

Risk Monitoring & Warning in Tajikistan

MONTHLY REPORT

JANUARY 2011





RISK TRENDS

This report contains a special supplemental report discussing the impact of recent dry weather and future monitoring needs.

NATURAL HAZARDS

CoES reported no natural disasters in January. Flooding of the Yahsu and Kizilsu rivers in eastern Khatlon Province during February is possible if there are rains and unusually warm temperatures in this area.

ENERGY SECURITY

Water stocks in Nurek Reservoir are above average indicating increased capacity to produce electricity during the remainder of the winter. Electricity generation in December was at highest level for any of the past 14 months due to full operation of the Sangtuda-1 hydro-electric power plant. With more capacity to generate electricity, “Barki Tojik” was able to meet increased demand for heating during December.

FOOD SECURITY

Wheat flour and petrol prices are close to or above levels recorded since January 2008. Wheat flour prices in Khujand and Kurgan-Tube slightly increased in January but were unchanged in Dushanbe. Petrol prices in January only increased Dushanbe. Diesel prices did not increase from December to mid-January.

HEALTH

The influenza season has begun. MoH surveillance has not identified an unusual spike in infection rates, despite increased numbers of calls for emergency medical assistance for more severe cases, likely due to the low number of individuals seeking professional health care for moderate influenza.

MACROECONOMIC TRENDS

Tajikistan’s trade deficit continued to grow in December, increasing by 173.8 million USD. Exports in December increased by 9.7% but imports increased by 11.8% compared to November 2010. Remittances, which are a mainstay of the Tajik economy, totaled 2.36 billion USD for 2010.

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1. HAZARDOUS EVENTS¹

(A brief summary of potential and experienced natural hazard events in Tajikistan)

In February, rains and warm temperatures may result in flooding on the Yahsu and Kizilsu rivers in eastern Khatlon Province. Spring flooding in Tajikistan usually starts with these two rivers. In February 2010 there was an increase in water level in these rivers in Vose District and avalanches on the road from Dushanbe to Khujand.

Typical Hazard Events in Tajikistan During February 1992 to 2010	
Event	Number of Events
High Winds	17
Heavy Rain	4
Earthquake	14
Avalanche	32
Flood	3
Landslide	11
High Ground Water	2
Mudflow	2
Heavy Snow	42
Source: Information Management and Analytical Center, Committee of Emergency Situations	

2. WEATHER CONDITIONS

2.1 Forecast for February 2011²

Average monthly temperatures in Sughd Region, mountainous areas of the Direct Rule Districts (DRD) and western regions of Gorno Badakhshan Autonomous Oblast (GBAO) are expected to be 1°C above normal in February. In Khatlon Region, at lower elevations in DRD and eastern regions of GBAO, the temperatures are forecasted to be 1 to 4°C below normal. The first and the fifth 5-day period in the month are expected to be the warmest in most of the country. The average temperatures for February are indicated below.

- Khatlon Region: 1 to 5°C
- Sughd Region: -5 to 3°C
- Mountainous DRD and Western GBAO: -7 to -1°C
- Eastern GBAO: -18 to -17°C

Monthly precipitation totals are forecasted to be above normal in most of most parts of the country except in Sughd, where below normal precipitation is expected at lower elevations (normal is 17-38 mm) and mountainous areas (normal is 9-20 mm).

(See Annex A for a more detailed forecast for February 2011).

(Please see the supplement discussing the impact of recent dry weather and future monitoring needs attached to this report).

2.2 Weather Summary for January 2011

January has warm weather with little precipitation. Monthly average temperatures at lower elevations and in the foothills were close to normal, or 1°C above normal in some locations. At higher elevations, temperatures were 2 to 4°C above annual averages. The warmest temperatures were in early and late in the month, with daytime temperatures 13 to 18°C, and daily averages 4 to 9°C above long-time annual averages. The coldest

Percent of Average Precipitation January 2011	
Location	%
Sughd Region	0 to 48%
Khatlon Region	24 to 74%
Lower Elevations, DRD	31 to 34%
Higher Elevations, DRD	33 to 60%
Western GBAO	23 to 82%
Eastern GBAO	0 to 34%

¹ Data reported by Information Management and Analysis Center, Committee of Emergency Situations

² The information in Sections 1.2 and 1.3 and Annex A is based on reports from the State Administration for Hydrometeorology of Tajikistan.

temperatures were during January 12 to 15 with temperatures in lower elevations from 5 to -2°C.

3. ENERGY

3.1 Electricity Supply

Total power generation in December 2010 was 1,556 Gigawatts with average daily electricity generation in December 2010 50.1 Gigawatt compared to 45.6 Gigawatt in the same month in 2009. This is the highest level of electricity production for any of the past 14 months, and is linked to the full operation of the Sangtuda-1 hydro-electric power plant (HPP). Sangtuda-1 now contributes 14.4% of total hydro electrical production in the country. A total of 8 million kWh were imported in December.

In total, Tajikistan generated 16,243 Gigawatts in 2010. Calculations indicate that if only electricity was used to meet all heating demands during winter that a total of approximately 2,500 Gigawatts would be needed per month or 40% more than was produced in December.

3.2 Electricity Availability

The table at right shows the average daily consumption of the electricity by major regions of Tajikistan and by the Tajik Aluminum Company “TALCO” (the largest commercial energy consumer).

Electricity consumption increased in the South (13.5%), North (18.8%) and Dushanbe (31%) during December compared to November. As there was more capacity to produce electricity in December, it was possible for “Barki Tajik” to meet the demand for heating during the month. Note that no restrictions on electricity have been imposed on Dushanbe but rationing does continue in other parts of the county.

Average Electricity Generation - Tajikistan November 2009 - December 2010 (Gigawatt)			
Year	Month	Nurek	Total for Tajikistan
2009	November	858	1,303
	December	866	1,414
2010	January	849	1,429
	February	825	1,382
	March	809	1,383
	April	824	1,267
	May	986	1,346
	June	975	1,331
	July	992	1,412
	August	938	1,388
	September	874	1,284
	October	731	1,180
	November	782	1,285
	December	935	1,556

Average Daily Electricity Consumption – Tajikistan (Gigawatt) (Not including GBAO)				
Month	South (Including TALCO and Dushanbe)	North	Talco	Dushanbe
April	35	7	18	6
May	36	6.5	18.5	5.9
June	35	11.8	18.2	4.5
July	33	12	18	4.8
August	33	12	18	4.8
September	32	10	17	4.8
October	32	5.9	17	5.7
November	37	6.9	17	8.4
December	42	8.2	17	11

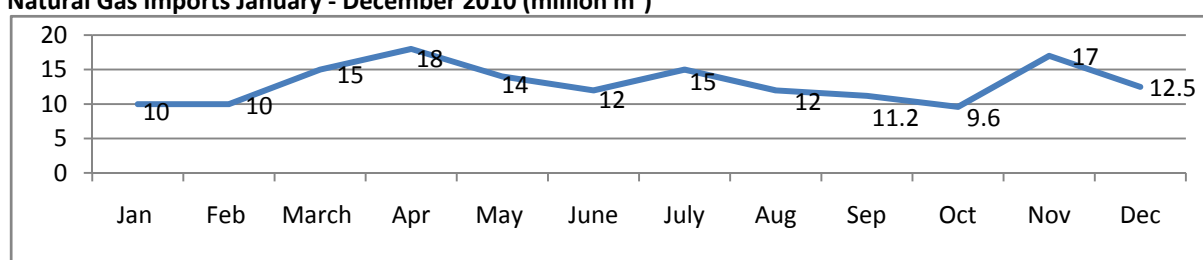
3.3 Natural Gas & Coal

Natural Gas Imports in Tajikistan (2004 – 2010)

Year	2004	2005	2006	2007	2008	2009	2010
Million m ³	622.5	629	635	644.7	512.7	216.7	156.3

In December a total of 12.5 million m³ of natural gas was imported to Tajikistan (daily average consumption 415 thousand m³). “Tajiktransgaz” supplied total 156.3 million m³ of natural gas in 2010, 93.7 million m³ less than projected imports. Uzbekistan has agreed to sell natural gas to Tajikistan at a 33% discount³ for at least the first three months of 2011. Tajikistan will pay Uzbekistan US \$227.85 per 1,000 m³ of gas while paying an average of US \$240 for the same quantity of gas in 2010.

Natural Gas Imports January - December 2010 (million m³)

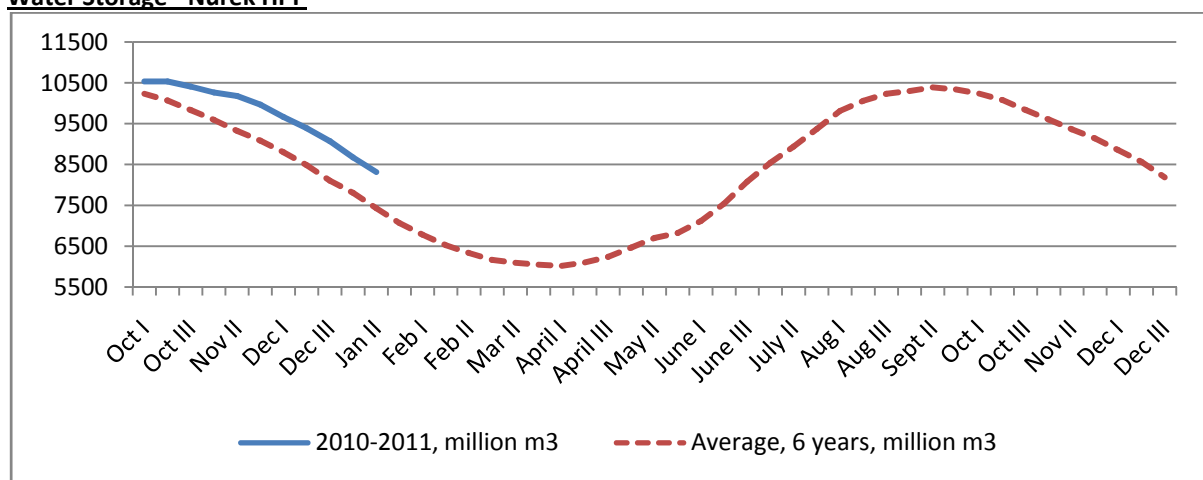


A total of 200,000 tons of coal were produced, and 204,000 tons sold, in 2010.

3.4 Reservoir Levels⁴

The first chart below (**Water Storage – Nurek HPP**) indicates the volume of water in the Nurek reservoir as of mid-January 2011 compared to the 6 year average (2004-2010). The volume of water in the reservoir is above the 6 years average.

Water Storage - Nurek HPP

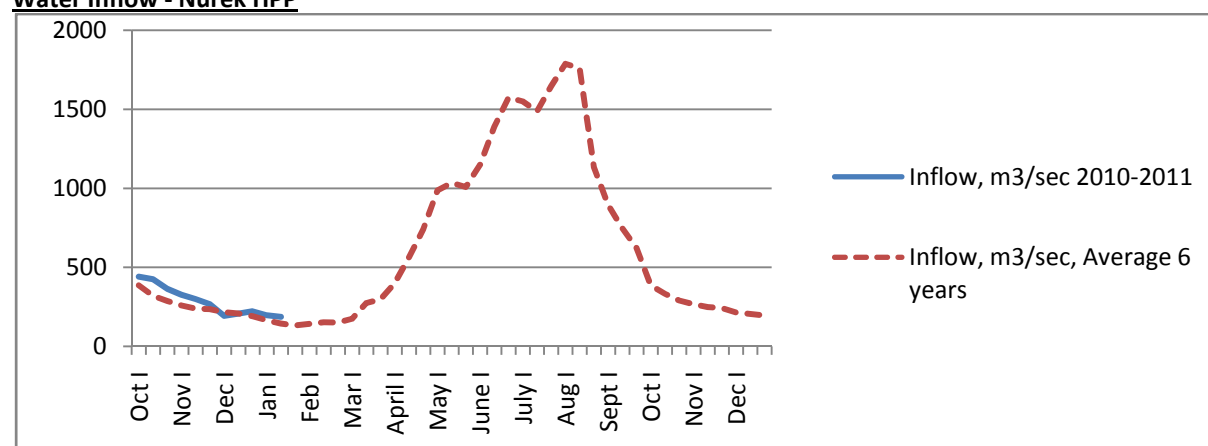


³ http://www.centralasiaonline.com/cocoon/caii/xhtml/en_GB/newsbriefs/caii/newsbriefs/2011/01/07/newsbrief-14

⁴ Data from CAWaterInfo, http://www.cawater-info.net/analysis/water/nurek_e.htm#

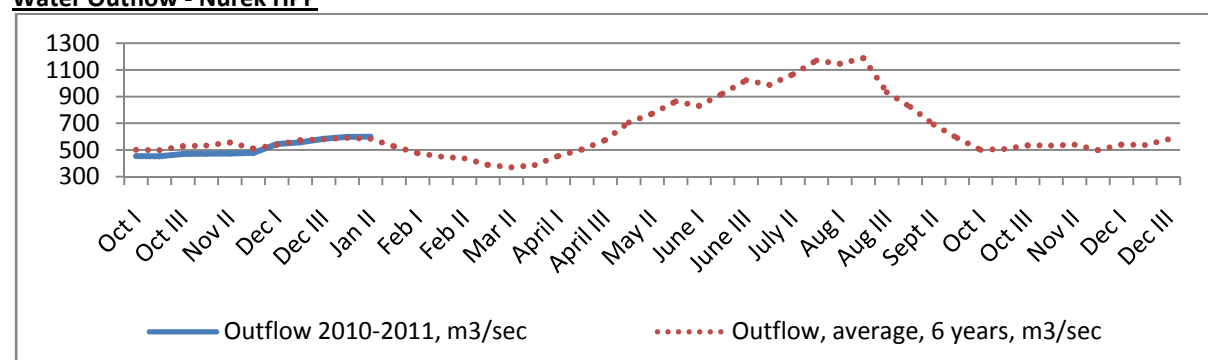
The second chart (**Water Inflow – Nurek HPP**) shows water inflows to Nurek. During the first 20 days in January 2011, inflows dropped 16% compared to the level during the last 10 days in December 2010, but the inflow was 22.6% above the six year average.

Water Inflow - Nurek HPP



Despite decreased inflow, outflow increased by 16.1 m³/sec during mid-January 2011 compared to last 10 days in December 2010, a rate slightly above the 6 year average. (See chart below.)

Water Outflow - Nurek HPP



The higher than average reserves in Nurek indicate a better than average capacity to **generate electricity during the remaining winter months of 2011.**

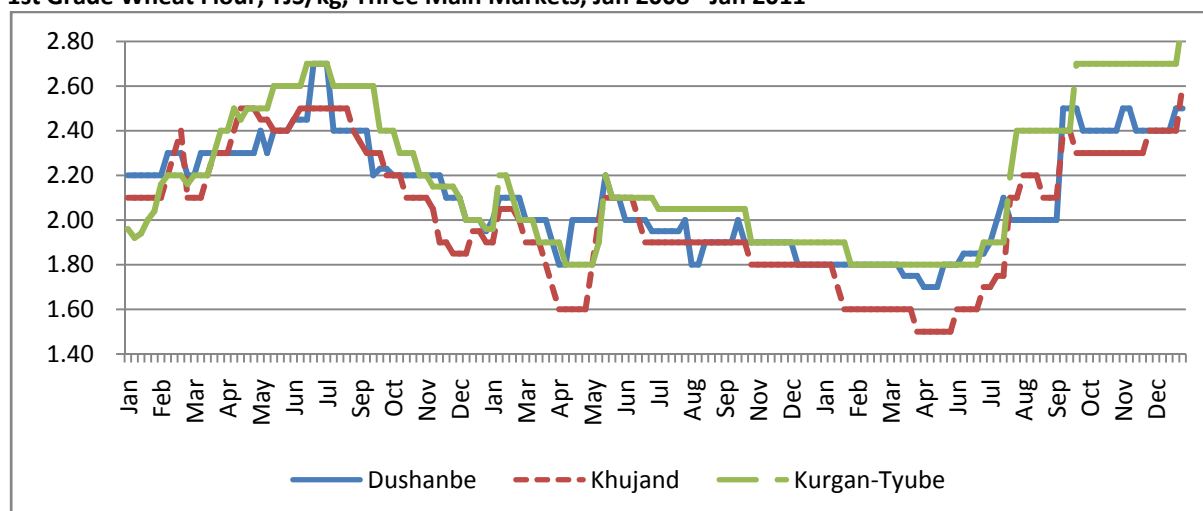
4. FOOD SECURITY

4.1 Food and Fuel Prices⁵

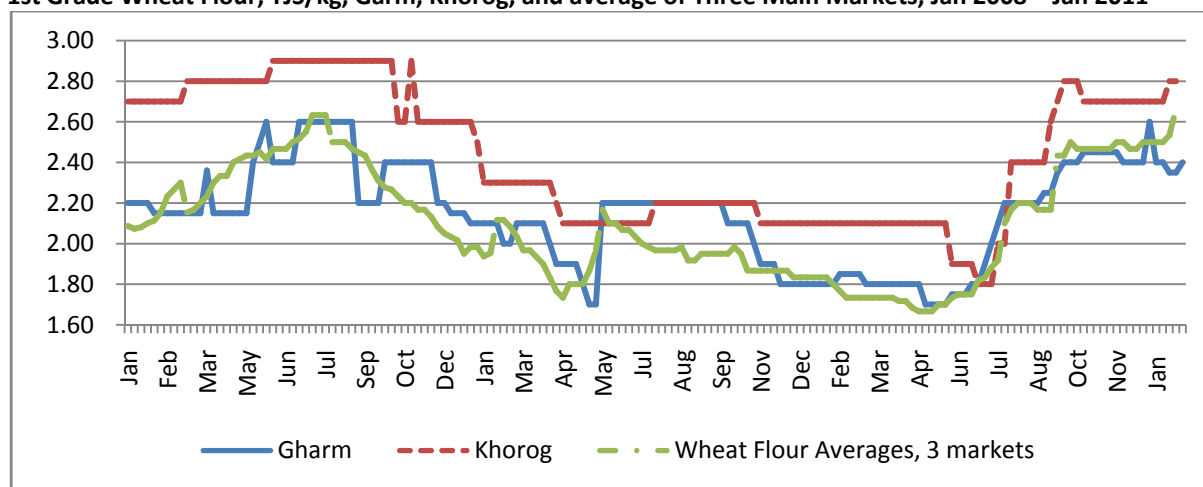
1st Grade Wheat Flour

The first table below shows prices for the 1st grade wheat flour in Dushanbe, Khujand and Kurgan-Tube from January 2008 to mid January 2011. Prices for wheat flour in Khujand and Kurgan-Tube slightly increased in January but remained unchanged in Dushanbe. These levels are above or close the highest level since January 2008.

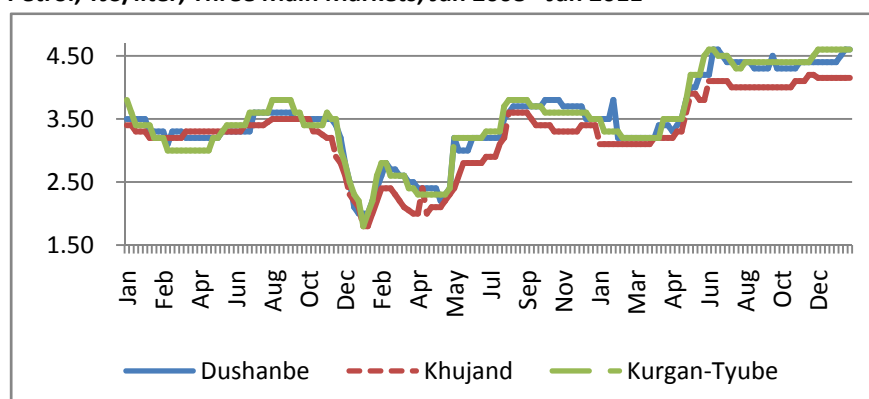
⁵ Food and fuel prices are from WFP Food Security Weekly Market Monitoring, Tajikistan
http://untj.org/country_context/coordination_mechanisms/agriculture&food_security/fsms/

1st Grade Wheat Flour, TJS/kg, Three Main Markets, Jan 2008 - Jan 2011

The following table provides prices for 1st grade wheat flour in two large regional markets, (Garm and Khorog, together with the average price for the Dushanbe, Khujand and Kurgan-Tube markets). Wheat prices in Khorog and Garm were close to historically high in January. The drop in price in Garm in December remains to be explained as it is contrary to the trend for other markets.

1st Grade Wheat Flour, TJS/kg, Garm, Khorog, and average of Three Main Markets, Jan 2008 – Jan 2011

4.2 Fuel Prices

Petrol, TJS/liter, Three Main Markets, Jan 2008 - Jan 2011

Petrol prices in January only increased in Dushanbe. Diesel prices did not increase between December and the middle of January.

A Perspective on Local and Global Food Prices

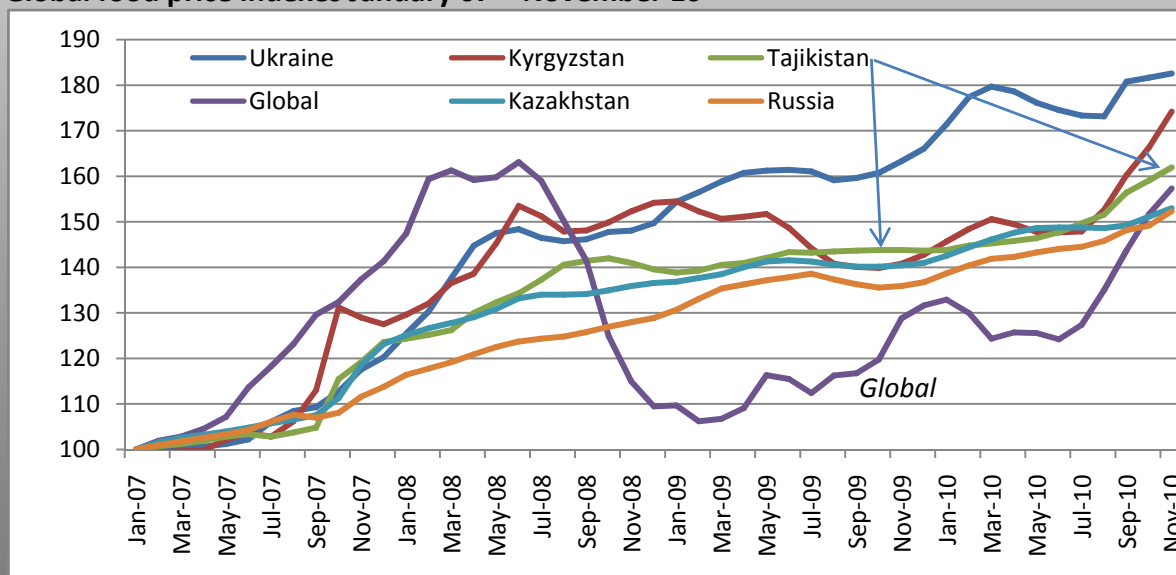
Accelerating food price inflation became an additional cause for concern in Tajikistan during the second half of 2010. As the data in the chart below show, food prices in Tajikistan shot up with the global food price surge between January 2007 and mid-2008, and then never really declined afterwards, despite the sharp downward correction in global food prices after mid-2008. Food prices began to surge again in the third quarter of 2010, under the influence of rising global food prices, as well as of drought in parts of Russia and Kazakhstan. By December 2010 food prices in Tajikistan were nearly 60% above their January 2007 levels (according to official statistics).

As foodstuffs comprise nearly two thirds of Tajikistan's consumer price index, rising food prices can deepen food insecurity and reduce living standards in net food-consuming households. WFP's **November 2010 Tajikistan: Phases of Food Insecurity** bulletin found that some 580,000 people were estimated to be living in circumstances of a "humanitarian emergency" or an "acute food and livelihood crisis".

A number of factors appear to be responsible for these continuing high food prices. These include:

- Rising costs for domestic food production: fuel prices (e.g., for tractor fuel) since mid-2008 have been rising at rates roughly double that of the Consumer Price Index; and
- Supply constraints, possibly associated with border closures with Uzbekistan, or with long-term contracts or elements of monopolization within the food processing supply chain.

Global food price indexes January 07 – November 10



Provided by: Ben Slay, Senior Economist, UNDP Bureau for Europe and the CIS

<http://europeandcis.undp.org/senioreconomist>

5. HEALTH

The Ministry of Health (MoH) continues active surveillance for acute flaccid paralysis (AFP) to identify possible cases of Polio. No laboratory-confirmed cases of Polio have been since 4 July 2010, with AFP reporting up-to-date to 31 January 2011. Blood samples taken to determine the country's level of protection against Poliomyelitis, Measles and Rubella, Diphtheria (tetanus) are being processed and will help to determine future immunization actions. Preliminary control measures for 2011 were agreed with the European Regional Polio Certification Committee in January.

The influenza season has begun, with rumors of widespread illness. MoH surveillance has not identified an unusual spike in infection rates. Despite increased numbers of calls for emergency medical assistance for more severe cases, low numbers of individuals seeking professional health care for mild to moderate influenza symptoms have limited the ability to quantify the overall situation. The H1N1 virus has been identified among those seeking care. "The H1N1 2009 virus circulating in Europe corresponds with the strain included in the vaccine for the 2010/2011 season in the northern hemisphere (WHO EURO online)". The influenza season is being closely monitored [with regular reporting to regional EUROFLU network](#) and through teleconferences.

More information on the influenza situation in the WHO European region can be found at: <http://www.euro.who.int/en/what-we-do/health-topics/diseases-and-conditions/influenza/news2/news/2012/01/increasing-influenza-activity-in-the-who-european-region>

6. ECONOMIC TRENDS

6.1 General Trends

Gross domestic product (GDP) from January to December 2010 totaled 24.7 billion Tajik Somoni (5.6 billion USD), or 6.5% more in comparable prices than for the same period in 2009. The share of goods in GDP for December was 41.6%, and the share of services was 47.9%. At the same time the share of taxes in GDP remained almost unchanged at 10.5%. GDP in December was 3.5 billion Tajik Somoni (794.9 million USD), 1.25 billion Tajik Somoni (283.9 million USD) more than in November 2010.

The production of manufactured goods continued to exceed sales, and increased from 450.3 million Tajik Somoni (102.2 million USD) in November to 528.2 million Tajik Somoni (119.9 million USD) in December⁶. This situation is typical for the metallurgic, chemical and petrochemical industries as well as light industry.

There is an increasing risk for economic insecurity due to an increase in dependence of national economy on foreign markets and remittances. From a macroeconomic perspective this trend can be monitored through an indicator of excess demand (the difference between domestic demand and GDP produced). Analysis shows an excess of demand over GDP from September (19%) till November (29.9%). In December, this ratio remained high, at 22.0%. This situation is a direct reflection of the excess of imports over exports in December, which

⁶ Social-economic situation in Tajikistan from January till December 2010. Dushanbe, Tajikistan.

was 173.8 million USD (imports – 308.1 million USD and exports – 134.3 million USD). From January to December 2010, the excess demand over GDP was 26.3%, similar to the pre-crises period. Imports exceeded exports by 1.5 billion USD.

Tajikistan's trade deficit continued to grow in December, increasing by 173.8 million USD. Exports in December increased by 9.7% and imports by 11.8% compared to November 2010. The trade deficit for 2010 totaled 1.5 billion USD. The trade deficit with Commonwealth of Independent States members was 1.4 billion USD, and with other countries 60.1 million USD. Only 43% of import costs were covered by export income in December, raising concerns of Tajikistan economic insecurity.

The total value of credits extended by financial institutions in Tajikistan in 2010 was more than 6.1 billion Tajik Somoni (1.3 billion USD) or 8.8% more than in 2009. National Bank of Tajikistan (NBT) data indicates that the share of credits extended in national currency was 70.2%, and in foreign currency – 29.8%. There remain high levels of overdue debt in the banking and micro financial systems. As of beginning of December 2010, these debts totaled 2.5 billion Tajik Somoni (567.8 million USD) or 41% of the total amount of extended credits, with 94.4% of this debt in Tajik Somoni, and the remaining 5.6% in foreign currencies.

The National Bank provides support to banks to maintain liquidity. However, this support is basically of short-term character and increases risk for banks in the long-term period.

6.2 Inflation

As was earlier predicted, demand-driven inflation contributed to price increases for consumer goods, with year-on-year inflation in December at 10%. For 2010, the consumer price index was 109.8 %, including food goods 113.4%, non-food goods 105.5% and services 104.0%.

The December inflation rate in the consumer sector was 0.9%. The Statistics State Agency reported a 1.1% increase for foodstuffs and a 0.8% increase for non-foodstuffs, as well as 0.4 % increase for services. The monthly cost of foodstuffs in the consumer basket for one family member in December increased 1.1% compared to November 2010 and totaled to 110.55 Tajik Somoni (25.11 USD). The per person monthly food cost based on nutritional standards was 214.40 Tajik Somoni (48.70 USD).

6.3 Delayed Rail Freight Deliveries to Tajikistan

The Tajikistan Railroad Company claimed a total of 20 million USD in damages had occurred as the result of delayed rail cargos bound for Tajikistan from April to December 2010. Following the meeting between Tajikistan and Uzbekistan Presidents late in July 2010, the issue of the rail freight transit with Uzbekistan has been resolved according to the Tajikistan Railroad Company. Currently there are only 17 rails cars delayed on the territory of Uzbekistan due to customs regulations procedures⁷, down from 778 rail cars reported as delayed in Uzbekistan on 6 January 2011 (See December 2010 RMWS report).

⁷ Asia Plus newspaper, #5 (594), January 19, 2011

6.4 Population movement/migration

Please refer to the **December Risk Monitoring and Warning Report** for the latest information on migration⁸.

6.5 Employment and Wages

The Statistics State Agency reported 2,153,600 economically active individuals in November 2010. Out of the total active population, 2,104,900 (97.7%) are employed in economic sector and the remainder unemployed.

Monthly average salaries in November increased compared to November 2009 from 308.17 Tajik Somoni (TJS - 70 USD) by 384.13 Tajik Somoni (87.25 USD) or 24.7%.

Regional Wage Increases (November 2009 – November 2010)

Region	November 2009 (TJS)	November 2010 (TJS)	% increased
Sughd Region	238.48	295.47	23.9%
Khatlon Region	179.78	240.68	33.9%
DRD	334.64	388.60	16.1%
GBAO	262.86	328.50	25.0%
Dushanbe	629.84	767.68	21.9%

6.6 Wage Payment Arrears

The total value of arrears in November 2010 was 13.5 million Tajik Somoni (3.1 million USD). The situation with wage arrears is improving. As of 24 December 2010 wage arrears totaling 56.3 million Tajik Somoni (12.8 million USD) were paid off, 3.1 times more than in 2009 and 7 more than in 2008. There are no retirement benefits arrears as of December 2010. The table on the right shows monthly totals of wage arrears from January to November in 2010.

Wage Arrears Jan – Nov 2010 ⁹	
Month	TJS (000)
January	6,485
February	7,128
March	9,366
April	8,993
May	9,914
June	1,105
July	11,884
August	11,675
September	10,224
October	9,318
November	8,681

6.7 Exchange Rate

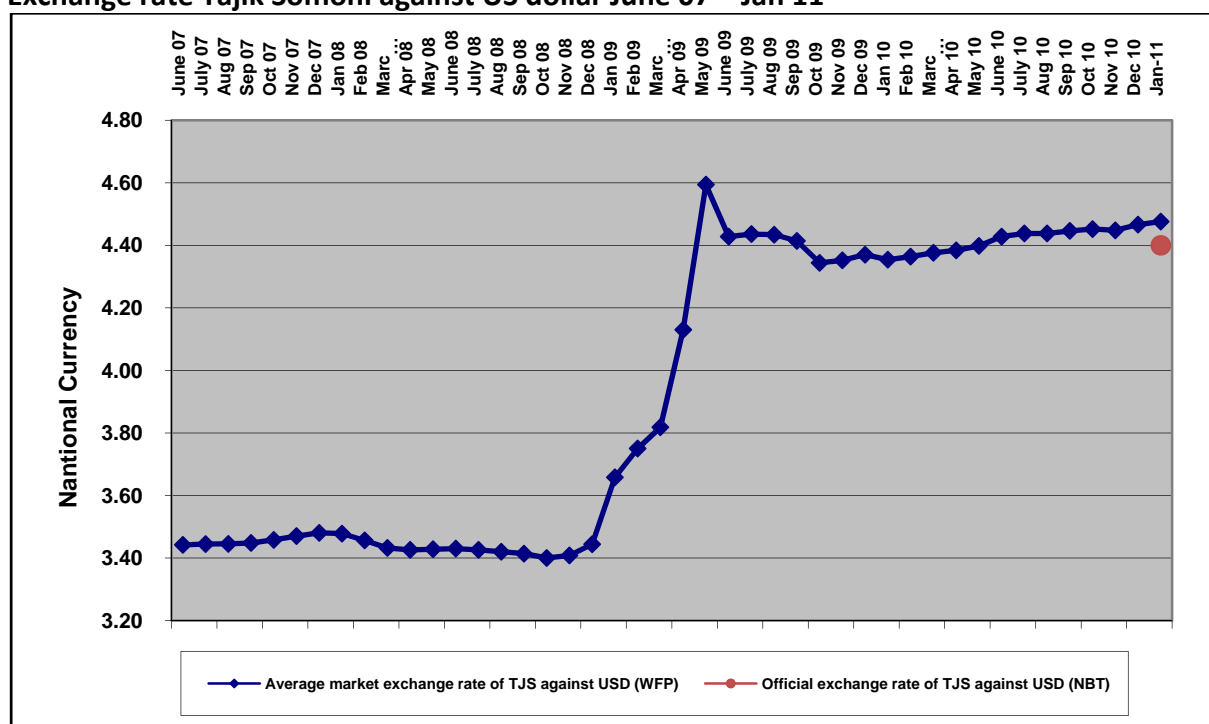
The NBT official rate was 4.40 Tajik Somoni against a US dollar on Jan 31, 2011. The following chart provides both the official NBT exchange rate and the WFP reported average market exchange rate for 5 markets in Tajikistan (4.5 Tajik Somoni per 1 USD) as of mid-January¹⁰.

⁸ RMWS December report can be accessed at http://untj.org/country_context/coordination_mechanisms/disaster_management/compound_crisis/early_warning_indicators/

⁹ Data provided by Statistics Agency in Tajikistan as of January 20, 2011.

¹⁰ http://untj.org/country_context/coordination_mechanisms/agriculture&food_security/fsms/

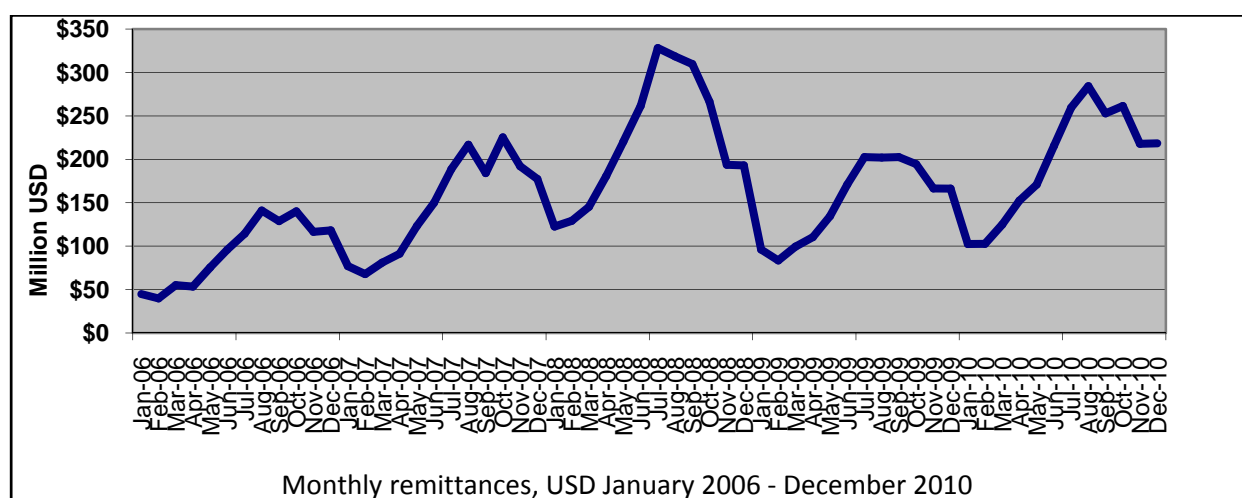
Exchange rate Tajik Somoni against US dollar June 07 – Jan 11



The average exchange rate of the Tajik Somoni against USD did not change significantly in December compared to November, 2010. The average exchange rate in December was 4.40 Tajik Somoni per 1 USD, while in November it equaled to 4.3935 Tajik Somoni per 1 USD. However, the national currency dropped 0.1 points against Russian Ruble and 0.15 points against Euro.

6.8 Remittances¹¹

The National Bank of Tajikistan reported a total of 1.834 billion USD in remittances in 2009 and 2.363 billion USD in 2010, or an increase of 528.8 million USD.



The table below shows detailed amounts of remittances in Tajikistan in 2010.

¹¹ National Bank of Tajikistan

Remittances Per Month, 2010 (million USD¹²)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
102.4	102.6	125	152.5	170.8	215.5	259.4	284.2	252.8	261.3	217.8	218.4

Tajik experts have raised concerns about recent unrest in major cities of Russia in December 2010. The Government of Russia may tighten registration rules for migrants and amended legislation in Russia may slow down the flow of migrants from Tajikistan to Russia. This may affect the level of remittances in 2011.

¹² Data provided by GoT working group expert on monitoring and warning under the Ministry of Economic Development and Trade of Tajikistan.

Annex A. Weather Forecast for February 2011**Khatlon Province and Lower Elevations, Direct Rule Districts (DRD)**

The average monthly temperatures at the lower elevations and in the foothills are expected to be 0.7 to 1°C below normal, and be 4 to 5°C at lower elevations and 1°C in foothills.

Temperature at night are expected to range between 5°C to -5°C, and during daytime range from 7 to 16°C. The warmest weather is expected during the first and fifth 5-day period in the month with temperatures 15 to 20°C. During the second 5-day period in February, daytime temperatures will drop to 0 to -5°C and nighttime temperatures will range from -10 to -15°C, and in the foothills down to -18°C.

Monthly precipitations (rain, snow) is expected often in February and will be above normal at lower elevations (normal is 28-100 mm) and in the foothills (normal is 100-150 mm).

Sughd Province

The average monthly temperatures in most of the region are expected to be 1°C above normal with temperatures at lower elevations 3°C, and in higher elevations -3 to -5°C.

Nighttime temperatures are expected to range from -1 to -6°C and daytime temperatures from 3 to 13°C. The warmest weather is expected during the first and fifth 5-day period in the month with daytime temperatures 11 to 16°C. During the second 5-day period in February, daytime temperatures will drop to -3 to 2°C, and nighttime temperatures will be -7 to -12°C.

Monthly precipitation (rain, snow) is expected often in February, but will be below normal at lower elevations (normal is 17-38 mm) and higher elevations (normal is 9-20 mm), and above normal in the foothills.

Mountainous Regions of DRD and Western Regions of GBAO

The average monthly temperatures in higher elevations of DRD and western GBAO are expected to be 1°C above normal and range from -1 to -7°C.

During the month, nighttime temperatures will fluctuate from 2°C to -8°C and daytime temperatures from -2 to 10°C. The coldest weather is expected during the first 10-day period in the month with nighttime temperatures dropping to -11 to -16°C, and daytime temperatures to -2 to -7°C.

Precipitation will be frequent and above normal during the month at higher elevations of the DRD (normal is 37-140 mm) and in western areas of GBAO (normal is 9-50 mm). Passes will be foggy.

Eastern Regions of GBAO

The average monthly temperatures are expected to be 1 to 4°C below normal with temperatures -17 to -18°C, and in Bulunkulya, -21°C.

Low temperatures are expected. General daytime temperatures will fluctuate from -1 to -15°C, and nighttime temperatures from -20 to -34°C. In other parts of Eastern GBAO, temperatures may drop to -45°C. The warmest weather is expected during the first 5-day period in the month, with daytime temperatures 3 to -2°C, and nighttime temperatures -4 to -9°C, and in Bulunkulya, -10 to -15°C.

The monthly precipitation is expected to be above normal: normal is 4-15 mm.

Special Supplement – Dry Weather in Tajikistan

January 2011

This special supplement to the **January Risk Monitoring and Warning Report** covers a number of issues related to the recent dryer-than-normal weather affecting Tajikistan. The supplement lays out in summary form the data available on the dry weather, identifies needs for future monitoring and summarizes some of the expected impacts if the current trend of dry weather continues.

A Dry Fall¹³

Tajikistan has two periods when it can expect rainfall: March to May and October to December (depending on elevation). Most rain falls in the spring, but rain during autumn is important for the germination of the Winter wheat planting.

Weather in October and November was both usually dry and warm based on reports from the State Administration for Hydrometeorology of Tajikistan. Averaged temperatures were 2 to 4 C above long term averages. Precipitation was 0% to 78 % of average in Khatlon Province, 24 to 66% of average in the mountains of western Tajikistan, 15 to 61% of the average in Sughd Province and 24 to 66 % of average in GBAO.

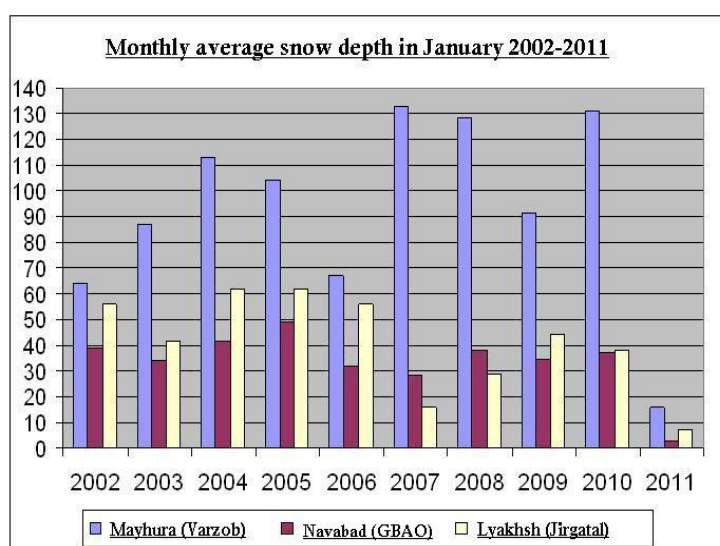
Low autumn precipitation can affect the Winter wheat planting. Given the dry conditions on the autumn, the Ministry of Agriculture has recommended a shift to crops which require less moisture.¹⁴

Less Snow To-Date

Winter snow

- Protects winter wheat and other seedlings from excessive cold
- Provides moisture for growth in the spring when the snow melts and
- Is the main source of water for electricity generation and irrigation for Tajikistan?

The low precipitation of October and November continued into December and January. December precipitation was 0 to 7 % of average in Sughd Province, 0 to 1% in Khatlon Province, 10 to 19% of average in the mountains of western Tajikistan and 0 to 53% of average in GBAO. January 2011 was considered warm with only minimal precipitation: 24 to 74% of average in Khatlon Province, 33 to 60% of average in the mountains of western Tajikistan and 0 to 82% in GBAO.

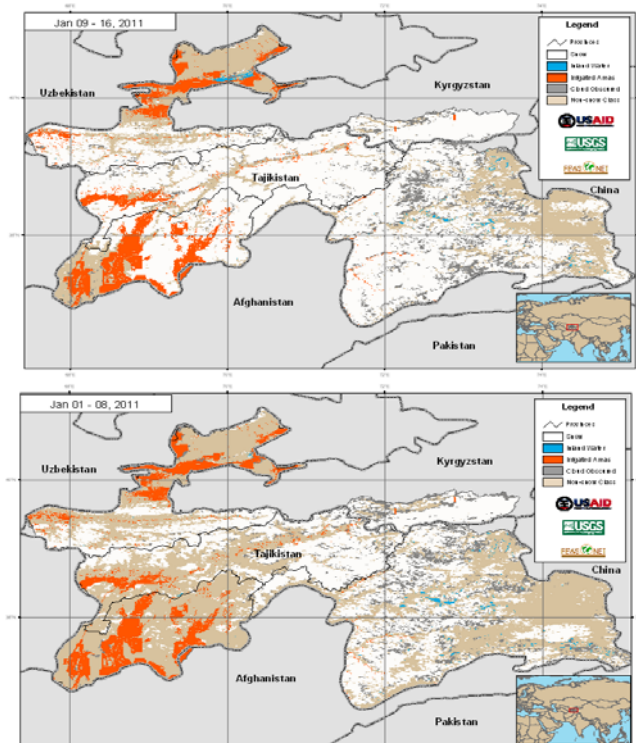


¹³ Precipitation and temperature data in this and following section from the State Administration for Hydrometeorology

¹⁴ <http://www.fergananews.com/news.php?id=16173>

The most striking presentation of the low level of snowfall in the mountains of Tajikistan is provided by the graph at right which indicates that snow levels are considerably below any time in the past 10 years.

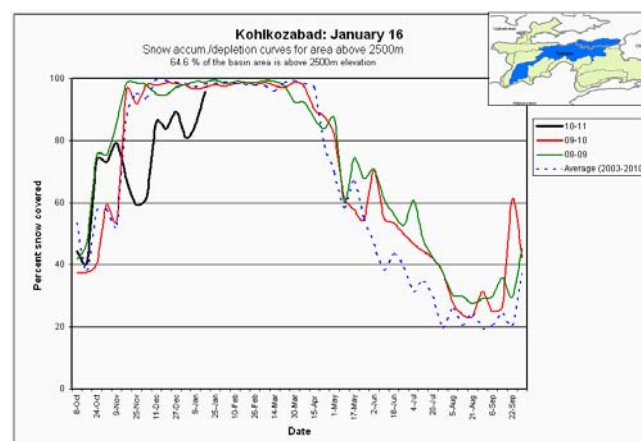
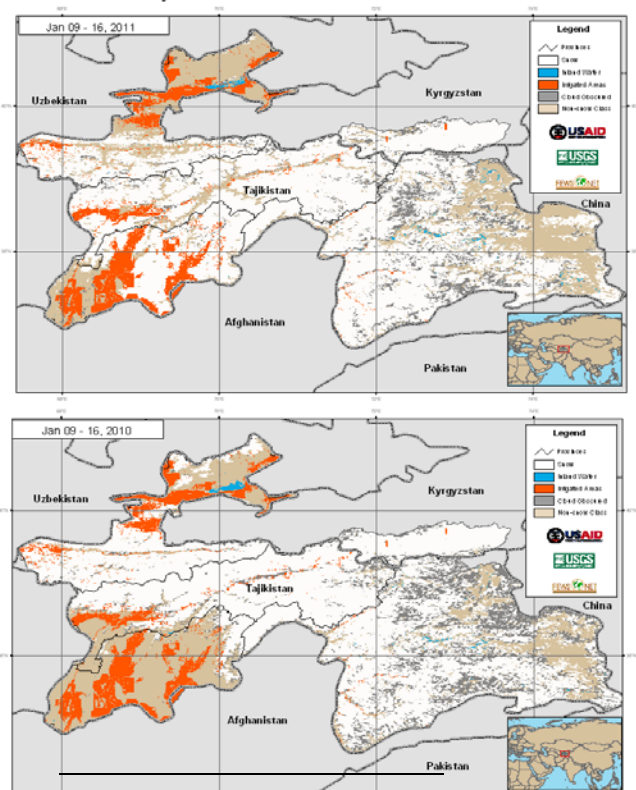
MODIS 8-day Snow Cover Extent - Current vs. Previous



Satellite imagery from FewNet¹⁵ (see left) indicates improvement in snow cover from early to mid-January 2011 (first set of maps) and mid-January coverage similar to the same period in 2010 (second set of maps).

However, snow level data from the same source indicates that snow accumulation (the development of the winter snow-pack) is off the average pattern and reflects the low snowfall earlier in the winter.¹⁶ The chart below shows estimated cumulative snowfall for the Vakhsh drainage, important to Tajikistan for irrigation and electricity production (85% of Tajikistan's electricity comes from dams along the Vakhsh River.)

MODIS 8-day Snow Cover Extent - Current Period 2011 vs 2010



Low levels of snow are of critical concern. However, there are two months remaining in the normal winter snow season. Close monitoring of snow fall, snow pack and snow water content is necessary to assess whether snowfall in the coming months will be sufficient for crop production

¹⁵ See <http://earlywarning.usgs.gov/fews/tajikistan/web/modsnwpy.php>

¹⁶ For more information see <http://earlywarning.usgs.gov/fews/tajikistan/web/readme.php?symbol=scdeplrm>.

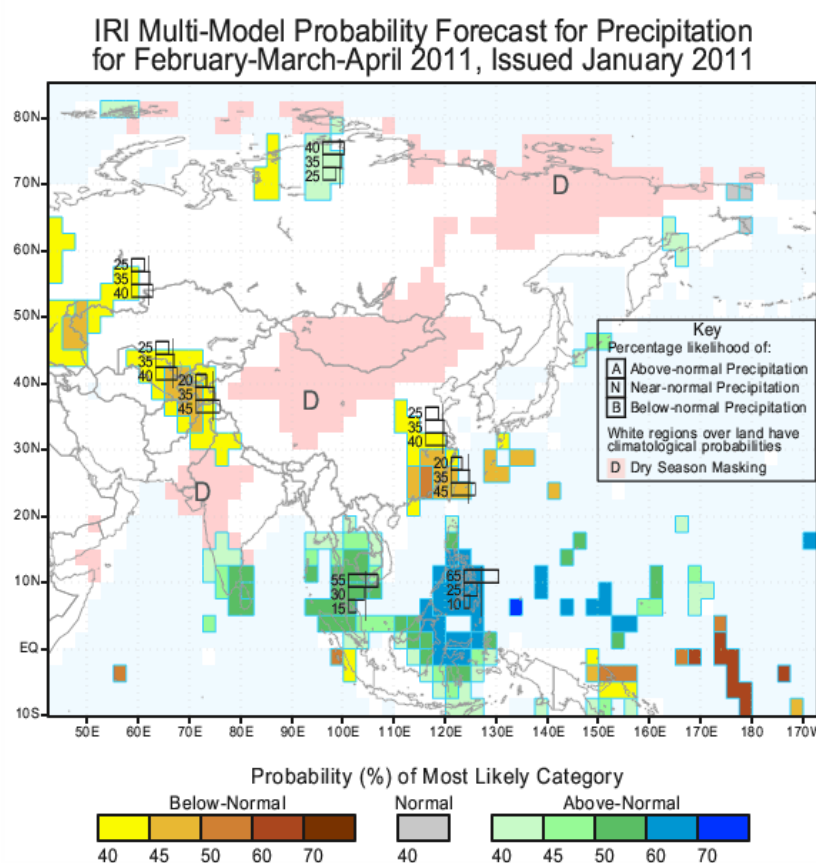
during the spring and summer, and for electrical production.

Will the Dry Conditions Continue?

Seasonal forecasts do not agree as to whether dry conditions will continue. The State Administration for Hydrometeorology of Tajikistan has reported that February and March will have abundant precipitation.¹⁷

A seasonal forecast, prepared by the State Administration for Hydrometeorology of Tajikistan and the Russian Hydrometeorology Center in December 2010,¹⁸ indicated that February would have above normal precipitation and slightly below normal temperatures and March would have precipitation and temperatures close to average across most of the country.

A forecast prepared by the International Research Institute for Climate and Society (see map at right), issued in January 2010, suggest a greater chance of dryer than normal conditions for Tajikistan for February to April 2011 period¹⁹.



Given the divergent forecasts, it is essential that current weather conditions, including snowfall, rainfall and temperature, be monitored closely to assess whether the recent dry conditions are continuing.

¹⁷ Asia-Plus, #7 (596), 26 January 2011, page A2.

¹⁸ **Weather Forecast for January-March 2011** (2011), Hydrometeorology Centre, State Hydrometological Agency, Republic of Tajikistan and the Hydrometeorological Center, Russian Federation.

¹⁹ See <http://portal.iri.columbia.edu/portal/server.pt?open=512&objID=944&mode=2> for more details on the forecasting process.

Will Dry Conditions Affect Electricity Generation?

The Vakhsh Cascade provides 80% of the electricity generated in Tajikistan and is reliant on snow melt for most of the water used in generating electricity²⁰. During winter there is relatively little flow of water into the Nurek reservoir (which supplies the rest of the Cascade), with hydro-generation coming from stored water.

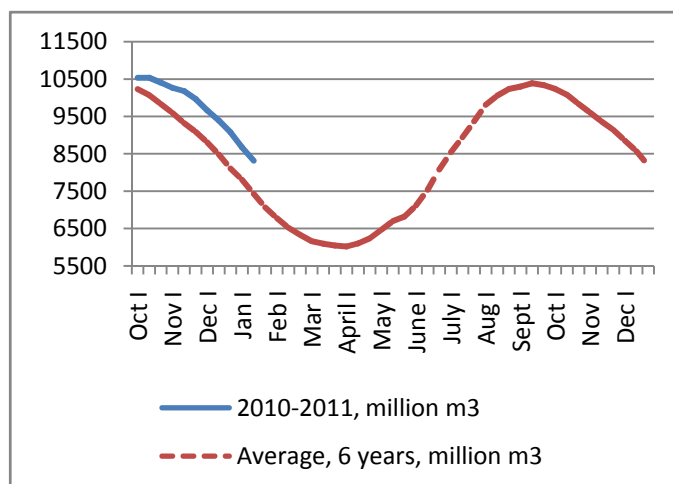
As indicated in the first graph at right, Nurek has more than the average quantity of water in storage for this time of the year. As a result, the Cascade should be able to continue to generate electricity through to March 2011, when melting snow normally begins to refill the Nurek reservoir.

The possible impacts of below average snow cover on the volume of water flowing into Nurek in the spring are as yet unclear. A comparison of the volume of water in Nurek at the beginning of the winter season from 1991 to 2010 is provided in the second chart.²¹

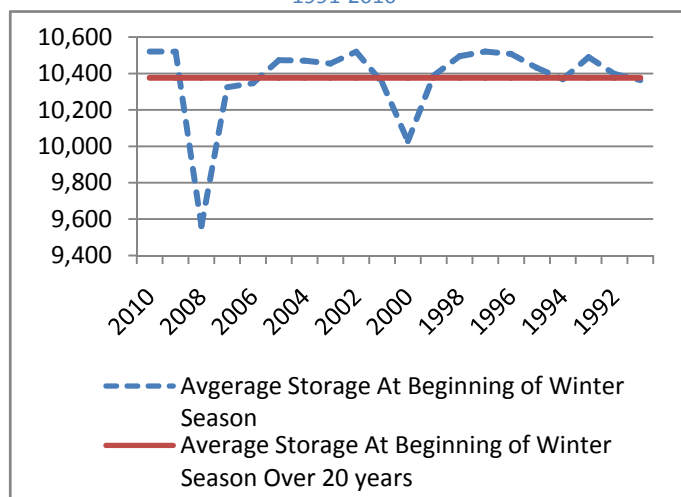
During the reported drought years of 2008 and 2000, the reservoir did not fill up to the average level at the beginning of the winter electrical production season (end September-beginning October). The greatest shortfall, in 2008, was 18% of the average fill level, or 815 Mm3, against a usable volume in the reservoir of approximately 4,500 Mm3.

The third chart at right shows the volume of inflows (in million cubic meters) into Nurek from 1991 to 2010 during the main filling period from April to September and the maximum storage capacity of 10,500 Mm3. The data indicate that the reservoir received

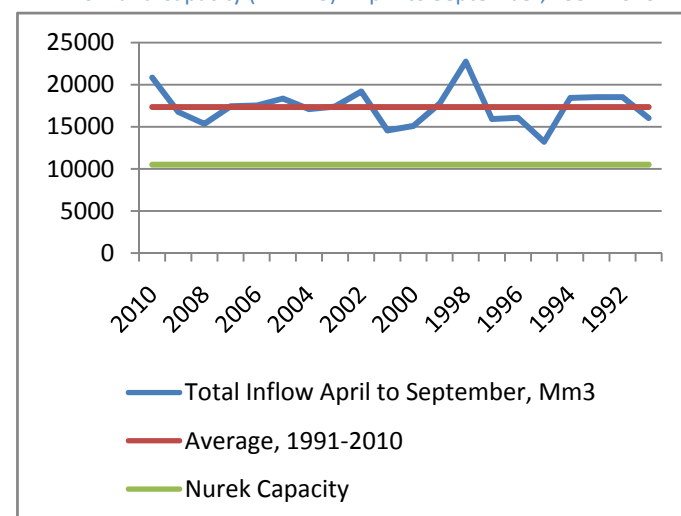
Volume of Water in Storage - Nurek Reservoir (mln m3)
October 2010- Jan 2011 and 6 Year Average



Volume of Water in Storage - Nurek Reservoir (mln m3)
1991-2010



Inflow and Capacity (mln m3) - April to September, 1991-2010



²⁰ Approximately 20% of the inflow to Nurek comes from October to March.

²¹ The average volume at the September/October point was calculated from the average storage volume for the last 10 days of September and the first ten days of October for each year.

sufficient water to reach the maximum fill level even during reported drought years.

The potential for a storage shortfall at the end September due to reduced flows into the reservoir can be addressed by reducing outflows during the April to September irrigation season. This could, however, impact crop production by reducing water for irrigation.

Further assessments of snow pack, using ground and satellite data, are essential to assessing the impact of this winter's snows on the availability of water for irrigation in 2011 and for electrical generation during the winter of 2011-2012.²²

Will the Current Dry Conditions Immediately Affect Food Security?

Tajikistan is a net importer of some basic commodities and in particular of wheat. The wheat market has already been affected by dry conditions in Kazakhstan and elsewhere, which contributed to price increases in 2010. (See the main RMWS report for more information on food prices.)

Dry conditions have already had an impact on the prospective production of wheat this spring. The result will be a need for additional imports or releases from Government stocks to off-set the lost production. These requirements can be quantified based on winter wheat production estimates, average production and historical imports.

Future impacts of dry weather on food security will depend on several factors, including:

- Will snow fall during the rest of the winter continue to be below averages, with an impact on spring melt, run-off and water for irrigation? The immediate impact will be on irrigated crops such as cotton and cereals.
- Will dry weather persist into spring, affecting spring-planted crops? The impact would be reduced harvests in the fall and concern about staple crops such as wheat and potatoes.
- Will dry weather and a lack of snow cover affect pasture production, increasing the demand for feed and reducing animal health and production?
- Will dry weather affect others parts of Central Asia, and particularly Kazakhstan, a major source of wheat for Tajikistan?

The impact of further dry weather on food security later in 2011 will depend to the extent to which imports can be increased to off-set reduced production. At a macro-level, if Tajikistan is able to maintain the inflow of funds, and particularly remittances, there is a good prospect that any need for increased imports can be met. However, if the price for food remains at current levels, or increases, then those with no or limited disposable income will be at a disadvantage, an issue already raised in recent food security reports.²³

²² Data from http://www.cawater-info.net/analysis/water/nurek_e.htm#.

²³ See **Tajikistan Food Security Monitoring Bulletin # 8** (2010) World Food Program, Dushanbe, and **Executive Brief: Tajikistan, Integrated Food Security Phase Classification (IPC) August – November 2010** (2010), World Food Program, Dushanbe

The aim of the Tajikistan Monthly Risk Monitoring Reports is to provide regular information and succinct analysis on the evolution of natural, economic, food-related, energy-related and other risk factors in Tajikistan. Data and information in this report are provided by different sources and compiled by the RMWS Group of Experts and UN Agencies in Tajikistan. The United Nations in Tajikistan and UKAid are not responsible for the quality or accuracy of the data provided by external sources or the analysis contained in this report.



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