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Agromet Network

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Summary

The temperature decrease for the month of July 2007 compared to the same month in 2006 is just 1°C likely lower. The temperature decreased effected on climate change and resulted optimal situation for rainfall occurrence.

Rainfall for the month of July is higher in Gardiz and Kabul stations and lower in Ghazni, Ghaziabad and Paghman during the month of July 2007 compared to the same month in 2006.

There is no change in rainfall situation in the remaining stations of the country.

Cereal Crops Phenological Stages

Central Region:

In most parts of this region wheat is harvested as in Kapisa and Parwan Provinces, Karizmir and Paghman Districts of Kabul Province and Chak District of Wardak province. Reports are indicating from Chak District of Wardak Province that rice is in vegetative and maize is in grain filling stage. While in Kohistan District of Kapisa Province and Charikar central Parwan Province maize is in emergence and vegetative stages. In Mahmmud Raqi central Kapisa Province maize is in ploughing and rice is in emergence stage. Panjsher Province indicated that maize is in ploughing and planting stages.

East Central Region:

Reports are indicating from Panjab District of Bamyan Province that winter wheat is in grain filling stage. In Yakawlang District and central Bamyan Province winter wheat is in harvesting stage.

North Eastern Region:

Reports from Imam Sahib, Chahar Dara, Aqtipa and Qali-I-Zal Districts and central Kunduz Province, Bangi District and central Takhar Province, Baghlan and Badakhshan Provinces are showing that wheat is harvested, while rice and maize are in planting stage.

Northern Region:

Reports from Shibirghan central Jawzjan Province, Samangan, Saripul and Faryab Provinces, Dehdadi and Nahri Shahi Districts of Balkh Province are indicating that wheat is harvested. In Faryab Province maize is in ploughing stage. Saripul Province showed that maize is in flowering stage.

Southern Region:

From Kandahar, Nimroz, Zabul, Uruzgan and Hilmand Provinces reports are indicating that wheat is in harvesting stage. Reports indicated that In Uruzgan Province maize and rice are in vegetative stage.

Western Region:

Reports are indicating from Muqur District and Qala-I-Naw central Badghis Province, Farah and Ghor Provinces showed that maize is in emergence stage.

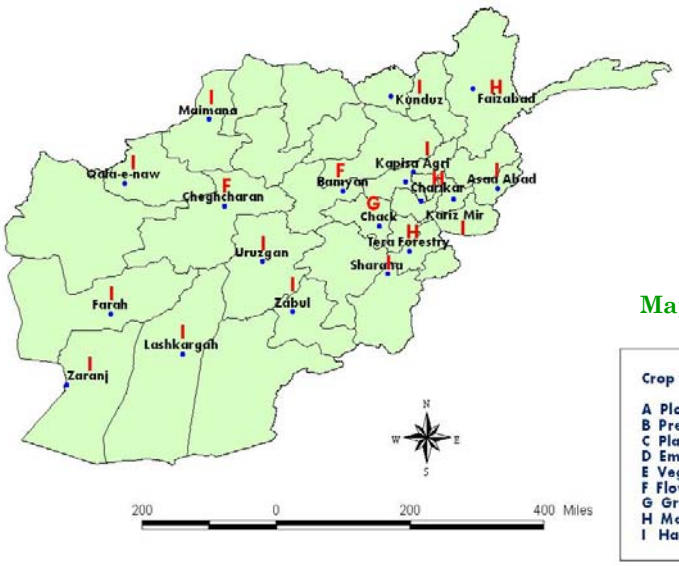
Eastern Region:

In most parts of this region as Asmar District and Asadabad central Kunar Province, Shesham Bagh, Ghaziabad and Agam farms, central Nangarhar Province and Mihterlam centeral Laghman Province reports are showing that wheat is harvested. In the above stated areas maize and rice are in vegetative stage except in Laghman Province where maize is in flowering stage.

South Eastern Region:

In Khost Province, Muqur and Sardy Districts of Ghazni Province, Tera and Rohani Baba farm in Paktya Province, Khairkot and Urgun Districts and Sharana central Paktika Province reports indicated that wheat is harvested. In the above stated areas maize is in vegetative stage except Rohani Baba and Tera farm of Paktya Province where maize and rice are in flowering stage.

Cereal Crops Stages July — 2007



Map 1

Cereal Crops Condition

Central Region:

In some parts of this Region cereal crops (wheat, maize and rice) are in normal condition as in Kohistan District and Mahmmud Raqi central Kapisa Province, Dashtak District of Panjsher Province, Syagerd District of Parwan Province, Chak District of Wardak Province. In Karizmir and Paghman Districts of Kabul Province, Chaharikar central Parwan Province and Dara District of Panjsher Province cereal crops are in good (better then normal) condition.

Eastern Region:

Mihterlam central Laghman Province, Agam District and central Nangarhar Province are showing normal wheat condition. Reports indicated from Asmar District and center of Kunar Province and Ghaziabad farm of Nangarhar Province that wheat is in good (better than normal) condition.

North Eastern Region:

In Aqtipa and Qala-I-Zal Districts of Kunduz Province and central Takhar and Baghlan Provinces cereal crops are in normal condition. Reports showed from Imam Sahib, Chahar Dara and central Kunduz Province, Bangi District of Takhar Province and central Badakhshan Province that cereal crops are in good condition.

Northern Region:

From most parts of this region reports are indicating that cereal crops are in normal condition as in Maymana central Faryab Province, Shibirghan center of Jawzjan Province, Sozmaqala District of Sripul Province, Nahri Shahi and Dihdadi Districts of Balkh Province. Central Saripul Province is showing good cereal crop condition (better than normal).

Southern Region:

Reports are showing from this region that wheat is in normal condition as in Kandahar Province, Zaranj central Nimroz Province, Nad Ali and Greshk Districts of Hilmand Province and central Zabul Province. In Urozgan Province maize and rice are in poor condition.

Western Region:

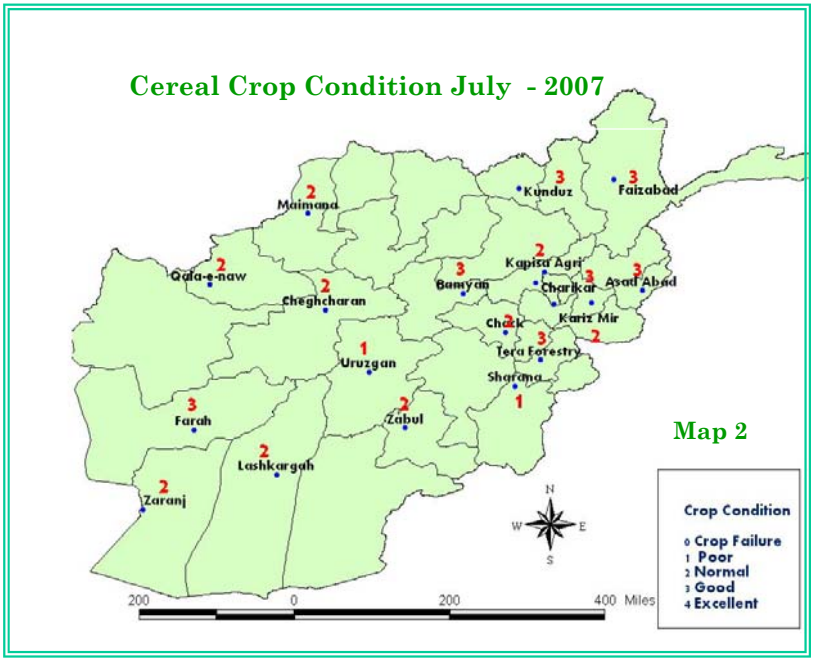
In central Farah Province, Ghor Province, Qala-I-Naw and central Badghis Province reports are showing normal cereal crop condition. Muqur District of Badghis Province indicated good cereal crops condition (better than normal).

East Central Region:

In Bamyan Province wheat is ranging from normal to good condition as central Bamyan Province is showing good wheat condition (better than normal). In Yakawlang District of the same Province wheat is in normal condition.

South Eastern Region

In Paktya Province reports are indicating good cereal crop condition. Normal crop condition reported from Ali Sher farm and central Khost Province, Muqur and Sardy Districts of Ghazni Province. Kairkot and Urgun Districts and Sharana central Paktika Province is showing poor cereal crop condition.



Adverse Factors

Central Region

Syagerd District of Parwan Province indicated wheat rust. Reports from Jaghatoo district of Wardak Province showed potato worms. In Paghman District of Kabul Province and Dara District of Panjsher Province too much weeds existed. In Charikar central Parwan Province and Kohistan District and central Kapisa Province foot and mouth disease (F.M.D) of animals, too much weeds and shortage of inputs reported.

East Central Region:

Reports from Bamyan Province are showing shortage of agricultural inputs and existence of too much weeds in cereal crop fields.

North Eastern Region:

Reports from Imam Sahib, Chahar Dara, Aqtipa and Qala-I-Zal Districts and central Kunduz Province, Faizabad center of Badakhshan Province, Bangi Districts and central Takhar Province indicated existence of pests, diseases and too much weeds.

Northern Region:

Main adverse factors in Saripul Province noted were shortage of inputs, pests, diseases and too much weeds. In Faryab and Jawzjan Provinces fly melon insect attacked on the fields of melons and water melons. And negligible rainfall could not fulfill the water requirement of the cereal crops in the area.

South Eastern Region:

Reports from Urgun and Khairkot Districts and Sharana central Paktika Province showed heavy rainfall has damaged vast area of agricultural productive lands. In Ali Sher District and central Khost Province shortage of inputs and too much weeds noted.

During 2007 Production of cereal crop is estimated about 5.6 million tones, among which wheat production is 4.5 million tones

Southern Region:

Nimroz and Kandahar Provinces, Greshk, Nawa and Nad Ali Districts and central Hilmand Province and Qalat central Zabul Province is showing negligible rainfall which could not fulfill the water requirement of the cereal crops in the area.

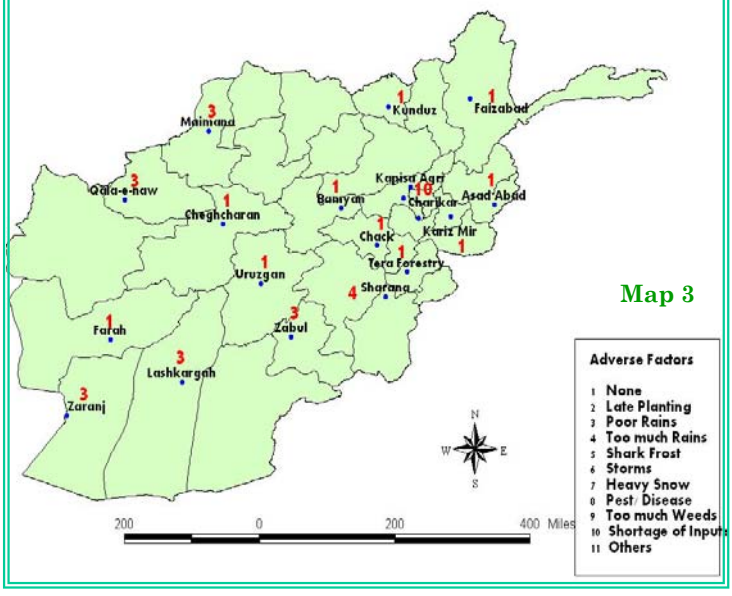
Western Region:

Reports are indicating from Chaghcharan central Ghor Province, Muqur District and central Badghis Province and Farah Province shortage of agricultural inputs and trace (less than 0.2 mm) amount of rainfall observed.

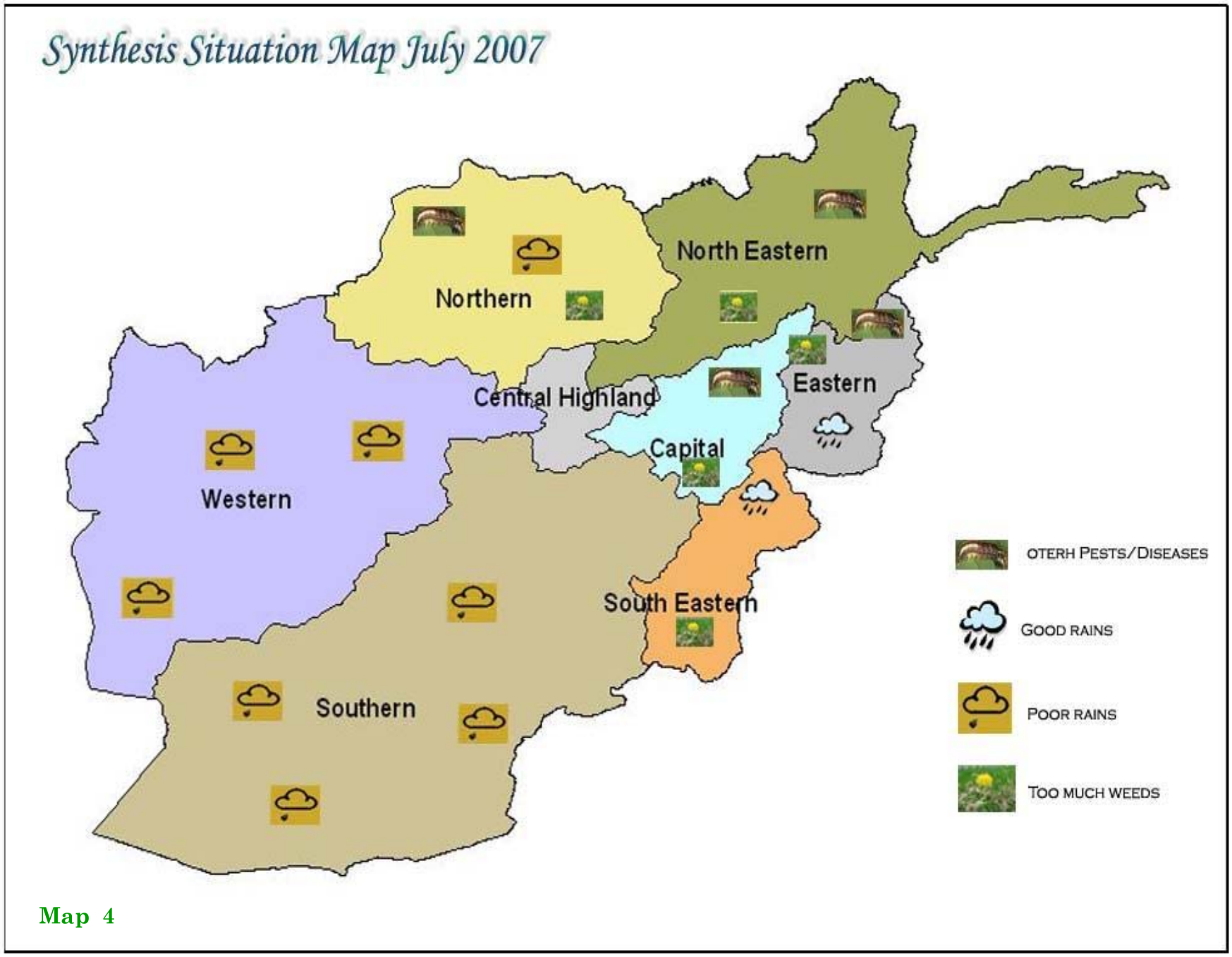
Eastern Region:

Reports in Kunar Province are showing anthrax disease in animals (specifically in cattle and goats). In Laghman Province shortage of agricultural inputs and less amount of rainfall noted. In Agam and Ghaziabad farm of Nangarhar Province pests, diseases and too much weeds existed.

Cereal Crops Adverse Factors July - 2007



Map 3


Synthesis Situation Map July 2007
North Eastern
Northern
Eastern
Central Highland
Capital
Western
South Eastern
Southern
OTERH PESTS/DISEASES
GOOD RAINS
POOR RAINS
TOO MUCH WEEDS

Map 4

Rainfall Situation

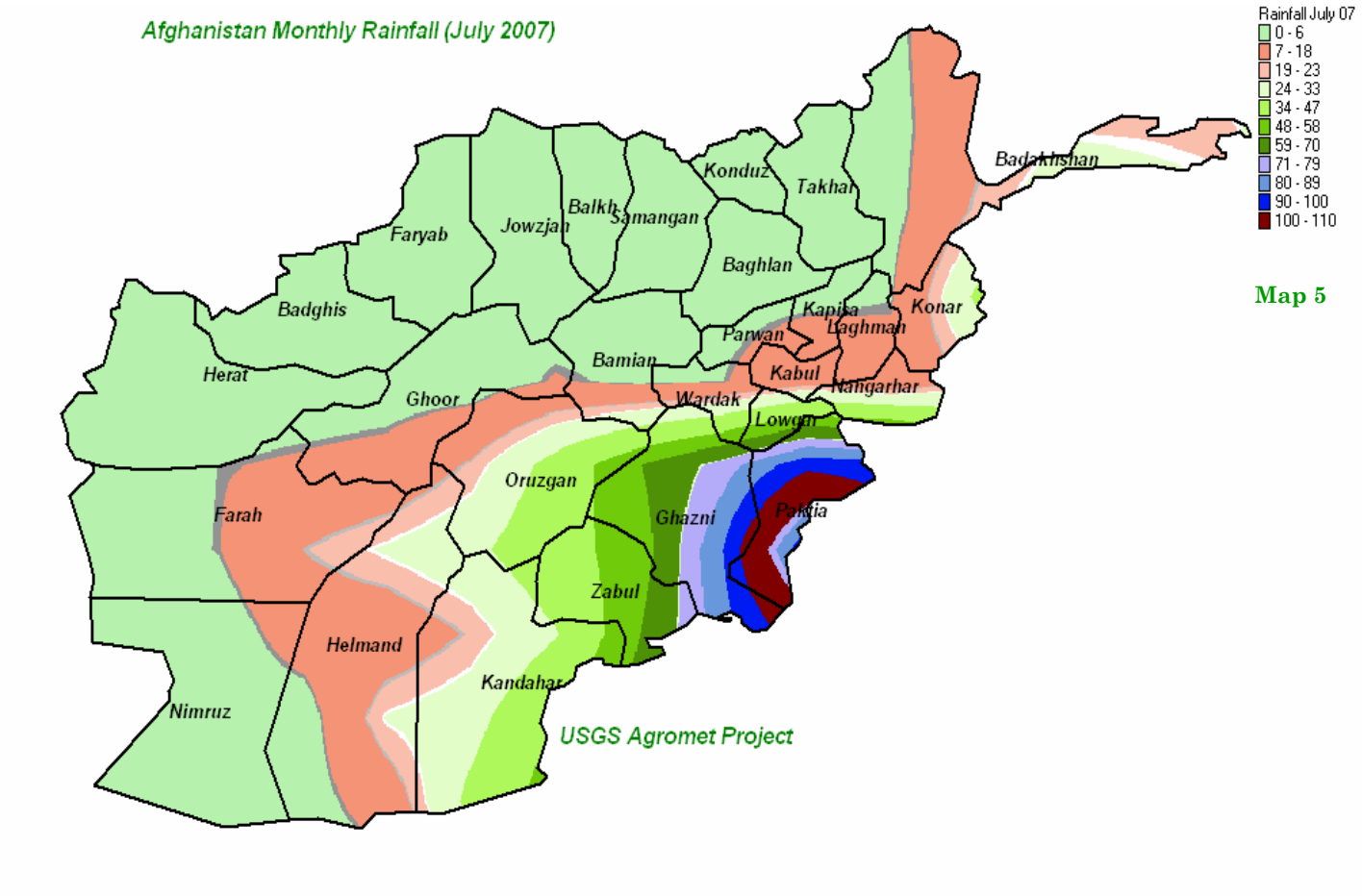
Rainfall for the month of July 2007 had different situation around the country.

Comparison of rainfall value for the month of July 2007 with the same month in 2006 (chart 1) shows that the amount of rainfall is higher in Gardiz and Kabul stations and lower in Ghazni, Ghaziabad and Paghman during the month of July 2007 compared to the same month in 2006 . There is no change in rainfall situation in the remaining stations of the country. The percentage +/- of rainfall is as follows:

Gardiz 1178 %, Ghazni – 100 %, Ghaziabad – 100 %, Kabul 100 % and Paghman – 100 %.

Comparison of rainfall values for the month of July 2007 with the same month of long term average (chart 2) shows the rainfall had decreased in most where the rainfall had increased during the month of July 2007 compared to the same month of long term average. The percentage +/- of rainfall is as follows:

Baghlan 0 %, Darul Aman -100 %, Faiz Abad - 100 %, Farah 0 %, Gardiz 64 %, Ghazni - 100 %, Ghaziabad -100 %, Jabul Seraj -100 %, Jalalabad 2233 %, Kabul - 38 %, Kandahar - 100 %, Kariz Mir -100 %, Kunduz -100 %, Asmar 243 %, Logar – 100 %, Maimana -100 %, Mazar 0 %, Murghab 0 %, Paghman - 100 %, Sheberghan 0 %, Sarobi - 100 % and Sari Pul - 65 %.



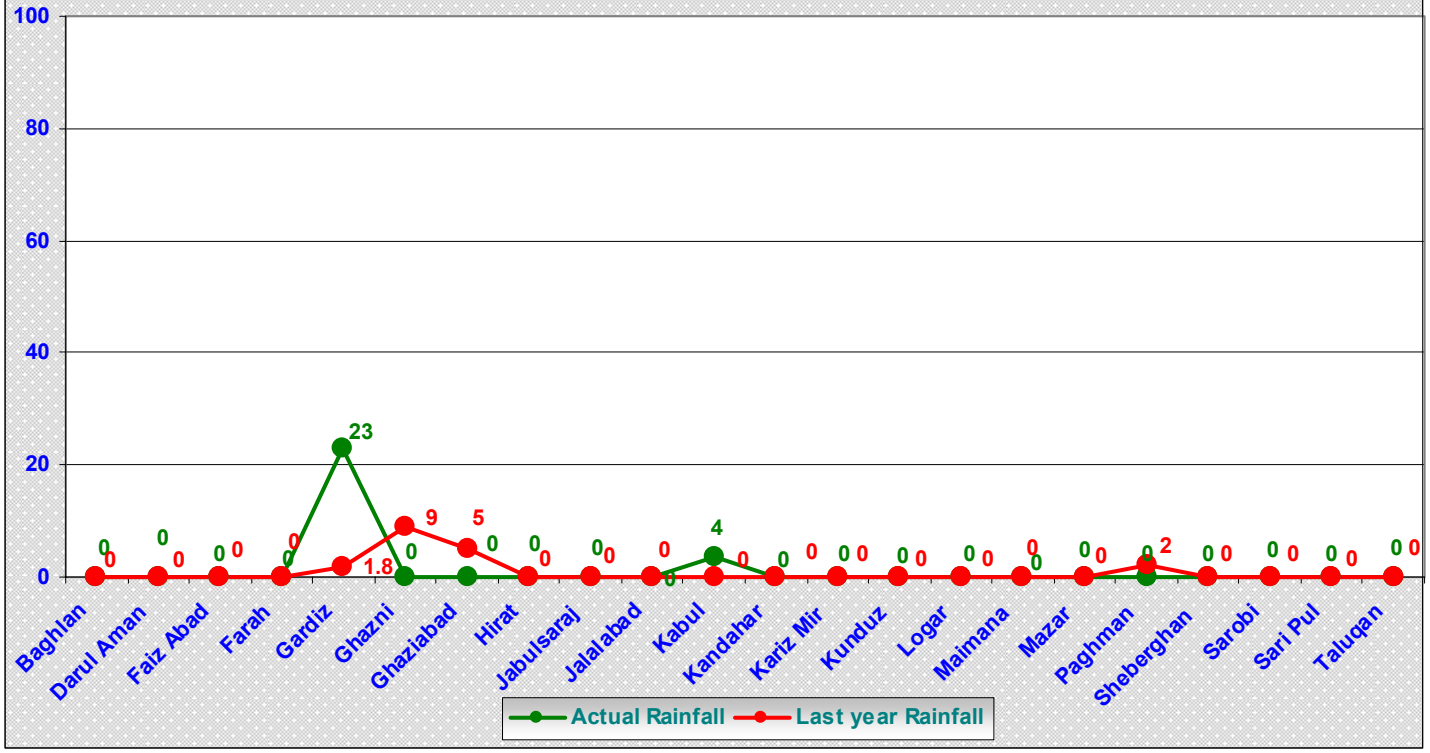
Map 5

Distribution of rainfall varies in different regions of the country, as map (5) shows significant rainfall occurred in the South Eastern regions particularly in Paktya Province, the North Eastern regions, Capital and some parts of the Southern region having good amount of rainfall. Northern region, Western and South Western regions experienced less amount of rainfall during the month of July 2007.

Rainfall Graphs for the Month of July 2007

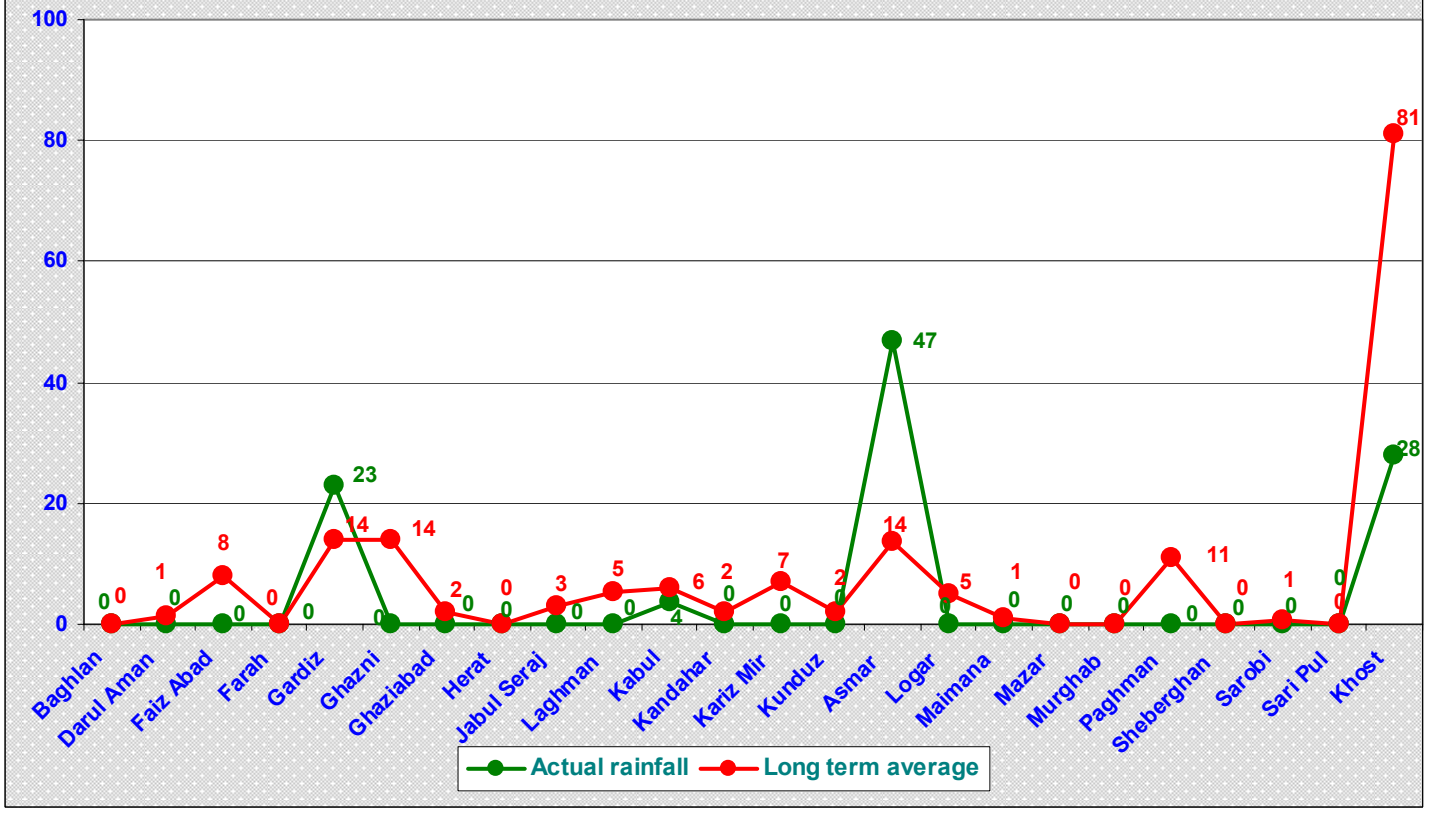
Comparison of Actual and Last Year Rainfall (July 2007)

Chart 1

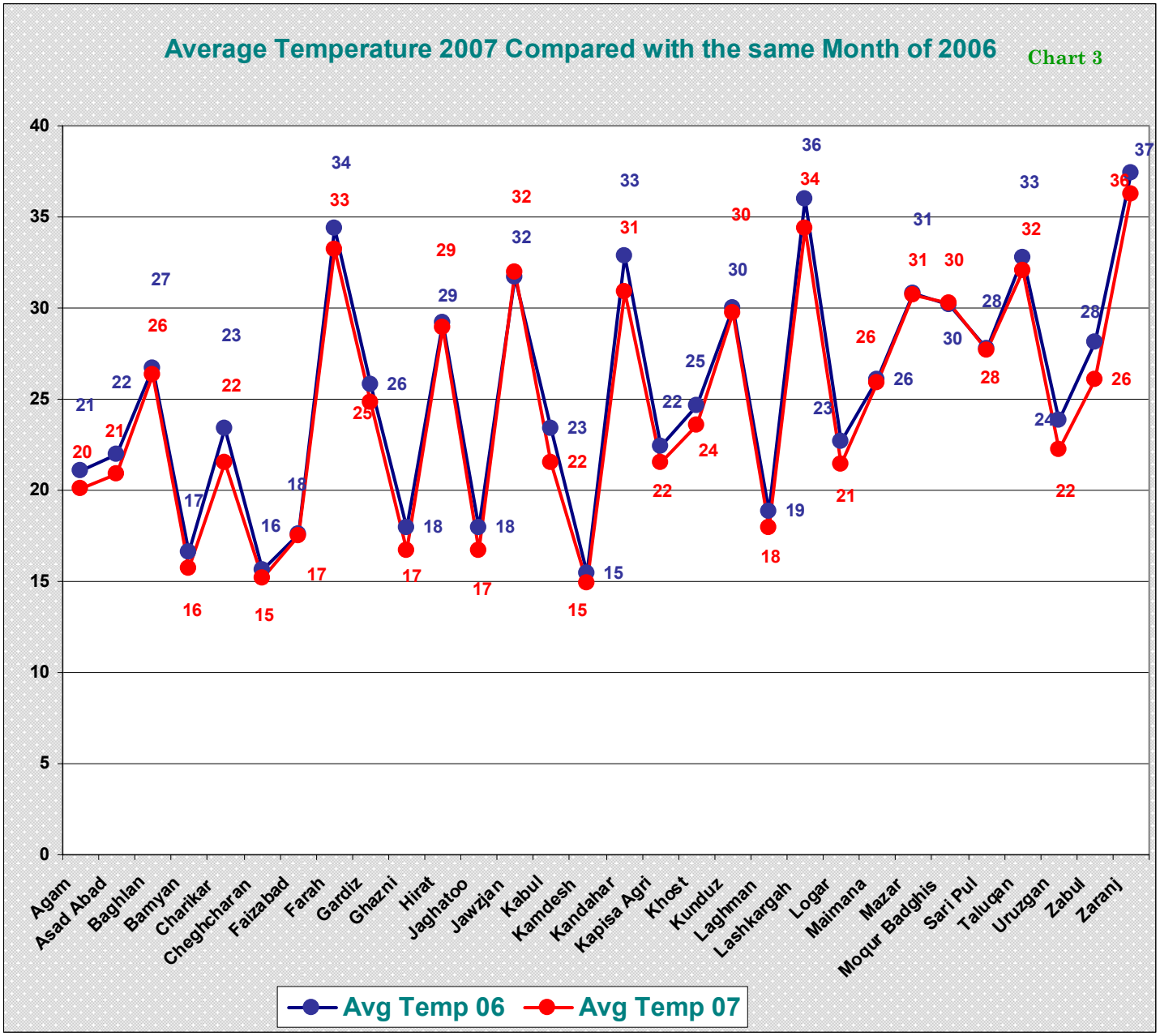


Comparison of Actual and Long Term Average Rainfall (July 2007)

Chart 2



Average Temperature for the Month of July 2007

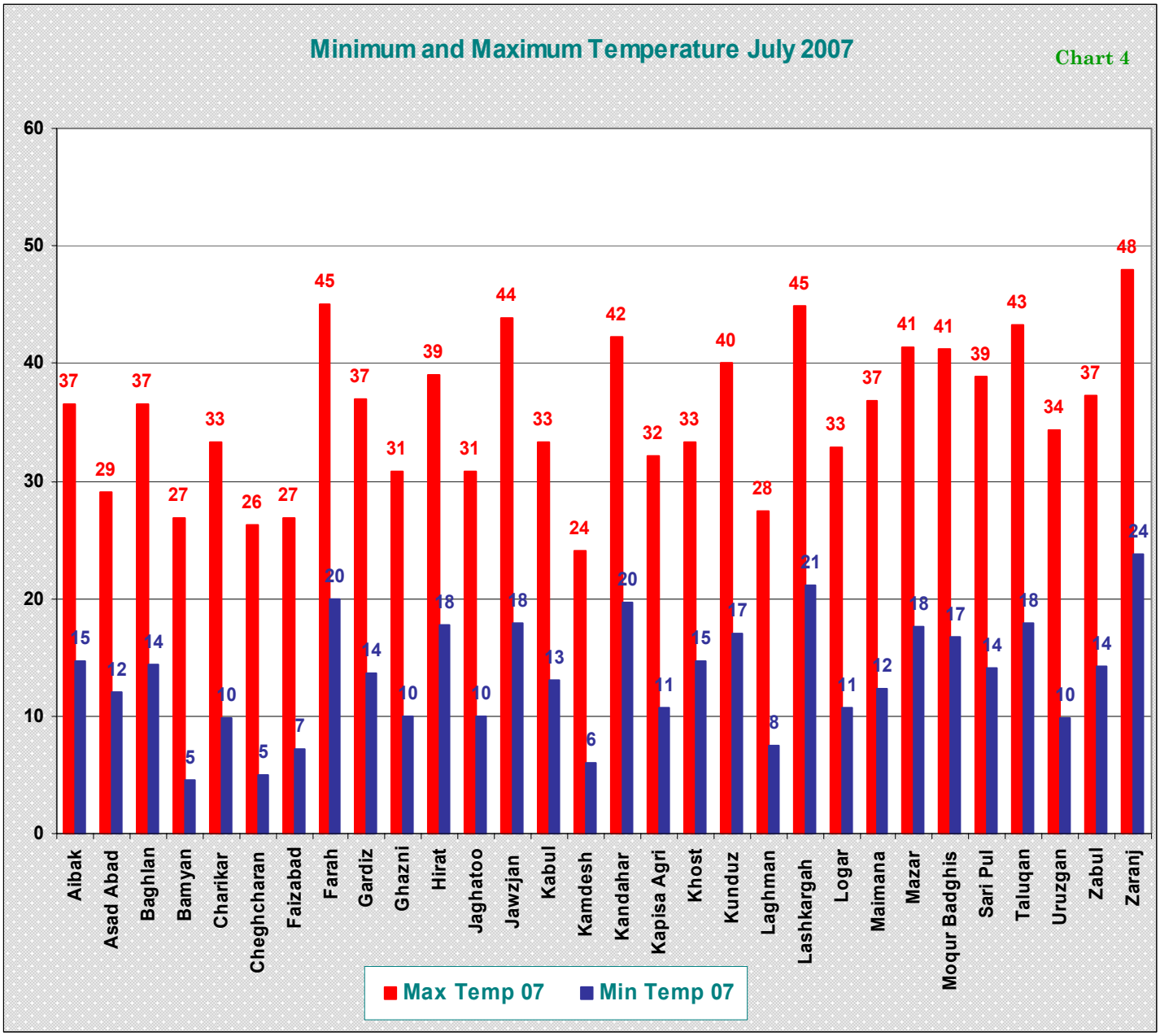


Comparison of temperature values shows small decrease of temperature during the month of July 2007 over the same month in 2006 across the country.

In general the country experienced lower temperature during the month of July 2007 compared to the same month in 2006.Comparison of temperature values (chart 3) shows small decrease of temperature during the month of July 2007 over the same month in 2006 across the country.

The temperature decrease for the month of July 2007 compared to the same month in 2006 is just 1°C likely lower (chart 3). The temperature decreased effected on climate change and resulted optimal situation for rainfall occurrence.

Temperature for the Month of July 2007

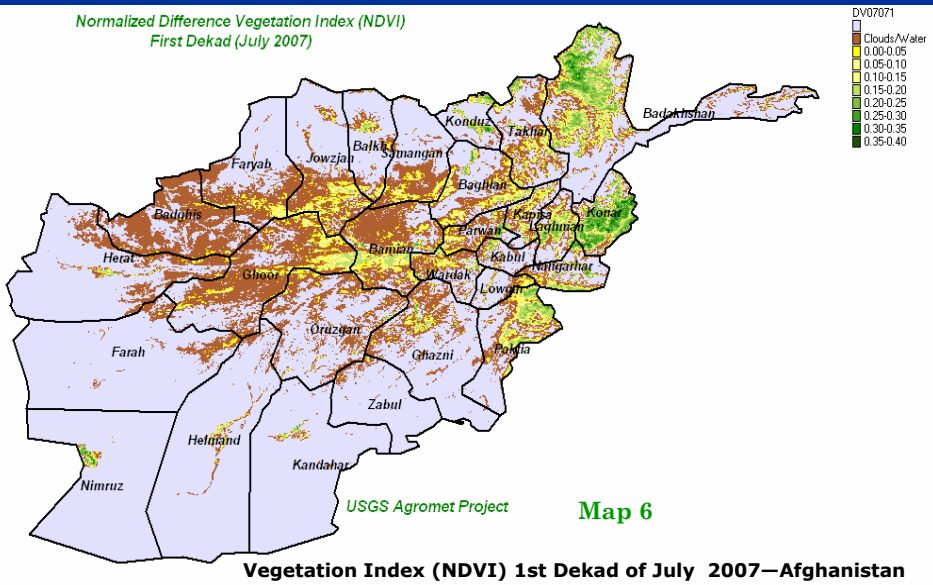


Zaranj center of Nimroz Province with 48 ° C was the warmest spot in the country

Chart (4) shows maximum and minimum temperature for the month of July 2007 where minimum temperature had positive values across the country.

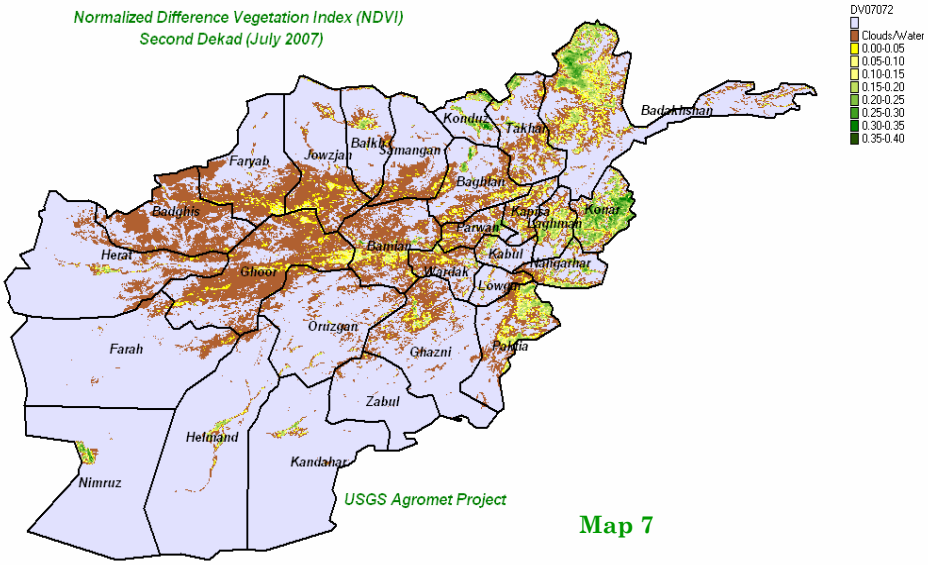
Zaranj with 48°C was the warmest spot in the country. Bamyan and Cheghcharan with 5°C experienced lowest temperature regions during the month of July 2007.

Normalized Difference Vegetation Index (NDVI) (July 2007)



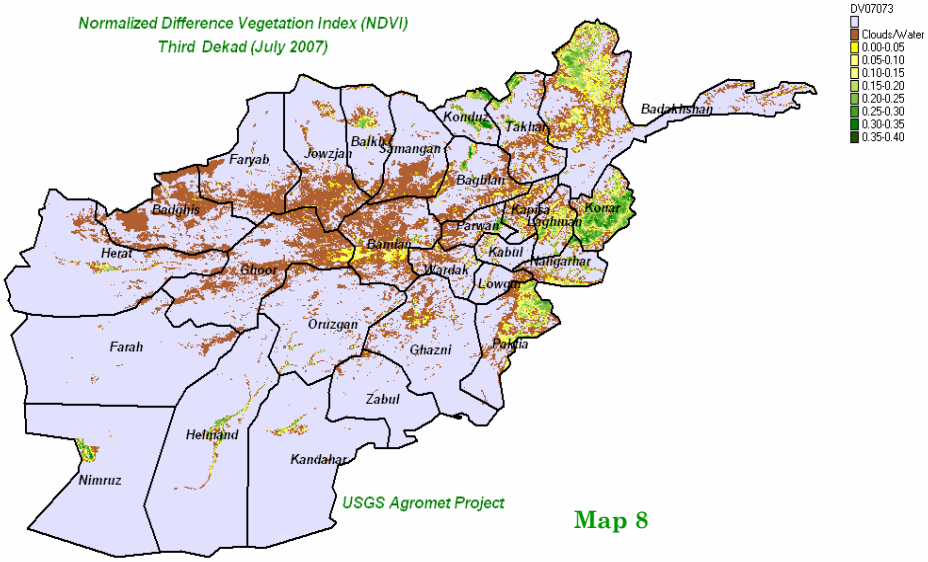
Map 6

Vegetation Index (NDVI) 1st Dekad of July 2007—Afghanistan



Map 7

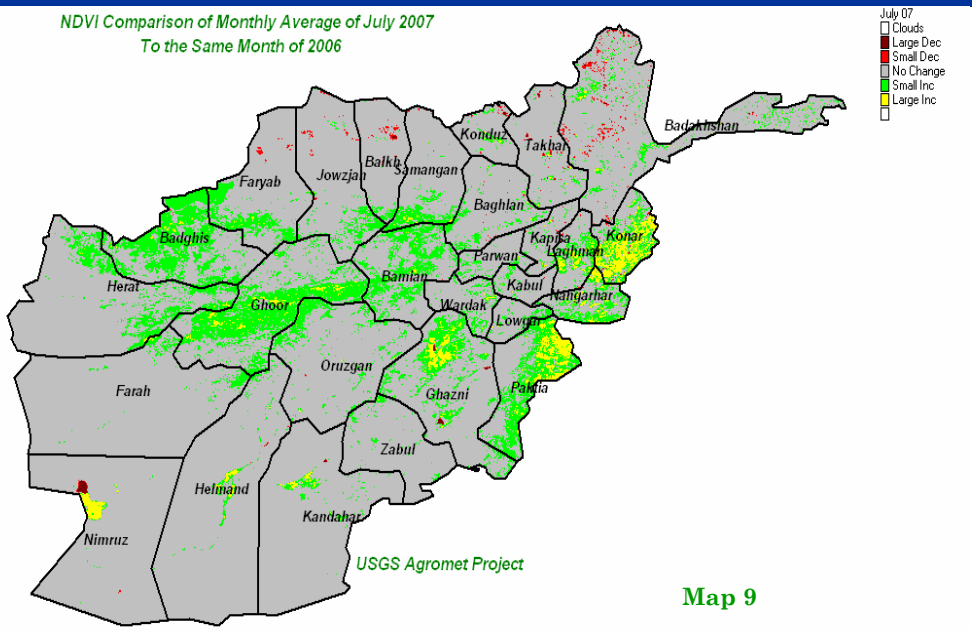
Vegetation Index (NDVI) 2nd Dekad of July 2007—Afghanistan



Map 8

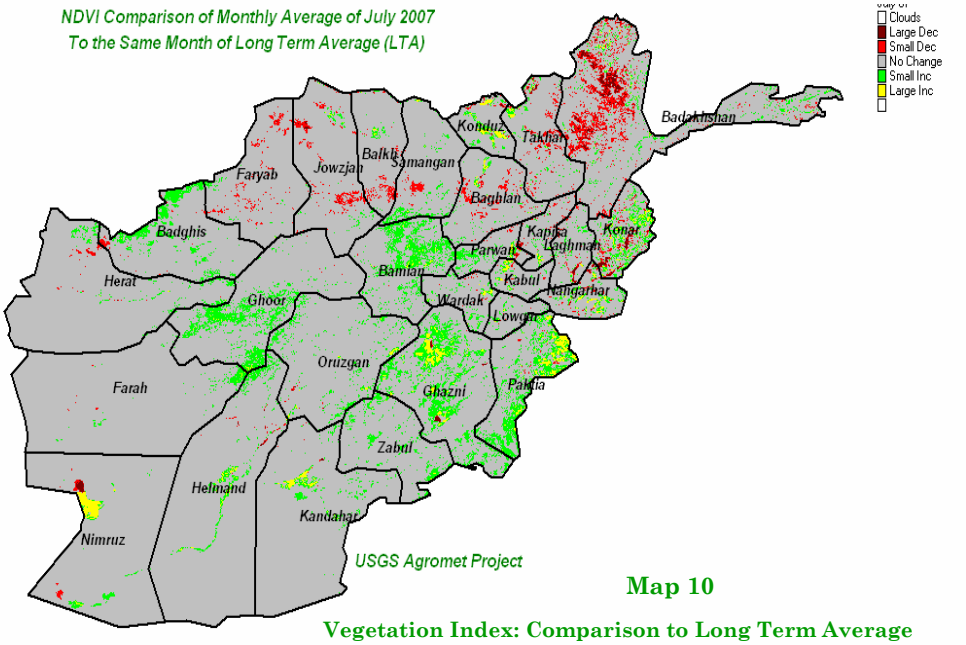
Vegetation Index (NDVI) 3rd Dekad of July 2007—Afghanistan

Comparison of NDVI July 2007



Map 9

Vegetation Index: Comparison to Last Year



Map 10

Vegetation Index: Comparison to Long Term Average

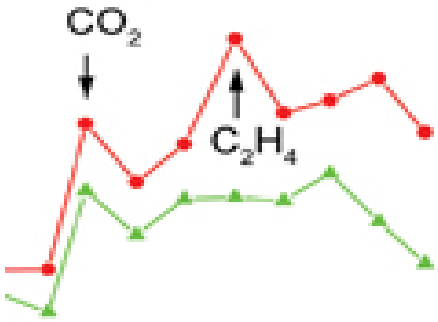
NDVI: July 2007

Comparison of monthly average of NDVI for the month of July 2007 with the same month in 2006 (Map 9) shows large increase in NDVI values in most parts in Eastern regions and some parts in South Eastern regions, so small increase in NDVI values has been occurred in some parts of the Central Highlands and North Western regions during the month of July 2007 over the same month in 2006.There is no significant change in NDVI values in the remaining regions during the month of July 2007.

Comparison of NDVI monthly average for the month of July 2007 with the same month of long term average (Map 10) shows large increase in NDVI values in some parts in South Eastern regions and small increase in NDVI values has been occurred in Central Highlands and limited areas in the North Western regions, so small decrease in NDVI values occurred in North Eastern regions and limited areas in Northern regions during the month of July 2007 over the same month of long term average. There is no change in NDVI values in the remaining regions during the month of July 2007 compared to the same month of long term average.

Laser gas analyzers are an efficient way to study variations in gas-exchange processes between vegetation and the atmosphere under anthropogenic stress.

Gas-exchange processes are key to raising crops yields and improving plant resistance to climatic and anthropogenic impacts.[1] The significance of gas-exchange studies has grown in recent years because of global climate change.



Photosynthesis and plant respiration in the dark are the main components of the gas exchange cycle. The principal evolving gas in the process is CO_2, which is also central to the greenhouse effect. In addition, recent data on methane emissions by different plants indicates that it is the second most important greenhouse gas.[2] These estimates of methane emissions suggest that a reappraisal of atmospheric methane dynamics and their impact on plant biochemistry is necessary.

Several methods can be used to measure small variations in the concentrations of gases such as CO_2, C_2H_4, and CH_4 during gas-exchange processes. Gas chromatography and mass spectrometry are the most popular.[2] Our research shows, however, that laser absorptional spectroscopy, based on the use of frequency-tunable CO_2 or diode lasers, is very efficient for studying the kinetics of gas emissions from plants.

The photoacoustic (PA) gas analyzer is based on the photoacoustic effect that results from the absorption of CO_2 laser radiation by gases having absorption bands in the spectral range of 9.2–10.8μm. The gas analyzer is composed of a waveguide CO_2 laser and a differential resonant Helmholtz photoacoustic detector.[3] . The dectator provides real-time measurements of CO_2 (0.4ppm) and C_2H_4 (0.03ppm) concentrations in the ambient air.

The detector is sensitive to CH_4 concentrations as low as 0.04ppm. The mean ground concentration of CH_4 in the atmosphere is ~2.00ppm.

We used the PA gas analyzer with the waveguide CO_2 laser to study dark respiration of pine needles.[3] The needles (20g) were separated from their branches and placed in a shadowed, sealed 5l chamber. After 3h, an air sample was taken from the chamber by blowing it through the PA detector. Figure 1 presents the absorption spectra of the air in the chamber prior to the experiment, the obtained gas sample, and a mixture of CO_2 (5000ppm) and N_2. Comparison of the spectra shows that needle dark respiration under the experimental conditions is accompanied by emission of CO_2—10(20) line, 944.194cm^{-1}—and ethylene, which has a characteristic absorption peak at the 10P(14) line, 949.479cm^{-1}.

Figure 1. *Spectra of gas absorption in the wavelength range of CO_2 laser radiation (P branch of the 10μm band). 1: Room air. 2: Needle emission. 3: Testing mixture.*

We used the methane detector with a 1.65μm diode laser to measure CH_4 emission by various plants. Fresh green samples (leaves or needles) were placed in a 5l closed volume filled with room air (at a background methane concentration of 1.9ppm), where they were kept during the exposure time (10–300h). Before taking measurements, the analytical cell was blown through with pure nitrogen (for zero-level definition) and the control air. The incubation chamber was then blown through with room air and again with nitrogen. The variation of the methane concentration in the incubation chamber was estimated from the amplitude of the characteristic peak in the time dependence.

Experiments[6] with Siberian stone pine needles, torn off at a temperature of -40°C, showed a clearly pronounced decrease in the methane mixture ratio (see Figure 2), as did those with leaves of the indoor plant *Dieffenbachia*. Further measurements with different samples and longer exposure times also produced decreases rather than increases in the methane mixture ratio when room air blew through the incubation chamber. The rates of methane emission we observed are significantly smaller than those found by other researchers.[2] This may be connected to differences in the gas chromatography and absorption gas analysis methods.

Figure 2. *Methane mixture ratio measured after blowing room air through a 5l volume filled with a green mass of 85g.*

Absorptional laser spectroscopy and multi-wavelength gas analysis are efficient for studying the kinetics of gas exchange between vegetation and the atmosphere under natural and anthropogenic stresses.

For more information please contact:

Mohammad Fahim Zaheer
fahim.zaheer@agriculture.gov.af
fahimzaheer@gmail.com
Cell: 0772214307, 0799793334

Or

Abdussalam Shinwary
asalam.shinwary@agriculture.gov.af
salam.shinwary@gmail.com
Cell: 070156738/ 077-9019012

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