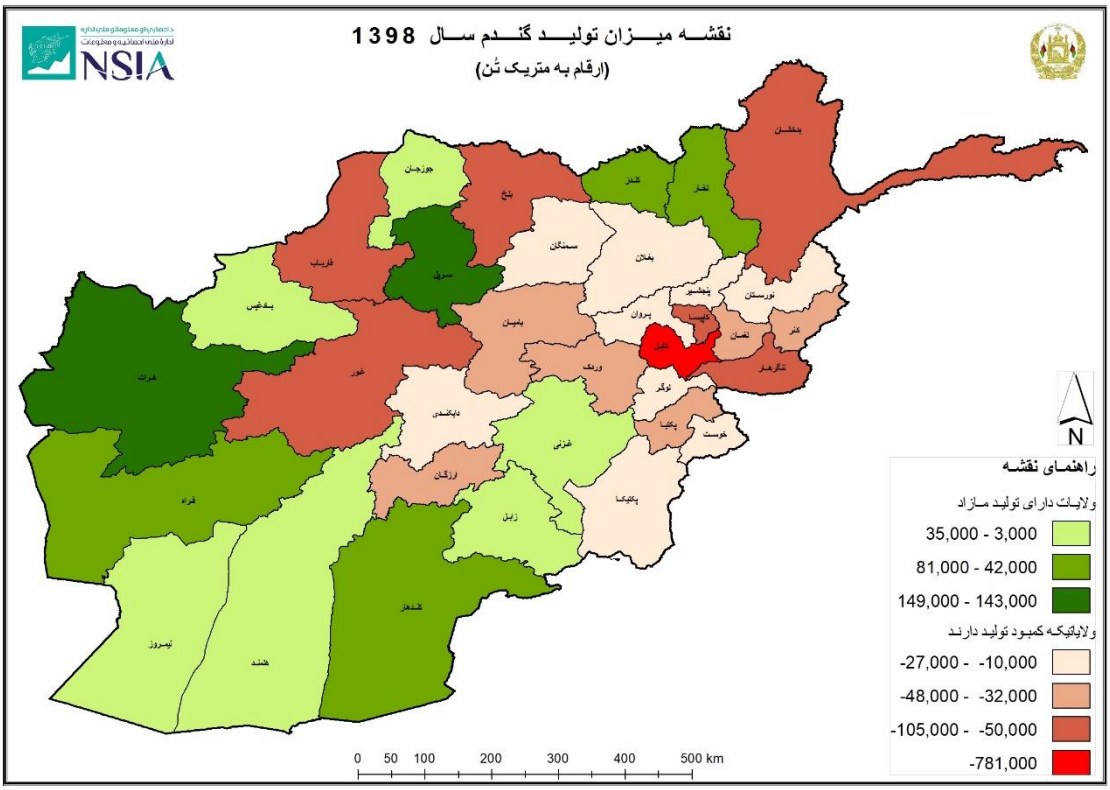
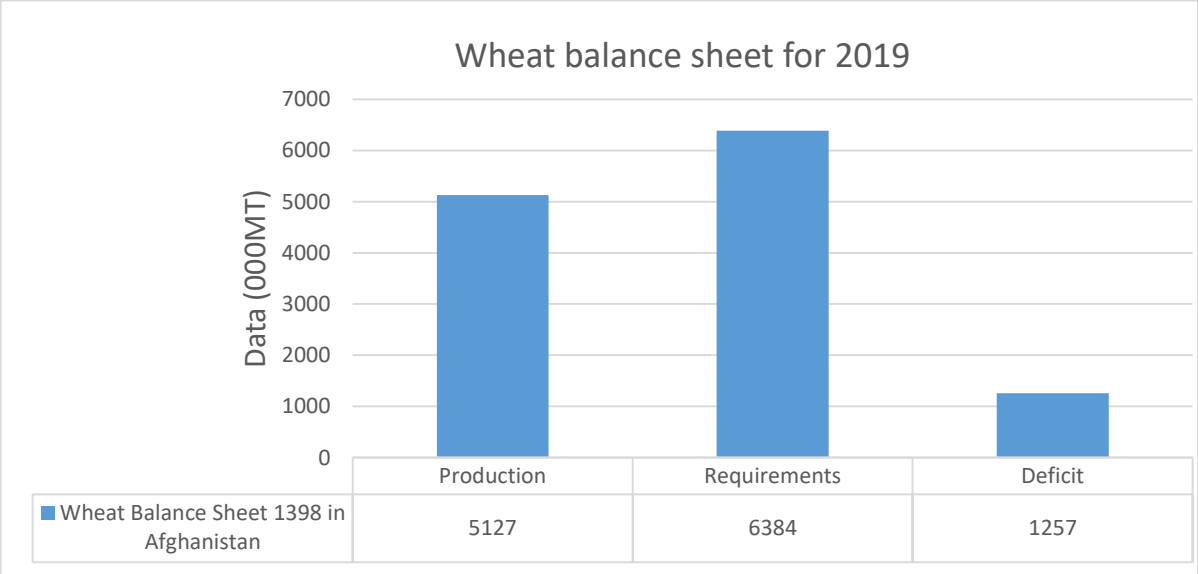


Wheat Balance Sheet for 2019:

Preharvest survey findings for 2019 indicate that the irrigated and rainfed wheat production was higher than last year. For the current year, the amount of wheat production is estimated at more than 5,135 million metric tons which shows a 42 percent increase.

Based on population estimates, around 6 million metric tons of wheat will be in demand in Afghanistan in 2019 taking into consideration the amount of wheat seeds used in the farm for cultivation and the wastages. Therefore, the deficit is supposed to be around 1 million metric tons during the current year, while last year wheat deficit was estimated to be around 2.3 million metric tons.



It is worth mentioning that the above estimates are highly accurate allowing only for a small deviation (positive or negative) in the irrigated wheat cultivation areas once the crop is harvested, and the final figures will be presented after harvests are collected.

Use of Seeds and Chemical Fertilizer:

Certified seeds and quality chemical fertilizers are among the major factors of production. Farmers have always tried to take this into consideration and use certified seeds and high-quality fertilizers in their farms especially for wheat crop which is an essential food item for the people.

Natural Disasters that Destroyed Farmlands

Pursuant to the presidential order, National Statistics and Information Authority prepared an analytical report on floods, the early warning system and vulnerable areas for 2019. The report was shared with stakeholders. According to the office of state minister for emergency preparedness, heavy rain and floods in 88 districts and 13 provinces destroyed a total of 6300.2 hectares of agricultural land which also includes 82.2 hectares of gardens and 5,100 fruit bearing and non-fruit bearing trees. However, UNOCHA reports more than 15,000 hectares of land washed off at 129 districts in 2019. (The following map shows the affected agricultural areas by hectare from 1/1/1398 through 21/3/1398 by province (Figure 10)

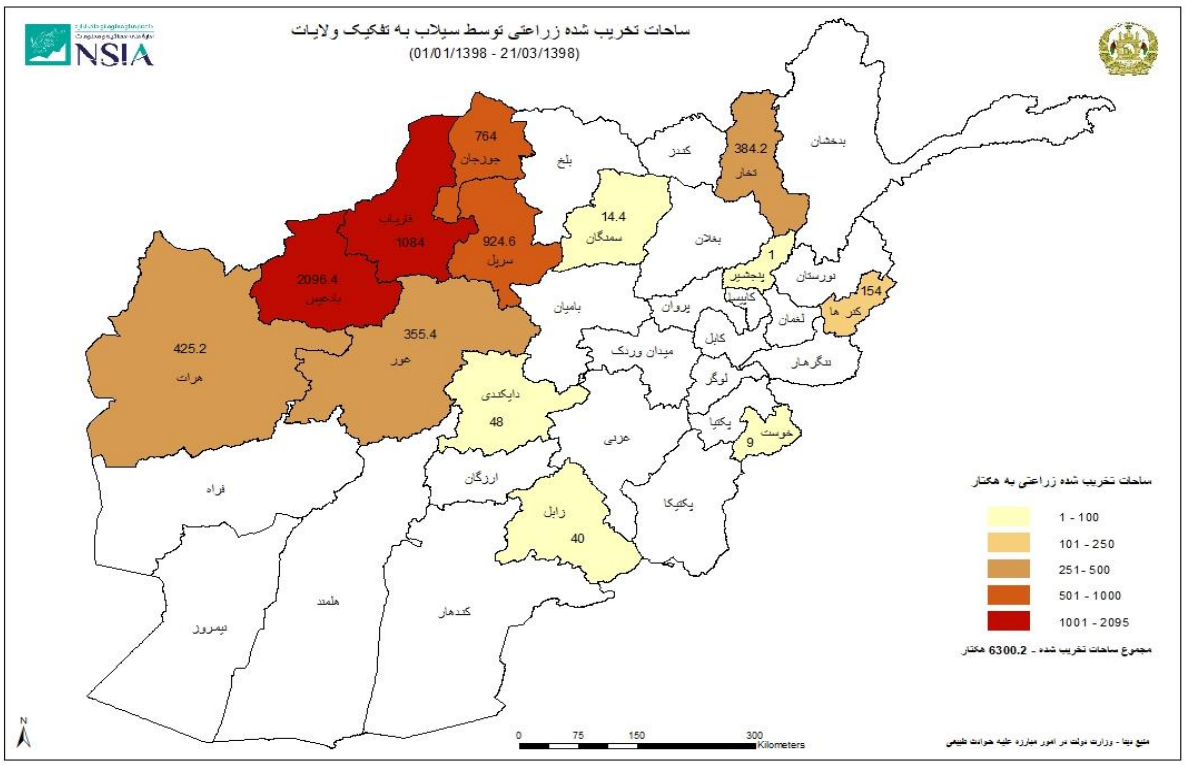


Figure 10: Statistics of the agricultural areas affected by flood in the current year

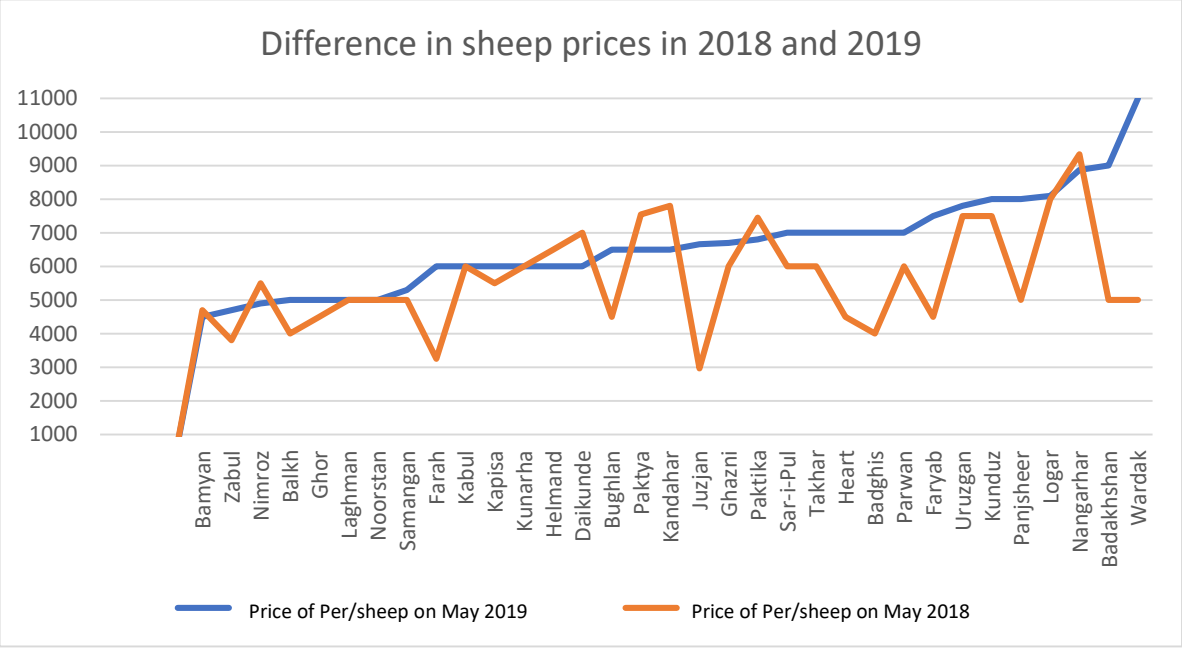
Animal Husbandry in 2019

Data collected in preharvest survey shows that 93 percent of farmers are also involved in animal husbandry, while only 53 percent of these farmers have access to veterinary services. However, as far as fodder for livestock, figures indicate that around 81 percent of farmers interviewed expressed more satisfaction with having rangelands for their livestock compared to last year. Similarly, results of interviews with community councils indicate that some 97 percent of

community councils have stated that the rangelands in their community are in good shape, while only three percent were not satisfied with the condition of their rangelands.

Over the last year sheep prices saw increase in different ranges in various provinces. The dynamics of this increase have been different for every province. The difference in sheep prices during April and May this year are indicative of an overall spike in sheep prices. Nevertheless, some provinces saw a drop in their sheep prices, though the number of such provinces is far smaller than those with an increase in sheep prices.

The following graph shows that, except for a few provinces, sheep prices have seen an increase in the majority of provinces from May 2018 to May 2019 with some provinces seeing up to two fold increase.



Sources

- *National Statistics and Information Authority*
- *Ministry of Agriculture, Irrigation and Livestock*
- *ANDMA*
- *FEWS NET*
- *GEOGLAM*
- *UNODC*
- *NOAA*
- *MODIS*
- *USDA*