



Crop and Food Security Assessment Mission Report Tajikistan 2011

Ministry of Agriculture of Republic of Tajikistan

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Acronyms

AKF	Aga Khan Foundation
ADB	Asian Development Bank
CFSAM	Crop and Food Security Assessment Mission
CIS	Commonwealth of Independent States
DRD	Direct Rule Districts
FAO	Food and Agriculture Organisation of the United Nations
FSMS	Food Security Monitoring System
FYM	Farm Yard Manure
GAO	Gross Agriculture Output
GBAO	Gorno-Badakhshan Autonomous Oblast
GDP	Gross Domestic Product
GIZ/GTZ	German International Cooperation
GNI	Gross National Income
GIEWS	Global Information and Early Warning System
GoT	Government of Tajikistan
HH	Household
KG	Kilogramme
MEDT	Ministry of Economic Development and Trade
MoA	Ministry of Agriculture
Oblast	Province
Rayon	District
SSC	State Statistics Committee
TJS	Tajik Somoni
TLSS	Tajikistan Living Standard Survey
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
WUAs	Water User Associations
WB	World Bank
WFP	World Food Programme

Part one: Crop and Food Security Assessment

(Main Report)

Introduction

This report has been released by Food and Agriculture Organisation of the United Nations (FAO) in Tajikistan through its European Union (EU) supported "Support to Strengthening of National Food Security Information System" project: GCP/TAJ/007/EC.

An International Consultant, Crop Assessment Specialist, was hired to develop the methodology of crop assessment, who also trained national teams, combined of FAO Agronomists and Technical Specialists from Ministry of Agriculture (MoA) of the Republic of Tajikistan and to oversee field observations and data collection as well as draft the initial report. Field work was substituted by available data and information available within Government of Tajikistan agencies, including MoA, State Statistics Committee (SSC) as well as Ministry of Economic Development and Trade (MEDT) and National Bank of Tajikistan (NBT) as well as international organisations and donor agencies in Tajikistan.

The World Food Programme (WFP) Tajikistan, with support from a technical specialist from its headquarters in Rome, prepared the section on food security that describes current trends in food security and the need for targeted assistance.

FOA – Global Information and Early Warning System (GIEWS) in Rome prepared the cereal balance sheet taking into account international data on amount of food imported to Tajikistan, chiefly from Kazakhstan, Russia and Ukraine.

Part one presents national production, food imports and summarises both into a Food Balance for the Marketing year 2011/2012, including food security trends. Part two includes detailed data on national production per Rayon (district) so as to allow for policy and decision makers for possible intervention in targeted areas in terms of food security assistance.

Report Highlights

- Wheat production for marketing year 2011/12 is estimated at 679,000 tonnes, 25 percent below last year's estimates and 8 percent below the average of the past 4 years.
- Wheat imports amounting to 960,000 tonnes are required in marketing year 2011/12 (July/June) for a population of 7.851 million people. According to FAO-Global Information and Early warning System (GIEWS) statistics, some 900,000 tonnes of wheat grain and wheat flour has been imported to Tajikistan in 2011, mainly from Kazakhstan, Ukraine and Russia.
- The wheat import requirements are 7 percent more than in the previous marketing year 2010/11. In 2010/2011 market year around 900,000 of wheat grain and wheat flour were imported that together with good harvest year – according to Ministry of Agriculture and State Statistics Agency, national production in 2010 was estimated around 900,000 tonnes – there was a surplus in the stocks.
- Wheat crop reduced performance connects to a) no autumnal rain, and erratic spring rains that finished early in most districts and b) a disrupted electricity supply to irrigation water pump schemes until late April.
- Barley production 2010/11 is estimated at 83,000 tonnes, 24% below last year's estimates due to similar factors affecting wheat performance.
- Rice and maize harvests are estimated to be 67,000 tonnes of paddy rice and 98,000 tonnes of maize grain respectively. With the inclusion of summer crop forecasts for crops not yet mature, marked increases on previous year's single season estimates.
- Potato production is estimated at 862,000 tonnes, 27 percent greater than last year from a 23% increase in area.
- Cotton area increased by 20 percent compared to last year due to an almost 100 percent rise in cotton prices in 2010, reversing the downward trend noted in 2009. However, in the meantime, international cotton prices have reached back the level of 2009 or 50 percent below 2010, following very good harvest expected by cotton producing countries.
- Increased prices in all commodities, with no apparent seasonal fluctuation, reflect an inflation of 10+ percent that is expected to increase in the coming year, which may reduce consumption. However, between June and August wheat and wheat flour prices were down by 15-20 percent but remained 30% higher compared to August 2010. Meat, sugar and cooking oil stayed at the same rate as in early 2011. Fruit and vegetable as well as potato reduced drastically from June and rice expected to drop too due to increase in national production.
- The incidence of undernourishment in the overall population, as measured by inadequate caloric intake (1 830 kcal/person/day), is high at 17 percent.
- A greater proportion of the urban population is food insecure, mainly due to high food prices and worsening terms of trade between wage rates and food prices.
- With record remittances, as reported by the International Monetary Fund and Government sources, the situation in rural areas would be much better.
- Poor cereal harvests are likely to exacerbate the degree of severity in food insecure households, increasing the need of targeted support estimated at around 50,000 tonnes of wheat equivalent.
- The following areas zones are to be considered priority for food assistance, based on the combination of food caloric intake, dietary diversity and incidence of wheat production shocks: Jirgatol, Tojikobod, Rasht, Panjakent, Khuroson, Yovon and Jomi.
- While cereal production in Tajikistan dropped by 20% compared to 2010, Russia, Ukraine and Kazakhstan reported excellent production at the end of the harvest season. Kazakhstan, for instance reported an almost 60% increase in its cereal production much of which much in wheat production. It is worth noting that around 22% of Kazakhstan's wheat is exported to Tajikistan annually. Thus an increase in wheat production in Kazakhstan indicates easing of wheat and wheat products prices for Tajikistan during 2011/2012 marketing year.

1. OVERVIEW

Food and Agriculture Organisation of the United Nations (FAO) and the Ministry of Agriculture (MoA) of the Republic of Tajikistan conducted a Crop and Food Assessment Mission (CFSAM) in Tajikistan from June to August 2011 a) to estimate the main (first) season cereal and pulse production, b) estimate potato production and, as far as possible, c) forecast the production of second season crops to be harvested later in the year. From these and secondary data collected from in-country sources, FAO Global Information and Early Warning System (GIEWS) prepared a cereal supply and demand balance sheet for marketing year 2011/2 (July/June) and WFP undertook the analysis of the food security situation.

In June, experts from the Ministry of Agriculture (MoA); the Dushanbe-based Crop Husbandry Research Institute, Tajik Agrarian University in Dushanbe and FAO attended a 3-day FAO consultant-led workshop in Dushanbe to familiarise team members with FAO protocols and methods prior to conducting crop and food production assessments in 31/42 districts. The assessments were conducted in two phases to coincide with the main harvest, Phase 1 in 31 districts in June-July for cereals; and, Phase 2 in August in 15 districts to assess potatoes. At the same time, the assessment team in Dushanbe analysed dekadal rainfall data, received from the State Committee for Hydro-Meteorological; agricultural import data, received from Customs and Excise Department; seed production data, from MoA and key informant data received from WFP, UNDP, USAID, Mercy Corps, Helvetas, FINCA, local NGOs including SHIFO, MoA Divisions –Crop Production, Plant Protection, Finance and Planning, Livestock and Range Management; and the State Statistics Agency.

Production estimates, disaggregated to district level were determined from collected area-harvested data and team average yield per unit area estimates. The Crop and Food Security Assessment teams obtained harvested (or harvestable) area data for all major food and cash crops from district agricultural offices for *dehkan* farms and *enterprises*. Similarly, harvested (or harvestable) area data were collected from the district statistics officers for all *household* (hh) and *presidential* plots in the districts. Data collected were collated in Dushanbe and cross-checked and reinforced where necessary by a) data from districts not visited by the teams (11 districts) collected directly for this mission by the MoA Dushanbe Senior Expert and by data released, in Tajik, by State Statistical Agency in August 2011. The quantitative data were triangulated with qualitative information and spot-check sample data obtained from 356 independent interviews/ case studies with farmers, NGOs, household and presidential plot gardeners. The case studies with farmers included 750 spot-check sample 1 m² crop-cuts of cereals and 200 spot-checks 1 m² hand-dug samples of potatoes. Continuous transect observation-recording of crops and their conditions were conducted over all routes taken by the teams within their assigned districts. The transect information provided the background with which the crop assessment teams judged performance estimates received from key informants and the relevance of their own samples.

The overall agricultural performance of the main season 2010/11 is much lower than the 2009/10 main season as a direct result of virtually no autumnal rainfall; erratic and early-finishing spring rains; and, severely disrupted irrigation delivery systems due to no or intermittent electricity supplies to pump set schemes until April 20th. Areas of the minor cereals, rice and maize; potatoes and pulses planted later in spring and during a second season benefitted from improved irrigation.

Regarding main season cereals, areas harvested are estimated at:-

- Total wheat area harvested at 308,000 ha is 10 percent below 2009/10.
- Total barley area harvested at 69,861 ha is 2.0 percent below 2009/10.

Late planted spring crops and summer season crops areas are estimated at:-

- Total rice area expected to be harvested at 21,000 is 52 percent greater than last year.
- Total maize area expected to be harvested at 29,083 ha is 237 percent greater than last year¹.

The adverse rainfall and irrigated water supply in autumn and spring in most areas also means that cereal yields are also lower than last year. However, a virtually pest-free year, and, despite a doubling of prices since 2009, a sustained use of fertilisers on irrigated land and on some rain fed land, means that the decline in production, although highly significant, is not as high as it might have been expected.

- The expected cereal harvest rounded to nearest thousand tonnes is:-
- Wheat production is estimated at **679,000** tonnes, 20 percent below estimated production in 2009/10; comprising winter wheat production at **534,000** tonnes, down by 24 percent; and spring wheat production at **144,000** tonnes down by 1 percent.

¹ Summer season areas have not been included in previous assessments for rice or maize.

- Barley production is estimated at **83,000** tonnes, 29 percent below estimated production in 2009/10; comprising winter barley at **34,000** tonnes down 29 percent; and spring barley at **49,000** tonnes, down 27 percent.
- Paddy rice is forecast at **67,312** tonnes (from both main and second season crops, 54 percent above last year's single season estimates.
- Maize grain is forecast at **98,000** tonnes from the main and second season crops, more than doubling last year's single season estimates.

Potato production is assessed to have improved this year with an expected harvest of **862,000** tonnes from 37,152 ha, an improvement of around 27 percent with 99 percent produced in the main season.

Although outside of the scope of the Mission to study in detail, pulse production is estimated to have increased by 11 percent during the first season, and is forecast to more than double to **43,000** tonnes with the summer season crop included. Similarly, oilseed production is estimated to have risen by 37 percent in the main season and is forecast to increase by 71 percent to **24,000** tonnes with the total of main and second season harvests.

The area sown to cotton is noted to have increased by 20 percent reversing the downward trend noted in 2009 and 2010. With cotton yields similar to last year, production should also increase to **362,000** tonnes by some 20 percent, boosting local economies.

Livestock numbers to 2010 continue to show an increasing trend, with both large and small ruminant returns showing 1 percent to 5 percent increases in breeding females. This year, transhumance began early in March, pushed by diminishing winter feed stocks and exhausted in-bye pasture, and pulled by earlier than usual access to the summer ranges due to a less severe winter. Birth rates from returns from case-studies in 26/31 districts visited suggest the following averages for cattle: 74 percent in GBAO; 39 percent in Khatlon; 37 percent in Sughd; with no returns from DRD team. Sheep and goat birth rates estimates are 74 percent in GBAO; 59 percent in Sughd; 56 percent in Khatlon; with, again, no returns from the DRD team. Forage shortages on the lowland and in-bye this year have already caused the market price of hay to increase steeply. High levels of autumn sales, extending to breeding stock are to be expected as farmers may well off- load weaker stock as well as the usual fat, store and cull animal sales, to restore numbers to a sustainable winter carrying capacity.

Based on a 2011/12 (July/June) population of 7.851 million and a wheat consumption of 177 kg /head/year, the CFSAM Cereal Balance suggests a wheat deficit of **960 000** tonnes, equivalent to 57 percent of domestic utilisation and a deficit of 30, 000 tonnes of maize for the poultry industry. Rice is expected to be in balance at an expected use of 5.2 kg milled rice (7.4 kg paddy) per head per annum, although high quality rice may be imported as a luxury product. All barley is expected to be used for animal feed, with a further 9,000 tonnes imported for malting. The wheat import requirements are 7 percent more than the approximately 900,000 tonnes of wheat grain equivalent, estimated by FAO-GIEWS to have been imported in marketing year 2010/11(July/June). **50,000** tonnes of the estimated 2011/2012 import requirements to be in the form of food aid with the remainder, **910,000** tonnes expected to be met by commercial imports.

2.0 SOCIO-ECONOMIC CONTEXT

2.1 Macroeconomic Situation²

General

Located in Central Asia, landlocked between Uzbekistan (west and north); Kyrgyzstan (north); China (east) and Afghanistan (south), Tajikistan with a population of around 7.8 million people (SSA, 2011) in approximately one million households (hh) has existed as an independent republic for the past 20 years. Some 70 percent of the population are estimated to live in rural areas³ with most communities concentrated in the irrigated valleys connected to agricultural systems which provide subsistence and surpluses for sale.

The initial five years of independence (1992-1997) were fraught with internal problems culminating in civil war which resulted in large scale death and Internally Displaced People. At the same time, the widespread collapse of the Soviet industrial network, social support mechanisms and the value of the currency caused

² This section is based on a variety of sources, including the Ministry of Economic Development and Trade (MEDT), and the National Bank of Tajikistan (NBT)

³ Bellmon Analysis Amendment Requirement, (2006); and UNDP (2009); ADB (2011) =50 percent

the start of the economic migration of a substantial proportion of the labour force growing from an estimated one million people in 2008, to almost 1.2 million in 2011, most of who work in the Russian Federation. Therefore, it is worth noting that the requirements as indicated above may not reflect the actual size of population and would thus reduce by around 15 percent. Since 1997, the progress of transition from the Soviet command economy to a market economy is considered to have been steady. From levels that fell ten-fold during the period 1992-97 to less than US \$250 per head, annual Gross Domestic Product (GDP) per head bottomed-out and, since 2000, has grown at an average rate of 7-8 percent for the past 10 years driven principally by cotton and aluminium exports, as well as remittance incomes from Tajik migrants working abroad. In 2008, annual GDP per head is noted at US\$ 490⁴ with 33 percent of the economically active population engaged in external labour migration and remittances represented approximately 50 percent of GDP. Nominal GDP is noted at US \$ 704 in the same year (Table 1),.

In the past 3 years, Tajikistan's macro-economic short and medium-term prospects fluctuated, and remain very fragile, with a slower GDP growth, high inflation levels, and growing energy and water insecurities. The downturn of the Russian economy in 2008 reduced labour requirements in the Russian Federation (RF), particularly in the unskilled, semi-skilled sectors. The falling demand resulted in a reduction in the need for migrant labour and a negative effect on timely payment of workers already in the Russian Federation, cutting the flow of remittances to Tajikistan and significantly affecting local household incomes and purchasing power at a time of a reduction in export revenues and increasing prices. The situation in 2010 became more promising, reflecting directional change regionally, and recent international reports indicate an increase in remittances in 2011 by around 24 percent compared to 2010, when global financial and economic downturn had severe impact on Russian economy and its growth and slowed down migrant labourers' involvement.

Macro-Economy 2009-2011

A closer look at recent macro-economic indicators through key informant interviews, reviews of recent analyses and announcements relating to the macro-economy⁵ of Tajikistan, suggest a) the slowing down in growth, increasing inflation and falling remittances following the global crash of 2008, followed by b) a period of recovery, albeit dogged by inflation, which began in 2010 and is expected to be sustained⁶ in 2011. Remittances rose from US \$ 1.7 billion in 2009 to an estimated US\$ 2.4 billion in 2010, again reaching 40 percent of GDP and are expected to increase during 2011 to reach 2008 levels in 2012. The GDP growth must be off-set against inflation which rose to 10.1 percent by the end of 2010 and is expected to continue to rise. A brief time series of macro-economic indicators from the ADB analysis is provided in Table 1.

Table 1: Economic Indicators, 2008-11, Tajikistan (ADB⁷)

Economic Indicator	2008	2009	2010	2011(p)
Per capita Nominal GDP (\$) (Tajstat)	704	666	740	n/a
GDP growth (percent change per year)	7.9	3.4	6.5	6.8
Inflation (percent change per year)	20.4	6.5	6.4	10.5
Exports (percent growth)	18.7	-10.7	40.9	24.5
Imports (percent growth)	55.4	-24.9	8.2	28.4
Balance of trade (US\$ billions)	-2.72	-1.97	-2.01	-2.6
Exchange rate vs. US \$ (yr average)	3.4	4.1	4.4	4.8(July)

P= projected

The fluctuations in balance of trade result, in part, from Tajikistan's landlocked situation and transit disputes during 2009 and 2010 with Uzbekistan, which exacerbated the effect of the global financial crisis. The dispute connecting to rail services, restricted imports more than exports thereby lowering the balance of trade deficit. The apparent resolution of these disputes is predicted to lead to increased international trade, which will necessarily increase the trade deficit but will increase GDP in the services sector. The contributions to Gross National Income (GNI) by sector in 2007 are noted as services 45.6 percent, industry 30.4 percent and agriculture 23.6 percent, with exports connecting to aluminium 60 percent, cotton 30

⁴ Robinson WI, 2008 Mission calculated, but estimates collected vary from US\$ 423 (UNDP) to US\$ 508 (NBT).

⁵ ADB (2008) Factsheet for Tajikistan, ADB, Manila; State Committee for Statistics (2008) Information Bulletin: Food Security and Poverty, Dushanbe; UNDP (2007) Communities Programme, Dushanbe;

⁶ ADB (2011) *Asian Development Outlook*, Manila

⁷ ADB (2011) *Asian Development Outlook*, Manila

percent and hydro-electricity at 10 percent. In 2010, Tajstat, *Food Security and Poverty No 4* notes that the contribution of agriculture to GDP (not GNI) is 18.7 percent.

2.2 Population and Employment

The population of Tajikistan in 2011 is estimated by SSA at 7.8 million, based on growth rate of 2.1 percent. Of these some 2.2 percent to 3.2 percent, are officially (i.e. registered) unemployed. Non-employment, i.e. unregistered jobless, is reported to be around 60 percent of the active population, comprising some 33% of workforce in overseas occupations and 27 percent working unofficially. Such persons make significant contributions to the household food economies through a) remittances likely to be in excess of US\$ 2.4 billion per annum officially recorded by the National Bank of Tajikistan (NBT) in 2010; and, through b) working in the subsistence and near subsistence agricultural sub-sector connected to the home-gardens. These gardens (household and presidential plots) are now held by some 770,000 and 375,000 families, respectively. The household plots were responsible for rural survival during the years, post-1992, of > 1000 percent hyper-inflation and the following half-decade of strife. These, and the more recent "President's Plots", formed when un-privatised land was allocated to some 375,000 families in 2005/7, also provide value-chain opportunities emanating from the production activities noted above. Transactions connected to endeavours arising from this agricultural subsector form part of the barter-based, informal economy reviewed by Olimov (2007)⁸ and estimated to be equivalent to around 60 percent of the formal GDP comprising 33 percent from tax avoidance (production from plots is not taxed- and value chain transactions are not recorded); 14.7 percent from home produced/consumed goods and 13.2 percent from barter and wages in kind.

Regarding quality of life and welfare, notwithstanding the steady economic improvements to 2008, the subsequent crisis in 2009 and an apparent recovery in 2010, Tajikistan, ranked at 112 out of 169 countries, is still below Uzbekistan (102); Kyrgyzstan (109) but above Pakistan (125) and Afghanistan (155) in the United Nations Human Development Index exhibiting a slight progress since 2000.

2.3 Agriculture Sector

Agriculture is one of the most important sectors of the economy. The share the agricultural sector contribution to the GDP was estimated (Tajstat, 2011) to be 18.7 percent in 2010. Agricultural products make up 30 percent of official exports and the agricultural sector employs most of the economically active rural population, many of whom are women. The importance of agriculture belies the comparatively small area of arable land at 7 percent (around one million ha).

Tajikistan is a mountainous country, with 93 percent of its surface area taken up by a complex of east-west and north-south ranges forming the Tyan-Shan and Pamir mountain systems, which means that half the country is at altitudes of more than 3,000 m. Elevations range from 300 m above sea level in the Ferghana Valley to 7,495 m at the Ismail Somoni Peak in the Akademiya Nauk Range (Pamir). Huge glaciers covering more than 8,000 sq. km, mainly in the Pamir Mountains, are the primary source of water for Tajikistan's many rivers, which feed the irrigated sector not only of Tajikistan but also of Uzbekistan to the west.

Arable agriculture is confined, primarily, to river valleys where 68% of the farmed land is usually dependent on irrigation to provide a harvestable crop with the number of irrigations varying from one or two up to eight to ten, depending on crop (cotton taking precedence) and the effectiveness of the lift/delivery system.⁹ There are four main, well-defined valley systems:-

- the Ferghana Valley in the north of the country along the Syr Darya, the south-western part of the valley that stretches from Uzbekistan into Tajikistan;
- the broad Khatlon lowlands in the south-west, extending from Kulyab in the east to the border with Uzbekistan in the west;
- the Hissor Valley between Dushanbe and Tursonzode, just north of Khatlon;
- the narrow strip of the Zarafshan Valley extending east to west between Ferghana and Hissor valleys.

The agricultural significance of the republic's four provinces (oblasts) Sughd, Khatlon, DRD (DRD) and Gorno Badarkhshan (GBO) connects to the proportional representation of the four river basins with their feeder

⁸ Olimov, J. (2007) *Informal Economy in Tajikistan*, UNDP, Dushanbe.

⁹ FAO Stat (2004); Rustamov, M. (2008) Personal Communication, UNDP

water-catchments within the respective provincial boundaries. The main agricultural areas of Tajikistan are therefore, Khatlon Province in the south-west, Sughd Province in the north and the Hissor zone in the western part of DRD. Table 2 presents the provincial percentages of agricultural land, cropped area, livestock, average gross agricultural output (GAO).

Table 2: Agriculture significance of Tajikistan's four provinces by percentage contribution (approximate data)¹⁰

Province	Sughd	Khatlon	DRD	GBAO	Tajikistan
Gross Agriculture Output (GAO)	25%	45%	26%	4%	100%
Agriculture land	24%	33%	26%	17%	100%
Cropped	32%	49%	18%	1%	100%
Cattle	27%	40%	26%	7%	100%
Sheep /Goats	31%	39%	21%	8%	100%

The mountainous GBAO is the largest province by territory but has the smallest population and the smallest level of agricultural activity. Khatlon Province has the largest population (2.5 million) and the largest agriculture area in Tajikistan accounting for 45 percent of GAO, with 60 percent of cotton, 50 percent of cereals, and 40 percent grazing for cattle and small ruminants (2006). Sughd and DRD provinces make roughly the same contribution to agricultural production and GBAO province contributes 8 percent. Overall, the area sown to cereals is roughly the same in Sughd and DRD. Horticultural crops, potatoes, vegetables, and melons, are evenly distributed among the three major agricultural provinces. Orchards and vineyards are grown mainly in Sughd and Khatlon, Sughd has over 50 percent of the orchards and Khatlon has over 50 percent of the vineyards. Despite the privatisation of agricultural sector and trade liberalisation, patterns of production from the agricultural sector outlined above still reflect the inter-state dependencies established during the era of the Soviet Union. Cotton previously grown under irrigation in enforceable quotas is still the main cash crop with related levels of inputs. In 2007, area quotas were apparently relaxed and more flexibility was granted to farmers. However, supply for the cotton crop remains linked to the ginneries and seemingly separate supply chains into the country. According to official statistics, cotton area fell from 280,000 ha to 255,000 ha but still accounted for 31 percent of the cropped area in 2007¹¹. Notwithstanding the relaxation of quotas, it is the indebtedness, exacerbated by the repeat loans in successive years to bad debtors that committed farmers to continue to grow significant areas of cotton; cotton inputs available on *further* credit as part of the cotton contracts being a more attractive option to impoverished farmers having no funds for increased quantities of inputs, without credit, for larger areas of alternative crops. Therefore, long-term cotton debts at household level not only restricted farming options but also prevented farmers seeking more lucrative alternative markets. In addition to the direct competition for land during the spring and early summer, growing cotton prevents the planting of a second crop in mid-summer. Whereas winter wheat production allows the same area of land to be planted following the wheat harvest in June, to maize, potatoes and a significant amount of vegetables for consumption and for sale, the cotton crop is not harvested until it is too late for a second crop to be grown, thereby affecting directly both food security and income generation from sale of surplus.

In 2008, following a landmark court case in 2006, a process to dismiss cotton debts was initiated. In April, 2010, the IMF reported that the writing-off of US\$ 580 million worth of long-term cotton debts was being completed and reforms were in place to link farm-gate price more effectively with world prices. In anticipation of this event, before the planting season in 2009, a statement was issued from the office of the President encouraging farmers in a) low potential cotton areas, and b) areas with high marketing potential for other crops to diversify further, effectively reversing the long-standing policy to grow as much cotton as possible. In 2010, cotton area is noted to have dropped to 164,000 ha. The combination of cotton quota lifting and debt removal, in theory, offers opportunities for the production and sale of a wider range of cash crops as well as increased production of staples. In practice, manifestation of such opportunities depends on the proper and timely functioning of the water delivery systems; and, exporting the increased products depends on traders being able to navigate the national export bureaucracy¹².

In the privatization of state assets that followed the break-up of the Soviet Union, new forms of management evolved relating to land reform, changing in the structure of the agricultural sector. The

¹⁰ Lerman, Z and D Sedk (2009) The Economy Effects of Land Reform in Tajikistan, EC/FAO Food Security Programme, Phase 2

¹¹ Bellmon Amendment Requirement (2008)

¹² Robinson, WI (2008) Regional market Survey- Central Asia, WFP, Cairo.

structure of agriculture is now based on three types of farms; a) enterprises – resulting from the privatization of specialized state farms; b) *dehkan* farms - cooperative and private resulting from worker accessions of collective (*kolkhoz*) land on a group or individual basis; and (c) family plots, - household plots and President's plots. Enterprises are large scale units, former state farms taken over by companies during privatization. The private *dehkan* farms are split into individual/family (18,300 small enterprises) and cooperative holdings (8,300 units), the latter managed by former managers on behalf of workers with land share certificates; the former are more fully privatized with associated land use titles conferred on the owners creating private landholdings with 50-year leases. The enterprises and farms are tax-paying registered businesses. Household plots/kitchen gardens are an important household asset and have probably been responsible for the subsistence of most families for decades. The majority of households, in the rural areas and smaller towns, have access to a small plot (0.08-0.3 ha) of land depending on the regions/areas and availability of land, usually attached to homes. Some part of the produce from the household plots is supplied to the local markets, the accumulation of which by traders involved in trading networks supply the cities and exports to other CIS states. The area under productive cultivation in such units was increased by 75,000 ha under a Presidential Decrees in 1997 that released additional land under “President’s Plots” scheme to households in all districts giving access to land for more urban dwellers.

An approximate breakdown of annual food crops is presented in Table 3 divided by the type of land upon which they are grown. According to the official statistics for domestic production, apart from cotton, 85-96 percent of all field crops are grown on the *dehkan* farms and family plots, with family plots providing 60-75 percent of the maize and potatoes and the wheat being split evenly between the two types of holding. All vegetables and fruits follow the pattern recognized for potatoes and maize, illustrating the high level of significance of the informal agricultural sector. The differences noted in Table 3 between the % contributions of *dehkan* farms in 2007 and in 2010 suggest that the management of *dehkan* farms may be improving.

Table 3: Contribution of Produce by Farm Type, comparing 2007 and 2010 Tajikistan

Crop	Wheat 2007	Wheat 2010	Maize 2007	Maize 2010	Potato 2007	Potato 2010	Cotton 2007	Cotton 2010
Household/ Presidential plots	42%	37%	75%	61%	69%	65%	0%	0%
<i>dehkan</i> ¹³	43%	52%	18%	32%	27%	28%	63%	75%
Enterprise	15%	13%	7%	7%	4%	7%	37%	25%
Total	100%	100%	100%	100%	100%	100%	100%	100%

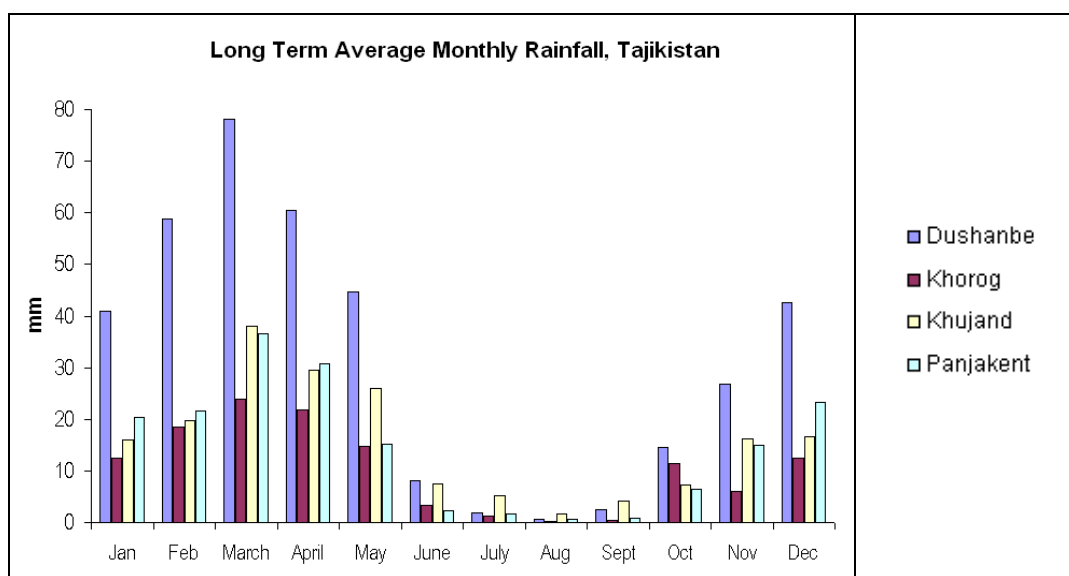
Data – Based on State Statistics Agency Year Books

Whatever the farm type, vegetable, garden-orchard, cotton, maize and rice and around 70 percent of all other field crops are grown under irrigation; surpluses are exported to Uzbekistan, where borders are not entirely closed and Afghanistan. Winter and spring sown cereals; spring sown oilseeds and pulses, early sown potatoes and cotton comprise the first or main season. Where water delivery systems allow, early harvests of all main season crops, except cotton, afford the opportunity for second crops planted in series which comprise maize, rice, potatoes, oil-seeds and a significant amount of vegetables.

The importance of irrigation from the glacier sources notwithstanding, annual rainfall directly affects the performance of some 32 percent of the crops usually grown under rainfed conditions; and dramatically increases area planted to rain fed cereals and oilseeds through opportunistic planting in the foot hills in good years. Figure 1 presents long-term average monthly rainfall data from four different cities roughly corresponding to the provincial divisions (Dushanbe –DRD; Khorog- GBAO, Khujand- Khatlon and Panjikent-Sughd). The graph clearly shows rainfall patterns that support autumn and winter planting and good spring growth in DRD, as well as the usual universal absence of rain in all regions from June until November, indicating a high level of dependency of late-spring sown and second-season planted crop production on, at least, supplementary irrigation and the importance of good water management. Snowmelt also provides substantial quantities of moisture to support growth in the rain fed sectors in years of heavy snow fall.

Figure 1: Long term rainfall patterns in Tajikistan

¹³ Fully privatised dehkan farms c 18,300 (320,000 ha); Collective dehkan farms; around 8300- 165,000 ha



In general, the Republic has abundant surface water resources to sustain a core crop-producing area of some 700,000 ha where irrigation systems are functioning, albeit with problems connected to delivery, particularly power supply for pump schemes. Despite the needs for improvements in maintenance and efficiency of use, it is anticipated that the systems still allow a further 100,000 ha¹⁴ of second cropping in summer. Observations from transects driven in 2008¹⁵ and during the CFSAM Missions 2009 and 2011 suggest that much of this area is maize for both grain and fodder and rice areas are increasing.

The importance of water delivery management has already been noted. The present system is an adaptation of the inherited Soviet system whereby primary supply is controlled and managed by the relevant Ministry departments, who are responsible for delivering water to the areas that were previously *sovkhos* and *kolkhos*. Thereafter, the responsibility for command area distribution networks, previously managed by the *sovkhos* and *kolkhos*, is now, in privatised areas, allocated to water users associations (WUAs), where they exist. Since 2003/4 USAID, ADB, GTZ (currently renamed as GIZ) and AKF have supported, through awareness building and direct support projects, the introduction of WUAs. Around 200 WUAs have been established, of which 77 are functioning well, others are more apparent in their paperwork than from their actions¹⁶. Functional WUAs improve equitable water distribution with fewer losses, better gates, fewer leaks and greater observation of command area timetables. The payment of water dues (0.17 US\$/m³) has increased by 40 percent, and areas of double cropping with a second crop, maize for grain or fodder, sunflowers or potatoes following wheat and barley, have increased. On-farm water management is the responsibility of the farmers themselves. Drainage problems connected to poor maintenance of the greater network are, seemingly, often beyond the capacity of WUAs to improve resulting in increasing salinity and abandonment of land.

Most cereal crops are grown from seed carried over from the previous harvest. According to the 2005 FAO Crop and Food Supply Assessment Mission, only 10 percent of wheat area is planted with certified seeds. Poor quality seed use results in a decline in genetic yield potential, low germination rates, increased seed-borne diseases such as smut and increased weed infestation. Seed certification is limited to some 13% of the annual seed requirement (wheat only). Farmers may receive support from Government, from humanitarian aid through NGOs, or through locally-managed seed schemes. These amounts represent only a small fraction of the country's annual requirement of at least 85,000 tonnes. In 2008, FAO provided 1,100 tonnes of improved wheat seed for 5,500 ha, which, if sown in 2008/9 with the 1,100 tonnes of fertiliser provided under the scheme, had the potential to provide improved seed for 137,500 ha¹⁷ of wheat in 2009/10, which should have extended to more farmers for use in the sowing season under review (2010/11) through farmer-to-farmer exchanges.

Regarding other inputs, until 2007/2008, commercial import and marketing of inputs was constrained due to deteriorating agricultural terms of trade. Costs of agricultural inputs such as fertilisers, agro-chemicals,

¹⁴ FAO Rep (2008) Personal Communication quoted in Robinson WI (2008)

¹⁵ Robinson WI (2008) Central Asia Regional Markets Survey, WFP, Cairo; CFSAM (2009) FAO, Rome; CFSAM (2011) Transects driven

¹⁶ USAID (2011) WUA specialist

¹⁷ 200 kg per ha sowing rate

machinery and fuel, reflect international prices, while agricultural products have been discriminated against due to the prohibitive tariff and non-tariff taxes in neighboring countries. Therefore, the use of fertilizers, agro-chemicals and improved seed varieties has declined continuously since independence. At the same time, the absence of any home production of fertilizers since 2008, and low imports of compound or phosphate or potassium-based fertilisers compromises rational maintenance of soil fertility and reduces the response to the nitrogenous fertilisers that are available. However, this is a long-term problem and is applicable to the private, cooperative and enterprises that do not have such importing capability. The fertility of the much smaller household and president's plots is restored annually by the use of animal manure due to the integrated nature of the crop / livestock system that has emerged since the state livestock units were fragmented.

Farm machinery and irrigation equipment such as pumps and pipes are in a dilapidated condition and most machinery has passed its usual life expectancy, being at least 20 years old. The consequence is that the Soviet-style cultivation practices previously followed are executed badly with concomitantly high sowing rates intended to compensate for sub-standard practices of cultivation.

Regarding vulnerability to pest attack, migratory pests remain the concern of government. Following the pattern established during the Soviet era, thousands of hectares of the dry steppe, semi-desert grasslands in areas bordering Afghanistan, which comprise one of the internationally-recognised breeding grounds for the grassland locusts *Calliptamus italicus*- the Italian locust; and *Doclostaurus maroccanus*- the Moroccan locust, are blanket sprayed every year by the authorities with broad spectrum pesticides to control the hopper (larval) generations before they reach the flying stages and threaten field crops in the bordering arable areas. Following surveys in locust nursery areas in twelve districts in March, 2011, 133,000 ha (Mustafakulov, 2011)¹⁸ of the semi-desert steppe were sprayed to control hoppers, as part of a Regional initiative to control the pest. This year, as in the past two years, the reproductive cycle was broken and a possible migration contained for another year, with no recorded losses noted by the Mission.

Regarding non-migratory pests, given the liberalisation of trade in goods and commodities, pesticides against non-migratory pests are available in the market place and are used mostly on cash crops, especially cotton; but many are of dubious provenance and others are sold with instructions for use and storage in languages unknown to the users *i.e.* other than Russian, which begs questions over their accurate and efficient use. As against this, commercial enterprises selling chemicals, often managed/owned by ex-MoA or ex- *Sovkhoz* *Kohlkoz* staff, are increasingly assuming an important advisory role.

3. Cereals and other field crop production, 2010/11

3.1 General

Crop production for any crop over any area may be estimated simply by multiplying estimates of area harvested by the assessed yield per unit area. The rapid appraisal methods used by the CFSAM team to estimate area and yield for cereal crops are noted in detail in Annex 3. As well as calculating the production for each district using the simple equation <production = area x yield (also termed productivity), the Mission, through key informant interviews and rapid case studies, have tried to ascertain and explain in the following sections of the report, the factors that have resulted in this year's estimated performance. In this regard, in a semi-arid country such as Tajikistan, water supply is the critical element determining area planted, plant survival, plant growth and plant development. Thereafter, factors including:-soil fertility, seed type, land management/husbandry, input supply, pest control and the very important ingredient of timeliness, combine together to determine crops and varieties grown and the performance of such crops. The following sections look at such factors as noted during the mission from both first hand and secondary sources.

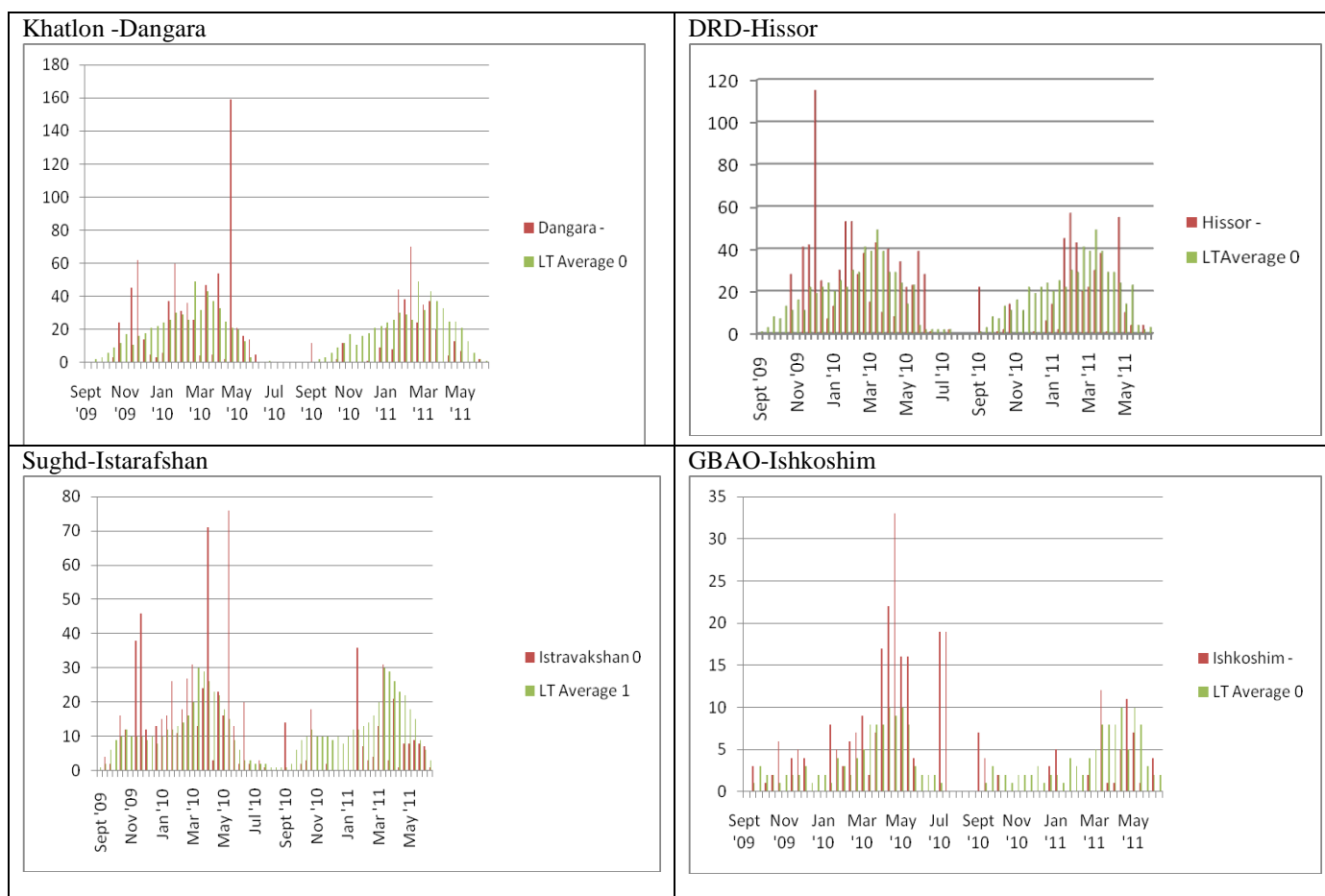
3.2 Factors affecting area and production 2010/11 -Rainfall.

Dekadal rainfall data from the Meteorological Institute (Hydromet) were obtained and analysed by the Mission. Graphs of dekadal precipitation in three Provinces in Sughd, DRD and GBAO; and six districts in Khatlon province (three districts in Kulyab; three districts in Kurgantube) and presented in Annex 1.

In Figure 2, dekadal rainfall data from one representative district of each Region are presented to show the differences in precipitation in the main seasons 2009/2010 and 2010/ 11 against long-term averages.

¹⁸ Mustafakulov, U. (2011) June Report to FAO.

Figure 2: Dekadal Rainfall Estimates.



Each graph in Figure 2 clearly shows:

- There was significantly above average rainfall throughout the 2009/10 season.
- Equally significantly, there was below average rainfall throughout the 2010/11 season.
 - a. In 2010/11, useful precipitation in September, October, November, and December was non-existent.
 - b. In 2010/11, in January, the very latest time to sow winter wheat, rainfall was way below the long-term average in almost every dekad in each region.
 - c. In 2010/11, rainfall in DRD and Khatlon improved considerably; but that was not the case in GBAO or Sughd¹⁹.
 - d. In 2010/11, the spring rains finished much earlier than in 2009/10.

Hydromet data findings are reinforced by returns from the case studies/key informant interviews conducted by the Mission. According to the 256 key informant/farmer sample, this year has been an exceptionally poor rainfall year. In the main agricultural regions, precipitation was noted to have been non-existent in autumn and continued, to be late and irregular in spring, with profoundly bad effects on the performance of cereals and other crops in the rain fed sector. The negative effects were exacerbated in early spring by poor levels of performance in delivery of water in the pump schemes depending on electricity supply. It was not until April 20th that energy supplies returned to normal to improve delivery of water to some 250,000 ha. The delays in both rain and water delivery mean that in areas where either one or both of such problems were manifested, winter and spring planting plus subsequent crop development were significantly affected.

3.3 Other factors affecting area 2010/11.

While collecting area data from all districts for all main season field crops, the Mission teams visiting the 32 districts in Phase 1, concentrated their investigations more specifically towards situation reports on wheat (5

¹⁹ Dekadal graphs in Annex 1 show that Ayni was an exception.

teams) and factors affecting area (and performance); and, the Mission teams visiting 14 districts in Phase 2 (3 teams) on factors affecting potatoes. Such attention is warranted, given the national importance of these two crops; and, factors affecting wheat area, whether associated with land, ploughing, seed availability, seed source, sowing dates, and sowing rates are equally likely to affect other winter or spring planted cereals and other spring planted field crops.

In a near-subsistence economy, area cultivated generally depends on a) access to land; b) workforce (traction) and c) planting material. In a market-economy, area cultivated is usually fine-tuned by terms of trade. In the former case, crop choice is limited to staples and familiar, locally saleable cash crops. In the latter case, crop area and even overall area may fluctuate due to terms of trade if markets are thought to exist. Agriculture in Tajikistan is, near subsistence (Table 3). Therefore, the initial premise usually applies.

Access to land

Regarding overall access to land, none of the CFSAM Mission teams note any significant changes in overall access to land during the past year. Boundaries and holdings appear to remain as noted in FAO Crop Assessment Report 2009. Within the boundaries, however, changes from the 2009/10 main season are noted leading to an estimated overall increase in main season area cultivated to field crops (total = cereals + pulses + oilseeds + cotton) by two percent (2 percent) to reach 675,334 ha seemingly at the expense of alfalfa (TajStat, 2011).

Traction and Machinery.

Regarding the means and resources to plant, tractors in use are still mostly as inherited at the break-up of the *sovkhos* and *kohlkoz*, and maintained by the larger farm businesses through re-using units or obtaining spare-parts from Russia. Therefore, most tractors and farm machinery are in a deteriorated condition and most machinery has passed its usual life expectancy, being at least 20 years old. The consequence being that on the *dehkan* farms, the Soviet-style cultivation practices of multi-pass, land preparation have apparently been reduced to a minimum of 3 passes, one ploughing, one harrowing, one seeding- to conserve machinery and save money, except for cotton fields, where more elaborate cultivation practices are used. Those small farm businesses and plots using tractors depend on hiring from the larger farms at rates which are noted to vary significantly between provinces and between districts within provinces as noted in Table 4, according to demand. However, where newer tractors are available through leasing companies, greater efficiency has reduced the price. With regard to tractor use, in all regions except GBAO all sizeable fields, not plots, have an initial ploughing by tractor, thereafter, the second cultivation may be done by hand- often involving land forming-and the sowing may be by machine or by hand. In GBAO, at least 50 percent of the farms use animal traction for secondary field operations with some using animals for all passes. Weeding of cereals is always done by hand. No use of herbicides for cereal production is noted, although herbicides are available in the private agricultural input shops.

Table 4: Summary of key- informants' returns regarding tractor use, 2011 by Region²⁰.

Region		Tractors cost per ha			Mechanised cost		Hand labour cost			Comments
Region	Districts assessed/actual	Plough ha - 1 pass	Harrow ha-1 pass	Seed ha-1pass	Harvester ha	Thresh ha	Sowing per ha	Weed per ha	Harv per ha	
Sughd	9/14	200-450s	120-240s	n/a	480s			All hh 100-200		Animal for secondary <200 TS/ha-
DRD 6 districts	6/13	500-600s	100-200s	180-200s	500-740s		<	5 dist		
K-Kulyab	7/11	100-200s	100-110s	120-150s				1 dist		Tractors cheaper due to leasing company.
K-Krgantube	7/13	150-280s	100-120s	120s				50s		Tractors cheaper due to leasing company.
GBAO	6/7	500 s	animal	hand				3 dist		Bulls used up to 40% of area in 4 districts

By contrast, the hand-digging and land forming on the household plots are noted to be performed with care and in a timely manner. That said, transects taken by the International Consultant identify a rapid series of

²⁰ Drawn from 256 Mission returns.

activities immediately following the harvest of winter cereals in Khatlon and DRD, with tractors following the combine and an impressive array of land-forming techniques used to prepare land for a second season planting of rice, maize, pulses and vegetables.

Despite genuine difficulties with weather, a 2 percent greater area was cultivated this season, as shown in Table 5, a factor that appears to bear witness to the regular availability of machinery during what was a prolonged planting season.

Seed Supply

The national, annual, wheat seed requirement is around 85,000 tonnes for an expected 425,000 ha of wheat (200 kg/ha). Certified seed from MoA advised seed multiplication units of which 7 out of 9 functioning are noted to have produced 18,000 tonnes of wheat seed for planting in season 2010/11. A further 34,000 t of quality seed was available for sale from specialist *dehkan* farms at prices ranging from 1.5-2.0 TJS/kg.

Mission collected information indicate that for 2010/11 season, some farmers in Khatlon (Khuroson, Dangara, Vose) DRD (Vakhdat); and Sughd (Kanibodom, Zafarobod, Shariston and Ghonchi) obtained seeds from seed multiplication units, with the seeds in Sugd all coming from the unit in Kanibodom. In Dangara and Vakhdat, MoA-led revolving seed funds are noted to be active.²¹ In addition, a very minor amount has been imported by agencies and companies. Mission returns show 2 out of 256 case-studies reported importing wheat seed, from Afghanistan and Russia respectively.

For the most part, farmer use carry-over seeds either held in store on the home farm or purchased from local markets, or in farmer-to-farmer exchanges. This home-produced, cleaned but untreated, carry-over seed is sown at higher than recommended rates to counterbalance impurities and lower than optimum germination percentages.

In any event, although improved seeds are clearly in short supply, there is no indication that shortages of cereal seeds restricted area planted this year. CFSAM team reports from case-studies note a mixed approach in the sowing of autumn/winter cereals depending on location. Very little October sowing of wheat is noted anywhere; November - December sowing of wheat predominates in Khatlon-Kurgan Tube; November-December sowing predominates in the sample studied in DRD; December-January/ spring sowing of wheat is most common in Khatlon - Kulyab; and autumn and spring sowing of winter wheat is noted in Sughd. The only examples of replanting of winter wheat to another crop (spring wheat to chickpeas) were cited in Panjikent (4 out of 14 case-studies), Zafarobod (wheat to cotton 2 out of 14 case-studies). It is, therefore, likely that delays in initial planting, precluded replanting.

Areas planted by crop by Region, excluding²² crops reported to be un-harvestable due to inadequate water supply, collected by Mission teams and supported by SSA data for 2010/11 main season, are shown in Table 5.

Table 5: Area harvested in hectares; main season field crops 2009/10 and 2011/11

Region Sugd Crop	2009/10			2010/11			Region GBAO			Region DRD			Region Khatlon Kulyab			Region Khatlon Kurgantube			National		
	Area ha	Area ha	%	Area ha	Area ha	%	Area ha	Area ha	%	Area ha	Area ha	%	Area ha	Area ha	%	Area ha	Area ha	%	Area ha	Area ha	%
Total C	121410	112874	93	4736	4961	105	84278	76249	90	140273	134180	96	84927	75636	89	437511	403900	92			
Wheat W	43597	32585	75	1639	955	58	73863	35007	47	101851	97947	96	61211	60477	99	282161	226971	80			
Barley W	12885	10746	83	0	0	###	6395	1512	24	4968	5232	105	2020	2412	119	26268	19902	76			
Wheat S	15546	15337	99	2835	3864	136	1887	30491	1616	29297	26648	91	11845	4701	40	61410	81041	132			
Barley S	36847	40596	110	236	111	47	0	5384	#####	2855	3099	109	2238	769	34	42176	49959	118			
Maize	4297	5591	130	26	31	119	1887	2038	108	642	639	100	4146	4497	108	10998	12796	116			
Rice	8238	8019	97	0	0	###	2133	1817	85	660	615	93	3467	2780	80	14498	13231	91			
Total Pulse	4239	4795	113	1268	1373	108	5285	4205	80	2151	4016	187	577	2083	361	13520	16472	122			
Potato	10750	12752	119	2023	2072	102	8413	11628	138	3214	3982	124	5384	6073	113	29784	36507	123			
Total OS	2333	4271	183	68	71	104	7574	8519	112	6437	6366	99	3839	4291	112	20251	23518	116			
Cotton	55637	58996	106	0	313	###	8050	11897	148	26783	31476	118	73814	94488	128	164284	197170	120			
GTOTAL	194369	193688	100	8095	8790	109	113600	112498	99	178858	180020	101	168540.5	182571	108	663463	677567	102			

C= cereals; P= pulses; W= winter; S= spring; OS= oil seeds.

From Table 5, the following points emerge; from a 2 percent increase in field crop area to 677,567 ha there is:

²¹ CFSAM 2009, suggested MoA programmes supplied up to 20 tonnes of improved seed in districts for sale in Sughd; 100 tonnes in Khatlon-Kulyab; at least 50 tonnes in Khatlon - Kurgantube- part of 10,000 tonnes seed of which 8,000 t were produced in Hissor and 2,000 tonnes on Institute farms elsewhere (90 percent wheat 10 percent all other crops).

²² All areas of damaged crops provided to the Mission were noted and subtracted from area planted; and, cross checked with SSA 2011 reference data.

- 20 percent and 24 percent decline in *harvested* winter wheat and winter barley areas respectively.
- 32 percent²³ and 18 percent increase in *harvested* spring wheat and spring barley areas.
 - Total wheat area of 308,012 ha- 10 percent below 2009/10.
 - Total barley area of 69,861 ha 2.0 percent above 2009/10
- Areas of other crops in the main season are:-
- 16 percent increase maize area (data incomplete with late planting included in second season).
- 9 percent decrease in area planted to rice (data incomplete with late planting included in second season).
- 22 percent increase in *harvestable* main season pulses area to 16,472 ha.
- 23 percent increase in *harvested* main season potato area to 36,507 ha.
- 16 percent increase in *harvestable* oils seed area to 23,518 ha.
- 20 percent increase in *planted* cotton area to 197,170 ha.

Changes are accommodated within a 2 percent increase in area. The difference of some 14,000 ha is noted, from the recently released SSA TajStat (2011), to have come from an estimated 16,000 ha decrease in alfalfa area.

Regarding areas planted to rice and maize, these early returns suggest a main season 9 percent decrease in rice area, with maize showing a 16 percent increase. Both returns reflect the late spring and uncertainty of regular irrigation until after April 20th. Data collected by the Mission for the second season crops, show substantial increases in area of both crops, capturing area data for late sown rice and maize as well as post-wheat summer cropping. These second season data for rice and maize and their forecast contribution to domestic production are shown in section 3.7.

3.4 Factors affecting yields/ha (productivity) of cereals 2010/11

Production is a function of area x yield/unit area. This section considers the factors affecting first season cereal yield per unit area which necessarily include - water supply (rainfall and irrigation), land preparation, seed use, fertiliser use, pests and disease challenges, weed competition and associated husbandry practices and harvesting/threshing mechanisms. Regarding the yield estimates used to calculate production by district, in the absence of any objective measurements, the mission teams followed up their case studies, incorporating all types of farms, with field inspections involving the cutting/digging of stratified sample one square metre plots. A total of around 950 samples were taken and weighed from a total of 256 cereal fields and 100 potato fields. In addition, all visits were considered by all teams to be transects during which every cereal field seen is given a score according to agreed standards. The transect returns have been used by the International and National consultants as one of the means to validate the returns from the samples taken²⁴.

Rainfall and Irrigation Delivery

Section 3.2 has already established that the rainfall throughout the agricultural areas has been poor for cereal growing at all stages of development. Transects driven by the team through 31 districts confirm poor performance in the rain fed sector, and similarly poor performance in pump - irrigated sector fields that, at best, did not receive irrigation until after April 20th due to electricity shortages. Consequently some 50% of the wheat area harvested may be considered to be rain fed, with perhaps one or two supplementary irrigations. The similar proportion of barley is likely to be greater. Elsewhere, where wheat fields received 3 - 5 irrigations, crop performance has been as much better. Regarding potatoes, team visits confirm that potato fields, of which some 65% are in household plots, have been irrigated between two and five times.

Seed Use

This season, MoA records indicate that 22 percent of wheat seeds sown were certified, marking a significant increase compared to 2009 (13 percent). Nevertheless, 78% of wheat seeds and all barley seeds are local seeds, carried over from the previous harvest either a) by the farmers themselves, following the traditional on-farm selection process whereby the farmer identifies next year's seed stock while it is still maturing in the field and gives it special protection; or b) by buying from preferred seed stock kept by farmers in the same locality; or c) seeds bought indiscriminately in the local market. In the surplus producing areas, such seeds

²³ This reflects DRD data, which shows no spring wheat planting in 2009/10. In 2009/10 DRD spring wheat data is *probably* included in winter wheat data, therefore, the increase of 42% (24,000 ha) of spring wheat nationally, connects to the noted drop of 53 percent (39,000 ha) in DRD winter wheat area, and the corresponding increase of 30,000 ha in spring wheat area in the same region. The data even out, when total wheat area is considered i.e. a 13 percent drop in wheat area in DRD.

²⁴ Others are- performance of factors affecting yields; key- informant estimates; previous reports and time series data.

are mostly open-pollinated releases from government seed agencies that have stabilised over the last two decades and have acquired local identities reflecting their origin. Farmer multiplication of more recent releases, followed by farmer-to-farmer exchanges, increases the flow of quality seeds but their volume is difficult to quantify. MoA figures suggest that further 34,000 tonnes of wheat seed (40 percent) may fit into this quality seed category and may reasonably be expected to be used by farmers who wish to change their carry-over seed stock every 3-4 years, as is recommended.

Although chemical seed treatment is rare among the smaller farmers, FAO case studies in 2009 noted that seed treatment to be part of the preparation process in the collective *dehkan* farms and the cooperatives sampled. Elsewhere, seeds are cleaned (manually with sieves), weed seeds and impurities removed by hand, washed, dried and stored in sealed containers. No seed priming is apparently conducted before sowing which is noted to be conducted on the plots and smaller farm by broadcasting, mostly hand but occasionally by a tractor mounted spinner. Larger farms still use the planters inherited from the *sovkhoz/ kohlkoz* units.

Wheat and barley seeding rates are high conforming to the North German system that favours heavy plant populations over tillering for winter wheat, anticipating 600 ears/m² at harvest. Rates this year are noted to be 170 - 220 kg/ha in Khatlon (Kulyab²⁵ and Kurgan Tube); 180 - 220 kg/ha in DRD and 180 - 250 kg/ha in Sughd. In GBAO, rates are noted to be much higher at 200 – 320 kg/ha noted, the greater rates being used in the mountain valley plots to offset poor germination and to smother weeds in spring.

Given the delays in winter and spring planting in favourable rainfall, no replanting of cereals was undertaken, except for 5 out of 256 cases noted above in section 3.3.

Fertiliser Use

Regarding other inputs, in 2006/7 the national level of fertiliser use was around 280,000 tons. At that time, global prices were low and imports from Uzbekistan in both formal and informal were high. As might be expected, most fertilizer use was used on cotton, with the fertilizer regimes of the former *sovkhoz/kohlkoz* farming systems sustained by the enterprises and the private *dehkan* farms with base applications of phosphate and two split top dressings of nitrogenous fertilizer, the whole comprising 700 kg or more of gross product per ha. Wheat, maize and rice are the other field crops on which fertilizers are regularly used. Although base dressing of phosphates are now uncommon and potassium applications non-existent, top-dressing applications of nitrogenous fertilizer in spring remain part of standard cultivation procedures. At the household plot and Presidential plot level, some nitrogenous fertilizers are noted to have been used on wheat this year. However, on such plots, soil fertility is noted to be maintained by the application of farm yard manure (FYM) on wheat, on potatoes and other vegetables. Small plot farmers in both the household plots and *dehkan* farms also adopt alfalfa- based rotations within their plots to maintain fertility.

Since 2007/8, fertiliser use is noted to be under pressure from three directions; a) global price increases; b) the cutting of the official supply chain from Uzbekistan; and c) in the past two years, no local production of urea due to severing of gas-supplies from Uzbekistan to the local factories. Fertiliser import data in 2010 were obtained by the Mission from the Customs and Excise Department and have been included in Table 6, compared with CFSAM data from 2009.

Table 6: Quantities of Fertiliser, 2009 and 2010, Tajikistan

Source	Quantity (t), 2009	Quantity (t), 2010
Local Production	60,000	0
Informal import From Uzbekistan	Estimated 30,000	?
Formal Imports (various sources)	20,000	66818 9380 543
Total	110,000 (all)	76,741 (all)

Source- Collected Customs data, Dushanbe; Personal communications, MoA, Dushanbe; Trader interviews, Dushanbe

In 2009, the estimated as available 110,000 tonnes, was thought be only 67 percent of the requirement. This year poor water supply (rain and delivery failure) and a doubling of price are thought to have caused

²⁵ It should be noted that in one case–study (i.e. 1/256), in Timurmalik, winter wheat seeding rate had been reduced to 150 kg because the farmer did not have enough seed. This would seem to have been an isolated case.

farmers to use less nitrogenous fertilizer than in previous years, although the Mission case studies show otherwise.

Disregarding fertilizer type or origin, Mission teams note that fertiliser use on wheat was widespread on *dehkan* farms and chemical fertilisers were also used to some extent on some household and presidential plots to supplement the farmyard manure (FYM). Fertiliser application rates and local prices paid by the farmers are summarized from information collected by the Mission teams in Table 7. The highest cost is noted in GBAO, where farmers also reported the lowest rates of use. Urea, carbamide, ammonium sulphate, ammonium phosphate are noted to have been used this year at rates of application ranging from 50-120 kg per ha for phosphate types, from 50 kg/ha up to 350 kg/ha for nitrogenous fertilisers. Prices also vary considerably for, supposedly, the same products, although variable quality and no market quality control or standards are big issues between traders and farmers for all agricultural inputs.

Table 7: Mission fertiliser use on wheat by Region

Fertiliser	Sughd			DRD			Khatlon- Kulyab			Khatlon- Kurgantube			GBAO		
	use	rate kg/ha	cost TS/50 kg	use	rate kg/ha	cost TS/50 kg	use	rate kg/ha	cost TS/50 kg	use	rate kg/ha	cost TS/50 kg	use	rate kg/ha	cost TS/50 kg
Nitrogenous	yes	100-200	150-170	yes irrigable and rainfed	150-250 50-100	140-150	yes	170-200	110-135	yes	150-250	140-190	yes	50-100	200- 220 (25 s/bag transport)
Phosphate	yes	70-150	70-110	some	50	65 or 120 ²⁶	no	-	-	some	80-100	70-100	no	-	-
Potassium	no	-	-				no	-	-	no	-	-	no	-	-

Extrapolating from the data received from 256 case studies suggests that despite farm-gate price increases of 100% since 2009, around 30,000 tonnes of various fertilisers were used on the wheat crop this year, which is equivalent to an average application of just under 100 kg/ha of gross fertilizer. The expected use on the cotton crop of 500 kg/ha of gross fertilizer plus 200 kg/ha for rice; 100 kg/ha for maize, and 500 kg/ha for potatoes adds further 110,000 tones bringing the estimated total for the main field crops to around 136,000 tonnes. As official imports identify around 77,000 tonnes some 59,000 tonnes have, apparently, been procured via channels not connected to Customs and Excise or has been carried forward from previous years.

Pests and Diseases

Apart from the rigorous application of cotton pesticide cocktails, the use of pesticides, that is to say the field application of fungicides and insecticides at farm level, is universally confined to orchard, garden and vegetable plots in both the public and private sectors. Mission teams noted that pest and disease concerns this year, a dry year, are confined to Colorado Beetle in potatoes, spider mites, cutworms, aphids, the Turkistan Moth and bollworm. Incidents of yellow rust in wheat crops are noted in Sughd, GBAO, Khatlon and DRD; but were neither reported as serious nor subject to treat. Smut is noted in Shurobod, Khatlon but was not reported as serious.

As noted in Section 2.3, government intervention regarding pest control is limited to locust control. In March-June 2011 133,000 ha (Mustafakulov, 2011)²⁷ of grazing land were blanket sprayed with broad spectrum pesticides to control the hopper (larval) generations before they reach the flying stages and threaten field crops in the bordering arable areas. This compares to 73,000 ha of pasture breeding grounds sprayed in the same period in 2010. This year's actions led to the pest being controlled before arable areas were threatened.²⁸

Weed control is almost entirely by hand, cotton crops are continuously hand-hoed and mechanically-hoed during the sequence of fertiliser applications to the extent that, during Mission transects through 23 districts, all cotton crops were noted to be perfectly clean. Other field crops were far more variable. Wheat and other

²⁶ Double super phosphate twice as expensive

²⁷ Mustafakulov, U. (2011) Report to FAO

²⁸ MoA Head of Crop Inst. Dep. Chief Locust control- (June 2011) Personal Communication (June 2011)

cereals are generally weeded once by hand at, or just before, top-dressing. Thereafter, hand cleaning may or may not follow. Maize fields cultivated for grain are noted to be clean-weeded by hand, as are all potato and vegetable crops reflecting the importance of the crops and the availability of family labour at household level. The Mission notes the use of herbicides in only three locations in DRD connected to paddy rice planting in areas where labour costs are high.

Credit Supply

Key informants²⁹ confirmed the source of credit and stressed that the government policy is that such credit should be available at affordable interest rates to farmer. Farmer interviews present a different picture. Mission rapid case studies in this regard included cooperatives, collective *dehkan* farms, and private *dehkan* farms. In almost all cases, interest rates of seasonal credit available to the farmer were quoted above 20 percent and often above 30 percent. Additional 10 percent payments to *secure* the credit were frequently mentioned. As a result few farmers took up credit, other than cotton input supply offers.

Other sources of funds noted include funds invested by migrant laborers/remittances for use in the plots and small scale private *dehkan* farms, though not so widespread.

3.5 Crop Production Estimates – Main Season 2010/11

Given all the foregoing, insufficient and poorly-distributed rain, adequate seed supply, adequate if inefficient cultivation practices, reduced fertilizer supply compared to last year, complete control of migratory pests, and no significant non-migratory pests and diseases, expected level of yields per ha this year for the two main cereals assessed by the Mission are noted to be lower than last year, as noted in Table 8.

Production calculations are based on yields disaggregated by districts, based, for the two main cereals, wheat and barley, on 700 weighed samples taken and processed by the Mission teams. Production calculations for the other main staple, including potatoes, are similarly disaggregated, based on 200 samples taken by Mission teams in the second round of visits. Further details of wheat, barley and potato area, yield and production are given by district in tables in Annex 1. Those districts not visited, were excluded because of their minimal areas of agriculture. However, the district data are included in the estimates as area values for all districts not visited by Mission teams were collected from the relevant District Agriculture and District Statistics Offices; and crop yields were drawn, by extrapolation, from values obtained by teams checking neighbouring districts, cross checked against TajStat summaries for 2009/10.

Production for crops not yet harvested, that is to say the main season pulses, oilseeds, rice and maize have been calculated at district level using yields projected by the Mission teams, based on last year's performance. All such crops have benefitted from improvement in pump irrigation schemes delivery since April 20th.

Table 8: Production in tonnes; main season field crops 2009/10 and 2010/11

Region Sugd	2009/10			2010/11			Region GBAO			Region DRD			Region Khatlon Kulyab			Region Khatlon Kurguntub			National		
	Prod t	Prod t	%	Prod t	Prod t	%	Prod t	Prod t	%	Prod t	Prod t	%	Prod t	Prod t	%	Prod t	Prod t	%	Prod t	Prod t	%
Total C	233788	168889	72	10798	10670	99	183468	174371	95	349400	290805	83	272337	215404	79	1051830	860138	82			
Wheat W	85031	56106	66	3802	2196	58	155549	90532	58	258963	219188	85	198196	166511	84	701540	534532	76			
Barley W	21570	13089	61	0	0		10261	4248	41	10769	10707	99	5674	6368	112	48274.27	34411	71			
Wheat S	26735	17535	66	6560	8189	125	5632	56045	995	68628	50140	73	37463	12232	33	145017	144142	99			
Barley S	54924	33069	60	330	155	47	0	8275	0	6375	5744	90	5681	1724	30	67310	48967	73			
Maize	18740	21838	117	106	129	122	2038	6945	316	2628	2908	111	15449	18810	122	38961	50630	130			
Rice	26788	27253	102	0	0		12027	8326	69	2039	2119	104	9874	9760	99	50728	47457	94			
Total Pulse	4455	5081	114	2598	2652	102	7833	5535	71	2298	4266	186	866	2413	279	18050	19947	111			
Potato	275212	326494	119	44269	42666	96	197725	257738	130	55007	82614	150	104401	142501	136	676614	852014	126			
Total OS	2272	5665	249	88	89	101	4361	6368	146	4036	4015	99	3637	3613	99	14394	19750	137			
Cotton	84123	98739	117	0	0		15596	16827	108	56104	65801	117	141849	180967	128	297671	362333	122			

C= cereals; P= pulses; W= winter; S=spring; OS= oil seeds.

Table 9, summarizes production of the two main season cereals.

Table 9: Estimates of the major main season cereals wheat and barley.

²⁹ MoA Head of Dept Credit and Finance (2011) Personal Communication

	2009/10			2010/11			%A	%P
	Area ha	t/ha	Prod-t	Area ha	t/ha	Prod-t		
Total	412731		963706.9	377873		762052	92	79
Wheat	343571	2.46	846557	308012	2.20	678674	90	80
Barley	69160	1.69	117150	69861	1.19	83378	101	71

- Wheat production at 678,674 tonnes is 20 percent below estimated production in 2009/10; comprising winter wheat production at 534,532 tonnes is down by 24 percent; and spring wheat production at 144,142 tonnes, down by 1 percent.
- Barley production at 83,378 tonnes is 29 percent below estimated production in 2009/10; comprising winter barley at 34,411 tonnes, down by 29 percent; and spring barley at 48,967 tonnes, down by 27 percent.

Except in the case of spring wheat which is noted to have increased in harvested area by 32 percent, due mostly to data from DRD where spring wheat data was not available for 2009/10, all reductions noted reflect a decrease in both area and yield.

Table 10 shows area and production estimates for the minor main season cereal, not including oats (647 ha only), potatoes, total pulses, total oilseeds and cotton. Potato production data are based on Mission samples, whereas yields of other crops are forecasts only.

Table 10: Estimates main season minor cereals and other crops.

Crop	2009/11			2010/11			%A	%P
	Area ha	t/ha	Prod-t	Area ha	t/ha	Prod-t		
Maize	10998	3.5	38961	12796	4.0	50630	116	130
Rice	14498	3.5	50728	13231	3.6	47457	91	94
Pulses	13520	1.3	18050	16472	1.2	19947	122	111
Potato	29784	22.7	676614	36507	23.3	852014	123	126
Oilseeds	20251	0.7	14394	23518	0.8	19750	116	137
Cotton	164284	1.8	297671	197170	1.8	362333	120	122

The main features to emerge from Table 10 regarding food crops are:

- Potato- 26 percent increase in production from a 23 percent greater area.
- Pulses- 11 percent increase in production from a 22 percent increase in area.
- Rice- 6 percent decrease in rice production from 9 percent decrease in area (incomplete data, with late planting incorporated into estimates of second season crops).
- Maize-30 percent increase in production from 16 percent increase in area.
- Oilseeds 37 percent increase in production from 9 percent increase in area.
- Cotton 22 percent increase in production from 20 percent increase in area.

Cereal estimates for the main season harvest are compared with main season estimates in a five-year time-series in Table 11. This year's wheat production is similar (slightly higher) than the production estimates in 2007 and 2008.

Table 11: Main Season Production Time Series –'000s tonnes 2007-2011

Crop	2007	2008	2009	2010	2011
Wheat	649	623	829	847	678
Barley	75	56	81	116	83
Maize	130	43	(28)	37	51
Rice	52	25	(2)	51	47

3.6 Crop Production Estimates – second (summer) season 2010/11

The second season of irrigated field crops has not previously been incorporated in CFSAM reports and does not feature in SSA data. This year, the Mission estimated area will be harvested and forecast yields of cereal,

pulses, oilseeds and potatoes with a view to establishing a baseline for the coming food security programme. Table 12 summarises national area and production based on data collected by Mission teams.

Table 12: Second season cropping areas and forecast production.

Crop	Area, ha	t/ha	Prod-t
maize	15809	3.0	47427
Rice	7942	2.5	19855
Pulses	15373	1.5	23060
Oilseeds	2705	1.5	4058
Potatoes	645	15	9675

There is no time-series for second season data. It is hoped that the information series will expand over the next three years to improve the general understanding of the extent that the second season harvest contributes to food security at district and national levels. The cereal data are incorporated as a separate entry in the cereal balance sheet; and a further 23,000 tonnes of pulses and 9,600 tonnes of potatoes have been added to the national harvest.

3.7 Estimated and forecast harvest data 2010/11

Table 13 summarises the CFSAM estimate of the expected field crop harvest 2010/11 from the main and second seasons.

Table 13: National Total area and Production summary

Est. total harvest field crops 2010/11			
Crop	Area ha	t/ha	Prod-t
Wheat	308012	2.20	678674
Barley	69861	1.19	83378
Maize	28605	3.43	98057
Rice	21173	3.18	67312
Pulses	31845	1.35	43007
Potato	37152	23.19	861689
Oilseeds	26223	0.91	23808
Cotton	197170	1.84	362333

3.8 Livestock

After privatization of the collective holding livestock, ownership resides in household and peasant farmer units (cattle- 88 percent; sheep and goats- 76 percent; horses- 100 percent). As such, livestock numbers per unit are very small, easily managed but difficult to monitor compared to the highly recorded, huge herds and flocks of the soviet era. Winter carrying capacity limits the number per holding and, unless artificially increased by imported rations (as in the Soviet era) regulates summer grazing stocking rates. Consequently, there was a dramatically significant drop in livestock numbers in the years following 1992, when supplementary winter feed supplies were withdrawn and numbers fell until a sustainable accommodation between ambition and reality was reached.

This year, as in previous years, Mission interviews suggest that livestock rearing systems practiced for all the sheep and goats and for a major proportion of the cattle incorporate seasonal movement to intermediate and high mountain pastures. The migration usually begins in April/May and finishes in September or October. Key informants explained that for cattle raisers, output is normally spring-borne male calves sold off the mountain ranges as store stock, or over-wintered using home-grown fodder and grain; and sold as fattened steers. Some domestic units regularly build up cattle herds to 2-3 milking cows in order to produce extra female followers to sell after calving as cow-calf couples in spring.

Sheep and goat systems are based on a classical mountain seasonal system involving: spring lambing; seasonal migration and mountain grazing of the whole flock; (household and collective farm flocks are taken to mountain grazing by family members or in groups of flocks by village shepherds and by farm staff); late summer, autumn weaning of male lambs for sale as slaughter stock or stores; retention of around 50 percent of ewe (female)-lambs to replace broken-mouthed ewes (4-5 year old) as breeding stock members; sale of surplus ewe-lambs for slaughter, stores and breeding stock; fattening of broken-mouthed, cull ewes on for eating or sale.

Winter carrying capacity depends on a variety of home-produced feeds including the poorer quality wheat, maize and barley grain; and arable by-products straw, stover; wheat bran and cotton seed cake to supplement in-bye grazing and locally-produced meadow and lucerne hay.

National livestock numbers for the past three years are presented in Table 14, they show a year-by-year increase as more female breeding stock are retained, a feature noted in all regions except DRD, where there is less seasonal movement and migration to higher pastures.

Table 14: Livestock numbers

Livestock: Cattle, cows, sheep and goat data-'000s head and % 2010/2009.												
Year	2008	2009	2010	2010	2008	2009	2010	2010	2008	2009	2010	2010
	Cattle			%	Sheep			%	Goats			%
Tajikistan	1799,5	1829997	1896894	104	2578,6	2617373	2728556	104	1568,1	1582811	1665636	105
DRD		466564	487684	105		541560	588337	109		451045	473297	105
Sughd		505368	510707	101		800912	801277	100		380921	390767	103
Khatlon		756419	794913	105		1098623	1154997	105		622015	672380	108
GBAO		101646	103590	102		176278	183945	104		128380	129192	101
	Cows				Sheep breeding females				Goats breeding female			
Tajikistan	932,8	951534	984926	104	1356,4	1386316	1428617	103	841,4	874990	886265	101
DRD		251074	262219	104		347056	352348	102		296638	296593	100
Sygd		268092	275391	103		407684	431003	106		214449	219221	102
Khatlon		394741	409149	104		541800	548888	101		292651	304460	104
GBAO		37627	38167	101		89776	96378	107		71252	65991	93

Source- SSA (2011)

This year's Mission returns from 26 districts where livestock questions were asked by the teams, suggest that:

- Rainfall-generated pasture around the villages was poor in winter, late in spring and was a push factor leading to early seasonal movement in March in Sughd, in Khatlon and in GBAO.
- Mountain ranges opening earlier, due to a less severe winter, enabled animals to move as winter food resources were consumed.
- No outbreaks of contagious diseases are noted, a condition explained by the widespread use of vaccines.
- Livestock performance during the year is noted to vary greatly within as well as between regions, as might be expected given the hundreds of different management regimes.
- Mission case-studies birth rates of *large* ruminants range from 74 percent in GBAO; 39 percent in Khatlon; 37 percent in Sughd; with no figures from DRD team.
- Mission case-studies birth rates of *small* ruminants range from 74 percent in GBAO; 59 percent in Sughd; 56 percent in Khatlon; with no figures from the DRD team.

At present numbers, livestock feeding requirements this winter, as estimated by the Mission are:-

- 2.03 million Livestock Units (LSUs) (1.89 million cattle @ LSU 0.8; 2.55 million sheep and goats @ LSU 0.2; require around 1.52 million tonnes of dry matter (DM) to eat to appetite during a 100 day winter (3+ months; LSU put at 300 kg)
- Laying hens (large Rhode Island type) will consume around 150g cereals per day, that is 54 kg/year; at an estimated 2 million birds, the national laying flock will require a further 108,000 tonnes of cereal based compound feed. Domestic feed and supplementary feed supply for the coming winter (hay, cereals, wheat-bran and other by-products) is estimated as follows:
- 57,000 ha of irrigable land alfalfa plots and grass leys (SSA-2011) should provide at least 250,000 tonnes DM (hay at 5 t/ha);
- 445,000 ha of short cereal straw and 27,000 ha stover will provide another 750,000 tonnes DM (straw at 1.5 t/ha DM; stover 3.5 t/ha DM);

- Around 800,000 tonnes wheat milled at 15 percent bran recovery offers 120,000 tonnes; maize 72,000 tonnes; barley 69,000 tonnes; wheat-feed standard at 136,000 tonnes cereals plus an unknown quantity of cotton seed cake.

Estimated supplementary winter feed (DM) apparently available is about 1.38 million tonnes DM plus an unknown quantity of cotton seed by products. Rough grazing on in-bye land will provide currently an unknown quantity of in spring. In addition, the indigenous breeds have a strong capability, shared with most highland stock, of rapidly gaining condition in summer to live off their backs in winter. However, it would seem a) maize or equivalent high quality feeds will need to be imported for poultry and for exotic dairy stock; and, b) breeding stock adjustments downwards will need to be made. Reversing the trend to increase numbers every year (possibly made possible by remittances), will be necessary at household level to meet carrying capacity.

Prices are firm or rising, and trader expectations are that the prices would remain firm until the regular annual sales began in September as stock return from summer grazing, when prices usually fall, although this appears to make no impact on the retail price of meat, as shown in Figure 1. However, as the price of hay bales is noted to be 3-5 times higher than in 2009 at 10-20 TS per bale, breeding herd and flock reductions in September/ October, as well as regular store and fatstock cattle and sheep sales are to be expected.

4. Cereal Availability

4.1 Cereal balance 2011/12 (July–June)

Data included in the National Cereal Balance, Table 15 below are sourced from the joint FAO/MoA Crop Assessment analyses, official SSA data, FAO-GIEWS Country Cereal Balance Sheets archives and MoA information. The parameters used are listed below.

- Population of Tajikistan in 2011 is estimated at 7.851 million people, extrapolating at 2.1 percent per annum growth from SSA official data.
- Stocks; no information is available on strategic, traders or household stocks. However, a draw-down in stocks of 40 000 tonnes of wheat is assumed in the balance following two consecutive bumper harvests in 2009 and 2010, coupled with relatively high levels of imports (between 900 000 and 1 million tonnes) in the past two years.
- Domestic production comprises Mission main season cereal production estimates plus Mission second season production forecasts.
- Human consumption; wheat is by far the main cereal consumed as food in the country. Available official information on production and imports of wheat and wheat flour in recent years suggests that consumption of wheat has been increasing. Based on FAO-GIEWS cereal balances for Tajikistan, annual per capita intake of wheat (including all wheat products) is estimated at 177 kg/head/annum. This increased level of apparent consumption is supported by information on wheat products consumption from a recent Household Survey of the World Bank (2009), as well as by data from the Food Balances of SSA (Food Security and Poverty quarterly bulletins). Rice consumption has also been adjusted to account for increased home-grown rice production to 5.2 kg/head per annum. Taking into account minor quantities of maize and barley, the total apparent cereal consumption is estimated 184.3 kg/head per annum (rice in milled terms).
- Feed use (animals and poultry): 20 percent of the wheat is expected to be fed to livestock; plus all available barley and most of the maize.
- Seed use is noted by Mission teams to be high, reflecting both tradition and high seed rates used to offset carry-over seed germination failure and compete with weeds in spring. Rates used for wheat is estimated at 200 kg/ha; barley at 180 kg/ha; maize at 25 kg/ha; and rice at 100 kg/ha for the average planting areas of the past three years.
- Post harvest losses: Rates used wheat at 12 percent; barley at 6 percent; maize at 9 percent and rice at 4 percent.

Table 15: Cereal balance sheet, 2011/12 marketing year ('000 tonnes)

	Wheat	Rice (milled)	Maize	Barley	Total
Domestic availability	719	45	98	83	945
Drawdown stocks	40	0	0	0	40
Domestic production	679	45	98	83	905
Total	1679	45	128	92	1944
Utilization					
Food use	1390	41	8	8	1447
Feed use	136	0	108	67	311
Other uses	153	4	12	17	186
Import requirements	960	0	30	9	999

The balance suggests an overall cereal deficit of close to **1 million tonnes** of which **960,000 tonnes** comprise wheat or wheat products, the latter as wheat equivalents; plus **30,000** of maize (or compounded alternatives) for the poultry industry. Rice is expected to be in balance this marketing year, necessitating the need to import some 29,000 tonnes as was reported by the Department from Customs and Excise during 2010/11, although some high quality rice may be imported as a luxury product. Imports of malting barley for industrial use are expected to be around 9000 tonnes.

The wheat import requirements for 2011/12 at 960,000 tonnes are 7 percent above the preliminary estimate of 900,000 tonnes of wheat grain equivalent imported 2010/11. Food aid is expected to be around **50,000** tonnes under the current proposed WFP programme, suggesting that wheat commercial imports needed to balance the equation will amount to **919, 600 tonnes**.

With the inclusion of the second crop, the potato harvest is estimated to have increased to **862,000** tonnes, 27 percent over last year's poor performance; and production of pulses is estimated, with the second crop, to have more than doubled to **39,239** tonnes. It is, therefore, unlikely that any additional compensatory imports of cereals will be necessary.

4.2 Cereal marketing

Tajik self-sufficiency in 2011 extends to potatoes, most vegetables and fruits but no more than 50 percent wheat products. Further, 75-80 percent of milk products, meat, eggs, and 100 percent of sugar and vegetable oil must be imported each year.

Access to neighboring countries is extremely restricted due to the landlocked nature of the country. All imported goods from Russia (sugar, pasta) and the west (frozen meat, milk products) whether dispatched by road or rail must enter through Uzbekistan. Wheat and wheat products from Kazakhstan are shipped only by rail and so must also come via Uzbekistan. An alternative road route from Kyrgyzstan is used more often since 2010 to move goods from China, but also partially from Kazakhstan, and trade is increasing. Goods from Iran (vegetable oil) may now enter over the newly constructed road bridge from Afghanistan or through the traditional Turkmenistan-Uzbek route. The limited access places an enormous dependency on import supply on relations with Uzbekistan and Uzbek import and export taxes and conditions vary according to the best interests of Uzbek markets and consumers. By the same token, the Uzbek policy regarding transit of goods varies. In an attempt to ease the situation, Government of Tajikistan started to operate the first direct railway road from Khujand to Russia late August/early September 2011, in its initial stage, if successful, and this new development will facilitate transport of goods from Russia and reduce dependence on routes through Uzbekistan.

In general, all trade is liberalised and, in theory, international trade is open to any trader with foreign exchange and the appropriate international connections. However, the cumbersome customs procedures Makes it difficult for the private sector to engage more in trade.

The structure of the agricultural industry comprising a combination of small production units, the absence of processing plants, generally poor roads with mountain routes impassable for many months in the year and a railway line that goes only to Uzbekistan, means that local production tends to be used locally; levels of export are low; and surpluses of fruit and vegetables are often wasted. However, seasonal local markets

thrive with produce from the household plots and *dehkan* farms including maize, maize flour, vegetables and an abundance of fruits. Vegetables and fruits in-season are sold, in quantities varying from a few hundred grams to car-boot/pick-up truck volumes of about 700 kg, by the backyard producers themselves. Larger volumes are traded by second-step traders in smaller markets in both housing complexes (shops and street corners) and in remote villages, depending on the location of the primary market.

Locally produced wheat and wheat flour supplies fit the model outlined above. Wheat from the household plots is consumed practically as flour after milling in local facilities. Such facilities comprise small “Chinese” mills and electrically-powered stone mills usually milling no more than 2-3 tonnes per day. The bulk of the wheat from the 27,000 *dehkan* farms, 52 percent of national production in 2010, is likely to be divided between farmer members and workers as either payment-in-kind or share of produce and also milled at village level, with the remainder sold in the local market. The Mission surmises that although local wheat is not purchased by the large mills nor by most medium-sized flour mills, smaller mills may mix some local wheat, bought in local markets from workers cashing-in their payment-in-kind, or farmers selling their higher quality surplus, with imported wheat for flour production. Similar distribution and utilisation patterns may be expected from the state farms producing 13 percent of total production. Mission estimates suggest that after subtracting 136,000 tonnes (20 percent) for animal feed, losses (73, 000 tonnes) and seeds (88,000 tonnes) and using the same wheat grain consumption pattern of 177 kg/head/annum, it is likely that only 22 percent of the total population will be supplied, this year, with wheat flour through such local transactions. This means that the remaining 78 percent of the population buy bread or wheat flour in regional towns and cities from bakers, shops, and markets supplied by the 7 large mills and some 10 medium-sized mills from imported wheat or wheat flour, distributed by the larger wholesalers.

4.3 Prices, Volatility and Terms of Trade

The landlocked nature of Tajikistan exacerbates the vulnerability of the population to global price increases in all the essential commodities that must be imported. In this regard, as the country is dependent on imports, *inter alia*, for approximately 50 percent of its main staple wheat/wheat flour; most of its vegetable oil and all of its fuel, the price increases of these commodities are being constantly recorded by WFP since 2002. The returns show that the household economies are again under pressure as they were during the crisis in 2008, from a) increases that reflect the global upturn; exacerbated by b) increased export tariffs; c) increased transit tariffs through Uzbekistan; d) increased import tariffs for fuel; e) increased international transport cost and f) increased local transport costs. At the same time, the urban population, in particular, is being challenged by increased costs of locally-produced goods such as meat (both lamb and beef, the prices of which doubled between March 2007 to March 2011³⁰); fruits, vegetables and milk.

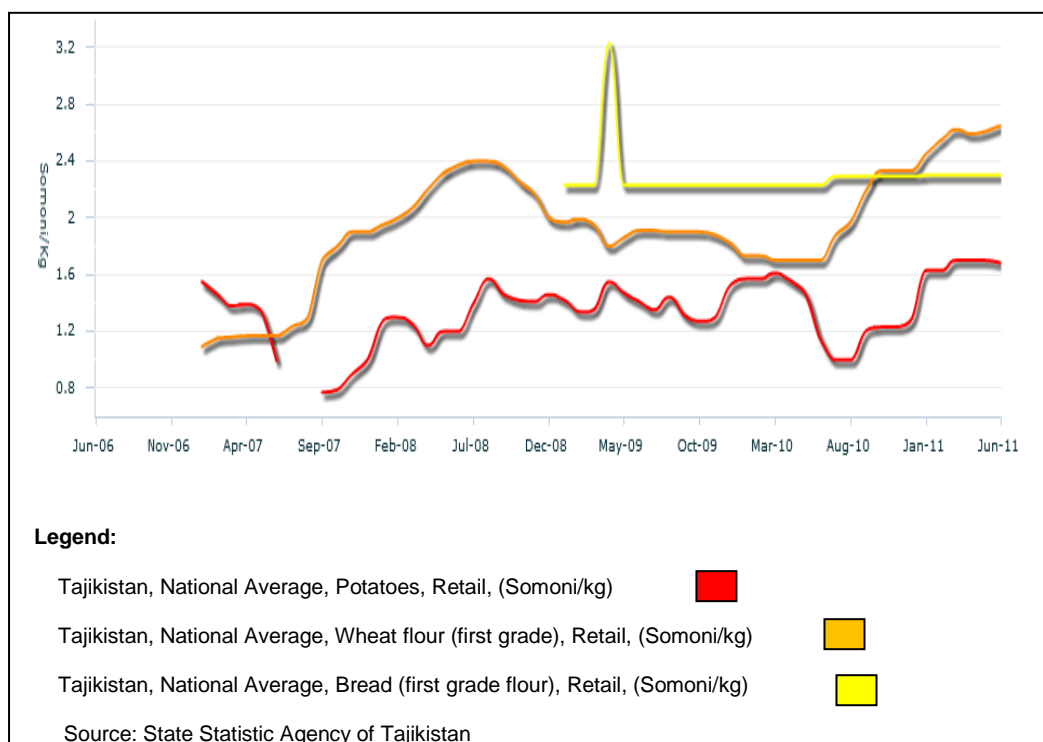
Previous studies have shown that with regard to imported goods, retailers buy mostly from Dushanbe, so the market prices across the country have, hitherto, been highly correlated. Increases in local prices in the margins usually only reflect transport costs. Therefore, for the bigger picture, price increases in Dushanbe for key commodities may be considered to represent changes nationally.

Food Prices

Although wheat flour (first grade) and wheat grain prices remained stable from March to June 2011, they were at record levels and 44 to 67 percent higher than in June 2010 when they started to rise. In July and August, wheat and wheat flour prices eased somewhat in Dushanbe market reflecting the progress of the 2011 harvest and the cut in export duties on fuel by the Russian Federation, the country's main supplier. However, prices remained 30 percent higher than a year earlier (Figures 3 and 4).

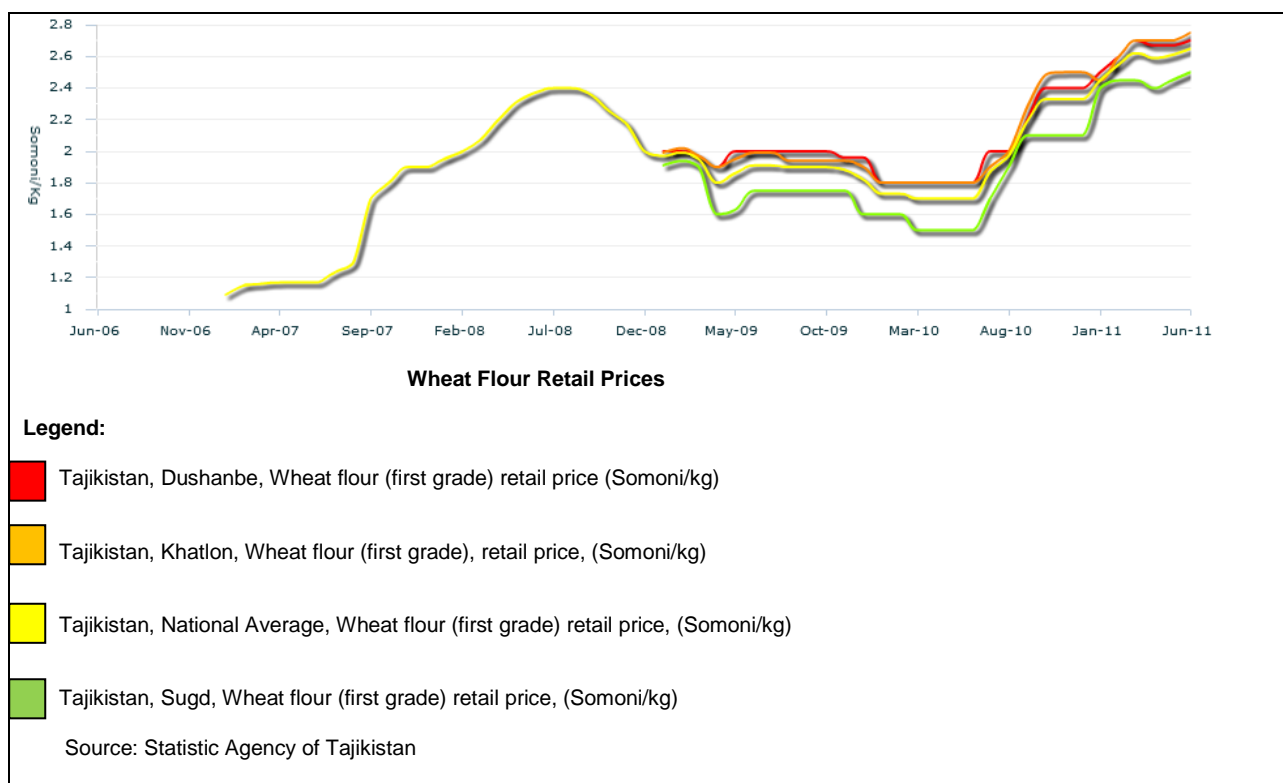
³⁰ 11 TJS to 22m + TJS,

Figure 3. National Retail Prices for Major Commodities



A more detailed look at wheat flour prices in Dushanbe, Sughd and Khatlon compared to the national average is presented in Figure 5, confirming the rise until June 2011.

Figure 4: Wheat Flour Retail Prices in 3 markets

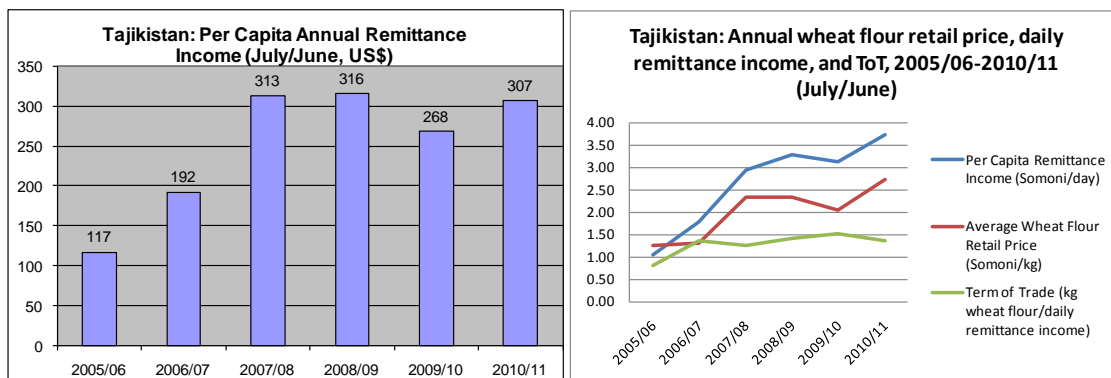


Terms of Trade

Terms of trade between wages and wheat flour price provide a strong indicator of changes of access of some 70-80% of households who buy the main staple. The more universal the application of wage rate

used, the stronger the level of indication. Remittances are recognised in WFP Food Security Monitoring System (WFP FSMS) as a major source of income for 41% of households. The terms of trade between a calculated, daily national average (per head) remittance income and wheat flour retail price over the past six years is shown in Figure 5.

Figure 5: Terms of Trade: Remittance income and wheat flour price

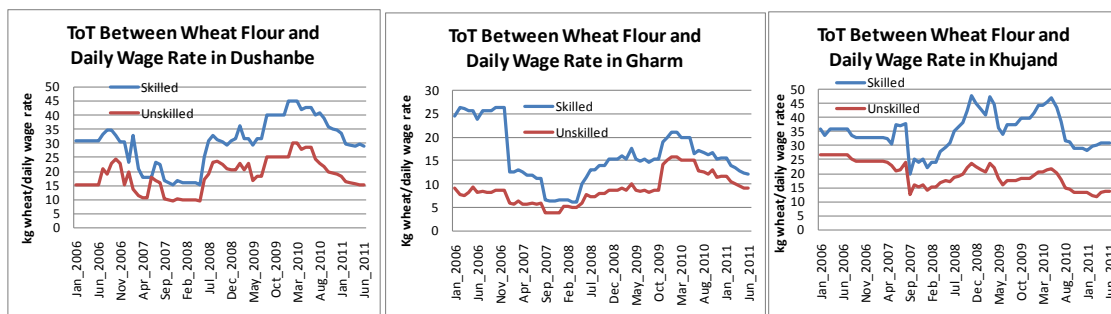


Source: WFP estimates based on data from National Bank of Tajikistan (NBT)

The graphs show a strong co-movement between the two parameters. The actual ratios, however, reveal changes in wheat flour purchasing power a) the highest ratio was 1.53: 1.0 in 2009/10; and b) the four year average (2006/07-2009/10) is 1.36: 1.0. In 2010/11, the ratio was 1.36: 1.0, some 11 percent below the highpoint in the previous year, matching the four years average, but indicating a downward trend.

Similar downward trends from a high ratio is noted in terms of trade between FSMS daily wage rates (skilled and unskilled) but at a much higher level of exchange, are shown in Figure 6.

Figure 6: Terms of trade: Daily wage rates in Dushanbe, Gharm and Khatlon.



Source: WFP estimates based on crop assessment data (2011)

5. Food Security and Food Assistance 2011/12

This section, prepared by WFP, analyses prevalence of food insecurity in Tajikistan, highlights the main shocks/factors to food insecurity, food diversity and nutrition status, and describes household coping strategies. It estimates food assistance requirement and identifies the priority areas for intervention in 2011/12 (crop year: July/June).

The methodology followed includes a review of the existing studies, a secondary/household survey data analysis, and an update based on the WFP food security monitoring system in Tajikistan. Two household level survey data sets have been used to profile the food insecure people and analyze the impact of shocks on food security at the household level:

- 1) *The Tajikistan 2009 Living Standards (TLSS)* The data set presents household income and consumption expenditure data, resulting from a national representative survey of 1503 households, all of whom were also interviewed as part of the 2007 TLSS.
- 2) *WFP Food Security Monitoring System (FSMS) household survey data.* The sample includes 665 rural households and 475 key informants across 19 livelihood/geographical zones, interviewed every quarter since 2008.

5.1 Population with inadequate food intake

The current population of Tajikistan is expected to reach 7.851 million people by the middle of marketing year 2011/12. The urban population is roughly 2 million people, of which 36 percent (some 730,000 people) live in the city of Dushanbe. Although Tajikistan has achieved considerable progress in domestic food production, poverty-related food insecurity is widespread and prevalent. Data from the last household living standards survey (2009) revealed that more than 47 percent of the rural population of the country (World Bank³¹) fell below the poverty line in 2009³².

National levels of food insecurity

Using TLSS data, the estimated share of the population with inadequate food intake and number of food insecure people are presented in Figure 8. On average, 2721 kcal are consumed daily, while the urban average stands at 2573 kcal/day and the rural average is 2774 kcal/day. The total national average is 34.5 percent of the population with inadequate food intake. Within this population, 17.13 percent of national population was categorized as “Severe Food Insecure”, failing to meet the minimum energy requirement (MER) of 1830 kcal per person per day. In addition 11.28 percent of the population was in the “Mid-range Severity” in terms of inadequate food intake, failing to acquire 2100 Kcal per person per day, though reaching the MER of 1830 kcal/person/day intake. In addition, there are 6.14 percent of national population who are classified as “Moderate” in terms of inadequate food intake with a daily caloric intake over 2100 kcal, but below 2 250 kcal.

Although income in urban areas is significantly higher and poverty is lower, the kcal intake in urban areas is lower than in rural areas and the share of the population below the requirement is much higher. As shown in Figure 7, some 23 percent of urban and 15 percent of rural populations are “Severe Food Insecure” with per capita daily intakes below 1830 kcal, thanks to the reliance on home produce. Compared to the Severe Food Insecure group, the share differences between urban and rural households in other two categories are pretty small. The share of population in “Midrange Severity” in terms of inadequate food intake is 12.81 percent in urban and 10.73 percent in rural, while that in “Moderate” is 5.96 percent in urban and 6.20 percent in rural, suggesting a similar food access and consumption for both urban and rural households.

Figure 7: Population with inadequate food intake (2009)

Share of population with inadequate food intake in 2009				
	National	Urban	Rural	
50%				Moderate FI (between 2100 and 2250)
40%		5.96%		
30%	6.14%	12.81%	6.20%	Midrange FI (between 1830 and 2100)
20%	11.28%		10.73%	
10%	17.13%	23.21%	14.95%	Severe FI (<1830 kcal/person/day)
0%				

Source: WFP estimates based on World Bank 2009TLSS

Based on the 2009 TLSS, the food security analyses have been conducted by the households’ main livelihood characteristics. The findings suggest that the following households are much more food insecure: households with more than 7 people female-headed households; households with an unemployed head;

³¹ World Bank (2011), Europe & Central Asia, Information Brief

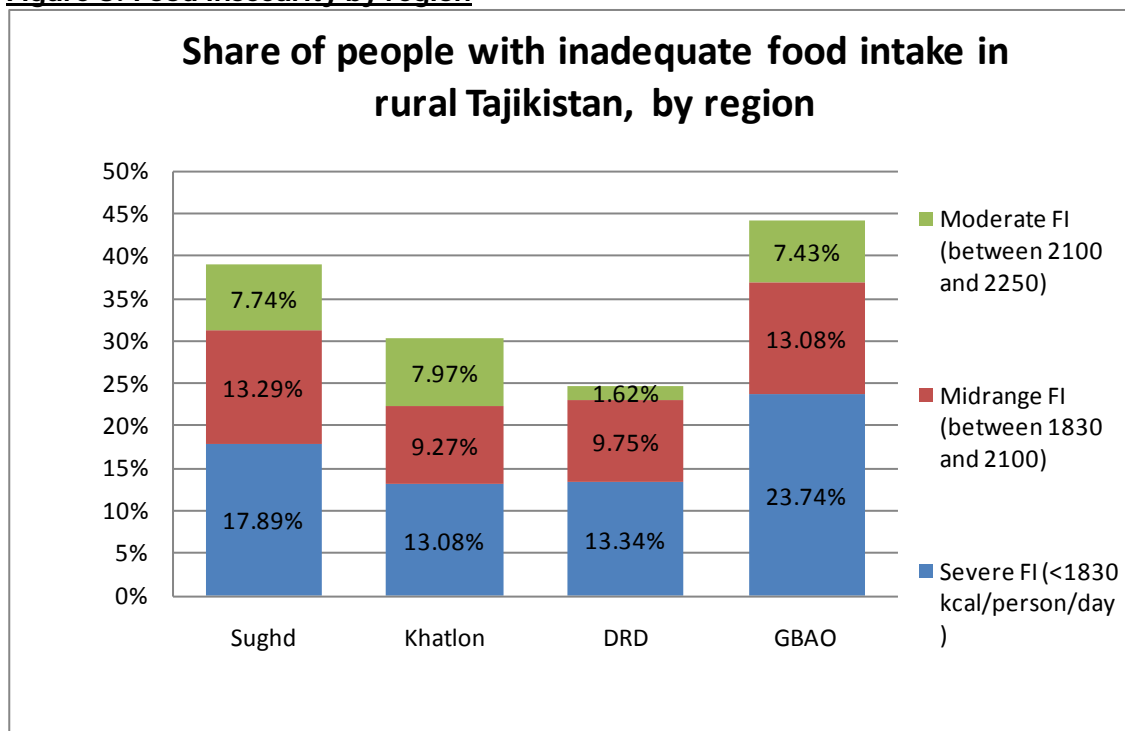
³² Poverty lines were constructed using the cost-of-basic-needs approach whereby the poverty line depends on the cost of buying a diet of 2,250 calories per capita per day and an allowance for non-food consumption

households with a ratio of dependents above 40 percent; households headed by an unmarried head; households headed by a young head (age <35).

Inadequate food intake and Food insecurity by region

Figure 8 shows the percentage of population with inadequate food intake by region in 2009. The prevalence of food insecurity varies considerably by region. The proportion of population with inadequate food intake (<2250 kcal/person/day) was highest in GBAO (44 percent) in 2009, followed by Sughd (39 percent) and Khatlon (30 percent). The lowest percentage was in DRD (25 percent). When considering the severe Food Insecurity group (<1830 kcal/person/day), the pattern across regions was similar with GBAO (23.74 percent), Sughd (17.89 percent), DRD (13.34 percent), and Khatlon (13.08 percent).

Figure 8: Food insecurity by region



Source: WFP estimates based on WB 2009 TLSS.

Combining poverty and food insecurity baseline data in 2009 with more recent information on food prices, wages, remittance, and other food security and nutrition-related variables can help to target food assistance more effectively. This type of analysis can and should be integrated with monitoring data on ongoing or planned assistance for the purpose of optimizing resource allocation.

5.2. Food Consumption Score (FCS) in April-June 2011

The recent food security related shocks/changes include the market price hikes and a poor performance of cereals in the main season 2011. Households interviewed from April-June 2011 during the latest WFP FSMS, reported an inadequate and low quality diet characterizes food insecurity experienced by very poor households. It is based predominantly on cereals, and is almost completely devoid of proteins and fats.

During the survey, households were asked to recall what food items they consumed over the last seven days. Each item was given a score, depending on the number of days on which it was consumed. Each food group was assigned a weight reflecting its nutrient density. A food consumption score (FCS) was calculated for each household by multiplying the frequency of consumption by weight for each food group. The household score was then compared with thresholds that indicate the status of the households' food consumption: Poor (28 or less); Borderline (28 to 42) and Acceptable (greater than 42). Among households in rural Tajikistan, 7.22 percent had a Poor food consumption score, indicating the lack of adequate diversity in their diet; 15.19 percent had a Borderline and 77.59 as Acceptable FCS. The people with satisfactory FCS are not necessarily food secure in terms of quantity or kcal intake.

As shown in Table 16, major source for concern in terms of food quality and nutrients is for households with a poor FCS, who reported eating only cereals and tubers (7 days/week) and vegetables (5 days/week). Food consumption in quality was much better for families belonging to borderline group, who reported eating oil/fats, beans, fruits, sugar/honey, milk product and condiments, in addition to cereals and vegetables. However this group showed also no consumption of meat products at all. Families in the acceptable FCS group lived on a diet consisting of food items from all categories, consumed in a week.

Table 16: Tajikistan: Food Consumption Score – Food Groups, April-June 2011

		cereals and tubers	Beans, lentils, peas, nuts	Vegetables	Fruits	meats (animal proteins)	Milk, cheese and other milk products	Sugar, honey, jam, candies	Oil, fats	Condiments
FC groups (28, 42 cut off)	poor	7.0	0.0	5.0	0.0	0.0	0.0	5.0	0.0	0.0
	borderline	7.0	1.3	4.3	4.3	0.0	1.7	4.3	4.7	4.0
	acceptable	7.0	2.6	5.9	4.7	3.0	4.9	5.6	5.8	3.6
	Total	7.0	2.5	5.8	4.6	2.7	4.6	5.5	5.5	3.6

Source: WFP FSMS Survey, April-June, 2011.

Household Coping Strategies

The WFP FSMS highlighted different strategies households adopted to cope with price shocks and food shortages during April-June 2011. Introducing changes in the quality and quantity of food consumed was the most common coping strategy. On national average, households were relying on less preferred and less expensive food for three days in a week. Other two commonly adopted strategies included purchasing food on credit, incurring debts (2.2 days), borrowing food or relying on help from friends and/or relatives (2 days).

Households were also resorting to more severe coping strategies that could affect their long term food security, such as eating seeds stocks held for the next season (1.4 days). Other severe coping strategies employed included skipping entire days without eating, selling household assets, selling productive assets, and migration (out of the village) to seek for a job (1.4 days).

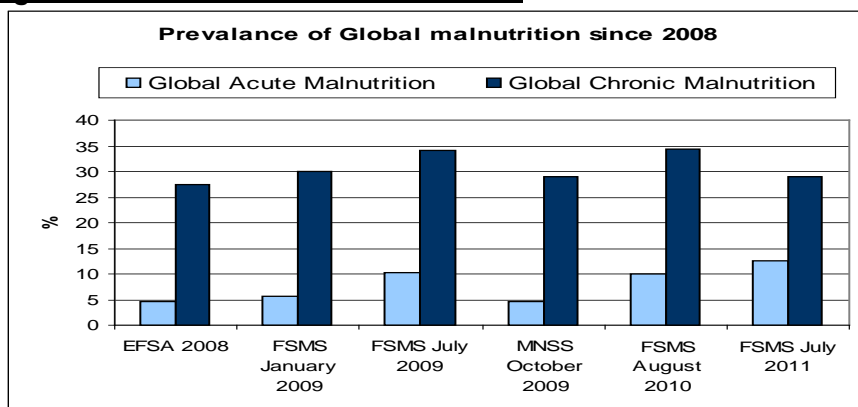
Households were also adopting coping strategies that could change from sustainable to more severe, depending on their frequency. These included decreased expenditures for health care and drugs (1.6 days), decreased expenditures for agriculture and livestock (1.5 days) and increased selling of livestock (1.5 days).

Nutritional status of children under 60 months in April-June 2011

Nutritional status among children is assessed through a comparison of *weight for height*, which is reported as *wasting* (low weight for height), and *height for age*, which is reported as *stunting* (low height for age). Wasting is also referred to as acute malnutrition, indicating pronounced under-nutrition (lack of food); stunting is also referred to as chronic malnutrition, indicating a sustained period of poor nutrition coupled with other non-food related anomalies such as illness due to poor hygiene, poor feeding and caring practices.

The results of WFP/WHO monitoring system in April-June also show an increase in child acute malnutrition at 12.5 percent compared with August 2010 (10 percent) and July 2009 (10.3 percent). Chronic malnutrition showed a slight decrease at 29.1 percent compared to August 2010 (33.1 percent) and July 2009 (34.1 percent).

Figure 9: Child malnutrition 2008-2011



Source: CFSAM estimates

5.3 Food assistance needs for 2011/12

Identifying the priority areas for intervention in 2011/12 by zone

To identify priority areas for intervention in Tajikistan, vulnerability to food insecurity is analyzed by zone. Household food security is measured by both inadequate food intake and food consumption score. Inadequate food intake is an important quantity indicator and immediately associated with food insecurity. The dietary energy consumption (DEC) index is developed based on the average share of population with inadequate intakes (<2100 kcal/person/day) in a zone, ranging from 1 (least food insecurity) to 4 (Severe in food insecurity). For instance, DEC index suggests that Isfara in Sughd region has the worst food security situation in Tajikistan.

Different from dietary energy consumption, dietary diversity measures the quality of diet, which is equally as important as quantity of diet because it is associated with a number of outcomes in the health area, such as birth weight, child's anthropometric status, and haemoglobin concentrations. A more diversified diet is highly correlated with such factors as caloric and protein adequacy, percentage of protein from animal sources (high-quality protein), household income, and food availability due to household location. Similar to DEC, four groups of dietary diversity are developed by FCS Index based on the percentage of households with FCS in poor or borderline categories.

Agricultural production is one of the pillars of food availability and an important income source for farmers, both at the level of households and of agro-ecological and livelihoods zones. Wheat is by far the main cereal consumed and produced as food in the country.

Based on crop assessment report of 2011, the zones with higher vulnerability to food insecurity due to reduced wheat production in 2011/12 are Khuroson, Panjakent, Jirgatal, Ghonchi, Qumsangir, Temumalik, Nurbod, Aini, and Isfara zones.

6. Recommendations for food security monitoring and evaluation

- Government of Tajikistan, with support from its development partners, needs to monitor the food security situation in the country, especially in the current context of rising food and fuel prices and natural disaster shocks. The process has to be implemented in a coordinated manner and integrated in national and regional Agricultural Market Information System (AMIS) mechanism.
- Monitor household food insecurity/vulnerability in urban area. Given the high prevalence of undernourishment and limited coping capacities for urban households due to high and volatile food and fuel prices, the mission highly recommend to include the samples of urban households in future Food Security Monitoring System and Nutritional/Health Monitoring System.
- The EC-funded, FAO project "Support to Strengthening of National Food Security Information System": GCP/TAJ/007/EU is beginning this quarter with a view to:
 - Supporting national crop/ livestock assessment, monitoring and forecast capacities;
 - Supporting improved national information system, from data collection to processing;
 - Improving in-country food security monitoring and analysis that effectively respond to needs of policy and decision makers;
 - Improve market information for major food and agriculture input commodities.

Part Two: Annexes

Annex 1- CROP PRODUCTION SITUATION BY REGION

Annex 2- Crop and Food Security - agricultural assessment methodology

Annex 1. CROP PRODUCTION SITUATION BY REGION

Sughd

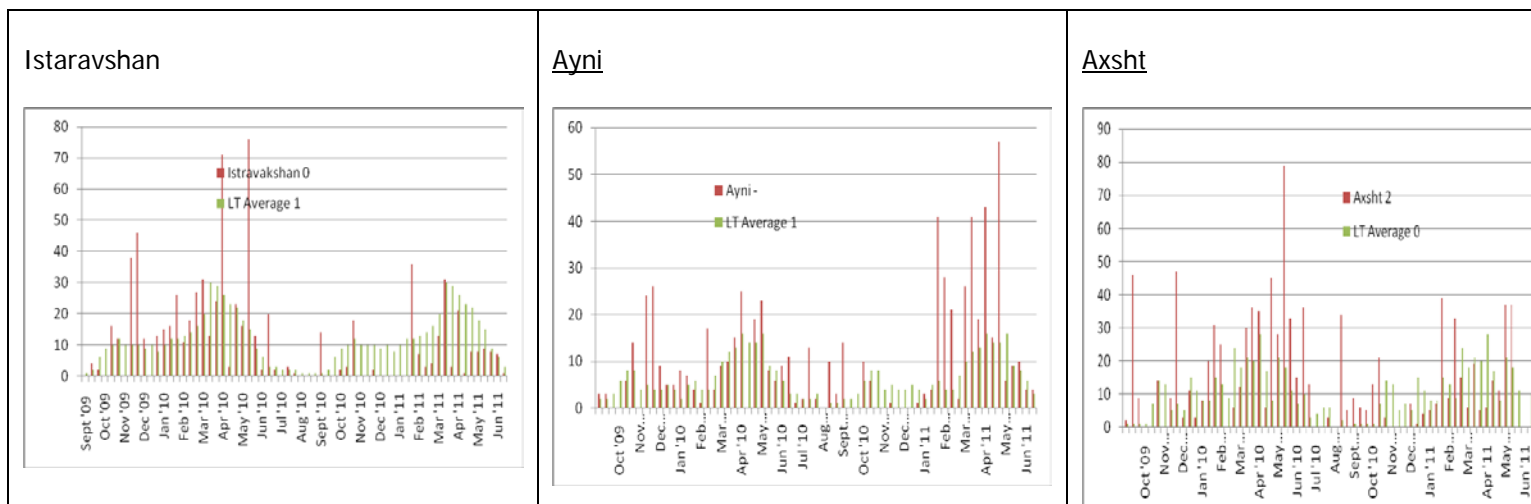
Sughd province is located in the north comprising-

- Northern Tajikistan, territory straddling the south-western part of the Ferghana Valley along the Syr Darya with the eastern part of the valley in Uzbekistan. Enclosed by two east-west mountain ranges, namely the Kuramin Range from the north and Turkestan Range from the south, the valley has rich alluvial soil and the natural conditions are favourable for cotton and Mediterranean crops (grapes, apricots, peaches).
- Zeravshan zone, the southern part of Sugd, stretching east to west in a narrow valley along the Zeravshan River, edged by the Turkestan Range in the north and the Zeravshan Range in the south.

Sugd ranks first in the production of rice, tobacco, and fruits. Tajikistan's entire tobacco harvest comes from the Zeravshan Valley. Main crops in order of importance are Northern (N) cotton, cereals, livestock, horticulture; Zeravshan (S) tobacco, potato, cereals, livestock, horticulture.

Dekadal rainfall data from Hydromet, Dushanbe for three stations in three districts in Sughd are shown below in Figure A1. The graphs show that while the adverse conditions prevailed throughout the duration of the rainy season in Istaravshan and Asht, the spring rains in Ayni were much better than usual and continued into May. However, failure of water delivery systems in Sughd are noted by Mission teams to have been prevalent until April 20th with equally detrimental effects on performance.

Figure A1: Sugd Dekadal Rainfall data from Sept 2009 to May 2011; and long-term average.



Cereal production in Sugd from the 2011/2012 marketing season is forecast at 169,000 tonnes, comprising 74,000 tonnes wheat and 46,000 tonnes barley; and 22,000 tonnes maize and 27,000 tonnes of rice without the second season maize and rice harvests- some 28 percent below last year's SSA estimate of total cereals. The potato harvest is estimated at 326,000 tonnes, 19 percent greater than last year. Pulses and oilseeds have an increased area of 14 percent and 82 percent. Cotton area has gone up by 6 percent to around 59,000 ha. Main crop cereal and total potato performance are given by district, compared to performance in 2009/10 in Table A1- Sughd below.

Table A1: Sugd

Annex 1-Sugd									
Years	2009/109				2010/11				
Districts	Crop	Area	t/ha	Prod- t	Area	t/ha	Prod- t	%A	%P
Asht	Wheat W	1523	2.6	3960	807	2.4	1937	53.0	48.9
	Barley W	7	3.5	25	6	1.7	10	85.7	41.6
	Wheat S	0		0	282	2.4	677	This year only	
	Barley S	0		0	17	1.7	29	This year only	
	Potato	297	8.9	2643	363	13.8	5009	122.2	189.5
Ayni	Wheat W	630	2.32	1462	460	2.5	1150	73.0	78.7
	Barley W	355	2.2	781	360	2.0	720	101.4	92.2
	Wheat S	347	2.08	722	312	2.5	780	89.9	108.1
	Barley S	933	1.74	1623	984	2.0	1968	105.5	121.2
	Potato	180	9.3	1674	409	25.4	10389	227.2	620.6
Gafurov	Wheat W	2664	2.33	6207	1955	1.80	3519	73.4	56.7
	Barley W	583	2.18	1271	264	1.4	370	45.3	29.1
	Wheat S	1468	2.3	3376	1561	2.0	3122	106.3	92.5
	Barley S	702	2.1	1474	806	2.0	1612	114.8	109.3
	Potato	340	17.8	6052	355	26.6	9443	104.4	156.0
Gonchi	Wheat W	5890	1.42	8364	4769	1.2	5723	81.0	68.4
	Barley W	3881	1.36	5278	3968	0.9	3571	102.2	67.7
	Wheat S	4733	1.24	5869	4835	0.9	4352	102.2	74.1
	Barley S	15396	1.23	18937	16310	0.7	11417	105.9	60.3
	Potato	3241	31.21	101152	4026	28.9	116351	124.2	115.0
Isfara	Wheat W	1284	3.62	4648	1359	2.3	3126	105.8	67.2
	Barley W	147	2.5	368	186	1.7	316	126.5	86.0
	Wheat S	0		0	0		0	0.0	0.0
	Barley S	0		0	0		0	0.0	0.0
	Potato	638	20.0	12760	445	21.3	9479	69.7	74.3
Istravakshan	Wheat W	7893	1.75	13813	5135	1.5	7703	65.1	55.8
	Barley W	1616	1.62	2618	293	1.3	0	18.1	0.0
	Wheat S	1541	1.48	2281	1868	0.8	1494	121.2	65.5
	Barley S	9776	1.36	13295	10800	0.7	7560	110.5	56.9
	Potato	1347	23	30981	1446	23.2	33547	107.3	108.3
Rasulov	Wheat W	3186	2.31	7360	2857	2.3	6571	89.7	89.3
	Barley W	884	1.98	1750	791	2.2	1740	89.5	99.4
	Wheat S	436	1.9	828	142	1.1	156	32.6	18.9
	Barley S	1592	1.8	2866	1733	1.2	2080	108.9	72.6
	Potato	372	14.24	5297	521	11.6	6044	140.1	114.1
Konibodom	Wheat W	1782	2.41	4295	1521	2.3	3498	85.4	81.5
	Barley W	342	1.83	626	263	1.7	447	76.9	71.4
	Wheat S	87	1.77	154	32	1.7	54	36.8	35.3
	Barley S	80	1.44	115	74	1.6	118	92.5	102.8
	Potato	200	19	3800	185	11.9	2202	92.5	57.9
K Mascho	Wheat W	248	2.5	620	241	2.5	603	97.2	97.2
	Barley W	0		0	0		0	0.0	0.0
	Wheat S	103	1.5	155	73	2.2	161	70.9	103.9
	Barley S	197	1.5	296	144	2.0	288	73.1	97.5
	Potato	1532	36.7	56224	2001	35.4	70835	130.6	126.0
Mascho	Wheat W	1131	0.98	1108	406	1.7	690	35.9	62.3
	Barley W	207	0.64	132	60	1.8	108	29.0	81.5
	Wheat S	1121	1.0	1121	1060	1.4	1484	94.6	132.4
	Barley S	638	1.0	638	237	0.5	119	37.1	18.6
	Potato	67	19.25	1290	83	21	1743	123.9	135.1
Panjakent	Wheat W	4726	2.65	12524	4195	1.7	7132	88.8	56.9
	Barley W	2032	2.39	4856	2447	1.8	4405	120.4	90.7
	Wheat S	1698	2.26	3837	911	1.4	1275	53.7	33.2
	Barley S	3475	2.15	7471	4507	0.5	2254	129.7	30.2
	Potato	1365	23	31395	1525	23.8	36295	111.7	115.6
Shariston	Wheat W	5416	2.48	13432	5194	2.3	11946	95.9	88.9
	Barley W	311	2.23	694	524	2.2	1153	168.5	166.2
	Wheat S	3863	2.13	8228	4063	1.1	4469	105.2	54.3
	Barley S	3326	2.27	7550	3237	1.2	3884	97.3	51.4
	Potato	894	22.8	20383	1040	22.6	23504	116.3	115.3
Spitamen	Wheat W	2163	1.2	2596	1446	2.3	3326	66.9	128.1
	Barley W	798	1.2	958	0	2.2	0	0.0	0.0
	Wheat S	149	1.1	164	134	1.1	147	89.9	89.9
	Barley S	731	0.9	658	1384	1.2	1661	189.3	252.4
	Potato	89	24.0	2136	188	21.4	4023	211.2	188.4
Zafarobod	Wheat W	5061	1.7	8604	2240	0.5	1120	44.3	13.0
	Barley W	1722	1.3	2239	647	0.4	259	37.6	11.6
	Wheat S	0		0	44	0.4	18	This year only	
	Barley S	0		0	363	0.3	109	This year only	
	Potato	188	11	2068	165	16	2640	87.8	127.7
Total	Wheat W	43597		85031	32585		56106	74.7	66.0
	Barley W	12885		21570	10746		13463	83.4	62.4
	Wheat S	15546		26735	15337		17535	98.7	65.6
	Barley S	36847		54924	40596		33069	110.2	60.2
	Potato	10750		275212	12752		326494	118.6	118.6

Direct Rule Districts (DRD) - Central

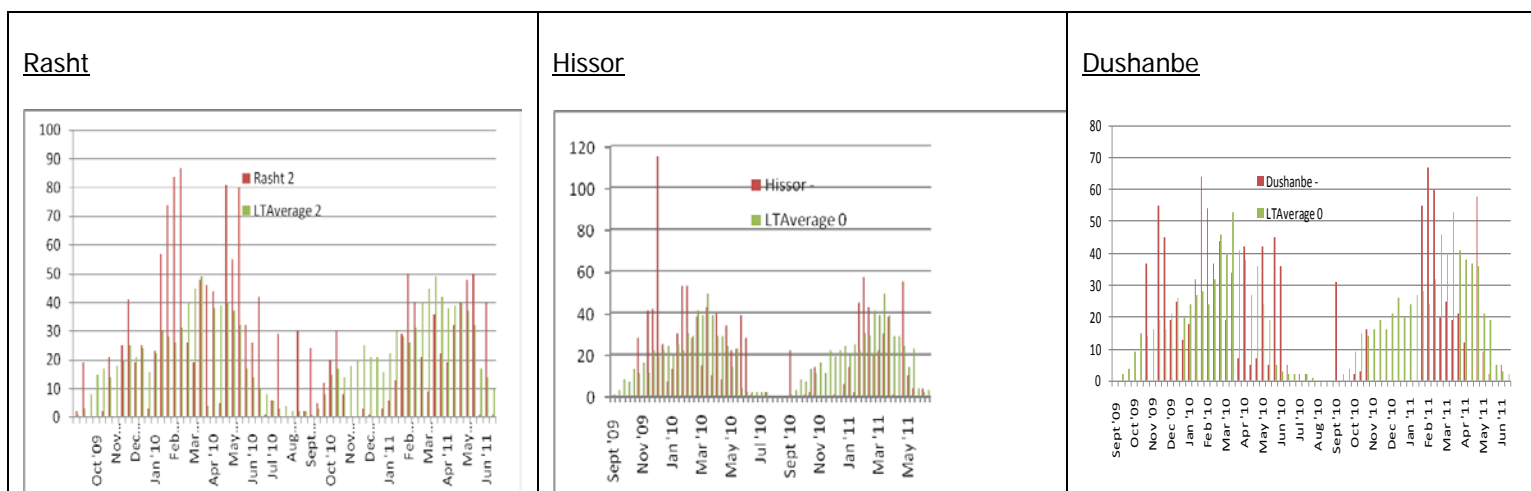
DRD consisting of 13 districts stretches in a long band from east to west, between the Hissor and Zeravshan mountain ranges in the north, the Vakhsh and Darvaz ranges in the south, and the western edge of Pamir Mountains in the east (Akademiya Nauk Range). This mountainous belt creates a natural barrier between the Khatlon lowlands in the south and the northern valleys of Istravakhshan and Ferghana in Sugd Province. Natural vegetation in Central Tajikistan ranges from semi-desert to mountain meadows and pastures. The elevations rapidly rise from the western part (Hissor) to the rugged Hissor-Alay Mountains in the eastern part (Rasht). Crops flourish mainly in the Hissor Valley, which stretches from Dushanbe to the border with Uzbekistan (Tursanzade)

Most agricultural production of DRD, both crops and livestock products, originate from the eastern part centred on the Hissor Valley around Dushanbe. The Hissor zone produces significant quantities of flax, grapes, and vegetables. It also grows rice and cotton, although in quantities much smaller than Khatlon and Sugd.

In the Rasht zone crop farming is restricted to the long and narrow valley that stretches from east to west following Surkhob River on its way to Vakhsh River in Khatlon Province further south-west. Potatoes grown by rural households for own consumption and sales appear to be only significant crop in Rasht. Main crops are DRD (Centre) and Hissor- Cotton, livestock, horticulture, cereals; Rasht Livestock, cereals, horticulture, cotton.

Dekadal rainfall data from Hydromet, Dushanbe for three stations in three districts in DRD are shown below in Figure A2. The graphs show that while the adverse conditions prevailed throughout the autumn in all three districts. Rains in February were above normal, and were sustained, albeit at below normal levels until May- encouraging spring planting. However, as with Sugd, failure of electricity-powered pump water-delivery systems in DRD is noted by Mission teams to have been prevalent until April 20th with detrimental effects on performance of the irrigated crop.

Figure A2: DRD Dekadal Rainfall data from Sept 2009 to May 2011; and long-term average.



Cereal production in DRD from the 2010/11 main season is forecast at 174,000 tonnes, comprising 146,500 tonnes wheat and 12,500 tonnes barley; and 7,000 tonnes maize and 8,000 tonnes of rice - apparently 23 percent above and 31 percent below last year's State Statistics Agency estimates without the second season maize and rice harvests, which will contain late first season rice. The potato harvest is estimated at 258,000 tonnes, 30 percent greater than last year. Pulses area is down by 30 percent will increase with second season planting. Oilseeds have an increased area of 13 percent. Cotton area has gone up by 48 percent to around 12,000 ha. Main crop cereal and total potato performance are given by district, compared to performance in 2009/10 in Table A1- DRD below.

Table A1: DRD

Annex 1- DRD										
Years	2009/109				2010/11					
Districts	Crop	Area	t/ha	Prod- t	Area	t/ha	Prod- t	%A	%P	
Faizobod	Wheat W	4793	1.94	9298	2484	3.0	7452	51.8	80.1	
	Barley W	215	1.71	368	70	3.0	210	32.6	57.1	
	Wheat S	0		0	1142	2.0	2284	This season only		
	Barley S	0		0	175	1.8	315	This season only		
	Potato	234	14	3276	412	18.9	7787	176.1	237.7	
Rogun	Wheat W	1966	1.67	3283	574	1.4	804	29.2	24.5	
	Barley W	144	1.08	156	25	1.5	38	17.4	24.1	
	Wheat S	0		0	803	1.1	883	This season only		
	Barley S	0		0	400	0.8	320	This season only		
	Potato	144	17	2448	158	20.4	3223	109.7	131.7	
Nurobod	Wheat W	2034	1.2	2441	2256	1.4	3158	110.9	129.4	
	Barley W	32	1.07	34	0	0	0	0.0	0.0	
	Wheat S	0			165	1.1	182	This season only		
	Barley S	0			38	0.8	30	This season only		
	Potato	341	17	5797	564	27.4	15454	165.4	266.6	
Rasht	Wheat W	3807	1.64	6243	1278	1.2	1534	33.6	24.6	
	Barley W	95	1.46	139	0		0	0.0	0.0	
	Wheat S	0			645	1.2	774	This season only		
	Barley S	0			110	0.9	99	This season only		
	Potato	1247	27	33669	2039	27.9	56888	163.5	169.0	
Tojikobod	Wheat W	2510	2.04	5120	1151	1.2	1381	45.9	27.0	
	Barley W	146	1.98	289	0		0	0.0	0.0	
	Wheat S	0		0	1484	1.2	1781	This season only		
	Barley S	0		0	120	0.9	108	This season only		
	Potato	733	28	20524	1086	26.7	28996	148.2	141.3	
Jirgital	Wheat W	1057	1.85	1955	864	1.2	1037	81.7	53.0	
	Barley W	0		0	0		0	This season only		
	Wheat S	0		0	1524	1.2	1829	This season only		
	Barley S	0		0	0			0.0	0.0	
	Potato	1810	39	70590	3307	22.3	73746	182.7	104.5	
Turzanzod	Wheat W	12374	2.14	26480.4	5694	3.3	18790	46.0	71.0	
	Barley W	1374	1.03	1415.2	196	3.0	588	14.3	41.5	
	Wheat S	0		0.0	5571	1.9	10585	This season only		
	Barley S	0		0.0	1034	1.9	1965	This season only		
	Potato	570	11	6270.0	573	15.9	9111	100.5	145.3	
Sharinav	Wheat W	7294	2.31	16849	1708	3.3	5636	23.4	33.5	
	Barley W	580	2.45	1421	193	3.3	637	33.3	44.8	
	Wheat S	0		0	2099	1.9	3988	This season only		
	Barley S	0		0	312	1.9	593	This season only		
	Potato	130	24	3120	125	21.9	2738	96.2	87.7	
Hissor	Wheat W	10673	2.22	23694	4086	3.3	13484	38.3	56.9	
	Barley W	1357	1.72	2334	351	3.0	1053	25.9	45.1	
	Wheat S	0		0	4266	2.5	10665	This season only		
	Barley S	0		0	995	1.4	1393	This season only		
	Potato	573	13	7449	620	10.9	6758	108.2	90.7	
Rudaky	Wheat W	14279	2.06	29415	6992	3.0	20976	49.0	71.3	
	Barley W	1710	1.68	2873	515	3.0	1545	30.1	53.8	
	Wheat S	0		0	8534	2.0	17068	This season only		
	Barley S	0		0	1664	1.8	2995	This season only		
	Potato	856	14.5	12412	865	19.5	16868	101.1	135.9	
Varzob	Wheat W	2726	0.85	2317	984	3.0	2952	36.1	127.4	
	Barley W	235	1.01	237	64	3.0	192	27.2	80.9	
	Wheat S	0		0	1408	2.0	2816	This season only		
	Barley S	0		0	167	2.0	334	This season only		
	Potato	290	7.16	2076	301	16.4	4936	103.8	237.7	
Vakhdad	Wheat W	9029	2.8	25281	5826	3.3	19226	64.5	76.0	
	Barley W	217	2.05	445	98	2.0	196	45.2	44.1	
	Wheat S	0		0	2600	2.0	5200	This season only		
	Barley S	0		0	119	2.0	238	This season only		
	Potato	968	25	24200	1000	25.9	25900	103.3	107.0	
Tavildera	Wheat W	1321	2.4	3170	1110	1.4	1554	84.0	49.0	
	Barley W	290	1.9	551	0	1.5	0	0.0	0.0	
	Wheat S			0	250	1.1	275	This season only		
	Barley S			0	250	0.8	200	This season only		
	Potato	517	11.4	5893.8	578	22.7	13121	111.8	222.6	
Regional	Wheat W	73863		155549	35007		90532	47.4	58.2	
	Barley W	6395		10261	1512		4248	23.6	41.4	
	Wheat S	0		0	30491		56045	This season only		
	Barley S	0		0	5384		8275	This season only		
	Potato	8413		197725	11628		257738	138	130	

4.3 Khatlon

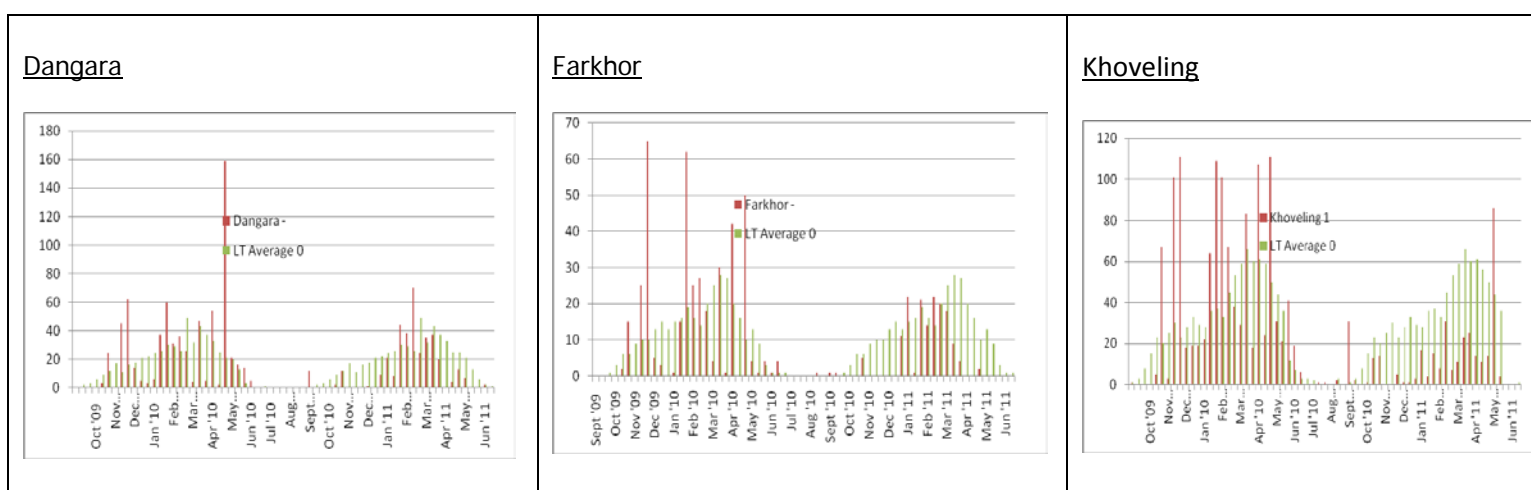
Khatlon Province is located in the South-West of Tajikistan stretching south of the Hissor Range and west of Pamir. It is a region of wide river valleys (Lower Kofarnikhon, Vakhsh, Kyzylsu) separated by mountain ridges that fan out in the south-westerly direction from the mountain system in the north. Khatlon is the main producer of cereals, cotton, grapes, and flax. It is also the leader in livestock production (milk and meat). The western part Khatlon- Kurgantube enjoys the warmest climate in the country. Cotton and other subtropical crops are grown on large irrigated areas in Lower Kofarnikhon and Vakhsh valleys in western Khatlon. The eastern part of the province, Kulyab, is more mountainous with one relatively small valley along the Yakhsu and Kyzylsu rivers around the town of Kulyab where cotton farming is the main activity. Main crops in order of importance are Khatlon Kurgantube Cotton, cereals, livestock, horticulture; Khatlon Kulyab (E) Cotton, cereals, livestock, horticulture.

Rainfall and key crop performance for the two zones are shown below.

Khatlon- Kulyab

Dekadal rainfall data from Hydromet, Dushanbe for three stations in three districts in Khatlon –Kulyab are shown below in Figure xxx. All three graphs show adverse conditions throughout the autumn. Graphs for Dangara and Farkhor do show rain spring but very little rain after the end of March. Khoveling rainfall is extremely poor throughout the season. As with the other regions, failure of electricity powered pump water delivery systems in Khatlon is noted by Mission teams to have been prevalent until April 20th with detrimental effects on performance.

Figure A3: K- Kulyab Dekadal Rainfall data from Sept 2009 to May 2011; and long-term average.



Cereal production in Khatlon- Kulyab from the 2010/11 main season is forecast at 289,000 tonnes, comprising 219,000 tonnes wheat and 15,000 tonnes barley; and 3,000 tonnes maize and 2,000 tonnes of rice without the second season maize and rice harvests- some 17 percent below last year's SSA estimates. The potato harvest is estimated at 83,000 tonnes, 50 percent greater than last year. Pulses area is greater by 86 percent and oilseeds area is similar to 2009/10. Cotton area has gone up by 17 percent to around 31,500 ha. Main crop cereal and total potato performance are given by district, compared to performance in 2009/10 in Table A1- Khatlon Kulyab below.

Table A1: Khatlon Kulyab

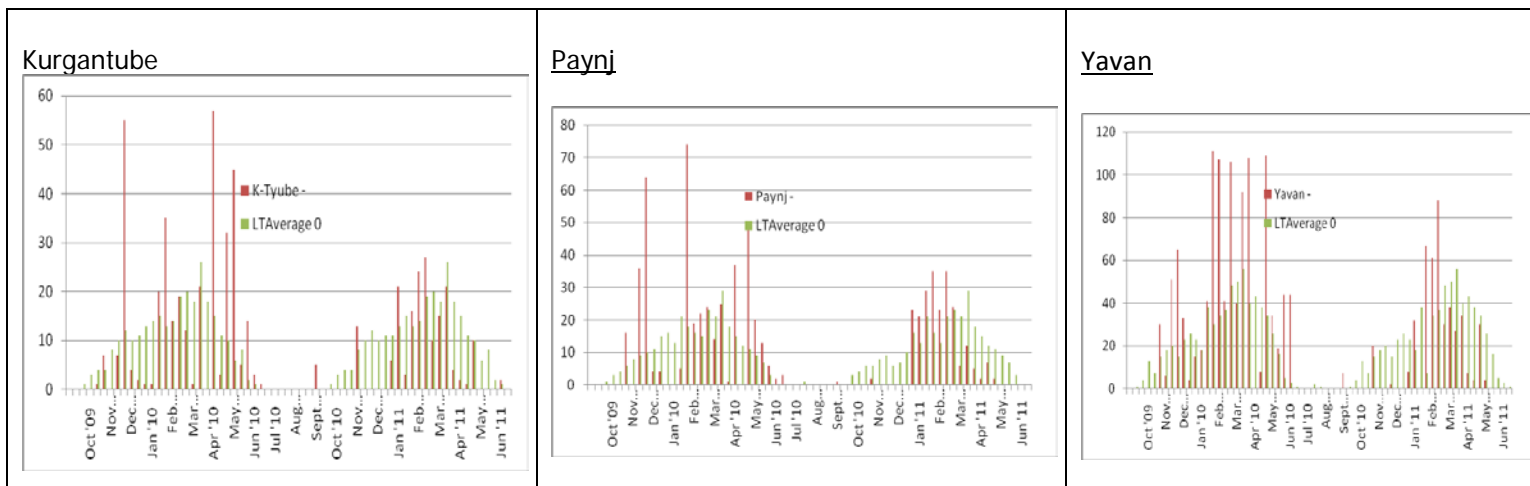
NB This year/ season only refers to an absence of cropping or data in 2009/10.

Annex 1 K Kulyab										
Years	2009/109				2010/11					
Districts	Crop	Area	t/ha	Prod- t	Area	t/ha	Prod- t	%A	%P	
Muminobod	Wheat W	6778	2.35	15928	8654	2.2	19039	127.7	119.5	
	Barley W	315	2.73	860	604	1.3	785	191.7	91.3	
	Wheat S	5656	2.28	12896	2313	1.5	3470	40.9	26.9	
	Barley S	415	2.98	1237	203	1.3	264	48.9	21.3	
	Potato	647	20	12940	900	23.3	20970	139.1	162.1	
Norak	Wheat W	644	1.55	998	627	1.5	941	97.4	94.2	
	Barley W	19	1.48	28	30	2.5	75	157.9	266.7	
	Wheat S	259	1.46	378	220	2.1	462	84.9	122.2	
	Barley S	9	1.45	13	0	2.0	0	0.0	0.0	
	Potato	70	4.3	301	77	20.8	1602	110.0	532.1	
Shurobod	Wheat W	4246	1.96	8322	4400	1.8	7920	103.6	95.2	
	Barley W	0		0	160	1.9	304	this season only		
	Wheat S	9730	2.09	20336	10564	1.7	17959	108.6	88.3	
	Barley S	110	1.96	216	160	1.7	272	145.5	126.2	
	Potato	205	16	3280	340	20.8	7072	165.9	215.6	
Termumali	Wheat W	13513	2.03	27431	13320	2.0	26640	98.6	97.1	
	Barley W	876	1.94	1699	766	1.9	1455	87.4	85.6	
	Wheat S	144	2.06	297	498	2.0	996	345.8	335.8	
	Barley S	787	1.77	1393	762	1.9	1448	96.8	103.9	
	Potato	77	12.4	955	97	14.2	1377	126.0	144.3	
Vose	Wheat W	16346	2.87	46913	12091	2.6	31437	74.0	67.0	
	Barley W	659	2.67	1760	630	2.6	1638	95.6	93.1	
	Wheat S	1767	2.43	4294	4073	1.5	6110	230.5	142.3	
	Barley S	111	2.6	289	99	1.7	168	89.2	58.3	
	Potato	396	20.15	7979	401	19.9	7980	101.3	100.0	
Baljuvon	Wheat W	3700	1.96	7252	3729	2.0	7458	100.8	102.8	
	Barley W	0		0	275	1.9	523	#DIV/0!	#DIV/0!	
	Wheat S	1143	1.93	2206	1076	2.0	2152	94.1	97.6	
	Barley S	264	2.1	554	285	1.9	542	108.0	97.7	
	Potato	198	17	3366	241	19.0	4579	121.7	136.0	
Dangara	Wheat W	30472	2.69	81970	29650	2.0	59300	97.3	72.3	
	Barley W	2560	2.32	5939	2570	1.4	3598	100.4	60.6	
	Wheat S	2701	2.65	7158	1979	2.1	4156	73.3	58.1	
	Barley S	392	2.28	894	412	2.0	824	105.1	92.2	
	Potato	235	11.5	2703	255	14.9	3800	108.5	140.6	
Hamadoni	Wheat W	8071	2.87	23164	6943	3.0	20829	86.0	89.9	
	Barley W	130	2.81	365	130	3.0	390	100.0	106.8	
	Wheat S	1039	3	3117	762	3.0	2286	73.3	73.3	
	Barley S	262	2.14	561	372	2.9	1079	142.0	192.4	
	Potato	286	14	4004	318	21	6678	111.2	166.8	
Farkhor	Wheat W	7582	2.6	19713	9078	2.4	21787	119.7	110.5	
	Barley W	385	2.37	912	22	1.3	29	5.7	3.1	
	Wheat S	4464	2.57	11472	3006	2.4	7214	67.3	62.9	
	Barley S	395	2.54	1003	747	1.3	971	189.1	96.8	
	Potato	483	25.54	12336	507	24.4	12371	105.0	100.3	
Khoveling	Wheat W	5824	2.2	12638	5407	2.0	10814	92.8	85.6	
	Barley W	0		0	0		0	0.0	0.0	
	Wheat S	888	2.0	1776	1135	2.0	2270	127.8	127.8	
	Barley S	0		0	0		0	0.0	0.0	
	Potato	277	15.6	4321	505	18.8	9494	182.3	219.7	
Kulob	Wheat W	4675	3.13	14633	4048	3.0	12144	86.6	83.0	
	Barley W	24	2.59	62	40	3.0	120	166.7	193.1	
	Wheat S	1506	3.12	4699	1022	3.0	3066	67.9	65.3	
	Barley S	110	1.96	216	64	2.9	186	58.2	86.1	
	Potato	340	8.3	2822	341	19.6	6691	100.4	237.1	
Regional	Wheat W	101851		258963	97947		219188	96.2	84.6	
	Barley W	4968		10769	5227		8917	105.2	82.8	
	Wheat S	29297		68628	26648		50140	91.0	73.1	
	Barley S	2855		6375	3104		5753	108.7	90.2	
	Potato	3214		55007	3982.4		82614	123.9	150.2	

Khatlon- Kurgantube

Dekadal rainfall data from Hydromet, Dushanbe for three stations in three districts in Khatlon- Kurgantube are shown below in Figure xxx. All three graphs show adverse conditions throughout the autumn and no rainfall in late spring or early summer. All three graphs show above average rain in early spring, which then fails way below the long term averages. As with the other regions, failure of electricity powered pump water delivery systems in Khatlon is noted by Mission teams to have been prevalent until April 20th with detrimental effects on performance.

Figure A4: K- Kurgantube Dekadal Rainfall data from Sept 2009 to May 2011; and long-term average.



Cereal production in Khatlon-Kurgantube from the 2010/11 main season is forecast at 215,400 tonnes, comprising 178,700 tonnes wheat and 8,000 tonnes barley; and 19,000 tonnes maize and 10,000 tonnes of rice without the second season maize and rice harvests- some 20 percent below last year's SSA estimates. The potato harvest is estimated at 142,500 tonnes, 37 percent greater than last year. Pulses area is three times greater and oilseeds by greater 12 percent than 2009/11 SSA first season data. Cotton area has gone up by 28 percent to around 95,000 ha. Main crop cereal and total potato performance are given by district, compared to performance in 2009/10 in Table A1- Khatlon Kurgantube below.

Table A1-Khatlon -Kurgantube

NB This year/ season only refers to an absence of cropping or data in 2009/10.

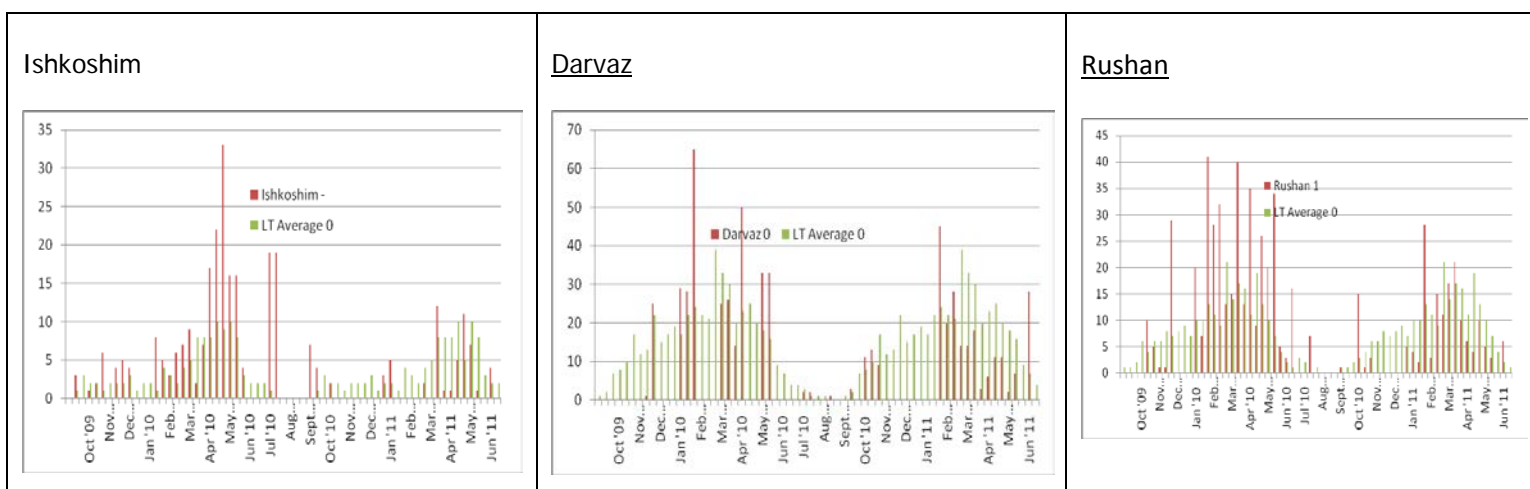
Annex 1 - Kkurgantube										
Years	2009/10				2010/11					
Districts	Crop	Area	t/ha	Prod- t	Area	t/ha	Prod- t	%A	%P	
N. Khusra	Wheat W	2106	3.76	7919	2154	2.9	6247	102.3	77.1	
	Barley W	176	3.66	644	144	3.7	533	81.8	101.1	
	Wheat S	160	3.05	488	0	4.1	0	0.0	134.4	
	Barley S	38	3.08	117	10	3.7	37	26.3	120.1	
	Potato	60	23.6	1416	78	30.3	2363	130.0	128.4	
Shaartuz	Wheat W	4208	3.86	16243	4176	3.8	15869	99.2	98.4	
	Barley W	69	3.69	255	46	3.7	170	66.7	100.3	
	Wheat S	1245	3.84	4781	275	4.1	1128	22.1	106.8	
	Barley S	97	3.47	337	60	3.7	222	61.9	106.6	
	Potato	370	20	7400	397	24.2	9607	107.3	121.0	
Kabadiyan	Wheat W	3496	4.37	15278	3286	4.1	13473	94.0	88.2	
	Barley W	116	3.95	458	26	3.7	96	22.4	21.0	
	Wheat S	875	5.0	4375	888	4.1	3641	101.5	83.2	
	Barley S	25	3.48	87	83	3.7	307	332.0	353.0	
	Potato	510	26.42	13474	503	27.2	13682	98.6	101.5	
Jilikul	Wheat W	3400	3.4	11560	3820	2.9	11078	112.4	95.8	
	Barley W	35	2.7	95	25	2.7	68	71.4	71.4	
	Wheat S	1450	2.26	3277	0	0	0	0.0	0.0	
	Barley S	154	2.17	334	0	0	0	0.0	0.0	
	Potato	265	18.59	4926	331	17.7	5859	124.9	118.9	
Jami	Wheat W	7115	3.09	21985	5819	2.3	13384	81.8	60.9	
	Barley W	453	2.02	915	316	2.3	727	69.8	79.4	
	Wheat S	644	3.6	2318	0	2.1	0	0.0	0.0	
	Barley S	5	3	15	140	1.63	228	2800.0	1521.3	
	Potato	624	24.53	15307	690	23.8	16422	110.6	107.3	
Kumsangi	Wheat W	4167	3.26	13584	4240	2.4	10176	101.8	74.9	
	Barley W	20	3	60	25	1.3	33	125.0	54.2	
	Wheat S	163	3	489	0	2.4	0	0.0	0.0	
	Barley S	15	3	45	0	1.3	0	0.0	0.0	
	Potato	473	25	11825	479	26.9	12885	101.3	109.0	
Panj	Wheat W	6088	3.55	21612	5025	3.0	15075	82.5	69.8	
	Barley W	0		0	730	3.0	2190	This year only		
	Wheat S	731	3.38	2471	0		0	0.0	0.0	
	Barley S	1202	2.16	2596	0		0	0.0	0.0	
	Potato	426	18.7	7966	466	23.2	10811	109.4	135.7	
Rumi	Wheat W	4985	1	4985	5412	2.9	15695	108.6	314.8	
	Barley W	117	1	117	125	2.7	338	106.8	288.5	
	Wheat S	608	1	608	106	2.9	307	17.4	50.6	
	Barley S	37	1	37	0	0	0	0.0	0.0	
	Potato	525	1	525	561	29.3	16437	106.9	3130.9	
Bokhtar	Wheat W	4181	3.89	16264	3445	3.1	10680	82.4	65.7	
	Barley W	0		0	13	3.0	39	This season only		
	Wheat S	225	3.66	824	254	3.1	787	112.9		
	Barley S	16	2.19	35	19	3.0	57	118.8		
	Potato	881	18.7	16475	1012	23.2	23478	114.9	142.5	
Vaksh	Wheat W	6067	3.15	19111	6907	2.8	19340	113.8	101.2	
	Barley W	349	2	698	109	3.0	327	31.2	46.8	
	Wheat S	110	3	330	0	0	0	0.0	0.0	
	Barley S	60	2.5	150	0	0	0	0.0	0.0	
	Potato	685	20.6	14111	785	19.1	14994	114.6	106.3	
Sarband	Wheat W	833	3.66	3049	745	3.1	2310	89.4	75.8	
	Barley W	22	3.14	69	25	3.0	75	113.6	108.6	
	Wheat S	74	2.46	182	3	3.1	9	4.1	5.1	
	Barley S	0		0	16	3.0	48	#DIV/0!	#DIV/0!	
	Potato	55	19	1036	58	20.0	1160	106.4	112.0	
Khoroson	Wheat W	5730	2.66	15242	5860	1.9	11134	102.3	73.0	
	Barley W	278	3.08	856	438	2.0	876	157.6	102.3	
	Wheat S	1697	3.4	5770	1538	1.9	2922	90.6	50.6	
	Barley S	278	3.31	920	286	2.0	572	102.9	62.2	
	Potato	241	20.04	4830	268	19.7	5280	111.2	109.3	
Yavan	Wheat W	8835	3.55	31364	9588	2.3	22052	108.5	70.3	
	Barley W	365	4.01	1464	390	2.3	897	106.8	61.3	
	Wheat S	3863	2.99	11550	1637	2.1	3438	42.4	29.8	
	Barley S	311	3.24	1008	155	1.63	253	49.8	25.1	
	Potato	269	19	5111	445	21.4	9523	165.4	186.3	
Regional	Wheat W	61211		198196	60477		166511	98.8	84.0	
	Barley W	2020		5674	2412		6368	119.4	112.2	
	Wheat S	11845		37463	4701		12232	39.7	32.7	
	Barley S	2238		5681	769		1724	34.4	30.3	
	Potato	5383.5		104401	6073		142501	112.8	136.5	

4.4 Gorno Badarkhshan (GBAO)

GBAO comprises the Pamir Mountains which cover the entire eastern half of the country. Agriculture is limited by the terrain and the altitude. While Western Pamir has some narrow river valleys suitable for cultivation at altitudes up to 3,700-4,200 m, Eastern Pamir is distinguished by the driest and coldest climate in Tajikistan. This is a cold high-mountain desert, without trees and hardly any vegetation, suitable only for rough grazing during a short summer season.

Dekadal rainfall data from Hydromet, Dushanbe for three stations in three districts in GBAO are shown below in Figure All three graphs show adverse conditions throughout the autumn, variable rainfall in early spring with Rushan having more favourable precipitation than Darvaz and Ishkoshim. Irrigation is from small diversion schemes in the different water catchments, so not so dependent on electricity from the national grid.

Figure A1-GBAO Dekadal Rainfall data from Sept 2009 to May 2011; and long-term average.



Cereal production in GBAO from the 2010/11 main season is forecast at 11,000 tonnes, comprising 10,500 tonnes wheat and a little barley and maize; just 1% below a similar level of production to 2009/10 main season from SSA estimates. The potato harvest is estimated at 43,000 tonnes, 4 percent less than last year. Pulses area at 1373 ha, is greater by 8 percent. No cotton is grown in GBAO. Main crop cereal and total potato performance are given by district, compared to performance in 2009/10 in Table A1- GBAO below.

Table A1-GBAO

Annex 1-GBAO									
Years	2009/109				2010/11				
Districts	Crop	Area	t/ha	Prod- t	Area	t/ha	Prod- t	%A	%P
Ishkoshim	Wheat W	5	2.6	13	5	2.4	12	100.0	92.3
	Barley W	0		0	0		0	0.0	0.0
	Wheat S	1513	2.36	3571	1527	2.2	3359	100.9	94.1
	Barley S	0		0	0		0	0.0	0.0
	Potato	511	21	10731	512	20.8	10650	100.2	99.2
Rushon	Wheat W	213	2.26	481	215	1.5	323	100.9	67.0
	Barley W	106	2.07	219	0	1.0	0	none	
	Wheat S	228	2.4	547	220	1.43	315	96.5	57.5
	Barley S	0		0	111	1.4	155	This season only	
	Potato	276	20.5	5658	277	15.6	4321	100.4	76.4
Roshkala	Wheat W	5	3.2	16	5	2.4	12	100.0	75.0
	Barley W	112	2.38	267	263	2.3	605	234.8	226.9
	Wheat S	578	2.42	1399	580	2.2	1276	100.3	91.2
	Barley S	0		0	0		0	0.0	0.0
	Potato	212	23.83	5052	213	19.2	4090	100.5	81.0
Shugnon	Wheat W	7	0.2	1	7	1.5	11	100.0	750.0
	Barley W	0		0	0		0	0.0	0.0
	Wheat S	327	1.34	438	272	1.43	389	83.2	88.8
	Barley S	236	1.4	330	0		0	0.0	0.0
	Potato	447	19	8493	490	18.4	9016	109.6	106.2
Vanj	Wheat W	376	2.98	1120	321	3.1	995	85.4	88.8
	Barley W	142	2.95	419	127	2.5	318	89.4	75.8
	Wheat S	189	3.2	605	215	3.0	645	113.8	106.6
	Barley S	0		0	0		0	0.0	0.0
	Potato	379	26	9854	380	26.5	10070	100.3	102.2
Darvaz	Wheat W	1033	2.1	2169	402	2.1	844	38.9	38.9
	Barley W	0		0	0		0	0.0	0.0
	Wheat S	0		0	1050	2.1	2205	This season only	
	Barley S	0		0	0		0	0.0	0.0
	Potato	198	22.63	4481	200	22.6	4520	101.0	100.9
Total	Wheat W	1639		3802	955		2196	58.3	57.8
	Barley W	0		0	0		0	0.0	0.0
	Wheat S	2835		6560	3864		8189	136.3	124.8
	Barley S	236		330	111		155	47.0	47.0
	Potato	2023		44269	2072		42666	102.4	96.4

NB This year/ season only refers to an absence of cropping or data in 2009/10.

Annex 2. Crop Assessment Process

The International Consultant provided support at the onset of Phase 1 field missions and returned after Phase 1 was completed to assist in preparations for Phase 2 and in the analysis and interpretation of data; and report writing/ debriefing of international agencies. In Phase 1 and Phase 2 field missions:-

- Phase 1: Five x 2-person teams comprising senior agronomists mostly from MoA, Dushanbe and Crop Research Institutes, Dushanbe visited 32 districts (*rayon*) in 4 regions (*oblasts*) Sughd, DRD, Khatlon- (Kulyab and Kyrguntube) and GBAO over 15-25 day periods beginning in early June. The teams
 - collected of all available farm data regarding area planted during the first season (autumn and spring) for all crops on enterprises (state farms) cooperative and private *dekhan* farms, household and Presidential plots from District Agricultural Offices and District Statistics offices (for *Jamoat* collected family plot data). The data for the eleven unvisited districts, which were of minor agricultural significance, were obtained by telephone by the MoA senior specialist;
 - a total of 256 farm visits and key informant interviews were conducted on all types of farms noted above; visits to each district began, in each case, with a semi-structured interview with the District Agricultural Office; then included farmers, gardeners, traders, markets, combine harvester and thresher operators as well as local specialists to cross-check the information given;
 - prior to the visits, all team members attended a 3-day refresher workshop during which CFSAM standard operating procedures³³ were introduced and explained regarding:
 - district level protocols
 - the use of a common, semi-structured interview checklist to collect key informant qualitative and quantitative data during all interviews and case studies,
 - the use of interview and case study summary sheet for rapid analysis of qualitative data.
 - cereal crop-cut sampling, weighing and recording
 - transects- and the use of a demonstration PET manual for wheat and barley.³⁴
- Phase 2: Three x 2-person teams comprising senior agronomists from the State University and MoA commissioned to assess potato production received a condensed version of the training, then visited, in late July/ early August, over periods ranging from 6-15 days, the 14 major potato growing districts in 3 regions, Sughd, Khatlon (Kulyab and Kyrguntube) and DRD, where they undertook identical tasks to the cereal teams but this time relating to potatoes.

Upon return to Dushanbe, the teams presented their data, sample weights, transects and summary sheets for analysis by the International Consultant, which included lengthy explanatory interviews with each team. The crop area data were cross-checked and, where necessary, supplemented with State Statistics Agency (Tajstat) 2011 area estimates to form a final table of crop areas harvested to be combined with productivity estimates to provide estimates of production per district

Productivity (yield per ha) estimates were determined by triangulating crop assessment team weighed-sample and transect data average yields per ha estimates with all local estimates for crops ready for harvest (cereals- phase 1; potatoes –phase 2). Crops other than cereals and potatoes have no independently assessed estimates of yield per ha as the mission visits are too early for maize, rice, oilseeds and cotton harvests. In such cases, local estimates of probable performance tempered by team observations and past performance under similar conditions are used to determine production. Regarding the relevance and validity of area estimates, the following points pertain-

- the large farm area data were obtained at district level, prior to adjusting/ cleaning;
- the mechanisms for collecting the data conform to a uniform approach noted to be based on a series of steps;
 - registered businesses complete forms quarterly describing *inter alia* areas planted; and provide the data to the DAO. Large scale enterprises, cooperatives, collective farms and private *dekhan* farms are required to conform to this system. Such data are the data usually cited by the Ministry of Agriculture as cropped areas and are transformed to production data by using *productivity* estimates from the farmers and as determined by DAO specialists; passed to the regional office, cleaned and then passed to the Ministry office in Dushanbe for final preparation to the GoT. In the case of this Mission's assessment, the productivity estimates (yield per ha) are

³³ FAO/ WFP (2009) Joint Guidelines for CFSAMs, Rome

³⁴ Determine usefulness of the technique.

from the Mission's own cereal crop sample estimates, transect and key informant data for each district.

- Household and Presidential plot area data were obtained from a) district level SSA officers, b) who, in their turn receive data from the sub-districts (*jamoat*); c) who, in their turn receive data from village representatives with the responsibility for recording crop areas farmed in each village or hamlet. Whereas there are obvious opportunities for error and mis-representation, mitigating factors are that a) the number of households in each village is well documented. b) the plot areas are small, c) land distribution is documented and may be cross-checked case-by-case if necessary; c) most hh plots contain permanent crops with areas unchanging from year to year, d) no taxes are levied on household or presidential plot area or production, therefore, there are no obvious disincentives to underestimate area planted or production obtained in these cases. The SSA officers pass their data, via regional offices to the SSC HQ for processing and publication along with the MoA data in the statistical year books.

The International Consultant and the National Consultant managing the Mission, jointly, followed-up three teams (Khatlon Kulyab; Khatlon Kurgantube; and DRD) in the field to observe adherence to SOPs. The National Consultant visited the other two teams (GBO and Sugd). During the visits, the Consultants also interviewed traders and harvesting machinery operators, visited NGO projects and kept their own transect records (walking and driven) using the demonstration PET manual.

In Dushanbe, prior to field visits, the International Consultant and the National Consultant held detailed discussions with the MoA Heads of Departments for crops, pest control and input supply, finance and credit, and pastures and ranges to obtain first hand opinions on factors affecting production since last autumn. The International Consultant conducted a series of interviews with key stakeholders in food security *viz* WFP, USAID, UNDP, Mercy Corps, World Vision and World Bank. The National Consultant visited a selection of traders and trade- associations.

Secondary data and reviews use in the compilation of this report include FAO Consultant reports, Annual reports and Bulletins; WFP Reports and Bulletins, UNDP Reports; FEWSnet bulletins and remote-sensed false imagery vegetation charts. Included also were downloads from websites of National Bank of Tajikistan (NBT); Asian Development Bank; and SSA-TajStat.

