

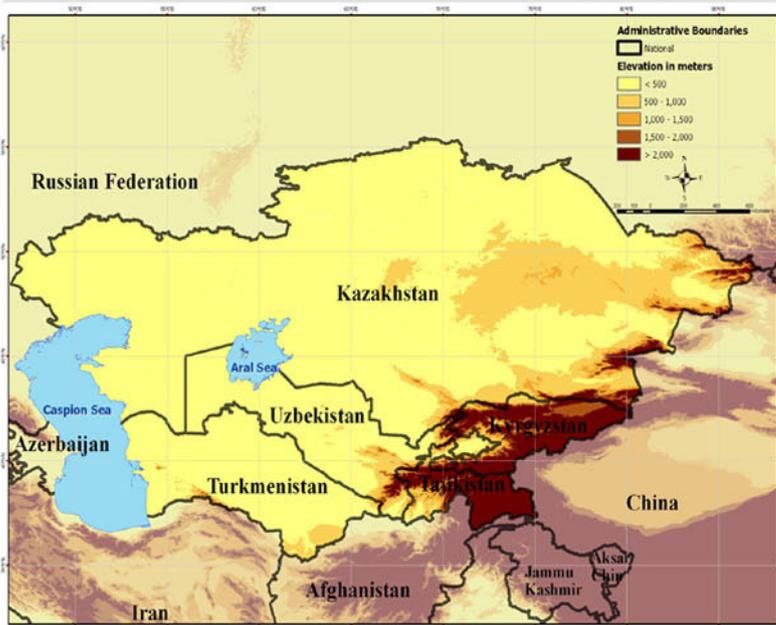


World Food Programme



World Food Programme Regional Market Survey for the Central Asian Region

Food Markets and Food Insecurity
in Tajikistan, Uzbekistan,
Kyrgyzstan, Kazakhstan



By . Ian Robinson B.Sc. PhD
June - August 2008

Regional Market Survey Central Asian Region

Report of Mission

June – August 2008

Contact

Thomas Beuter

**WFP, Regional Bureau Middle East, Central Asia &
Eastern Europe (OMC)**

Prepared by

W. Ian Robinson B.Sc. PhD

**AA International Ltd, Technium, Y Lanfa, Aberystwyth,
Ceredigion, SY231AS, Wales, UK**

TABLE OF CONTENTS

EXECUTIVE SUMMARY	9
1. INTRODUCTION.....	13
1.1 Background.....	13
1.2 Mission Structure	15
2. THE CENTRAL ASIAN REPUBLICS.....	17
2.1 Communications.....	17
3. MARKET SITUATION ASSESSMENTS	22
3.1 Tajikistan	22
3.1.1 General	22
3.1.2 Macro–Economy	23
3.1.3 Agricultural Sector	26
3.1.4 Crop Production 2007/8	31
3.1.5 Market Supply Chains	39
3.1.6 Market Prices	44
3.1.7 Social Support.....	49
3.2 Uzbekistan	51
3.2.1 General	51
3.2.2 Macro–Economy	52
3.2.3 Agricultural Sector	53
3.2.4 Crop Production 2007/8	58
3.2.5 Market Supply Chains	63
3.2.6 Market Prices	67
3.2.7 Social Support.....	71
3.3 Kyrgyzstan	74
3.3.1 General	74
3.3.2 Macro–Economy	75
3.3.3 Agricultural Sector	76
3.3.4 Crop Production 2007/8	81
3.3.5 Market Supply Chains	89
3.3.6 Market Prices	93
3.3.7 Social Support.....	97
3.4 Kazakhstan	100
3.4.1 General	100
3.4.2 Macro–Economy	101
3.4.3 Agricultural Sector	102
3.4.4 Crop Production 2007/8	109
3.4.5 Market Supply Chains	115

3.4.6 Market Prices	117
3.4.7 Social Support.....	121
4. CONCLUSIONS.....	123
4.1 General	123
4.2 Priority Concerns	124
4.2.1 Baseline Data on Food Price Increases	124
4.2.2 In-Country Food Stocks and Availability for Emergencies	129
4.2.3 Government Policy Measures Related to Food Price Increases (export quotas/taxes – internal price controls, increase in subsidies etc.)	132
4.2.4 Government Safety Nets	141
4.2.5 Impact of Price Increases/ Production Shortages/ Government Policies on the Vulnerable Segments of the Population.....	143
4.2.6 Organisations Involved in Collecting Information on Food Prices/Food Security/Social Situation.....	148
4.2.7 Opportunities for Local Purchase for WFP.....	151
5. RECOMMENDATIONS	154
5.1 Activity Extension	154
5.2 Import Vulnerability.....	156
5.3 Local Purchase Opportunities.....	156
6. BIBLIOGRAPHY	157
ANNEXES.....	161

LIST OF TABLES

Table 1. Gini Indices for Mission Countries, Egypt, UK, USA and the Russian Federation.....	15
Table 2. Prioritised Concerns (March 2008).....	16
Table 3. Economic Indicators, 2003-2007, Tajikistan	23
Table 4. Farm Structure in Tajikistan	29
Table 5. Sources and Quantities of Nitrogenous Fertiliser, 2007/8, Tajikistan.....	33
Table 6. Annual Crop Areas and Production Outline Estimates, 2008, Tajikistan.....	34
Table 7. Cereal Production Time Series, '000s tonnes, Tajikistan	35
Table 8. Cereal Balance, 2008, '000s tonnes, Tajikistan	36
Table 9. Wheat and Wheat Flour Imports, '000's tonnes.....	36
Table 10. Contribution of Produce by Sub-Sector, 2007, Tajikistan ...	37
Table 11. Wheat Prices, Tajikistan	42
Table 12. Wheat Flour Prices, Tajikistan	43
Table 13. Social Support, US\$, Tajikistan	49
Table 14. Economic Indicators, 2003-2007, Uzbekistan.....	53
Table 15. Farm Structure in Uzbekistan, 2008.....	56
Table 16. Annual Crop Areas and Production Outline Estimates, 2008, Uzbekistan.....	60
Table 17. Cereal Production Time Series, '000s tonnes, Uzbekistan...	60
Table 18. Cereal Balance, '000s tonnes, 2008, Uzbekistan.....	61
Table 19. Percentage Contribution of Produce by Farm Type, 2007, Uzbekistan.....	62
Table 20. Local Wheat to Wheat Flour Supply Chain, Uzbekistan	64
Table 21. Wheat Prices, Uzbekistan	66
Table 22. Wheat Flour (1st Grade) Prices, 2007/8, Uzbekistan	66
Table 23. Social Support, US\$, Uzbekistan	72
Table 24. Economic Indicators, 2003-2007, Kyrgyzstan.....	75
Table 25. Farm Structure in Kyrgyzstan	77
Table 26. Contribution to Agricultural Sector, Kyrgyzstan	80
Table 27. Annual Crop Areas and Production Outline Estimates, 2008, Kyrgyzstan.....	84
Table 28. Cereal Production Time Series, '000s tonnes, Kyrgyzstan ..	84
Table 29. Cereal Balance, 2008, '000s tonnes, Kyrgyzstan	85
Table 30. MoA Production Estimates, 2008, Kyrgyzstan.....	86
Table 31. Transport Charges, US\$/tonne, Kazakhstan to Kyrgyzstan.	90
Table 32. Wheat Prices, Kyrgyzstan	92
Table 33. Wheat Flour Prices, Kyrgyzstan	93
Table 34. Social Support, US\$, Kyrgyzstan	98
Table 35. Economic Indicators, 2003-2007, Kazakhstan	101
Table 36. Farm Structure (Approximate) in Kazakhstan.....	103
Table 37. Wheat Production Time Series, '000s tonnes, Kazakhstan	106

Table 38. Other Crops Production Time Series, '000s tonnes, Kazakhstan	106
Table 39. Wheat Areas, '000s ha, 2007-2008, Kazakhstan.....	110
Table 40. Annual Cereal Areas and Production Estimates, 2007-2008, Kazakhstan	111
Table 41. Cereal Production Time Series, '000s tonnes, Kazakhstan	112
Table 42. Cereal Balance, 2008, '000s tonnes, Kazakhstan	113
Table 43. Wheat and Wheat Flour Price, Kazakhstan	117
Table 44. Social Support, Kazakhstan	122
Table 45. GDPs per capita 2007	124
Table 46. Prioritised Concerns (March 2008)	124
Table 47. Average % Price Increases for 18 and 12 Months	128
Table 48. Wheat Stocks.....	130
Table 49. Wheat Vulnerability Index, Mission cVI. 2008/9.....	132
Table 50. Wheat Production and Wheat Equivalent Import/ Export Summary 2007 and 2008	146

LIST OF FIGURES

Figure 1. Relief Map of Central Asia	19
Figure 2. Road Map of Central Asia	20
Figure 3. Rail Map of Central Asia	21
Figure 4. Rainfall Patterns in Tajikistan	26
Figure 5. National Average Monthly Potato Prices, 2007-2008, Tajikistan.....	37
Figure 6. Sheep Meat Prices, 2007-2008, Tajikistan	39
Figure 7. Retail Commodity Prices by Market, Tajikistan	45
Figure 8. Retail Market Prices by Commodity, Tajikistan	46
Figure 9. EBRD Transition Indicators of Uzbekistan	52
Figure 10. Rainfall Patterns in Uzbekistan	54
Figure 11. Retail Commodity Prices by Market, Uzbekistan	69
Figure 12. Retail Market Prices by Commodity, Uzbekistan	70
Figure 13. Rainfall Patterns in Kyrgyzstan.....	78
Figure 14. Farm Gate Sheep Prices, 2007/2008, Kyrgyzstan	89
Figure 15. Farm Gate Wheat Prices (US\$/tonne), 2007-2008, Kyrgyzstan.....	92
Figure 16. Retail Commodity Prices by Market, Kyrgyzstan	95
Figure 17. Retail Market Prices by Commodity, Kyrgyzstan	96
Figure 18. Rainfall Patterns in Kazakhstan	104
Figure 19. Rainfall Zones in Kazakhstan	104
Figure 20. Retail Commodity Prices by Market, Kazakhstan.....	119
Figure 21. Retail Market Prices by Commodity, Kazakhstan.....	120
Figure 22. National Average Prices, by Commodity	127

GLOSSARY

ADB	Asian Development Bank
ADRA	Adventist Development and Relief Agency
AKF	Aga Khan Foundation
APU	Animal Production Unit
BASIS	Household Survey system
CA	Central Asia
CARE	NGO
CASE	Household Survey system
CARITAS	NGO
CERF	Central Emergency Response Fund
CFSAM	Crop and Food Supply Assessment Mission
CIS	Commonwealth of Independent States
CPI	Consumer Price Index
CSI	Committee for State Inspection
cVI	Comparative Vulnerability Index
DFID	Department for International Development
DM	Dry Matter
EBRD	European Bank for Reconstruction and Development
EFSA	Emergency Food Supply Assessment
ETOP	Emergency Transboundary Outbreak Pest
EU	European Union
FAO	Food and Agriculture Organisation
FCC	Food Contract Corporation
FOB	Freight on Board
GAIN	Global Alliance for Improved Nutrition
GDP	Gross Domestic Product
GI	Gini Index
GIEWS	Global Information and Early Warning System
GNI	Gross National Income
GoT	Government of Tajikistan
GTZ	<i>Gesellschaft für Technische Zusammenarbeit</i> - German development agency
hh	Household
IDP	Internally Displaced Persons
IMF	International Monetary Fund
JSC	Joint Stock Company
KAMIS	Kyrgyz Agriculture Market Information System
KGS	Kyrgyzstani Som
KZT	Kazakhstani Tenge
LIFFE	London International Financial and Futures Exchange
LRF	Land Redistribution Fund
LPO	Local Purchase Option (1 and 2)
LU	Livestock Units
MoA	Ministry of Agriculture
MoAW	Ministry of Agriculture and Water

MoE	Ministry of Economics
MoSAI	Ministry of Social Affairs and Immigration
MoLSP	Ministry of Labour and Social Protection
NATO	North Atlantic Treaty Organization
NGO	Non-Governmental Organisation
nsd	no significant difference
OCHA	Office for the Coordination of Humanitarian Affairs
ODI	Oversees Development Institute
ODC	Operations Department Cairo
PET	Pictorial Evaluation Tool
PHP	Private Household Plots
SCF	Save the Children Fund
SPIRU	Strategic Policy Impact and Research Unit
SSC	State Statistics Committee
TES	Training and Extension Service (Centres)
TJS	Tajikistani Somoni
ToR	Terms of Reference
UDM	Uzdonmaksulot
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Dev.
USDA	US Development Administration
UZS	Uzbekistani Som
VGF	Vulnerable Group Feeding
WB	World Bank
WFP	World Food Programme
WUAs	Water Users Associations

Acknowledgements

The production of this Report has been possible because of the unstinting support and cooperation received by the author from the staff of the WFP Country Office in Tajikistan; and the staff and consultants of the UNICEF Offices in Tashkent, Bishkek and Astana.

The access granted to offices and personnel in a wide variety of government departments and institutions, non-government organisations, UN and multi-lateral agencies in all the Republics visited provided the Mission with much needed data, opinion and advice for which the author is most grateful. The openness of some individuals in the commercial sector, who were not only willing to share their knowledge and experience with the Mission but were also willing to discuss practical details of their business added a further dimension to the information gathered.

The Mission also owes special debts of gratitude to all visit organisers and translators for their patience and tenacity; and to Nikolai, without who's driving, logistic and negotiating skills the contiguous journey through three states might never have been completed.

Finally, may I thank WFP Regional Office staff for their advice, support and comments on the Report. The foregoing notwithstanding, the views expressed in the Report are those of the Consultant, not the official views of WFP.

Ian Robinson
September 2008

Executive Summary

A field Mission to 4 Central Asian Republics was undertaken on behalf of WFP Regional Office, Cairo from June 22nd to August 3rd 2008, by a Consultant from AA International Ltd, UK. Activities included a briefing in Cairo by Regional WFP (March 2008); followed by contiguous field visits to Tajikistan, Uzbekistan, Kyrgyzstan and Kazakhstan. The purpose of the Mission was to conduct a Regional Market Survey following general Terms of Reference, which were prioritised, after the briefing in Cairo, to a final checklist of concerns to be addressed. As WFP is only operational in Tajikistan, the Mission was hosted by UNICEF in the other three countries

The approach adopted included a) detailed discussions using a basic but flexible checklist with 100+ key informants comprising market traders, wholesalers, millers, importers, farmers, farmers' association leaders, mayors, officials from Ministries of Economics, Agriculture, Social Affairs/ Protection and Labour, National Statistics Agencies, National Banks, Credit Agencies and NGOs, World Bank, USDA, UNICEF, UNDP, FAO and WFP staff; b) collection and review of reports collated by the Mission; c) downloading of official statistics from official websites, press releases and summaries of international grain boards' reviews d) acquisition of price data from market information services e) driving transects and farm/ pastoralist-livestock unit-field visits including crop sample taking and weighing.

The findings of the Mission identify Kazakhstan as the current, sub-Regional, resources and trade super-power with an economy that dwarfs the remaining states and with burgeoning trade partnerships that are equally strong with the Russian Federation and the West while harbouring clear intentions of expanding trade in energy and grain with China. Of the other three states, Uzbekistan and Tajikistan have sustained a 7% GDP growth for the past 3 years and Kyrgyzstan, following a year of recession and a year of 2% growth in the 2 previous years, posted an 8% GDP growth in 2007. However, whereas Uzbekistan has had an identified fiscal surplus for the past 5 years, Tajikistan and Kyrgyzstan are in fiscal deficit i.e. situations which restrict their opportunities for increased state investments and budgetary supplementary adjustments to relieve economic hardships.

Regarding food security, three of the four countries- Uzbekistan, Kyrgyzstan and Tajikistan have high cereal import requirements. Kazakhstan exports cereals but imports fruit, vegetables and potatoes from neighbours. Considering wheat to be by far the most important staple in the sub-Region, the Mission constructed a national vulnerability index *cVI*, linking wheat import requirements with GDPs and population sizes. The index, in which the highest score indicates the greatest vulnerability, was calculated for each Republic with the following results- Kazakhstan as a wheat exporter has a "0" score, Uzbekistan scores "65", Kyrgyzstan "145" and Tajikistan "204" placing the latter in the most vulnerable position. Although, according to Mission calculations, Uzbekistan is by far the greatest importer of wheat and flour needing an estimated 1.2 million tonnes of wheat equivalents in 2008/9 compared to 752,000 t for Tajikistan and 515,000 t for Kyrgyzstan, Tajikistan is the most vulnerable to price increases. At the same time, Tajikistan has virtually no strategic stocks of wheat or flour with only 10,000 t in reserve stocks compared to Kyrgyzstan's reserves noted at 132,000 t and Uzbekistan's stocks noted at 700,000 t. Given the global wheat price hikes of the past year and the propensity for export bans and export tax levies in what is proving to be an uncertain and administratively burdensome trading environment in the sub-Region, the Mission feels that the vulnerability of Tajikistan should be reduced and that WFP Regional Office has a role in this regard.

The 2008 import figures are based on Mission cereal production estimates for the coming harvest, which, due to a combination of various promotional packages, no significant pest losses, increased fertiliser use and irrigation patterns not dissimilar to last year, are expected to be similar to 2007 in each country. The Mission estimates that increased area of winter wheat in the irrigated sector in Uzbekistan, Kyrgyzstan and Tajikistan and increased spring wheat planting in the rainfed sector in the northern oblasts in Kazakhstan makes up for any yield per unit area loss that may have occurred due to unfavourable climatic conditions during

winter. Other food crops are noted to have also increased in area planted and are expected to return a slightly improved harvest compared to 2007.

All countries have experienced rapid food price increases for all commodities, except sugar. Average national price increases from January 2007 to July 2008 (18 months) and from July 2007 to July 2008 (12 months) for 1st grade wheat flour, vegetable oil, meat, sugar, diesel fuel and wage labour price calculated by the Mission from regression equations are tabulated below. In the table, the higher percentage increases over 18 months connect to low initial starting prices.

Commodity	Kazakh.		Uzbek.		Kyrgyz.		Tajik.	
	18m	12m	18m	12m	18m	12m	18m	12m
Wage Labour	23%	14%	n/a	194% ¹	83%	42%	63%	34%
Wheat Flour	238%	85%	n/a	83%	184%	74%	148%	64%
Meat	19%	12%	n/a	65%	37%	22%	53%	30%
Veg/Sunflower Oil	187%	75%	n/a	135%	229%	84%	286%	94%
Sugar	18%	11%	n/a	93%	2%	2%	5%	3%
Diesel	74%	39%	n/a	12%	80%	42%	69%	41%

¹Tashkent, Mission data 1 market sample only.

Mission analyses on the price data collected using T-tests and the determination of correlation coefficients show:-

- High levels of **market integration** (C's >0.95;T- nsd) of wheat flour *between all countries*;
- High levels of **market integration** (C's >0.90;T-nsd) for vegetable oil between all countries *except Uzbekistan*;
- High levels of **market integration** were identified for wheat flour (C's >0.90;T-nsd) and for vegetable oil (C's>0.90;T-nsd) *within* all countries except in *Tajikistan*, where Khorog market prices were consistently different, presumably due to Khorog's location on the Afghan border;
- Diesel price increases displayed partial integration between countries with price increases in Kazakhstan highly correlated (C's >0.9) with each of the other countries suggesting **market integration**;
- Sheep meat prices in Tajikistan and Kyrgyzstan have a high (C >0.9) correlation coefficients suggesting **market integration**;
- No close relationships were found regarding the increases in wage labour rates between or within countries;

Food price increases have prompted all governments to increase significantly pensions, allowances, supplementary benefits and salaries in a series of steps during 2007 and 2008. At the same time, the approaches to levying import and export duties and other taxes differ from country to country but are rooted in measures considered to be in the best interests of each country *at the time* in each case.

- All import taxes have been removed on wheat in Kyrgyzstan and Tajikistan, but retained in Uzbekistan at 5%.
- VAT is levied on imported wheat in Tajikistan and on non-UDM mills in Uzbekistan, but is not levied in Kyrgyzstan.
- Import tax of 30% is levied on flour in Uzbekistan but not in Kyrgyzstan or Tajikistan.
- VAT on flour is 10% in Kyrgyzstan, 13% in Kazakhstan but 20% in Uzbekistan and Tajikistan where debate continues regarding its removal.

Although there are differences in average flour price over the 18 months studied, the differences are not statistically significant, (Uzbek quota flour, c.50% below market price is not included). This result suggests that as the *FOB* price of flour in Kazakhstan is similar for all countries, where VAT has been lowered *i.e.* Kyrgyzstan, other factors are pushing the price up.

The non-standard nature of a loaf of bread caused the Mission to use 1st grade wheat flour as the price comparator for the main staple. Mission calculations based on the traditional cost component ratios of a standard leavened loaf suggest that, across the 4 countries, the 50% of

the cost of the loaf that is due to flour (a) may be expected to increase by 64% to 85% in the past 12 months. The remaining 50% of the cost (b) connect to labour and diesel (energy) costs with increases ranging from 14%-42% (194% UZ- Tashkent 1 sample only is excluded) and 12%-42% respectively. With a 30:20 emphasis on labour, component (b) may be expected to rise by an average 30%. Combining (a) and (b) suggests overall wholesale cost increases of a standard loaf to be in the order of 62% (Taj), 67% (Kyr), 72% (Uzb- non quota) and 73% (Kaz) without profit taking, to which must be added retails costs and profit taking. Mission data on the retail price of bread, not used for analysis because of the extreme variability of the product, suggests that *doubling the price* of a standard loaf over the 12 month period has been a normal response.

Regarding market data generally, WFP-collected information is available only in Tajikistan. Food-security related market data are normally available from official sources in each Republic in a cleaned and summarised form. Original collections of monthly average prices of indicator commodities were obtained by the Mission from KAMIS (Kyrgyzstan), KazAgroMarketing (Kazakhstan) but no such sources were found in Uzbekistan, which meant that, in the absence of official data, prices were compiled from Mission market visits and extracts of articles/ journals.

The Mission suggests that WFP Regional Office's need for regular, accurate reports on the markets from independent sources should be translated into long-term contracts for KAMIS and KazAgroMarketing with an option for them to extend activities into Uzbekistan. The former may also have a role to play in monitoring the *actual* movement and ease of movement (varying policies-bans, taxes; procedures- up to 60 instruments noted and delays up to 104 days; costs- up to US\$ 4500 per shipment), both formal and informal, between importing and exporting countries in the cluster.

Regarding agricultural data, Mission transects and farm visits suggest that with the exception of the large-scale, rainfed farming enterprises in Kazakhstan with some farm companies reaching 1 million ha and applying very modern management practices, production is generally underestimated as i) for large farms; National Statistics Committee agricultural data rely on self-completed forms, which are also used for tax purposes and ii) for small farms; data from sampled farmer interviews are also used for tax purposes. In the latter case, once samples are correctly identified, because of a lack of equipment and training, the National Statistics Committees' official numerators methods lack the required objective assessment and measurement. It seems too that the *baggage* of analysts used to agricultural yields of the Soviet era not the yields of the highly-productive, sustainable systems now used by smallholders that presently make up the post- privatisation agricultural sector in each Republic, means that low yields reported in survey interviews are accepted.

Further, iii) *Ad hoc* rapid assessments by emergency task forces and mission teams rely on *hearsay* from focus group meetings or returns from post-event (harvest) household interviews when dealing with the agricultural sector. No emergency assessments of agriculture/ livestock production exhibit the rigour and the objective-measurement-based methodologies used by WHO/UNICEF in the Health and Education sectors. It is very necessary to establish the recognition of the importance of accurate and objective information retrieval relating to the Agricultural and Livestock sector. These should involve, transect-based objective field observations using standard procedures through all agro- eco zones; and at sample household level, area measurement, crop sampling and weighing. When necessary, repeat observations of field conditions should be made with a view to establishing realistic benchmarks for all farming/ pastoralist systems. Only then will it be possible to make meaningful evaluation regarding variations from year- to- year of key indicators such as yields of crops and births and deaths of livestock.

Summarising roles for WFP, the Mission suggests-

- Extending current operations in Tajikistan into Kyrgyzstan;
- Continuing and extending WFP market monitoring in Tajikistan to include farm gate prices and presentations for sale (crops and livestock).

- Contracting KAMIS to provide monthly market and farm gate prices and presentations for sale in Kyrgyzstan
- Contracting KazAgroMarketing to provide monthly market and farm gate prices and presentations for sale in Kazakhstan.
- Establishing market monitoring procedures in Uzbekistan (explore roles for KAMIS or UNICEF).
- Establishing a means of regularly monitoring international movement/ ease of movement/ and cost of movement of food commodities between countries in the cluster using the services of KAMIS and KazAgroMarketing or similar agencies.
- Developing and establishing objective crop and food supply assessment methodologies as standard operating procedures throughout the sub-Region;
- Reducing national vulnerability of Tajikistan to global wheat price hikes and export restrictions by supporting the establishment of strategic reserves using
 - LPO 1 contract growing of wheat by rainfed farmers in northern Kazakhstan for specific export to Tajikistan to WFP managed strategic stocks for use in Tajikistan;
- Stimulating local economies through support to small farmers/ communities in Tajikistan and Kyrgyzstan;
- Enhancing food security in vulnerable urban communities by improving supply of and access to local products in urban areas. The Mission connects these two suggestions to
 - LPO 2 in Tajikistan and Kyrgyzstan, contract growing of field crops, vegetables and fruits-connecting to the formation and support of a) smallholder producer pre-cooperatives (rural) and b) urban- based or remote village based, vulnerable group, consumer pre-cooperatives; and c) brokering commercial activities between the two groups;
 - Following the example from Kazakhstan and investigating/ promoting crop (and animal) insurance to safeguard individual and group investments at peasant farm and household plot levels.

When combined with the incredibly burdensome procedures of importing and exporting in each independent republic in the sub-Region, the protectionist measures applied by each country create formidable barriers to trade that are allegedly overcome easily by influential high-level connections and or bribes. WFP is in a position to compare these practices with good practice elsewhere and expose the undesirable nature of their presence with regard to all round food security improvement.

The emergence of a *regional interest* (Russian Federation, Ukraine and Kazakhstan and perhaps others), noted by the Mission, in establishing a forum for grain producing and exporting countries provides considerable food for thought. Such a forum might offer a platform for WFP Regional Office to discuss issues such as the ease of movement of food supplies and the continuity of supply of cereals to grain dependent states in the region. With regard to the latter, the Mission urges WFP Regional Office to invite WFP HQ to consider ways and means of legally requiring grain-exporting nations to maintain minimum flows of grain to wheat deficit neighbours, perhaps in a manner similar to water-resource release agreements between neighbouring countries in the same water basin.

1. Introduction

1.1 Background

The interdependence of the twelve CIS states (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan), as discussed in the earlier report in this series relating to the Caucasus Republics¹, was such that the break-up of the Soviet Union in 1991 heralded an economic, fiscal and social collapse of enormous proportions.

The local effects of the disintegration are well-catalogued featuring the shattering of industrial infrastructure, an immediate and protracted fall in GDPs, cessation in domestic investments, hyper-inflation, rampant unemployment, civil unrest, internal displacement and migration. At the same time the erosion of the USSR infrastructure of social welfare that had provided health care, education, pensions and food security meant that, *inter alia*, safety nets for the vulnerable disappeared almost overnight, leaving the various populations to their own devices². Similar effects resulting in the decline and fall of the organisation and management of the state organs of agricultural production, which with the severing of interdependence resulting from the inter-state coupling of raw material production on the one hand and food processing on the other hand, resulted in severe reductions in areas planted and in sizes of breeding-herds/ flocks with concomitant falls in production of up to 80%. By the same token, the demise of the mega –units pushed to prominence an acceptance of the importance of the household plots and the small peasant farm that form the backbone of current production systems today³.

Although somewhat out of phase with each other and at varying degrees of severity, three sequential conditions, namely economic decline, bottoming out, and recovery are discernable in each of the CIS republics from 1991 to 2007⁴. Cutting across these phases has been the simultaneous reduction in the controlling influence of government in most of the republics, with a concomitant emergence of oligarchs and monopolies in almost all areas of human endeavour.

¹ Robinson W.I. (2008) Regional Market Survey, WFP Cairo

² The role of the home-gardens (*dacha* gardens) was extremely important with regards to food security during such times and remains so today in all republics.

³ Now dominate production systems except for field crops in Kazakhstan.

⁴ Robson, M. (2006) Estimating Russia's Impact on the Economic Performance of the Commonwealth of Independent States since 1991: The ESAU Working Paper 16, ODI, London.

The Central Asian Republics of Tajikistan, Uzbekistan, Kyrgyzstan and Kazakhstan, one third of the CIS countries and the subjects of this review, were not all exempt from these experiences. In this regard events in Tajikistan present the worst case in the sub-Region with unrest, civil strife and finally civil war resulting in 100,000 deaths and 1,000,000 IDPs/ refugees⁵ from 1992-1997; conditions that prompted *inter alia* WFP interventions that continue until today in the form of targeted food aid programmes, regular situation analyses and price change monitoring. There are no WFP Country Offices, nor WFP programmes in the other three Central Asian countries included in this Mission.

Elsewhere in the cluster, although much less unrest is noted, the effects of the removal of the Soviet Union's

- fiscal mortar of internal trade in raw materials and commodities
- unified transport systems
- integrated government fund transfers,

which had not only held the disparate and, to a certain extent, antagonistic nation states together, but had also provided the means and way of living for their populations, was devastating for the first 5 or 6 years post independence.

Economic growth, albeit from base-line GDPs way below those enjoyed pre-1991, began throughout the cluster of republics after 1997. GDPs increased regularly at annual growth rates ranging from 5-10%; however, even now, in 2008, only Kazakhstan falls in the middle (upper) bracket in the World Bank classification scheme of national incomes, with the other three republics, Uzbekistan, Kyrgyzstan and Tajikistan being classified in the lower orders of low income countries.

In keeping with CIS republics reviewed earlier⁶, and the previous paragraph notwithstanding, UNDP Gini indices (2007) for income inequality shown in Table 1 suggest less inequality in all four Central Asian republics than in the comparator countries of Egypt, Russian Federation, UK or the USA⁷.

Food consumption Gini indices⁸, on the other hand, are higher than in Egypt, Russian Federation, UK and the USA suggesting greater food consumption inequality in the Central Asian sub-Region. However

⁵ Bellmon Amendment Requirement (2008) CARE, Tajikistan

⁶ Robinson, W. I. (2008) *op cit*

⁷ Higher value denotes higher levels of inequality

⁸ Only available for 2004.

given the non-inclusion of the value of production from home gardens (*dehkan* plots or *korajai*) in most sets of national statistics, food access of the rural poor may very well be underestimated.

In consideration of Regional WFP's mandate for *inter alia* the Central Asian sub-Region, WFP's programme activities in Tajikistan and in view of the more recent concerns regarding both global and sub-regional challenges caused by cost of living increases, a Regional Market Survey Mission was organised to analyse the development and dynamics of food markets throughout the Region. This report presents the findings of the Central Asian component of the Mission implemented in June - August 2008.

Table 1. Gini Indices for Mission Countries, Egypt, UK, USA and the Russian Federation

	Egypt	UK	USA	Russ Fed	Kazakh	Tajik	Kyrgyz	Uzbek
2007 GI Income¹	0.344	0.360	0.400	0.399	0.30	0.32	0.30	0.27
2004 GI Income²	0.340	0.360	0.410	0.310	n/a	0.33	0.35	0.27
2004 GI Food Consmp²	0.160	0.120	0.130	0.160	n/a	0.19	0.17	0.17

¹ UNDP 2007; ² FAOSTAT, 2004

1.2 Mission Structure

The Mission, undertaken from June 21st to August 2nd 2008, included

- an initial four-day briefing in Cairo by Regional WFP⁹;
- contiguous field visits to
 - Tajikistan (Dushanbe, Panjakent, Hisor),
 - Uzbekistan (Samarkand, Chinoz, Tashkent, Yangiyul),
 - Kyrgyzstan (Bishkek, Osh, Uzgen, Arevan),
 - Kazakhstan (Shymkent, Almaty, Balkash, Karagandy, Astana, Makinsk).

The methods used by the Consultant¹⁰ were:

a) Detailed discussions, using a basic but flexible checklist, with some 100 key informants comprising variously, according to availability, market traders, wholesalers, millers, importers, farmers, presidents of

⁹ This briefing was held in Cairo before the Caucasus Mission in March 2008.

¹⁰ W. Ian Robinson, BSc, PhD; AA International Ltd, Aberystwyth, UK

grain/ millers'/ farmers' associations, mayors, officials from Ministries of Agriculture, Social Affairs and Labour, National Statistics Agencies, National Banks, Credit Agencies and NGOs (Winrock Int. Mercy Corps, CARE Int; ADRA; CARITAS), World Bank, Helvetas, USDA, UNDP, FAO and WFP staff.

b) Collection and review of reports collated by the Mission.

c) Downloading of official statistics from official websites.

d) Driving transects- all journeys made in the rural area were considered transects and *all* fields- crops, livestock, pasture and water points along the transects were scored according to type and condition using previously determined criteria¹¹. In such a way c. 7,000 km were assessed during the Mission.

At the initial briefing in Cairo, the original Terms of Reference (ToRs), included in Annex 1, were prioritised and priority concerns identified. These are reproduced below in Table 2 and reappear again as the basis for the Mission conclusions.

Table 2. Prioritised Concerns (March 2008)

<ul style="list-style-type: none">• Baseline data on food price increases• In-country food stocks & availability for emergencies• Government policy measures related to food price increases (export quotas/taxes – internal price controls, increase in subsidies etc.)• Government safety nets.• Organisations involved in collecting information on food prices/food security/social situation.• Impact of price increases/production shortages/government policies on the vulnerable segments of the population.• Opportunities for local purchase for WFP.• Market indicators to monitor.

Information obtained from key informant interviews was entered into a database, disaggregated by source and, loosely, by the relevant sub-sector of food security (policy, farming, markets, mills). These data were then triangulated with the sets of secondary data collected or downloaded and analysed to provide the descriptions, findings and conclusions reported below. A list of visits made is included in Annex 2.

¹¹ FAO (2008) CFSAM Field Manual (Agriculture Section), GIEWS, FAO, Rome.

2. The Central Asian Republics

2.1 Communications

The Central Asian Republics comprise five independent nation states, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan with a population of some 60 million people. As their collective name implies, the five republics are located at the centre of the Eurasian continent bordered by the Russian Federation to the north, China to the east and Afghanistan and Iran to the south. Although universally described as *land-locked*, two of the states, Kazakhstan and Turkmenistan, border the Caspian Sea, however, all the republics may be considered double or triple *land-locked* if access to the world's oceans is considered as the criterion. Although within the cluster, Turkmenistan is not included in this review.

Officially, land-based communication between countries is restricted because of mountain ranges, the limited nature of the road and rail routes established by the USSR during the Soviet period of industrial development, and of unresolved boundary disputes, consequently:-

- Kazakhstan serves as a transit country between Kyrgyzstan, Tajikistan and Uzbekistan on the one hand and the Russian Federation and the Caucasus on the other.
- Kyrgyzstan and Tajikistan serve as transit countries between Uzbekistan and the People's Republic of China; and now, since the opening of a new bridge to the south of Tajikistan, between China and Afghanistan.
- Uzbekistan serves as a transit country between Kazakhstan and Afghanistan and onwards to Iran; and between Tajikistan and the Russian Federation via Kazakhstan.

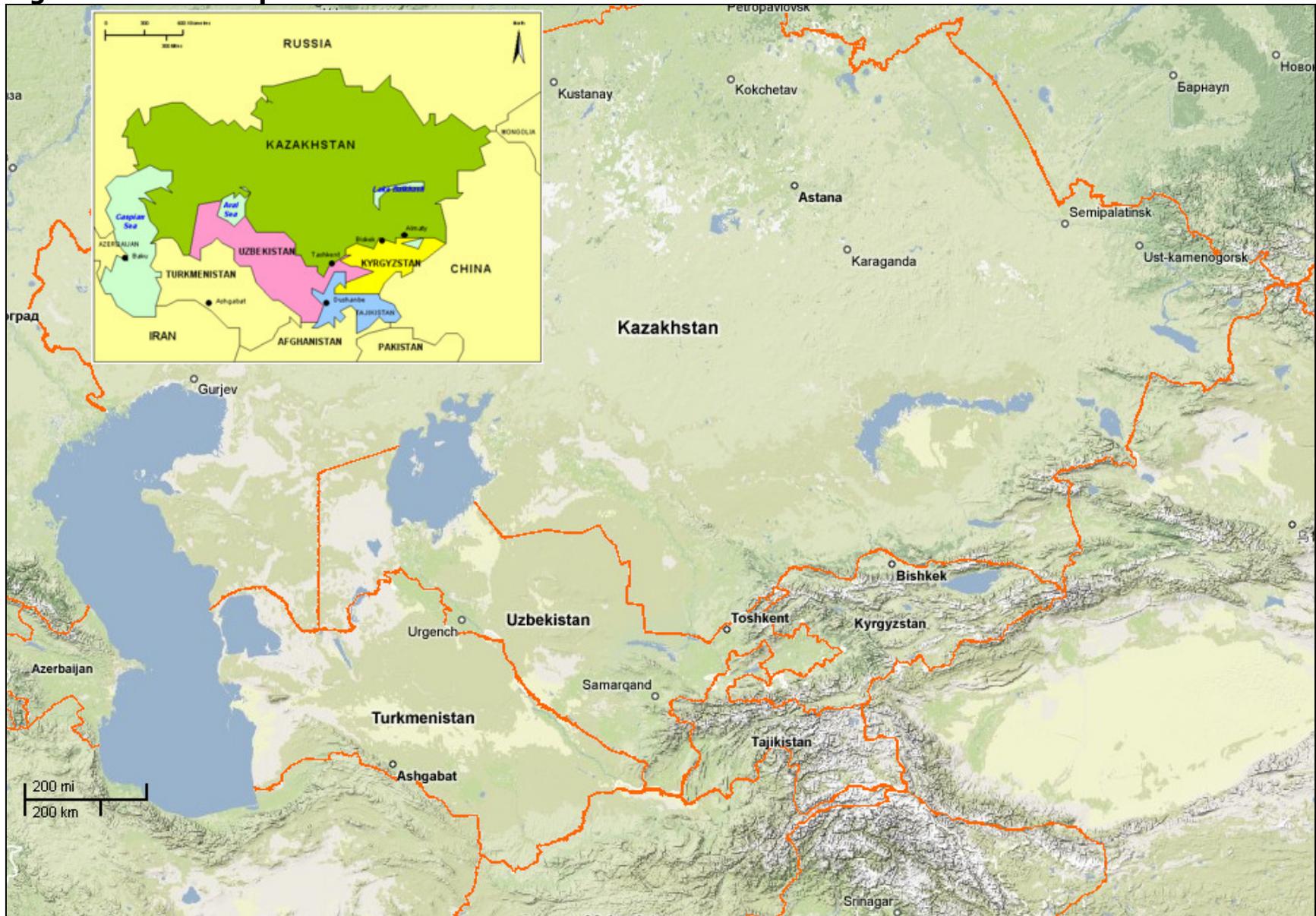
The comparative sizes and juxtapositions of the republics are shown in Figure 1 and the official routes¹² for all commodities are described in Figures 2 and 3.

Unofficial supply chains exist and allegedly thrive between the depopulated mountain fastnesses affording access, where price differences are attractive enough, for the movement of every-day commodities including flour and fertiliser; and for the illegal trafficking of women, children, labour and drugs, much to the grave concern of international authorities.

¹² Do not include *informal* crossing points

In the past 10 years, diverging development styles have evolved resulting from a) diametrically opposed approaches to the interpretation and maintenance of political legacies and allegiances and b) extreme differences in natural resource assets. Consequently, in the past few years, a new order within the cluster has been established. Regarding food (grain) security at least, if not yet energy, Kazakh hegemony over the area is being created given that they are not only the sole net exporter of wheat and wheat flour within the group but are also more favourably positioned than any regional competitor (Russian Federation, Ukraine) to meet all the cereal deficits of all other states.

Figure 1. Relief Map of Central Asia



Adapted from: <http://maps.google.co.uk/maps?hl=en&tab=wl>

Figure 2. Road Map of Central Asia



Adapted from: <http://maps.google.co.uk/maps?rls=ig&hl=en&tab=wl>
http://www.unescap.org/ttdw/common/TIS/TAR/images/tarmap_latest.jpg

The international standard roads in Figure 2, mirror, to a great extent, the railway lines shown in Figure 3. Both were established during the Soviet era to link capitals to capitals and, for the railway, to the ports on the Caspian Sea. The routes traverse transit states if such routes were the routes of least resistance *i.e.* the easiest and cheapest to construct. The lack of direct routes between Bishkek and Tashkent and Bishkek and Dushanbe because of the physical barriers of the mountain ranges didn't particularly matter at a time when all states were part of the same country. Nowadays, the need for all trade to pass through frontiers and customs of a third country, to arrive at destinations of choice, is even at the best of times, a serious inconvenience for any nation depending on imports. At the worst of times, the dependency on international good-will carries the possibility of increased transport charges linked to transit charge and even economic blockades.

3. Market Situation Assessments

3.1 Tajikistan

3.1.1 General

Located in Central Asia between Uzbekistan (west and north); Kyrgyzstan (north); China (east) and Afghanistan (south), Tajikistan with a population of around 7.2 million people in c. 1,000,000 households (hh) has existed as an independent republic for the past 17 years. Some 73% of the population is estimated to live in rural areas¹³, most communities being concentrated in the irrigated valleys connected to subsistence- plus agricultural systems.

The initial five years of independence (1992-1997) were fraught with internal problems culminating in civil war which resulted in 100,000 deaths and a million IDPs. At the same time, the widespread collapse of the Soviet industrial network, social support mechanisms and the value of the currency caused the start of the economic migration of a substantial proportion of the labour force estimated, in 2008, to involve around 1,000,000 people, most of who work in the Russian Federation.

The progress of transition from the Soviet command economy to a market economy is considered to have been "steady" since 1997 but unsatisfactory in its achievements to date. In 2005, the World Bank¹⁴ determined that 64% of the population were living below a poverty line established at 2 dollars per day and 18% exist on less than a dollar a day.

In the same year, a WFP study¹⁵ determined that 10% of the rural population (500,000 people) were chronically food insecure. A more recent analysis (EFSA 2008) found that in the rural population, 11% were severely and 23% were moderately food insecure. In the urban population 15% and 22% were found to be severely and moderately food insecure respectively. This translates to 800,000 severely and 1.4 million moderately food insecure people. A situation update by the UN¹⁶ in February 2008 identifies 550,000 people as being seriously affected and, of these 260,000 people are placed in need of emergency assistance.

¹³ Bellmon Analysis Amendment Requirement, 2006

¹⁴ World Bank (2005) Poverty Study.

¹⁵ WFP (2005) Country Situation Report, Dushanbe, Tajikistan.

¹⁶ Food Security Sector Cluster, (2008) Report on Food Security Emergency in Tajikistan, Dushanbe (EFSA, 2008 is updated version.)

3.1.2 Macro-Economy

A closer look at the macro-economics through key informant interviews, reviews of several recent analyses and announcements relating to the macro-economy of Tajikistan was undertaken by the Mission¹⁷. The conclusions reached regarding the earlier years, confirm the extent of a mega-economic and fiscal collapse which saw GDP fall by up to 10 fold, depending on observer, to less than US\$ 250 per capita per annum by 1997; followed by an enduring recovery with GDP growth rates achieving double figures in 2003 and averaging 7-8% per year for the past 10 years to reach US\$ 490¹⁸ per capita per annum in real dollar terms by 2008. The GDP growth must be off-set against inflation in 2007, variously estimated at 13.1% by the ADB (see Table 3); at 20.9% by the IMF and at 21.5% by the Interstate Statistical Committee of the CIS. A brief time series of macro-economic indicators from the ADB analysis is provided in Table 3.

Table 3. Economic Indicators, 2003-2007, Tajikistan

Economic Indicator	2003	2004	2005	2006	2007
Per capita GNI (\$)	210	280	330	390	423 ¹⁵
GDP growth (% change per year)	10.2	10.6	6.7	7.0	7.8
CPI (% change per year)	16.4	7.2	7.3	10.1	13.1
Unemployment rate (%)	2.4	2.0	2.0	2.3	2.6
Fiscal balance (% of GDP)	-1.7	-2.4	-2.9	1.7	-6.4
Export growth (% change per year)	29.6	21.0	-68.5	1.2	9.4
Import growth (% change per year)	24.6	20.2	-21.5	38.0	39.2
Current account (% of GDP)	-1.3	-4.0	-2.5	-2.5	-15.2
External debt (% of GNI)	78.7	49.6	46.2	42.5	n/a

CPI = consumer price index, GDP = gross domestic product, GNI = gross national income

Sources: ADB 2008. *Asian Development Outlook*. Manila

World Bank. 2008. Global Development Finance Online

World Bank. 2008. World Development Indicators Online

However, despite the steady economic improvements, in the UNDP Human Development Report 2006, Tajikistan's Human Development Index is still ranked 122 (in the "Medium" countries ranking) out of 177 countries exhibiting slight progress since 1995 but still below the value achieved from 1985 to 1990. Tajikistan is in a similarly ranked

¹⁷ ADB (2008) Factsheet for Tajikistan, ADB, Manila; State Committee for Statistics (2008) Information Bulletin: Food Security and Poverty, Dushanbe; UNDP (2007) Communities Programme, Dushanbe; CIA (2008) Factbook for Tajikistan.

¹⁸ Mission calculated, but estimates collected by the Mission vary from US\$ 423 (UNDP) to US\$ 508 (NBT).

position in the World Bank Wealth Ranking table, at 40th from bottom with a score of US\$ 8,500 wealth per capita¹⁹.

The negative fiscal balance²⁰ noted by the ADB in Table 3 at -6.4% GDP is now considered by the IMF to have been positive at +1.5% GDP. However, aiming for a balanced budget in 2008 is said to require a limit of 9% on the Public Investment Programme²¹, which will still accommodate support to the cotton sector and support to winter vulnerable communities. However, a high current account deficit and gross official reserves at less than the coverage of one month's imports would seem to reduce substantially the GoT's options regarding subsidies or tariff/ tax reductions to tackle contemporary food and energy price increases.

Given the macro-economic indicator estimates noted above and a low level of financial reserves, stringent changes to the administration, practices and reporting of The National Bank have been proposed by the IMF and accepted by the Government in recent months²². Similar adjustments are being initiated in the financial management of state enterprises and institutions.

The contributions to GDP by sector in 2007 are noted as services 45.6%, industry 30.4% and agriculture 23.6%, with exports connecting to aluminium 60%, cotton 30% and hydro-electricity, of which 25% of the output is exported²³.

Regarding the industrial and energy sectors, problems with the electricity supply during the exceptionally cold winter earlier this year reduced the operating capacity of light industry in the first half of 2008 initially causing GDP growth rate forecasts for the current year to fall to 5%, however, a resurgence of activity in early summer in the northern factories²⁴ suggests that growth may be sustained at around 7-8%. The recent completion of Sangtuda 1 dam for hydro-electric

¹⁹ Compare- Kyrgyzstan 56th from bottom US\$ 14,000; Uzbekistan 60th from bottom US\$ 15,000; Turkmenistan 84th from bottom US\$ 29,000; Kazakhstan 92nd from bottom US\$ 32,000 (all middle-wealth ranked)

²⁰ Negative fiscal balance is when budget spend exceeds income. During IMF reviews the recalculated balance was slightly positive.

²¹ IMF (2008) Letter of Intent; Memorandum of Economic and Financial Policies; Memorandum of Understanding, Washington, USA

²² Ysupov, D. (2008) Personal Communication, National Bank of Tajikistan, Dushanbe.

²³ Key informants alleged increased exports this winter, reduced local availability later in year.

²⁴ Saliev, F. (2008) Personal Communication, Min of Econ. Dev., Dushanbe

power is expected to boost the electric supply and the economy and may offer some respite for such problems. In addition, in the longer term, if construction of the Rogon Dam on the River Vaksh, which was started in 1976 but has been on hold since 1991, is restarted, output could double, thus capitalising more fully on Tajikistan's main asset, water resources from the Pamir Mountains. However, as the dam was conceived and started during Soviet times, as part of a comprehensive plan of water use for both energy provision and irrigation of agricultural lands down-stream throughout the region, any changes to river flows are likely to become subjects of a great deal of international concern and debate but could provide an important bargaining chip when considering energy exchange within the region²⁵.

Notwithstanding the official figure of 5.2% and ADB's 2.1% (Table 3), real unemployment is reported regularly to be in the order of 60% but perhaps this may be more accurately described as *non-employment* as the "unemployed" make significant contributions to the household food economies through what is most clearly a thriving subsistence and near subsistence agricultural sub-sector connected to the long-term home-gardens. These gardens were responsible for rural survival during the years of *1000+% hyper-inflation* post-1992 and the following half-decade of strife. These, and the more recent "President's Plots", previously unprivatised land allocated to some 700,000 families, both rural and urban, in 2005, provide opportunities for gainful endeavours in all rural communities. Such work is ignored in the usual livelihoods analyses based on cash-income contributions and, therefore, may cause rural standards of living to be underestimated. However, transactions connected to such work form part of the barter based informal economy reviewed by Olimov (2007)²⁶ and estimated to be equivalent to c. 60 % of the formal GDP comprising 33% from tax avoidance; 14.7% from home produced/consumed goods and 13.2% from barter and wages in kind.

By the same token, the remittances resulting from the worker migrations that began in 1992, the value of which may really only be guessed at but is likely to be in excess of US\$ 1.7 billion per annum²⁷ from 1,000,000 workers each sending back c. US\$ 1,700 per annum, would also appear to be ignored in the macro-indicators such as

²⁵ Linn, J. (2008) Water-Energy Links in Central Asia: A long-Term Opportunity and Challenge, Brookings Institution, <www.brookings.edu>

²⁶ Olimov, J. (2007) Informal Economy in Tajikistan, UNDP, Dushanbe.

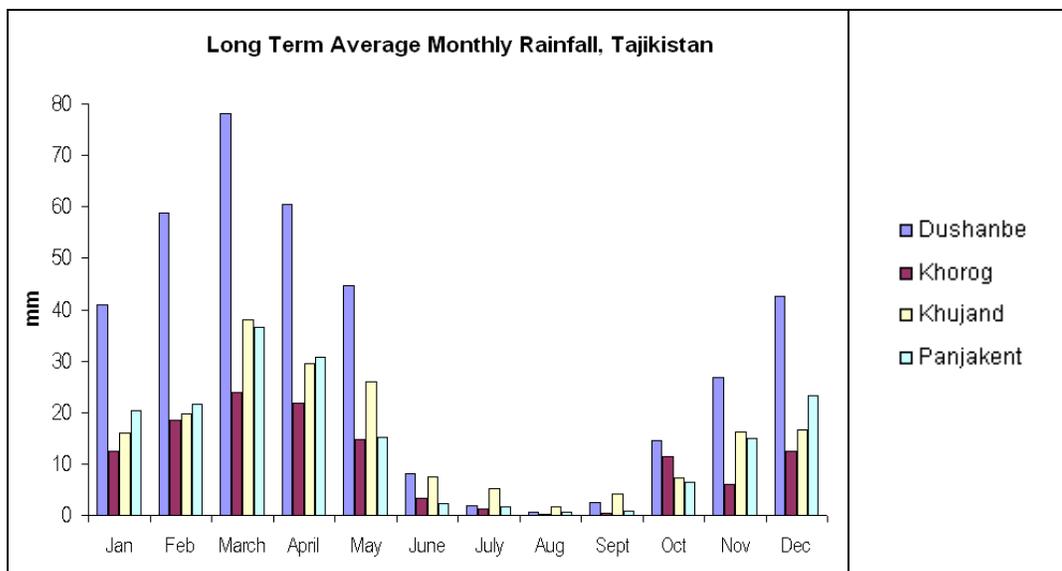
²⁷ Ysupov, D. (2008) Personal communication Nat Bank, Dushanbe; increased from US\$ 1.0 billion in 2006 quoted by Beuter, T. (2007) Tajikistan Market Profile, WFP, Cairo.

estimates of GNI quoted in Table 3. Adding the two seemingly unheralded contributions to annual national income lifts the GNI revised by the Mission to US\$ 600 per annum.

3.1.3 Agricultural Sector

Agriculture is one of the most important sectors of the economy: share of agricultural production in GDP made up 23.6% in 2007 and 30% of official exports and employed about 67% of the economically active population. The importance of agriculture belies the comparatively small area of arable land at 7% (c. 1,000,000 ha) of the total area of which 68% is dependent on irrigation to provide a harvestable crop²⁸. This figure compares to 85% reported by Beuter (2007)²⁹. Figure 4 presents long-term average monthly rainfall data from four different areas of the country and clearly shows the virtual absence of rain from June until November, indicating the high level of dependency of crop production on irrigation and the importance of good water management. Snowmelt may also provide substantial quantities of moisture to support growth in the rainfed sectors in years of heavy snow fall.

Figure 4. Rainfall Patterns in Tajikistan



Presently, the republic has abundant surface water resources to sustain a core crop-producing area of some 700,000 ha where

²⁸ FAO Stat (2004); Rustamov, M. (2008) Personal Communication, UNDP

²⁹ Beuter, T. (2007) Tajikistan Market Profile, WFP Cairo

irrigation systems are functioning, albeit below previous levels of efficiency. Despite the needs for improvements in maintenance and efficiency of use, it is anticipated that the systems allow a further 100,000 ha³⁰ of second cropping in summer. Mission observations from transects driven suggest that much of this will be grain maize this year.

Since the times of the USSR, cotton has been considered the most important crop accounting for 75-90% of agricultural exports depending on the year, and, therefore, purchased centrally and subject to mandatory growing quotas by district. Whereas state procurement for other crops and commodities was dismantled from 1997 onwards, state control over the cotton crop was sustained. However, in 2007, area quotas were apparently relaxed and more flexibility was granted to farmers. Therefore, according to official statistics, cotton area fell from 280,000 ha to 255,000 ha but still accounted for 31% of the cropped area in 2007³¹. The trade-off between cash crops (cotton) and staples (wheat) is balanced on the relative values of each commodity and associated production costs. Cotton has always been the main cash crop for the nation as well as the individual household, sustained in Soviet times by inter-state supply chains mentioned earlier. With the demise of the upstream and down stream supply chains, production fell by 50% to around 400,000 t from where it increased to 550,000 t in 2005 only to fall back to 400,000 t in the past 2 years. During the post-Soviet period mismanagement of all aspects of the cotton industry has culminated in an enormous debt which affects all elements of the value chain from the peasant farmers through the ginneries to the cotton dealers. Long term cotton debts not only restrict farming options but also prevent farmers seeking more lucrative alternative markets. External debts at the national level would also appear to restrict purchasing options for modern ginning machines as well as farm inputs, exacerbating the downward spiral.³²

Notwithstanding the relaxation of quotas, it is the indebtedness that commits farmers to continue to growing significant areas of cotton. Cotton inputs are available as part of the cotton contracts when the impoverished farmers have no funds for increased quantities of inputs for larger areas of alternative crops. The cotton crop has also provided

³⁰ FAO Rep (2008) Personal Communication

³¹ Bellmon Amendment Requirement (2008)

³² World Bank and ADB projects are presently under implementation to resolve the farmers' debt and to reform associated policies including supply chain development and farm gate prices to farmers linked to the world price.

cash when sold, albeit until now at prices below world market prices, and, hitherto, prices for surplus cereals have not been at all competitive.

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 plethora 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 food security and income generation from sale of surplus.

Home grown wheat, the acreage of which increased greatly after the Soviets, is not considered to be of high quality. It is, however, used for local flour production and consumption at village level but is rarely, if ever, processed through the medium- large commercial millers for sale as flour³³ and some 20% is probably used as animal feed. However, its market price is linked to the price of imported wheat or imported flour, which has been increasing over the past 18 months as the Mission figures shown later confirm, which makes it an increasingly attractive cash crop alternative to cotton, particularly as second crops may be grown after the harvest.

Other changes in the structure of the agricultural sector, particularly since 1997, relate to land reform. The structure of agriculture is based on three types of farms as shown in Table 4: (a) large state (*sovkhos*) and collective (*kolkhoz*) farms from the Soviet system; (b) *dehkan* farms, created as a result of land reform; and (c) households plots, the number of which was increased enormously by Presidential Decree. The *dehkan* farms are split into individual/ family (18,300 enterprises) and collective holdings (8,300 units), the latter managed by former managers on behalf of workers with land share certificates; the former are more meaningfully privatised with associated land use titles conferred on the owners creating private landholdings with 50-year leases that can be bought and sold³⁴.

³³ The local wheat has a lower protein content than imported Kazakh flour. It is less "sticky" but lower protein flour keeps longer and is to make local bread. It is also bartered locally.

³⁴ Apparent contradictions exist in the same reports regarding sale/ ownership. It would seem that leases may be sold but the land may not be sold and is subject to confiscation and reallocation if used "irrationally"

Table 4. Farm Structure in Tajikistan

Type of Entity	Number	*Arable Land (ha)	Average Size (ha/farm)	% Arable Area
State and Collective Farms	193	62,146	322	8.6%
Dehkan Farms	27,040	486,720	18	68.1%
Household Plots	740,400	166,700	0.27	23.3%
Total:	-	715,566	-	100%

Sources: State Statistic Department and State Land Committee.
World Bank, 2006 Mission data 2008

*Irrigated arable land.

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 have access to a small plot (0.08-0.3 ha) of land, usually attached to homes. Some part of the produce from the household plots is supplied to the local markets. The area under productive cultivation in such units was increased by 75,000 ha under a Presidential Decree that released more land for "Presidential Plots" to households with financial difficulties.

The importance of water 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). Since 2003-2004, USAID, ADB, GTZ and AKF have all supported the introduction of WUAs through awareness building and direct support projects. Thirty WUAs have been established and are functioning well. Where WUAs have been created, the payment of water dues (0.17 US\$/ cu m) has increased by 40%, more equitable and effective water use is reported and areas of double cropping (second crop usually of maize, sunflowers or potatoes following wheat and barley) have increased. On-farm water management is the responsibility of the farmers themselves.

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

chemicals, machinery and fuel, reflect international prices, while agricultural produce 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 continuously declined since independence. At the same time, the absence of any home production or 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 has been around for the past 17 years. Whereas the fertility of the small household plots is restored annually by the use of animal manure due to the integrated nature of the crop/ livestock system, the larger *dehkan* and state farms do not have such a capability, so improved access to compound fertilisers is highly recommended.

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 17 years old. The consequence being that the Soviet-style cultivation practices followed are executed badly with concomitantly high sowing rates intended to compensate for sub-standard practices.

Pesticide and herbicide use is low due to limited access to and availability of agricultural chemicals. In this regard there is therefore:-

- no development of the zero/ minimum tillage techniques in the rainfed sector to minimize soil-moisture loss that are gaining acceptance in the rainfed sector in Kazakhstan;
- increased crop vulnerability to pest attacks.

Regarding vulnerability to pest attack, 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.

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 *Dociostaurus 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 on 180,000 ha in twelve districts in March 2008, 152,000 ha (Mustafakulov, 2008)³⁵ of the semi-desert steppe were sprayed. Financial support organised by the UN Office for the Coordination of Humanitarian Affairs (OCHA) from the Central Emergency Response Fund (CERF) assisted the process, and the reproductive cycle was broken and a possible migration contained for another year with no recorded losses noted by the Mission.

In order to avoid a possible emergency appeal/ response cycle each year to contain what is a well-known, annual, bio-phenomenon throughout Central Asia, FAO is presently developing a regional programme that should help re-establish coordinated control over these and other locust breeding grounds in the dry steppe grasslands of Tajikistan and its neighbouring republics³⁶.

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% of wheat 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 almost absent and farmers are not able to follow the origins of seeds on sale. Farmers often rely on humanitarian aid through NGOs, or locally produced seed schemes supported by NGOs. Unfortunately, these amounts represent only a small fraction of the country's annual requirement of at least 60,000 tonnes. In 2008, FAO have funds to provide 1,100 tonnes of improved wheat seed for 5,500 ha, which, if sown in 2008/9 with the 1,100 tonnes of fertiliser to be provided under the scheme, has the potential to provide improved seed for 137,500 ha³⁷ of wheat in 2009/10.

3.1.4 Crop Production 2007/8

As the design and timing of the Mission and level of access and actual availability of the current production data precludes a full analysis of crop production, secondary data, key informant interviews and transects and time-series data downloaded from independent websites

³⁵ Mustafakulov, U. (2008) Quoted by OCHA- <http://www.IRIN news.org/Report>

³⁶ Although expedient, blanket spraying of broad spectrum insecticides is heavily criticised by environmentalists eager to reduce toxic chemical residues in the Aral Sea Basin (Lockwood, J. A., Latchinsky, A.V., and Sergeev, M.G. ,2000) Grasshoppers and Grassland Health, NATO Science Series, Springer, New York

³⁷ 200 kg per ha sowing rate

have been brought together to provide an outline estimate of production of the main staple, wheat, and other cereals.

The 2007/8 winter is on record as having been one of the most severe winters in recent history. Only qualitative statements are available but it would seem that following a slightly drier than normal autumn, rain and snow fall was heavy in December and January, and temperatures were much lower prompting international concern/ responses to an energy crisis. Notwithstanding reports of the negative effects on the planted crops already issued³⁸, the heavy snowfall will have had an insulating effect against the lower than normal temperatures that prevailed, therefore, protracted snow cover; and the extra volume of melt will have boosted soil moisture, stimulated an early-bite in the mountain pastures and increased flow to the reservoirs. As against these benefits, lower than usual rainfall in spring plus higher than normal temperatures are noted to have added to the stress on the rainfed crops and slowed pasture development around villages in the Piedmont foothills.

According to the Ministry of Agriculture autumn/ winter sowing was completed in a fashion similar to 2007 using predominately on-farm saved seeds. Area sown to winter cereals was 400,000 ha comprising both rainfed (55%) and irrigated (45%) sub-sectors. Pests and disease challenges during the season are noted to have been at normal levels, with the perennial threat of grassland locusts controlled by a spraying programme organised by the authorities encompassing 152,000 ha of steppe/ semi-desert grazing from March to May.

Regarding other inputs, the level of fertiliser used in 2007 is estimated at around 280,000 t. This year, adequate fertiliser use is under pressure from two directions. Firstly, global price increases are noted to be causing reductions in use per hectare. Secondly, the official supply chain from Uzbekistan has been cut this year³⁹ placing increased reliance on either an increase in smuggling of urea across the Uzbek border; or the identification of new suppliers by traders to make up a 61% deficit. Table 5 summarises the differences in fertiliser supply as reported to the Mission.

³⁸ Emergency Food Security Assessment, April-May, 2008 Joint Food Security Cluster Appeal, Dushanbe.

³⁹ Not due to an export ban but due to non-payment of outstanding bills (Centre for Economic Research, Tashkent)

Table 5. Sources and Quantities of Nitrogenous Fertiliser, 2007/8, Tajikistan

Source	Quantity (t), 2007	Quantity (t), 2008
Local Production	60,000	60,000
Smuggled From Uzbek	30,000	30,000
Legal Imports	130,000 – Uzbek 7,000 – Kazakh	No supply – Uzbek 20,000 – Pakistan
Total	290,000	110,000 (apparent deficit - 61%)

The area sown to spring crops had not been assessed at the time of the Mission. However, it is anticipated that the area sown is likely to be equivalent to the irrigated area sown to winter wheat (c. 180,000 ha) as wheat is the only winter crop harvested early enough for a second crop to be sown.

Winter sown cereal yields in the rainfed sector are expected to be much lower than last year at 0.5 to 0.75 tonnes per hectare (average 0.6 t/ha) compared to 1.0 to 1.1 tonnes per hectare last year; whereas yields in the irrigated sector are expected by the MoA to be similar at around 3.5 tonnes per hectare. Such yields are similar to those achieved this year by farmers' groups working with CARE International⁴⁰. During transects driven between Dushanbe and the Uzbekistan border, the Mission noted yields of irrigated winter wheat ranging between 4-6 tonnes per hectare that were confirmed by both farmers and combine harvester drivers working in the districts visited. However, as fertiliser application may be reduced for reasons noted above, the Mission average yield estimate for the irrigated wheat is a conservative 3.3 tonnes per hectare resulting in an average⁴¹ wheat yield of 1.88 tonnes per hectare. Given the foregoing information an outline estimate of cereal production is presented below in Table 6.

⁴⁰ Gfarova, D. (2008) Personal communication, CARE, Dushanbe

⁴¹ Rainfed and irrigated areas

Table 6. Annual Crop Areas⁴² and Production Outline Estimates, 2008, Tajikistan

Crop	Area (ha)		Production (t)		Total	
	Irrigated	Rainfed	Irrigated	Rainfed	Area (ha)	Prod (t)
W. Wheat¹	169,000	186,000	557,000	111,600	355,000	668,600
W. Barley²	11,000	34,000	33,000	13,200	45,000	46,200
Maize²	50,000	none	150,000	-	50,000	150,000
Rice² paddy	20,000	none	50,000	-	20,000	50,000
Total Cereals					470,000	891,000
Potatoes¹	30,000	none	579,000	-	30,000	579,000
Veg¹	40,000	none	835,000	-	40,000	835,000
Melons¹	11,000	none	255,000	-	11,000	255,000

¹ MoA estimates; ² Mission estimates extrapolated from CFSAM 2005

The estimates connect to a combined spring and cereal harvest of 891,000 tonnes of which an estimated 668,600 tonnes is expected to be wheat. This production estimate is 3% more than last year's production recorded by State Statistical Committee at 649,000 tonnes but is calculated from an area of wheat that is 17.5% greater in total than last year and 11% greater than in 2005 (CFSAM FAO, 2005). The area increase is noted to be in the irrigated sub-sector on the *dehkan* farms where wheat is expected to have increased at the expense of cotton; and on the household plots where wheat is expected to have replaced some barley. Production figures for the rice and maize spring crops are included at levels similar to 2007.

Table 7 presents two time-series for production estimates for the four main cereal crops drawn from State Statistics Committee (SSC) data and from the only other source available to the Mission, USDA data, for the past four years. Data from UN FAO/WFP CFSAM 2005 is also included in the 2005 set. The unvarying USDA data for the past four years places a question mark over the validity of the data presented on the website⁴³.

⁴² Not including cotton or irrigated forage.

⁴³ www.indexmundi.com

Table 7. Cereal Production Time Series, '000s tonnes, Tajikistan

Crop Source	2004		2005		2006		2007	
	SSC	USDA	SSC	USDA- FAO	SSC	USDA	SSC	USDA
Wheat	631	650	618	530-607	640	530	649	530
Barley+	63	90	65	90-60	64	90	75	90
Maize	113	n/a	155	n/a-112	139	n/a	130	n/a
Rice	51	44	62	44-55	49	44	52	44

The time-series from SSC suggests that wheat production estimates for 2008 are in the order to be expected given a poor year.

Such production estimates link to a cereal balance suggesting that some 752,000 t of wheat equivalents will be required for the 2008/9 marketing year for a mid-marketing year population of 7.32 million people. Table 8 provides the outline balance for each of the main cereals. Parameters of the balance have been calculated based on the following premises:-

- Population mid marketing year 2008/9 will be 7.32 million based on 1.6%⁴⁴ annual growth rate;
- Annual consumption patterns⁴⁵; wheat 155 kg/ head, barley 2 kg/ head; rice 4.5 kg/ head; maize 2.5 kg/ head= 161 kg/ head cereals;
- Seed requirements as practiced; wheat 200 kg/ha; barley 200 kg/ha; rice 80 kg/ha; maize 25 kg/ha;
- Post harvest handling and storage losses 12%;
- Animal feed use⁴⁶- supplementary concentrates assuming grain feed: wheat 20%, barley+ 34%; maize 72%; and all of the bran wheat by-product.
- Stocks – no draw down (10,000 t wheat flour estimated in storage⁴⁷)

⁴⁴ World Bank (2002)

⁴⁵ UN FAO/WFP CFSAM (2005) – Wheat consumption adjusted by Beuter (2007)

⁴⁶ Animal diets also include fodder beets and conserved forages

⁴⁷ USAID (2008) Personal Communication

Table 8. Cereal Balance, 2008, '000s tonnes, Tajikistan

	Wheat	Rice¹	Maize	Barley+	Total
Dom Av	669	40	130	43	882
Stocks	0	0	0	0	0
Dom prod	669	40	130	43	882
Dom Req	1421	40	130	43	1634
Food use	1135	32	18	14	1199
Seed use	72	2	2	9	85
Feed use	133	0	94	15	242
Losses	81	6	16	5	108
Imports	752	0	0	0	752
Stocks	10	0	0	0	0
Food	155	4.5	2.5	2.0	161
use/yr	kg/head ²	kg/head ³	kg/head ³	kg/head ³	kg/head ⁴

1 Milled; 2 Beuter (2007); 3 FAO/WFP CFSAM (2005); 4 Mission figure; Barley+: includes rye and oats

The estimated import requirement for 2008/9 is almost double the requirement noted by CFSAM in 2005. However, more recent figures from Beuter (2007) provide a very different picture. Table 9 reproduces Beuter's figures and includes the wheat grain equivalents based on a 75% conversion rate of wheat to wheat flour. Beuter's figures also show how wheat flour imports have increased, a trend that is very likely to have continued into 2008 given the export tariff of 40% on Russian wheat (not on flour) and the Kazakhstan ban on wheat grain export but not on flour.⁴⁸

Table 9. Wheat and Wheat Flour Imports, '000's tonnes

Commodity	2004	2005	2006	2007
Wheat	126	284	277	251*
Wheat flour	222	351	377	463*
Wheat equ.	423	752	779	868

* Kazakhstan only (data from Kazakhstan exports)

The Mission import estimate of 752,000 tonnes is lower than last years' apparent imports noted using data from Kazakhstan and may be reduced further if, a) more local wheat is used for flour production- presently 20% of wheat is assumed to be animal feed quality but may still be milled at hh/farm level; b) more maize flour is used.

⁴⁸ Given the large reserves of wheat grain in each country (Kazakhstan 1 million tonnes; Central Russia alone- several million tonnes), outside observers might see both actions as devices to boost flour sales at the expense of local millers, rather than internal food security measures.

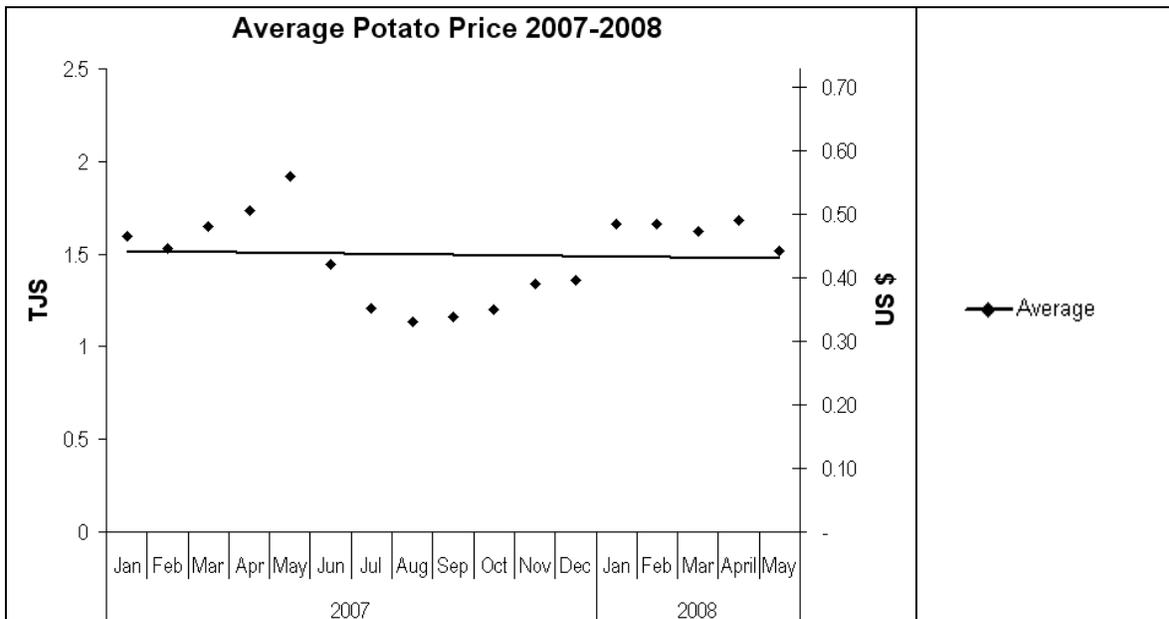
Regarding other crops; following the growth in hh plots, according to the official statistics for domestic production, nearly all food crops are now provided by a combination of hh plots and *dehkan* farms, with most coming from the hh plots. The latest (2007) returns are given in Table 10. The data shows that cotton is not grown at the hh level.

Table 10. Contribution of Produce by Sub-Sector, 2007, Tajikistan

Crop	Wheat	Maize	Potato	Veg	Fruit	Cotton
hh plots	42%	75%	69%	66%	72%	0%
<i>Dehkan</i>	43%	18%	27%	24%	19%	63%
State	15%	7%	4%	10%	9%	37%
Total	100%	100%	100%	100%	100%	100%

Despite earlier predictions of crop failures, production of top-fruit, vegetables, and melons would appear to be at usual levels for July with local surpluses feeding into the cities in quantities reflecting their availability at levels similar to 2007.

Figure 5. National Average Monthly Potato Prices, 2007-2008, Tajikistan



Potato prices in Figure 5 are derived by the Mission from five markets monitored by WFP. The prices show a) the seasonal variation with a lower peak price in 2008 than in 2007 and b) a slight downward trend over period from January 2007 to May 2008 suggesting that availability of potatoes for purchase is unlikely to have changed and, given the general rise in cost of living, may even have increased.

Regarding livestock; post-Soviet livestock ownership is predominantly in the hands of hh units (88% cattle and 76% sheep and goats). As such, systems follow a traditional seasonal production pattern relying on a variety of home-produced feed and by-products to supplement grazing and locally-produced meadow, lucerne and annual grass-ley hay. Livestock numbers per unit are very small and easily managed. 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, as was witnessed by the dramatically significant drop in livestock numbers in the years following 1992, when numbers fell until a sustainable accommodation between ambition and reality was reached.

Assessments earlier in the year forecast forage/ pasture shortfalls prompting the initiation of a FAO support programme designed to provide fodder for the winter 2008/9 for target communities, which is to be implemented later this year⁴⁹. Taking sheep as probably the most vulnerable and most disposable of farm animals usually sold for cash release and/or down-sizing to match grazing available, it is reasonable to propose that the price of sheep meat in markets across the country may be considered as a good indicator of pasture condition and fodder availability. Figure 6 presents graphs of monthly sheep meat prices from January 2007 to May 2008 for five markets. The graphs show that, except in Khorog on the Afghan border, sheep meat prices have continued to rise throughout the past 18 months as both sheep and beef meat prices have done in a steady fashion, in all markets monitored by WFP since 2002⁵⁰. Figure 6 graphs exhibit no price spikes, indicating shortages due to widespread mortalities, or price troughs, indicating market surpluses from a strategic downsizing of flocks. However, the year is not yet over and data on both prices and market presentations- i.e. sold and unsold should be monitored to

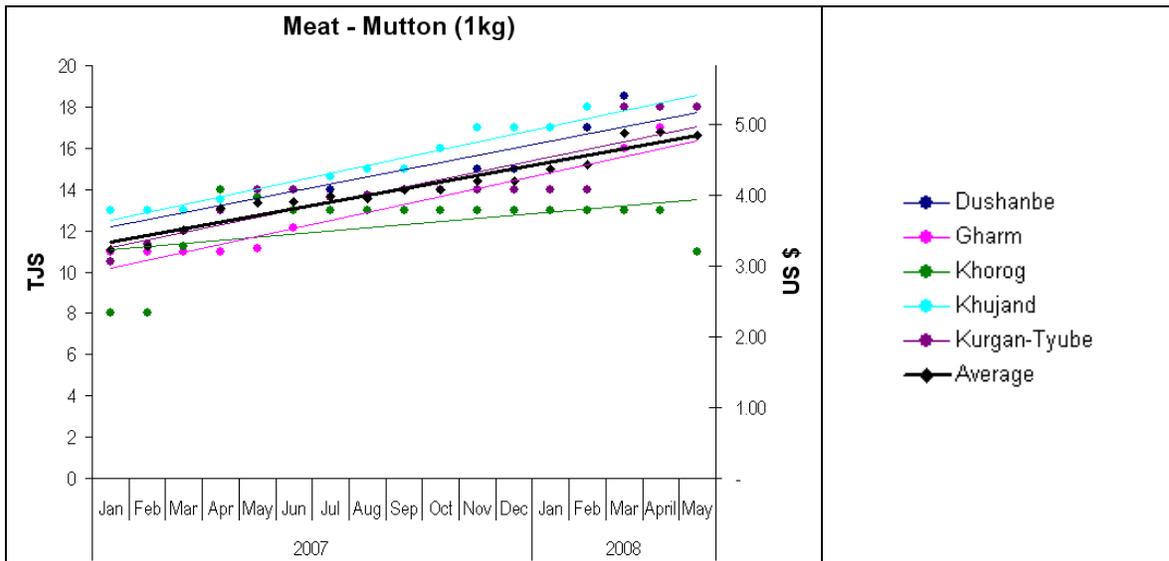
⁴⁹ FAO Rep (2008) Personal Communication, Dushanbe

⁵⁰ Beuter, T. op cit; beef prices presented 2002-2006 show steady increase, except in Khorog.

assess the situation more fully in case Khorog⁵¹ market is the indicator that other markets may follow.

The absence of basic livestock data under the current production systems points to the need for the introduction of objective recording⁵² that may both inform planners and provide management information to farmers and extension offices alike. In such a way, plans built on surveys based on questions such as "have you got enough winter feed?"; "did any animals die this year?", may be replaced by norms and benchmarks viz actual quantities of hay made and purchased, supplementary feed used; adult and neo-natal mortalities, by which to judge prevailing situations.

Figure 6. Sheep Meat Prices, 2007-2008, Tajikistan



3.1.5 Market Supply Chains

Tajik self-sufficiency extends to potatoes, most vegetables and fruits but more than 50 % wheat products, 75-80% of milk products, meat, eggs, and 100% of sugar and vegetable oil must be imported each year.

⁵¹ Located on the Afghan border, prices may well be influenced by non-Tajik factors, particularly security, which will influence a number of buyers.

⁵² Given the importance of livestock, a programme of identifying and monitoring indicator units to provide such data in each agri-eco zone, should be seriously considered.

Access to neighboring countries is extremely restricted as noted by the relief map in Figure 1 and the communications maps in Figures 2 and 3. Consequently, 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 may be used to move goods from China to eastern parts of the Republic, but with no apparent route further west it is of limited use. Goods from Iran (vegetable oil) may now enter over the newly constructed road bridge from Afghanistan or through the traditional Turkmenistan- Uzbek route for earlier and probably more reliable arrival in Dushanbe. The limited access places an enormous dependency on import supply on relations with Uzbekistan⁵³ 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 may also vary. Presently, road traffic is subject to a blanket tariff of US\$ 400 per truck and no such charges are presently attached to rail wagons. However, WFP experienced difficulties in importing wheat and pulses through Uzbekistan last year.⁵⁴

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 with 60 steps to complete⁵⁵ allegedly exacerbate corruption and reinforce monopolies by effectively deterring competition⁵⁶.

A combination of the small size of the individual production units, mostly hh plots, 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; surpluses of fruit and vegetables are often wasted and the major cities are supported by imports for several months of the year. However, seasonal local markets thrive. Locally produced goods from the hh plots and *dehkan* farms, including wheat in bulk from the latter, maize, maize flour, vegetables and an abundance of fruits were noted on sale in both well-established markets and in *ad hoc* gatherings by railway

⁵³ Saidov, B (2008) Personal communication. Min Foreign Econ Relations Tashkent Uzbekistan

⁵⁴ Milisic, Z (2008) Personal communication, WFP, Dushanbe.

⁵⁵ Beuter, T. (2007) op cit,

⁵⁶ Trader interviews

halts and strategic cross-roads and parking lots along side more formal shopping areas.

Vegetables and fruits in-season are sold, in quantities varying from a few hundred grams to car-boot/ pick-up truck volumes of about 700kg, by the backyard producers themselves. Larger volumes seen traded were second steps in supply chains to smaller markets in both housing complexes (shops and street corners) and in remote villages, depending on the location of the primary market. No processed/ dried vegetables or fruits were evident on sale at the time of the Mission, confirming, by their absence, the contention that much of the surplus seasonal production is probably wasted⁵⁷.

Wheat and wheat flour supply fits the model outlined above. Using figures from Tables 9 and 10, 42% (280,000 t) from the hh plots is consumed *in situ* 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, 43% (290,000 t), 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 market mostly as animal feed wheat. Similar distribution and utilisation patterns may be expected from the 193 state farms producing 15% (100,000) tonnes. Mission estimates suggest that after subtracting 133,000 t (20%) for animal feed, losses (81,000 t) and seeds (72,000 t); 34% of the total population, being 50% of the rural population, will be supplied with wheat flour through such local transactions.

The Mission surmises that although local wheat is not purchased by the large mills nor by most medium-sized flour mills, smaller mills may use local wheat bought in local markets from workers cashing-in their payment-in-kind, or bought from farmers selling their higher quality surplus for flour production for sales/ exchanges/ barter at village level.

This means that the remaining 66% of the population buy bread or wheat flour in regional (*oblast*) towns and cities from bakers, shops, and markets supplied by the 7 large mills and c. 10 medium-sized mills, and from imported flour distributed by the larger wholesalers.

⁵⁷ Not including home bottling/ curing/ salting/ drying/ smoking which occur in every hh to conserve surplus production for winter use. Such practices if coordinated offer income generating opportunities.

Such mills are all sited at or close to the rail-heads for receipt of imported grain from Kazakhstan or Russia.

Table 9 shows that the imported flour component has been growing rapidly over the past few years. Further, the closure of Kazakh wheat exports, that began in April 2008, has reduced wheat grain exports to Tajikistan from 250,000 tonnes (Sep 2006- Aug 2007) to 213,000 t (Jan 2007- April 2008). Consequently, given the current Russian 40% export tax on wheat grain, which makes the purchase of Russian grain uneconomic, and the continuing ban on flour grade wheat grain export from Ukraine⁵⁸, alternative sources of wheat have not been available. Therefore, flour mills have closed early⁵⁹ or are running at a fraction of their capacity, mill workers have been laid off, albeit expecting re-employment in September when the export ban is likely to be lifted, and traders in small towns outside of Dushanbe reported that no local flour had been available for about two months. The ban on Kazakh wheat exports has probably reduced local flour production from the larger mills by 15%. Therefore flour imports are expected to have increased by a similar volume. WFP experience suggests that a *de facto* export ban of wheat leaving Tajikistan was introduced in 2007/08, when the re-export of WFP wheat to Afghanistan was disallowed⁶⁰.

The foregoing notwithstanding, terms of trade relating to previous and current prices for wheat and wheat flour are included in Tables 11 and 12 below.

Table 11. Wheat Prices, Tajikistan

	2007 US\$/t (May)		2008 US\$/t (April)	
	Imported	Local	Imported	Local
Wheat Grain	230	240	350	509
Transport	67	0	89	0
Import tax 1.5%	3.45	0	5.25	0
VAT 20%	46	(48)	70	(102)
Total	346	288	514	611

Source: Mission collected data

⁵⁸ Feed grain wheat export from Ukraine opened in June

⁵⁹ 5 flour mills visited, 4/5 were closed for summer holidays, cleaning, maintenance

⁶⁰ Milisic, Z (2008) Personal communication, WFP. Tajikistan

Imported and local wheat prices in mid-2007 are higher than earlier in the year. Grain imported from Kazakhstan is reported to have risen to 400 US\$ per tonne in mid 2008, before exports were banned, which, with all taxes and tariffs, would have been on the Tajik market at up to 550 US\$ per tonne. By contrast, Russian wheat delivered was offered to the Mission in June at 512 US\$/tonne all-in price, which begs many questions regarding the rigour of customs procedures.

Table 12. Wheat Flour Prices, Tajikistan

	2007 US\$/t (May)			2008 US\$/t (April)		
	Imp	Local Flour, imp w.	Local	Imp	Local Flour, imp w.	Local
Wheat Flour	338	294		512	542	
Import tax 1.5%	5.0	0		7.7	0	
VAT 20%	68	59		102	109	
Ex-mill/ or Trader Prices	394	353	308	622	651	635
Wholesale	411	382	barter	685	668	barter
Retail	441	412	barter	696	674	barter

Values in Table 12 have been derived by the Mission from data collected from traders and millers. Prices per tonne have been calculated back from the price of 50 kg sacks of flour at different stages of the supply chain from Mission sources and Beuter (2007). Assumptions and generalisations have been made in an attempt to summarise a trade that was extremely volatile during the 18 months under review. It is hard to reconcile the ex-mill flour selling price with the purchase price of wheat in May 2007 if 20% VAT was paid by the large scale millers⁶¹. The explanation would seem to be that the purchase price of grain used by large millers in May was, lower than the price quoted to the Mission.

⁶¹Local small scale millers are probably either VAT exempt (turnover) or avoid paying VAT.

3.1.6 Market Prices

WFP and other agencies have been monitoring a wide range of retail market prices for several years. Prices to the end of 2006 have been reviewed by Beuter⁶², consequently this review has focussed on price changes of six selected commodities in five markets from January 2007 to May 2008. The selected commodities comprise wheat flour, sheep meat, sugar, vegetable oil, diesel and wage labour.

Data collected are given in Annexes 3-6 alongside a) tables of correlation coefficients for price combinations within and between markets, and b) the results of T-tests on monthly average prices for the commodities between markets over the same period. The data are presented in Figure 7 in a series of five market graphs showing average monthly prices. Linear regression lines show that:

- vegetable oil, sheep meat and wage labour show similar rates of increase, except in Khorog;
- wheat flour and diesel show similar rates of increase.

More detailed analyses of the relationship between commodities within markets shown in the 6 x 6 contingency tables in Annex 4 reveal strong relationships i.e. correlation coefficient (C) >0.9 between:-

- wheat flour and vegetable oil price increases, all markets except Gharm;
- diesel and vegetable oil price increases, all markets except Khorog;⁶³
- diesel and wheat flour price increases, Khujand only;⁶⁴
- diesel and mutton price increases, Khujand only;
- wage labour and mutton price increases, Khorog only.

The data are also presented in Figure 8 in a series of six commodity graphs. Linear regression lines show that:

- except sugar, all commodities have been increasing in price in all markets;
- sugar prices have been falling in all markets except Khorog;

⁶² Beuter, T. (2008) op cit

⁶³ Very close at 0.878

⁶⁴ Very close in Dushanbe (0.87) and Khorog (0.877)

Figure 7. Retail Commodity Prices by Market, Tajikistan

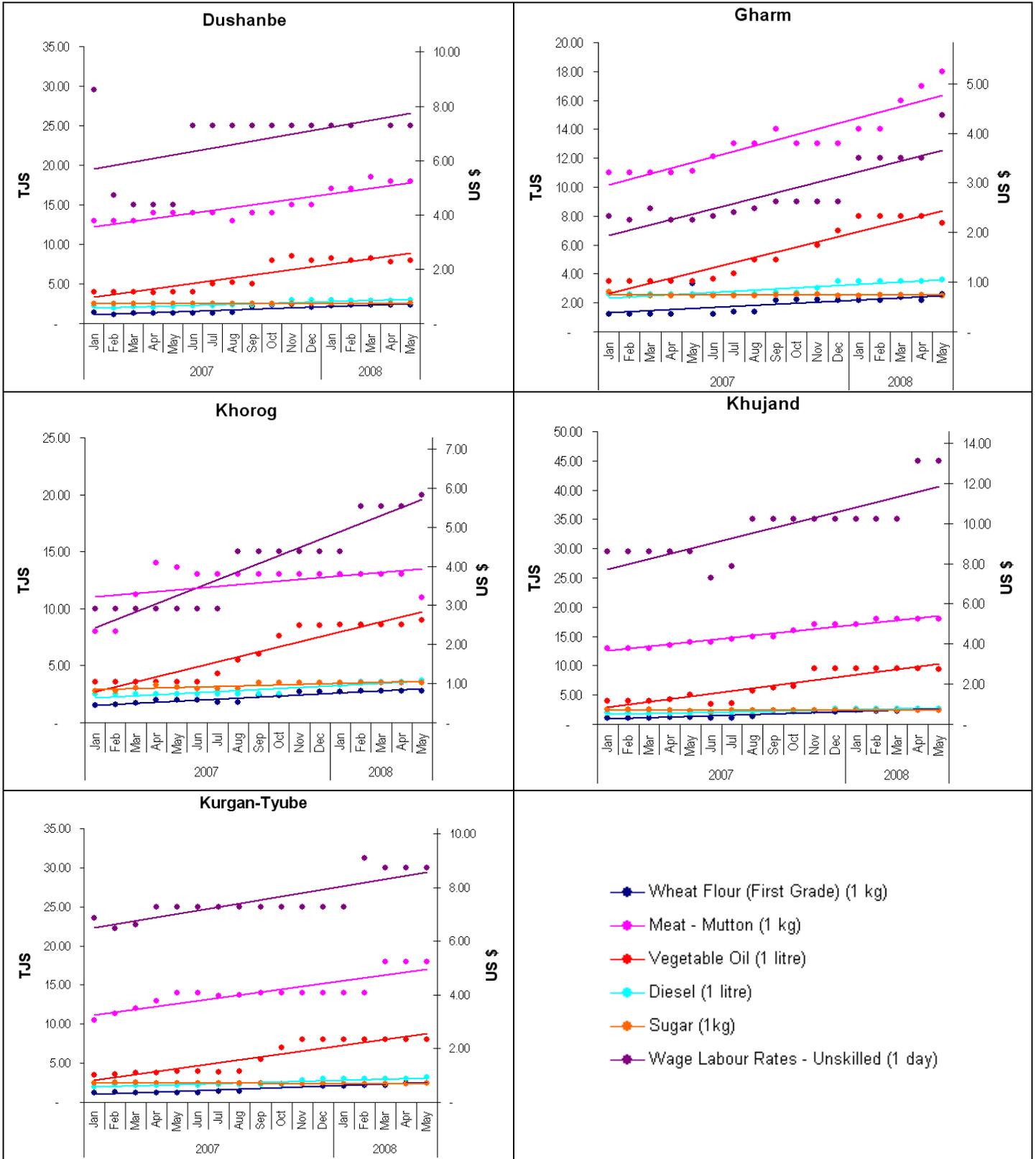
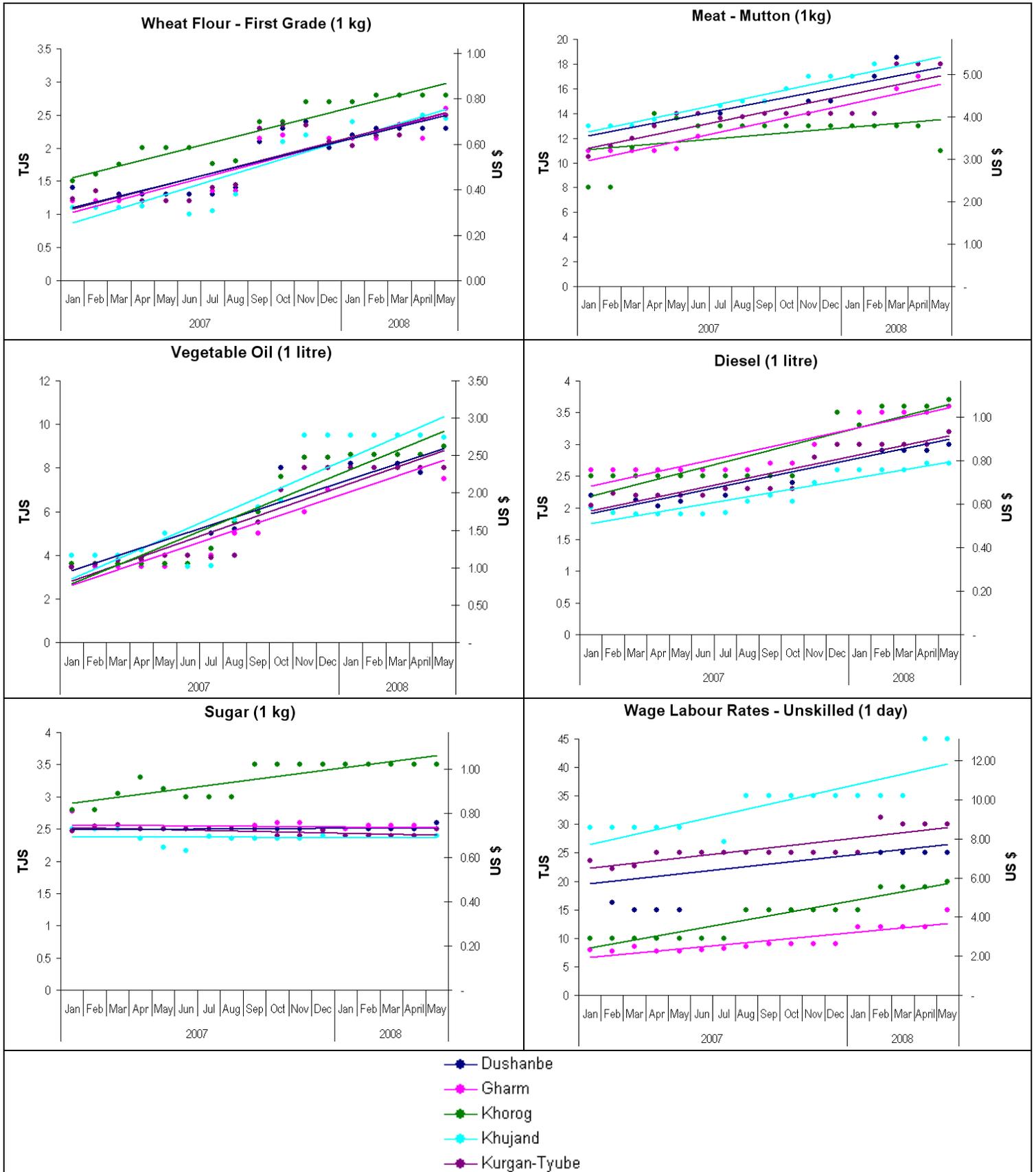


Figure 8. Retail Market Prices by Commodity, Tajikistan



Correlation coefficients for commodity prices shown in the 5 x 5 contingency tables in Annex 4, reveal very strong relationships, $C > 0.9$, for:-

- wheat flour, all market pairings $C=0.928-0.974$ (except Khorog and Kurgan-Tyube at 0.89);
- vegetable oil, all market pairings $C=0.95-0.983$;
- diesel, all markets pairings $C= 0.928-0.989$;
- mutton, Gharm and Kurgan-Tyube ($C=+0.91$) only;

However, no strong relationships are noted for wage labour and sugar.

The results suggest a high degree of market integration for wheat flour, vegetable oil and diesel. All three commodities are imported for specific and generally increasing markets. Two commodities, vegetable oil and diesel are without local import substitutes and the local version of third commodity, 1st grade wheat flour, is dependent on what has been shown to be inconsistent imports of raw material. As later analyses (4.2.1) show all prices are increasing in parallel throughout the sub Region, as they originate from the same sources and are subject to the same inflationary forces.

Notwithstanding the relationships between price increases noted above, Figure 8 reveals consistent differences in monthly values between markets. The significance of the differences over the 18 months was tested using a series of T-tests, the results of which are shown in a series of 5 x 5 contingency tables in Annex 4 and are summarised below indicating that for:-

- Wheat flour:
 - prices in Khorog are significantly higher than prices in the other four markets;
 - there are no significant differences in price between the other four markets suggesting they are all fully integrated.
- Mutton:
 - prices in Khorog are significantly lower than prices in all the other markets except Gharm;
 - prices in Gharm (production area) are significantly lower than in Khujande and Dushanbe.
- Vegetable oil:
 - no significant differences in price between markets confirming all markets are fully integrated.
- Sugar:
 - prices in Khorog are significantly higher than prices in all the other markets;

- prices in Khujand are significantly lower than in all other markets.
- Diesel:
 - prices in Khujand are significantly lower than prices in all other markets;
 - prices in Dushanbe are significantly lower than prices in Khorog and Gharm
- Wage labour:
 - wages in Khujande are significantly greater than wages in all other markets;
 - wages in Kurgan-Tyube are significantly higher than wages in Dushanbe, Khorog and Gharm;
 - wages in Dushanbe are significantly greater than wages in Khorog and Gharm.

The differences over the 18 month period present a mixed picture. Supply of imported products (wheat flour, vegetable oil and diesel) to rural areas depends on the degree of isolation and communications. Roads are not good and become impassable in winter. Prices of vegetable oil and diesel in Gharm and Khorog do exhibit an apparent seasonal effect (spot prices higher in winter), but the overall increases elsewhere means that there are no significant differences in the price of wheat flour and vegetable oil over the period. This suggests that in the absence of price controls, the presence of locally-milled flour from local grain, cushions further increases in price of the improved commercially option in rural areas. To a certain extent, locally produced sunflower seed oil may perform a similar role. Diesel, on the other hand, is significantly more expensive in the rural areas.

Sheep meat is significantly cheaper in the two markets in the sheep producing areas; however, the similarities reflect convergence rather than market integration.

Higher wages reflect supply and demand as in the case of a) Dushanbe, exhibiting an increased demand for day labour in the capital city compared to Gharm and Khorog; and b) Khujande a possible effect of proximity to Tashkent, where wages have increased dramatically in past year (Fig 22). The Mission has no explanation for the higher wages in Kurgan- Tyube.

3.1.7 Social Support

As an ex-member of the USSR, Tajikistan's social support system follows the pattern adopted throughout most of the CIS republics. However, during the Soviet era 60% of the budget came from federal sources with only 40% coming from local sources and that at a time when the GDP was ten times higher. The inevitable fiscal collapse and years of strife removed the social support network. However, the structure has been sustained and regular payments are made to a typical CIS cluster of beneficiaries as indicated in Table 13.

Directed and managed by the Ministry of Social Affairs and Immigration (MoSAI), the distribution of pensions, allowances and benefits according to the national criteria, is at the discretion of local commissions established by the MoSAI District Offices including local councillors (*jamoat*) to represent the people's interest. Payment is made through cash transfers to bank accounts. Presently, the MoSAI budget has a 26 million TJS (7.58 million US\$) deficit, so increases to be implemented on July 1st to match rates shown in Table 13, will depend on veering funds from other Ministries⁶⁵.

Despite the proposed increases noted in Table 13, state support remains low and could not support an individual pensioner trying to buy the minimum food basket each month. With regard to food security of the elderly, the Mission is informed that Tajik society does more than just expect families to honour Central Asian traditions and care for elderly parents, responsibility for their welfare is enshrined by law, and pensioners may sue children for alimony if the responsibility is shirked.

Table 13. Social Support, US\$, Tajikistan

Pensions	Allowances	Payments
Disability; <ul style="list-style-type: none"> • Regular monthly payments to disabled and invalids. • Amount varies according to 	Maternity- one off; <ul style="list-style-type: none"> • 1st born- 21 US\$ was 18 US\$ • 2nd born- 14 US\$ was 11 US\$ • 3rd born- 7 US\$ was 6 US\$ 	<ul style="list-style-type: none"> • Burial 141 US\$. • Vulnerable families with income less than the minimum wage receive supplementary payments for fuel

⁶⁵ Sanginov (2008) Personal communication, MoAI, Dushanbe

<p>degree of disability Old age;</p> <ul style="list-style-type: none"> • Old age pension for men >63 years and women >58 years. • Was 50% of min wage; July 1st 2008 reduced to 40% of minimum wage after min wage increased from 6 US\$/month to 18 US\$/month. • Discretionary for workers from generals/judges to labourers median = 13 US\$/month 	<ul style="list-style-type: none"> • Others- 7 US\$ was 6 US\$ • Pregnancy leave is 140 days at 100% salary. • Child care- 7 US\$ per month all children for national insurance paying/employed women 	<p>and electricity.</p>
---	--	-------------------------

The nominal minimum of 60 TJS/month (18 US\$) is less than the actual minimum wage received by workers, which is estimated variously at around US\$ 100-120 per month, some 300% greater than the wage in 2006 noted by Beuter (2007)⁶⁶. Day labourers' wages in 2008 included in the Mission analyses range from 2.5 to 9.7 US\$ per day depending on location (75 to 291 US\$/month), however, numbers of days worked per month or per annum are not recorded.

Notwithstanding the above, a recent analysis (EFSA 2008)⁶⁷ found that in the rural population, 11% were severely and 23% were moderately food insecure. In the urban population 15% and 22% were found to be severely and moderately food insecure respectively. This translates to 800,000 severely and 1.4 million moderately food insecure people.

⁶⁶ Beuter, T. (2007) *op cit*

⁶⁷ EFSA (2008) *op cit*

3.2 Uzbekistan

3.2.1 General

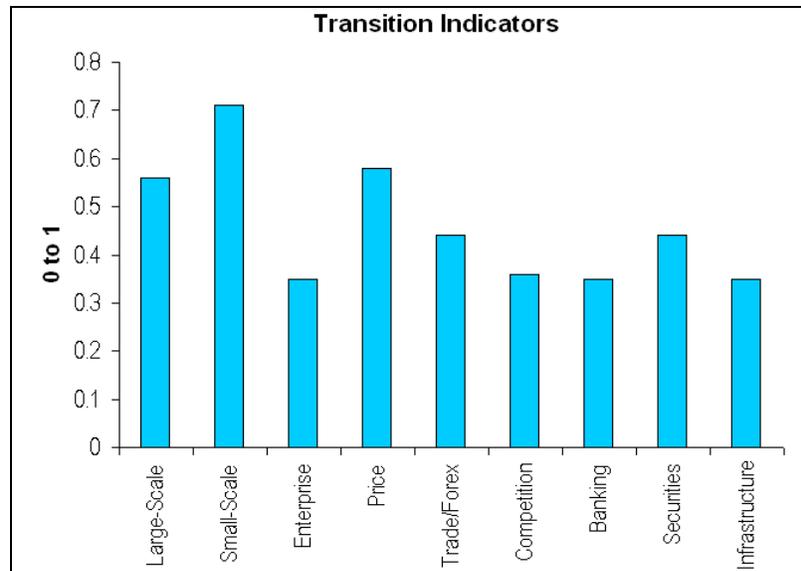
Located in Central Asia between Kazakhstan to the north; Tajikistan and Kyrgyzstan to the east; Turkmenistan to the west and Afghanistan to the south. Uzbekistan is a double land-locked country with a population of 28.12 million people in c. 4.5 million households, similar to the population of all the other Central Asian states added together. The country is characterised by the vast Kyzyl Kum desert, which dominates the central- west plateau; and semi- arid, upland pastures to the east. Summer temperatures of around 40°C and an annual rainfall of 100-200 mm mean that any agriculture of consequence depends on irrigation. Water for irrigation is channelled from the external water resources of the Aral Sea (fresh-water lake) in the north-west and rivers formed from the run-off from the mountain ranges of Tajikistan and Kyrgyzstan to the east. These two water supply systems were first exploited under the USSR's integrated development policy to found an enormous cotton and grain growing agricultural sector based on surface water irrigation schemes encompassing 4.4 million ha, supported by associated agro-chemical plants producing fertilisers and pesticides. Some 61% of the population is estimated to live in the rural sector concentrated in the irrigated valleys connected to increasingly privatised agricultural enterprises.

The Republic has existed as an independent state since 1991, and in a situation shared with Kazakhstan, with the same President since 1990. The initial 4 years (1991-94) as an independent republic were subject to similar problems that beset other states in similar positions but without the violence and civil strife experienced in Tajikistan, as the Government of Uzbekistan, assisted by inherited assets connected to indigenous resources, sustained the Soviet-style administration and command economy, exercising control over production and distribution. Nevertheless, hyper-inflation at 1000% per annum caused a lessening of controls in 1994 and the first steps to privatisation which *inter alia* saw inflation reduced to 50% by 1997, reaching single digits by 2003/4.

Consequently, the progress of transition from the Soviet command economy to a western-orientated capitalist economy is considered to have been unsatisfactory to date by the IMF and other outside observers; while the lack of transparency in all aspects of government raises concerns connected to corruption, monopolies and human rights. However, the apparent economic crisis in neighbouring

countries that have made more progress away from the command economy does beg the question "*transition to what?*" The European Bank for Reconstruction and Development's (EBRD) analysis of transition up to 2007 is shown in Figure 9, where progress made is scored from 0 to 1, 1 being 100% privatized.

Figure 9. EBRD Transition Indicators of Uzbekistan



3.2.2 Macro-Economy

As well as cotton, Uzbekistan's mineral resources of gold, natural gas, oil and a manufacturing legacy offered alternative areas for post-Soviet investment and development. A closer look at the macro-economics through reviews of time-series data and several recent analyses, announcements and key informant interviews suggest that GDP was sustained in 1995 and 1996 and then grew by 4-6% per annum until 2004. After 2004, growth increased to 7-8% and has been sustained as shown in Table 14. In real dollar terms GDP reached US\$ 670 per capita per annum⁶⁸ in 2007. The GDP growth must be off-set against inflation in 2007 variously estimated at 12.5% by the EBRD, at 16% by the official statistics and 24% if estimated from the GDP deflator used by the World Bank. The GDP figure noted above does not include remittances⁶⁹. Mansoor and Quillin (2007),⁷⁰ using data from

⁶⁸ Mission data, MoE (2008)

⁶⁹ Shoabdurahmanov, R. (2008) Personal Communication, Ministry of Economy, Tashkent

State Statistics Committee, estimate that net migration from Uzbekistan to Russia was in the order of 1 million people between 1989-2003, exceeded only by Kazakhstan at 1.75 million. Short term migration flow is not estimated, however remittance flow is expected to be in the order of 5-10% of GDP value (equivalent to 50 US\$ per head), lifting per capita GDP⁷¹ to at least 720 US\$ per annum per head.

Table 14. Economic Indicators, 2003-2007, Uzbekistan

Economic Indicator	2003	2004	2005	2006	2007
Per capita GDP (\$)	488	525	572	616	670
GDP growth (% change per year)	4.4	7.0	7.7	7.3	8
CPI (% change per year)	4	4	8	n/a	n/a
Unemployment rate (%)	n/a	n/a	n/a	10	10
Fiscal balance (% of GDP)	-1.7	-2.4	-2.9	1.7	-6.4
Export growth (% change per year)	n/a	n/a	n/a	n/a	n/a
Import growth (% change per year)	n/a	n/a	n/a	n/a	n/a
Current account (% GDP)	7	10	13	17	23
Fiscal balance (% GDP)	0	1	5	4.5	4

CPI = consumer price index, GDP = gross domestic product, GNI = gross national income
Sources: EBRD 2008. Uzbekistan Country Fact Sheet

However, despite the steady economic improvements, in the UNDP Human Development Report 2006, Uzbekistan's Human Development Index is still ranked 113th (in the "Medium" countries ranking) out of 177 countries and in a similarly ranked position in the medium World Bank Wealth Ranking table at 60th from bottom with a score of US\$ 15,000 per capita⁷².

3.2.3 Agricultural Sector

Agriculture is one of the most important sectors of the economy. The share of agricultural production in GDP has been sustained since the demise of the Soviet-era until 2006 at 26-28%. The last two years has witnessed a fall in GDP contribution to 22-23%, as trade and communications have posted higher growth rates. Never the less, 21%

⁷⁰ Mansoor, A. and Quillin, B. (2007) Migration and Remittances, World Bank, Washington. USA

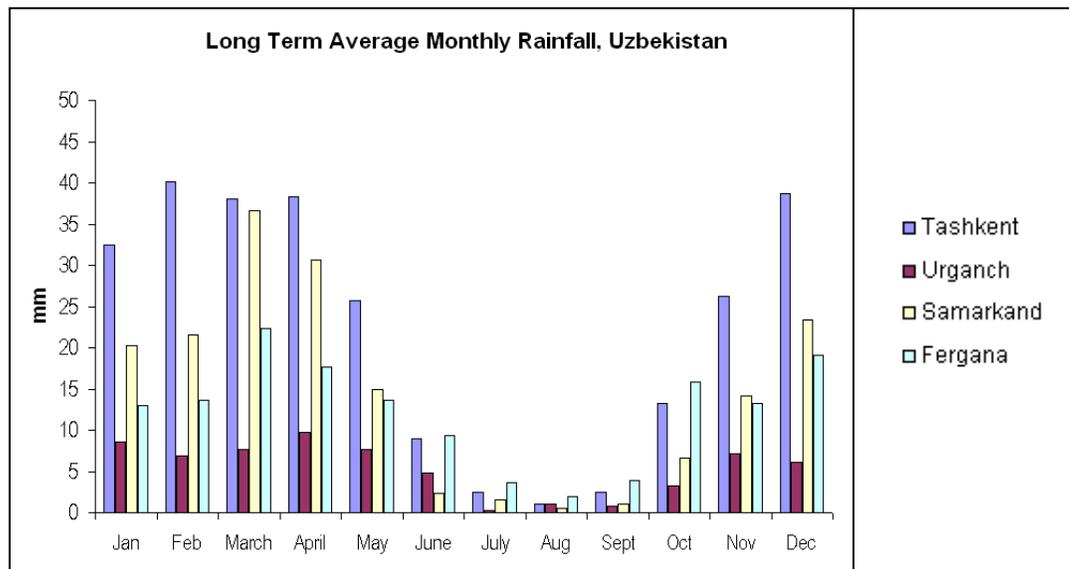
⁷¹ Or more accurately, GNI.

⁷² Compare- Tajikistan 40th from bottom US\$ 8,500; Kyrgyzstan 56th from bottom US\$ 14,000; Turkmenistan 84th from bottom US\$ 29,000; Kazakhstan 92nd from bottom US\$ 32,000 (middle-wealth ranked)

of official exports, cotton 12.5% and food 8.5%, still come from the agricultural sector with Uzbekistan recognised as the 6th largest producer and 2nd largest exporter of cotton in the world⁷³.

The agricultural sector employs about 44% of the economically active population and is believed to provide the main source of livelihood for a further 20% categorised as *underemployed*⁷⁴. The importance of agriculture depends on c. 4,200,000 ha of crops currently irrigated using the surface water sources noted above, out of a potential 5,700,000 ha of arable land available for cultivation. Rainfed agriculture contributes highly variable grain harvests from year-to-year depending on the opportunistic use of the meager 100-200 mm of rainfall according to area. Figure 10 presents long-term average monthly rainfall data for four different areas of the country and clearly shows the virtual absence of agriculturally useful rain from May until October, indicating the high level of dependency of crop production on irrigation and the importance of good water management.

Figure 10. Rainfall Patterns in Uzbekistan



Concern regarding the reserves of surface water resources needed to sustain a core crop-producing area of 4,200,000 ha where irrigation systems are functioning albeit below previous levels of efficiency, has grown in the past 10 years. Falling water levels and the increasing

⁷³ Tajikistan is apparently the 4th largest exporter as almost all cotton is exported.

⁷⁴ *Dehkan* plots and family farms, unregistered labour paid in kind and barter

pollution of the Aral Sea are noted as a problem of *global* concern. Recent investments in the agrarian sector, predominantly into infrastructure improvements and new machinery have included rehabilitation programmes to improve water-use efficiency. Consequently, production has increased each year for the past few years for each crop, despite decreases in total area farmed⁷⁵.

Since the times of the USSR, cotton and wheat have been considered the most important crops. Under the prevailing administration, the growing patterns of both crops are still centrally controlled through mandatory growing quotas by district and farm. All cotton and 50% of the wheat crop is subject to state procurement at prices unknown to farmers until harvest time. This year, the price for wheat for the preset farm quotas was 160 UZS⁷⁶ per kg for first 25% of harvest (123 US\$ per tonne); 192 UZS per kg for second 25% (146 US\$ per tonne). The remaining 50% of wheat harvest, for farmers meeting locally determined quotas, is free to be sold at will at prevailing farm-gate prices noted by the Mission as 250-300 UZS/kg (190-228 US\$/t). These prices are much lower than the Mission noted market prices of grade 3 local wheat at 550 UZS/kg (412 US\$/t) suggesting;

- high mark up by intermediate traders;
- added value for farmers selling directly or delivering to mills.

Other changes in the structure of agriculture are based around the types of farms. From 1988 onwards large State and Collective Farms from the Soviet system were converted into *shirkats*, cooperatives of worker units called *purdats* with the *shirkat* management controlling cropping patterns for wheat and cotton. Following the various stages of privatisation culminating in the redistribution of most of the *shirkat* land by December 2007, farms now fit into the following different categories: (a) remaining *shirkats*, greater than 1,500 ha being joint stock companies and state farms⁷⁷; (b) *dehkan* farms, created as family farms as a result of land reform and registered as business enterprises⁷⁸; and (c) households plots, known as *dehkan* plots as seen in Table 15.

⁷⁵ Bearing- Point (2006) Economic Reform Project, USAID. Tashkent.

⁷⁶ calculated to be 20% over costs purchased through the local administrations

⁷⁷ Including karakul sheep breeding centres, seed breeding and multiplication units; other pastoralist units

⁷⁸ 49 year leases, pay rent and taxes

Table 15. Farm Structure in Uzbekistan, 2008

Type of Entity	Number	Arable Land (ha)	Average Size (ha/farm)	% Arable Area
State Farms (<i>shirkats</i>)	105	158,000	>1,500 ha	>2.7%
Joint Stock Companies	221	300,000	>1,300 ha	>5.25%
Farms	220,000 (including 86,000 enterprises)	3,330,000	15 ha (40-100 ha)	58.4%
<i>Dehkan</i> hh Plots	3,500,000	1,225,000	0.35 ha	21.5%
Unallocated or areas with joint stock companies	n/a	700,000	n/a	12.3%
Total:	-	5,713,000	-	100%

Source: Min of Agriculture

Dehkan plots are, as noted in all other CIS countries, an important household asset. According to the Crole-Rees (2006)⁷⁹ in Uzbekistan, 97% of all rural families have at least one plot. Unlike the farms, companies and state farms, the plots are not subject to governmental cropping controls. The diverse cropping patterns that result not only provide staples, legumes, oilseeds, vegetables, and fruits and spices for family use, but also provide products for sale in local markets for barter for local goods and services.

The importance of efficient water management has already been noted. The present system is the legacy of an integrated Soviet system whereby primary water supply is controlled and managed by the Department of Water Management in the Ministry of Agriculture and Water, who are responsible for macro-basin management and for delivering water to the areas that were previously *sovkhos* and *kolkhos* and then *shirkats*, (i.e. state farms and collectives). Thereafter, the responsibility for command area distribution networks, previously

⁷⁹ Crole-Rees, A. (2006) Uzbek; wheat and flour sub-sectors, GAIN, Dushanbe

managed by the *sovkhoz* and *kolkhoz*, is now, in privatised areas, allocated to water users associations (WUAs).

Since 2000 when WUAs were initiated, 1676 associations have been formed and more than 180,000 contracts with farmers have been signed⁸⁰ at local authority level, formalising water allocations and payments. According to farmers interviewed by the Mission during wheat harvest time⁸¹, who received water in autumn (1x) and in spring and early summer (3-4x), WUAs have led to more transparent, equitable and effective water-use. Areas of double-cropping, second crop of maize, sunflowers or potatoes following wheat and barley, have also increased. On-farm water management is the responsibility of the farmers themselves. Flood irrigation using border strips or ridge and furrow layouts, depending on crop, predominate and connect to the land allocation systems creating strip farming patterns that made unit boundaries easy to identify during Mission transects.

Regarding inputs, the supply of seeds, fertiliser and plant protection chemicals for the strategic quota crops, cotton and wheat, is organised through the state procurement company and implemented by the local authorities at district and village level with assistance from the MoA district offices. Prices are fixed and allocations pre-determined at a level to suit the crops and soil fertility of the farms bearing in mind "*international prices and farmer efficiency and profit margins*"⁸². Inputs for non-strategic crops are available on the open market at prices this year 10%-20% higher than the state prices. The presence of a local chemical industry means that either through home production or imports by the state import company, compound, phosphate, potassium and nitrogen-based fertiliser requirements are met and use of fertilisers is high. Farmers are also obliged to use improved wheat and cotton seeds provided through the government structure.

At the same time, the fertility of the small household plots is restored annually by the use of animal manure due to the integrated nature of the crop/ livestock system, the larger *dehkan* farms and *shirkats* do not have such a capability.

⁸⁰ Mamarasulov, K. (2008) Personal Communication, Sen Advisor, MoA and W, Tashkent.

⁸¹ Chinoz, 3 farmer group random selection- winter wheat measured samples 6 t/ha (confirmed by combine harvester drivers)

⁸² Farmanov, I. (2008) Personal communication, Dir. Econ. Reform, MoAW, Tashkent.

Farm machinery and irrigation equipment have been renewed regularly and Mission transects confirm that the latest equipment manufactured in western countries is obviously readily available throughout the country.

Regarding vulnerability to pest attack, pesticide and herbicide use on the strategic crops under government control is high with agro-chemical supply organised through the state procurement company. Given the liberalisation of production and trade in other farm commodities, herbicides and pesticides against non-migratory pests are available in the market place but many are of dubious provenance and many 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.

Migratory pests are the concern of government, and as with the neighbors, following the pattern established during the Soviet era, thousands of hectares of the dry steppe- grasslands are blanket sprayed every year by the authorities with broad spectrum pesticides to control the hopper (larval) generations of grassland locusts *Calliptamus italicus*- the Italian locust; and *Dociostaurus maroccanus*- the Moroccan locust, before they reach the flying stages and threaten field crops in the bordering arable areas. This year, concerns expressed in May 2008 on the Emergency Transboundary Outbreak Pest (ETOP) website regarding a Moroccan locust infestation in eastern Uzbekistan were not followed up in June or July, nor reported to the Mission by MoA agronomists, nor noticed by the Mission during a transect driven from Hisor (Tadjik Border) via Samarkand to Tashkent. The Mission assumes that the danger passed when the main breeding season ended in June/July.

3.2.4 Crop Production 2007/8

As the design and timing of the Mission and level of access and actual availability of the current production data precluded a full analysis of crop production; early data (Jan-March) from the Statistical Review of Uzbekistan⁸³, secondary data from reports, key informant interviews and transects and time-series data downloaded from independent websites have been brought together to provide an outline estimate of production of the main staple, wheat, and other crops.

The 2007/8 winter is noted in the region as having been severe. Only qualitative statements are available but it would seem that snow fall

⁸³ National Statistics Committee (2008)

was heavy in December and January in the mountain water catchments of Tajikistan and Kyrgyzstan, followed by a quick melt and early run-off feeding the rivers upon which the Uzbek production depends.

According to Ministry of Agriculture autumn/ winter sowing of wheat was completed in a fashion similar to 2007 using predominately improved seeds from government sources. Area sown to irrigated winter wheat was 1.357 million ha. Some 14,000 ha of rainfed wheat and barley crops⁸⁴ were sown in spring, the yields of which were noted in Mission transects to be poor in the south (0.3 t/ha - 0.9 t/ha) compared to the 5.0 t/ha noted in the irrigated sub-sector. The main spring sown grain crops are, maize, rice and sunflowers grown as second crops under irrigation and covering around 200,000 ha⁸⁵ this year. Pest and disease challenges during the season are noted to have been at normal levels for both non-migratory and migratory pests, with the perennial threat of grassland locusts controlled by a spraying programme organised by the authorities. The details of areas sprayed under the locust control programme were not available to the Mission.

Regarding other inputs, the level of fertiliser used in 2008 is expected to have been in the order of 1.9 million tonnes, if applications on strategic crops quoted by MoA officials and reported to the Mission by farmers visited, were similar elsewhere. Fertiliser use on non-strategic crops may have decreased due to global price increases reflected in the liberalised market sector. Also, as the official supply chain from Uzbekistan to Tajikistan has been cut this year⁸⁶ smuggling of urea across the Uzbek border is expected to have increased dramatically. However, the high quality of the maize, noted during transects driven from the irrigated valleys south of Samarkand to the Kazakhstan border, near Shymkent, suggests otherwise.

Cereal yields in the rainfed sector are expected to be lower than last year at 0.5 t/ha to 0.75 t/ ha (average 0.6 t/ha) compared to 1.0 to tonnes per hectare last year; whereas yields in the irrigated sector are expected by the MoA to be higher than 2007 at around 5.0 tonnes per ha. Irrigated wheat yields were matched or exceeded on farms visited by the Mission and were quoted by combine drivers as being commonplace, however, lower yields were also noted during the

⁸⁴ Includes safflower crops; all crops mostly in the piedmont areas in the east.

⁸⁵ Mission calculation from a MoA estimate of 817,000 ha of spring crops in 2008.

⁸⁶ Not due to an export ban but due to non-payment of outstanding bills (Centre for Economic Research, Tashkent)

transects. Consequently, an average yield of 4.5 t/ha has been used in the outline estimate of cereal production presented below in Table 16.

Table 16. Annual Crop Areas⁸⁷ and Production Outline Estimates, 2008, Uzbekistan

	Area (ha)	Production (t)
Wheat¹	1,357,000	6,107,000
Barley/others	60,000	180,000
Maize²	70,000	280,000
Rice² paddy	70,000	210,000
Total cereals	<i>1,557,000</i>	<i>6,369,000</i>
Potatoes¹	59,000	1,180,000
Veg¹	91,000	4,670,000
Melons¹	15,000	80,000

¹ MoA estimates; ² Mission estimates extrapolated from various sources⁸⁸

The estimates connect to a combined spring and winter cereal harvest of 6.777 million tonnes of mixed cereals of which 6.107 million tonnes are expected to be wheat. All estimates are similar to last year's levels except maize, which is greater than recorded in 2007, reflecting a Mission based assumption that the area planted to maize has increased by virtue of a) the position of maize as the predominant spring culture in the MoA reported increased area of second crops, and b) Mission transects noting maize as the dominant second crop.

Table 17 presents production estimates since 2004 for the four main cereal crops drawn from State Statistics Committee.

Table 17. Cereal Production Time Series, '000s tonnes, Uzbekistan

Crop	2004	2005	2006	2007
Wheat	5,377	5,927	5,996	6,197
Barley	155	108	110	73
Maize	156	164	195	200
Rice (milled)	112	112	112	112

Source: State Statistics Committee

⁸⁷ Not including cotton or irrigated forage.

⁸⁸ Despite Mission requests passed formally through Min of For Affairs and agreed by Dep Minister MoA, no data was provided for detailed agriculture performance or for consumer/ wholesale/ farm gate prices.

The time-series from State Statistics Committee suggests all cereals are increasing each year except barley. Mission figures in the cereal balance have included estimates for rye and oats with the barley estimate.

Such production estimates link to a cereal balance suggesting that some 1,256,000 t of cereals of which 1,226,000 t are wheat will be required in the 2008/9 marketing year for a mid- marketing year population of 28.1 million people. Table 18 provides the outline balance for wheat and rice. Parameters of the balance have been calculated based on the following premises:-

- population mid marketing year 2008/9 will be 28.1 million;
- annual consumption patterns- wheat 208⁸⁹ kg/head, rice 2.45⁹⁰ kg/head;
- Seed requirements as practiced; wheat 220 kg/ha; rice 80 kg/ha;
- Post harvest handling and storage losses 7.5%;
- Animal feed use⁹¹- supplementary concentrates assuming grain feed: wheat 12.5% considered animal feed standard, all barley and oats less brewing use; all maize less brewing/ distilling use and all wheat by-products.
- Stocks – no draw down (but >700,000 t estimated in storage⁹²)

Table 18. Cereal Balance, '000s tonnes, 2008, Uzbekistan

	Wheat	Rice¹	Total
Dom Av	6,107	130	6,237
Stocks used	0	0	0
Dom Prod	6,107	130	6,237
Dom Req	7,333	160	7,493
Food use	5,844	69	5,913
Seed use	299	60	359
Feed use	763	0	763
Losses	427	31	427
Imports	1,226	30	1,256
Stocks	Possible use to 50% of deficit	0	0
Food use/yr	208* kg/head	2.45 kg/head	210.5 kg/head

¹ Milled; * HBS data- Survey conducted by GAIN 2004;

⁸⁹ Crole-Rees, A. (2006) Uzbek Wheat and Flour Report, GAIN, Tashkent

⁹⁰ USDA (2008)

⁹¹ Animal diets also include fodder beets and conserved forages

⁹² Huge reserve stocks of most foodstuffs as legacy of previous position of Uzbekistan as quartermaster of Soviet army; (2008 Personal Communication, Min Econ Dev, 2008)

The import requirement of wheat including flour as wheat equivalence for 2008/9 is 1,226 million tonnes. This requirement falls just outside the range of c.1.1 million tonnes quoted by USDA⁹³ for the past few years.

Using Mission collected wheat and wheat flour 2007 export data from Kazakhstan, the Mission figures suggest that Uzbek official and *unofficial* imports from Kazakhstan alone reached 1.12 million tonnes of wheat equivalent comprising 730,000 t of wheat flour and 141,000 t of wheat grain. Other countries exporting wheat and wheat flour to Uzbekistan in 2007 included the Russian Federation (both wheat and wheat flour), USA (wheat) and Ukraine (wheat flour). Kazakh wheat grain exports to Uzbekistan to April 2008 were 86,600 tonnes. Given that the Kazakh grain export ban was applied in April, other sources of wheat will have to have been found or, wheat flour imports from all sources are expected to have increased to make up the shortfall.

Regarding other crops; according to the official statistics for domestic production nearly all food crops are now provided by a combination of the *dehkan* plots and *dehkan* farms, with most coming from the *dehkan* plots. The latest (2007) returns are given in Table 19.

Table 19. Percentage Contribution of Produce by Farm Type, 2007, Uzbekistan

Crop	Wheat	Potato	Veg	Melon	Fruit	Grapes
Dehkan hh Plots	16.7	84.5	65.9	48.8	52.2	43.6
Farms	81.6	15.0	33.2	49.4	45.7	54.5
JS Co's/ State Farms	1.7	0.5	0.9	1.8	2.1	1.9
Total	100	100	100	100	100	100

The table confirms the importance of *dehkan* plots and the major role of small private (*dehkan*) farms in the food supply sub-sector. MoA forecasts that production of top-fruit, potatoes, vegetables, and melons⁹⁴ will continue to increase. Key informants report that local surpluses are feeding into the cities in quantities reflecting their

⁹³ www.indexmundi.com

⁹⁴ Melons are revered throughout the CIS and exported in season particularly to Kazakhstan and Russia

availability at levels similar to the usual levels for July and are being exported to Kazakhstan.

Cotton is not grown at the hh plot level but 98.4% of the cotton crop is now grown on the private *dehkan* farms in accordance with quotas issued by local authorities/ MoA. Mission transects confirms the ubiquitous presence of cotton on all irrigated farms. The crop was still in the vegetative stage, universally very clean, reflecting widespread herbicide use, and was being top-dressed with nitrogenous fertilizers in all areas visited.

Regarding livestock; post-Soviet livestock ownership is predominantly in the hands of the *dehkan* hh plot units (cattle- 93%; sheep and goats- 76%; pigs- 70%; chickens- 68%). As such, livestock numbers per unit are very small and easily managed. 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. Systems follow traditional seasonal production pattern relying on a variety of home-produced feeds including the poorer quality wheat; maize and barley grain; and by-products (bran, straw and stover) to supplement grazing and locally-produced meadow and lucerne hay.

Production, predominantly from the *dehkan* plots, is expected to increase in 2008 by around 4-6% for each livestock based commodity.

3.2.5 Market Supply Chains

Retail trade indices (Statistical Review of Uzbekistan, 2007⁹⁵) show that 40% of retail food sales come from *dehkan* markets selling home-grown and locally-processed food. Other outlets for local produce are not specified but the quality/ volume of presentations of fresh farm produce suggest to the Mission that much of the produce sold via supermarkets is imported. More succinctly, regarding specific foods Goskomstat (2006) indicate that *official* imports provide 9.2% vegetable oil, 20% animal fats, 13% meat, 9% potatoes and 7% fruits sold. Mission estimates of a cereal balance for 2008 also suggest that 21% of the total wheat and wheat flour requirements (expressed in wheat equivalents)⁹⁶ and 23% of total rice requirements are also imported.

⁹⁵ State Statistics Committee.

⁹⁶ Not including pasta or biscuits.

The gap between the range of import estimates on the one hand and the provenance of retail food sales on the other hand, suggest that many food imports are unaccredited (*unofficial*). Imports come from all over the world. Uzbekistan is linked to Russia by rail via Kazakhstan; to the Caspian Sea by rail via Kazakhstan and Turkmenistan; and to China by rail then road through Kyrgyzstan, but;

- all imports are subject to a variety of tariffs that increase prices by up to 30%;
- the customs processes are complicated and prolonged;
- by the time VAT (20%) is added, prices of most goods are 50% greater than their FOB prices without including the transport costs.

These three factors invite evasion of official channels of entry causing parallel (paper) import routes to be created. Where imports escape the official tariffs, however, they are still subject to commodity *black market* price increases to pay off the corrupt officials/ guards causing price hikes to the consumer.

All farm products except wheat and cotton⁹⁷ sold to the State, are sold in a free market fashion either a) through chains of traders collecting from farms on behalf on major wholesalers who supply the big markets, or b) by the backyard producers themselves in quantities varying from a few hundred grams to car-boot/ pick-up truck volumes.

The wheat and wheat flour supply chain is more complicated. Table 20 summaries the flow chart for ex-farm wheat according to provenance.

Table 20. Local Wheat to Wheat Flour Supply Chain, Uzbekistan

Supply	Dehkan plots	Private Farms		Ag Ent
Production	16.7%	81.7 %		1.7%
Quota/ non quota	non quota	50% fixed price sales to state	50% open market	=Private Farms
Mill type	Local village	UDM (44 mills)	mill- private mills (c 30)	=Private Farms
Use	hh uses; food/ feed/ barter/ sale	Sold via "exchange" at c. fixed price to brokers and to	Sold- open market to wholesalers, bakeries,	=Private Farms

⁹⁷ All cotton sold to State at fixed price; 2007 price 355 US\$/t; global price c. 450 US\$/t but inputs subsidised

		Tashkent <i>Non</i> bread bakeries ⁹⁸ ; national institutions; other bakeries; traders.	supermarkets, consumers	
--	--	--	-------------------------	--

Uzdonmaksulot (UDM), a state association designated a Joint Stock Company (JSC) with 44 mills (2 mills in each *oblast* and 7 mills in Tashkent), has the responsibility to buy and process all the wheat grown for the state according to the local authority quotas, at predetermined prices. UDM has a milling capacity of c. 3 million tonnes and is guaranteed 50% of the harvest used for flour, or some 2.3 million tonnes in 2008 according to Mission estimates. UDM also imports wheat under state-assisted schemes to increase production output according to policy. The state reserve stocks of wheat are held in the silos of such mills.

Private mills buy locally from traders and the larger farms at competitive prices and import from any available source. They sell flour at a price determined by the market, which means that with import tariffs on flour at 30%, they have a wide margin to explore. All mills are sited at or close-to the rail-heads for receipt of imported grain from Kazakhstan or Russia.

The closure of Kazakh wheat exports that began in April 2008, has reduced wheat grain exports to Uzbekistan from 141,000 t (Sep 2006-Aug 2007) to 86,000 t (Jan 2007- April 2008). Consequently, given the current Russian 40% export tax on wheat grain, which makes the purchase of Russian grain uneconomic, and the continuing ban on flour grade wheat grain export from Ukraine⁹⁹, alternative sources of wheat have not been available. Therefore, UDM flour mills may be using reserve stocks, to be topped up when the Kazakh export ban is lifted in September.

Estimates by the Mission for terms of trade relating to 2007 and 2008 prices of wheat and wheat flour are included in Tables 21 and 22 below.

⁹⁸ ex State association of bakers- 56 enterprises.

⁹⁹ Feed grain wheat export from Ukraine opened in June

Table 21. Wheat Prices, Uzbekistan

	2007 US\$/t (May)		2008 US\$/t (April)		
	Imported	Local	Imported	Local	
Wheat Grain Farm gate:	230	q (50%) 91	350	q (50%) 121	nq 50% nq <228
Trader chain:	n/a	n/a	n/a	none	(380)
Transport	67	0	89	0	0
Import tax 5%	11	0	18	0	0
VAT 20%	46	18	70.0	24	46 (76)
<i>Total</i>	<i>354</i>	<i>109</i>	<i>527</i>	<i>145</i>	<i>274 (456)</i>

q= quota wheat, fixed price; nq= non quota open market farm gate price;
final price to mill of nq may be as high as 456 US\$/t if bought through traders

All prices were collected from traders and millers during the Mission and have been adjusted by the extant tariffs and taxes. Imported and local wheat prices in mid-2007 were higher than earlier in the year. The open market wheat price (non quota) for traders at 380 US\$/tonne is similar to Kazakh FOB prices in 2008; but farm gate price is 35% lower signalling a high trader mark-up along the supply chain from farm to mill. The price of grain imported from Kazakhstan is reported to have risen to 400 US\$ per tonne in early-mid 2008, before exports were banned, which with all taxes and tariffs would have been on the Uzbek market at 674 US\$ per tonne.

Table 22. Wheat Flour (1st Grade) Prices, 2007/8, Uzbekistan

	2007 US\$/t (May)				2008 US\$/t (April)			
	Imp. Flour	Local-q Flour	Local-nq Flour	Local Village	Imp. Flour	Local-q Flour	Local-nq Flour	Local Village
Flour	333	174	184	184	622	200	410	410
Import Tax 30%	117	0	0	0	187	0	0	0
VAT 20%	78	35	37	0	125	41	82	0
Ex-mill/ Trader Prices	585	209	221	0	934	246	492	0
Wholesale	n/a	n/a	n/a	barter	n/a	n/a	n/a	barter
Retail	720 ¹	240 ²	368 ³	barter	1064 ⁴	250 ⁵	684 ⁶	barter

Source: Mission data

¹ Kazakh flour Tashkent prices 45,000 UZS/50 kg;

² Tashkent UDM price 17,000 UZS/50 kg;

³ Tashkent local price 24,000 UZS/50 kg;

⁴ Kazakh flour Tashkent 70,000 UZS/50 kg

⁵ Samarkand UDM flour 33,000 UZS/50 kg

⁶ Tashkent local flour 45,000 UZS/50 kg

Values in Table 22 have been derived by the Mission from data collected from traders and millers. Prices per tonne have been calculated back from the price of 50 kg sacks of flour at different stages of the supply chain from Mission sources in Uzbekistan and Kazakhstan as shown in the foot notes to the table. Assumptions and generalisations have been made in an attempt to summarise a trade that was volatile during the 18 months under review and with prices and policies that may differ between *oblasts*¹⁰⁰. The May 2007 and April 2008, ex-mill *non-quota* flour price compared with the retail price in both years, suggests high broker and trader mark-up for locally milled flour from *non-quota* wheat in both years but particularly in 2007, which may reflect the number of links involved in the chain. Bread prices vary according to bread type. The price of “*non*” bread (local standard bread) from UDM bakers connects to *quota* wheat price and is reported to have been sold at controlled rates. Bread of different types made from non-quota wheat flour has been subject to inflationary pressures noted elsewhere and the price is reported to have doubled.

3.2.6 Market Prices

Following advice from Deputy Ministers in the Ministry of Economic Development and the State Statistics Committee during key informant interviews, the Mission approached the Ministry of Foreign Affairs, via UNICEF, for permission to receive price data for six commodities from three markets for the period January 2007 to June 2008. Although a letter of request was apparently issued, no data were received. Consequently, the Mission collected data on seven commodity prices from two markets for the same period from extracts of articles in newspapers, gleaned from websites, the most useful of which was www.uznews.net.

Data collected are given in Annexes 3-5 alongside a) tables of correlation coefficients for price combinations within and between markets, and b) the results of T-tests on average monthly prices for the commodities between markets over the period. The data are presented in Figure 11 in a series of commodity graphs showing the average monthly prices by market. Linear regression lines show that:

- except for sugar in Tashkent, all commodities have been increasing in price in both markets;
- rice, sunflower oil and beef show similar rates of increase in Tashkent;

¹⁰⁰ UDM flour is cheaper and bought on contract by certain association bakers and institutions in Tashkent. In Samarkand, consumers and stall holders spoke of sales of UDM flour to ration card holders (50 kg/ family/ month)

- imported wheat flour, rice and sunflower oil show similar rates of increase in Nukus;

More detailed analyses of the relationships between commodities within markets, shown in the 7 x 7 contingency table in Annex 4, reveal strong relationships i.e. correlation coefficient $C > 0.9$ between:-

- imported wheat flour and sunflower oil price increases in both markets,
- imported wheat flour and beef price increases in Tashkent.

Figure 11. Retail Commodity Prices by Market, Uzbekistan

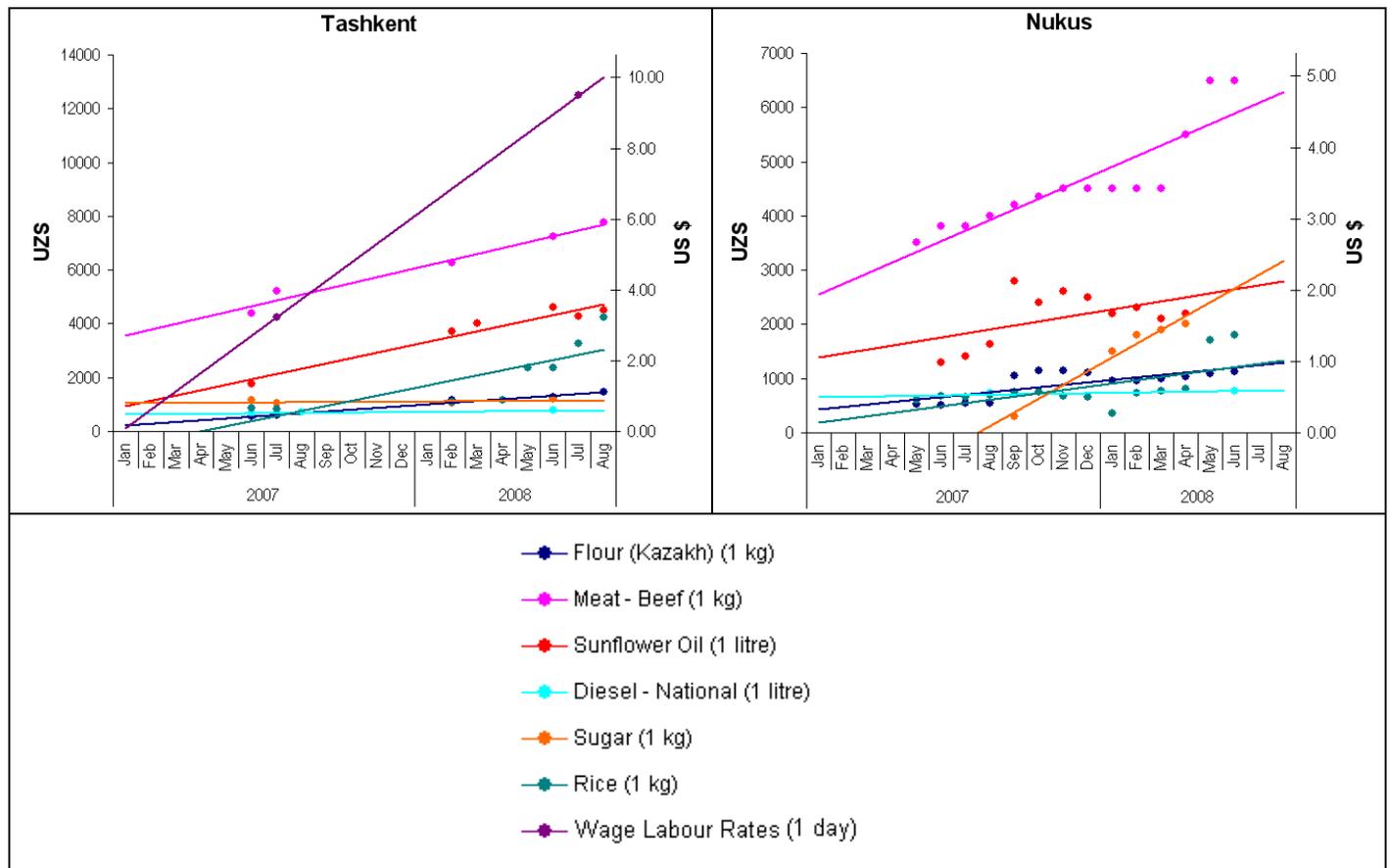
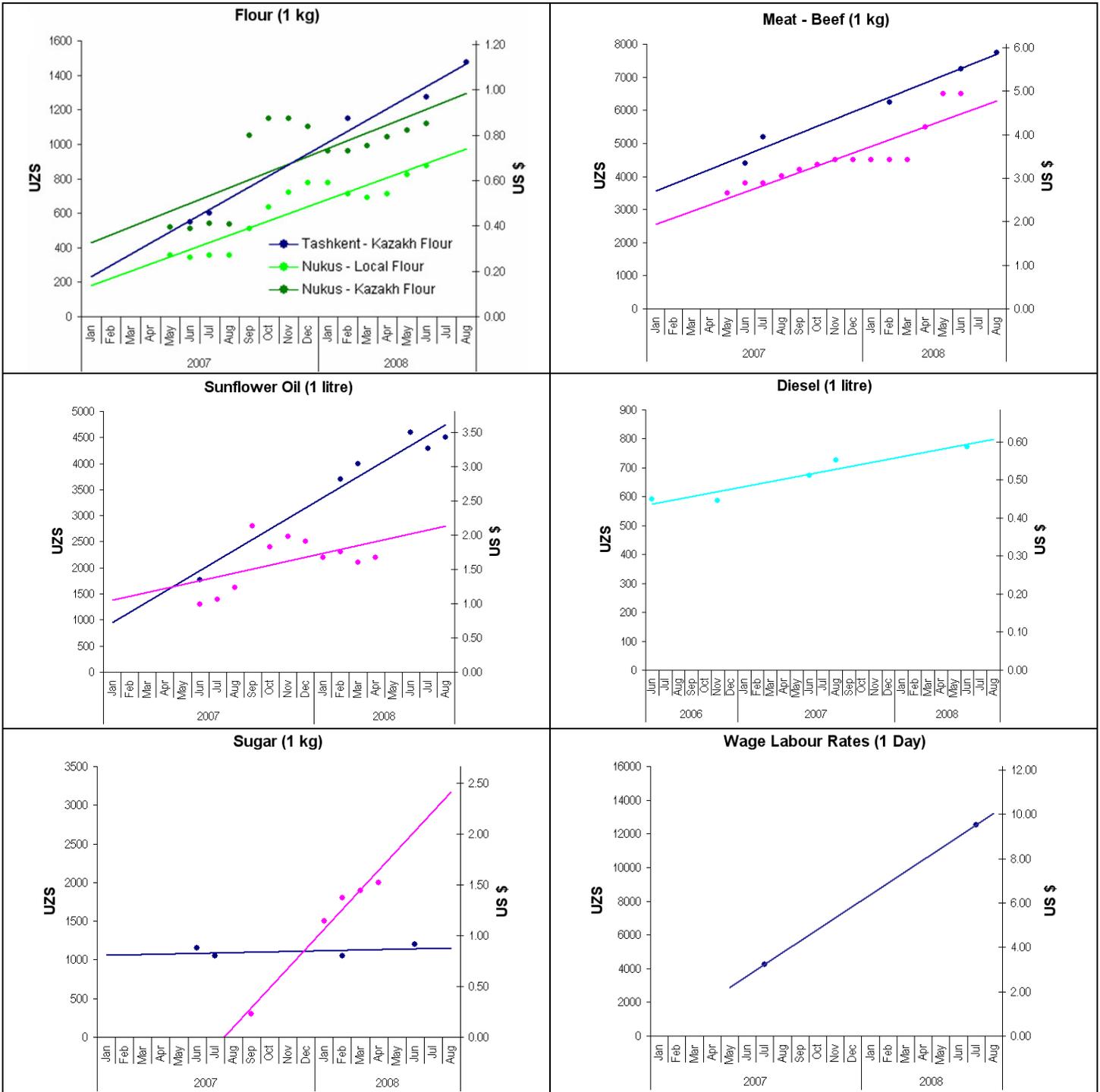
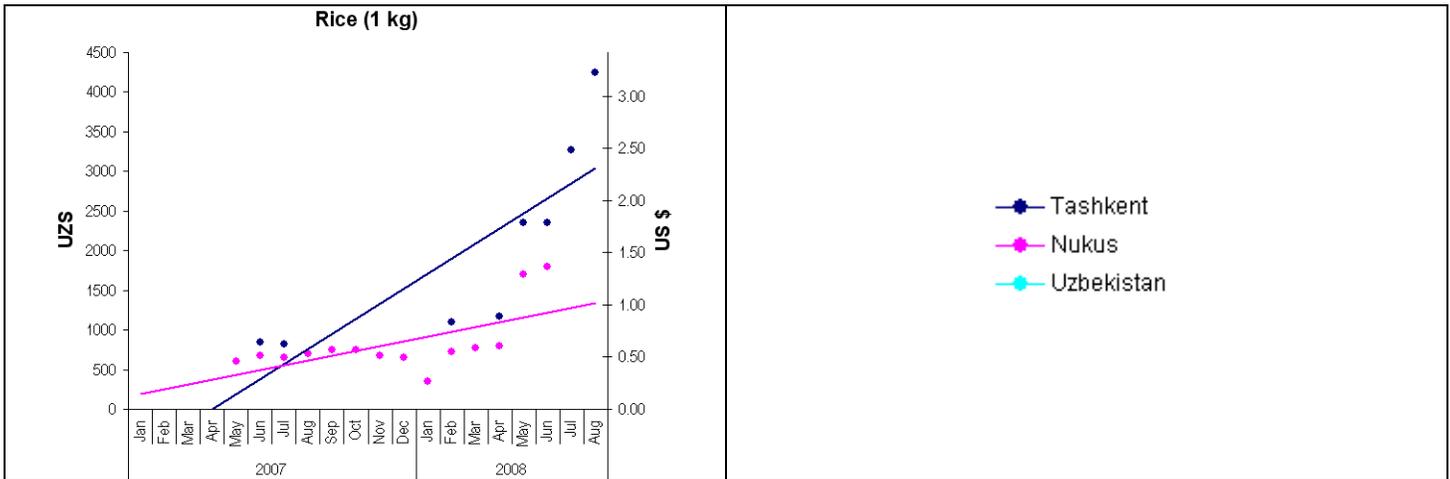


Figure 12 presents price graphs for seven commodities and shows similar slopes for beef and the two types of flour in Nukus. For all commodities except beef there is no apparent relationship between the two markets. Correlation coefficients, given in Annex 4, support the assumption with only beef prices showing a correlation coefficient >0.9.

Average country values for diesel and minimum wage gleaned from the same www.uznews.net website demonstrating increases are included for comparison purposes. Price differences between markets for the same commodities over the 18 months were tested for statistical significance using a series of T-tests, the results of which, are shown in Annex 4 with the average monthly values, and summarised below indicating that for:-

Figure 12. Retail Market Prices by Commodity, Uzbekistan





- Wheat flour:
 - differences in average price (US\$) of Kazakh flour between Tashkent (0.77 /kg) and Nukus (0.69 /kg) over the period were not statistically significant; but both are significantly higher than the price of local flour in Nukus at 0.47 /kg.
- Beef:
 - average prices (US\$) in Tashkent (4.96 /kg) are significantly higher than prices in Nukus (3.51 /kg);
- Sunflower seed oil:
 - average prices (US\$) in Tashkent (2.90 /kg) are significantly higher than prices in Nukus (1.62 /kg);
- Sugar:
 - average prices (US\$) in Tashkent (0.85 /kg) are not significantly lower than prices in Nukus (1.14 /kg);
- Rice:
 - average prices (US\$) in Tashkent (1.54 /kg) are significantly higher than prices in Nukus (0.63 /kg);

3.2.7 Social Support

As an ex-member of the USSR, Uzbekistan's social support system follows the pattern adopted throughout most of the CIS republics. However, during the Soviet era much of the budget came from federal sources. However, the structure has been sustained and regular payments are made to a typical CIS cluster of beneficiaries as indicated in Table 23.

The nominal minimum wage upon which the pensions and allowances are based is 12.6 US\$ per month. The actual minimum wage received by workers is estimated at US\$ 100 month, 15% greater than the

wage in 2006 (EBRD, 2008)¹⁰¹. Daily wages appear to have increased rapidly in Tashkent but no figures are available for other locations. Unless the birth rates in the rural sector were higher than in the urban sector in 2006 and 2007, around 71% of the population live in rural areas as official birth rate data show 71%- 72% of births were in rural areas. However, other official data (see 3.2.1) suggest 61% live in the rural sector, most of them, it is surmised, access dehqan plots.

Directed and managed by the Ministry of Labour and Social Protection (MoLSP), the distribution of pensions, allowances and benefits according to the national criteria, is at the discretion of local authorities. Website statistics place 33% of the population below the poverty line. Vulnerable families, *i.e.* those with incomes below 1.5 times the nominal minimum wage receive support which is reviewed every 6 months; 35% of all families are noted to be receiving benefits of some description.

Table 23. Social Support, US\$, Uzbekistan

Pensions	Allowances	Payments
<p>Old age;</p> <ul style="list-style-type: none"> • Old age pension for men >60 years and women >55 years. • Level set at 150% of min wage; was increased August 2007 by 25%; and by 12% in April 2008- now 18 US\$/month. • Discretionary supplements for workers where increased by 20% to 14 US\$/month in Nov 2007 	<p>Maternity;</p> <ul style="list-style-type: none"> • Child care – 2x min wage, 24 US\$/month up to 2 yrs old for non-working mothers. • Children under 18 years old with families receive 50% min wage per month <p>Disability;</p> <ul style="list-style-type: none"> • As regular monthly payments to vulnerable • Free care and prostheses 	<ul style="list-style-type: none"> • Vulnerable families with income less than the 150% minimum wage receive variable supplementary benefit from 6 to 36 US\$/month.

Despite the increases noted in Table 23 state support remains low and could not support an individual pensioner trying to buy the minimum food basket each month. Further support noted by the Mission includes: a) in some districts ration cards are issued to the vulnerable

¹⁰¹ Usamanov, S. (2008) Personal communication, EBRD, Tashkent

to allow purchase of UDM flour and other commodities (veg/ cotton seed oil) at state controlled rates b) vulnerable families are offered state-assisted holidays.

Since 1997, regulations have been in place to ensure that food imports and exports are controlled strategically to "*protect the markets and consumers*". Four agencies are responsible for imports Uzmakazimport; Uzprommashimpex; Markazsanatoexport; and Uzinterimpex. While there are, presently, a range of taxes on imports as noted above, there are no taxes or restrictions on exports.¹⁰² As against this official position, WFP were unable to import pulses from Uzbekistan during the past year, which presents a case for the regular monitoring of actual and advised custom procedures.

¹⁰² Saidov, B (2008) Personal communications. Min of For Econ Relations, Tashkent

3.3 Kyrgyzstan

3.3.1 General

Located in Central Asia between Uzbekistan (west); Kazakhstan (north); China (east) and Tajikistan (south), Kyrgyzstan is a double land-locked country with a population of 5.22 million people in c. 1,000,000 households that has existed as an independent republic for the past 17 years, since the break-up of the USSR. The form of the break-up has left three Kyrgyz enclaves outside of the existing borders (2 in Uzbekistan; 1 in Tajikistan) around which serious disputes still prevail, which in the light of recent events regarding enclaves in the Caucasus, should swiftly become the focus of international attention.

The country is mountainous with an arable area of only 6.5% (1.4 million ha) and a pastoralist heritage which informs the prevailing seasonally-orientated livestock production systems that provides, with crop production, the basis of the livelihoods of 66% of the population that live in rural areas.

The initial years (1992-95) of independence witnessed a dramatic decline on an economy dependent import-export interchanges between republics within the USSR. Thereafter, steady GDP growth linked to the export of gold is recorded, until social upheavals in 2005/6 caused growth to falter. GDP growth in 2007 is posted at 8.2%.

The progress of transition from the Soviet command economy to a western-orientated capitalist economy is considered to have been satisfactory with the associated involvement of international financial institutions. However, recent Government and International Agency pronouncements regarding the state's ability to withstand shocks suggests that the state of the economy is still fragile. By the same token, in 2007 there was an internal negative fiscal balance of 4 million US\$ (Nat Bank, 2008¹⁰³) and some 39% of the population are living below the poverty line, which, although lower than the 49.9 % noted in 2003¹⁰⁴, is still high and apparently connected to a lowering recent of the threshold. Presently, a Bill is before Parliament awaiting signature identifying government measures to bolster food security.

¹⁰³ www.stat.kg; www.cisstat.com - 13 million US\$

¹⁰⁴ National Statistics Committee (2008) Socio-Economic Situation of Kyrgyz Republic, Bishkek.

3.3.2 Macro-Economy

A closer look at the macro-economics through key informant interviews, reviews of several recent analyses and announcements relating to the macro-economy of Kyrgyzstan was undertaken by the Mission. The conclusions reached confirm the fluctuating fortunes in the past five years. Growth rates of 0% to 10% in the previous ten years delivered a 680¹⁰⁵ US\$ GDP per capita per annum in 2004. The GDP growth since 2004 has improved from the recession in 2005 to reach 8.2% in 2007. However, there is still an on-going budget deficit that limits room for manoeuvre. External debt is judged to be 70% of 2007 GDP; and > 2x the reserves of gold and foreign exchange. A brief time series of macro-economic indicators is provided in Table 24 indicating the recent recovery.

Table 24. Economic Indicators, 2003-2007, Kyrgyzstan

Economic Indicator	2003	2004	2005	2006	2007
Per capita GDP real (US\$)	635*	680*	674*	693*	750*
GDP growth (% change per year)	7.0	7.0	-0.2	2.7	8.2
CPI (% change per year)	3.0	4.0	4.0	6.0	10.2
Unemployment rate (%) ¹⁰⁶	4.2	4.0	3.7	3.5	3.2
Export growth CIS (% change per year)	19	37	10	25	49.6
Export growth non CIS (% change per year)	17	20.2	83	13	36.6
Import growth CIS	27	42	17	46	53.8
Import growth non-CIS	16	17	17	72	22.8

CPI = consumer price index, GDP = gross domestic product

Sources: www.cisstat.com

* Nat Bank, 2008- Mission extrapolated; 721 US\$/ head USA Dept of State

In the UNDP Human Development Report 2006, Kyrgyzstan's Human Development Index is ranked 116th (in the "Medium" countries ranking) out of 177 countries. Kyrgyzstan is also in a similarly ranked position in the World Bank Wealth Ranking table at 56th from bottom with a score of US \$14,000 per capita¹⁰⁷.

¹⁰⁵ Calculated by Mission count back from 2007 figure given by National Bank, Bishkek (2008)

¹⁰⁶ Official- unofficial (2008) 28-29% including *non-employed*

¹⁰⁷ Compare- Tajikistan 40th from bottom US\$ 8,500; Uzbekistan 60th from bottom US\$ 15,000; Turkmenistan 84th from bottom US\$ 29,000 Kazakhstan 92nd from bottom US\$ 32,000 (all middle-wealth ranked)

The contributions to GDP by sector in 2007 are noted as services 49.1%; industry 19.9% and agriculture 30.9%. Exports consist of gold and other metals, hydro-electricity of which 25% of the output is exported, and agricultural products.

Notwithstanding the official figure of 3.2% (Table 24), real unemployment is reported regularly to be in the order of 28% but perhaps this may be more accurately described as *non-employment* as the “unemployed” make significant contributions to the household food economies through what is most clearly a thriving subsistence and near subsistence agricultural sub-sector connected to the long-term home gardens.

As well as home gardens the other saving grace for survival is the money sent home by migrant workers. Such remittances began in 1992, the value of which may really only be guessed at but may be equal to 27% of the GDP or in excess of US\$ 1.0 billion per annum¹⁰⁸ from 1,000,000 workers each sending back >US\$ 1000 per annum. Although it was impossible to confirm in any key informant interviews, the Mission suggests that this source of revenue is not included in the GDP a) by definition and b) as there is no obvious place in the disaggregated total where remittances could be /have been placed. Adding remittances to GDP lifts a possible GNI to US\$ 952 per annum per head.

3.3.3 Agricultural Sector

Agriculture is one of the most important sectors of the economy: share of agricultural production in GDP is noted as 36% in 2002, matching levels reached in Soviet times. However, since 2002, initially slower rates until negative growth in 2005 and near-stagnation thereafter led to a fall in the agricultural contribution to GDP, as trade and communications have posted higher growth rates over the same period. Nevertheless potatoes and vegetables contribute 12% to the value of official exports.

The agricultural sector employs about 340,000 workers¹⁰⁹ a drop of c. 60% since 1991. At the same time the structure of the sector has altered dramatically. As part of the initial moves in the transition from the command economy, land reform began in 1992 when 400 collectives (*kolkhoz*) accounting for 75% of the arable land, were privatised and land distributed to the peasant members. Of the

¹⁰⁸ Seilback, Y. (2008) Personal communication, Nat Bank, Bishkek;

¹⁰⁹ World Bank (2004) Kyrgyz Republic; Agricultural Policy Update, Washington

remaining 25%, previously connected to state farms, some is now being farmed on long-term leases by agricultural enterprises; and 18% is termed Land Redistribution Fund land and is leased annually. These much quoted proportions are presently being challenged as cadastral surveys and mapping in 130 of 442 districts suggest that the area distributed is closer to 66% and that a significant area of land has "gone missing"¹¹⁰. In the districts that have been mapped, local authorities are adopting a more transparent policy to leasing LRF land. Public auctions for leases are being held and rents are, on average, four times higher at 9,550 KGS/ ha/ year (US\$ 267) instead of 2,400 KGS / ha/ year (US\$ 67) a year ago.

To summarise, the agricultural sector now comprises four types of production units. Three, the peasant farms, large enterprises and leased land units are registered as businesses. The fourth type of unit, the *korajai* or household plot, remains much as it was under the USSR, an unregistered source of most of the potatoes and vegetables; a modest proportion of grain and fodder and, nowadays, about half of the livestock products. Table 25 presents rough estimates of the areas of land involved.

Table 25. Farm Structure in Kyrgyzstan

Type of Entity	Number	Arable Land (ha)	Average Size (ha/farm)	% Arable Area
Agric Enterprises; State farms; Large Coops (incl. pasture only holdings. + Unallocated and LRF areas)	659	360,000	546	25%
Peasant farms, registered as farming businesses	330,000 (including small coops)	990,000	c. 3.0	69%
<i>Korajai</i> hh Plots	880,000 ¹¹¹	90,000	0.1	6.3%
Total:	-	1,440,000	-	100%

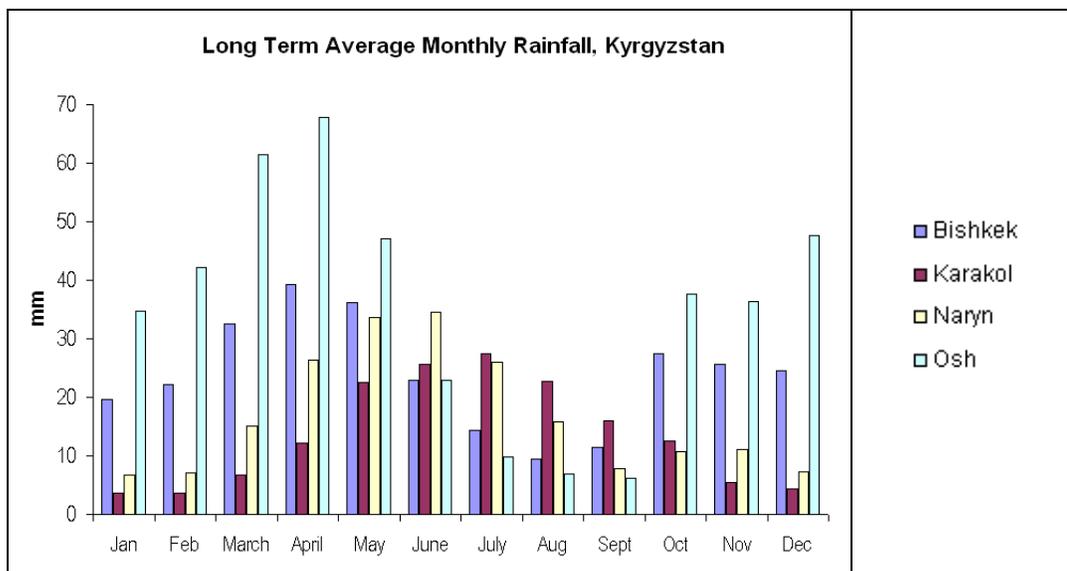
Source: Mission data 2008- collected MoA; Chemonics; WB.

¹¹⁰ Arapova, C. (2008) Personal communication, Chemonics, Bishkek

¹¹¹ World Bank (2004) APU figure. MoA (2008) suggest 60% of hh; some hh have, therefore, more than one plot.

The foregoing notwithstanding, agricultural production and more specifically crop production depends on c. 1.07 million ha of irrigable land out of a potential 1.43 million ha of arable area available for cultivation. Rainfed agriculture on the remaining areas contributes variable grain harvests from about one year in three, depending on the opportunistic use of the rain in the piedmont areas of the ubiquitous mountain ranges. Figure 13 presents long-term average monthly rainfall data for four different areas of the country. The histograms show that the lowest rainfall period, in all areas except Karakol, is during the main crop growing season. By the same token, regular autumn rains and early winter rains in the Osh (and Jalabat) *Oblast* provide a significant boost to December sown winter wheat and to the autumn pastures on the in-bye land for the transhumant livestock returning from mountain pastures.

Figure 13. Rainfall Patterns in Kyrgyzstan



The core crop-producing area of some 1.07 million ha is sustained by surface water flow from the mountains through irrigation systems inherited from Soviet times. Functioning, albeit below previous levels of efficiency with only 0.8 million ha estimated as having a satisfactory water supply for the main crop and only 0.2 million ha likely to be double-cropped, the system is undergoing a managerial transformation. Under the recently established Water Code, Water Users' Associations (WUAs) are responsible for the delivery of water to

the individual farms. Hitherto, this link between the primary canals from the river basins that are managed by the Department of Water Resources was the concern of the *kolkhoz* irrigation specialists. With the break-up of the *kolkhoz*, experts of all descriptions moved elsewhere, most returning to Russia, leaving a technical and administrative vacuum. The creation of 450 WUAs covering c. 0.8 million ha has established a new format for organising equitable and transparent distribution regimes to command areas, improving maintenance and delivery and setting up locally acceptable fee collecting mechanisms to fund irrigators and improvements. The WUAs supported by NGOs/ International Agencies are noted to be leading to more efficient water use and improved yields¹¹². On-farm water management is the responsibility of the farmers themselves. Flood irrigation using border strips or ridge and furrow layouts, depending on crop, predominate and connect to the land allocation systems¹¹³.

Since the times of the USSR, emphasis has switched from industrial crops¹¹⁴ to food crops in keeping with the early subsistence nature of the new holdings created by land reform. From 1997 onwards growth of production from the c. 300,000 new farms continued each year within the food supply sector rather than the industrial crop sector, confirming their usefulness as both an engine for development and a major cog in the drive for food security. By 2002 production from the peasant farms exceeded the value of production from the *korajai* as shown in Table 26, as input use increased and marketing chains evolved to handle the surplus.

This real improvement has continued and is being supported by a number of NGOs and agencies working with self-help groups and pre-cooperatives to improve production, processing and marketing. In strict terms of return per ha, Table 26 shows that the labour-intensive, multi-cropped, mixed-farming systems of the *korajai* are far more productive than the emerging peasant farms. However, it is worth noting that the difference between the two larger enterprises (taxable) and the *korajai* yields (not taxable) is very likely to be exaggerated due to a lack of reporting objectivity to local authorities/ National Statistics Committee enumerators, whose annual estimates are based on verbal reports from samples of peasant farmers and written reports

¹¹² Baxter, J. (2008) Personal Communication, Winrock International, Osh.

¹¹³ These features create strip farming patterns that *inter alia* make unit boundaries easy to identify during crop assessment and extension related activities.

¹¹⁴ Termed technical crops in most documents.

from the enterprises¹¹⁵; *both sets of data being shared with tax officials*. At the same time, the fertility of the small household plots is restored annually by the use of animal manure due to the integrated nature of the crop/ livestock system, the larger peasant farms and enterprises do not have such a capability.

Table 26. Contribution to Agricultural Sector, Kyrgyzstan

	<i>Korajai</i>	Peasant Farms	Agric Enterprises
Number	880,000	330,000	659
Ave. Size	0.1 ha	3.0 ha	546 ha
% Arable Land	6%	69%	25%
% Labour	40%	52%	8%
% Value	38%	59%	3%
Value Added /ha	3400 US\$	500 US\$	86 US\$

Source: Mission updates of World Bank 2004.

Regarding inputs, the supply of seeds, fertiliser and plant protection chemicals is liberalised and subject to market forces. Fertilisers are used on all categories of farms but since Soviet times, regular or even spasmodic government soil-sampling and analysis has stopped and no private or NGO has taken up this activity. Blanket application of ammonium nitrate or urea is the most common practice at application rates 50% or less than MoA recommendations for most crops; the new generation of farmers seemingly being unwilling to pay extra for compound or ammonium phosphate alternatives. The loss of specialists at village level due to break-up of the *kolkhoz* is felt by one of the leading agencies¹¹⁶ to be responsible for an all-pervading loss of technical knowledge, which is taking time to reinstall among the new farm decision makers.

Regarding pest control; given the liberalisation of trade in farm inputs, herbicides and pesticides against non-migratory pests are available in the market place. Cheap Chinese versions at 4 US\$/litre, compared to globally recognised brands at 12 US\$/litre and Russian brands at 9 US\$/litre, are available but are of unknown efficacy and are sold with instructions in Chinese, which begs questions over their accurate and efficient use.

¹¹⁵ No independent measurements, sampling, weighing or auditing observations.

¹¹⁶ Toktosunov, S. (2008) Personal communication, Regional Manger, Rural Advisory Services, Osh

Migratory pests are the concern of government, and as with the neighbors, following the pattern established during the Soviet era, thousands of hectares of the dry steppe- semi-desert grasslands are blanket sprayed every year by the authorities with broad spectrum pesticides to control the hopper (larval) generations of grassland locusts *Calliptamus italicus*- the Italian locust; and *Dociostaurus maroccanus*- the Moroccan locust, before they reach the flying stages and threaten field crops in the bordering arable areas. Dramatic staff cuts, non-replacement of old equipment and insufficient budgets for recurrent expenditure have negatively affected the service. Presently, a proposal is being considered by FAO funders to establish an integrated network of locust control in the sub-Region. Kyrgyzstan specialists consider they are well-placed and well-suited to be the hub of that programme.

3.3.4 Crop Production 2007/8

As the design and timing of the Mission and level of access and actual availability of the current production data precludes a full analysis of crop production; early data¹¹⁷, secondary data from reports, key informant interviews and transects and time-series data downloaded from independent websites have been brought together to provide an outline estimate of production of the main staple, wheat, and other crops.

The 2007/8 winter is noted in the region as having been severe. Only qualitative statements are available but it would seem that snow fall was heavy in December and January in the mountain water catchments, with temperatures below normal.

Heavier than normal rains were recorded in February in most districts which, with a quick snowmelt reflecting higher than normal temperatures in March, meant:-

- early run-off from the mountains feeding the rivers with higher than normal discharges in 8/9 river basins; significant increases into the Orto-Tokoi, Kirov and Toktogol reservoirs at 34%, 27% and 17% above norm respectively¹¹⁸;
- early start to the spring planting season and a 68% increase in area sown by the end of the first quarter compared to 2007¹¹⁹;
- a good early bite in the mountain pastures.

¹¹⁷ MoA/ EU (2008), Quarter 1 Food Security Information Bulletin, Kyrgyzstan (2008)

¹¹⁸ Main Department of Meteorology, Bishkek (2008)

¹¹⁹ National Statistics Committee (2008) Food Security Bulletin

No data are available for late-spring, early-summer rainfall but key informants in Bishkek agreed that the rains in April and May were considered to have been less than usual. The Department of Water Resources quoted in the MoA/ EU Bulletin on Wheat and Food Situation May/ June (2008) identifies a significant water shortage (50%) in the reservoirs. This appears to connect to increased releases for energy generation, particularly from the Toktogul reservoir, and, in this respect may have a greater effect on irrigation in Uzbekistan than in the Kyrgyzstan. The Mission transects, driven in July from Bishkek to Osh *Oblast* via Jalalabat and onwards to Aerevan; and from Bishkek to the border confirm a lack of rainfed cereal crops. Farm visits also suggest that rainfed planting of spring cereals, which is always opportunistic, was minimal this year. The hill pastures around the villages and towns were all grazed-out with no growth expected until autumn. Livestock had, for the most part, migrated to the summer pastures in the mountain areas following their usual pattern, where by contrast, steady rains were both reported to the Mission and noted by the Mission during a field visit to flocks/ herds on the south facing slopes of the northern mountain range.

According to the National Statistics Committee (2008), by June, sowing of wheat (winter and spring) and barley had exceeded the areas sown in 2007 by some 80,000 ha and 392,000 ha of wheat and 160,000 ha of barley. Maize and potatoes were still being sown at the time of the Mission but already the early start to the spring planting season meant that last year's planted areas had already been achieved for both of these two crops, many of the crop-stands noted being very well advanced with tasseled maize in evidence in plots and farms in both Bishkek (north) and Jalalabat and Osh (south). Total crop cover at 1st June is reported to be 692,000 ha, with a further 20% of the area likely to be second-cropped after harvest. The Mission estimates that some 830,000 ha will be sown in 2008. Earlier claims of lack of seed would seem to apply to improved seeds only, not farmer carry-over seeds and local seeds purchased through village markets that have, presumably, allowed planned targets to be met.

Pests and disease challenges during the season are noted to have been at normal levels for both non-migratory and migratory pests with the perennial threat of grassland locusts controlled by a spraying programme organised by the Department of Chemicalisation and Plant Protection. This year, locust surveys in three *oblasts* over 943,000 ha of permanent pasture, where the Moroccan and Italian hoppers hatch and develop, resulted in the treatment of 154,000 ha by spraying of broad spectrum insecticides using aeroplanes and aerosol generators

under contract from the private sector. The hoppers were controlled before reaching the arable area and no crop losses were reported.

Regarding other inputs, the level of fertilizer used in 2008 is expected to have been in the order of 90,000 tones, 25% of the recommended level of 360,000 tones but higher than last year despite prices increase of 100% from 8 to 15 KGS/kg (220 US\$/t to 420 US\$/t).

The yields of rained cereals noted during Mission transects were poor (0.3- 0.9 t/ha) compared to the 2.5- 6.0 t/ha yields of wheat noted in the irrigated sub-sector. Average cereal yields published by the National Statistics Committee have dropped from 2.73 t/ha in 2002 to 2.43 t/ha in 2007. Wheat yields are said to have been 2.0 t/ha in 2006 and 2007. This is worrying for the following reasons;

- there appears to be a time lag between the acknowledgement that peasant farms are now embracing technological improvements and the yield that is *assigned* to that sub-sector;
- there is no apparent distinction between the irrigated wheat yields and the yield of rained wheat;
- this year almost all wheat is irrigated¹²⁰;
- average wheat yields bear no relation to the yields of irrigated wheat observed during transects, reported by projects at 4-6 t/ha or reported in neighboring countries under similar conditions of irrigation, inputs and husbandry;
- wheat yields BASIS/CASE Farm survey¹²¹ estimated by World Bank suggest an average of 3.125 t/ha (2006);

The above observations suggest that national average yields of wheat are underestimated and have been for some time. By contrast, maize yields noted at 5.9 t/ha would seem to be over estimated at this stage of growth, a more conservative 4.0 t/ha is preferred by the Mission. For reasons noted above, the Mission offers two estimates of cereal production, an estimate based on time-series yield/ha data and another estimate based on Mission adjusted time-series data, shown in Table 27.

¹²⁰ Data should distinguish clearly between rainfed and irrigated wheat area.

¹²¹ World Bank (2006) APU, Washington. South: 65% between 3.5 to >5 t/ha - median 4 t; North: 85% 1.5 to 4 t/ha - median 2.8t.

Table 27. Annual Crop Areas¹²² and Production Outline Estimates, 2008, Kyrgyzstan

	Area (ha)	Production (t) ¹	Production (t) ²
Wheat	392,000	784,000 (2.0 t/ha)	1,176,000 (3.0 t/ha)
Barley/Others	150,000	270,000 (1.8 t/ha)	150,000 (1.0 t/ha)
Maize	74,000	436,000 (5.9 t/ha)	296,000 (4.0 t/ha)
Rice paddy	8,000	12,000	12,000
Total cereals		1,502,000	1,634,000

¹ MoA estimates; ² Mission estimates extrapolated from various sources¹²³

The MoA estimate connects to a combined spring and cereal harvest of 1.502 million tonnes of mixed cereals of which 0.784 million tonnes are expected to be wheat. Mission estimates are 1.634 million tonnes for cereals of which 1.176 million tonnes are expected to be wheat. All estimates used by the Mission for other crops are similar to last year's levels except maize, which despite transect observations that the crop is excellent, is estimated more conservatively than MoA, as at least 0% of the crop has yet to tassel.

Table 28 presents two time-series for production estimates for the four main cereal crops drawn from USDA data for the past four years¹²⁴.

Table 28. Cereal Production Time Series, '000s tonnes, Kyrgyzstan

Crop Source	2004		2005		2006		2007	
	MoA	USDA	MoA	USDA	MoA	USDA	MoA	USDA
Wheat	998	1000	950	950	840	890	709	710
Barley	233	200	214	235	204	200	227	205
Maize	452	n/a	437	n/a	438	n/a	461	n/a
Rice	18	12	17	12	18	12	17	12

The time-series from USDA appears to be calculated using yields of 2 t/ha for wheat for each year, which suggests no analysis or observation of production performance.

¹²² Not including cotton, irrigated forage or other food crops.

¹²³ Despite Mission requests passed formally through Min of For Affairs; and agreed by Dep Minister MoA, no data was provided for detailed agric performance or for consumer/ wholesale/ farm gate prices.

¹²⁴ www.indexmundi.com

Production estimates link to a cereal balance suggesting that some 1,502,000 t of cereals (MoA) (1,634,000 t - Mission), of which 784,000 t (1,176,000 t - Mission) will be wheat, is required in the 2008/9 marketing year for a mid-marketing year population of 5.30 million people. Table 29 provides the outline balance for wheat and rice. Parameters of the balance have been calculated based on the following premises:-

- Population mid marketing year 2008/9 will be 5.30 million;
- Annual consumption patterns- wheat equivalent 205¹²⁵ kg/head, rice 2.45¹²⁶ kg/head;
- Seed requirements as practiced; wheat 250 kg/ha; rice 80 kg/ha;
- Post harvest handling and storage losses - 12%;
- Animal feed use¹²⁷ - supplementary concentrates assuming grain feed: wheat 10% MoA; *Mission estimate 20%* considered animal feed standard; all barley less brewing use; all maize less brewing/ distilling use, use as *kasha-apish* (soup dish) and all wheat-bran by-products;
- Stocks – *Mission build up to 132,000 t*¹²⁸; MoA assumes no draw down.

Table 29. Cereal Balance, 2008, '000s tonnes, Kyrgyzstan

	Wheat MoA	Wheat Mission	Rice - Milled Mission	Total MoA Wheat	Total Mission Wheat and Rice
Dom Av	784	1,226	8	784	1,234
Stocks used	No change	50	0	No change	50
Dom Prod	784	1,176	8	784	1,184
Dom Req	1,359	1,695	14	1,359	1,709
Food use	1,087	1,087	12	1,087	1,099
Seed use	100	100	1	100	101
Feed use	78	235	0	78	235
Losses	94	141	1	94	142
Stocks	No change	132	0	No change	132
Imports	575	469	6	575	475
Food use/yr	205 kg/head	205 kg/head	2.45 kg/head	205 kg/head	210.5 kg/head

¹²⁵ USDA (2008) Consumption estimate

¹²⁶ USDA (2008) Milled Consumption estimate for Uzbekistan, adopted by Mission in absence of other

¹²⁷ Animal diets also include fodder beets and conserved forages

¹²⁸ MoA policy, actual amount uncertain; 50,000 t assumed

The import requirement of wheat, incorporating flour as wheat equivalents, for 2008/9 is estimated at **0.575 million tonnes** using MoA figures and **0.469 million tonnes** using Mission figures. The figures are either side of the National Statistics Committee import estimates of **0.506 million tonnes** for 2007 but are double the 0.275 million tonnes estimated by USDA¹²⁹.

Using Mission-collected data, wheat and wheat flour export from Kazakhstan reached **0.425 million tonnes** of wheat-equivalent comprising 117,000 tonnes of wheat flour and 269,000 tonnes of wheat grain in 2007. Kazakh wheat grain exports to Kyrgyzstan to April 2008 were 274,000 tonnes, 5,000 tonnes more than was exported during the whole Kazakh marketing year in 2007. Flour exports to June 2008 were already recorded by Kazakh officials at 70,000 t.

Regarding other food crops; following the growth in production from the peasant farms, *korajai* (hh plots) now provide less of the production of other crops than previously cited, all other crops are spring planted, grow under irrigation and are estimated to be similar in both area and performance to 2007. Table 30 below shows MoA expected production levels and percentages available for export.

Table 30. MoA Production Estimates, 2008, Kyrgyzstan

Crop	Area	Production	Exportable Surplus
Potatoes	86,000	1,376,000	60%
Veg	43,000	774,000	14%
Melons	5,000	80,000	14%
Forage	244,000	n/a	0

Source: Food Security Information Bulletin

Regarding livestock; after privatisation of the collectives holding livestock, post-Soviet livestock ownership is predominantly conducted in *korajai* and peasant farmer units (cattle- 96%; sheep and goats- 96%; horses- 97%; chickens- 85%). As such, livestock numbers per unit are very small and easily managed. 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, the post-Soviet decline in livestock numbers noted in

¹²⁹ www.indexmundi.com This connects to wheat grain only and is similar to Mission figures for 2007 and 2008

Tajikistan is noted here in Kyrgyzstan. Sheep and goat numbers fell by 60% until stabilising in 1996, with a breeding population of 2.7 million ewes and does. Cattle numbers initially fell by 25% and have since increased slightly to some 0.6 million head or 85% of Soviet stocking. Therefore the livestock sector currently, with small populations of horses at 0.15 million head, and yaks at 9,000 head, comprises c. 1.2 million herbivorous livestock units (LUs), plus a small pig sub-sector and poultry industry equivalent to 0.5 million layers.

Key informants explained that for cattle, unit 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 montane¹³⁰ seasonal system involving:

- spring lambing;
- transhumant mountain grazing of the whole flock; hhs' flocks are taken to mountain grazings (*gylo*) by family members or in groups of flocks by village shepherds;
- late summer, autumn weaning of male lambs for sale as slaughter stock or stores;
- retention of around 50 % of ewe-lambs to replace broken-mouthed ewes (4-5 year old) as breeding stock members;
- sale of surplus ewe- lambs for slaughter/ stores/ breeding stock;
- fattening of broken-mouthed, cull ewes on *korajai* for eating or sale.

Winter carrying capacity determines the size of the hh breeding flock, which, in turn depends on a variety of home-produced feeds including the poorer quality wheat, maize and barley grain; and by-products *viz* straw, stover and bran to supplement in-bye grazing and locally-produced meadow and lucerne hay.

- 1.2 million LUs require 1.8 million tonnes of dry matter (DM) to eat to appetite during a 150 day winter (5 months);

¹³⁰ A Mission review of the World Bank (2005) Livestock Sector Survey, the only sector review available, indicated that the review was very veterinary focussed. The production cycles/ systems/ seasonal nature of animal production noted by the Mission may not be fully understood, A Sector Survey update with extensive field study of the production systems currently used, especially role of the *gylo* seems urgently needed.

- 244,000 ha of irrigated lucerne plots and grass leys will provide at least 1 million tonnes DM;
- 500,000 ha of cereal straw and stover will provide another 1 million tonnes DM;
- in-bye rough grazing in autumn and spring will provide a currently unknown quantity of DM that needs to be estimated¹³¹;
- supplementary concentrates required to increase quality of the ration for fattening, pregnancy and milk production supplements are in the order of 750,000 tonnes of grains and 150,000 tonnes of bran, .
- in addition, the indigenous breeds have a strong capability, shared with most montane stock, of rapidly gaining condition in summer to *live of their backs* in winter. Such a characteristic needs nurturing in development programmes.

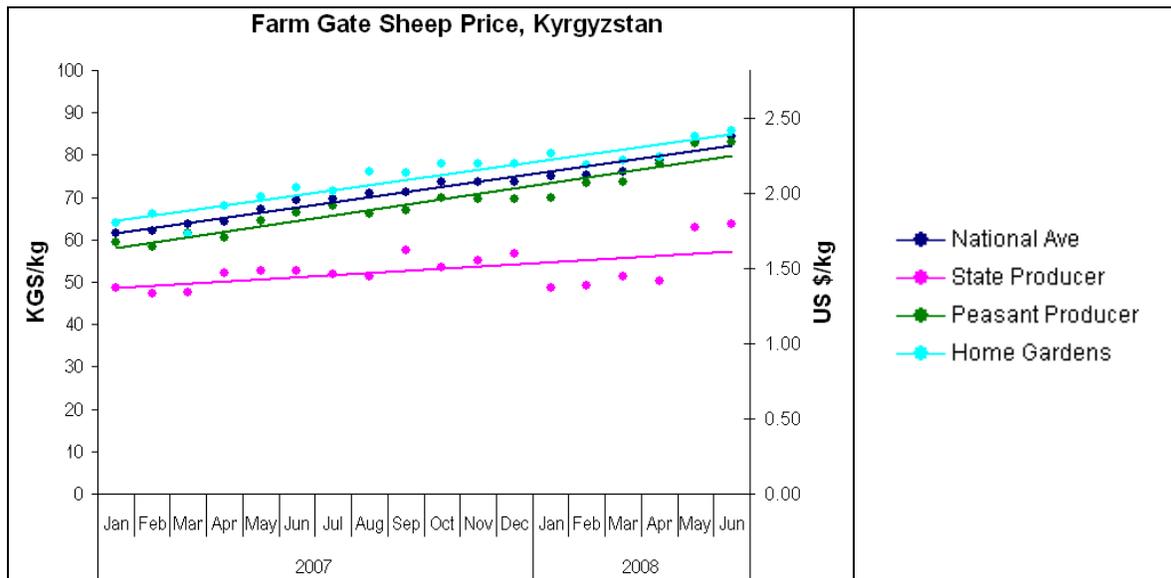
The production of each livestock based commodity is estimated to have increased in 2007, by around 4-6%, however levels are low particularly in the larger specialist flocks (75-80% lambing noted). Calving interval is noted in the World Bank review to be two years, although Mission visits suggest it is nearer to one year but with a lot of *slippage* that doesn't seem to be counted. Horses foal annually in Jan-Feb and the number of mares with foals at foot noted across the mountain ranges confirm the probability of a high foaling percentage per annum.

Recorded observations taken during Mission transects around Bishkek *Oblast* and traversing the mountains through Karakal via Jalabad to Osh confirm cattle, horses, sheep and goats to be in excellent body condition. Further, transhumant patterns were normal in both the northern and southern grazing areas and selling practices, noted in Osh's main animal market, were following the traditional trends of presentations. Prices were firm and trader expectations were that the prices would remain firm until the regular annual sales began in September as stock return from summer grazing, when prices usually fall. National farm gate prices of sheep meat shown in Figure 14 and show steady increases in price throughout the year with no spikes, indicating shortages, but troughs in prices for state farm produce are noticeable from Jan to March in both years suggesting increased sales or poorer quality items in the long winter months.

¹³¹ May be done using exclusion cages; should be linked to indicator farm/unit monitoring.

Figure 14 suggests that data on both prices and livestock, presentations sold and unsold, should be monitored in key markets to assess the situation more fully.

Figure 14. Farm Gate Sheep Prices, 2007/2008, Kyrgyzstan



3.3.5 Market Supply Chains

Kyrgyz self-sufficiency extends to potatoes, most vegetables and fruits, milk products, meat (93%) and eggs; while 85% of sugar and 44% of vegetable oil needs are imported.

Access to neighboring countries is extremely restricted as noted by the relief map in Figure 1 and the communications maps in Figures 2 and 3. Consequently, all imported goods from Russia (sugar, pasta) whether dispatched by road or rail must enter through Kazakhstan or Uzbekistan. Road traffic through Uzbekistan is subject to a blanket tariff of US\$ 400 per truck. No such charges are presently attached to rail wagons. Wheat and wheat products from Kazakhstan are transported directly by rail although road access is available. International road and rail prices have increased since 2007 as indicated by the Almaty–Bishkek tariffs in US\$ per tonne given in Table 31.

Table 31. Transport Charges, US\$/tonne, Kazakhstan to Kyrgyzstan

Route: Almaty-Bishkek	2007 Price (US\$/t)	2008 Price (US\$/t)
Road	25	40 (+60%)
Rail	27.4	29.5 (+10%)

No such increases were noted for internal road transport, which have remained steady over the past year, at 42.9 US\$ per tonne for the Bishkek–Osh route.

Trade is liberalised and international trade is open to any trader with foreign exchange and the appropriate international connections. There are presently no import taxes on food stuffs although sugar is subject to seasonal tariffs that may reach 30%. In July 2008, an export tax of 100% was introduced on sales of wheat, wheat products, oilseeds and vegetable oils effectively blocking export of home produced goods and the re-export of imported goods. No such tax is levied on fruit or vegetables or on any of their derivatives. This is a very important distinction as most USAID/ GTZ/ EU/ DFID supported agricultural programmes connect to the improved marketing of surpluses, especially fruits and vegetables and their processed products, to boost livelihoods and prevent wastage. A combination of the small size of the individual production units and the absence of processing plants means that non-wheat, local produce is;

- consumed locally;
- traded through a series of merchant steps from village to main centers;
- transported by fleets of small, two-tonne trucks by groups of producers to the main markets.

The agency programmes are designed to support the expansion of such activities. No processed or dried vegetables or fruits were evident at the time of the visit, confirming by their absence, the contention that much of the surplus seasonal production is probably wasted¹³². In addition to technical and funding support through credit services, such programs included the establishment of a market price monitoring

¹³² Not including home bottling/ curing/ salting/ drying/ smoking practices which occur in every hh to conserve surplus production for winter use.

agency, KAMIS¹³³, who publish a bimonthly newspaper presenting lists of monthly prices for producers and consumers.

Wheat and wheat flour follows a different model. There are 3,000 flour mills in villages and rural towns, 80% of which have a capacity of 2 t per day and practice *toll* milling for farmers at rates of c. 150 US\$ per tonne (7.5 US\$ per 50 kg sack). Twenty-five mills with capacities of 20-500 tonnes per day belong to the Millers' Association, buying wheat and selling flour to the main city bakers and distributors; the remaining 575 occupy an intermediate position. The advantage of being small is that millers/ bakers with a turnover below US\$ 134,000 a year do not have to charge VAT on their products. Forty¹³⁴ of the larger millers and bakers do have to charge VAT, which was reduced from 20% to 10% in Jan/ Feb 2008¹³⁵. The larger millers in the 20% fraction (c. 600) buy local and Kazakh wheat and mix them in a 3:1 ratio to maintain quality, which is reflected in both the quantity of wheat grain imports and the price of flour. In addition to home milled flour, wheat flour is imported from Kazakhstan and Russia and is sold through wholesaler distribution networks, including mills in the off-season¹³⁶. First grade or premium grade flour from the flour mills is sold to;

- large baking companies,
- wholesalers for distribution;
- large retailers.

Scroll-down credit is commonplace all along the supply chain from the mill to the Kazakh exporter for imported wheat. The closure, in April 2008, of Kazakh wheat exports, does not seem to have negatively affected the quantity of wheat grain imported (0.273 million tonnes in 2008; 0.269 million tonnes in 2007).

Figure 15 presents official farm gate wheat prices throughout the year, confirming the Mission findings that prices increased to the farmers in line with international prices.

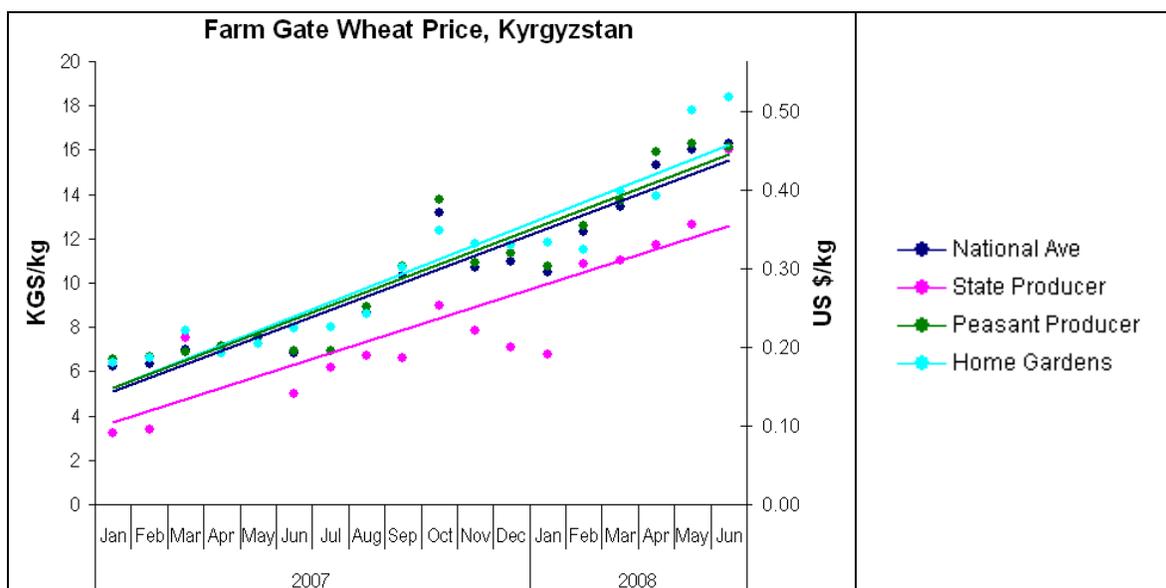
¹³³ KAMIS data for three sample markets have been used in the mission analyses. The agency needs support to survive as not enough local companies subscribe to the service.

¹³⁴ Tungatorov, U. (2008) Personal communication, Head Marketing/ Processing, MoA, Bishkek

¹³⁵ Semenchuk, S. (2008) Personal communication, Pres. Millers Association, Bishkek

¹³⁶ Some mills close for 1- 3 months each year before new season Kazakh grain arrives in Sept. those situated at railheads receive and sell flour as noted by Mission.

Figure 15. Farm Gate Wheat Prices (US\$/tonne), 2007-2008, Kyrgyzstan



Source Nat Stats Com 2008

Terms of trade relating to previous and current prices for wheat and wheat flour are included in Tables 32 and 33 below.

Imported and local wheat prices in mid-2007 are higher than earlier in the year. Grain imported from Kazakhstan is reported to have risen in price to 400 US\$ per tonne in mid 2008, before exports were banned, which with all taxes and tariffs would have been on the Kyrgyz market at 430 US\$ per tonne.

Table 32. Wheat Prices, Kyrgyzstan

	2007 US\$/t (May)		2008 US\$/t (April)	
	Imported	Local	Imported	Local
Wheat Grain	230	240	350-400	450-507
Transport	27.8	0	29.5	0
Clearing	0.4	0	0.5	0
0.15% VAT	0	0	0	0
Total	258	240	380-430	450-507

Values in Table 33 have been derived by the Mission from data collected from traders and millers, calculated back from the price of 50 kg sacks of flour at different stages of the supply chain. Assumptions

and generalisations have been made in an attempt to summarise a trade that was extremely volatile during the 18 months under review. It is hard to reconcile the trader margins for imported (Kazakh) flour at 39% in 2008 compared with 23% the previous year.

Table 33. Wheat Flour Prices, Kyrgyzstan

	2007 US\$/t (May)			2008 US\$/t (June)		
	Imp	Local Flour, imp w.	Local	Imp	Local Flour, imp w.	Local
Wheat Flour	338	350	340	578	580-674	528
Transport	27	0	0	29.5	0	0
Clearing 0.15%	1	0	0	1	0	0
VAT 20% (2007)	*	70	0	*	58-67	0
10% (2008)						
Ex-mill or Trader Prices	366	420	340	609	709	528
Wholesale	n/a	n/a	barter	816	760	barter
Retail	453	450	barter	850	820	barter

* paid 14% in Kazakhstan

3.3.6 Market Prices

Price data for six commodities, wheat flour, vegetable oil, sugar, sheep meat, diesel and wage labour and from three markets, Bishkek, Naryn and Osh, for the period January 2007 to June 2008 were obtained from KAMIS¹³⁷ and the National Statistic Committee. Data collected are given in Annexes 3-6 alongside a) tables of correlation coefficients for price combinations within and between markets, and b) the results of T-tests on average monthly prices for the commodities between markets over the period.

The data are presented in Figure 16 in a series of commodity graphs showing the average monthly prices by market. Linear regression lines show that:

- except for sugar, all commodities have been increasing in price in all markets;
- Wage labour, vegetable oil and mutton seem to have similar rates of increase in both Bishkek and Naryn;

¹³⁷ Independent agency established by DFID Know How Fund in late 1990s; produces a regular newspaper for price data.

More detailed analyses of the relationship between commodities within markets, shown in the 6 x 6 contingency table in Annex 4, reveals strong relationships i.e. correlation coefficient $C = >0.9$ between:-

- in all markets
 - wheat flour and vegetable oil price increases,
- in Bishkek-
 - vegetable oil and diesel;
 - sheep meat and diesel;
- in Naryn-
 - vegetable oil and wage labour;
 - sheep meat and diesel;
- in Osh-
 - vegetable oil and wage labour.

Figure 16. Retail Commodity Prices by Market, Kyrgyzstan

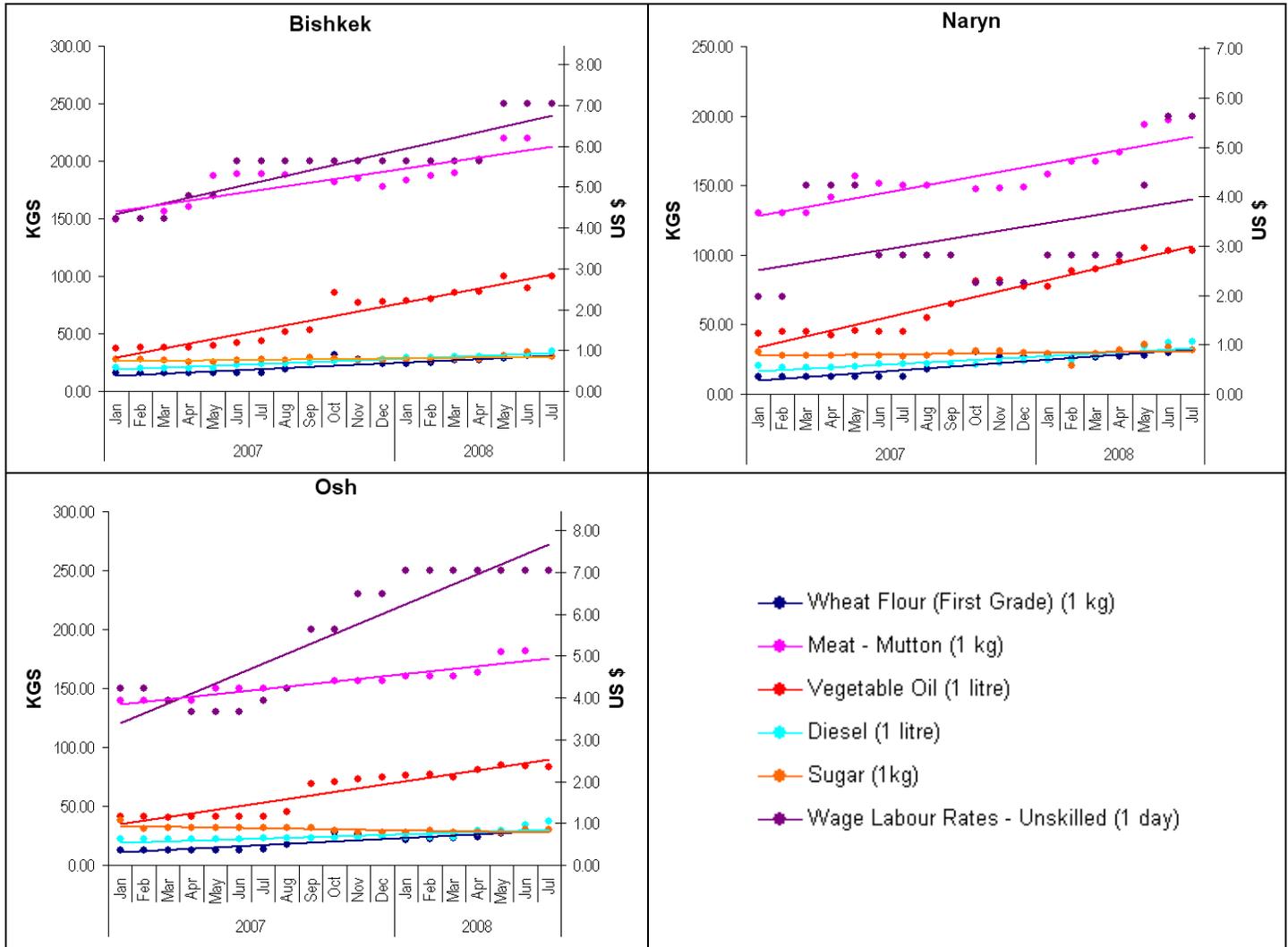
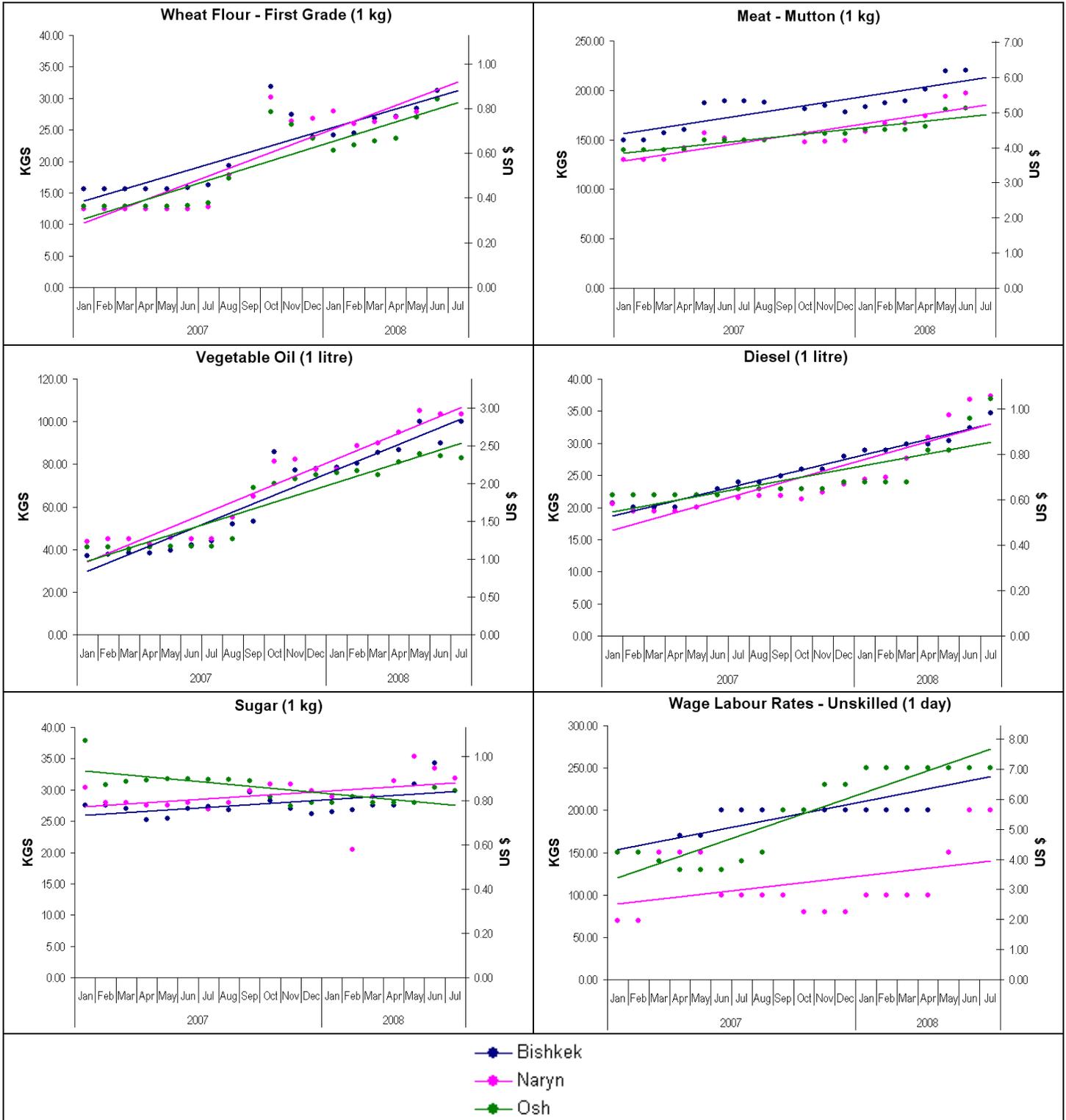


Figure 17 presents market price graphs by commodity. Similar slopes on the regression lines for all commodities except sugar and wage labour, suggest a high level of market integration. Correlation coefficients (Annex 4) support the assumption for the following commodities:

- very high values across the board for wheat flour and sheep meat;
- vegetable oil prices are closely related in Bishkek and Naryn;
- diesel values are closely related in Naryn and Osh;
- no close relationships are noted for wage labour or sugar.

Figure 17. Retail Market Prices by Commodity, Kyrgyzstan



Differences between the prices over the 19 months were tested using a series of T-tests, the results of which are also presented in Annex 4. The results show;

- wheat flour
 - although there are different average prices (US\$/kg) in Bishkek 0.63 : Naryn 0.59 : Osh 0.55 the differences are not statistically significant, which, with the high correlation coefficients, suggests *market integration* over the 19 months;
- vegetable oil
 - average prices (US\$/litre) in Bishkek 1.85: Naryn 1.98: Osh 1.75 show statistically significant differences between the higher average price in Naryn and the other two markets. High correlation coefficients suggest market integration over the 19 months between Bishkek and Naryn;
- sheep meat
 - average prices (US\$/kg) in Bishkek 5.16: Naryn 4.38: Osh 4.37 show statistically significant differences between Bishkek and the other 2 markets but not between Naryn and Osh. With the high correlation coefficients this suggests that Naryn and Osh markets are responding to similar pressures in a similar fashion but with a noticeable Bishkek capital city effect;
- sugar
 - average prices (US\$/kg) in Bishkek 0.79: Naryn 0.83: Osh 0.86 show no statistically significant differences. However there are no high correlation coefficients suggesting few market connections;
- diesel
 - average prices (US\$/litre) in Bishkek 0.73: Naryn 0.70: Osh 0.70 show no statistically significant differences, which, with the high correlation coefficients means *complete market integration* over the 19 months between Naryn and Osh. Bishkek is less closely connected to the other two through a capital city effect;
- wage labour
 - average labour rates (US\$/day) in Naryn 3.23 compared to Bishkek 5.54 and Osh 5.53, are statistically significantly lower than in the other two markets.

3.3.7 Social Support

As an ex-member of the USSR, Kyrgyzstan's social support system follows the pattern adopted throughout most of the CIS republics.

However, during the Soviet era much of the budget came from federal sources. However, the structure has been sustained and regular payments are made to a typical CIS cluster of beneficiaries as indicated in Table 34.

Directed and managed by the Ministry of Labour and Social Protection (MoLSP), the distribution of pensions, allowances and benefits according to the national criteria, is at the discretion of local authorities (*yoluk mootoo*).

Table 34. Social Support, US\$, Kyrgyzstan

Pensions	Allowances	Payments
Old age; <ul style="list-style-type: none"> • Old age pension for men >63 years and women >58 years. • Basic pension 12.7 US\$/month plus work adjustments:- ave 31.5 US\$/month. 	Maternity; <ul style="list-style-type: none"> • Child care – 1x min wage, 20 US\$/month for 4 months for working mothers. • Children under 21 years old with families receive 3.5 US\$/month. Social; <ul style="list-style-type: none"> • Old age but never worked- 20 US\$/month Disabled; <ul style="list-style-type: none"> • Free care and prostheses • Variable allowances 	Vulnerable families; <ul style="list-style-type: none"> • 50kg flour at 20-40% discounts for 310,000 hh (2007-one off) • 25kg flour at 20-40% discounts for 320,000 hh (2008-one off) Funeral allowance; <ul style="list-style-type: none"> • n/a Pension top-ups (discretionary) 3.7 US\$/month

Despite the increases noted in Table 34 state support remains low and could not support an individual pensioner trying to buy the minimum food basket each month. MoLSP calculated increases to follow the cost of living and the next round, for application as soon as possible, are presently awaiting an executive decision to bring;

- minimum salaries to 100% of minimum food basket,
- pensions up to 43% of the value of the minimum food basket.

The actual minimum wage received by workers is estimated at US\$ 103 per month. In addition to the above, measures adopted by the government to enhance food security include:

- the release of 4,500 tonnes of flour from the State Fund of Material Reserve;
- the distribution of 10 million litres of diesel for spring ploughing for sale at 27% discount to farmers;
- a special fund established for credit for agricultural producers;
- instructions to re-establish strategic State Wheat Reserve;
- instructions to establish a 90-day food stock for eight commodities;
- the introduction of 100% export tariffs on wheat, wheat flour, vegetable oil, and sunflower seeds;
- US\$ 3,000,000 released for easy terms (7%) loans to farmers through Aiyl Bank.

3.4 Kazakhstan

3.4.1 General

Existing as an independent republic for the past 17 years, since the break-up of the USSR, Kazakhstan is located in Central Asia between the Russian Federation to the north and west; China to the east and Kyrgyzstan, Uzbekistan and Turkmenistan to the south. Kazakhstan has a land mass roughly two times larger than all the Central Asian Republics added together. It also has direct rail and road connections with Russia, links to the Caucasus and Iran via the Caspian Sea and road links with China; plus a vibrantly expanding economy due to a wealth of natural resources. The Republic straddles the rest of Central Asian like a brood hen on a nest of eggs. The population of Kazakhstan is estimated at 15.2 million people living in around 4 million households with 52% in large industrial cities and 48% of the population living in 7194 villages with some 1000 people in each village. Apart from clusters of peri-urban communities around the main industrial cities, the location of villages follows the agro-ecology¹³⁸ with most villages located in the fertile valleys of the south. The agro-ecological zones may be summarised from north to south as follows:

- forest/ pasture- steppe in the north;
- moor-land steppe;
- arid-steppe throughout the middle band of the country;
- semi-desert steppe;
- piedmont in-by land and fertile river valleys;
- mountain pastures to the south east.

The initial years (1992-95) after independence witnessed a dramatic decline in an economy dependent on exports of heavy industrial products to the rest of the USSR. Thereafter a quick recovery followed due to enormous oil and gas resources, a wide range of minerals including uranium, and early privatisation that guaranteed ready markets elsewhere. GDP reached double digits in 2001 and growth has been sustained at 8%+ until 2008. Two recent pipeline developments, a) from the Tengiz oilfields to the Black Sea and b) new internal stretches from west to east, will increase sales options to both the west and China. These pipelines coupled with overtures from Iran, will diversify the exploitation of the Kazakh Caspian Sea reserves estimated at 38 billion barrels. Current exports are estimated at c 1.6

¹³⁸ The Mission transects passed through all zones from south of Shimkent; through Almaty- via Karagandy; to Astana; to the forest /pasture zones north of Makinsk.

million barrels per day or 6.6% of global crude oil output¹³⁹. Gas production presently equals local requirements but exports are expected to flow in late 2008¹⁴⁰. The progress of transition from the Soviet command economy to a western-orientated, capitalist economy is considered to have been more than satisfactory and the banking system is well integrated with global institutions.

3.4.2 Macro-Economy

A closer look at the macro-economics through key informant interviews, website reviews of several recent analyses and announcements relating to the macro-economy of Kazakhstan was undertaken by the Mission. GDP growth rate in 2007 is posted variously from 8.5% to 10.2% per annum. GDP per capita per annum in 2007 is noted at US\$ 3,949; 6-8 times higher than other Central Asia Republics. A brief time series of macro-economic indicators is provided in Table 35 indicating the recent growth pattern and emerging trade links.

Table 35. Economic Indicators, 2003-2007, Kazakhstan

Economic Indicator	2003	2004	2005	2006	2007
Per capita GDP real (US\$)	2,658	2,930	3,241	3,625	3,949*
GDP growth (% change per year)	9.3	9.6	9.7	10.6	8.5
CPI (% change per year)	6.0	7.0	8.0	9.0	10.8
Unemployment rate (%) ¹⁴¹	4.0	4.0	4.3	4.1	4.5
Export growth CIS (% change per year)	-17.0	36.0	-0.7	37.0	42.9
Export growth non CIS (% change per year)	33.0	61.0	49.0	37.0	21.8
Import growth CIS	29.0	56.0	33.0	36.0	32.0
Import growth non-CIS	26.0	49.0	38.0	37.0	44.0

CPI = consumer price index, GDP = gross domestic product, GNI = gross national income

Sources: www.cisstat.com

* US\$/ head/ annum www.cisstat.com

In the UNDP Human Development Report 2006, Kazakhstan's Human Development Index is ranked 73rd (in the "Medium" countries ranking) out of 177 countries. Kazakhstan is also in a similarly ranked position in the World Bank Wealth Ranking table at 84th with a score of US\$

¹³⁹ IMF estimates (2007)

¹⁴⁰ MoE, Astana

¹⁴¹ Official data (2008)

32,000 per capita¹⁴², four times the assessment for Tajikistan and double all other countries in the region, except Turkmenistan.

The contributions to GDP by sector in 2007 are noted as services 39.4%, industry 54.8% and agriculture 5.8%, with exports connecting to energy (oil) 59%, metals 19%, chemicals 5%, agriculture and coal c. 15%.

Notwithstanding the official figure of 4.5% (Table 35), real unemployment¹⁴³ is probably higher but perhaps this may be more accurately described as *non-employment* as the “unemployed” make significant contributions to the household food economies through subsistence and near subsistence agricultural sub-sector connected to the long-term, home-gardens in the *dacha* plots held by most families.

3.4.3 Agricultural Sector

The agricultural area is an enormous 220 million ha, of which 68%, 150 million ha, is permanent pasture and 22 million ha is designated arable land including field crops, gardens, orchards and leys and post-Soviet unfarmed land that is increasingly being rented by big farming companies with international connections. Unlike neighbouring republics, large-scale, mechanised farming is practised on 75% of the land as shown in Table 36 below. The agricultural sector now comprises four types of production units. Three types, the peasant farms, and the big and the medium sized farm companies all registered as businesses, rent land on either long-term (49 year) or short term (5 year) leases, and are all paying an annual land rent of 0.01% of the value of the land, as estimated by the local authorities. The fourth type of unit, the *dacha* household plot, remains much as it was under the USSR, an unregistered source of most of the home-grown potatoes, vegetables and fruits, a modest proportion of grain and fodder and, nowadays, about half of the livestock products. Table 36 presents rough estimates of all the areas of land involved.

¹⁴² Compare- Tajikistan 40th from bottom US\$ 8,500; Uzbekistan 60th from bottom US\$ 15,000; Turkmenistan 84th from bottom US\$ 29,000; Kyrgyzstan 56th from bottom US\$ 14,000 (all middle-wealth ranked)

¹⁴³ The dereliction of small isolated communities, previously dependent on failed industries, remains in stark contrast to the extreme signs of wealth in Astana and Almaty.

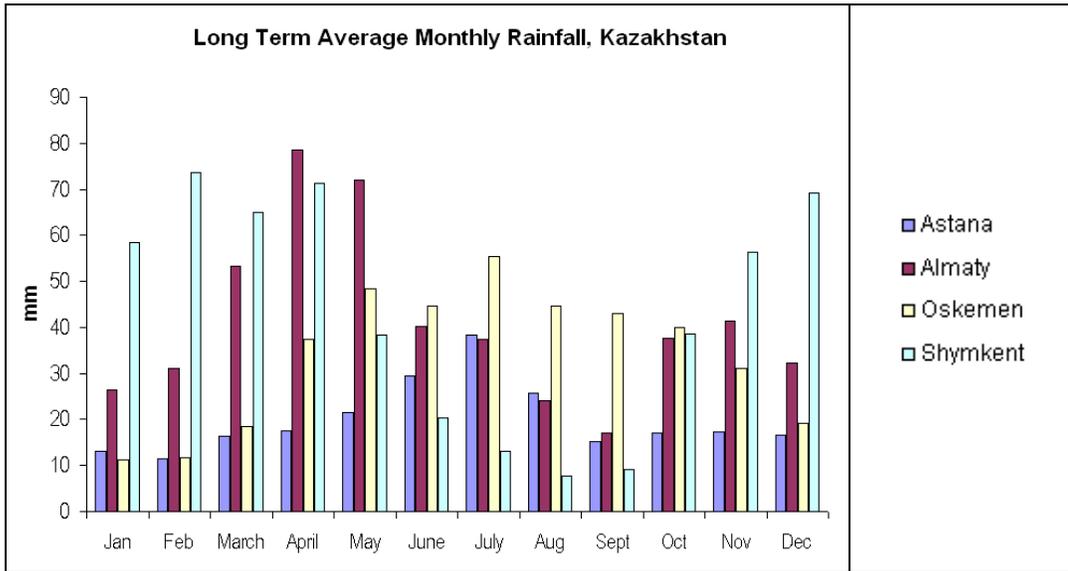
Table 36. Farm Structure (Approximate) in Kazakhstan

Type of Entity	Number	Farmed Land (ha)	Size Range (ha/farm)	% Farmed Area
State farms	65	n/a	n/a	n/a
Big farm companies	10	3 million	0.2 million to 1 million	15%
Medium size farm companies	1,200	12 million	5,000 to 0.2 million	60%
Peasant farms, registered as farming businesses (in the North)	30,000	1.2 million	1 to 200	6%
Peasant farms plus coops, registered as farming businesses (in the South)	90,000	3.6 million	1 to 200	18%
Dacha hh Plots	1,000,000	100,000	0.1	<1%
Total	-	19.9 million	-	100% (90% of 22 million ha arable land)

Source: Mission data 2008- collected MoA, Grain Producers Ass. Union of Farmers; probable cross-over of numbers

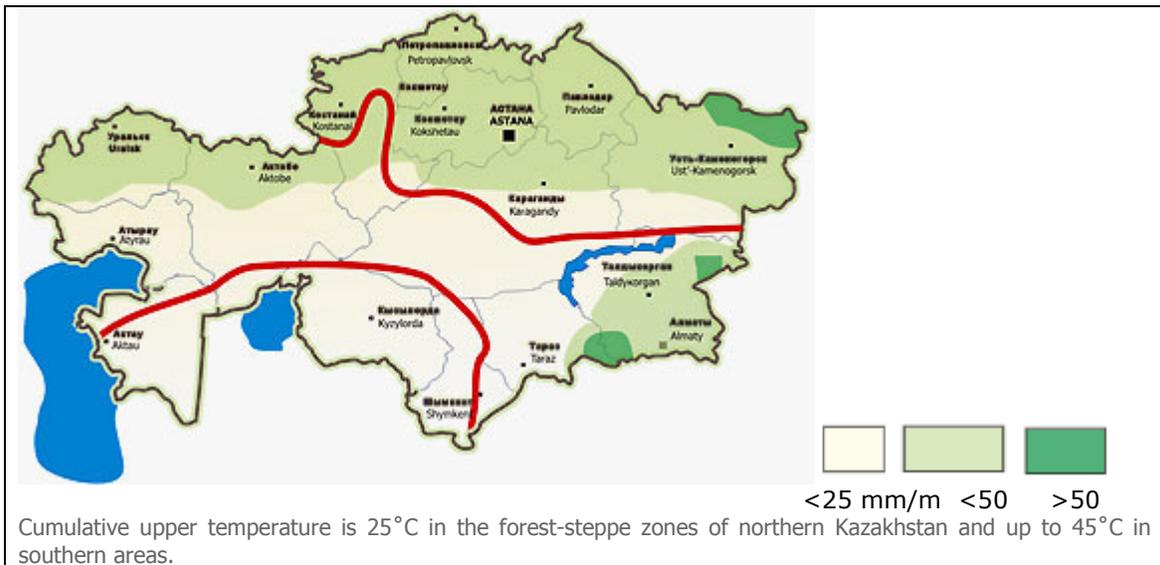
Annual wheat and barley crop production comes mostly from enormous, mechanised, rainfed farms in the northern *oblasts*, increasingly associated with the latest western technology and equipment, not from small irrigated fields farmed with a Soviet style of land management as is the case in the other Republics. Figure 18 presents long-term average monthly rainfall data for four different areas of the country, Astana (north), Oskemen (east), Almaty (southeast) and Shymkent (south).

Figure 18. Rainfall Patterns in Kazakhstan



The rainfall zones represented by the four locations are marked in Figure 19 showing average monthly rainfall and cumulative temperature isotherms.

Figure 19. Rainfall Zones in Kazakhstan



In the north and east, the rainfed crops are spring sown, germinating on the residual moisture from the steppe spring snow-melt¹⁴⁴ and sustained by increasing rains of varying quantity from March until August. This same rainfall pattern supports pasture growth on millions of ha of the forest steppe. Wheat and barley rainfed crops in the south are winter sown to take advantage of the autumn and winter rains that continue until the spring, practices in the south are still rooted in the Soviet style systems of land management using aging equipment inherited from the *kolkhoz*.

Irrigation schemes supplied by surface run-off from the southern mountain ranges provide water to small farms in the southern valleys for the production of maize, vegetables, potatoes, melons, orchards and some winter wheat¹⁴⁵ and fields of irrigated alfalfa. The alfalfa crops provide high quality green and dry forage for large-scale animal production units located in the piedmont area and the semi-arid steppe, before it yields to desert forbs-scrubland. Wheat exports come only from the rainfed cereals in the north- central *oblasts*, where the application of minimal tillage and snowmelt harvesting techniques is lifting average yields to 2 tonnes per ha¹⁴⁶.

Although agriculture is an important sector of the economy and is expanding, the expansion is not reflected in GDP figures as other industries grow more quickly. However, Kazakhstan is the 7th placed global wheat exporter with production increasing each year from 9.9 million tonnes in 2004 to 16.5 million tonnes in 2007, as shown in Table 37, a fact that is of considerable consequence to wheat-deficit, neighbouring states in Central Asia and the Caucasus. Export is however expensive as 85% of wheat production comes from the northern *oblasts*, 2,000 km away from the nearest Central Asian states and >3,000 km away from the Black Sea ports.

¹⁴⁴ Techniques to harvest the snowmelt have application in neighbouring states.

¹⁴⁵ Hitherto the price of wheat has not been attractive to the irrigated sub-sector, given the million tonnes available from rainfed systems; other much more profitable crops are grown under irrigation.

¹⁴⁶ The Mission transect passed through each zone; the application of water conserving techniques on 25,000ha was noted south of Karagandy producing crops twice as productive as neighbouring farms.

Table 37. Wheat Production Time Series, '000s tonnes, Kazakhstan

	2003	2004	2005	2006	2007	2007%
Kazakhstan	11537	9937	11198	13461	16467	100
Akmolinskaya	2680	2215	2622	3060	3942	
Kostanaiskaya	3026	2218	3257	4320	5443	
Pavlodarskaya	213	255	211	255	354	
North-KZ	2377	2429	3013	3944	4260	
North	8296	7118	9102	11579	13998	84
East-KZ	439	489	398	343	461	
East	439	489	398	343	461	3
Karagandinskaya	527	511	244	350	474	
Central	527	511	244	350	474	3
Atyrauskaya	0	0	0	0	0	
Aktyubinskaya	405	307	179	108	365	
Mangystauskaya	0	0	0	0	0	
West-KZ	450	277	107	165	261	
West	855	584	286	273	627	4
Zhambylskaya	527	422	416	233	227	
Kyzylordinskaya	17	15	17	15	11	
Almatinskaya	507	432	447	408	408	
South-KZ	369	368	288	259	260	
South	1420	1236	1168	915	906	6

The production of other crops is more concentrated in the southern *oblasts* as noted in the production figures for 2007 shown in Table 38 showing that all the cotton, all the beets and 69% of the vegetables are grown in the south. Potatoes, on the other hand appear in *dacha* gardens all over the country. Oil seeds are grown mostly in the east and are presently the subject of a government plan to increase areas sown through the use of substantial incentives and subsidies to farmers.

Table 38. Other Crops Production 2007, '000s tonnes, Kazakhstan

	Veg	Potatoes	Oilseed	Beets	Cotton
Kazakhstan	2196	2415	206	309	442
Akmolinskaya	62	186	2	0	0
Kostanaiskaya	50	167	3	0	0
Pavlodarskaya	83	187	27	0	0
North-KZ	121	363	3	0	0
North	316	903	35	0	0
East-KZ	169	308	115	0	0
East	169	308	115	0	0
Karagandinskaya	58	175	0	0	0
Central	58	175	0	0	0

Atyrauskaya	42	11	0	0	0
Aktyubinskaya	45	72	3	0	0
Mangystauskaya	0	0	0	0	0
West-KZ	31	36	6	0	0
West	118	120	9	0	0
Zhambylskaya	360	103	5	0	0
Kyzylordinskaya	83	92	1	0	0
Almatinskaya	589	552	33	309	0
South-KZ	495	151	9	0	442
South	1526	898	48	309	442

The importance of agriculture to the nation may be judged by the existing subsidies and incentives¹⁴⁷ listed below:-

- wheat and barley incentive payment, 3 years old, 5 US\$/ha;
- sugar beet incentive payment, June 2008 onwards, 400 US\$/ha;
- rice incentive payment, June 2008 onwards, 150 US\$/ha;
- sunflower incentive payment, June 2008 onwards 160 US\$/ha;
- diesel spring ploughing incentive, all farmers 10-15% discount for 18 litres diesel/ ha;
- diesel harvesting incentive, all farmers 10-15% discount for 18 litres diesel/ ha for combine harvesters;
- fertiliser discount of 40%/ ha is expected *next year* to counterbalance price rises of 330 US\$/t to US\$ 1,000 US\$/t reported in 2008.

In addition registered farmers are entitled to the following tax concessions:

- all big farm companies are entitled to an 80% reduction of all taxes;
- small farmers have a special lump sum tax rate of US\$ 1,000 per annum;
- agricultural equipment, including some processing machinery, on *leasing* agreements is import tax and VAT exempt;

Such subsidies, incentives and concessions are multi-purpose devices to promote adoption of modern techniques and to promote growing of a more diverse range of crops. These actions are intended to enhance food security, reduce imports and increase cereal exports to existing and new markets, especially China. In addition, agricultural unions and associations have initiated their own programmes to update equipment and machinery. Such machinery procurement has been financed by

¹⁴⁷ Tleubayev, N. S. (2008) Personal Communication, Grain Union of Kazakhstan

several sources viz investing companies (29.1%), JSC "KazAgroFinance" (40.5%), agriculture products producers (13.5%), local budgets (5.3%), and leasing companies (11.6%). For instance "KazAgroFinance" alone has recently bought and leased agricultural machinery for a total cost of US\$ 49.7 million, and specialized machinery and technological equipment for a cost of US\$ 4.7 million.

Regarding input use, the above connects to concerted efforts to align the wheat production systems with those of western wheat producing countries such as Canada¹⁴⁸ to arrive at a high quality product. Kazakh varieties are already established throughout Central Asia as high protein varieties and seed multiplication enterprises receive significant funding from Government to multiply seeds that are sold at predetermined rates back to the Government for distribution. Seeding rates of 150 kg/ha, the use of ammonium phosphate fertiliser at around 20 kg/ha, and aerial applications of pesticides are all different from Soviet-era norms and are now accepted as standard operating procedures for 50% of the medium-sized companies and 100% of the big companies, many of whom have established trading partnerships with global agro-chemical concerns. Access to credit for inputs depends on the scale of the enterprise with bank support on offer to large enterprises, and credit-in-kind and purchasing contracts available for smaller enterprises. Pre-sale cash advances to farmers storing grain in the joint stock company silos (*elevators*) are also available to enhance farmer marketing options. In a more recent development, the Union of Farmers is establishing a seasonal credit scheme for its members (60,000 subscriptions in 2008) for input purchases.

In an interesting development to safeguard investments for all stakeholders, all registered farmers are required to take out crop insurance within 10 days of sowing. The premium for crop insurance in 2008 is 0.66 US\$ per ha and provides cover against pests, accidents and inclement weather. Claims are investigated by the insurance companies (including the Union of Farmers), MoA and local authorities. In 2007, six claims were lodged by the end of August connecting to an area of 1,000 ha (0.01% wheat area). In 2008, eight claims affecting 3,000 ha had been lodged by the end of July (0.027% wheat area) and no more are expected. All claims made so far this year connect to extreme weather incidents. No locust related claims have been lodged with the Union since 2000.

¹⁴⁸ Identified as the model to follow in the northern oblasts viz, land forming for snow-melt capture, herbicide use, direct drilling of spring wheat, fertiliser use, aerial spraying of pesticides.

Regarding vulnerability to migratory pest attack, the MoA Committee for State Inspection (CSI) controls large scale operations to combat the Moroccan, Italian and Asian locusts that use the grassland steppe as breeding grounds. By July 2008, following surveys of 9.7 million ha in 14 *oblasts*, 1.72 million ha of grassland steppe were treated by aerial and land-based spraying with broad spectrum chemicals compared to 1.29 million ha in 2007. No losses of field crops were noted this year¹⁴⁹.

3.4.4 Crop Production 2007/8

As the design and timing of the Mission, the level of access and actual availability of the current production data precludes a full analysis of crop production, early data from the National Statistics Committee grain associations and farmers unions and farmers estimates, secondary data from reports, key informant interviews and transects and time-series data downloaded from independent websites have been brought together to provide an outline estimate of production of the main staple, wheat, and other crops.

The 2007/8 winter is noted in the region as having been severe. Only qualitative statements are available but it would seem that snow fall was heavy in December and January with temperatures below normal.

According to National Statistics Committee (2008), by July 2008 sowing of wheat has exceeded the areas sown in 2007 by some 5%. Table 39 below constructed by the Mission from National Statistics Committee data shows that this is due to c. 600,000 ha more spring wheat sown in the northern oblasts, plus an increase of 38,000 in East Kazakhstan. Wheat area in the southern oblasts, mostly winter wheat, by contrast fell by 60,000 ha.

¹⁴⁹ Suleimenov, S.I. (2008) Personal Communication. Chairman CSI, Astana.

Table 39. Wheat Areas, '000s ha, 2007-2008, Kazakhstan

	Wheat			Including					
	2008	2007	2008 in % 2007	Spring Wheat			Winter Wheat		
				2008	2007	2008 in % 2007	2008	2007	2008 in % 2007
Kazakhstan	13489	12885	105	12986	11950	108	500.9	557.2	89
Akmolinskaya	3675	3485	105	3674	3485	105	1.0	0.7	143
Kostanaiskaya	3845	3672	105	3844	3669	105	0.9	2.4	38
Pavlodarskaya	447	421	106	446	421	106	0.6	0.7	86
North-KZ	3084	2851	108	3082	2851	108	1.7	0	n/a
North	11051	10430	106	11046	10426	106	4.2	3.8	111
East-KZ	419	383	109	413	379	109	5.7	4.4	130
East	419	383	109	413	379	109	5.7	4.4	130
Karagandinskaya	606	608	100	606	608	100	0	0	n/a
Central	606	608	100	606	608	100	0	0	n/a
Atyrauskaya	0	0	n/a	0	0	n/a	0	0	n/a
Aktyubinskaya	548	542	101	536	537	100	11.2	4.8	233
Mangystauskaya	0	0	n/a	0	0	n/a	0	0	n/a
West-KZ	332	328	101	311	298	104	21.1	30.1	70
West	880	870	101	847	835	101	32	35	93
Zhambylskaya	162	184	88	0	3	12	162	182	89
Kyzylordinskaya	8	10	84	2	3	58	6	7	93
Almatinskaya	219	229	96	57	56	101	162	173	94
South-KZ	144	171	84	15	19	80	129	152	85
South	533	594	90	74	81	92	459	514	89

Barley area increased nationally by 13.5% due to an expansion of spring barley sowing in the northern *oblasts* while, at the same time, spring and winter barley sowing fell dramatically in the south. By contrast areas sown to maize and vegetables that are grown mostly in the south have increased by 17%.

Pests and disease challenges during the season are noted to have been at normal levels for both non-migratory and migratory pests with the perennial threat of grassland locusts controlled by the 1.7 million ha spraying programme organised by the MoA.

Regarding other inputs, the level of fertiliser used in 2008 is expected to have been in the order of 320,000 tonnes. The yields of rainfed cereals, mostly barley, in southern *oblasts* noted during Mission transects were poor 0.3 to 0.9 t/ha. Yields of wheat seen further north were in the order of 1.0 to 1.2 t/ha except for 25,000 ha of wheat noted near *Karagandy* likely to produce over 2.0 t/ha. According to farmers' associations average cereal yields from the south this year are likely to be lower than normal at 0.8 t/ha whereas northern wheat

growers are likely to have an average yield of 1.6 t/ha or possibly higher, depending on rainfall.

Table 40. Annual Cereal Areas and Production Estimates, 2007-2008, Kazakhstan

Crop	2008		2007	
	Area ¹ 000's ha	Prod ² 000's t	Area ¹ 000's ha	Prod ² 000's t
<i>Wheat</i>	13,489	16,713	12,885	16,467
North	11,051	14,366	10,430	13,998
East	419	503	383	461
Central	606	500	608	474
West	880	704	870	627
South	533	639	594	906
<i>Barley</i>	2,119	2,646	1,868	2,441
North	1,297	1,946	1,051	1,546
East	92	110	101	127
Central	86	75	88	72
West	319	255	289	236
South	322	260	333	459
<i>Maize</i>	99	500	93	421
<i>Rice</i>	76	230	88	294
<i>Rye</i>	57	68	53	65
<i>Oats</i>	160	208	171	230
Total	16,000	20,365	15,158	19,981

¹ National Statistics area estimates; ² Mission estimates extrapolated from various sources

The Mission estimates given in Table 40, provide a combined cereal harvest of 20.365 million tonnes of mixed cereals of which 16.713 million tonnes are expected to be wheat, 1.2% more than last year's National Statistics Committee estimate from a 4.7% increase in area.

Table 41 presents two time-series for cereal production estimates for the four main cereal crops drawn from National Statistics Committee data for the past four years.

Table 41. Cereal Production Time Series, '000s tonnes, Kazakhstan

Source	2004		2005		2006		2007	
	Nat Stats	USDA						
Cereals	12,374	11,500	13,781	12,650	16,511	15,450	20,138	19,150
Wheat	9,937	9,950	11,198	11,100	13,461	13,500	16,476	16,600
Barley	n/a	1,500	n/a	1,500	n/a	1,900	n/a	2,500
Maize	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Rice	n/a	50	n/a	50	n/a	50	n/a	50
Rye	n/a	50	n/a	50	n/a	50	n/a	50

Production estimates for 2008 link to a cereal balance suggesting that 10.308 million tones of cereals, of which 9.58 million tonnes are wheat, will be available for export in the 2008/9 marketing year. Table 42 provides the outline cereal balance for wheat, rice, barley and maize. Parameters of the balance have been calculated based on the following premises:-

- population mid marketing year 2008/9 will be 15.56 million ;
- annual consumption patterns- wheat 200 kg/head¹⁵⁰, rice 2.45 kg/ head¹⁵¹, maize 3.02 kg/ head;
- seed requirements as practiced; wheat 156 kg/ha; barley 175 kg/ha; maize 25 kg/ha; rice 80 kg/ha;
- post harvest handling and storage wheat losses 1.5%¹⁵²; others 10%;
- animal feed use¹⁵³- supplementary concentrates assuming grain feed: wheat 10%, considered animal feed standard; all barley less brewing use; all maize less corn-on-cob/ brewing/ distilling and all of the wheat-bran by-product. In the absence of feed use data the following grain rations have been estimated¹⁵⁴-
 - cows- 0.5 t/ head/ annum; ewes and does 25 kg/ head/ annum; mares- 0.5 t/ head /annum; pigs- 1 t /head/ annum; poultry 36 kg/ head/ annum;
- stocks- 1 million tonnes (0.5 million t strategic reserve; 0.5 million t millers' stocks). Strategic reserve has 150,000 tonnes replaced each year by government purchase.

¹⁵⁰ USDA (2008) Consumption estimate

¹⁵¹ USDA (2008) Milled Consumption estimate for Uzbekistan, adopted by Mission in absence of other info

¹⁵² Low due to most wheat stored in 'elevators' – grain processors estimate 1%.

¹⁵³ Animal diets also include fodder beets and conserved forages

¹⁵⁴ Cows, sheep, horses- feed-wheat, barley, oats, bran: pigs /poultry - barley and maize,

Table 42. Cereal Balance, 2008, '000s tonnes, Kazakhstan

	Wheat	Rice (paddy)	Barley	Maize	Total Cereals
Dom Av	16,713	230	2,646	500	20,089
Stocks Used	0	0	0	0	0
Dom Prod	16,713	230	2,646	500	20,089
Dom Req	7,133	103	2,045	500	9,781
Food Use	3,112	78	0	50	3,240
Seed Use	2,100	1	371	3	2,475
Feed Use ¹	1,671	0	1,410	397	3,478
Losses	250	23	264	50	587
Stocks	0	0	0	0	0
Imports	0	0	0	0	0
Exports	9,580	127	600	0	10,308
Food Use /yr	200 kg/head	5 kg paddy/ head			

¹ (+778 wheat- bran for cows +208 oats)

The cereal export availability for the marketing year 2008/9 is estimated from the above balance to be 10.3 million tonnes being, 9.58 million tonnes of wheat, 0.6 million tonnes of barley and 0.127 million tonnes of rice¹⁵⁵. The capacity to export is available via the railway network¹⁵⁶.

Mission collected *official* export data show that 6.97 million tonnes of cereals were exported in 2007, being 6.32 million tonnes of wheat, 0.6 million tonnes of barley and 0.042 million tonnes of other cereals including rice. Wheat flour exports are recorded at 1.46 million tonnes. This means that 8.32 million tonnes of wheat equivalent were exported in 2007 compared to the 9.58 million tonnes estimated to be available in the above Mission balance for 2008.

Regarding other food crops; Production from all farms is expected to follow the pattern shown in Table 38 with a projected National Statistics increase of 4%.

Regarding livestock; after privatisation of the collectives, post-Soviet livestock ownership is predominantly (90%) conducted by hh units and peasant farmer units. Initially numbers fell dramatically but, according

¹⁵⁵ This is based on a low consumption pattern similar to other CA states

¹⁵⁶ Concerns voiced by commercial wheat flour exporters regarding an apparent shortage of rolling-stock post-April 2008 were explained by an informed source as being due to an administrative decision to limit flour exports "indirectly"(see 3.4.5).

to statistical data, by the end of 2007 the number of cattle reached 5.84 million head (cows 2.6 million); sheep and goat numbers had risen to 16.1 million head (12 million ewes and does); horses to 1.3 million head; camel to 154 thousand head; pigs to 1.3 million head and poultry to 29.5 million birds. Regarding the herbivores, these numbers connect to 10 million LU¹⁵⁷s in a potential grazing/conservation area of 180 million ha or 18 ha per LU.

Production units are now much smaller than before comprising, in the pastoralist sector, herds of 30-40 cows or brood mares or both; and flocks of 200-300 ewes and does. Except for a few specialist enterprises, mixed farming household units in the south have far fewer heads per unit. Two pastoralist units in the central moorland area and southern, semi-arid, in-bye zone visited during Mission transects identified their grazing areas in terms of km radius from the stading at 2.5 km radius and 5 km radius connecting to areas of c. 2,000 ha¹⁵⁸ and c. 8,000 ha¹⁵⁹ respectively.

Winter carrying capacity limits the number per holding unless artificially increased by imported rations. In the two specialist units visited, the Aksu Auly unit makes hay every year; the Shamalgan unit makes hay every other year, depending on rainfall. This year

- Aksu Auly unit made 54 t of meadow hay from 40 ha (1.35 t/ha) at a contractor cost of 37 US\$/ha which was similar to the cost in 2007. The unit is fodder self-sufficient;
- Shamalgan unit bought-in grass-hay this year at 46 US\$/t compared to 38 US\$/t in 2007. The unit relies on winter forage from further north to carry a milking herd of 24 Brown Swiss. Semi-arid, in-bye land in the southern *oblasts* was noted to be producing less forage this year;
- supplementary feed in the form of feed-grade wheat and barley are available at 180 US\$/t for all classes of stock.

The amount of feed noted above is supplemented annually by cereal straw and stover that will be at least 10 million tonnes. Therefore, the Mission feels that fodder supplies in Kazakhstan for the national herds and flocks are much more than adequate for the coming winter and that price increases of fodder noted around Almaty (Shamalgan) are likely to be a temporary phenomenon.

¹⁵⁷ LU= international livestock unit, approximately equal to 1 Brown Swiss cow

¹⁵⁸ Aksu-Auly (887 km N of Almaty); 106 LUs = 19 ha /LU.

¹⁵⁹ Shamalgan (59 km N of Almaty); 374 LUs= 21 ha/ LU + summer mountain pasture.

3.4.5 Market Supply Chains

Kazakhstan self-sufficiency extends only to cereal grains. Vegetables, fruits and processed foods are imported from neighboring countries. Import and export routes are noted in the relief map in Figure 1 and the communications maps in Figures 2 and 3. Consequently, all imported food stuffs from Russia (sugar, pasta, processed oils) arrive directly by road and rail as do the more perishable vegetables and fruits from Uzbekistan and Kyrgyzstan. Western goods arrive via the Black Sea ports.

Rail tariffs for all goods except wheat and coal were increased by 15% the single Joint Stock Company controlling the track and rolling stock in April 2008. At the same time, wheat exports were closed in order to conserve wheat stocks against a possible shortage connected to disappointing early-rains in the northern steppe. This safeguard protected the strategic stocks of wheat of 1 million tonnes (3.4.4) against any *panic buying on an international scale*, thus allowing a buffer of 4 months, from end of April until Sept, to be sustained until the new harvest was well underway. Key informants suggested to the Mission that contemporary policy dictates that all constraints to exports will be lifted with the onset of the new harvest, with a view to sustaining the traditional markets and increasing sales of agricultural straight and commodities to new markets in China, Iran and beyond the Black Sea.¹⁶⁰

Simultaneously, an apparent shortage of rolling-stock prevented a proliferation of wheat flour exports, to the chagrin of commercial millers. As such a shortage is counter-intuitive if wagons are dual purpose, the Mission questioned the cause and was informed that rolling stock was administratively made '*less available*', allegedly by a state-inspired minimum wagon turn-around time which effectively restricting exports of flour to a *normal* level without a ban and without the introduction of export tariffs, which would have contravened trade agreements.¹⁶¹

Presumably, imports were also negatively affected unless trucks were rolling empty to the border. In any event, current charges for transport of goods to and from the Black Sea ports are 75 US\$/ tonne; to Bishkek 29.5 US\$/tonne and to Afghanistan 60 US\$/ tonne.

¹⁶⁰ FAO (2008) GIEWS- Kyrgyzstan Update states Kazakhstan ban on wheat sales was lifted on Sept 1st 2008.

¹⁶¹ Wheat flour has a lower shelf life than grain. Therefore, milled wheat should be sold quickly unless stored in oxygen free containers.

Market chains for goods other than grains and flour connect to international traders distributing to wholesalers in a series of links that culminate in the retailers outlets. Supplies are delivered to large, strategically-placed, distribution markets. Presently huge new market complexes are being built for fruit and vegetables in Shymkent, Askiminarsky, and Astana.

Trade is liberalised and international trade is open to any trader with foreign exchange and the appropriate international connections. Import taxes vary from 5% to 20% depending on the food stuff. No such tax is levied on fruit or vegetables. VAT is universally levied on all processed goods at a rate of 13%, but is not levied on primary farm products.

The wheat and wheat flour supply chain follows a different model. There are 300 major flour mills serving the 14 *Oblasts* and two major cities, termed *elevators*. They are the focal points of the cereal supply chain in general and the wheat/ wheat flour trade in particular. The *elevators* have a storage capacity of 17 million tonnes and serve as repositories for grain after harvest as well as stores for wheat to be milled. Situated at railheads, the *elevators* are the initial link in the wheat and flour distribution chains.

Such centers are used by the farmers and traders for national and international distribution of grain. Buyers of grain include governments and their agents, international trading companies and the Food Contract Corporation (FCC), who buy 30% (150,000 t) of Kazakhstan's strategic reserves (500,000 t) to refresh stocks each year. The chain, linked by the rail network, is presently under improvement with construction of elevators and flour mills in the Black Sea ports of Baku, Azerbaijan and Batumi, Georgia being undertaken by FCC, with sights on enlarging old markets and increasing new ones, particularly Iran¹⁶². Their action is being repeated by huge privately owned farming companies who are also opening *elevators* and mills outside Kazakhstan¹⁶³.

Mills are linked through trade associations, the biggest being the League of Grain Processors and Bakers that negotiates with Government and provides market intelligence to members¹⁶⁴. Buyers of flour include governments and their agents, international flour

¹⁶² Asimov, A. (2008) Personal communication, President, FCC

¹⁶³ Tleubayev, N. (2008) Personal communication, President, Grain Union of Kazakhstan

¹⁶⁴ Gan, E. (2008) Personal communication, President, League of Grain Processors and Bakers

traders as well as bakers' associations, flour wholesalers and large retailers. Scroll down credit is commonplace all along the supply chain from the mill to the high street baker or flour retailer.

Wheat farm gate prices differ according to grade¹⁶⁵. Prices have fluctuated in the past year *viz*: Class 3, the highest grade of wheat in Kazakhstan, increased from 200 to 350 US\$/t in 2007 to 410 US\$/t in March 2008 and has since fallen to 320 US\$/t by July, reflecting global price changes, and is expected to decrease further, later in the year, as the northern harvest reaches the market. The price of class 4 wheat is now 220 US\$/t and feed wheat has fallen to 180 US\$/t.

Table 43. Wheat and Wheat Flour Price, Kazakhstan

Year	2007 (US\$/t)	2008 (US\$/t)
	Local	Local
Wheat	220	320
Wheat Flour ex-mill	300	530
VAT 13%	40	70
Wholesale	340	600
Retail	410	810

Comparative wheat and wheat flour prices in Table 43 have been derived by the Mission from data collected from traders and millers. Prices per tonne have been calculated back from the prices at different stages of the supply chain. Assumptions and generalisations have been made in an attempt to summarise a trade that was extremely volatile during the 18 months under review.

3.4.6 Market Prices

Price data for five commodities, wheat flour, sunflower oil, sugar, sheep meat, and diesel from three markets, Astana, Almaty and Shymkent, for the period January 2007 to July 2008 were obtained from KazAgroMarketing. Data collected are given in Annexes 3-5 alongside a) tables of correlation coefficients for price combinations within and between markets, and b) the results of T-tests on average monthly prices for the commodities between markets over the period.

The data are presented in Figure 20, as a series of graphs showing the average monthly prices within each of the three markets. Linear regression lines show that:

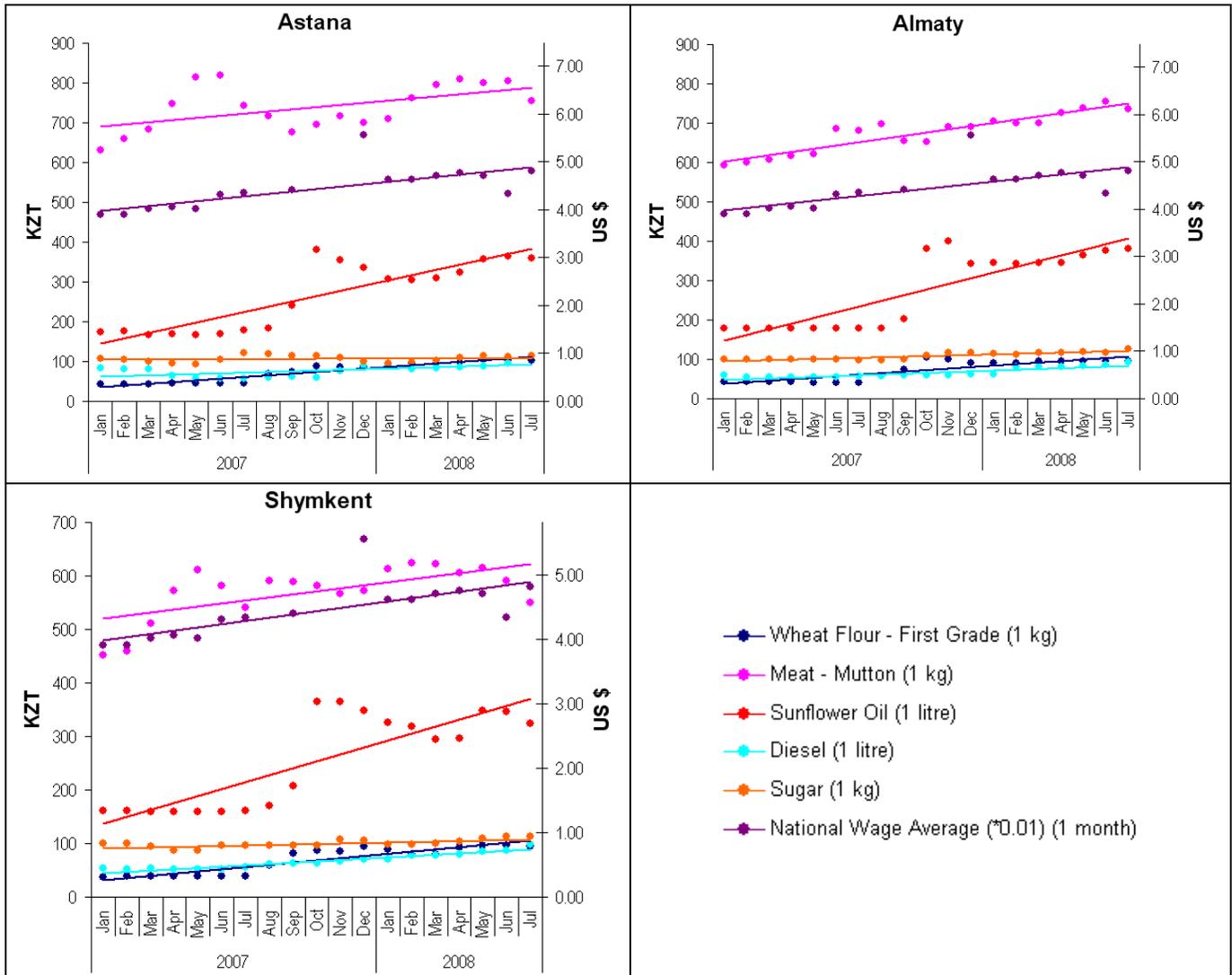
¹⁶⁵ Tleubayev, N. (2008) *op cit*

- except for sugar, all commodities have been increasing in price in all markets;
- meat and wage labour seem to have similar rates of increase in all three markets;
- wheat flour and diesel seem to have similar rates of increase in all three markets;

A more detailed analysis of the relationship between commodities within markets shown in the 6 x 6 contingency tables in Annex 4 reveals strong relationships i.e. correlation coefficient $C > 0.9$ between:-

- wheat flour and vegetable oil price increases in all markets;
- sunflower oil and sugar in Almaty;
- no close relationships are noted with the national average wage

Figure 20. Retail Commodity Prices by Market, Kazakhstan

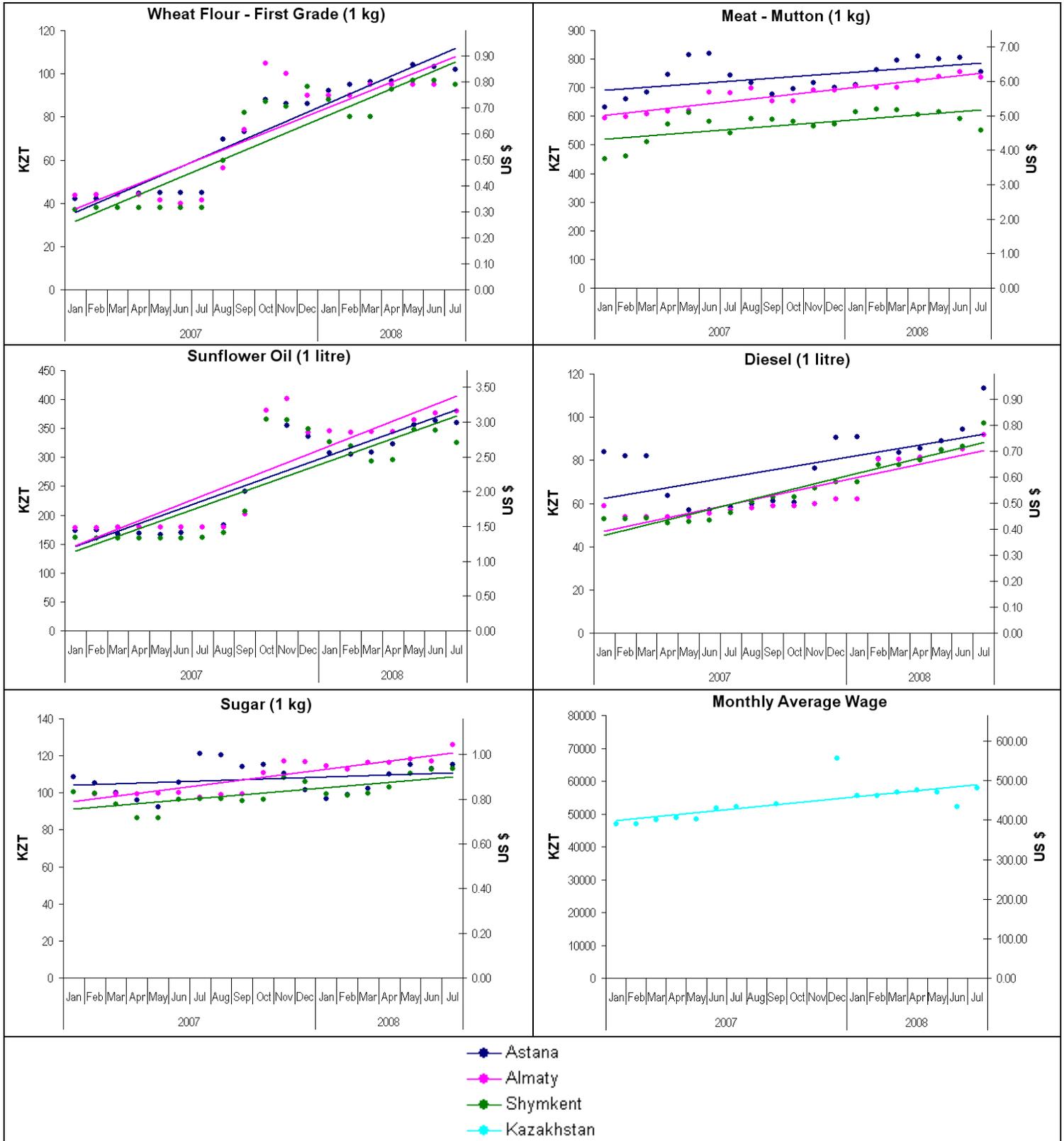


Retail Market Prices by Commodity are shown in Figure 21. Similar slopes on the regression lines for all commodities except sugar suggest market integration. Correlation coefficients (Annex 4) support the assumption for the following commodities:

- very high values in all three markets for wheat flour, sunflower oil and sheep meat prices.

Differences between the prices over the 18 months were tested using a series of T-tests, the results of which are also presented in Annex 4.

Figure 21. Retail Market Prices by Commodity, Kazakhstan



The results of the T-tests show:

- wheat flour
 - although there are different average prices (US\$/kg) in Astana 0.61 : Almaty 0.60 : Shymkent 0.57 the differences between them are not statistically significant, which, with the high correlation coefficients suggests almost *complete market integration* over the 19 months;
- vegetable oil
 - although there are different average prices (US\$/litre) in Astana 2.2 : Almaty 2.3 : Shymkent 2.11 the differences between them are not statistically significant, which, with the high correlation coefficients suggests almost *complete market integration* over the 19 months;
- sheep meat
 - differences in average price (US\$/kg) between the markets viz Astana 6.14 > Almaty 5.62 > Shymkent 4.75 are statistically significant. However high correlation coefficients suggest that the markets are responding to similar pressures in a similar fashion but with a noticeable big city effect with Astana prices > Almaty prices > Shymkent prices;
- sugar
 - differences in average price (US\$/kg) between Astana 0.89 and Almaty 0.90 are not statistically significant; however prices in both markets are significantly higher than Shymkent 0.83. As there are no high correlation coefficients, few market connections exist;
- diesel
 - differences in average price (US\$/litre) between Astana 0.64 and Almaty and Shymkent, both 0.55, are statistically significant suggesting high *market integration* over the 19 months for the 2 southern markets but other factors affecting diesel price in Astana.

3.4.7 Social Support

As an ex-member of the USSR, Kazakhstan's social support system follows the pattern adopted throughout most of the CIS republics. The basic structure has been sustained and regular payments are made to a typical CIS cluster of beneficiaries as indicated in Table 44. Pension payments fell initially from 7.0% GDP in 1991 to a nadir of 4.5% in 2005. Since 2007, new laws have been introduced to strengthen support to the vulnerable and to encourage the unemployed to seek employment and contributions have risen to 5% GDP. Vulnerable

families are defined as those with incomes less than 40% of the minimum wage, which is noted as US\$ 100 per month.

Directed and managed by the Ministry of Labour and Social Protection (MoLSP), the distribution of pensions, allowances and benefits according to the national criteria, is at the discretion of local authorities and payments are made from both the national and local authority budgets.

Table 44. Social Support, Kazakhstan

Pensions	Allowances	Payments
<p>Old age;</p> <ul style="list-style-type: none"> • Old age pension for men >63 years and women >58 years. • Basic pension plus CPI+2% adjustments:- now ave. pension 150 US\$/month • Was increased July 2008 by a range from 15%-35% to become 40% of minimum food basket cost • 1.6 million people receive pensions (10.5% popn.) <p>Disabled;</p> <ul style="list-style-type: none"> • Free care and prostheses • Variable allowances 	<p>Maternity;</p> <ul style="list-style-type: none"> • Lump sum at birth each child 289 US\$ • Child care- each child 41.5 US\$ per month for 12 months. Rate increases if other children in hh up to 66 US\$. <p>If poor i.e. income <60% food basket cost;</p> <ul style="list-style-type: none"> • Children under 18 years old with families receive 10 US\$/month <p>Ave social allowance is 88 US\$ per month. 0.65 million people receive allowances.</p>	<p>Local authorities- benefits for vulnerable families (12.9% population);</p> <ul style="list-style-type: none"> • get housing and heating allowances • 204 discount shops • 315 discount trading points in stores • hh present ID get discounted food stuffs shops/stores • pension top-ups as cost of living rises <p>Special allowances 99 US\$/month received by 1.142 million people, subject to changing circumstances, as the cost of living/ min food basket changes.</p>

In addition to the above, measures adopted by the government to enhance food security include:

- support to farmers as listed in section 3.4.3 above;
- closing of export of wheat from April;
- special fund established for credit for agricultural producers;
- go-slow on transport of wheat flour exports;
- establishment of new market distribution centres;
- speed up of the trickle down effect of windfall profits of oil and mineral companies through accelerated social programmes

regarding education, healthcare, housing and diversifying employment opportunities¹⁶⁶.

4. Conclusions

4.1 General

Given the description of the shared experiences of the Central Asian countries during the Soviet era and in the immediate post-Soviet chaos, it is hardly surprising that despite different paths of development taken in the past 17 years, there are still similarities with regard to the style of the governance, irrespective of label, among the countries. Obvious differences in the structure of the economies and inherent opportunities for economic and social advancement in both local and global contexts connect to resources, communications and security and in regard to these criteria Kazakhstan enjoys an atypical oil and mineral-based prosperity among the cluster of states, reminiscent of Nigeria's position among West African states in the late 1970's¹⁶⁷.

In general, in each Central Asian republic visited, the path to liberalisation of the command economy through privatisation of industry, commerce and land, has passed through a series of steps with each country exhibiting, according to their assets and political will, waves of activity culminating in different degrees of liberalisation. At the same time, the pattern noted previously in the Russian Federation and the Caucasus¹⁶⁸ of civil unrest, dismantling of interstate dependencies, failure of industrial and macro-agricultural units all resulting in economic and social decline, bottoming-out and subsequent growth are also apparent in all the republics. Global events are now challenging the fragile conditions of at least three of the new republics that may only respond to rather than influence such events¹⁶⁹. The GDPs per capita for each republic shown below in Table 45 demonstrate clearly that in the post-Soviet hierarchy Kazakhstan sits head and shoulders above the other countries in the sub-region.

¹⁶⁶ President's Annual message (2007)

¹⁶⁷ Do the similarities end at this level?

¹⁶⁸ Robinson, W. I. (2008) Regional Market Survey, WFP, Cairo

¹⁶⁹ Kazakhstan influenced events by closing grain export market to grain deficient neighbours in April 2008

Table 45. GDPs per capita 2007¹⁷⁰

Kazakhstan	Kyrgyzstan	Uzbekistan	Tajikistan
3949 US\$	750 US \$	670 US \$	490 US \$
-	(952)	(720)	(600)

() Mission estimated GNI with remittances added.

The priority concerns for the Mission as expressed by the WFP Regional Office, Cairo are presented below in Table 46. They provide a template for the structure of the Conclusions of this report.

Table 46. Prioritised Concerns (March 2008)

- Baseline data on food price increases
- In-country food stocks & availability for emergencies
- Government policy measures related to food price increases (export quotas/taxes – internal price controls, increase in subsidies etc.)
- Government safety nets.
- Organisations involved in collecting information on food prices/food security/social situation.
- Impact of price increases/production shortages/government policies on the vulnerable segments of the population.
- Opportunities for local purchase for WFP.
- Market indicators to monitor.

4.2 Priority Concerns

4.2.1 Baseline Data on Food Price Increases

Wheat flour, vegetable/ sunflower oil, meat, sugar, diesel fuel and wage labour price increases are presented in a series of graphs and simple statistical analyses for 2007 and for the first six months of 2008. As neither time nor resources were available for the Mission to mount market surveys and as only the WFP Office in Tajikistan has actually been monitoring markets, other sources were used to provide the base-line data required for all the remaining countries. Consequently, data included in each of the country reviews presented in Section 3 and included in Annexes 3-6 have come from:

- WFP regular monitoring returns of prices of six commodities in five markets in Tajikistan;
- Mission collected data and data gleaned from www.uznews.net for 6 commodities from two markets in Uzbekistan;
- KAMIS collected prices for six commodities from three markets in Kyrgyzstan Republic;

¹⁷⁰ Mission calculated

- KazAgroMarketing collected data for five commodities in three markets in Kazakhstan.

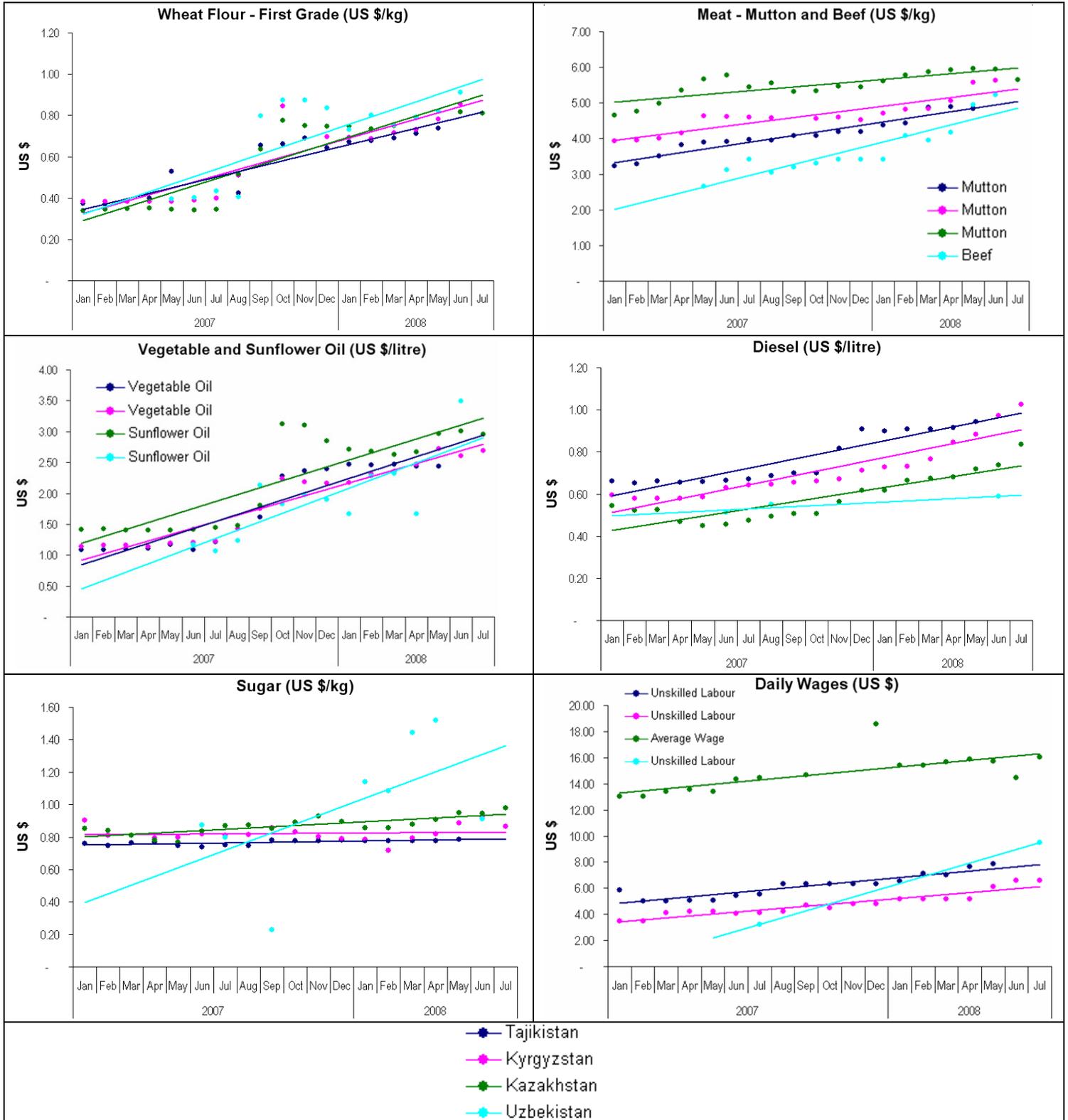
From analyses of prices of commodities between and within markets it is apparent that all commodities, except sugar, exhibit significant price rises over 18 months from January 2007 to July 2008 in all markets in all four countries. High levels of market integration are evident for wheat flour and vegetable/ sunflower oil within and between all countries and between diesel prices in Kazakhstan and each of the other countries in turn. A more complete summary of the analyses is given in Figure 22 and following notes.

Within the review's limitations it appears that for:

- wheat flour
 - although there are differences in average price over the study period *viz* (US\$/kg) Uzbekistan 0.70, Kazakhstan 0.60, Kyrgyzstan 0.59 and Tajikistan 0.55 the differences are not statistically significant, which, with the high ($C > 0.9$) correlation coefficients suggests high **market integration** over the 18 months reviewed;
- vegetable/ sunflower oil
 - although there are differences in average price over the study period of vegetable/ sunflower oil between republics *viz* (US\$/litre) Kazakhstan 2.2, Uzbekistan 1.9, Kyrgyzstan 1.86 and Tajikistan 1.78, the differences are not statistically significant. High ($C > 0.9$) correlation coefficients exist between all markets except Uzbekistan suggesting high **market integration** between Kazakhstan, Kyrgyzstan and Tajikistan over the 18 months reviewed;
- meat
 - differences in average price of mutton over the period between three of the markets *viz*-(US\$/kg) Kazakhstan 5.5, Kyrgyzstan 4.63 and Tajikistan 4.09 are all statistically significant. Price changes in Tajikistan and Kyrgyzstan have a high ($C > 0.9$) correlation coefficient suggesting **markets responding in a similar fashion to similar pressures**. Beef prices in Uzbekistan, included for trend comparison purposes, are increasing more quickly than in the other countries and show no close relationship with the sheep meat prices in the other states;
- sugar
 - unlike all other commodities in all the countries, sugar prices in Tajikistan and Kyrgyzstan have fallen over the period. The differences in average price (US\$/kg) between

Tajikistan 0.77, Kyrgyzstan 0.82 and Kazakhstan 0.87 are statistically significant; however, the most expensive sugar noted to be in Uzbekistan (US\$ 1.0/kg) does not show significance because of the upward surge from a very low price in 2007. Correlation coefficients are very low ($C < 0.2$) suggesting **no** market integration, possibly due to unexplained local interventions;

Figure 22. National Average Prices, by Commodity



- diesel
 - average prices over the period are lowest in Uzbekistan at 0.55 (US\$/litre), Kazakhstan 0.58, Kyrgyzstan 0.71 and most expensive in Tajikistan at 0.77, however shortage of data from Uzbekistan means that only Kazakhstan’s price difference reaches statistical significance. Price increases in Kazakhstan are highly correlated with each of the other countries suggesting high **market integration** over the 18 months; Price changes in Tajikistan and Kyrgyzstan have a high ($C > 0.9$) correlation coefficient suggesting **market integration**
- wage labour
 - wage labour rates have been compiled from a variety of sources, but although increasing trends are noted throughout, there are no close relationships detected. The fastest rate of increase is recorded in Uzbekistan. Difference in average daily rates between Kazakhstan and all others are highly significant *viz* (US \$/ day) Kazakhstan 14.8¹⁷¹, Uzbekistan 6.37, Tajikistan 6.17 and Kyrgyzstan, the poorest paid at 4.77.

Percentage price changes over 18 month and the last 12 month periods for each commodity, in each Republic¹⁷², based on regression equations not spot prices, are included in Table 47. The 18 month and 12 month values show how percentage price increases depend on the value of the starting point (intercept), therefore the percentage increases tail off as prices rise, although the rate of change is the same. This phenomenon has significance when comparing percentage price changes with other assessments.

Table 47. Average % Price Increases for 18 and 12 Months

Commodity	Kazakhstan		Uzbekistan		Kyrgyzstan		Tajikistan	
	18m	12m	18m	12m	18m	12m	18m	12m
Wage Labour	23%	14%	n/a	194%	83%	42%	63%	34%
Wheat Flour	238%	85%	n/a	83%	184%	74%	148%	64%
Meat	19%	12%	n/a	65%	37%	22%	53%	30%
Veg/Sunflower Oil	187%	75%	n/a	135%	229%	84%	286%	94%
Sugar	18%	11%	n/a	93%	2%	2%	5%	3%
Diesel	74%	39%	n/a	12%	80%	42%	69%	41%

¹⁷¹ Based on a monthly wage- day rates may be higher.

¹⁷² 18 month data where not available for Uzbekistan

Regarding wheat flour, the only intermediate product in the list, determining an effect of the price rise further down the chain requires an understanding of the proportional contribution of the prices of the components of a standard loaf of bread delivered to the retailer to the whole cost of that loaf. In the absence of local information, the Mission suggests that the traditional cost-component ratios for the wholesale price of a standard loaf of leavened bread used for fair-trading evaluation purposes (UK Competition Commission, 1976) may serve as a guide. The ratios are: raw materials 50%, manufacturing 20% and sales and delivery 30%.

Given that the raw material is predominantly wheat flour with price increases in the past year of 64% (Taj), 74% (Kyr), 83% (Uzb) and 85% (Kaz) as noted in Table 47, 50% of the cost of the loaf (a) may also be expected to increase by 64% to 85% in the past year depending on location. The remaining 50% of the cost (b) connects to labour and diesel with increases ranging from 14%-42%¹⁷³ and 12%-41% respectively, which, with a 30:20 emphasis on labour, links to an average 30% increase in other costs. Combining (a) and (b) suggests overall cost increases of a the wholesale price of a standard loaf to be in the order of 62% (Taj), 67% (Kyr), 72% (Uzb) and 73% (Kaz) without retail cost increases and changes in profit taking. Mission data on the retail price of bread, not used for analysis because of the extreme variability of the product,¹⁷⁴ would suggest that doubling of the price of a standard loaf over the past 12 months has been the most common retailers' response.

4.2.2 In-Country Food Stocks and Availability for Emergencies¹⁷⁵

In contrast to the Caucasus Republics¹⁷⁶ all four Central Asian Republics have established authorities with mandates to create and manage strategic stocks known generally as state reserves. Whereas the existence of such stocks is confirmed, details of their scale, scope and condition are less easily determined as they are often considered to be *state or commercial secrets*. Only wheat stocks were discussed and even where they were described *in toto*, details of drawdown for use in balances were either unknown, closely-guarded secrets or

¹⁷³ Excluding 194% noted by the Mission in Tashkent- only one Mission market sample.

¹⁷⁴ Wheat flour 1st grade is used throughout the analysis to represent the staple as it is common to all countries and sold in known and measurable aliquots.

¹⁷⁵ Wheat/ wheat flour, this concern has been addressed using wheat and wheat flour only as the supply chains are understood from the information obtained.

¹⁷⁶ Robinson, W. I. (2008) *op cit*

counted as zero in published balances. In the absence of better information, the Mission's balances have attempted to describe what may be happening based on inferences, rather than authenticated statements. The information garnered is presented in Table 48.

Table 48. Wheat Stocks

Country	National Stocks	State Reserve Location	Other Stocks Location
Kazakhstan	1 million t	0.5 million t (FCC) ¹⁷⁷	0.5 million t <i>elevators</i>
Uzbekistan	700,000 t	700,000 t UDM <i>elevators</i> ¹⁷⁸	Unknown private
Kyrgyzstan	132,000 t (target)	132,000 t – In private mills	Unknown private
Tajikistan	<i>uncertain</i>	10,000t* for release by Min Social Affairs	Unknown private

* Only 3 days supply; no real buffer against change

Uzbekistan is thought to have considerable reserves of foodstuffs as a legacy from the USSR when the country was the centre of garrison operations for the war in Afghanistan. Strategic reserves for all commodities are high; strategic wheat reserves are estimated at 700,000 t, which is enough for 1.5 months of flour consumption, to be released as needed through UDM mills. Additional stocks held by private millers are sustained on a commercial basis by purchases of imported and local non-quota grain. These stocks vary according to time of year, diminishing as each new marketing year approaches. The whole amount is expected to cover the population's flour consumption for at least 60 days.

Kyrgyzstan is building stocks to cover an 80 day hiatus in supply (60 - 90 days discussed). Strategic wheat reserves are programmed at 132,000 t which is enough for 1.5 months of consumption. It is unclear to the Mission if this stock includes private millers' stocks. If yes, then such stocks are likely to be drawn down each year as the new marketing year approaches.

¹⁷⁷ Managed by Food Contract Corporation on behalf of government.

¹⁷⁸ Managed by Min Econ Dev under oversight of Cabinet

Tajikistan may only have 10,000 t¹⁷⁹ in stock, less than three day's supply for the whole population. Tajikistan data does not include millers' suppliers but despite entreaties from the Mission, no miller visited was willing to discuss their stocks. It appeared that most had run-out of grain, either as part of an annual routine, which includes a *milling holiday* to clean and maintain the mill before the new marketing year begins in September, or because of the unavailability of affordable imports of wheat for milling. Unlike Uzbekistan and Kyrgyzstan, commercial millers in Tajikistan use exclusively imported grain. When the new Kazakh harvest is collected and the export ban is lifted, *de facto* reserves of grain, held by commercial millers as part of good milling practice, are expected to increase and may add a further 50,000 t of grain to the reserves until June/ July when stocks will again be run down. The exclusive use of imported grain (nb. no local grain is used by commercial millers) does add another layer of vulnerability to the supply of Tajik's main staple.

Three republics under review are wheat importers, the quantity of wheat required annually offers an indication of the national level of dependency in strict *deficit of wheat* terms. Level of vulnerability connects to economic health as reflected in the GDP. In an attempt to look at what may be termed *comparative vulnerability*, an index, the comparative vulnerability index, (*cVI*) has been derived by the Mission to compare levels of vulnerability in the four Central Asian Republics:

$cVI^{180} = \text{Wheat Import Requirement in tonnes} / (\text{Population number in millions} \times \text{GDP per head per annum in US \$})$

The score resulting from the calculation enables comparisons of apparent vulnerability to wheat price hikes to be made; the higher the score, the greater the vulnerability of the country concerned. A non-importing country has a zero score. A country with no GDP has an infinite score. Table 49 shows that although Uzbekistan is the greatest wheat importer in the set the country most vulnerable to increases in imported wheat price is Tajikistan, with a *cVI* three times greater¹⁸¹ than Uzbekistan. Even when remittances are added to the GDP Tajikistan remains the most vulnerable.

¹⁷⁹ May be in form of flour (4 days consumption)

¹⁸⁰ Mission construct; millions in integers ie 1 million=1

¹⁸¹ Also compare Georgia =81; Azerbaijan=38; Armenia=36;

Table 49. Wheat Vulnerability Index, Mission cVI. 2008/9

	Kazakh	Uzbek	Kyrgyz	Tajik
	Exporting <10 million t	Import 1,226,000 t	Import 575,000 t	Import 752,000 t
cVI	0	65	145	204
cVI²	(GNI)	60	134	167

cVI² based on GDP + remittances

4.2.3 Government Policy Measures Related to Food Price Increases (export quotas/taxes – internal price controls, increase in subsidies etc.)

As determined in 4.2.1 sugar is the only commodity not exhibiting substantial retail price increases in all the countries reviewed. The reasons behind this enigma are unclear but may connect to local controls. In the absence of accessible data for most commodities, the Mission has taken wheat as the sample commodity to track changes and interventions in a supply chain.

In late 2007, a 40% tariff was levied on the export of Russian wheat to all countries including the CIS. This effectively placed Russian wheat outside the commercial reach of all but subsidised millers. Coupled with bans clapped on export of Ukraine wheat in late 2007 and on Kazakh wheat export sales in April 2008, this meant that wheat grain supply chains to millers in Central Asia's deficit states were effectively severed from April 2008 onwards.

The Mission notes that such actions are forcing the smaller millers in Tajikistan and Kyrgyzstan, dependent on imported grain, to shut down as their wheat supplies run out, leaving the market open to imported flour sold in ever increasing quantities at what seems to be ever increasing prices. Further, as wheat flour is not subjected to any export duty (Russia) and has no export ban imposed (Ukraine or Kazakhstan), claims that the tariffs or ban have been levied to reduce pressure on home flour/ bread prices need to be questioned. Unless brakes of some sort are imposed on the increased exodus of wheat flour, it is difficult to see how the home consumers are being protected¹⁸². However, increased export of *commodities* (flour) not *straights* (wheat) generates greater revenues due to the added value of the processed goods.

¹⁸² Mission key informant interviews suggest that an informal go-slow on flour exports occurred through reduced access to railway rolling stock after April 2008.

Box 1 summarises the price changes and associated interventions of wheat exporting and importing countries, the following conclusions arise;

1. In Kyrgyzstan and Tajikistan, *local* wheat prices in the market and at the mill gate at the time of the Mission were 44% higher than in Kazakhstan; and 85% more than non-quota farm gate prices in Uzbekistan. This would suggest that the Kazakh export ban has had a dramatic effect on wheat grain prices both in Kyrgyzstan where millers continue to operate using local grain; and also in Tajikistan, where no commercial mills use local grain, unless home-grown wheat is circulating for milling in the 2 tonnes per day “Chinese mill” sub-sector¹⁸³.
2. This year’s wheat harvest prices in Uzbekistan are very low compared to all neighbouring and global prices. Grain bought by the State at quota price, 121 US \$/t, and milled by UDM, provides 39% of flour on sale at subsidised prices of 500 US \$/t or less. Non-quota grain bought privately at 274 US \$/t provides 41% of the flour sold at c. 680 US \$/t. The remaining 20% is imported flour, seen as a luxury product and seen to be sold at 970 US \$/t during the Mission.
3. April 2008 imported Kazakh wheat grain price in Uzbekistan and Tajikistan is 50%+ higher than in the source country. In Tajikistan price increases connect to transport costs, 20% VAT and profit-taking. In Uzbekistan, the increases connect to transport costs, 5% import tax, 20% VAT, and profit taking.
4. In Kyrgyzstan, April 2008 imported Kazakh wheat grain prices were reported to have been up to 430 US \$/t ha, an increase of 22% over farm gate price in Kazakhstan, connecting to transport costs and profit taking as there is no VAT on wheat or import taxes on wheat.
5. In Kyrgyzstan¹⁸⁴ and Tajikistan, imported flour prices are 3-4 % higher than the price of local flour. In Uzbekistan, the price of imported flour is higher due to a 30% import tax, as well as 20% VAT and profit taking.

¹⁸³ Increased wheat prices connect to backyard livestock in urban/ peri-urban houses.

¹⁸⁴ From Mission collected figures, Kyrgyz flour prices (local and imported) are 10% higher than in Tajikistan although VAT is 10% less and imported wheat is cheaper.

Box 1. Price and Policy Relationships

Local **Wheat** Wholesale Price in US \$ per tonne

	Kazakhstan	Uzbek	Kyrgyz	Tajik
mid 2007	190	91 ^q /108 ^{nq}	288	240
July 2008	350	121 ^q /274 ^{nq}	507	509

^q= quota, ^{nq}= non quota¹⁸⁵

Export/ Import **Wheat** Taxes/ action mid 2008

	Kazakhstan	Uzbek	Kyrgyz	Tajik
Export tax	Banned export in April 2008	US\$400 transit tax levied on all road vehicles in transit	100% tax on export, re-export wheat and flour	Export ban on wheat ◊ no taxes. Only exports fruits nuts and veg.
Import tax	-	5%	0.5%	1.5%
VAT	13%	20%	0	20%
Price to mill	-	537	430-507**	525
VAT	-	20%	10%	20%
local imp w. flour	-	680	736	674

Retail **Imp Flour** Price in US\$ per tonne

Imp. Wheat flour	Kazakhstan	Uzbek	Kyrgyz	Tajik
Import tax	-	30%	0.5%	1.5%
VAT	13%*	20%*	10%*	20%*
mid 2007	410	450	441	441
Av 07/08	600	700	590	550
mid 2008	810	970	764	696

◊ Export ban noted by WFP re-exporting wheat to Afghanistan¹⁸⁶

Kazakhstan: Alleged go slow on rail truck availability reduced flour export¹⁸⁷

* VAT cheaper in Kazakhstan at 13%; reduced in Kyrgyzstan in January 2008

^q Uzbekistan UDM mills produce cheap flour at <50% imported price for institutions, bakers producing local *non* bread and certain retailing outlets.

^{nq} Uzbekistan Non quota- local flour sold on open market to any miller; flour price determined by market forces- June 2008 noted at c. 680 US\$ /t.

** Kyrgyzstan flour wheat mix apparently 3:1

¹⁸⁵ Wheat quotas apply to all registered farms c. 50% is sold at predetermined prices to the governments UDM millers. Cheaper flour is then available for institutions and *non* bread bakers. UDM flour is estimated by Mission as 39% of flour trade.

¹⁸⁶ Milisic, Z (2008) WFP Tajikistan could not import pulses from Uzbekistan and Uzbekistan.

6. Wheat flour provision, as seen by the Mission, is as follows:

- In Uzbekistan, the current structure of the agricultural industry and government interventions and policies would seem to provide 84% of the population with lower cost flours being 5% on-farm flour, 39% UDM flour at 500 US \$/t; 40% non-quota local flour at 680 US \$/t as against high-priced imported flour at 970 US \$/t for the remaining 16%.
- In Tajikistan, the current structure of the agricultural industry means 41% of the population access on-farm, locally-milled flour, the rest buy flour milled from imported wheat when available, at a price some 3% cheaper than imported flour at 696 US \$/t or buy the imported flour.
- In Kyrgyzstan, the current structure of the agricultural industry means 30% access on-farm, locally-milled (village) flour, the rest buy flour milled from a mixture of local and imported grain at 736 US \$/t, a price 4% cheaper than imported flour at 764 US \$/t but 6% more expensive than in Tajikistan despite 10% less VAT, suggesting lowering VAT in January 2008 has not kept flour prices down.
- In Kazakhstan, the current structure of the agricultural industry means fewer than 2% of the population access on-farm flour, 1st grade flour retails at 810 US \$/t including 13% VAT whereas grade 3 wheat price is 350 US \$/t and is presently falling, which begs the question "Why is the flour price so high?"

All Governments have taken several initiatives to promote food security as listed below by country.

Tajikistan;

Recent measures promoting food production:-

- relaxation of application of cotton quotas requiring local authorities to deliver specified targets of raw cotton at both central and local levels, frees new areas for wheat growing¹⁸⁸.

¹⁸⁷ Mission informed by private millers rail trucks were not available to meet transport requirements for export orders placed at private mills after wheat ban was introduced, later information to Mission suggests this reflected policy to restrict egress of flour not truck shortages.

¹⁸⁸ Not likely to be possible for indebted farmers tied to cotton companies

- Presidential plots- expansion of hh plot farms by distribution of more unallocated land to families including some urban hh (now 750,000+ plots).
- 152,000 ha of permanent pasture sprayed to control breeding locusts/ hoppers before invasion of cropland, with CERF assistance.
- Agency supported seed potato initiative¹⁸⁹.
- FAO wheat seed/ fertiliser package (1,100t each) for this autumn sowing¹⁹⁰.
- No import taxes on agricultural inputs.

General measures;

- No import taxes on foodstuffs.
- No VAT on local farm goods.
- Removal of income taxes or other taxes on remittances. Now almost all remittances are transferred through banks eliminating theft and confiscation at border crossings boosting family incomes.

Uzbekistan;

Recent measures promoting food production:-

- At both central and local levels strict application of wheat quotas requiring all farmers to sow c.50% of irrigated area to winter wheat.
- Maintenance of cotton quotas- this may deny extra area for wheat but produces cotton-seed oil for reduced price sales through State Procurement processes.
- Inputs *viz* fertilisers and sprays for quota crops are 10-20% below market prices.
- Low interest credit (3%) available for agric. enterprises.
- Exemption from income tax for 3 years for new farm businesses.
- Non-VAT registered farmers (<110,000 US \$/annum) have a flat tax rate of 5.2%.
- 1.225 million ha of arable land are distributed as *dehkan* plots. Land use is not subjected to quotas, production is for hh use and surpluses are saleable, untaxed and considerable.
- The perennial threat of Italian, Moroccan and Asian locusts controlled by a spraying programme organised by the authorities before invasion of cropland.

¹⁸⁹ US\$ 0.5 million enough seed for about 100 ha-compared to 30,000 ha potato area planted this year

¹⁹⁰ At local high sowing rates enough for 4,400 ha / 170,000 ha irrigated wheat expected to be sown.

General measures;

- Local authority use of ration cards for wheat flour and cotton-seed oil to provide access of vulnerable families to subsidised commodities.
- Since 1997, food imports and exports are regulated using taxes and bans on movements in the "best interests of *markets and consumers*"

Kyrgyzstan;

Recent measures promoting food production:-

- Distribution of 10 million litres of diesel for spring ploughing for sale at 27% discount to farmers.
- US\$ 3,000,000 released for easy term (7%) loans to farmers through Aiyl Bank.
- No import tax on agricultural inputs.
- Promotion of farm business advisory services e.g. TES Centres.
- Promotion of land registration.
- Improvement in LRF land leasing arrangements through transparent auctions.
- The perennial threat of Italian, Moroccan and Asian locusts controlled by spraying 154,000 ha, organised by the authorities before invasion of cropland by the pest.
- No export tax on fruits and vegetables or on fruit and vegetable products, to promote expansion of exports.

General measures;

- Introduction of export tax (including goods re-exported) of 100% on wheat and all wheat products and oilseeds and all oil seed based products.
- No VAT levied on flour from small mills.
- Reduction of VAT levied on flour from large mills from 20% to 10% since February 2008.
- Proposal to reduce all VAT on all other goods from 20% to 12% now before Parliament.

Kazakhstan;

Recent measures promoting food production:-

- Wheat and barley incentive payment, 3 years old, 5 US \$/ha.
- Sugar beet incentive payment, June 2008 onwards 400 US \$/ha.
- Rice incentive payment, June 2008 onwards 150 US \$/ha.
- Sunflower incentive payment, June 2008 onwards 160 US \$/ha.
- Diesel spring ploughing incentive, all farmers 10-15% discount for 18 litres/ ha;
- Diesel harvesting incentive, all farmers 10-15% discount for 18 litres/ ha for combine harvesters;

- Fertiliser discount of 40% is expected **next year** to counterbalance price rises of US\$ 330 to US\$ 1,000 reported in 2008.

In addition registered farmer are entitled to the following tax concessions;

- All big farm companies are entitled to an 80% reduction of all taxes.
- Small farmers have a special lump sum tax rate of US\$ 1,000 per annum.
- Agricultural equipment (including processing machinery) on *leasing* agreements is import tax and VAT exempt.

General measures;

- Ban on wheat grain exports since April 2008.
- Mandatory crop insurance 10 days after planting secures loans and livelihoods.
- Unofficial go-slow initiated on export of wheat flour through slow access to rolling stock.

General relationships;

When combined with the actual procedures of import and export, the protectionist measures listed above by country produce formidable barriers to trade that are allegedly only overcome easily by influential high-level connections¹⁹¹, bribery or both. Beuter (2007) has identified 60 steps in the paper chain required to import goods into Tajikistan. The process in Uzbekistan is no less cumbersome. The list below in Box 2 shows the procedures necessary to import and export a standardized cargo of goods in Uzbekistan. The documents required to export and import the goods are also shown.

¹⁹¹“Protectionist” policies that seemingly protect only the income of the JSC monopolies and oligarchs.

Box 2 Import and Export Procedures, Uzbekistan¹⁹²		
Nature of Export Procedures	Duration (days)	US\$ Cost
Documents preparation	32	150
Customs clearance and technical control	4	200
Ports and terminal handling	8	200
Inland transportation and handling	36	2000
Totals:	80	2550
Nature of Import Procedures	Duration (days)	US\$ Cost
Documents preparation	50	150
Customs clearance and technical control	11	200
Ports and terminal handling	11	200
Inland transportation and handling	32	3500
Totals:	104	4050
Export documents	Import documents	
Bill of lading	Bill of lading	
Certificate of origin	Certificate of availability of funds	
Commercial invoice	Certificate of conformity	
Customs export declaration	Certificate of contract registration (with the Agency for Foreign Economic Relations)	
Packing list	Certificate of origin	
Technical standard/health certificate	Commercial contract	
Terminal handling receipts	Commercial invoice	
	Import license	
	Import transaction passport	
	Inspection report	
	Technical standard/health certificate	

A comparison of the time taken up by such procedures and the costs involved is given in Box 3. Transactions involving the export of goods from Kazakhstan to Uzbekistan are, therefore, not for the faint-hearted. Those to Tajikistan also include the onus of transit documents and payments (road only) per US\$ 400 per truck. It should be understood that most shipments are conducted by rail and involve numbers of rolling-stock usually comprising 60 tonnes capacity trucks.

¹⁹² Source: Doing Business 2008 Uzbekistan A Project Benchmarking the Regulatory Cost of Doing Business in 178 Economies, Doing Business Project, World Bank Group

Box 3 Trading across borders						
Country	No. of docs Export	Time in days	Cost in US\$	No. of docs Import	Time in days	Cost in US\$
Uzbek.	7	80	2550	11	104	4050
Tajik.	10	82	3000	11	83	4500
Kyrgyz	13	64	2500	13	75	2450
Kazakh	12	89	2730	14	75	2780
Russia	8	36	2050	13	36	2050

Source: Doing Business 2008 Uzbekistan A Project Benchmarking the Regulatory Cost of Doing Business in 178 Economies, Doing Business Project, World Bank Group

Best practice economies such as Canada, China and Denmark, cited by the same source have no more than 3 documents, take no more than 5 days and cost no more than US \$ 300 per shipment.

There may well be legal short circuits for perishable goods that have escaped the notice of the Mission, however, notwithstanding that possibility, negotiating a reduction in the legal processing procedures for food items, both straights and commodities, would appear to be highly desirable and would probably reduce smuggling/ customs evasion and improve revenues for the countries concerned.¹⁹³

During meetings with key informants from the large grain producing associations, the Mission was informed of the emergence of *regional interest* in the formation of a forum for grain producing and exporting countries. The reach and role of such a forum is unclear but it appears to include Russia, Ukraine and Kazakhstan. It would seem that if such a forum meets regularly it might offer a platform for discussing issues

¹⁹³ WFP Tajikistan experience suggests that the rules appear to be subject local interpretation which reinforces the need for regular monitoring and reporting to agencies.

such as the ease of movement and continuity of supply to grain dependent states in the region.¹⁹⁴

4.2.4 Government Safety Nets

Government direct and indirect safety nets are summarised below for each Republic. In part, the response of all four country administrations to price increases demonstrated in this report, has been to increase state pensions and allowances. Increases are noted to have been significant and wide ranging, either as part of an automatic reaction established within a system which links a minimum food basket to rates, or, as *ad hoc* responses to pressures. In some cases, *viz* Kyrgyzstan, implementation of the latest advised changes is awaiting final approval.

The two most vulnerable countries, Tajikistan (cVI-204) and Kyrgyzstan (cVI-145), are also in fiscal deficit; therefore, in each case the government's financial room for manoeuvre in response to international price hikes is limited. Options to reduce VAT on flour and other essential foods are being considered in Tajikistan but this action will reduce revenue at a time when budget demands are growing. Kyrgyzstan has reduced VAT on flour to 10% but the retail flour prices across the country are 10% higher than in Tajikistan, using similarly priced imported wheat and where daily wage labour rates are higher, which suggests the reduction has not had the desired effect. Uzbekistan's subsidised wheat production does appear to provide a foundation of lower priced flour, but the Mission would feel easier in confirming this if more data regarding prices and availability of UDM flour had been released.

Tajikistan has the highest cVI (204) and so, by our definition, is the most vulnerable. Social support is received by 40-50% of households. There has been a 300% increase in *nominal* minimum wage in 2008 lifting pensions and allowances based on such; but simultaneous raising of poverty threshold reduces eligibility for assistance. The overall effect of changes is, however, to include more families in the vulnerable bracket. Supplementary benefits are also available for vulnerable families faced with fuel and electricity price increases;

- Food security packages in operation for;
 - School feeding, malnourished children, emergencies, TB cases, VGF- WFP.
 - Food support to vulnerable hh- CARE Int; SCF; Mercy Corps.

¹⁹⁴ Comparison with OPEC springs immediately to mind.

- Wage labour (as noted by piece work charges) has increased 34% to c. 6 US \$/day since July 2007. Actual minimum wage is c. 100 US \$/month
- 74% of all families have farms (PHPs and back yards) and both farms appear to be far more productive than has been recorded.
- Remittances are another unmeasured source of income.

Uzbekistan has a lower *cVI* (64) than Tajikistan (204) and Kyrgyzstan (145) and so by our definition, is less vulnerable;

- Social support is received by 35% of households.
- 57% increase in pensions in the last year to July lifted basic pensions to 19 US \$/ month plus work awards.
- Wage labour (as noted by piece work charges) has increased by 194% since July 2007 to 8¹⁹⁵ US \$/ day.
- Actual minimum wage is 100 US \$/ month.
- 77% of all families have *dehkan* plots (back yards) which are highly productive.
- 80% of the population are thought to have direct or indirect (bread) access to Uzbek flour; *viz* 39% UDM quota flour at half imported flour prices, 41% local non-quota flour (bread) at two thirds imported flour prices.
- Remittances are another unmeasured source of income.

Kyrgyzstan has the second highest *cVI* (145) compared to Tajikistan (204) and Uzbekistan (64) and so, by our definition, is the second most vulnerable;

- Will establish a 90-day food stock for 8 commodities.
- Social support in some form is received by 50-60% of households. There has been a 37% increase in pensions and further increases to lift and sustain pensions at 43% of cost of minimum food basket are awaiting ratification.
- A proposal for civil service salaries to be raised to cover 100% of cost of minimum food basket is awaiting ratification.
- Food security packages in operation for;
 - limited quantity of discount priced (20-40%) flour on sale to 320,000 hh.
- Wage labour (as noted by piece work charges) has increased 42% to c. 5 US \$/day since July 2007.
- The actual minimum wage received by workers is estimated at 103 US \$/ month.

¹⁹⁵ Tashkent only.

- 88% of all families have *korojai* (backyard plots) and 33% of all families have farms; both appear to be far more productive than has been recorded.
- Remittances are another unmeasured source of income.

Kazakhstan as a wheat exporting country has a zero rated *cVI*. Nevertheless:

- a significant proportion (14.6%) of the population receives social support and benefits in the form of regular pensions and allowances.
- Pensions were increased in July 2008 by 15-35% to lift monthly rate to 40% of minimum food basket.
- A further 7.2% receive special allowances (reviewed 6 monthly).
- Local authority allowances are distributed to 12.9% of hh termed vulnerable.
- 204 discount shops and 315 trading posts within normal shops offer discounted goods to local authority registered consumers.
- Wage labour (as noted by piece work charges) has increased 14% to c. 16 US \$/day since July 2007.
- The actual minimum wage received by workers is estimated at 470 US \$/ month.
- 30% of all families have *dacha* plots that are used more diversely in the south; and more for potatoes in central and northern *oblasts*.

4.2.5 Impact of Price Increases/ Production Shortages/ Government Policies on the Vulnerable Segments of the Population

Increases in cost of living generally and the price of food in particular have been reported consistently throughout the Central Asian Republics during 2007 and 2008. Consumer price index increase rates ranging from 10-30% tend to mask individual commodity price increases confirmed by Mission data over the past 18 months at 83%-238% (wheat flour) and 187%-286% (vegetable/ sunflower oil). These increases, coupled with a particularly cold winter, hydro-electric energy policies that may have been orientated to providing heating and maximising energy exports rather than conserving water, and yearly rainfall deficits in the major catchments, have led to the recognition of the concept of the *compound crisis*, such as the "compound crisis" identified in Tajikistan during the winter of 2007-8 to which UN agencies and donors responded.

Disaggregating the socio-economic and policy components involved in a single sector crisis is difficult enough, isolating effects in a compound crisis, where components, by definition, are additive is a task beyond a Mission of this nature. However, following a UN Agency/ Donor joint meeting in Almaty, July 22nd 2008, a concerted assessment is now in progress to integrate exogenous and endogenous factors across sectors. To contribute to this process, the Mission has prepared cereal balances for each country linking expected production in 2008 to domestic requirements in marketing year 2008/9.

Regarding production, given that most prognoses concerning food production were made a) on the back of a prolonged winter, b) prior to spring planting and c) before the annual control of the locust breeding grounds in each of the four republics, they were, understandably, pessimistic.

Mission crop assessments based on a) the 2008 area data from National Statistics Committees, b) MoAs and Farmers' Associations 2008 harvest estimates, c) time-series input use, d) time-series yield data, e) Mission observations (transects) and spot samples and f) key farmer and trader informant interviews, are presented in each of the separate country analysis sections above. The general points emerging from the above and informing the assessments are;

- Rainfed cereal crops (barley and some wheat) have not performed well in Tajikistan, Kyrgyzstan, Uzbekistan and southern Kazakhstan. Consequently, low yields have been used by the Mission to calculate balances.
- Rainfed wheat and barley crop yields in north Kazakhstan, that is in the *oblasts* north and west of north of Karagandi, are expected to be similar or better than last year.
- Irrigated winter- cereal crops, wheat and some barley, have performed as well as and in some cases better than last year in Tajikistan, Kyrgyzstan and Uzbekistan.
- Recorded fertiliser use over all crops is noted to be heavier than last year except in Tajikistan¹⁹⁶. The estimated use by country is;
 - Uzbekistan- 1.9 million tonnes c. 0.45 t/ha (irrigated only, including cotton) reflecting increased use;
 - Kazakhstan- 0.33 million tonnes c. 0.02 t/ha (rainfed and irrigated);

¹⁹⁶ where official exports from Uzbekistan were substantially reduced, allegedly because of a non- payment of bills Alternative sources were being used including increased exports from Pakistan and non-official exports(smuggled goods)

- Kyrgyzstan- 0.09 million tonnes c 0.112 t/ha (irrigated only, including cotton); a 50% increase over use in 2007;
 - Tajikistan- (partial data only¹⁹⁷) 0.110 million tonnes c. 0.153 t/ha (irrigated only including cotton).
- Threats from locusts did **not** materialise. No challenges to arable areas were reported.
 - Other pest challenges are noted as normal. Agro-chemicals are available but cheaper sources from China are unknown and the instructions on use and storage are not understood.
 - Irrigated wheat areas have increased this year.
 - Irrigated maize crops are impressive in every *oblast*, in every republic. Judged by the frequency of appearance in transects driven in each country, maize area seems greater than is presented in data collected, suggesting a greater harvest of maize than estimated.
 - Fruit, melon and vegetable production is normal with slight increases reported in the three exporting republics.
 - In the areas visited by the Mission, there were no apparent shortages of local products, markets were functioning throughout the rural and urban communities in what may only be described as thriving fashion as evinced by the selection of photographs exhibited in Annex 7.

Cereal production estimates in general and wheat estimates in particular are thought likely to be similar to 2007 in all countries. Simply put, where yields may have fallen, areas of cereals have increased¹⁹⁸. Therefore, production shortages and the imports required to make up the deficits will also be similar to previous years as shown in Table 50.

¹⁹⁷ 180,000 t not officially purchased from Uzbekistan this year- may have leaked across border but is not recorded as imports.

¹⁹⁸ Mission cereal balance offers 2 production estimates of wheat production for Kyrgyzstan. A higher alternative is offered using, what the Mission believes to be, a more realistic 3t/ ha rather than 2t/ ha normally used.

Table 50. Wheat Production and Wheat Equivalent Import/Export Summary 2007 and 2008

	2007 Production '000s t	2007 Import '000s t	2008 Production '000s t	2008 Import '000s t
Kazakhstan	16,476	-9,508	16,713	-10,308
Uzbekistan	6,197	1,120	6,107	1,226
Kyrgyzstan	710	506	784 (1,176)*	575 (469)*
Tajikistan	649	867**	668	752

*Mission revised calculation based on higher yields of irrigated wheat similar to neighbours.

**For Tajikistan the 2007 import data were obtained from Kazakh export data. Level is much higher than c750-770,000 t recorded in 2005 and 2006.

Import requirements for the three Republics amount to 2.55 million tonnes, 2.45% higher than last year's estimated 2.49 million tonnes. As Kazakhstan will have an estimated exportable surplus of 10.3 million tonnes, plenty of wheat is likely to be available. This begs the question "*Will the importing republics be able to buy the quantities necessary to make good the deficits in marketing year 2008/9?*" In this regard, as most grain exported to Central Asian Republics is reported¹⁹⁹ to be bought by private traders and large scale milling associations (Tajikistan -100%; Uzbekistan -100%; Kyrgyzstan- 50%) such companies will either have funds to buy or will be backed by the banks who have funded purchases until April 2008.

Presently, farm gate prices of wheat in Kazakhstan have fallen to 320 US \$/ tonne and are expected to fall further matching falls in global futures prices noted as follows;

LIFFE²⁰⁰ grain exchange

- March 08- 360 US \$/ tonne; August 08- 240 US \$ /tonne; November 08- 218 US \$/ tonne.

These significant falls in price connect to very good 2008 harvest estimates in the region *viz*:

- Russia harvest is now expected to be 7% or 6 million tonnes greater than 2007 at 88 million tonnes.
- Ukraine harvest is now expected to increase by 38% or 11 million tonnes to 40 million tonnes.

The Mission surmises that funding will match needs in the form of usual trading patterns unless risks listed below emerge;

¹⁹⁹Tleubayev, N. (2008) President, Grain Union of Kazakhstan. Personal communication

²⁰⁰ LIFFE London International Financial and Futures Exchange

- Kazakhstan ban on wheat exports remains extant beyond September 2008²⁰¹. The ban is expected to be opened in September and will revitalise the mills in Tajikistan. (Kyrgyz and Uzbek mills are already working with local grain).
- Russian Federation maintains export tariff (40%) on wheat, closing buying options. The tariff is expected to be lifted in September 2008²⁰².
- Ukraine maintains export ban on flour quality wheat, which is unlikely given massive harvest estimates and feed-grain wheat has been exportable since July, 2008.
- Crisis in Georgia affects supply chains from Black Sea to Caspian Sea.
- An OPEC-like grain based organisation emerges that establishes control over grain-flow and prices.

Without time or resources to conduct household surveys, and with no information regarding quantities sold or even number of regular traders selling goods, the Mission may only comment on the impact of the increased prices from discussions with millers and traders with regard to their trading patterns and current business practices; and from the contemporary understanding of key informants. A consensus of the anecdotal replies is included below:

- Large flour mills are expanding, building new silos and attracting bank support. Their trade is increasing in all republics.
- Smaller mills fear losing sales of flour if they cannot compete in price with larger mills that are extending their market reach.
- Wholesalers are maintaining wheat flour sales under the *scroll-down* revolving credit terms.
- Market traders in wheat flour in all markets have not observed down turns in sales, despite price increases, except in Kazakhstan where almost all flour is passed through the market and prices have increased as much as in the importing republics.
- Market traders in imported wheat products report falling sales of macaroni, biscuits and cakes; but report increased sales of tea and sugar.
- Supermarkets report falling sales in small towns of imported household goods *viz*, pots, vacuum flasks, crockery and bed linen.

²⁰¹ FAO (2008) GIEWS update 20th Sept states ban lifted.

²⁰² Current crisis in Black Sea may cause Russian Federation to re-inforce links with CIS through preferential trading agreements to extend rather than diminish hegemony.

So far, regarding the welfare of the most vulnerable, support systems noted in 4.2.4 have been adjusted to take into consideration the price increases noted. Further increases are expected in the 2009 in Kyrgyzstan. Daily wage labour rates confirm the increases in each country but the range is enormous from 16 US\$ per day to 5 US \$ per day. Time will tell if further increases to pensions, allowances and salaries track any further food price increases that may arise despite what appears to be no great justification for such increases at the present time.

4.2.6 Organisations Involved in Collecting Information on Food Prices/Food Security/Social Situation

Presently the responsibility for the collection, analysis and presentation of agricultural, household and market data lies with the official government bodies including:

- Tajikistan- Committee of Statistics.
- Uzbekistan- National Statistics Committee.
- Kyrgyzstan- National Statistical Committee.
- Kazakhstan- National Statistical Committee

Each National Statistics Committee in each Republic collects data for nearly every aspect of human endeavour. In most cases, data are published in national language and Russian in quarterly hard-copy bulletins and on websites. English pages are available on some websites but are less regularly updated. The Mission was able to meet with Deputy Ministers/ Chairs of all the Committees and was, in all instances, most graciously received. In all cases bar one, the initial meetings resulted in receipt of data covering many aspects of the Mission's Terms of Reference. Unfortunately, in the case of Uzbekistan, despite representation from UNICEF, and a letter from the Ministry of Foreign Affairs requesting assistance, no data were obtained causing, in the absence of any other data collecting agencies, the Mission to rely on unofficial and incomplete sources on websites²⁰³.

In addition to the official source of statistics, other data, regarding specific activities, are available from Ministry or national institution sources but, for the most part, require detailed requests in writing specifying reasons, type, range and scope. In such a manner, the Mission was granted access to information from National Banks and Departments within Ministries of Social Affairs, of Agriculture and of Economic Development.

²⁰³ Future fact finding Missions should request access/ invitations before entry.

Notwithstanding the access that the Mission enjoyed, acquisition of actual farm, household and market data rather than averages and summaries was precluded, limiting the type of analyses that could be conducted on such data. Fortunately, with respect to market prices, in three out of four Republics, alternative raw-data sources were available.

In Tajikistan, monthly price data for a wide range of commodities have been/ are being collected by WFP. Beuter (2007) has already commented on this source and the Mission enjoyed access to the information required.

In Kyrgyzstan, a DFID Know- How- Fund initiative, mounted in 1997, established KAMIS, an independent marketing information service that monitors prices in most markets throughout the country. The information is presented to subscribing traders and consumers in a fortnightly newspaper. The network is also hired by agencies and companies to provide specific data sets on contract. KAMIS was contracted by the Mission to furnish data from their database for the analyses in this report. In addition, many of the NGOs with programmes promoting fruit and vegetable packaging and processing also collect data from within the confines of their programmes.

In Kazakhstan, a similar marketing information service is provided in Kazakh and Russian by KazAgroMarketing. The Mission has used independent data from KazAgroMarketing for the analyses in this report.

In Uzbekistan, no similar body was found. Various websites created outside the country were reviewed and some data were collected.²⁰⁴ However, for future reference, WFP, in conjunction with other agencies may wish to consider the possibility of extending the work of KAMIS more regionally *i.e.* into Uzbekistan; or to negotiate with UNICEF, who already collect some data, in this regard.

A unified approach to data collection is highly preferable if a coordinated approach to situation analysis is to be pursued. In anticipation of this, a range of indicators for inclusion in regular monitoring in four markets in production and deficit areas in each country is listed below.

²⁰⁴ Many of the plethora of websites relating to Central Asia appear to be politically motivated.

- Retail prices of wheat flour, vegetable oil, potatoes, sheep meat, a dairy product, and diesel fuel; all to be monitored monthly.
- Livestock prices including breeding stock, fattened slaughter stock, store stock and culls.
- Volumes and numbers presented for sale/ unsold on day of monitoring.
- Wage labour rates of daily-hired workers (labour pool) and uptake (number hired/ number available).
- Current pension rates in each location.
- Current procedures/ costs relating to import and export of food stuffs.

Whereas, regular collection of accurate price data appears to be a *sine qua non* for rural assessments, crop and livestock data are regarded in what seems to be a much more desultory fashion. Presently, in Tajikistan, Kyrgyzstan and Uzbekistan, the collection and analysis of such data is recognised to be the mandate of the National Statistics Committees. While the same may be said for Kazakhstan, several extremely powerful trade associations with strong vested interests in keeping abreast of every aspect of the crop sector, ensure a remarkable degree of transparency and regular reporting, at least where cereals are concerned.

In Tajikistan and Kyrgyzstan, agricultural and livestock data tend to be compiled as desk exercises²⁰⁵, scaling up previous data using factors from locally-derived, local authority produced forms a) from samples of peasant farmers; b) from all large farmers. The returns on the forms are also used for tax purpose which places one question mark over accuracy. Interestingly, the *dehkan plots* or *korojai*, which as noted earlier produce most of the fruit, vegetables and potatoes, are not assessed. Consequently, the Mission suggests that although area farmed may be fairly well understood, yields per unit area are not accurately reported and are likely to be under-estimated under the current system. Uzbekistan, with clear quotas for cotton and wheat is in a different category altogether with accurate area and yield assessments, at least for the quota crops.

Other sources of information come from rapid assessments conducted by NGOs and UN/ bilateral agencies²⁰⁶. Such assessments usually rely on a mixture of existing data and rapid appraisals of households in the area of concern. Surveys of farming households undertaken regarding

²⁰⁵ Some forms are returned monthly, others quarterly, 6- monthly and annually.

²⁰⁶ eg. EFSA (2008)

agriculture and livestock invariably draw conclusions from the most subjective sets of responses to what are, invariably, leading questions regarding distress or hardship, which are not tolerated in other sectors. For instance, in most surveys whereas anthropomorphic measurements provide objective estimates of child health status; whereas progress in education is supported by factual attendance sheets or examination results, no such objective measurements are used in agricultural assessments. The Mission feels that rapid crop/livestock assessments should be conducted **each** year at harvest times to audit National Statistics releases and to establish independent benchmarks for all the major food crops and involve:

- Transects driven and walked through production areas supported by PET²⁰⁷ manuals or similar tools to establish rough estimates of yields.
- In-field spot sampling of crops and weighing of samples to establish contemporary yields per unit area each year under each farming system in each agro-ecological zone²⁰⁸.
- Semi-structured interviews with *individual* small-holder producers *on their farms* when harvestable crops are present, not post-harvest focus group discussions.
- Semi-structured interviews with combine harvester drivers to obtain median yields per unit area in each district.
- Review of MoA/ Community administrations' agricultural area data with local agriculturalists from MOA district offices.

Livestock are less easily assessed; it is highly recommended that following discussion with livestock rearing communities, representative herds/ flocks should be selected by peers. Such herds/ flocks should be designated *indicator units* and monitored regularly throughout the year to establish benchmarks by which to judge the performance of others using the similar systems of production in the same agro-ecological zones.

The WFP office in Tajikistan is reasonably placed and equipped to form the hub of such independent monitoring systems.

4.2.7 Opportunities for Local Purchase for WFP

In the earlier mission to the Caucasus, two potential types of local purchase, LPO1 and LPO2, were identified by the Mission. One, LPO1, recognised the potential of unused arable land for cereal/ oilseed

²⁰⁷ Pictorial Evaluation Tools

²⁰⁸ Termed *Technical Audits* such appraisals offer checks and balances to the Nat. Stats. data

production to address the need for strategic stocks in grain deficit republics. The other, LPO2, recognised the excellence of unheralded, small-scale producers whose contributions required organising for both the future well-being of peasant farmers while simultaneously increasing goods to market for low-cost purchase. Similar initiatives are advocated here.

In Central Asia, the nature of the farming systems and need for irrigation preclude the application of the first option in all Republics bar Kazakhstan. In Kazakhstan, widespread Government-subsidised investment is presently sponsoring the development of millions of hectares of rainfed cereal production in the northern forest-steppe because of a) area of land available, b) high quality of the established wheat varieties, c) comparatively low cost of production and d) the progressive nature of the farm enterprises and their adoption of minimum tillage and snowmelt capture techniques.

Central Asia LPO1 suggests WFP enters contract growing agreements in Kazakhstan to obtain 150,000 t for the one-off establishment of a *strategic wheat reserve in Tajikistan for use in Tajikistan*. Appropriate enterprises, already using the latest equipment and technology, exist in the northern forest-steppe with the capacity to manage such an investment. However, notwithstanding the positive forecasts for wheat production in the region, given price fluctuations in the past 18 months, the venture would need to be metaphorically ring-fenced to ensure the availability of the product. Near neighbours and grain importers from the Middle East are apparently organising similar arrangements.

Central Asia LPO2 suggests linking production from formal groups of small farms and plots organised to formal groups of urban consumers. Earlier sections in this report have explained both the past and contemporary importance of small-scale farm units in Kyrgyzstan, Tajikistan and Uzbekistan. Current levels of production of cereals, fruits, vegetables, potatoes and livestock depend on what are now registered household farms and the ubiquitous hh plots, however, more can be done to improve access to the products and reduce probable waste and improve rural incomes. It is now clear to the Mission that in Kyrgyzstan, Uzbekistan and in Tajikistan, household farms have already been recognised as a suitable engine for sustainable and equitable agricultural development. In Uzbekistan, for the time-being, the role of the state in cropping quotas and associated subsidies complicates external intervention in production and marketing. However, in Kyrgyzstan and Tajikistan, major programmes,

supported by donors such as USAID and the Swiss Association for International Cooperation²⁰⁹ (Helvetas) and international NGOs such as CARE International, Winrock International, ADRA, CARITAS and World Vision are highly successful in mobilising groups of peasant farmers. Such programmes are variously designed to:

- assist in securing long-term tenure for the owners of such holdings;
- promote more efficient and equitable irrigation water use through formation and support to WUAs; and rehabilitation of delivery systems;
- promote the formation and capacity building of farmer groups with a marketing and processing focus, to enable the groups to handle production surpluses that are generally available and that can
 - boost rural incomes,
 - promote the sale of local produce in the cities at affordable prices,
 - improve the volume and quality of exports.

It behoves WFP, with its deep-rooted involvement in food security, to see where synergies may be found within existing structures in Tajikistan and Kyrgyzstan, with a view to fostering the emerging farmer groups as agents for producing and marketing food products under WFP sponsored programmes.

At the same time, at the other end of the supply chain, opportunities exist to establish small consumer groups throughout the apartment blocks in the *cities* and consumer groups in *isolated mountain communities* that do not have access to local food products from other areas at reasonable prices. Consumer groups organised as purchasing cooperatives or pre-cooperatives is a mechanism used elsewhere to assist remote communities in accessing food products. Linking two types of pre-cooperatives or cooperatives *i.e.* producers and consumers was used most effectively by the author for ACORD (then Euro Action Acord) in Mali in 1983, linking rice growing pre-coops on the banks of the Niger with pastoralist-based consumer groups located between Gao and Timbuktu²¹⁰. Crucial elements of such arrangements include:

- accurate knowledge of current and changing levels of production;
- access to credit for smallholders with no collateral;

²⁰⁹ Helvetas (2007) Adding Value in Agriculture, Bishkek, Kyrgyzstan

²¹⁰ ECC funded Local purchase programme.

- crop/ animal insurance policies to safeguard individual and group investments;
- formation of stable groups producer and consumer groups;
- preparation of group to group protocols and contracts;
- growing contracts issued to the small-holders by the group for several years linked to quality control and delivery schedules;
- food-processing options that can be locally managed;
- training and mentoring support in all technical, managerial and commercial aspects, is made available for the groups and for individual members.

With the exception of smallholder insurance²¹¹ all the components and no doubt many others have featured in WFP development programmes in other continents. The *local purchasing* funding umbrella is well-placed to support such activities.

An estimated 1.62 million household plots and 360,000 peasant farms exist in the two countries. The farming systems, common to both countries, involve local combinations of family hand-labour, short-term hire of antiquated machinery following the break up of *kolkhoz*, horse and bullock traction, carry-over seeds, farmyard manure use and proven combinations of perennials and annuals using intercropping, relay cropping and alfalfa- based rotations with the latter crop grown to support house-cows and other small stock.

There is a common need for a concerted effort to understand the constraints inherent in these existing farming systems and in the up-stream as well as down-stream supply chains; and to develop new and appropriately scaled interventions that will allow full expression of production potentials and efficient non-monopolistic marketing.

5. Recommendations

5.1 Activity Extension

The Mission recommends that:

- WFP Regional Office recognises that from the Mission *cVI* shown in Table 49, vulnerability in Kyrgyzstan although lower than Tajikistan is far higher than in the independent Caucasus Republics.

²¹¹ The president of the National Farmers Union informed the Mission that crop insurance is mandatory in Kazakhstan. The Union provides such insurance. Crop insurance is also currently under investigation by WFP Ethiopia

- WFP Regional Office recognises that the Tajikistan office is well-placed to extend key activities, already on-going in Tajikistan to vulnerable groups in targeted areas in Kyrgyzstan.
- WFP Regional Office recognises that the current UN Compound Crisis agenda establishes the need to continue work in Tajikistan and provides an entry-point for *ad hoc* food aid interventions in Kyrgyzstan.
- WFP Regional Office recognises that the current UN Compound Crisis agenda offers an entry-point to establish objective methods of crop, livestock and food supply assessment methodologies in keeping with objective *measurement and analytical* procedures favoured by UNICEF in the health and education sectors, throughout the sub-Region.
- WFP Regional Office purchases equipment and manuals for agricultural assessments including development of a PET (Pictorial Evaluation Tool) or similar for crops at harvest time in Central Asia.
- WFP Regional Office recognises the value of accessing accurate streams of price data throughout the year from both the importing and exporting countries in a similar format.
- WFP Regional Office forges links and contracts with KAMIS (Kyrgyzstan) and KazAgroMarketing (Kazakhstan) to provide market price (wholesale and retail) data on a regular basis in WFP proven formats for ready analysis and interpretation.
- WFP Regional Office obtains copies of the software developed for use in South Sudan and elsewhere (Africa) for the collection, storage and analysis of price data with the intention of adapting them for use in the Central Asia.
- WFP Regional Office extends the work initiated by this survey to add more detail, where required, to the supply chains for all commodities. In this regard,
 - WFP Tajikistan is well-placed to monitor seasonal patterns and quantities of internal and external trade in Tajikistan through their own market surveys and through key trader informants; and to note changes in obstacles to international and national supply and value chains.
 - KAMIS is well-placed to deliver a similar service to WFP for changing conditions in Kyrgyzstan and (possibly) in Uzbekistan.
 - In the case of KAMIS being unsuited to work in Uzbekistan, UNICEF should be approached to see if they will extend their current monitoring systems to include WFP's needs.
 - KazAgroMarketing has a fund of market intelligence including movements, which may be extended under

contract to incorporate the details of international trade required.

5.2 Import Vulnerability

The Mission recommends that:

- WFP Regional Office recognises that Tajikistan, by virtue of a staple-food structural deficit and double land-locked position is extremely vulnerable to external shocks regarding food availability.
- WFP Regional Office considers the recommendation that a UN (WFP) strategic stock of wheat grain is established in Tajikistan for use in Tajikistan to be managed locally and released as required in discussion with GoT.
- WFP Regional Office considers ways and means of legally requiring grain-exporting nations to maintain minimum flows of grain to importing neighbours, in a manner similar to water-resource sharing agreements between neighbouring countries existing in the same water basin.
- WFP Regional Office recognises that the constraints on international trading, identified by Beuter in Tajikistan, extend to all countries in the Region and considers ways of addressing such to reduce their various negative effects.
- WFP Regional Office takes notice of an initiative establishing a forum for sub-Region grain producers and exporters and contemplates both the advantages and disadvantages associated with existence of an OPEC-like body for grain.

5.3 Local Purchase Opportunities

The Mission recommends that:

- WFP Regional Office considers the proposal outlined in Section 4.2.7 (LPO 1) to link new large-scale, rainfed wheat growing enterprises in the north of Kazakhstan with WFP operations through the purchase of wheat grown on contract, such wheat to be purchased and exported to be held as strategic stocks in Tajikistan.
- WFP Regional Office considers the proposal outlined in Section 4.2.7 (LPO 2) relating to supporting existing (and new) farmer producer groups in Tajikistan and Kyrgyzstan and linking them through durable purchasing contracts to consumer groups of

vulnerable families in cities and isolated mountain villages through;

- encouraging production of local foodstuffs through formation and support to smallholder groups;
- encouraging and supporting the formation of consumer pre-cooperatives in cities;
- brokering the purchase of farm goods by the consumer groups, grown on contract for WFP by the small-holder groups.
- establishing crop insurance for peasant farmers following, with adaptations, the model used in Kazakhstan.

6. Bibliography

ADB Website	2008	Factsheet for Tajikistan, ADB, Manila www.adb.org/Documents/Fact_Sheets/TAJ.pdf
Bearing-Point	2006	Economic Reform Project, USAID, Tashkent
Bellmon	2008	Amendment Requirement, CARE, Tajikistan
Bellmon	2006	Analysis Amendment Requirement, CARE, Tajikistan
Beuter, T.	2007	Tajikistan Market Profile, WFP Cairo
Bremer, U. and Noleppa, S.	2007	Tajikistan Market Analysis – Food items, UNDP
CIA website	2008	Factbook for Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan https://www.cia.gov/library/publications/the-world-factbook/geos/ti.html
Crole-Rees, A	2006	Uzbek; wheat and flour sub-sectors, GAIN
FAO	2008	CFSAM Field Manual (Agriculture Section), GIEWS, FAO, Rome
Helvetas	2007	Adding Value in Agriculture, Bishkek, Kyrgyzstan

IMF	2006	Tajikistan Country Report, IMF, Washington
IMF	2008	Letter of Intent; Memorandum of Economic and Financial Policies; Memorandum of Understanding, Washington, USA
Interstate Statistical Committee of the CIS	2008	www.cisstat.com
Joint Food Security Cluster	2008	Report on Food Security Emergency in Tajikistan, Dushanbe
Labaude, T.	2007	Contingency Plan for Tajikistan, WFP
Linn, J.	2008	Water-Energy Links in Central Asia: A long-Term Opportunity and Challenge, Brookings Institution, www.brookings.edu
LIFFE London International Financial and Futures Exchange	2008	HGCA, London
Lockwood, J. A., Latchinsky, A.V. and Sergeev, M.G.	2000	Grasshoppers and Grassland Health, NATO Science Series, Springer, New York
Main Department of Meteorology, Bishkek	2008	EU Quarterly Bulletin, Bishkek
Mansoor, A. and Quillin,	2007	Migration and Remittances, World Bank, Washinton, USA

B.

MoA/ EU	2008	Quarter 1 Food Security Information Bulletin, Kyrgyzstan
MoA/ EU	2007	Quarter 4 Food Security Information Bulletin, Kyrgyzstan
Mustafakulov, U.	2008	Quoted by OCHA www.irinnews.org
National Statistics Committee	2008	Statistical Review of Uzbekistan
National Statistics Committee of the Kyrgyz Republic website	website	www.stat.kg
National Statistics Committee of the Kyrgyz Republic	2008	Socio-Economic Situation of Kyrgyz Republic, Bishkek
National Statistics Office,	2007-2008	Crop Area Estimates. Kazakhstan
Olimov, J.	2007	Informal Economy in Tajikistan, UNDP, Dushanbe
Robinson W.I.	2008	Regional Market Survey, WFP Cairo
Robson, M.	2006	Estimating Russia's Impact on the Economic Performance of the Commonwealth of Independent States since 1991: The ESAU Working Paper 16, ODI, London

State Committee for Statistics	2008	Information Bulletin: Food Security and Poverty, Dushanbe, Tajikistan
UNDP	2007	Communities Programme, Dushanbe
UN FAO/WFP	2005	CFSAM Tajikistan, FAO Rome
USDA website	website	Country facts, Kazakhstan, Uzbekistan and Kyrgyzstan www.indexmundi.com
World Bank	2005	Poverty Study, Washington, USA
World Bank Website	2008	World Development Finance Online, Washington, USA http://web.worldbank.org
World Bank	2002	Country Profile, Tajikistan
World Bank	2004	Kyrgyz Republic; Agricultural Policy Update, Washington
World Food Programme	2005	Country Situation Report, Tajikistan

ANNEXES

Table of Contents

ANNEX 1	162
Terms of Reference	162
Itinerary of Visits	165
ANNEX 3	168
ANNEX 3	168
Correlation Coefficients and T-Tests	168
Tajikistan.....	168
Uzbekistan	171
Kyrgyzstan.....	172
Kazakhstan	174
Central Asia	177
ANNEX 4	180
Correlation Coefficients between All Markets	180
ANNEX 5	183
Market Price Data	183
Tajikistan.....	183
Uzbekistan	185
Kyrgyzstan.....	187
Kazakhstan	188
ANNEX 6	191
Kyrgyzstan Farm Gate Prices	191
ANNEX 7	193
Markets and Typical Village Mill	193

ANNEX 1 Terms of Reference

Terms of Reference

Regional Market Study Central Asia (Tajikistan, Kyrgyzstan, Uzbekistan, Kazakhstan)

Background

The unique nature of the ODC region, with many countries having functioning food markets, and with populations increasingly obtaining food commodities from these markets, makes it particularly important to understand how markets function, how they contribute to food security and how WFP can build local capacities to support the most vulnerable within this context.

International food markets are becoming increasingly dynamic and integrated. Most countries of the ODC region depend on these markets, as natural as well as economic conditions in some countries limit self-sufficiency in food production. In Central Asia, countries like Tajikistan, Kyrgyzstan, Uzbekistan, are net importers of food commodities and are procuring an increasing share of their food needs on international markets, mainly from Kazakhstan and Russia, with which they have traditional trade links.

Despite significant improvements made in recent years with regard to food security in the Central Asian countries, in some of them poverty is still high and many of the poor continue to be vulnerable to food insecurity. Particularly in the case of natural disaster or political crises/conflict, both frequently observed in the region, food insecurity can increase fast and can affect considerable parts of the population.

In most of these countries, in the recent past prices of food commodities have gradually, and at times abruptly, increased by more than 50%, following trends in international food markets. The problem of high commodity prices, coupled with high transportation costs, is reducing access to food for the poorest and most vulnerable. All data indicate that this trend is likely to continue.

In countries of the region, both with WFP representation or without, WFP has the mandate to carefully monitor the food security situation of vulnerable populations in the region. Not only natural disaster or political crisis, but also abrupt changes in market supplies combined with sudden and sharp price increases may expose vulnerable populations to the risk of food insecurity and increased poverty.

Against this background, there is a strong need to analyse the development and dynamics of food markets in the region, to understand market trends and to draw conclusions from this analysis for appropriate contingency planning, emergency preparedness and response.

Sound market information will in turn create an enhanced WFP organisational learning and knowledge management of both the Regional Bureau and country offices, which will contribute to a more robust methodology enabling WFP to better adjust its approaches and tools allowing quick response to changing market conditions.

1 Objectives and Expected Outcome

Main objectives of the consultancy are

- Country specific market profiles
- Assessment of regional trade flows, dependencies and risks
- Assessment of the impact recent price trends have on access to food markets of the poorest segments of the population

2 Specific Activities

- Undertake desk review of country specific studies and reports related to food markets
- Analyse food markets of the countries in the region with regard to price developments and trends and analyse the consequences price increases have on food supplies and the food security situation of vulnerable populations.
- Analyse trends in food production, commodity prices, trade flows, stocks and import requirements (and export policies/strategies in the case of Kazakhstan).
- Assess food market structure, market integration, price elasticities and import parity prices in respective countries in the region.
- Assess regional trade flows, transport costs, dependencies and risks of regional markets (regional market profile)
- Analyse food (-security) and trade policies of specific countries and their consequences for regional trade.
- Provide input for emergency preparedness/contingency planning & the development of appropriate responses in support of vulnerable populations.

- Explore regional purchase options
- Collaborate/coordinate with other agencies (FAO) and partners working in the field of market analysis.
- Elaborate country specific & regional market studies

4. Output

- Country specific market analysis for Tajikistan, Kyrgyzstan, Uzbekistan, and Kazakhstan.
- Regional specific analysis for Central Asia region
- Recommendations for WFP related to food markets, including market monitoring indicators and monitoring responsibilities

ANNEX 2

Itinerary of Visits

Date	Place	Organisation	Person	Position
TAJIK				
23.06.08	Dushanbe	UNDP	Mubin Rustamov	Senior Econ. Advisor
	Dushanbe	DFID	Zainiddin Karaev	Programme Officer
24.06.08	Dushanbe	Min Econ Dev and Trade	Farukh Soliev	Head of marketing
	Dushanbe	Min Soc Affairs and Im	5 Senior staff	n/a
	Dushanbe	EU	Charlotte Adriaen	Head of Mission
	Dushanbe	FAO	Gisela Nauk	Project Coordinator
	Dushanbe	Ministry of Agriculture	S. Bahriddinov	Dept Head
	Dushanbe	Ministry of Agriculture	T.M Murodov	Head International Relations
25.06.08	Dushanbe	FINCA	Azamat Maksytbekov	Chief Finance Officer
	Dushanbe	National Bank	Jamshed Yusupov	Deputy Chairman
	Dushanbe	Commitee of Stat's	Turaev Barot	Chief Funds
	Dushanbe	Commitee of Stat's	Jdanova Lyubov	Chief External Affairs
	Dushanbe	Commitee of Stat's	Saganov	Deputy Chair
	Dushanbe	UNICEF	Farhod Khamidov	M and Evaluation Officer
	Dushanbe	Care Int.	Dilbar Gfarova	Programme Manager
	Dushanbe	Care Int.	Farukh Nuriddinov	Food Security Officer
	Dushanbe	USAID	Ubaidullo Mirvaidulloev	Project Management
26.06.08	Dushanbe	Shahristom Rukom	Nikolai Stepanov	International Trader
	Dushanbe	Anshervor-2004	Izzatullo Inoyatov	International Trader
	Dushanbe	Gala Mills	Nuralli,R	Chief Tech Officer
	Dushanbe	Joikombinvest Mill	Mohmadyar Kulov	Owner
27.06.08	Hisor	Hisor private mill	Technician	
	Hisor	Private Farm	Farmer 1	
UZBEK				
29.03.08	Samarkand	Private Farm	Farmer 1	
			Farmer 2	
30.06.08	Tashkent	UNDP	Anvar Nasritdinov	Head of Environ Energy Unit
	Tashkent	UNDP	Ziyodullo Parpiev	Advisor Economist
	Tashkent	UNICEF	Nodira Khusanova	Consultant Economist
	Tashkent	UNICEF	Ali Mohamed Mahdi	Nutrition officer
	Tashkent	EuroBank for R and D.(EBRD)	Sanjar Usmanov	Senior Analyst
	Tashkent	Min of For Economic Relations	Bakhtiyor O Saidov	Head Dept Inter & Reg Relat
	Tashkent	Min of For Economic Relations	Head of Dept	Market and Food Sec Dept
	Tashkent	Min of For Economic Relations	Murat	Protocol
01.07.08	Tashkent	World Bank	Eskender Trushin	Economist
	Tashkent	World Bank	Dilshod Khidirov	Operations Officer
		Chinoz	Hamdam	Registered farmer
		Miraboos	Sultan	Registered farmer
02.07.08	Tashkent	Min. of Agric. Water	Rustam Ibragimov	Dir For Investment
	Tashkent	Min. of Agric. Water	Tulkun Farmonov	Dir Econ Reform
	Tashkent	Min. of Agric. Water	Khasan Mamarasulov	Sen Advisor
	Tashkent	Min. of Agric. Water	Olga Munaeva	Head Foreign Relations

	Tashkent	Centre for EconRes	Nishanbay Sirajiddinov	Deputy Director
	Tashkent	Min. of Economy	R. M. Shoabdurahmanov	Deputy Minister
03.07.08	Tashkent	Min of Labour etc	Alexandr Navotny	Head of Dept. Wages etc
03.07.08	Tashkent	Min of Labour etc	Dilmurod Pulatov	Head of Dept. Int Affiars
03.07.08	Tashkent	Shodlik Company	Sanjar Saidjanov	DG
03.07.08	Tashkent	Tashkent Don Mahsulotari (Mill)	Rustam Nazarov	Sen, Technical Officer
04.07.08	Tashkent	Chorsu Market	Tb.	Grain and feed trader
04.07.08	Tashkent	Chorsu Market	Several	Rice/ Potato traders
05.07.08	Dehkan	Registered farm	Renault and friend	Farmers
07.07.08	Tashkent	Nat Statistics Com	E. B. Torayev	Dep Minister
07.07.08	Tashkent	Nat Statistics Com	Inom Norkulov	International Relations
07.07.08	Tashkent	GAIN Miller	Olim Mirkuhashimov	Expert
KYRGYZ				
09.07.08	Bishkek	FAO	Rysbek Asapov	Head Dept.
09.07.08	Bishkek	Min. Econ. Dev. & Trade	Talent Sakishev	Head of Dept
09.07.08	Bishkek	Nat Bank of Kyrgy	Yrystemov seilbek	Director
09.07.08	Bishkek	Nat Bank of Kyrgy	Nasiba Imaraliena	Head Macro Economics
09.07.08	Bishkek	OSCE	Kimberly Barkley	Economic Issues
09.07.08	Bishkek	Winrock International	Bolotbek Orozbayev	Liaison Officer
10.07.08	Bishkek	Min. Labour and S Pr	Jypara Boronbaeva	Social Affairs
10.07.08	Bishkek	Min. Ag. /Water	Ulan Tungatarov	Head of Marketing
10.07.08	Bishkek	Millers Association	Stanislav Semenchuk	President and Miller
11.07.08	Bishkek	ADRA	Igor Litvinov	Dep. Director
11.07.08	Bishkek	ADRA	Victor Zotov	Country Director
11.07.08	Bishkek	Association of Consumers	Asylbek Koichiev	Executive Director
11.07.08	Bishkek	AIYL Bank	Azamatbek Zhorobekov	Dep. Chairman
11.07.08	Bishkek	World Bank	Brian Bedard	Senior Livestock Adviser
11.07.08	Bishkek	UNDP	Gulnura Dyikanbaeva	Senior Economist,
12.07.08	Torken	Farmer	Ismaat	Farmer
13.07.08	Aervan	Farmers	Mohkhat and Jamilla	Farmers
13.07.08	Aervan	Farmers	Combine driver plus others	Contractor
14.07.08	Osh	Rural Advisory Services	Saparbek Toktosunov	Regional Manager
14.07.08	Osh	Winrock International	John Baxter	Chief of Party
14.07.08	Osh	Helvetas	Tattibubu Shamieva	Project Consultant
15.07.08	Jylo	Hill farmer	Nrilla and family	Shepherds
16.07.08	Bishkek	Turkish Embassy	Tercan Tiryaki	Economic Counsellor
16.07.08	Bishkek wksp	OCHA	Gabriella Waaijmani	Regional Adviser
16.07.08	ibid	IMF	Bakt Dubashev	Economist
16.07.08	ibid	World Bank	Dinara Djoldosheva	Senior Country Officer
16.07.08	ibid	FAO	Rysbek Asapov	Head Dept.
16.07.08	ibid	UNDP	John Lewis	Peace and Dev Adviser
16.07.08	ibid	Companion Financial Group	Erkinbek Jumabaev	Chief Internal Audit
17.07.08	Bishkek	JICA	Okomoto Meiji	Project Chief Adviser,
17.07.08	Bishkek	JICA	Ito Takashi	Project Coordinator,
17.07.08	Bishkek	JICA	Karmyshakova Aigerim	Project Staff,
17.07.08	Bishkek	EU/Min. Ag. Water	Hugh Coulter	Tech. Assistant
18.07.08	Bishkek	Min. Ag. Water	Djancharov Daiyrbek	livestock Specialist
18.07.08	Bishkek	Tom Green Int.	Tom Green	President

18.07.08	Bishkek	Winrock International	Dilshod Abdulhamidov	Value Chain. Expert
18.07.08	Bishkek	Min. Ag.- Dept Chem.	Beksultova Marat	Locusts Control
18.07.08	Bishkek	Chemonics	Chynara Arapova	Country Manager
KAZAKH				
20.07.08	Almaty	Hay market	Dealer 1	Hay dealer
21.07.08	Almaty	Union Food Producers	Anatoliy Popelyushko	President
21.07.08	Almaty	J S C "Rakhat"	Rimma Rustemova	Dir. Econ.
21.07.08	Almaty	Prima Ltd	Arseny Naboko	Chief Exec.
21.07.08	Almaty	Ass of Consumers ADAL	Ms Satkalieva Artyk	President
23.07.08	Astana	Statistics Agency	Zhaslan Omarov	Deputy Chair.
23.07.08	Astana	Statistics Agency	Epbaeva Aiygul	Director Dept.
23.07.08	Astana	Min. of Industry and Trade	Edil Mamytbekov	Vice Minister
24.07.08	Astana	League of Kazakhstan Grain Ps.	Evgeniy Gan	President
24.07.08	Astana	Min of Trans & Comm (JSC-NC)	Salykbaeva GE	Dep Dir Tariffs
24.07.08	Astana	Min of Trans & Comm	Kurmankulov ZhA	Expert Com Mgmt Railways
25.07.08	Astana	Grain Union of Khazakhstan	Nurlan S Tleubayev	President
25.07.08	Astana	Tsena Asstyk	Temir Zholy	Dep Chair Marketing
25.07.08	Astana	Tsena Asstyk	Ibragimov Alibek	Sales- International
25.07.08	Astana	MoA Committee of State Inspect.	S. Seric Irmashevith	Chairman
28.07.08	Astana	Union of Farmers of Khazakhstan	Darinov Awezkhan	Head of Admin
28.07.08	Astana	Food Contract Corporation(FCC)	Ruslan Asimov	President
28.07.08	Astana	Food Contract Corporation(FCC)	Dzehekebayev Askar	Head of Marketing
29.07.08	Astana	Min of Labour and Social Protection	Tatiana Rud	Head of Dept
29.07.08	Astana	UNDP	Haoliang Xu	Res Rep
29.07.08	Astana	UNICEF	Elena Sialchonak	Dep Res Rep
30.07.08	Osakarovka	Wheat Seed Farm	Nikolai	Senior Agronomist
30.07.08	Aksu-Auly	Livestock Farm	Oul Aweli	Sheep farmer
30.07.08	Aksu-Auly	Livestock Farm	Oul Aweli	Farmer/ café proprieter
31.07.08	Shamalgan	Livestock Farm		Technicians

ANNEX 3 Correlation Coefficients and T-Tests

For T-Tests:

- * Mean values different, 95% confidence
- ** Mean values different, 99% confidence
- *** Mean values different, 99.9% confidence

Tajikistan

Correlation Coefficients between Commodities

Dushanbe	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.761	0.928	0.877	0.259	0.528
Mutton	0.761		0.773	0.830	0.402	0.324
Vegetable Oil	0.928	0.773		0.936	0.248	0.504
Diesel	0.877	0.830	0.936		0.315	0.534
Sugar	0.259	0.402	0.248	0.315		0.123
Wage Labour	0.528	0.324	0.504	0.534	0.123	

Gharm	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.474	0.523	0.510	-0.094	0.477
Mutton	0.474		0.829	0.788	-0.113	0.902
Vegetable Oil	0.523	0.829		0.965	-0.066	0.863
Diesel	0.510	0.788	0.965		-0.107	0.873
Sugar	-0.094	-0.113	-0.066	-0.107		-0.101
Wage Labour	0.477	0.902	0.863	0.873	-0.101	

Khorog	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.482	0.936	0.870	0.945	0.867
Mutton	0.482		0.314	0.165	0.587	0.261
Vegetable Oil	0.936	0.314		0.878	0.864	0.917
Diesel	0.870	0.165	0.878		0.701	0.847
Sugar	0.945	0.587	0.864	0.701		0.781
Wage Labour	0.867	0.261	0.917	0.847	0.781	

Khujand	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.898	0.923	0.905	0.090	0.839
Mutton	0.898		0.950	0.945	-0.014	0.786
Vegetable Oil	0.923	0.950		0.967	0.104	0.791
Diesel	0.905	0.945	0.967		0.181	0.828
Sugar	0.090	-0.014	0.104	0.181		0.207
Wage Labour	0.839	0.786	0.791	0.828	0.207	

Kurgan-Tyube	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.677	0.917	0.787	-0.672	0.632
Mutton	0.677		0.685	0.736	-0.452	0.818
Vegetable Oil	0.917	0.685		0.923	-0.771	0.685
Diesel	0.787	0.736	0.923		-0.593	0.751
Sugar	-0.672	-0.452	-0.771	-0.593		-0.569
Wage Labour	0.632	0.818	0.685	0.751	-0.569	

Correlation Coefficients between Markets

Wheat Flour	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe		0.965	0.928	0.966	0.965
Gharm	0.965		0.933	0.968	0.974
Khorog	0.928	0.933		0.932	0.892
Khujand	0.966	0.968	0.932		0.969
Kurgan-Tyube	0.965	0.974	0.892	0.969	

Mutton	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe		0.870	0.284	0.889	0.854
Gharm	0.870		0.224	0.854	0.910
Khorog	0.284	0.224		0.399	0.450
Khujand	0.889	0.854	0.399		0.798
Kurgan-Tyube	0.854	0.910	0.450	0.798	

Vegetable Oil	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe		0.950	0.981	0.938	0.974
Gharm	0.950		0.969	0.955	0.955
Khorog	0.981	0.969		0.970	0.983
Khujand	0.938	0.955	0.970		0.971
Kurgan-Tyube	0.974	0.955	0.983	0.971	

Diesel	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe		0.928	0.944	0.958	0.952
Gharm	0.928		0.989	0.972	0.979
Khorog	0.944	0.989		0.960	0.979
Khujand	0.958	0.972	0.960		0.968
Kurgan-Tyube	0.952	0.979	0.979	0.968	

Sugar	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe		-0.146	0.217	0.067	0.149
Gharm	-0.146		-0.118	0.308	-0.350
Khorog	0.217	-0.118		-0.108	-0.663
Khujand	0.067	0.308	-0.108		0.062
Kurgan-Tyube	0.149	-0.350	-0.663	0.062	

Wage Labour	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe		0.372	0.493	0.346	0.364
Gharm	0.372		0.866	0.806	0.819
Khorog	0.493	0.866		0.879	0.846
Khujand	0.346	0.806	0.879		0.670
Kurgan-Tyube	0.364	0.819	0.846	0.670	

T-Tests between Markets

Wheat Flour	Mean Value (US \$/kg)	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe	0.52		0.997	0.009**	0.718	0.954
Gharm	0.52	0.997		0.012*	0.726	0.958
Khorog	0.66	0.009**	0.012*		0.008**	0.013*
Khujand	0.50	0.718	0.726	0.008**		0.685
Kurgan-Tyube	0.53	0.954	0.958	0.013*	0.685	

Mutton	Mean Value (US \$/kg)	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe	4.36		0.019*	0.000***	0.403	0.235
Gharm	3.86	0.019*		0.159	0.003**	0.239
Khorog	3.58	0.000***	0.159		0.000***	0.010**
Khujand	4.53	0.403	0.003**	0.000***		0.052
Kurgan-Tyube	4.12	0.235	0.239	0.010**	0.052	

Vegetable Oil	Mean Value (US \$/litre)	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe	1.78		0.365	0.899	0.497	0.686
Gharm	1.60	0.365		0.345	0.155	0.622
Khorog	1.81	0.899	0.345		0.602	0.621
Khujand	1.94	0.497	0.155	0.602		0.312
Kurgan-Tyube	1.70	0.686	0.622	0.621	0.312	

Diesel	Mean Value (US \$/litre)	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe	0.73		0.003**	0.023*	0.049*	0.744
Gharm	0.86	0.003**		0.702	0.000***	0.007**
Khorog	0.84	0.023*	0.702		0.000***	0.041*
Khujand	0.65	0.049*	0.000***	0.000***		0.021*
Kurgan-Tyube	0.74	0.744	0.007**	0.041*	0.021*	

Sugar	Mean Value (US \$/kg)	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe	0.73		0.070	0.000***	0.000***	0.014*
Gharm	0.74	0.070		0.000***	0.000***	0.002**
Khorog	0.95	0.000***	0.000***		0.000***	0.000***
Khujand	0.69	0.000***	0.000***	0.000***		0.001***
Kurgan-Tyube	0.72	0.014*	0.002**	0.000***	0.001***	

Wage Labour	Mean Value (US \$/day)	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube
Dushanbe	6.70		0.000***	0.000***	0.000***	0.031*
Gharm	2.80	0.000***		0.000***	0.000***	0.000***
Khorog	4.06	0.000***	0.000***		0.000***	0.000***
Khujand	9.77	0.000***	0.000***	0.000***		0.000***
Kurgan-Tyube	7.54	0.031*	0.000***	0.000***	0.000***	

Uzbekistan

Correlation Coefficients between Commodities

Tashkent	Flour (Kazakh)	Beef	Sunflower Oil	Diesel - National	Sugar	Rice	Wage Labour
Flour (Kazakh)		0.974	0.971	NA	0.272	0.832	NA
Beef	0.974		0.980	NA	0.300	0.861	NA
Sunflower Oil	0.971	0.980		NA	0.127	0.735	NA
Diesel - National	NA	NA	NA		NA	NA	NA
Sugar	0.272	0.300	0.127	NA		0.720	NA
Rice	0.832	0.861	0.735	NA	0.720		NA
Wage Labour	NA	NA	NA	NA	NA	NA	

Nukus	Flour (Kazakh)	Beef	Sunflower Oil	Diesel - National	Sugar	Rice
Flour (Kazakh)		0.624	0.933	0.875	-0.467	0.353
Beef	0.624		0.513	0.889	0.620	0.864
Sunflower Oil	0.933	0.513		NA	-0.944	0.099
Diesel - National	0.875	0.889	NA		NA	0.867
Sugar	-0.467	0.620	-0.944	NA		0.053
Rice	0.353	0.864	0.099	0.867	0.053	

Correlation Coefficients between Markets

Flour	Tashkent - Kazakh Flour	Nukus - Local Flour	Nukus - Kazakh Flour
Tashkent - Kazakh Flour		0.992	0.997
Nukus - Local Flour	0.992		0.882
Nukus - Kazakh Flour	0.997	0.882	

Other Commodities	Tashkent vs. Nukus
Beef	0.908
Sunflower Oil	0.951
Sugar	0.311
Rice	0.993

T-Tests between Markets

Wheat Flour	Mean Value (US \$/kg)	Tashkent - Kazakh Flour	Nukus - Local Flour	Nukus - Kazakh Flour
Tashkent - Kazakh Flour	0.77		0.011*	0.523
Nukus - Local Flour	0.47	0.011*		0.002**
Nukus - Kazakh Flour	0.69	0.523	0.002**	

Other Commodities	Tashkent – Mean Value (US \$)	Nukus – Mean Value (US \$)	T-Test
Beef (1 kg)	4.69	3.51	0.012*
Sunflower Oil (l litre)	2.90	1.62	0.000***
Sugar (1 kg)	0.85	1.14	0.311
Rice (1 kg)	1.54	0.63	0.004**

Kyrgyzstan

Correlation Coefficients between Commodities

Bishkek	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.660	0.959	0.870	0.579	0.746
Mutton	0.660		0.715	0.785	0.613	0.934
Vegetable Oil	0.959	0.715		0.941	0.519	0.809
Diesel	0.870	0.785	0.941		0.591	0.875
Sugar	0.579	0.613	0.519	0.591		0.694
Wage Labour	0.746	0.934	0.809	0.875	0.694	

Naryn	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.663	0.948	0.689	0.381	0.023
Mutton	0.663		0.817	0.935	0.396	0.538
Vegetable Oil	0.948	0.817		0.858	0.458	0.319
Diesel	0.689	0.935	0.858		0.567	0.616
Sugar	0.381	0.396	0.458	0.567		0.304
Wage Labour	0.023	0.538	0.319	0.616	0.304	

Osh	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.843	0.946	0.694	-0.700	0.890
Mutton	0.843		0.858	0.877	-0.570	0.797
Vegetable Oil	0.946	0.858		0.670	-0.715	0.978
Diesel	0.694	0.877	0.670		-0.280	0.628
Sugar	-0.700	-0.570	-0.715	-0.280		-0.708
Wage Labour	0.890	0.797	0.978	0.628	-0.708	

Correlation Coefficients between Markets

Wheat Flour	Bishkek	Naryn	Osh
Bishkek		0.969	0.989
Naryn	0.969		0.975
Osh	0.989	0.975	

Mutton	Bishkek	Naryn	Osh
Bishkek		0.939	0.916
Naryn	0.939		0.957
Osh	0.916	0.957	

Vegetable Oil	Bishkek	Naryn	Osh
Bishkek		0.451	0.959
Naryn	0.451		0.423
Osh	0.959	0.423	

Diesel	Bishkek	Naryn	Osh
Bishkek		0.894	0.820
Naryn	0.894		0.952
Osh	0.820	0.952	

Sugar	Bishkek	Naryn	Osh
Bishkek		0.621	-0.082
Naryn	0.621		-0.142
Osh	-0.082	-0.142	

Wage Labour	Bishkek	Naryn	Osh
Bishkek		0.497	0.687
Naryn	0.497		0.143
Osh	0.687	0.143	

T-Tests between Markets

Wheat Flour	Mean Value (US \$/kg)	Bishkek	Naryn	Osh
Bishkek	0.63		0.617	0.267
Naryn	0.59	0.617		0.616
Osh	0.55	0.267	0.616	

Mutton	Mean Value (US \$/kg)	Bishkek	Naryn	Osh
Bishkek	5.16		0.000***	0.000***
Naryn	4.38	0.000***		0.938
Osh	4.37	0.000***	0.938	

Vegetable Oil	Mean Value (US \$/litre)	Bishkek	Naryn	Osh
Bishkek	1.85		0.000***	0.635
Naryn	1.98	0.000***		0.000***
Osh	1.75	0.635	0.000***	

Diesel	Mean Value (US \$/litre)	Bishkek	Naryn	Osh
Bishkek	0.73		0.503	0.446
Naryn	0.70	0.503		0.979
Osh	0.70	0.446	0.979	

Sugar	Mean Value (US \$/kg)	Bishkek	Naryn	Osh
Bishkek	0.79		0.098	0.002
Naryn	0.83	0.098		0.277
Osh	0.86	0.002	0.277	

Wage Labour	Mean Value (US \$/day)	Bishkek	Naryn	Osh
Bishkek	5.54		0.000***	0.970
Naryn	3.23	0.000***		0.000***
Osh	5.53	0.970	0.000***	

Kazakhstan

Correlation Coefficients between Commodities

Astana	Wheat Flour	Mutton	Sunflower Oil	Diesel	Sugar	National Average Monthly Wage
Wheat Flour		0.337	0.936	0.582	0.226	0.726
Mutton	0.337		0.223	-0.001	-0.090	0.223
Sunflower Oil	0.936	0.223		0.565	0.231	0.773
Diesel	0.582	-0.001	0.565		-0.030	0.457
Sugar	0.226	-0.090	0.231	-0.030		0.125
National Average Monthly Wage	0.726	0.223	0.773	0.457	0.125	

Almaty	Wheat Flour	Mutton	Sunflower Oil	Diesel	Sugar	National Average Monthly Wage
Wheat Flour		0.337	0.936	0.582	0.226	0.726
Mutton	0.705		0.717	0.781	0.754	0.686
Sunflower Oil	0.965	0.717		0.710	0.951	0.750
Diesel	0.690	0.781	0.710		0.811	0.509
Sugar	0.897	0.754	0.951	0.811		0.745
National Average Monthly Wage	0.762	0.686	0.750	0.509	0.745	

Shymkent	Wheat Flour	Mutton	Sunflower Oil	Diesel	Sugar	National Average Monthly Wage
Wheat Flour		0.337	0.936	0.582	0.226	0.726
Mutton	0.552		0.477	0.446	0.012	0.502
Sunflower Oil	0.925	0.477		0.784	0.700	0.795
Diesel	0.863	0.446	0.784		0.798	0.643
Sugar	0.712	0.012	0.700	0.798		0.548
National Average Monthly Wage	0.780	0.502	0.795	0.643	0.548	

Correlation Coefficients between Markets

Wheat Flour	Astana	Almaty	Shymkent
Astana		0.960	0.971
Almaty	0.960		0.964
Shymkent	0.971	0.964	

Mutton	Astana	Almaty	Shymkent
Astana		0.593	0.695
Almaty	0.593		0.632
Shymkent	0.695	0.632	

Sunflower Oil	Astana	Almaty	Shymkent
Astana		0.982	0.985
Almaty	0.982		0.987
Shymkent	0.985	0.987	

Diesel	Astana	Almaty	Shymkent
Astana		0.709	0.747
Almaty	0.709		0.954
Shymkent	0.747	0.954	

Sugar	Astana	Almaty	Shymkent
Astana		0.090	0.463
Almaty	0.090		0.789
Shymkent	0.463	0.789	

T-Tests between Markets

Wheat Flour	Mean Value (US \$/kg)	Astana	Almaty	Shymkent
Astana	0.61		0.897	0.535
Almaty	0.60	0.897		0.628
Shymkent	0.57	0.535	0.628	

Mutton	Mean Value (US \$/kg)	Astana	Almaty	Shymkent
Astana	6.14		0.001***	0.000***
Almaty	5.62	0.001***		0.000***
Shymkent	4.75	0.000***	0.000***	

Sunflower Oil	Mean Value (US \$/litre)	Astana	Almaty	Shymkent
Astana	2.20		0.673	0.727
Almaty	2.30	0.673		0.456
Shymkent	2.11	0.727	0.456	

Diesel	Mean Value (US \$/litre)	Astana	Almaty	Shymkent
Astana	0.64		0.020*	0.036*
Almaty	0.55	0.020*		0.837
Shymkent	0.55	0.036*	0.837	

Sugar	Mean Value (US \$/kg)	Astana	Almaty	Shymkent
Astana	0.89		0.764	0.006**
Almaty	0.90	0.764		0.004**
Shymkent	0.83	0.006**	0.004**	

Correlation Coefficients between Farm Gate and Market Prices

Wheat	Farm Gate Ave vs. Market Ave
Osh	0.918
Naryn	0.926
National Ave	0.971

Potatoes	Farm Gate Ave vs. Market Ave
Osh	0.367
Naryn	0.534
National Ave	0.704

Sunflower Oil	Farm Gate Ave vs. Market Ave
Osh	0.673
National Ave	0.745

Mutton	Farm Gate Ave vs. Market Ave
Osh	0.969
Naryn	0.900
National Ave	0.954

Central Asia

Correlation Coefficients between Commodities

Tajikistan	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.846	0.935	0.837	0.847	0.834
Mutton	0.846		0.836	0.852	0.642	0.857
Vegetable Oil	0.935	0.836		0.916	0.818	0.860
Diesel	0.837	0.852	0.916		0.737	0.859
Sugar	0.847	0.642	0.818	0.737		0.729
Wage Labour	0.834	0.857	0.860	0.859	0.729	

Uzbekistan	Flour (Kazakh)	Beef	Sunflower Oil	Diesel	Sugar	Wage Labour
Flour (Kazakh)		0.595	0.752	0.860	0.154	NA
Beef	0.595		0.812	0.841	0.375	NA
Sunflower Oil	0.752	0.812		0.870	0.005	NA
Diesel	0.860	0.841	0.870		NA	NA
Sugar	0.154	0.375	0.005	NA		NA
Wage Labour	NA	NA	NA	NA	NA	

Kyrgyzstan	Wheat Flour	Mutton	Vegetable Oil	Diesel	Sugar	Wage Labour
Wheat Flour		0.723	0.968	0.799	0.133	0.822
Mutton	0.723		0.797	0.918	0.286	0.920
Vegetable Oil	0.972	0.797		0.863	0.158	0.889
Diesel	0.799	0.918	0.863		0.406	0.948
Sugar	0.133	0.286	0.158	0.406		0.302
Wage Labour	0.822	0.920	0.889	0.948	0.302	

Kazakhstan	Wheat Flour	Mutton	Sunflower Oil	Diesel	Sugar	Average Wage
Wheat Flour		0.597	0.957	0.777	0.781	0.761
Mutton	0.597		0.528	0.485	0.400	0.520
Sunflower Oil	0.957	0.528		0.743	0.774	0.776
Diesel	0.777	0.485	0.743		0.785	0.574
Sugar	0.781	0.400	0.774	0.785		0.591
Average Wage	0.761	0.520	0.776	0.574	0.591	

Correlation Coefficients between Markets

Wheat Flour	Tajikistan	Kyrgyzstan	Kazakhstan	Uzbekistan
Tajikistan		0.939	0.951	0.919
Kyrgyzstan	0.939		0.983	0.962
Kazakhstan	0.951	0.983		0.936
Uzbekistan	0.919	0.962	0.936	

Meat	Tajikistan (Mutton)	Kyrgyzstan (Mutton)	Kazakhstan (Mutton)	Uzbekistan (Beef)
Tajikistan		0.903	0.883	0.876
Kyrgyzstan	0.903		0.881	0.929
Kazakhstan	0.883	0.881		0.703
Uzbekistan	0.876	0.929	0.703	

Veg and Sunflower Oil	Tajikistan (Vegetable Oil)	Kyrgyzstan (Vegetable Oil)	Kazakhstan (Sunflower Oil)	Uzbekistan (Sunflower Oil)
Tajikistan		0.976	0.962	0.740
Kyrgyzstan	0.976		0.951	0.757
Kazakhstan	0.962	0.951		0.627
Uzbekistan	0.740	0.757	0.627	

Diesel	Tajikistan	Kyrgyzstan	Kazakhstan	Uzbekistan
Tajikistan		0.897	0.935	NA
Kyrgyzstan	0.897		0.931	0.881
Kazakhstan	0.935	0.931		0.914
Uzbekistan	NA	0.881	0.914	

Sugar	Tajikistan	Kyrgyzstan	Kazakhstan	Uzbekistan
Tajikistan		0.007	0.567	0.197
Kyrgyzstan	0.007		0.453	-0.360
Kazakhstan	0.567	0.453		0.311
Uzbekistan	0.197	-0.360	0.311	

Daily Wage	Tajikistan (Unskilled Labour)	Kyrgyzstan (Unskilled Labour)	Kazakhstan (Average Wage)	Uzbekistan (Unskilled Labour)
Tajikistan		0.854	0.662	NA
Kyrgyzstan	0.854		0.553	NA
Kazakhstan	0.662	0.553		NA
Uzbekistan	NA	NA	NA	

T-Tests between Markets

Wheat Flour	Mean Value (US \$/kg)	Tajikistan	Kyrgyzstan	Kazakhstan	Uzbekistan
Tajikistan	0.55		0.572	0.499	0.023
Kyrgyzstan	0.59	0.572		0.898	0.107
Kazakhstan	0.60	0.499	0.898		0.146
Uzbekistan	0.70	0.023	0.107	0.146	

Meat	Mean Value (US \$/kg)	Tajikistan (Mutton)	Kyrgyzstan (Mutton)	Kazakhstan (Mutton)	Uzbekistan (Beef)
Tajikistan	4.09		0.003**	0.000***	0.067
Kyrgyzstan	4.63	0.003**		0.000***	0.000***
Kazakhstan	5.50	0.000***	0.000***		0.000***
Uzbekistan	3.67	0.067	0.000***	0.000***	

Veg and Sunflower Oil	Mean Value (US \$/litre)	Tajikistan (Vegetable Oil)	Kyrgyzstan (Vegetable Oil)	Kazakhstan (Sunflower Oil)	Uzbekistan (Sunflower Oil)
Tajikistan	1.78		0.703	0.075	0.637
Kyrgyzstan	1.86	0.703		0.126	0.878
Kazakhstan	2.20	0.075	0.126		0.247
Uzbekistan	1.90	0.637	0.878	0.247	

Diesel	Mean Value (US \$/litre)	Tajikistan	Kyrgyzstan	Kazakhstan	Uzbekistan
Tajikistan	0.77		0.200	0.000***	0.007**
Kyrgyzstan	0.71	0.200		0.003**	0.058
Kazakhstan	0.58	0.000***	0.003**		0.637
Uzbekistan	0.55	0.007**	0.058	0.637	

Sugar	Mean Value (US \$/kg)	Tajikistan	Kyrgyzstan	Kazakhstan	Uzbekistan
Tajikistan	0.77		0.000***	0.000***	0.024*
Kyrgyzstan	0.82	0.000***		0.005**	0.066
Kazakhstan	0.87	0.000***	0.005**		0.180
Uzbekistan	1.00	0.024*	0.066	0.180	

Daily Wage	Mean Value (US \$/day)	Tajikistan (Unskilled Labour)	Kyrgyzstan (Unskilled Labour)	Kazakhstan (Average Wage)	Uzbekistan (Unskilled Labour)
Tajikistan	6.17		0.000***	0.000***	0.853
Kyrgyzstan	4.77	0.000***		0.000***	0.126
Kazakhstan	14.81	0.000***	0.000***		0.000***
Uzbekistan	6.37	0.853	0.126	0.000***	

ANNEX 4
Correlation Coefficients between All Markets

Wheat Flour	TAJIKISTAN					KYRGYZSTAN			KAZAKHSTAN			UZBEKISTAN	
	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube	Bishkek	Naryn	Osh	Astana	Almaty	Shymkent	Tashkent	Nukus
Dushanbe		0.965	0.928	0.966	0.965	0.954	0.966	0.955	0.948	0.974	0.944	0.997	0.951
Gharm	0.965		0.933	0.968	0.974	0.942	0.962	0.959	0.954	0.953	0.960	0.997	0.930
Khorog	0.928	0.933		0.932	0.892	0.853	0.906	0.874	0.928	0.907	0.910	0.956	0.868
Khujand	0.966	0.968	0.932		0.969	0.925	0.969	0.936	0.951	0.946	0.972	0.999	0.926
Kurgan-Tyube	0.965	0.974	0.892	0.969		0.969	0.966	0.975	0.937	0.959	0.963	0.993	0.963
Bishkek	0.954	0.942	0.853	0.925	0.969		0.969	0.989	0.939	0.968	0.942	0.970	0.937
Naryn	0.966	0.962	0.906	0.969	0.966	0.969		0.975	0.974	0.988	0.985	0.998	0.960
Osh	0.955	0.959	0.874	0.936	0.975	0.989	0.975		0.951	0.967	0.964	0.971	0.953
Astana	0.948	0.954	0.928	0.951	0.937	0.939	0.974	0.951		0.960	0.971	0.998	0.860
Almaty	0.974	0.953	0.907	0.946	0.959	0.968	0.988	0.967	0.960		0.964	0.997	0.951
Shymkent	0.944	0.960	0.910	0.972	0.963	0.942	0.985	0.964	0.971	0.964		0.994	0.942
Tashkent	0.997	0.997	0.956	0.999	0.993	0.970	0.998	0.971	0.998	0.997	0.994		0.997
Nukus	0.951	0.930	0.868	0.926	0.963	0.937	0.960	0.953	0.860	0.951	0.942	0.997	

Meat	TAJIKISTAN (Mutton)					KYRGYZSTAN (Mutton)			KAZAKHSTAN (Mutton)			UZBEKISTAN (Beef)	
	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube	Bishkek	Naryn	Osh	Astana	Almaty	Shymkent	Tashkent	Nukus
Dushanbe		0.870	0.284	0.889	0.854	0.682	0.856	0.834	0.581	0.762	0.672	0.818	0.725
Gharm	0.870		0.224	0.854	0.910	0.823	0.905	0.919	0.489	0.848	0.626	0.760	0.902
Khorog	0.284	0.224		0.399	0.450	0.510	0.382	0.288	0.552	0.470	0.808		-0.835
Khujand	0.889	0.854	0.399		0.798	0.737	0.806	0.881	0.428	0.868	0.720	0.940	0.761
Kurgan-Tyube	0.854	0.910	0.450	0.798		0.855	0.900	0.843	0.738	0.799	0.760	0.382	0.758
Bishkek	0.682	0.823	0.510	0.737	0.855		0.939	0.916	0.776	0.901	0.748	0.727	0.860
Naryn	0.856	0.905	0.382	0.806	0.900	0.939		0.957	0.755	0.862	0.716	0.926	0.897
Osh	0.834	0.919	0.288	0.881	0.843	0.916	0.957		0.585	0.885	0.643	0.922	0.973
Astana	0.581	0.489	0.552	0.428	0.738	0.776	0.755	0.585		0.593	0.695	-0.022	0.320
Almaty	0.762	0.848	0.470	0.868	0.799	0.901	0.862	0.885	0.593		0.632	0.881	0.830
Shymkent	0.672	0.626	0.808	0.720	0.760	0.748	0.716	0.643	0.695	0.632		0.415	0.283
Tashkent	0.818	0.760		0.940	0.382	0.727	0.926	0.922	-0.022	0.881	0.415		0.902
Nukus	0.725	0.902	-0.835	0.761	0.758	0.860	0.897	0.973	0.320	0.830	0.283	0.902	

Vegetable and Sunflower Oil	TAJIKISTAN (Vegetable Oil)					KYRGYZSTAN (Vegetable Oil)			KAZAKHSTAN (Sunflower Oil)			UZBEKISTAN (Sunflower Oil)	
	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube	Bishkek	Naryn	Osh	Astana	Almaty	Shymkent	Tashkent	Nukus
Dushanbe		0.950	0.981	0.938	0.974	0.962	0.933	0.930	0.959	0.976	0.967	0.997	0.617
Gharm	0.950		0.969	0.955	0.955	0.958	0.944	0.942	0.908	0.905	0.894	0.992	0.531
Khorog	0.981	0.969		0.970	0.983	0.970	0.964	0.972	0.944	0.945	0.943	0.992	0.716
Khujand	0.938	0.955	0.970		0.971	0.916	0.930	0.943	0.880	0.906	0.896	0.992	0.678
Kurgan-Tyube	0.974	0.955	0.983	0.971		0.957	0.953	0.972	0.948	0.962	0.954	0.992	0.708
Bishkek	0.962	0.958	0.970	0.916	0.957		0.984	0.959	0.961	0.955	0.937	0.966	0.619
Naryn	0.933	0.944	0.964	0.930	0.953	0.984		0.972	0.940	0.930	0.906	0.992	0.685
Osh	0.930	0.942	0.972	0.943	0.972	0.959	0.972		0.950	0.928	0.928	0.986	0.831
Astana	0.959	0.908	0.944	0.880	0.948	0.961	0.940	0.950		0.982	0.985	0.990	0.761
Almaty	0.976	0.905	0.945	0.906	0.962	0.955	0.930	0.928	0.982		0.987	0.987	0.644
Shymkent	0.967	0.894	0.943	0.896	0.954	0.937	0.906	0.928	0.985	0.987		0.975	0.718
Tashkent	0.997	0.992	0.992	0.992	0.992	0.966	0.992	0.986	0.990	0.987	0.975		0.951
Nukus	0.617	0.531	0.716	0.678	0.708	0.619	0.685	0.831	0.761	0.644	0.718	0.951	

Diesel	TAJIKISTAN					KYRGYZSTAN			KAZAKHSTAN			UZBEKISTAN
	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube	Bishkek	Naryn	Osh	Astana	Almaty	Shymkent	National Ave
Dushanbe		0.928	0.944	0.958	0.952	0.920	0.747	0.673	0.628	0.741	0.904	NA
Gharm	0.928		0.989	0.972	0.979	0.908	0.820	0.750	0.731	0.845	0.928	NA
Khorog	0.944	0.989		0.960	0.979	0.886	0.847	0.774	0.723	0.894	0.932	NA
Khujand	0.958	0.972	0.960		0.968	0.942	0.829	0.775	0.684	0.842	0.963	NA
Kurgan-Tyube	0.952	0.979	0.979	0.968		0.920	0.825	0.759	0.670	0.822	0.939	NA
Bishkek	0.920	0.908	0.886	0.942	0.920		0.894	0.820	0.672	0.897	0.972	0.903
Naryn	0.747	0.820	0.847	0.829	0.825	0.894		0.952	0.710	0.933	0.931	0.856
Osh	0.673	0.750	0.774	0.775	0.759	0.820	0.952		0.719	0.849	0.872	0.893
Astana	0.628	0.731	0.723	0.684	0.670	0.672	0.710	0.719		0.707	0.748	0.889
Almaty	0.741	0.845	0.894	0.842	0.822	0.897	0.933	0.849	0.707		0.953	0.894
Shymkent	0.904	0.928	0.932	0.963	0.939	0.972	0.931	0.872	0.748	0.953		0.955
National Ave	NA	NA	NA	NA	NA	0.903	0.856	0.893	0.889	0.894	0.955	

Sugar	TAJKISTAN					KYRGYZSTAN			KAZAKHSTAN			UZBEKISTAN	
	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube	Bishkek	Naryn	Osh	Astana	Almaty	Shymkent	Tashkent	Nukus
Dushanbe		-0.146	0.217	0.067	0.149	0.677	0.561	-0.232	0.251	0.350	0.481	0.000	NA
Gharm	-0.146		-0.118	0.308	-0.350	0.156	0.174	0.479	0.168	0.051	0.199	-0.500	0.000
Khorog	0.217	-0.118		-0.108	-0.663	0.227	0.206	-0.792	-0.091	0.796	0.345	-0.500	NA
Khujand	0.067	0.308	-0.108		0.062	0.208	0.076	0.072	0.064	0.122	0.330	-0.997	0.963
Kurgan-Tyube	0.149	-0.350	-0.663	0.062		0.020	0.000	0.501	0.034	-0.730	-0.344	0.500	-0.963
Bishkek	0.677	0.156	0.227	0.208	0.020		0.621	-0.082	0.543	0.422	0.689	0.772	-0.809
Naryn	0.561	0.174	0.206	0.076	0.000	0.621		-0.142	0.435	0.447	0.597	0.844	-0.208
Osh	-0.232	0.479	-0.792	0.072	0.501	-0.082	-0.142		0.060	-0.691	-0.374	0.213	-0.923
Astana	0.251	0.168	-0.091	0.064	0.034	0.543	0.435	0.060		0.090	0.463	0.040	-0.549
Almaty	0.350	0.051	0.796	0.122	-0.730	0.422	0.447	-0.691	0.090		0.789	0.402	0.966
Shymkent	0.481	0.199	0.345	0.330	-0.344	0.689	0.597	-0.374	0.463	0.789		0.726	0.844
Tashkent	0.000	-0.500	-0.500	-0.997	0.500	0.772	0.844	0.213	0.040	0.402	0.726		NA
Nukus	NA	0.000	NA	0.963	-0.963	-0.809	-0.208	-0.923	-0.549	0.966	0.844	NA	

Wages	TAJKISTAN (Unskilled Labour)					KYRGYZSTAN (Unskilled Labour)			KAZAKHSTAN (Average Wage)	UZBEKISTAN (Unskilled Labour)
	Dushanbe	Gharm	Khorog	Khujand	Kurgan-Tyube	Bishkek	Naryn	Osh	National Ave	Tashkent
Dushanbe		0.356	0.486	0.341	0.349	0.534	-0.595	0.496	0.471	NA
Gharm	0.356		0.866	0.806	0.819	0.704	0.175	0.834	0.528	NA
Khorog	0.486	0.866		0.879	0.846	0.736	-0.068	0.909	0.684	NA
Khujand	0.341	0.806	0.879		0.670	0.639	0.051	0.799	0.572	NA
Kurgan-Tyube	0.349	0.819	0.846	0.670		0.653	0.157	0.705	0.509	NA
Bishkek	0.534	0.704	0.736	0.639	0.653		0.497	0.687	0.583	NA
Naryn	-0.595	0.175	-0.068	0.051	0.157	0.497		0.143	-0.045	NA
Osh	0.496	0.834	0.909	0.799	0.705	0.687	0.143		0.724	NA
National Ave	0.471	0.528	0.684	0.572	0.509	0.583	-0.045	0.724		NA
National Ave	NA	NA	NA	NA	NA	NA	NA	NA	NA	

Correlation > 0.99 Correlation > 0.95 Correlation < 0.30

ANNEX 5 Market Price Data

US\$ market price graphs are based on the data shown in these tables. Conversion rates used to get to the US\$ prices given in the tables where:

Tajikistan:-	US\$ 1 : 3.43	Somoni (TJS)
Uzbekistan:-	US\$ 1 : 1315.3	Uzbekistani Som (UZS)
Kyrgyzstan:-	US\$ 1 : 35.5	Kyrgyzstani Som (KGS)
Kazakhstan:-	US\$ 1 : 120.3	Tenge (KZT)

Tajikistan Source; WFP

Market	Year	Month	Wheat Flour - First Grade (US \$/kg)	Meat - Mutton (US \$/kg)	Vegetable Oil (US \$/litre)	Diesel (US \$/litre)	Sugar (US \$/kg)	Potatoes (US \$/kg)	Wage Labour Rates - Unskilled (US \$/day)
Dushanbe	2007	Jan	0.41	3.79	1.17	0.64	0.73	0.50	8.60
Dushanbe	2007	Feb	0.32	3.79	1.17	0.56	0.73	0.50	4.74
Dushanbe	2007	Mar	0.38	3.79	1.17	0.62	0.73	0.44	4.37
Dushanbe	2007	Apr	0.38	4.08	1.14	0.59	0.73	0.43	4.37
Dushanbe	2007	May	0.38	4.08	1.17	0.61	0.73	0.44	4.37
Dushanbe	2007	Jun	0.38	4.08	1.17	0.64	0.73	0.29	7.29
Dushanbe	2007	Jul	0.38	4.08	1.46	0.64	0.73	0.29	7.29
Dushanbe	2007	Aug	0.41	3.79	1.52	0.67	0.73	0.29	7.29
Dushanbe	2007	Sep	0.61	4.08	1.46	0.67	0.73	0.29	7.29
Dushanbe	2007	Oct	0.67	4.08	2.33	0.70	0.73	0.32	7.29
Dushanbe	2007	Nov	0.70	4.37	2.48	0.87	0.73	0.38	7.29
Dushanbe	2007	Dec	0.58	4.37	2.33	0.87	0.73	0.35	7.29
Dushanbe	2008	Jan	0.64	4.96	2.39	0.87	0.73	0.35	7.29
Dushanbe	2008	Feb	0.67	4.96	2.33	0.85	0.73	0.41	7.29
Dushanbe	2008	Mar	0.67	5.39	2.39	0.85	0.73	0.38	
Dushanbe	2008	April	0.67	5.25	2.27	0.85	0.73	0.38	7.29
Dushanbe	2008	May	0.67	5.25	2.33	0.87	0.76	0.38	7.29
Gharm	2007	Jan	0.35	3.21	1.02	0.76	0.81	0.41	2.33
Gharm	2007	Feb	0.35	3.21	1.02	0.76	0.73	0.42	2.26
Gharm	2007	Mar	0.35	3.21	1.02	0.76	0.73	0.42	2.48
Gharm	2007	Apr	0.35	3.21	1.02	0.76	0.73	0.42	2.26
Gharm	2007	May	0.98	3.24	1.02	0.76	0.73	0.41	2.26
Gharm	2007	Jun	0.35	3.53	1.06	0.76	0.73	0.39	2.33
Gharm	2007	Jul	0.39	3.79	1.17	0.76	0.73	0.35	2.41
Gharm	2007	Aug	0.39	3.79	1.46	0.76	0.73	0.36	2.48
Gharm	2007	Sep	0.63	4.08	1.46	0.79	0.74	0.32	2.62
Gharm	2007	Oct	0.64	3.79	2.92 #	0.79	0.76	0.29	2.62
Gharm	2007	Nov	0.64	3.79	1.75	0.87	0.76	0.35	2.62
Gharm	2007	Dec	0.63	3.79	2.04	1.02	0.73	0.32	2.62
Gharm	2008	Jan	0.63	4.08	2.33	1.02	0.73	0.50	3.50

Gharm	2008	Feb	0.63	4.08	2.33	1.02	0.74	0.52	3.50
Gharm	2008	Mar	0.69	4.66	2.33	1.02	0.74	0.50	3.50
Gharm	2008	April	0.63	4.96	2.33	1.02	0.74	0.50	3.50
Gharm	2008	May	0.76	5.25	2.19	1.05	0.73	0.44	4.37
Khorog	2007	Jan	0.44	2.33	1.05	0.73	0.82	0.38	2.92
Khorog	2007	Feb	0.47	2.33	1.05	0.73	0.82	0.36	2.92
Khorog	2007	Mar	0.51	3.28	1.05	0.73	0.89	0.58	2.92
Khorog	2007	Apr	0.58	4.08	1.05	0.73	0.96	0.75	2.92
Khorog	2007	May	0.58	3.97	1.05	0.73	0.91	0.82	2.92
Khorog	2007	Jun	0.58	3.79	1.05	0.73	0.87	0.82	2.92
Khorog	2007	Jul	0.51	3.79	1.26	0.73	0.87	0.59	2.92
Khorog	2007	Aug	0.52	3.79	1.60	0.73	0.87	0.44	4.37
Khorog	2007	Sep	0.70	3.79	1.75	0.73	1.02	0.44	4.37
Khorog	2007	Oct	0.70	3.79	2.22	0.73	1.02	0.44	4.37
Khorog	2007	Nov	0.79	3.79	2.48		1.02	0.44	4.37
Khorog	2007	Dec	0.79	3.79	2.48	1.02	1.02	0.44	4.37
Khorog	2008	Jan	0.79	3.79	2.51	0.96	1.02	0.44	4.37
Khorog	2008	Feb	0.82	3.79	2.51	1.05	1.02	0.50	5.54
Khorog	2008	March	0.82	3.79	2.51	1.05	1.02	0.50	5.54
Khorog	2008	April	0.82	3.79	2.51	1.05	1.02	0.50	5.54
Khorog	2008	May	0.82	3.21	2.62	1.08	1.02	0.58	5.83
Khujand	2007	Jan	0.32	3.79	1.17	0.58	0.73	0.56	8.60
Khujand	2007	Feb	0.32	3.79	1.17	0.56	0.73	0.50	8.60
Khujand	2007	Mar	0.32	3.79	1.17	0.55	0.73	0.44	8.60
Khujand	2007	Apr	0.33	3.94	1.24	0.55	0.69	0.44	8.60
Khujand	2007	May	0.35	4.08	1.46	0.55	0.65	0.67	8.60
Khujand	2007	Jun	0.29	4.08	1.02	0.55	0.63	0.22	7.29
Khujand	2007	Jul	0.31	4.26	1.03	0.56	0.69	0.18	7.87
Khujand	2007	Aug	0.38	4.37	1.64	0.61	0.69	0.26	10.20
Khujand	2007	Sep	0.67	4.37	1.81	0.64	0.69	0.29	10.20
Khujand	2007	Oct	0.61	4.66	1.90	0.61	0.69	0.35	10.20
Khujand	2007	Nov	0.64	4.96	2.77	0.70	0.69	0.44	10.20
Khujand	2007	Dec	0.61	4.96	2.77	0.76	0.70	0.50	10.20
Khujand	2008	Jan	0.70	4.96	2.77	0.76	0.70	0.73	10.20
Khujand	2008	Feb	0.64	5.25	2.77	0.76	0.70	0.58	10.20
Khujand	2008	March	0.64	5.25	2.77	0.76	0.70	0.58	10.20
Khujand	2008	April	0.73	5.25	2.77	0.79	0.70	0.67	13.12
Khujand	2008	May	0.71	5.25	2.74	0.79	0.70	0.44	13.12
Kurgan-Tyube	2007	Jan	0.36	3.06	1.01	0.59	0.72	0.49	6.88
Kurgan-Tyube	2007	Feb	0.40	3.30	1.04	0.65	0.74	0.44	6.47
Kurgan-Tyube	2007	Mar	0.37	3.50	1.10	0.64	0.75	0.52	6.61
Kurgan-Tyube	2007	Apr	0.35	3.79	1.11	0.64	0.73	0.50	7.29
Kurgan-Tyube	2007	May	0.35	4.08	1.17	0.64	0.73	0.47	7.29
Kurgan-Tyube	2007	Jun	0.35	4.08	1.17	0.64	0.73	0.38	7.29
Kurgan-Tyube	2007	Jul	0.41	3.97	1.14	0.67	0.73	0.35	7.29
Kurgan-Tyube	2007	Aug	0.42	3.99	1.17	0.67	0.73	0.30	7.29
Kurgan-Tyube	2007	Sep	0.67	4.08	1.60	0.67	0.73	0.35	7.29
Kurgan-Tyube	2007	Oct	0.69	4.08	2.04	0.67	0.70	0.35	7.29
Kurgan-Tyube	2007	Nov	0.69	4.08	2.33	0.82	0.70	0.35	7.29
Kurgan-Tyube	2007	Dec	0.61	4.08	2.33	0.87	0.72	0.38	7.29

Kurgan-Tyube	2008	Jan	0.59	4.08	2.33	0.87	0.70	0.41	7.29
Kurgan-Tyube	2008	Feb	0.64	4.08	2.33	0.87	0.70	0.42	9.11
Kurgan-Tyube	2008	Mar	0.64	5.25	2.33	0.87	0.70	0.41	8.75
Kurgan-Tyube	2008	April	0.71	5.25	2.33	0.87	0.70	0.41	8.75
Kurgan-Tyube	2008	May	0.73	5.25	2.33	0.93	0.73	0.38	8.75

- Data points removed during analysis

Uzbekistan

www.uznews.net

Market	Year	Month	Flour – Local (US \$/kg)	Flour – Kazakh (US \$/kg)	Beef (US \$/kg)	Sunflower Oil (US \$/litre)	Diesel (US \$/litre)	Sugar (US \$/kg)	Wage Labour (US \$/day)	Rice (US \$/kg)
Tashkent	2007	Jan								
Tashkent	2007	Feb								
Tashkent	2007	Mar								
Tashkent	2007	Apr								
Tashkent	2007	May								
Tashkent	2007	Jun		0.42	3.35	1.35		0.87		0.65
Tashkent	2007	Jul		0.46	3.95			0.80	3.23 ¹	0.63
Tashkent	2007	Aug								
Tashkent	2007	Sep								
Tashkent	2007	Oct								
Tashkent	2007	Nov								
Tashkent	2007	Dec								
Tashkent	2008	Jan								
Tashkent	2008	Feb	NA	0.87	4.75	2.81		0.80		0.84
Tashkent	2008	Mar				3.04				
Tashkent	2008	Apr								0.89
Tashkent	2008	May								1.79
Tashkent	2008	Jun		0.97	5.51	3.50		0.91		1.79
Tashkent	2008	Jul				3.26			9.50 ¹	2.49
Tashkent	2008	Aug	NA	1.12	5.89	3.42				3.23
Tashkent	2008	Sep								
Nukus	2007	Jan								
Nukus	2007	Feb								
Nukus	2007	Mar								
Nukus	2007	Apr								
Nukus	2007	May	0.27	0.40	2.66					0.46
Nukus	2007	Jun	0.26	0.39	2.89	0.99				0.51
Nukus	2007	Jul	0.27	0.41	2.89	1.06				0.49
Nukus	2007	Aug	0.27	0.41	3.04	1.24				0.53
Nukus	2007	Sep	0.39	0.80	3.19	2.13		0.23		0.57
Nukus	2007	Oct	0.48	0.87	3.31	1.82				0.57
Nukus	2007	Nov	0.55	0.87	3.42	1.98				0.51
Nukus	2007	Dec	0.59	0.84	3.42	1.90				0.49
Nukus	2008	Jan	0.59	0.73	3.42	1.67		1.14		0.27
Nukus	2008	Feb	0.54	0.73	3.42	1.75		1.37		0.55

Nukus	2008	Mar	0.52	0.75	3.42	1.60		1.44	0.59
Nukus	2008	Apr	0.54	0.79	4.18	1.67		1.52	0.61
Nukus	2008	May	0.63	0.82	4.94				1.29
Nukus	2008	Jun	0.67	0.85	4.94				1.37
Nukus	2008	Jul							
Nukus	2008	Aug							
Nukus	2008	Sep							
Uzbekistan	2006	Jun					0.45 ²		
Uzbekistan	2006	Jul							
Uzbekistan	2006	Aug							
Uzbekistan	2006	Sep							
Uzbekistan	2006	Oct							
Uzbekistan	2006	Nov					0.44 ³		
Uzbekistan	2006	Dec							
Uzbekistan	2007	Jan							
Uzbekistan	2007	Feb							
Uzbekistan	2007	Mar							
Uzbekistan	2007	Apr							
Uzbekistan	2007	May							
Uzbekistan	2007	Jun					0.51 ²		
Uzbekistan	2007	Jul							
Uzbekistan	2007	Aug					0.55		
Uzbekistan	2007	Sep							
Uzbekistan	2007	Oct							
Uzbekistan	2007	Nov							
Uzbekistan	2007	Dec							
Uzbekistan	2008	Jan							
Uzbekistan	2008	Feb							
Uzbekistan	2008	Mar							
Uzbekistan	2008	Apr							
Uzbekistan	2008	May							
Uzbekistan	2008	Jun					0.59 ²		
Uzbekistan	2008	Jul							
Uzbekistan	2008	Aug							
Uzbekistan	2008	Sep							

Sources: 1 -

² - Food prices increase Kyrg and Uzbek.xls

³ - <http://enews.ferghana.ru/>

NA – Commodity was not available at market

Kyrgyzstan

Source; KAMIS

Market	Year	Month	Wheat Flour - First Grade (US \$/kg) *	Meat - Mutton (US \$/kg) *	Vegetable Oil (US \$/litre)	Diesel (US \$/litre)	Sugar (US \$/kg)	Wheat (US \$/kg)	Potatoes (US \$/kg)	Wage Labour Rates - Unskilled (US \$/day)
Bishkek	2007	Jan	0.44	4.21	1.04	0.58	0.78	5.90	16.00	4.23
Bishkek	2007	Feb	0.44	4.23	1.06	0.57	0.78	6.50	14.00	4.23
Bishkek	2007	Mar	0.44	4.41	1.08	0.57	0.76	6.74	15.50	4.23
Bishkek	2007	Apr	0.44	4.51	1.08	0.57	0.71	7.00	15.20	4.79
Bishkek	2007	May	0.44	5.28	1.12	0.57	0.72	7.51	18.60	4.79
Bishkek	2007	Jun	0.45	5.33	1.18	0.65	0.76		19.60	5.63
Bishkek	2007	Jul	0.46	5.33	1.24	0.68	0.77	7.00	11.40	5.63
Bishkek	2007	Aug	0.54	5.29	1.46	0.68	0.76	8.70	8.60	5.63
Bishkek	2007	Sep			1.50	0.70	0.84	9.40	8.80	5.63
Bishkek	2007	Oct	0.90	5.12	2.42	0.73	0.80	12.90	10.30	5.63
Bishkek	2007	Nov	0.77	5.20	2.18	0.73	0.76	11.60	10.50	5.63
Bishkek	2007	Dec	0.67	5.01	2.19	0.79	0.74	12.00	11.10	5.63
Bishkek	2008	Jan	0.68	5.16	2.21	0.82	0.75	11.90	10.50	5.63
Bishkek	2008	Feb	0.69	5.28	2.27	0.82	0.76	12.00	10.30	5.63
Bishkek	2008	Mar	0.75	5.33	2.41	0.85	0.78	14.10	11.40	5.63
Bishkek	2008	Apr	0.76	5.67	2.45	0.85	0.78	14.50	10.90	5.63
Bishkek	2008	May	0.80	6.19	2.82	0.86	0.87	20.00	20.00	7.04
Bishkek	2008	Jun	0.88	6.20	2.54	0.92	0.97	16.00	18.00	7.04
Bishkek	2008	Jul			2.82	0.98	0.85	23.00	20.00	7.04
Naryn	2007	Jan	0.35	3.66	0.86	0.58	0.86	6.30	17.70	1.97
Naryn	2007	Feb	0.35	3.66	0.79	0.55	0.79	6.00	17.00	1.97
Naryn	2007	Mar	0.35	3.66	0.79	0.55	0.79	7.00	16.30	4.23
Naryn	2007	Apr	0.35	3.99	0.78	0.55	0.78	7.00	16.80	4.23
Naryn	2007	May	0.35	4.41	0.78	0.57	0.78	7.00	17.00	4.23
Naryn	2007	Jun	0.35	4.27	0.79	0.62	0.79	9.00	16.80	2.82
Naryn	2007	Jul	0.36	4.23	0.76	0.61	0.76	10.00	16.00	2.82
Naryn	2007	Aug	0.50	4.23	0.79	0.62	0.79	10.00	15.00	2.82
Naryn	2007	Sep			0.85	0.62	0.85	10.00	14.00	2.82
Naryn	2007	Oct	0.85	4.15	0.87	0.60	0.87	10.50	14.00	2.25
Naryn	2007	Nov	0.74	4.18	0.87	0.63	0.87	10.50	14.00	2.25
Naryn	2007	Dec	0.76	4.19	0.85	0.67	0.85	10.50	17.00	2.25
Naryn	2008	Jan	0.79	4.46	0.82	0.69	0.82	10.50	16.00	2.82
Naryn	2008	Feb	0.73	4.70	0.58	0.70	0.58	10.50	15.00	2.82
Naryn	2008	Mar	0.74	4.70	0.82	0.78	0.82	13.50	14.00	2.82
Naryn	2008	Apr	0.76	4.90	0.89	0.87	0.89	15.00	16.50	2.82
Naryn	2008	May	0.79	5.46	1.00	0.97	1.00	17.50	17.50	4.23
Naryn	2008	Jun	0.85	5.55	0.94	1.04	0.94	18.20	12.50	5.63
Naryn	2008	Jul			0.90	1.06	0.90	19.00	12.00	5.63
Osh	2007	Jan	0.36	3.94	1.16	0.62	1.07	7.60	11.00	4.23
Osh	2007	Feb	0.36	3.94	1.15	0.62	0.87	7.50	15.00	4.23
Osh	2007	Mar	0.36	3.94	1.14	0.62	0.88	7.40	10.00	3.94
Osh	2007	Apr	0.36	3.94	1.15	0.62	0.89	8.00	11.00	3.66

Osh	2007	May	0.36	4.23	1.17	0.62	0.90	8.90	15.29	3.66
Osh	2007	Jun	0.37	4.23	1.17	0.62	0.90	8.90	10.00	3.66
Osh	2007	Jul	0.38	4.23	1.17	0.65	0.90	8.50	10.00	3.94
Osh	2007	Aug	0.49	4.23	1.27	0.65	0.90	8.50	10.00	4.23
Osh	2007	Sep			1.94	0.65	0.89	11.00	7.75	5.63
Osh	2007	Oct	0.79	4.39	2.00	0.65	0.82	12.00	7.00	5.63
Osh	2007	Nov	0.73	4.39	2.06	0.65	0.77	12.00	7.00	6.48
Osh	2007	Dec	0.67	4.39	2.11	0.68	0.79	12.00	7.50	6.48
Osh	2008	Jan	0.61	4.51	2.14	0.68	0.79	12.50	7.00	7.04
Osh	2008	Feb	0.64	4.51	2.17	0.68	0.82	13.00	8.50	7.04
Osh	2008	Mar	0.65	4.51	2.11	0.68	0.79	14.00	7.00	7.04
Osh	2008	Apr	0.67	4.60	2.28	0.82	0.79	14.50	9.00	7.04
Osh	2008	May	0.76	5.10	2.39	0.82	0.79	15.00	13.50	7.04
Osh	2008	Jun	0.84	5.13	2.37	0.96	0.86	16.00	20.00	7.04
Osh	2008	Jul			2.34	1.04	0.85	18.00	17.50	7.04

Sources: * - Nat Stat Com

Kazakhstan

Source KazAgroMarketing

Market	Year	Month	Wheat Flour - First Grade (US \$/kg)	Meat - Mutton (US \$/kg)	Sunflower Oil (US \$/litre)	Diesel (US \$/litre)	Granulated Sugar (US \$/kg)	Average Wage (US \$/month)
Astana	2007	Jan	0.35	5.24	1.44	0.70	0.90	-
Astana	2007	Feb	0.35	5.48	1.45	0.68	0.87	-
Astana	2007	Mar	0.37	5.68	1.39	0.68	0.83	-
Astana	2007	Apr	0.37	6.21	1.40	0.53	0.80	-
Astana	2007	May	0.37	6.77	1.39	0.47	0.76	-
Astana	2007	Jun	0.37	6.80	1.41	0.47	0.88	-
Astana	2007	Jul	0.37	6.17	1.49	0.48	1.00	-
Astana	2007	Aug	0.58	5.96	1.52	0.50	1.00	-
Astana	2007	Sep	0.61	5.62	2.00	0.51	0.94	-
Astana	2007	Oct	0.73	5.78	3.17	0.50	0.96	-
Astana	2007	Nov	0.71	5.97	2.95	0.64	0.91	-
Astana	2007	Dec	0.71	5.82	2.80	0.75	0.84	-
Astana	2008	Jan	0.76	5.90	2.55	0.75	0.80	-
Astana	2008	Feb	0.79	6.34	2.54	0.67	0.82	-
Astana	2008	Mar	0.80	6.62	2.57	0.70	0.85	-
Astana	2008	Apr	0.80	6.73	2.69	0.71	0.91	-
Astana	2008	May	0.87	6.65	2.96	0.74	0.95	-
Astana	2008	Jun	0.86	6.68	3.02	0.79	0.94	-
Astana	2008	Jul	0.85	6.27	2.99	0.94	0.96	-
Almaty	2007	Jan	0.36	4.94	1.48	0.49	0.83	-
Almaty	2007	Feb	0.37	4.98	1.48	0.45	0.82	-
Almaty	2007	Mar	0.37	5.05	1.49	0.45	0.82	-
Almaty	2007	Apr	0.37	5.13	1.49	0.45	0.82	-
Almaty	2007	May	0.35	5.16	1.49	0.45	0.82	-

Almaty	2007	Jun	0.33	5.69	1.49	0.46	0.83	-
Almaty	2007	Jul	0.35	5.67	1.49	0.47	0.81	-
Almaty	2007	Aug	0.47	5.80	1.49	0.48	0.82	-
Almaty	2007	Sep	0.62	5.43	1.68	0.49	0.82	-
Almaty	2007	Oct	0.87	5.42	3.17	0.49	0.92	-
Almaty	2007	Nov	0.83	5.74	3.33	0.50	0.97	-
Almaty	2007	Dec	0.75	5.74	2.85	0.52	0.97	-
Almaty	2008	Jan	0.75	5.86	2.87	0.52	0.95	-
Almaty	2008	Feb	0.75	5.82	2.85	0.67	0.93	-
Almaty	2008	Mar	0.79	5.82	2.86	0.67	0.96	-
Almaty	2008	Apr	0.79	6.03	2.86	0.68	0.96	-
Almaty	2008	May	0.79	6.13	3.03	0.70	0.98	-
Almaty	2008	Jun	0.79	6.28	3.13	0.71	0.97	-
Almaty	2008	Jul	0.79	6.12	3.16	0.76	1.04	-
Shymkent	2007	Jan	0.31	3.76	1.34	0.44	0.83	-
Shymkent	2007	Feb	0.32	3.82	1.33	0.44	0.83	-
Shymkent	2007	Mar	0.32	4.25	1.33	0.44	0.78	-
Shymkent	2007	Apr	0.32	4.76	1.33	0.42	0.72	-
Shymkent	2007	May	0.32	5.09	1.33	0.43	0.72	-
Shymkent	2007	Jun	0.32	4.83	1.33	0.43	0.80	-
Shymkent	2007	Jul	0.32	4.49	1.34	0.46	0.80	-
Shymkent	2007	Aug	0.50	4.92	1.41	0.50	0.80	-
Shymkent	2007	Sep	0.68	4.89	1.72	0.52	0.79	-
Shymkent	2007	Oct	0.72	4.84	3.04	0.52	0.80	-
Shymkent	2007	Nov	0.70	4.71	3.03	0.56	0.90	-
Shymkent	2007	Dec	0.78	4.76	2.90	0.58	0.88	-
Shymkent	2008	Jan	0.73	5.10	2.71	0.58	0.82	-
Shymkent	2008	Feb	0.67	5.19	2.65	0.65	0.82	-
Shymkent	2008	Mar	0.67	5.17	2.44	0.65	0.83	-
Shymkent	2008	Apr	0.77	5.04	2.46	0.67	0.85	-
Shymkent	2008	May	0.81	5.11	2.89	0.70	0.91	-
Shymkent	2008	Jun	0.81	4.91	2.88	0.72	0.93	-
Shymkent	2008	Jul	0.79	4.57	2.70	0.81	0.94	-
Kazakhstan	2007	Jan	0.33	4.43	1.38	0.46	0.83	390.57 *
Kazakhstan	2007	Feb	0.33	4.53	1.39	0.46	0.82	390.57 *
Kazakhstan	2007	Mar	0.33	4.65	1.39	0.47	0.80	401.44 *
Kazakhstan	2007	Apr	0.33	4.87	1.39	0.47	0.78	406.17 *
Kazakhstan	2007	May	0.33	5.10	1.39	0.47	0.77	401.70 *
Kazakhstan	2007	Jun	0.33	5.16	1.40	0.47	0.82	430.71 #
Kazakhstan	2007	Jul	0.34	5.07	1.41	0.48	0.82	434.40 *
Kazakhstan	2007	Aug	0.42	5.06	1.44	0.49	0.81	-
Kazakhstan	2007	Sep	0.55	4.98	1.64	0.49	0.79	440.61 #
Kazakhstan	2007	Oct	0.62	5.01	2.87	0.49	0.85	-
Kazakhstan	2007	Nov	0.63	5.03	2.96	0.57	0.89	-
Kazakhstan	2007	Dec	0.62	5.04	2.76	0.64	0.87	556.53 #
Kazakhstan	2008	Jan	0.60	5.13	2.66	0.66	0.84	462.12 *
Kazakhstan	2008	Feb	0.60	5.22	2.60	0.65	0.84	462.12 *
Kazakhstan	2008	Mar	0.62	5.32	2.58	0.65	0.86	470.45 *

Kazakhstan	2008	Apr	0.64	5.51	2.61	0.66	0.88	476.24 *
Kazakhstan	2008	May	0.66	5.62	2.79	0.69	0.91	471.21 *
Kazakhstan	2008	Jun	0.67	5.66	2.87	0.70	0.92	434.00 *
Kazakhstan	2008	Jul	0.67	5.49	2.89	0.81	0.95	481.36 *

Sources: # - <http://www.nationalbank.kz/>

* - <http://eng.24.kg/cis/2008/07/31/5732.html>

<http://www.theinquirer.net/gb/inquirer/news/2007/07/30/kazakhstan-is-the-worst-place-in-the-world-for-the-internet>

<http://www.rususa.com/news/news.asp-nid-32943-catid-5>

<http://www.inform.kz/showarticle3.php?lang=eng&id=163158>

<http://www.inform.kz/showarticle3.php?lang=eng&id=163158>

<http://en.government.kz/site/news/082008/01>

ANNEX 6 Kyrgyzstan Farm Gate Prices

US\$ market price graphs are based on the data shown in this table.
The conversion rate used to get to the US\$ prices given was:

Kyrgyzstan:- US\$ 1 : 35.5 Kyrgyzstani Som (KGS)

Source; National Statistics Committee.

Producer	Year	Month	Sheep and Goats (US \$/kg)	Wheat (US \$/kg)	Maize (US \$/kg)	Rice (US \$/kg)	Oil Seeds (US \$/kg)	Potatoes (US \$/kg)
National Ave	2007	Jan	1.74	0.18	0.20	1.08	0.42	0.35
National Ave	2007	Feb	1.75	0.18	0.21	1.04	0.42	0.39
National Ave	2007	Mar	1.80	0.20	0.23	1.02	0.51	0.40
National Ave	2007	Apr	1.81	0.20	0.23	1.12	0.57	0.38
National Ave	2007	May	1.90	0.21	0.23	1.01	0.56	0.38
National Ave	2007	Jun	1.96	0.19	0.28	1.02	0.53	0.39
National Ave	2007	Jul	1.96	0.20	0.29	1.02	0.53	0.39
National Ave	2007	Aug	2.00	0.24	0.32	1.06	0.43	0.24
National Ave	2007	Sep	2.01	0.29	0.27	1.05	0.41	0.22
National Ave	2007	Oct	2.08	0.37	0.26	1.09	0.46	0.23
National Ave	2007	Nov	2.08	0.30	0.26	1.08	0.50	0.23
National Ave	2007	Dec	2.08	0.31	0.25	1.12	0.62	0.24
National Ave	2008	Jan	2.11	0.29	0.26	1.06	0.67	0.25
National Ave	2008	Feb	2.12	0.35	0.28	1.11	0.88	0.26
National Ave	2008	Mar	2.14	0.38	0.28	1.12	0.97	0.28
National Ave	2008	Apr	2.22	0.43	0.30	1.08	1.00	0.26
National Ave	2008	May	2.35	0.45	0.34	1.14	1.04	0.30
National Ave	2008	Jun	2.38	0.46	0.39	1.34	0.83	0.30
State Producer	2007	Jan	1.37	0.09	0.13	0.43	0.35	0.36
State Producer	2007	Feb	1.34	0.10	0.13	0.43	0.33	0.37
State Producer	2007	Mar	1.34	0.21	0.13	0.43	0.33	0.36
State Producer	2007	Apr	1.47	0.20	0.14	0.43	0.33	0.34
State Producer	2007	May	1.48	0.21	0.14	0.43	0.33	0.37
State Producer	2007	Jun	1.48	0.14	0.14	0.43	0.33	0.37
State Producer	2007	Jul	1.47	0.17	0.14	0.43	0.33	0.37
State Producer	2007	Aug	1.45	0.19	0.14	0.43	0.33	0.36
State Producer	2007	Sep	1.62	0.19	0.14	0.46	0.36	0.30
State Producer	2007	Oct	1.51	0.25	0.16	0.46	0.37	0.31
State Producer	2007	Nov	1.56	0.22	0.17	0.46	0.43	0.31
State Producer	2007	Dec	1.60	0.20	0.16	0.46	0.43	0.31
State Producer	2008	Jan	1.37	0.19	0.14	0.43	0.35	0.32
State Producer	2008	Feb	1.38	0.31	0.15	0.43	0.35	0.34
State Producer	2008	Mar	1.44	0.31	0.17	0.43	0.35	0.32
State Producer	2008	Apr	1.42	0.33	0.27	0.43	0.35	0.30
State Producer	2008	May	1.77	0.36	0.28	0.43	0.35	0.31

State Producer	2008	Jun	1.79	0.45	0.31	0.43	0.35	0.31
Peasant Producer	2007	Jan	1.67	0.18	0.20	1.08	0.28	0.34
Peasant Producer	2007	Feb	1.65	0.19	0.21	1.04	0.29	0.37
Peasant Producer	2007	Mar	1.73	0.19	0.23	1.02	0.30	0.36
Peasant Producer	2007	Apr	1.71	0.20	0.23	1.12	0.30	0.35
Peasant Producer	2007	May	1.82	0.21	0.23	1.01	0.30	0.36
Peasant Producer	2007	Jun	1.87	0.20	0.28	1.02	0.45	0.33
Peasant Producer	2007	Jul	1.92	0.20	0.29	1.03	0.30	0.32
Peasant Producer	2007	Aug	1.87	0.25	0.26	1.06	0.29	0.22
Peasant Producer	2007	Sep	1.89	0.30	0.26	1.05	0.31	0.19
Peasant Producer	2007	Oct	1.97	0.39	0.26	1.10	0.32	0.21
Peasant Producer	2007	Nov	1.97	0.31	0.25	1.08	0.34	0.20
Peasant Producer	2007	Dec	1.96	0.32	0.25	1.13	0.37	0.21
Peasant Producer	2008	Jan	1.97	0.30	0.26	1.06	0.86	0.22
Peasant Producer	2008	Feb	2.07	0.35	0.27	1.12	0.97	0.23
Peasant Producer	2008	Mar	2.08	0.39	0.28	1.13	0.94	0.26
Peasant Producer	2008	Apr	2.20	0.45	0.30	1.08	1.04	0.23
Peasant Producer	2008	May	2.33	0.46	0.32	1.15	1.04	0.25
Peasant Producer	2008	Jun	2.34	0.45	0.38	1.35	1.04	0.25
Home gardens	2007	Jan	1.81	0.18	0.22	1.06	0.47	0.36
Home gardens	2007	Feb	1.86	0.19	0.23	0.98	0.46	0.42
Home gardens	2007	Mar	1.73	0.22	0.24	1.16	0.59	0.45
Home gardens	2007	Apr	1.92	0.19	0.25	1.00	0.68	0.43
Home gardens	2007	May	1.98	0.20	0.25	0.85	0.67	0.42
Home gardens	2007	Jun	2.04	0.22	0.31	1.01	0.56	0.49
Home gardens	2007	Jul	2.02	0.23	0.31	1.08	0.62	0.50
Home gardens	2007	Aug	2.15	0.24	0.30	1.06	0.49	0.27
Home gardens	2007	Sep	2.13	0.30	0.30	1.03	0.45	0.26
Home gardens	2007	Oct	2.20	0.35	0.29	0.96	0.52	0.27
Home gardens	2007	Nov	2.20	0.33	0.29	0.97	0.56	0.28
Home gardens	2007	Dec	2.20	0.33	0.28	0.95	0.71	0.29
Home gardens	2008	Jan	2.26	0.33	0.24	1.06	0.62	0.29
Home gardens	2008	Feb	2.19	0.32	0.30	0.96	0.88	0.30
Home gardens	2008	Mar	2.22	0.40	0.31	0.84	1.02	0.31
Home gardens	2008	Apr	2.25	0.39	0.33	1.04	1.01	0.30
Home gardens	2008	May	2.38	0.50	0.42	1.14	1.07	0.37
Home gardens	2008	Jun	2.42	0.52	0.42	1.20	0.78	0.37

ANNEX 7 Markets and Typical Village Mill

Five Typical Markets and one village mill



Ad hoc Farmers' market, Dushanbe
Tajikistan



Grain (wholesale) market, Hisor,
Tajikistan



Typical Chinese style village mill,



Local Grain (retail) market, road to
Bekobod, Uzbekistan



Flour stall by market, Urzgen,
Kyrgyzstan



Local Market , Osh, Kyrgyzstan