

SPECIAL REPORT

FAO/WFP CROP AND FOOD SUPPLY ASSESSMENT MISSION TO MOLDOVA

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, ROME



WORLD FOOD PROGRAMME, ROME

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Mission Highlights

- Moldova's 2007 drought has been the most severe in living memory; however, it represents the extreme manifestation of a trend to drier weather conditions, which started in the early 1990s.
- Aggregate cereal production is down by 63 percent compared to last year, and about 70 percent lower than the average of the past five years. Wheat output is estimated at 464 000 tonnes, maize at 276 000 tonnes, and barley at 86 000 tonnes.
- Reduced yields in winter crops (mostly wheat and barley down by 40 percent and 55 percent, respectively) and summer crops (sunflower, maize, grapes, etc.) affected overall production and drastically reduced returns on leased land and on labour to the majority of small holders, who usually receive in-kind payments of wheat, corn, oil. Household production from home gardens, a mainstay of food supply for most rural families (70 percent of population) was also down sharply.
- Lack of pasture/fodder and the need to purchase increasingly expensive food have forced the majority of households to sell a substantial share of their livestock, notably cattle, but also pigs and sheep.
- The share of total lending going to the agricultural sector is relatively small, but small farmer associations and limited liability companies had borrowed from banks, Savings and Loans Associations, and from agricultural input suppliers. Debt outstanding is on the order of US\$30.5 million for small farms and associations, and over US\$100 million for Enterprises and Corporations. Unless loans are re-scheduled a failed cropping season may be followed by a delayed or sharply curtailed one.
- Since 2001, Moldova has had a growing deficit in live animals and animal products (the net trade deficit being about US\$40 million in 2005). In the last ten years the net trade in cereals has been positive except in 2003, when the country was struck by the preceding drought (nearly US\$10 million in net import value).
- To maintain the national food balance, commercial wheat imports, including for emergency stock build-up, are expected to reach about 237 000 tonnes. With greater damage to summer crops, and in spite of the reduction of the national livestock herd, maize imports are likely to be much higher, perhaps as much as 500 000 tonnes. Some of this will be for human consumption, but most of the maize imports will be for livestock feed. Even with adequate overall supply, food prices will remain high or rise further. With already stressed household budgets, food access is likely to decrease for the poorer part of the population.
- Urgent measures to be taken include the provision of agricultural inputs for October planting, subsidies for livestock feed, in order to prevent any further de-stocking, relief on land taxes and essential food import duties, and stepping up social assistance programs; the latter could include allowances to vulnerable groups, expanded school canteen programs and cash for public work programs. Given the prevalence of anaemia, imported wheat should be fortified.
- Medium-term measures should include a rebuilding of the national herd, improved seed production and multiplication, appropriate crop mix and water resources for home gardens, and an upgrade in food security monitoring and early warning tools/systems.
- Longer-term measures include a more sustainable strategy for the agricultural sector, greater and less expensive access to credit, and to agricultural insurance, including weather-indexed risk management instruments.

1. OVERVIEW

In response to a request by the president of the Republic of Moldova to the UN Secretary-General and to the Director-General of FAO, an FAO/WFP Crop and Food Supply Assessment Mission (CFSAM) visited Moldova between 13 and 22 August 2007. The Mission was requested to assess the impact of the drought on the agricultural and livestock sectors as well as the population at large. In addition, the Mission was tasked to devise immediate and medium-term rehabilitation measures to mitigate the impact of drought. Officials from the Ministry of Agriculture and Food Industries (MAFI) accompanied the Mission and a representative from the European Union (EU) participated as an observer.

The Mission held extensive discussions with various relevant Government institutions, in particular the staff of MAFI, the National Bureau of Statistics (NBS), the Ministry of Economy and Trade, the Ministry of Social Protection, the Department of Agro-meteorology and the National Task Force for Drought headed by the Deputy Prime Minister. In addition, the Mission held extensive consultation with all UN and other international and bilateral organizations, including the World Bank (WB), the International Monetary Fund (IMF), the European Union (EU), UNDP, UNHCR, UNICEF and USAID among others. Two highly successful and

important national NGOs deserve specific mention for assisting the Mission in its findings, the National Agency for Rural Development (ACSA) and the National Farmer's Association.

Following initial briefing in the capital, the Mission split into two teams to cover as many Raions (Districts) as possible in the limited time available. The Mission visited at least 4 Raions in each of the three regions of the country, the North, South and Centre. Discussions were also held with deputy Mayors from each of the 32 Raions, who happened to gather in one of the central Raions to discuss this year's drought and its impact with the Minister of Agriculture and Food Industries. MAFI staff in each one of the Raions annually prepare a three-stage crop forecast for all major crops. Their methodology for crop forecasting and estimation was reviewed in all the Raions visited. Though methodologically questionable, the overall forecasting was found to be sound and in line with crop estimates made by other agencies and the Mission spot-checks using Participatory Rural Appraisal (PRA) methods.

The Mission visited a number of Raion markets and held extensive discussions with large and small farmers throughout the field visits. Preliminary Mission findings were presented to the Government and the international community present in the country, before the Mission left the country.

The drought this year is compared with 1946, the worst drought in living memory when many Moldovans starved to death. The Mission witnessed that many lakes and rivers, usually full to capacity at this time of the year, were dry and water table in some areas had receded by almost two meters. Precipitation since early March has been less than 40 percent of the Long Term Average (LTA) throughout the country, except 3 Raions in the North. Not only was the monthly average precipitation far below the LTA but the rainfall frequency was also highly volatile. Irregular and far below average precipitation proved devastating for both winter and summer crops.

Cereal production this year is the lowest in the past decade. Aggregate cereal production is down by 63 percent compared with 2006, and 70 percent down on the average production of the past five years. This aggregate includes some 464 000 tonnes of wheat, 86 000 tonnes of barley and 276 000 tonnes of maize. Other important crops include vineyards, sunflower, sugar beet, fruits and vegetables.

2. SOCIO-ECONOMIC CONTEXT

2.1 Population

The National Bureau of Statistics (NBS) estimates the 2007 beginning-year population at 3.58 million, nearly one percent down from the last census in 2004 and about 10 percent down since independence. A census held around the same time in the breakaway region of Transdnistr reported a population of 580 000 in 2004, down from 700 000 reported in the previous census of 1989. The natural increase in population has consistently been negative since late 1990s and the current rate is about 1.5 percent decline year on year. Urbanisation is relatively stable and the urban population account for about 30 percent of the total.

Moldova: Population by Gender

Year	Number of population (‘000 inhabitants)		
	total	males	females
1959	2 884.5	1 333.8	1 550.7
1970	3 568.9	1 662.3	1 906.6
1979	3 947.4	1 858.4	2 089.0
1989	4 337.6	2 058.2	2 279.4
1990	4 361.6	2 077.8	2 283.8
1995	4 347.9	2 076.7	2 271.2
1996	4 334.4	2 071.0	2 263.4
1997	3 657.3	1 750.8	1 906.5
1998	3 655.0	1 749.9	1 905.1
1999	3 649.3	1 746.9	1 902.4
2000	3 643.5	1 744.2	1 899.3
2001	3 634.5	1 740.3	1 894.2
2002	3 627.2	1 737.4	1 889.8
2003	3 617.7	1 733.0	1 884.7
2004	3 383.3	1 627.7	1 755.6
2005	3 599.8	1 724.5	1 875.3
2006	3 589.3	1 719.3	1 870.0

Source: National Bureau of Statistics.

The IMF in January 2005 quoting survey results conducted in late 2004 estimated that more than 10 percent of the population (400 000 people) was working abroad and a further 290 000 people intended to migrate in the following months¹. The 2007 drought may compel much larger numbers to migrate in search of work outside the country. The total migrant potential estimated in 2005 accounts for about 50 percent of the economically active population, without taking into account this year’s potential migration following drought. This is bound to further deteriorate the demographic balance with significant social and economic consequences for the country, since almost all of the migrant workers are young men and women.

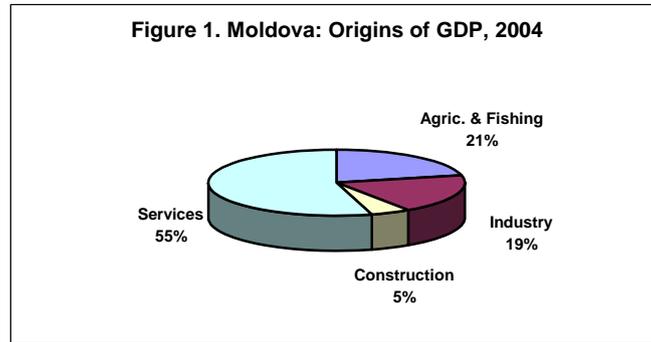
2.2 Macro-economic situation

A prolonged recession throughout the 1990s, following the break up of the Soviet Union, helped turn Moldova into the poorest country in Europe. By 1999 nearly 70 percent of the population was considered poor and more than 60 percent lived in extreme poverty. Rapid economic growth between 1999 and 2003 reduced poverty by about 37 percent, which was broad based and felt across the country. Economic growth since 2003 has, unfortunately, not been coupled with poverty reduction. Poverty in the rural areas, where nearly 70 percent of the poor reside, has actually been rising since 2003, while in the smaller towns it has stagnated. Only in the large cities has poverty been declining at a slow pace. Agriculture being the main source of informal employment and income for many households, poverty, currently estimated at about 29 percent, is likely to rise, following this year’s devastating drought.

Moldova’s official economy, despite a modest cumulative growth of 50 percent since the end of 1990s, is still 60 percent of its size at the time of independence. This reflects the severity of economic collapse suffered following the break-up of the Soviet Union. Unfortunately, economic recovery has been delayed by slow restructuring of the energy sector, the agricultural sector and the underdevelopment of the financial sectors, in particular rural finance. In addition, the 2002/03 drought and frost also compromised economic recovery and this year’s drought may further delay recovery. The robust economic recovery in the Russian Federation, at least until recently, played a key role in reviving Moldova’s export earnings. High energy prices, gas, fuel and electricity, and Russia closing down its market to Moldovan products, in particular wine and spirits, the Moldovan economy still managed to grow by about 4 percent. Domestic demand has been a major source of

¹ According to the National Bank of Moldova, Moldovan citizens working abroad transferred US\$854.6 million through official channels in 2006, a 25 percent increase over 2005. Since much money is being sent unofficially, total remittances may amount to US\$1.3-1.4 billion, or 40 percent of GDP.

growth – household consumption and construction fuelled by large remittances from workers abroad, officially estimated at about 30 percent of GDP.



Source: IMF, International Finance Statistics.

Public sector investment has remained very low, about 2 percent of GDP, resulting in deteriorating public infrastructure, roads in particular, with negative consequences for economic growth. Private investment, on the other hand, has slowly increased since the recovery, averaging 17 percent of GDP per year.

Consumer price inflation has remained in two-digit figures since 2002, reaching 12.5 percent in 2006. The International Monetary Fund (IMF) and the Economic Intelligence Unit (EIU) forecast the CPI inflation to drop to a single digit by the end of 2007 and remain so in 2008 and 2009. However, the 2007 drought that has devastated the agricultural and livestock sectors may increase pressure on prices and a single digit inflation rate may not be a realistic forecast under the circumstances. The exchange rate (Lei:US\$) remains stable and the strengthening of Lei against the US\$ during the second half of 2006 and the first quarter of 2007 reflects the high volume of remittances flowing into the country. In addition, the interventions of the Central Bank (the National Bank of Moldova) in the foreign exchange markets have been praised by various international organisations, including the IMF, the WB and EIU, as prudent monetary policies.

The Russian Federation remains Moldova's strong trading partner despite the ban on Moldovan agricultural exports in 2006, in particular wine. Russia accounted for nearly 40 percent of the total Moldovan exports in 2003, which declined to just over 17 percent of the total in 2006. Romania ranked second in the export destination for Moldovan exports (14.8 percent of total), which has also been restricted since the former joined the European Union (EU). Russia has gradually eased restrictions on Moldovan fruit imports, while negotiations still continue to ease restrictions on wine imports. The IMF and the EIU predict that the current trade deficit, estimated at over 40 percent of GDP, will continue to persist despite the promised easing of import restrictions by Russia. On the import side, remittances from workers abroad will continue to strengthen demand for imported consumer goods and foodstuffs, pushing up the trade deficit in 2007-08. The IMF and the EIU also predict that the remittances and the increase in foreign grants may narrow the current-account deficit from 12 percent of GDP in 2006 to around 6 percent in 2007-08. However, this optimism in a narrowing of the current account deficit may have also been compromised by this year's drought.

The 2007 drought has had severe impacts on the agricultural sector, which directly or indirectly support more than 60 percent of the population. In addition, more than 70 percent of the poor live in the rural areas mostly depending on kitchen gardens and small land areas under their management (1-6 hectares/household) or earn their living from casual farm labour. All categories of farms, large farms, small individual farms and kitchen gardens have all suffered reduced output by an average of 60 percent and in some cases the entire crops are compromised. In addition, relatively high prices for food products, in particular vegetables and bread prices have eroded the purchasing power of households in both rural and urban areas. Pensioners and wage labourers are particularly vulnerable to high food prices.

Table 1: Key Economic Indicators, 2002–2006

	2002	2003	2004	2005	2006
GDP per capita in Lei (at constant 2000 prices)	5 052	5 401	5 816	6 660	6 914
Real GDP growth rate % change year on year	7.8	6.6	7.4	7.1	4.0
Unemployment rate (incl. underemployment)	18.7	17.1	16.9	17.1	-
Employment in agriculture % of total employed	51.0	49.6	43.0	40.5	40.7
Exchange rate Lei:US\$ (annual average)	13.6	13.9	12.3	12.6	13.1
Consumer price inflation % change year on year.	5.2	11.6	12.4	11.9	12.5
Trade deficit in million US\$	378	623	754	1 192	1 591
Total external debt in billion US\$	1.8	1.9	1.9	2.1	2.6
Total debt service in million US\$	175	244	159	305	251

Source: IMF series, the Central Bureau of Statistics, the National Bank of Moldova and the EIU.

Most of the rural households have leased their land to large farms or producers' associations and the rent received is usually a significant part of their income. This year many land owners will either not receive anything or a fraction of the agreed rent, since the landowners bear most or all of the natural calamity risks as stipulated in the contract. In addition, most of the farm labour and those employed in agricultural related activities (marketing, processing and trading) have seen their employment decline since the start of summer this year. Many rural households have already sold the majority of their livestock and are precariously holding on to their best stock, owing to lack of feed (grass and concentrates). Livestock, a significant source of rural household nutrition and income, has been severely de-stocked, further weakening household food security.

3. PERFORMANCE OF THE AGRICULTURAL SECTOR

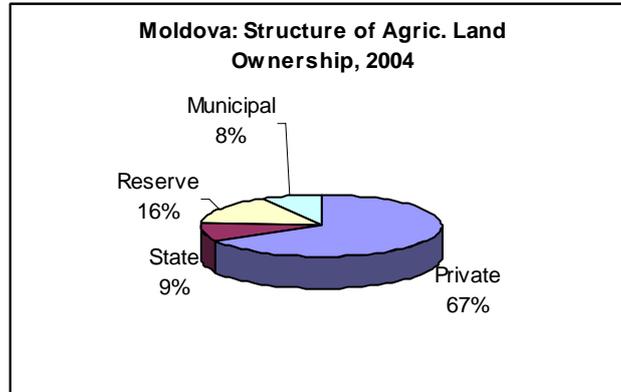
Agriculture's share of the economy has declined since independence, both in absolute and relative terms, with agricultural value added shrinking by 50 percent. However, it remains the largest real sector of the economy, accounting for more than 20 percent of the GDP (30 percent if agro-processing is included) and employing more than 40 percent of the labour force. The agricultural sector also suffers from policy uncertainty, lack of access to adequate farm inputs, extension services and limited access to financial and insurance services. Inefficient farm sizes, some exceeding 2 000 hectares, and the continued squeeze on small farmers through lack of access to sufficient farm inputs (credit, farm power, improved seeds and extension services) as well as markets have contributed to the underperformance of the agricultural sector.

Land entitlement and ownership security is considered one of the pillars of a market driven agricultural economy. As part of reforms the government adopted the Land Code and the Law on Peasant Farms in early 1992, which provided the legal tools and mechanisms for land privatisation and the establishment of individual private farms. The reforms were half-heartedly implemented until the USAID-supported National Land Programme (NLP) was initiated in 1997, which primarily focused on individual land entitlements, carved out of the former collective farms. Unfortunately, the NLP was not accompanied by efforts to address the agricultural service industries, including input supply and agricultural marketing. The second phase of the NLP, which was initiated only in late 2000 and financed by the World Bank and USAID, attempted to address agricultural servicing. It has been argued that focusing only on land distribution, without paying due attention to agricultural skills, extension services, marketing for inputs and outputs and rural finance institutions, had a severe impact on the agricultural sector as a whole. The agricultural and livestock sectors are still recovering from the shock in the 1990s and ignoring the agricultural servicing sectors are said to be one of the contributing factors to the shock.

Limited options, lack of adequate access to input and output markets as well as agricultural finance and farm machinery, have compelled many small holders to lease their land to corporate farms on unfavourable terms. The terms of the land lease in most cases are such that the landowners have borne most of the risk. Therefore, a re-collectivisation of farms has taken place, with very large farm sizes, reminiscent of the former collective farms. It is estimated that half of the agricultural land is used by 300 000 individual family farms and the rest is managed by 300-400 new corporate farms. The average farm size in Moldova is already 4-5 times larger than in Western Europe, owing to the rapid spread of leasing arrangements. A World Bank study (Agricultural Policy Notes: Agric. Land, December 2005), using Total Factor Productivity measure, has

conclusively established that small farms are significantly more efficient than the large farms, yet, small farms cannot thrive in the current context.

Figure 2.



Source: State Cadastre. Total Agric. Land 2.5 million ha.

Public expenditure on agriculture in Moldova is relatively low, about 3 percent of the total budget, which accounts for about 0.9 percent of GDP. Public expenditure in developing countries is typically 6-8 percent of the total budget, and in the developed industrialised countries the figure is 3-5 percent. The Medium Term Expenditure Framework (MTEF) agreed with the IMF and other donors does not envisage room for any increase in the near future.

Agriculture remains the main source of foreign exchange earnings in Moldova, after remittances from Moldovans working abroad. In 2005 aggregate earnings from agriculture-based exports (US\$528 Million) accounted for more than half the total export value. In 2006, despite the ban from Russia on Moldovan exports, in particular wine, total agricultural-based export revenue was US\$412.8 million, nearly 40 percent of total export earnings. Prospects are good for easing restrictions on Moldovan exports to Russia, while the European Union is increasingly becoming an important trade partner. Improved market outlets are essential for any improvement of the agricultural sector in Moldova.

Agricultural capital and infrastructure have suffered a dramatic decline during the economic crisis of the 1990s. Recovery, though significant, have not been able to reach the pre-crisis productive levels. Nearly 50 percent of the orchards and vineyards are out of production, irrigation is only 7 percent of the pre-crisis capacity, farm machinery has declined by 50 percent and existing machinery is on the average a decade old. Most of the high value crops are converted into high-volume-low-value crops such as cereals and sunflower. Significant investment through a comprehensive agricultural strategy is necessary to revitalise the agricultural sector.

4. FOOD CROP PRODUCTION IN 2006/07

The Ministry of Agriculture (MOA) in Moldova prepares preliminary crop forecasts about 4 times during phonological stages of crop development. All large-scale farms are provided with specific forms to record specific data, which is then shared with the Raion (district) department of agriculture. The data is then aggregated in the MOA and forecasts made accordingly. The small farmers (below 10 hectares) are left out of the survey, which make up nearly 50 percent of the total land area. However, inferences are made to estimate output on small farms from the data provided on large farms, covering more than 50 percent of total agricultural land area, which is a significantly large sample size.

Table 2: Output of Main Crops, 2004-2007

Crop	Region	Output '000 tonnes				Decline over 2004-2006 (%)
		2007	2006	2005	2004	
Wheat	Centre	98	140	258	198	51
	North	185	300	449	276	46
	South	181	208	343	319	38
Sub-total Wheat		464	648	1 050	793	44
Maize	Centre	118	282	510	314	68
	North	89	441	486	744	84
	South	70	600	497	552	87
Sub-total Maize		276	1 322	1 492	1 610	81
Barley	Centre	19	50	43	50	61
	North	24	56	68	80	65
	South	43	160	102	142	68
Sub-total Barley		86	266	214	272	66
Sunflower	Centre	64	115	71	74	27
	North	142	182	163	170	17
	South	38	117	95	90	62
Sub-total Sunflower		244	414	330	334	32
Sugarbeet	Centre	90	167	186	182	49
	North	452	880	758	719	42
	South	10	48	3	10	49
Sub-total Sugarbeet		552	1 094	947	910	44
Vegetables	Centre	118	194	60	43	19
	North	104	176	88	64	5
	South	44	100	169	173	70
Sub-total Vegetables		265	470	317	280	26
Grapes	Centre	139	126	138	240	17
	North	2	2	2	3	10
	South	217	320	367	442	42
Sub-total Grapes		358	448	507	685	35

Source: National Bureau of Statistics.

For example, wheat forecast is made in four stages: (i) right after seeds germinate – the germinated plants are counted per square meter of land, (ii) when plants are about 10 cm tall – number of plants per square meter just before snowfall, (iii) when crowns have developed and grains are in milky stage, and finally (iv) just before the crop is harvested – number of crowns per square meter of land and number of grains per crown and weight per 100 grains are estimated. Similar procedures are followed for other crops as well.

The Mission held extensive discussions with relevant staff of the MOA both at central and Raion levels to assess the efficacy and appropriateness of the methodology used for crop estimation. The Mission found that a great amount of data is collected in each Raion without necessarily following a common methodology throughout the country. The sample size is very large but not representative of all farms since it completely ignores the small farmers. More importantly, the MOA only receives a small fraction of all data collected and even then average figures for the whole Raion for each crop being shared with the MOA. The rest of the data remains at the Raion level, unprocessed and not put to any other use or shared with other interested agencies.

FAO/GIEWS has found over the years that Government estimates, though methodologically questionable, are, by and large, close to actual figures. Therefore, the Mission will use the data provided by the government, which is rigorously checked with auxiliary remote sensing data and other relevant information such as the type of varieties used, the amount of fertiliser application, precipitation, air temperatures and

reports on pest and disease outbreaks. The Mission was fielded at a time when all winter crops were already harvested. Therefore, winter crops could not be directly measured on the ground, as is the usual CFSAM methodology, but the Mission had to rely on information obtained from farmers, staff from the MOA in the Raions and other relevant organisations such as ACSA, National farmer's association among others. Nevertheless, the Mission was able to spot check all summer crops such as maize, vegetables, sunflower, sugar beat and perennial crops.

4.1 Main factors affecting production in 2006/07

Rainfall

According to the State Hydrometeorological Service, the frequency of severe dry spells and droughts in Moldova has increased markedly in the last few years. Nine significant dry periods or droughts have been recorded since 1990², the most severe ones before this year being 1990, 1992 and 2003. The length of dry spells in 2007, in terms of the number of continuous rainless days was 30 in the Central Region, and 35 days in the Southern one, with local extremes of 60 days (Vulcănești, Basarabeasca).

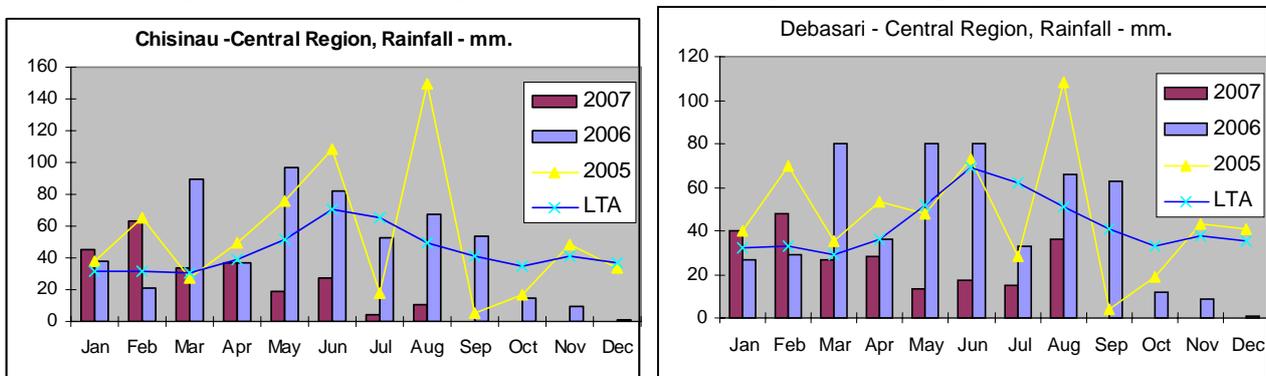
Figure 3 below presents rainfall for the three regions of the country. Average monthly precipitation in all regions has been far below Long Term Average (LTA) as well as 2006 and 2005, since early spring. In the Southern zone rains practically stopped during July and the first two dekads of August. Spring and summer precipitations are crucial for both winter and summer crops, which were not sufficient to support crop development. Winter cereals, mainly wheat, barley and rye, were at the stage of grain development in spring when rainfall significantly fell below critical levels to support crop development. Important summer crops such as maize, sunflower, sugar beet and vegetables as well as perennial crops (vineyards and fruit trees) also suffered to the extent that some of the annual crop areas (maize and sunflower) are prepared to be replanted with winter crops. Only part of the crop residues are good enough to be fed to livestock. The drought this year is compared with 1946, the worst drought in living memory when many people starved for lack of food.

Not only were average monthly rains significantly below LTA throughout spring and summer, but they were also erratic within the month. Most of the rain in June and July fell in a few days causing flash floods and significant damage to crops while failing to improve soil moisture. In some areas heavy rains and hail that fell within two days at the start of winter cereal harvest in July completely devastated wheat and barley crops as well as sugar beet.

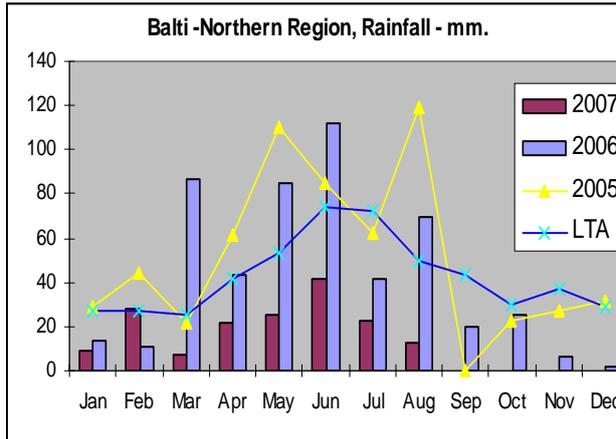
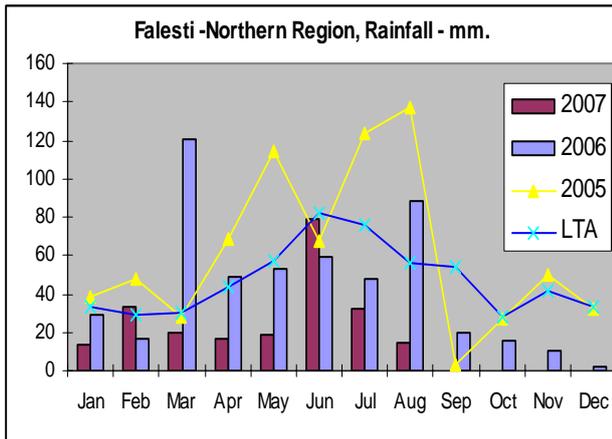
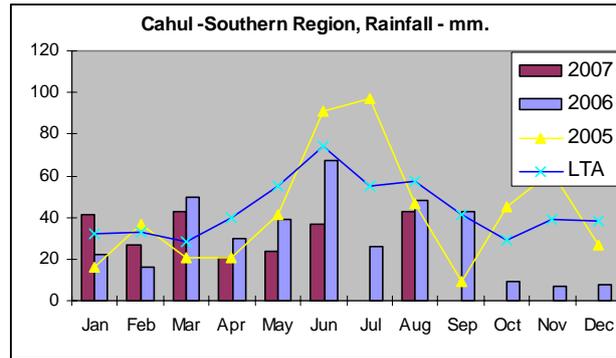
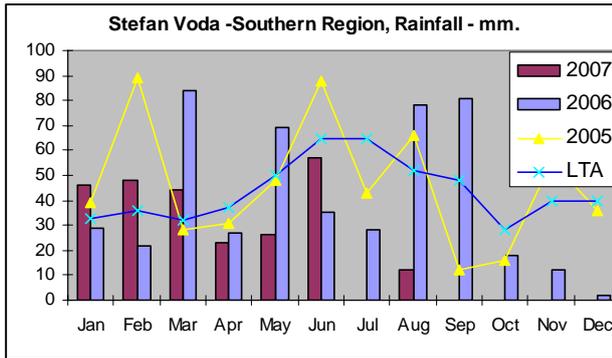
Late August and September precipitation is necessary for winter crop planting. The current soil moisture content is critically inadequate and if rains fail in September, winter crops may not be able to germinate for harvest next year.

In addition to critically low precipitation, air temperatures have been on average 3-5 degrees higher than LTA, 2005 and 2006. Not only were rains insufficient, but higher temperatures increased the crop demand for water - a combination that severely compromised large areas of winter and summer crops.

Figure 3. Rainfall by Region, 2005-2007 and Long Term Average (LTA), in mm



² In 1990, 1992, 1994, 1996, 1999, 2000, 2001, 2003 and 2007. See also Table in Appendix 1.



Source: Agro-meteorological Department, Government of Moldova.
 Note: August 2007 figure is average of 2 dekads.

Since early 2007, satellite imagery showing a Normalized Difference Vegetation Index for Moldova, updated every ten days, have shown a consistent deficit in vegetation compared to previous years for the south-eastern part of Romania and the western part of Ukraine. Moldova, however, has consistently shown a global and increasing vegetation deficit from the very first months of 2007, to a much larger extent than its neighbour countries. NDVI images for selected ten-day periods are shown in the Appendix.

Area Planted

Total agricultural land is estimated at about 2.5 million hectares and on average some 750 000 hectares (ha) are planted with winter and spring cereals. Aggregate area planted with cereals in 2006/07 cropping season was estimated at about 925 000 ha, some 67 000 ha up on the preceding year and some 26 000 ha down on the average of the past five years. This aggregate includes some 305 000 ha of wheat, 494 000 ha of maize and some 126 000 ha of winter and spring barley.

Sunflower, vineyards, fruits, sugar beet and vegetables are important cash and industrial crops, accounting for a large proportion of foreign exchange earnings. Sunflower was planted on 235 000 ha this year compared with just over 279 000 ha on average in the past five years. This year Sugar beet was planted on some 32 000 ha, vegetables on 38 000 ha and potatoes on more than 40 000 hectares, all slightly up on the area planted over the past five years (average of 2001-06). Expectations were for a bumper crop this year in lieu of the above average planted area, but most of the planted area could not be harvested following drought this year; see Appendix 1 for details of area planted, yields and output of main crops.

Crop Yields

Crop yields have been steadily recovering over the past several years with high fluctuations owing to increased volatility in weather conditions and adverse agricultural terms of trade. Cereal yields over the past tens years have fluctuated between just over one and five tonnes per ha of planted area. This year wheat yield is estimated at about 1.5 tonnes per ha, which is 40 percent down on the average yield of the past three years. Maize yield this year is estimated at about 0.6 tonnes/ha compared with about 3 tonnes/ha over the past three years. Barley yield is also down by about 55 percent compared with the average of the past three years.

Agricultural Inputs

Farm machinery is only 50 percent of the pre-crisis capacity and the existing machinery is on average a decade old with high maintenance costs. Small farmers entirely depend on large cooperative farms for their farm power and the former enjoys second priority, which sometimes causes delays in planting and harvesting. The Ministry of Agriculture estimates fertilizer use to be on average less than one-third of the pre-crisis levels. More importantly, mineral fertiliser use, NPK as well as micro-nutrients, are highly imbalanced and soil nutrient mining is visible in some areas. Supplies of farm power and mineral fertilisers have significantly improved compared with 1990s. However, access to purchased inputs, especially by small farmers, remains an issue, as do product market access, input-output terms of trade, and rural finance.

Seeds

The seeds sub-sector in Moldova shared similar fate to other sub-sectors in the agricultural and industrial sectors. Some of the causes for the collapse of the seeds sub-sector include fragmentation of land holding, reduced use of fertilizers and chemicals, collapse of the irrigation systems, lower yields, vulnerability to weather conditions resulting in striking variations in yields, dilapidated agricultural machinery, inadequacy of modern equipment and low labour productivity. In addition, a lack of adequate and appropriate equipment at the research stations and nascent seed enterprises exacerbated the effect of the recent drought on the availability of seeds. Relatively high grain prices have created a situation whereby the bulk of the early-generation seed of cultivated crops may be lost to the grain market. According to the seed loss assessment information compiled by the Ministry of Agriculture, seed requirements for the 2007/08 year ranges from 205 tonnes for sugar beet to 105 000 for winter wheat. Appendix 3 provides some estimate of seed needs for various crops. A more serious effect of the drought is the decimation of the seed stock of the National Agricultural Research system, which may have long-term consequences. Without urgent seeds assistance, many farmers will not be able to plant winter cereals (mainly wheat and barley) and some of the main seed farmers may sell early generation seeds to the grain market.

The GOM over the past several years have made significant efforts to revitalise the seeds sub-sector with notable achievements. Currently, the seed sector in Moldova is characterised by a well organised system for varietal evaluation and a systematic limited generation of seed production comprising super elite, elite, generation I and generation II. All crop varieties used for crop production in Moldova are registered and comprise varieties bred by the National Agricultural Research Stations (NARS) and those imported by seed companies for production in the country. The latter group of varieties are subjected to compulsory two-year test in Moldova before being allowed for cultivation. The system for varietal release and registration functions very well and in recent time more than 100 hybrids of maize, sunflower and more than 200 vegetable varieties have been released after rigorous testing of locally bred or imported advanced germplasm materials. Despite these achievements, under-equipped NARS, inadequate capacity both at NARS and the private sector as well as relatively low seed variety basis renders the seeds sub-sector highly vulnerable and insecure.

4.2 Food crop production estimates

The main staple food crops are wheat, barley and maize (which is also extensively used for livestock feed), followed by potatoes and vegetables. Cereal production this year is the lowest in the past decade. Aggregate cereal production is down by 63 percent compared with 2006, and 70 percent down on the average production of the past five years. This aggregate includes some 464 000 tonnes of wheat, 86 000 tonnes of barley and 276 000 tonnes of maize. Total cereal production for 2007 is estimated at 835.2 thousand tonnes. Over the 1998-2006 period, the long-term average has been 2.34 million tonnes, with a standard deviation of 427 000 tonnes.

Other food sources include potatoes, production from household vegetable gardens and orchards, as well as cow milk and meat from pigs and poultry. Potato production has been severely affected by weather, and vegetable garden production, which includes maize, beans, cabbage, carrots and rootcrops, tomatoes, etc. has been cut by at least half, overall.

4.3 Other crops

Other important crops include sunflower, sugar beet, table and wine grapes, fruit and field vegetables. Sunflower production is the most important industrial crop, and with 244 000 tonnes, losses are estimated at

32 percent compared to the average of the last four years. Sugar beet output is estimated at 552 000 tonnes, compared to 1 094 000 last year. Field vegetables may reach the 265 000 ton level, compared to 470 000 in 2006.

Grape output is estimated to be slightly over half of normal, but the fate of the grape and wine sector remains unclear; wine companies have had difficulty selling their output, and the purchases of grapes from last year are yet unpaid. It is not clear whether they will be able to purchase this year's lower production, even if it is of good quality.

Even orchards show signs of major stress and are not likely to produce more than half of average output, further reducing farm incomes. The scarcity (real and anticipated) of fruit is such that walnuts are being harvested precociously.

4.4 Livestock

Livestock is a key component of household financial and food security, providing nutrition and income to the majority of rural households. It is estimated that more than 90 percent of the livestock is owned and managed in small numbers by rural families. As shown in table 3 cattle population has been slowly declining, while swine, sheep and goat population has been stabilising following the dramatic decline of the 1990s. Poultry population on the other hand has been increasing steadily. Much of it is kept in household backyard system. Most of the households process dairy products at home for self-consumption and local markets. A few surviving large farms supply milk directly to processors and function as collection points for small livestock owners. The main sources of livestock feed are grass, alfalfa, crop residues and feed concentrates. The latter is usually mixed with hay and dry alfalfa in winter.

The 2007 drought caused severe shortage of alfalfa, grass and hay as well as crop residues, while feed concentrates are prohibitively expensive and inaccessible to many households. The government estimates over 25 percent of livestock have been slaughtered in distress sales by households³. The Mission forecasts of the 2007 end year livestock population is presented in Table 3 below, which is similar to the Government estimates of livestock losses.

Meat production, as a result of distress selling has increased by more than 11 000 tonnes, which reflects the reductions in livestock numbers. Beef prices, as shown in Figure 4 remained stable, owing to increased meat exports and processing. However, the Mission found that meat prices have begun to rise on most markets, since de-stocking has peaked out and most households are now trying to save whatever little livestock is left.

Table 3: Livestock and Poultry Population 2003-2007 ('000 heads)

	2003	2004	2005	2006	2007 (weighed forecast)
Cattle	410	373	331	311	228
of which:					
Cows	279	256	231	217	176
Pigs	508	446	398	461	372
Sheep and goat	956	938	942	938	805
Horses	78	78	73	69	66
Poultry	14 955	15 756	17 522	22 235	17 000

Source: Ministry of Agriculture and Industries for 2007 figures, CBS for other years.

5. MARKET SYSTEMS, CONDITIONS AND PRICES

The most important export market for the Moldovan high value agricultural products, mainly wine, fruits and vegetables, remains the CIS, in particular the Russian Federation. A ban by Russia on the imports of Moldovan wine and fruits in 2006 had caused tremendous problems for the latter's agricultural and agro-industrial sectors. A study by the USAID (*Moldovan High Value Agricultural Export Competitive Study, 2004*) predicts that, at least in the near future, the CIS will remain the most important market for Moldovan high value agricultural products (HVAP). Some of the reasons cited for this are:

³ For national balance sheet purposes, the Mission assumes that reduction in livestock is on the order of 10 percent for agricultural enterprises and 28 percent for small farms and households.

- The large and growing size of the CIS markets, in particular the Russian Federation, for the HVAP.
- A familiar business environment and trading relations, including trading routes.
- Favourable reputation of the Moldovan HVAP quality and an existing market niche.
- Competitive prices for the Moldovan HVAP.

Further negotiations are underway to improve trading relations between Russia and Moldova, which may result in easing current trade restrictions. However, more dialogue and measures are necessary to ensure the reliability of market outlets, necessary for investment in the HVAP sector. In addition, more dialogue and investment is needed to target the EU market and reach the necessary produce standards to supply for the niche in EU. It is vital for agricultural development and poverty reduction to identify and supply markets for products in which Moldova enjoys comparative advantage in production and processing. However, sanitary and phytosanitary as well as commercial standards are said to be major impediments to Moldovan agricultural exports to the EU and more recently to Russia.

High logistic costs, the requirement that all exporters use the state transportation, high administrative and handling costs, dilapidated road networks and lack of adequate storage and cold room facilities have combined to reduce profitability and impede further trade development. Investment in HVAP production, processing and trading is also hampered by lack of adequate access to credit. The banking system considers the agricultural sector as a risky investment and interest rates typically range between 20 percent and 30 percent, well beyond the reach of most farmers.

Domestic market for fruits and vegetables are relatively small and saturate rather quickly during the harvest season. Cold room capacity is very low and only a fraction of the pre-crisis capacity. Therefore, most of the harvest has to be sold in a relatively short period of time or wasted, which is reflected in the highly variable seasonal prices (see Figure 4 below). Off-season vegetables and fruits are imported and distributed through a small number of supermarkets and small shops in towns. Domestically produced fruits and vegetables are, by and large, directly marketed by small farmers in small towns and weekly markets. Relatively large-scale fruit and vegetable production are usually for export markets or larger towns, which require further sorting, packaging and processing.

Kitchen garden and livestock are the most important elements of household food security both in terms of nutrition and income. Most households directly sell their produce in the local weekly markets involving little or no marketing costs, i.e. intermediaries, packing and sorting. Dairy products are marketed either directly by households in the local weekly markets or sold to processors. The collection points for milk is usually situated closer to a large dairy farm and households with small number of livestock usually rely on large producers to supply to processors.

Markets throughout the country seem to be well integrated despite deteriorating road networks. A WB study (Moldova, Agricultural Policy Notes: Agricultural Markets, December 2005) shows that domestic input and output prices are highly distorted and there is a net transfer from producers to consumers. Producers receive significantly lower prices for their output, while paying much higher prices for purchased inputs compared with international prices. The indirect taxation of farmers was found not to be the result of Government revenue taxation but rather other distortions such as (a) inefficiencies and monopoly elements in processing, trading, marketing and transport (e.g. sunflower seed is bought, transported, processed and traded by only one company), (b) low product standards and (c) inefficient and distorting government interventions and regulations.

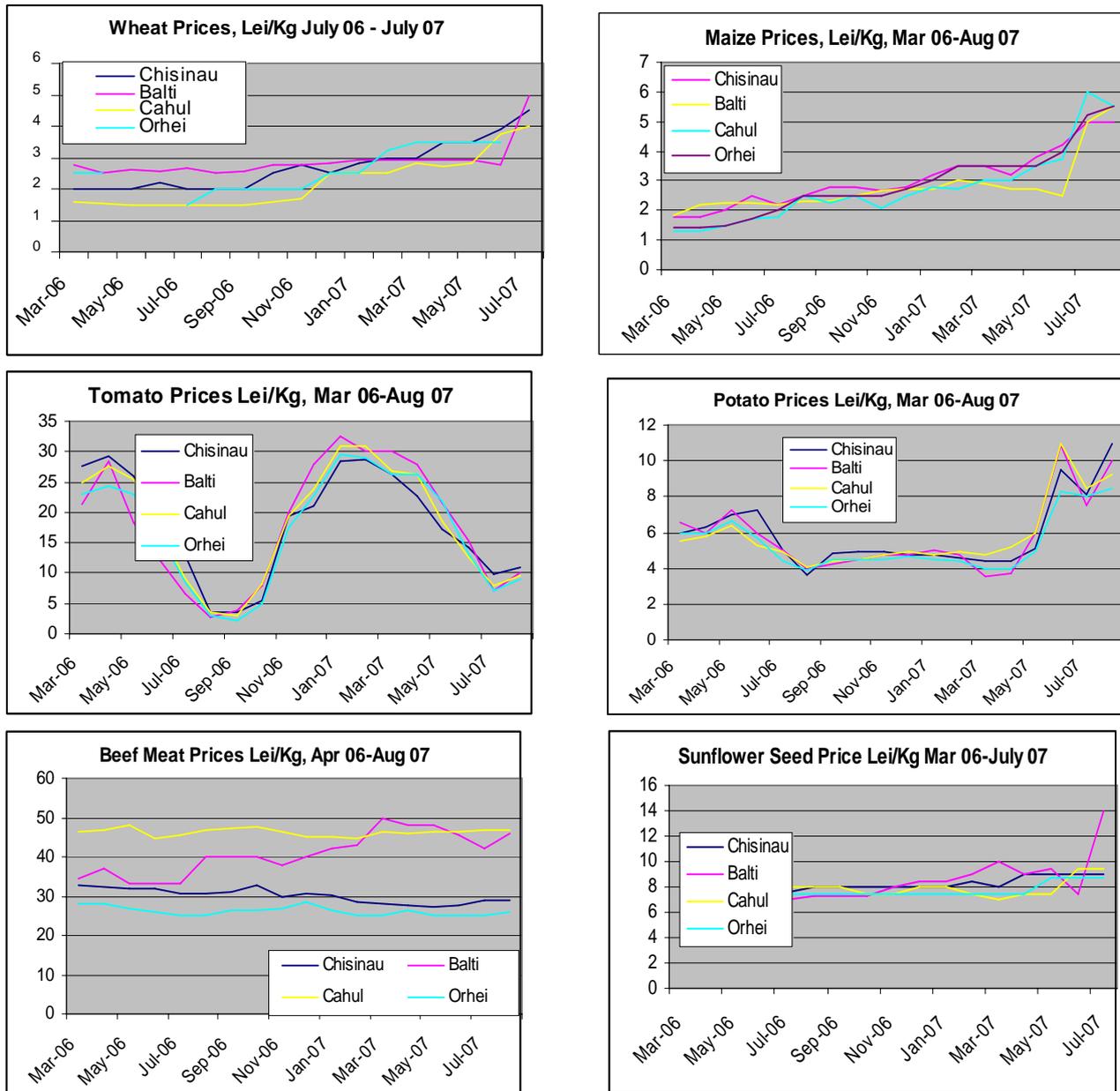
Wheat bread is the main staple in Moldova and annual consumption, estimated at about 110 kg per person per year, is similar to the high levels consumed in some Central Asian countries. Large mills dominate the market for wheat flour and bread, while small mills (up to 5 tonnes/day capacity) are also important players in the market. Government is weary of bread price hikes and regularly intervenes in the market to ensure stable prices for consumers, sometimes at the expense of producers.

Domestic food prices have begun to rise following the drought. The Mission observed in some markets vegetable prices had more than doubled compared with the same time last year, while bread prices had also increased by nearly 40 percent in some areas. The government has recently suspended import duties on cereal imports⁴, and the VAT on essential staples, which will ease somewhat pressure on the prices of bread

⁴ Until July 2008.

and maize. Figure 4 also indicates that prices in four major markets in the Centre, North, South and East, respectively as shown in the graphs, move together, suggesting good market integration. Prices of sunflower seeds have slightly increased despite the sharp drop in production, while meat prices have followed an upward trend, especially recently (Moldova is a structurally net importer of live animals and meat products).

Figure 4. Moldova: Food Prices in Four Major Markets, Lei/Kg, March 2006–August 2007



Source: National Bureau of Statistics and ACSA (March 2006-July 2007), Mission findings, August 2007.

6. FOOD SUPPLY/DEMAND BALANCE, MARKETING YEAR 2007/08

Generally speaking, Moldova is, in the aggregate, a food secure country, a net exporter of cereals in most years (the most recent exception being 2003). With remittances from Moldovans working abroad currently estimated at well over US\$1 billion per year (about US\$360/person/year), most families can procure for their basic food needs. National food balance sheets show, overall, how a nation deals with inter-annual fluctuations in the domestic supply of basic foods by adjusting commercial food imports to meet average total utilization requirements. The Mission has created a number of related worksheets to estimate total grain utilization from both net domestic and outside sources, given post harvest losses, requirements for seeds and livestock feed, household and (since 2003) emergency public stocks, and human consumption. Reconstructing these worksheets for the 1999-2006 period suggests, that evening out inter-annual supply

through adding to or subtracting from grain stocks, long-term average per capita consumption of grain, in milled terms, has been consistent with the 2006 estimate of 143 kg per year⁵.

The rough proportional breakdown of utilization for the total net grain supply, for the period 1999-2006 is as follows:

Losses	15 percent
Seeds	10 percent
Household roll-over stocks	3 percent
Livestock feed	35 percent
Human consumption	37 percent

The summary food balance sheet for 2007 is given below, with estimates for 2007.

National food balance sheets are a synthetic way to gauge the impact of a shortfall in production on commercial import requirements, assuming that the aggregate domestic grain supply is brought back to a level consistent with historical per capita consumption. In this case, the shortfall in domestic production, taking into account the lower requirements for a reduced livestock sector, amounts to about 737 000 tonnes. Although Moldova has, in the aggregate, ample means to meet this need, it is also clear that a number of the poorer families and most vulnerable groups will not be able to have access to this aggregate supply (especially in times of rising basic food prices) unless their purchasing power is increased through social programs, subsidies or other forms of assistance.

The long-term per capita human milled grain consumption trend and the 2006 Household Income and Food Consumption Survey indicate an average per capita consumption of cereal and derived products of 392.5 grams/person/day, equivalent to 143.2 kg/capita/year. It is used to set the target total human utilization level (unmilled) at 787 100 tonnes. To remain at this level of average consumption, Moldova would have to import about 737 000 tonnes of grain in 2007, assuming that household stocks are totally depleted at the end of the marketing year.

Table 4: Summary Balance Sheet for 2007 ('000 tonnes)

Total gross cereal production	835.2
Losses (%)	153.5
Total cereal seed requirements	181.6
Public stocks	50.0
Total livestock feed	500.0
Net commercial imports	737.0
Total human utilization (unmilled)	787.1

7. HOUSEHOLD FOOD SECURITY AND NUTRITION

About 60 percent of the population lives in rural areas (NBS 2007). Agriculture is the dominant sector of employment (Table 5). With cereal prices in neighbouring countries considerably less than local prices, imports due to low local production, may actually result in lower cereal prices on the market. This would benefit urban dwellers who rely on market purchases. The drought has far more damaging effect on rural population that relies on their own production for a major portion of their cereal and vegetable production.

Table 5: Employment Categories, 2005

Employment Categories	'000 persons
Agriculture	537
Industry	159
Retail	183
Public administration	244
Other	196

Source: NBS 2007.

⁵ Source: National Bureau of Statistics

7.1 Income and expenditures

Poverty is widespread (Table 6 below) with last year's pre-drought national poverty rate at 27 percent and that in rural areas exceeding 42 percent (WB 2006). Whereas urban residents saw their incomes rise and their poverty rates decline, poverty actually increased among farmers and rural pensioners (WB 2006). A major proportion of a poor man's expense is dedicated to food. The lowest quintile spends about 77 percent of its consumption expenditure on food and non-alcoholic beverages (Statistical Yearbook, 2006).

Table 6: Poverty Rates in Percentage Points

Economic Activity	2005
Farmer	48
Farm labour	51
Non-farm labour	31
Self-employed	17
Pensioner	35

Source: Poverty Update, 2006, World Bank.

Remittances play a major role in the national economy. Approximately one quarter of the economically active population of Moldova is located abroad (IOM 2007). The number of migrants grew from 100 thousand in 1999 to over 400 thousand in 2004 (Labour Force Survey, National Bureau of Statistics). A 2006 study by Kiel Institute (IOM/SICA) found a linear growth in number of migrants since 1999. However, the study also found:

- Mean remittances per household were greater than median i.e. there are many households with modest remittances and a much smaller number with relatively high remittances.
- Mean was relatively high due to some very high remittances reported by a few households in Chisinau.
- Remittance levels strongly depend on the country the migrant is working in. They are highest for migrants in Europe and lowest for migrants in Russia or Ukraine.
- Of the migrants to Russia and Ukraine, 77 percent (in construction sector) and 64 percent (non-construction) come from rural areas.

This suggests migrants from rural households remit least amounts of money. This is in line with poverty rates (42 percent rural). Studies of 2004 indicate only 3 percent of remittances reached the poorest quintile (WB 2006). The same study concluded that 'neither public transfers nor private remittances are reaching relatively poor groups in amounts sufficient to offset the loss of income from other sources, in particular agriculture'. It is therefore important to note, in spite of high national level figures on remittances, interpreting these as a strong safety net for poor rural households could be misleading.

Collapse of the kitchen garden production is evident from price rises for vegetables in local markets. Prices of vegetables have more than doubled since last year for tomatoes, potatoes and onions. Carrot and cabbage prices have risen by much greater factors.

For villages where gas services were available, a proxy wealth indicator of households would be the ability to afford the high expense for a gas connection. Similarly, kitchen garden produce was better in houses with private wells. Therefore, presence of a private well may be considered as a potential contributor to food security. However, a well could have been dug years ago and its presence does not necessarily indicate current household incomes being high.

7.2 Nutrition

Rural diets consist of staple (wheat), vegetables, occasional meat and seasonal fruits. Tea with bread, cheese and honey are consumed at breakfast. Meals consist of soup, bread and Mamalika (corn and cheese mixed with either fish or meat). On occasion, beverages may include wine, especially from own vineyards. Nationally, about 8 percent of children under 5 are moderately⁶ stunted and 4 percent are suffering from acute malnutrition i.e. are wasted⁷ (DHS 2005). About 4 percent children are underweight. According to the Demographic and Health Survey of 2005, 40 percent of households consume inadequate (<15 ppm) of iodized salt. The situation is worst in rural areas (51 percent). One percent of women suffer from night

⁶ A child between -2 and -3 SD is considered moderately stunted.

⁷ A child below -2 SD from the reference median for weight-for-height is considered wasted.

blindness (vitamin A deficiency) and 28 percent of women in Moldova have some level of anaemia (Table 7). Women living in rural areas and those with four or more children are more likely to have mild anaemia than other women. Women with these background characteristics would benefit the most from an iron supplementation programme.

Table 7: Percentage of Children and Women with Anaemia

Group	Mild Anaemia (10.0 – 11.9 g/dl)	Moderate Anaemia (7.0 – 9.9 g/dl)
Children (6-59 months)	22	10
Women	23	4

Source: DHS 2005.

7.3 Vulnerable groups

The communist era defined specific groups as vulnerable. These included pensioners, invalid (challenged), unemployed, large families and children with one parent. Poverty was not a criteria. This approach is currently under review at the Ministry of Social Protection which plans to introduce a vulnerability classification taking poverty into account. The government provides allowances to its vulnerable people. As is evident from Table 8, these allowances are small and can not sustain these families over the winter. The loss of crop, kitchen gardens and livestock requires an increase in government allowances to vulnerable groups.

Table 8: Vulnerable Groups as Defined by Ministry of Social Protection

Vulnerable Groups	Number of People	Government Allowance (13 Lei = 1 US\$)
Pensioners	614 000	550 lei/month
Invalids	169 000	300 lei/month
Unemployed	72 000	400 lei/month; up to 6 months
Large families/one parent families	59 000	Allowance plus subsidy on utilities

Source: Ministry of Social Protection.

In addition, meals for school children and vulnerable groups would be a useful form of assistance to sustain these families over the winter and in preventing malnutrition. The impact of drought has created its own vulnerability. Rural areas, with agriculture base livelihoods and high levels of subsistence farming, are more vulnerable than urban areas. The small farmer in rural areas is particularly vulnerable to the impact of drought. There is considerable overlap between small farmers and these traditionally classified vulnerable groups (Table 8 on vulnerable groups). A small farmer may well be a pensioner. Similarly, small landholders would often rent their land to associations and LLCs who collectively farm these lands and pay the owner from produce and sales. In the event of drought, these products have failed and many farmers have received neither product nor cash as compensation. Crop insurance is almost unheard of in Moldova farming communities. Support to the credit and insurance system would be essential medium and long-term goals and should be part of an overall agriculture sector support strategy. A sizable portion of these renters may well be part of the traditionally vulnerable groups.

The drought has reduced both on farm and off farm labour requirements. Families relying on casual labour have lost a major source of their livelihood. Such labour normally comes from able-bodied persons who do not qualify as pensioners, elderly or other vulnerable groups. They are too young to qualify for Social Canteen and too old for School Feeding. This group requires work opportunities to make up for loss of employment, especially during the winter season when heating costs are very high and there are strong incentives to cut forests for firewood.

8. ASSISTANCE REQUIREMENT AND RESPONSE OPTIONS

The severe 2007 drought had immediate and longer-term impacts on the population and the economy. Response options include several immediate and medium-term mitigation measures.

8.1 Immediate measures

The immediate measures are concerned with ensuring the most vulnerable population have access to sufficient food and other necessities during the 4-5 months of winter. In addition, some of the farmers should be assisted with winter cereal seeds and other inputs to enable winter planting and efforts should also be

made to save the remaining livestock under household management. Some of the proposed immediate measures are discussed below:

- i. **Emergency winter cereal seed assistance:** It is very important to procure winter wheat and barley seeds as well as other necessary agricultural inputs to enable farmers to plant in October. FAO together with other UN agencies in Moldova are making every effort to supply part of the seed deficit to farmers before the planting season comes to an end (15 October). The UN Resident Representation in Moldova, together with the Government Drought Task Force and other donors, is coordinating efforts to assist farmers in the shortest time possible. FAO will provide technical assistance for this to ensure eligible farmers receive appropriate seeds and other inputs, without compromising crop genetic purity and diversity of the country. The UN Resident Representation and other donors have already mobilised some resources to cover the most urgent requirements for winter seed delivery. An emergency project has been prepared to target a total of 90 000 wheat and barley farmers and some 300 contract seed producers for seed multiplication purposes. The project aims to import 4 000 tonnes of wheat seeds and 4 500 tonnes of barley seeds. The specific varieties to be imported have already been tested in Moldova over a number of years with satisfactory results. In addition, US\$1 million worth of wheat seeds will be procured domestically from some 300 contract seed producers who have not lost their entire crop to drought. This will strengthen the nascent but important seed multiplication system in the country. The total project cost is estimated at about US\$7.2 million.
- ii. **Emergency winter feed supply:** Ensuring food security for the years to come requires saving livestock among other productive assets. Winter months are rather lean and most households depend on concentrates, hay, dry alfalfa and other crop residues. This year most households will have to depend on concentrates alone, which is inaccessible to many households for lack of purchasing power. Feed will have to be provided between October-December to enable farmers to feed their livestock in winter. A project profile has been prepared to target some 120 most vulnerable beneficiaries in the worst affected Raions with a total cost of US\$275 000. The assistance package includes compound feed concentrates, barley and alfalfa. FAO will assist the government of Moldova to implement this project. The size of the project does not reflect the needs but rather the grant proposed by a specific donor. Therefore, much larger funds are necessary to meet the urgent feed needs to avoid further de-stocking of precious livestock during the coming winter.
- iii. **Social Canteens:** The drought has diminished normal sources of income and food of vulnerable families. Provision of a hot meal during the day would support the nutritional requirements of these people and assist in mitigating further loss of productive assets. The Mayor's office receives funds from Ministry of Social Protection to run such canteens. Village schools are equipped to prepare and serve meals. The local government recommends use of these facilities as Social Canteens. They are heated, centrally located and well known to locals. The Mayor's office has lists of families qualifying as Vulnerable Groups. These lists are prepared by Social Workers from the Ministry of Social Protection. This is a self-targeting programme. Only individuals who feel they need assistance would avail the opportunity. (For challenged people, social workers deliver food to homes.) Social canteen is an established social mechanism in rural Moldova and its acceptance among elderly and pensioners is widespread. Food should consist of locally acceptable traditional two course meals (soup and meal). The government, with international assistance, should ensure that food will be available for purchase at Raion markets and that local authorities are provided the funds necessary for preparing the meals. The vulnerable group listings are well-maintained. However, food secure people who become vulnerable specifically due to drought and do not qualify as traditionally vulnerable, would not be able to avail the facility.

Population		Persons
Total population		3 580 000
Rural population		2 310 000
Total vulnerable	from MoSP	900 000
Total rural vulnerable	2/3 of total	600 000

	Scenario 1: Partial targeting 10% of rural population = 40% of Vulnerable Population 20 days per month	Scenario 2: Full targeting 25% of rural population = 100% of Vulnerable Population 30 days per month
Target group	230 000	600 000
Months	6	6
Meals per month	20	30
Cereal in gms/meal	300	300
Food in kgs/person/month	1 380 000	5 400 000
Food in tonnes for 6 months	8 280	32 400

- iv. **School Feeding:** the drought has caused loss of revenue of local governments. This has threatened, and in many cases ceased, the school feeding programmes in villages. The daily meal for these children was a major source of nourishment and supported learning capacities. With loss of incomes and crops, families are unable to maintain the quality and quantity of food intake thus increasing the role of school feeding. Maintaining school lunches (grades 1-4), and extension to include kindergarten and children of grades 5-9 would be a direct support to household food security. Village schools are equipped to prepare and serve meals to children. They are heated, centrally located and children are available during weekdays. Therefore, the programme should be run during school days. Adequate alternatives must be sought for winter holidays, when home food reserves may be at their least. Food should consist of locally acceptable traditional two course meals (soup and meal). The Government, with international assistance, should ensure food will be available for purchase at Raion markets and that local authorities have funds for these purchases.

Population	Persons
Total population	3 580 000
Children age 0-14	646 000
Rural children (2/3 of total)	431 000

	Scenario 1: Partial targeting Half group = 50 percent of villages 20 days per month for 4 months	Scenario 2: Full targeting Ages 0-14 years = 100% of rural children 20 days per month
Target group	215 000	431 000
Months	4	6
Meals per month	20	20
Cereal in gms/meal	150	150
Food in		
Kgs/person/month	645 000	1 293 000
Food in tonnes for all months	2 580	7 758

- v. **Public Works Programmes:** Raion authorities should prepare public works programmes to engage available unemployed or underemployed personnel in rural areas. The target group for these programmes are able bodied, casual labourers in rural areas between ages 20 and 50 who have no land and no work. Caution is required during the implementation of these programmes. Soviet era public works programmes left a poor impression where State demanded labour and provided little or no compensation. Remuneration levels should be well communicated and paid on time. The programmes would have a self targeting element especially during cold winters when only those in need of work

would accept. Actual numbers of unemployed and underemployed are very difficult to get. Therefore the self targeting mechanism is useful to adopt. However, people with adequate food security may sign on for extra cash. To avoid this scenario, the wage should be set below normal. In order to avoid duplication, members of vulnerable groups eligible to other assistance should not sign up for these programmes.

Population	Persons
Total population	3 580 000
Rural Population	2 310 000
Ages 20-59	1 516 000
Rural population ages 20-59 (2/3 of total)	1 010 000

	Scenario 1: Partial targeting Pre-drought figures = 22 000 persons	Scenario 2: Full targeting Drought Impact: Unemployment x 2 =44 000 persons
Target group	22 000	44 000
Months	2	2
Wages per month (Lei)	500	500
Total wages per person	1 000	1 000
Total wages for whole group	22 000 000	44 000 000
Inputs for public works	5 500 000	11 000 000

- vi. **Increase in Social Allowances to Vulnerable Groups:** Current Government allowances (Table 8) are unable to meet the losses incurred by drought. Under normal circumstances, the lowest quintile incurs over three quarters of its expenditure on food. Loss of revenue, price increases in food commodities and increased utility expenses over the winter require higher allowances without which vulnerable families will be unable to meet food requirements. The mechanism of social allowance delivery is well entrenched and would serve as a useful mechanism to support vulnerable groups.

8.2 Medium-term measures

The medium-term measures aim to strengthen household capabilities to ensure their food security on a sustainable basis. The Mission has only considered four main agriculture-related interventions to initiate in the near future, while other longer-term measures are discussed below. The following proposed concepts for interventions will need to be prepared in the country by fielding technical project preparation missions in the near future.

- i. **Drip Irrigation for Household Kitchen Gardens:** Kitchen garden is the most important factor in rural household food security both as a source of nutrition and income through the sale of vegetables in local markets. Most rural households have a small kitchen garden and in some Raions, kitchen garden ownership is decreed by law. Seasonal vegetables are grown on very small plots of land with the limiting factor being irrigation, as kitchen gardens are irrigated by hand using water from wells in the neighbourhood. At most only two crops are harvested from a fraction of the kitchen gardens. When there is a drought, like this year, crop demand for water increases significantly and makes vegetable production very cumbersome. The project aims to increase the household control on water supply and enable increased area under vegetables as well as intensify production, including the introduction of off-season vegetables for markets and self-consumption. The project aims to utilise ground water on a very limited basis, far below the recharge levels, using small electric pumps and locally available drip irrigation systems for individual households. The maximum size of the kitchen garden per household will not exceed 0.2 hectares to ensure the ecology of the target areas are not disturbed, namely ensuring the water extraction does not exceed recharge levels. Preliminary estimates indicate that an investment cost of about US\$1 600 will be sufficient to enable rural households to improve their food security through vegetable gardens. The project aims to provide the initial investment costs to eligible households on soft or interest-free loans, which can be repaid over 2-3 years. The project will also include extension services to improve water use efficiency and vegetable production skills.

- ii. **Seed Multiplication System:** National food security in Moldova, like many other countries, is directly linked to seed security. The building blocks for national seed security are clear delineation of roles and responsibilities for both private and the public sector with appropriate capacity building to handle the various elements of the seed programme, which includes varieties development, seed production, seed quality control, seed distribution and marketing. The government of Moldova has made significant progress in establishing an efficient seed production and multiplication system. However, some bottlenecks remain, including appropriate facilitative seed legislation to both govern and provide incentive for private sector participation, capacity to produce adequate quantity of pre-basic, basic and commercial seed in line with annual seed demands, absence of facility for seed security stock and adequately equipped mechanism for seed quality control. The recurrent droughts have made the seed sector more vulnerable and this year's drought was a stark warning for disturbing the ecological balance in the country with severe and long-term consequences. It has also made apparent the present weaknesses of the prevailing seed system, particularly its vulnerability in the absence of some basic but important facility such as limited irrigation system for valuable germ plasm stock and the need to establish a credible system of carry over seed particularly for the early generation seeds. Therefore, it is necessary to assist the government of Moldova in its quest to establish an efficient seed production and multiplication system aiming to gradually achieve a fully private seed sector.
- iii. **Information System for Food Security and Early Warnings:** Moldova generates a staggering amount of data, both at national and sub-national levels. Unfortunately, most of the sub-national data are not standardized and much of the data do not leave the boundaries of Raions. Early warning, early action and appropriate policies require an efficient information system both at national and sub-national levels. The proposed project aims to standardise data collection through appropriate sampling, data analysis and data sharing at national level with interested institutions, capacity building in data analysis for food security analysis and policy and strategy formulation. A component of the project will include capacity building in the design and preparation of agricultural and rural development investment projects, which the Mission found to be rather weak in the Ministry of Agriculture. A further component of the project will also include the establishment of a market information system.
- iv. **Poultry development for household food security:** Poultry population has increased from just over 14 million in 2001 to about 22.5 million in 2006. The numbers are expected to decline to about 17 million by the end of 2007, as poultry meat is substituted for beef and pork this year. Poultry meat production has also been increasing significantly, from just over 27 000 tonnes in 2001 to about 49 000 tonnes in 2007. Domestic market for poultry meat is large and steadily increasing. In 2006 registered sale of poultry meat was estimated at about 32 000 tonnes, more than 53 percent of which was imported. Household level poultry development is seen to provide significant income for rural households as well as a good source of nutrition. In many villages, women are left behind to look after young children, while working age men go abroad in search of employment. The women, mostly young mothers or grandmothers, have very little opportunity to earn a living. Household poultry production system, requiring very little skills and investment costs, is a good source to supplement household income and nutrition. The proposed project will introduce bio-secure poultry production system with extension services on vaccination, early disease detection and feed preparation using locally available resources.

8.3 Long-term measures

- i. **Sustainable strategy for the agricultural sector:** A sustainable strategy for the agricultural sector, including proper farming practices, crop mixes, and efficient use of the natural resource base, including water, must be finalized on the basis of existing sectoral studies and analyses, and set in motion. The challenge will be to reconcile the need for diversification, risk management and reliance on state-of-the-art techniques of resource management with current constraints on markets for high-value products. Large-scale irrigation schemes, for instance, are not likely to be a viable response to the increasing frequency of dry spells and drought periods. Technical assistance will be available from FAO and can also be expected from other interested donor agencies.
- ii. **Agriculture finance:** The financial sector is heavily capitalized and generally very profitable, but concentrates on trade, construction, services and consumer credit. Agriculture is perceived as a high-risk area so that credit to this sector is both limited and very expensive (see, for example, World Bank Report 2006). Yet, any future growth in the agricultural sector requires that more LLCs, farmers' associations and individuals have less cumbersome and expensive access to credit. The most promising efforts, to be encouraged further, and insured against reasonable risk, combine analysis of farm enterprises, training of small rural entrepreneurs, and medium-sized lending. As far as smallholders are concerned, the

capitalization of the credit fund managed by the National federation of farmers, with ACSA technical assistance, could be increased by donor contributions. In any case, the credit fund should be insured (at least partially) against losses from weather-related disasters.

- iii. **Agricultural insurance:** Agricultural insurance, in various forms, must become part of the farming sector's risk management strategy, along with an appropriate and diversified crop mix and more efficient use of water and other resources. Better and more widespread agricultural insurance, including weather-indexed insurance, must be developed. It will reduce the risk of lending and therefore, lower the cost of borrowing. Properly combined with the financial sector, it will also provide the means to compensate people for losses due to disasters, and lower the burden on all segments of the economy. FAO, other institutions (World Bank, IMF) and donor agencies have expressed their readiness to respond to the Government's for any technical assistance in this area.

Area, Yield and Output of Main Crops, 2004-2007

Crop	Region	Area Planted '000 ha				Yield tonnes/ha				Output '000 tonnes				Decline over 2004- 2006 (%)
		2007	2006	2005	2004	2007	2006	2005	2004	2007	2006	2005	2004	
Wheat	Centre	79	65	91	75	1.2	2.2	2.8	2.6	98	140	258	198	51
	North	112	123	160	109	1.7	2.4	2.8	2.5	185	300	449	276	46
	South	114	103	151	104	1.6	2.0	2.3	3.1	181	208	343	319	38
Sub-total Wheat		305	290	402	287	1.5	2.2	2.6	2.8	464	648	1 050	793	44
Maize	Centre	180	97	93	122	0.7	2.9	5.5	2.6	118	282	510	314	68
	North	153	133	160	233	0.6	3.3	3.0	3.2	89	441	486	744	84
	South	161	229	203	230	0.4	2.6	2.4	2.4	70	600	497	552	87
Sub-total Maize		494	459	456	585	0.6	2.9	3.3	2.8	276	1 322	1 492	1 610	81
Barley	Centre	27	20	23	122	0.7	2.5	1.9	0.4	19	50	43	50	61
	North	37	35	38	123	0.6	1.6	1.8	0.6	24	56	68	80	65
	South	62	54	57	309	0.7	3.0	1.8	0.5	43	160	102	142	68
Sub-total Barley		126	109	119	554	0.7	2.4	1.8	0.5	86	266	214	272	66
Sunflower	Centre	70	59	59	62	0.9	2	1	1	64	115	71	74	27
	North	91	128	126	122	1.6	1	1	1	142	182	163	170	17
	South	73	100	91	87	0.5	1	1	1	38	117	95	90	62
Sub-total Sunflower		235	287	276	271	1.0	1	1	1	244	414	330	334	32
Sugarbeet	Centre	6	9	7	7	14.6	19	27	25	90	167	186	182	49
	North	25	32	27	27	17.8	27	28	27	452	880	758	719	42
	South	1	2	0	0	18.3	30	10	22	10	48	3	10	49
Sub-total Sugarbeet		32	42	34	35	17.2	26	28	26	552	1 094	947	910	44
Vegetables	Centre	15	17	3	3	7.9	12	18	17	118	194	60	43	19
	North	16	18	5	4	6.6	10	19	16	104	176	88	64	5
	South	7	8	10	8	6.3	13	17	22	44	100	169	173	70
Sub-total Vegetables		38	42	18	14	7.0	11	18	20	265	470	317	280	26
Grapes	Centre	54	44	46	45	2.6	3	3	5	139	126	138	240	17
	North	1	1	1	1	2.4	2	2	2	2	2	2	3	10
	South	85	94	93	92	2.6	3	4	5	217	320	367	442	42
Sub-total Grapes		140	139	140	138	2.6	3	4	5	358	448	507	685	35

Frequency and Relative Severity of Drought Events

Year	Spring		Summer		Autumn	
	Affected area (%)	Type of drought	Affected area (%)	Type of drought	Affected area (%)	Type of drought
1946	100	catastrophic	33	extreme	-	-
1963	40	extreme	7	local	93	catastrophic
1967	60	catastrophic	40	extreme	93	catastrophic
1982	60	catastrophic	-	-	93	catastrophic
1986	100	catastrophic	13	big	100	catastrophic
1990	7	local	67	catastrophic	60	catastrophic
1992	27	big	60	catastrophic	40	extreme
1994	87	catastrophic	40	extreme	100	catastrophic
1996	68	catastrophic	49	extreme	44	extreme
2000	75	catastrophic	55	catastrophic	49	extreme
2003	86	catastrophic	61	catastrophic	26	very big
2007	75	catastrophic	80	catastrophic	-	-

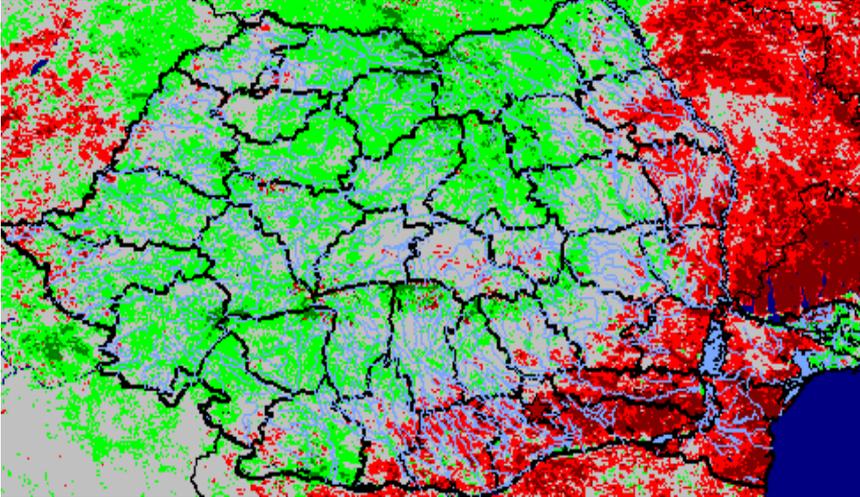
Source: V. Cazac, Director, Moldova Hydrometeorological Service, 2007.

APPENDIX 3

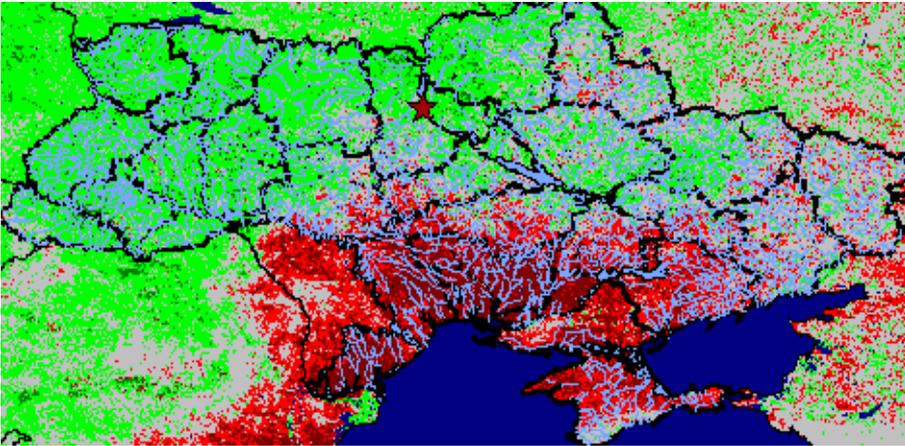
2007/08 Detailed Seed Requirements and Cost for Crops Affected by Drought in Moldova

Crop	Total area (a)	Total seed requirement per year (tonnes)	Seed requirement		Total cost (US\$) 5.4 lei/kg or US\$450 per ton
			Quantity available (tonnes)	Additional seed required (tonnes)	
Winter wheat	420 000	105 000			
• Pre-basic		39			240 000
• Basic		281			825 000
• Certified I		2 025			911 250
• Certified II		14 583			6 562 350
• Commercial seed			70 532	4 002	1 600 800
Barley	50 000	10 977	10 380	597	295 000
Winter rape	60 000	300	100	200	1 237 600
Peas	40 000	12 000	1 650	10 350	7 258 000
Spring barley	45 000	9 000	2 100	6 900	3 415 800
Sunflower	181 000	905	2 238	0	0
Corn	492 100	11 200	2 115	9 085	7 645 800
Soybean	55 000	6 000	1 400	4 600	3 719 500
Potato	4 500	13 500	13 500		

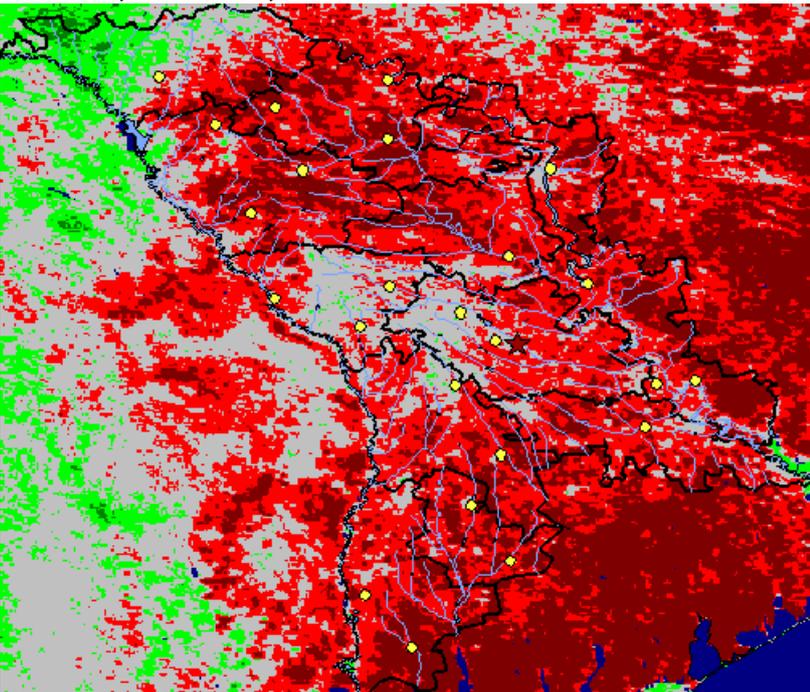
Romania, 2nd dekad, June 2007



Ukraine 2nd dekad, June 2007



Moldova, 2nd dekad, June 2007



Project Profile: Social Canteen

Situation Analysis

The drought has diminished normal sources of income and food of vulnerable families. Provision of a hot meal during the day would support the nutritional requirements of these people and assist in mitigating further loss of productive assets.

Implementation

The Mayor's office receives funds from Ministry of Social Protection to run such canteens. Village schools are equipped to prepare and serve meals to children. The local government recommends use of these facilities as Social Canteens. They are heated, centrally located and well known to locals.

Target Group

The Mayor's office has lists of families qualifying as Vulnerable Groups. These lists are prepared by Social Workers from the Ministry of Social Protection.

Population		Persons
Total population		3 580 000
Rural population		2 310 000
Total vulnerable	from MoSP	900 000
Total rural vulnerable	2/3 of total	600 000

	Scenario 1: Partial targeting 10% of rural population = 40% of vulnerable population 20 days per month	Scenario 2: Full targeting 25% of rural population = 100% of vulnerable population 30 days per month
Target group	230 000	600 000
Months	6	6
Meals per month	20	30
Cereal in gms/meal	300	300
Food in kgs/person/month	1 380 000	5 400 000
Food in tonnes for 6 months	8 280	32 400

Risks and Assumptions

This is a self targeting programme. Only individuals who feel they need assistance would avail the opportunity. Social canteen is an established mechanism in rural Moldova and its acceptance among elderly and pensioners is widespread. Food should consist of locally acceptable traditional two course meals (soup and meal). It is assumed food will be available for purchase at Raion markets. For challenged people, social workers deliver food to homes. Winter may dissuade some from the trip to the canteen even if the food is required.

Inclusion/Exclusion Error

The vulnerable group listings are well maintained with self targeting adopted within these families. However, food secure people who become vulnerable specifically due to drought and do not qualify as traditionally vulnerable would not be able to avail the facility. The Mayor's offices are updating lists and may include such cases.

Project Profile: School Feeding

Situation Analysis

The drought has caused loss of revenue of local governments. This has threatened, and in many cases ceased the school feeding programmes in villages. The daily meal for these children was a major source of nourishment and supported learning capacities. With loss of incomes and crops, families are unable to maintain the quality and quantity of food intake. Support to maintain school lunches to grades 1-4, and to extend the target group to include kindergarten and children of grades 5-9 would support household food security.

Implementation

Village schools are equipped to prepare and serve meals to children. The local government recommends use of these facilities as Social Canteens. They are heated, centrally located and children are available during week days.

Target Group

Support school feeding of grades 1-4. Expand to grades 5-9. Include kindergarten children.

Population	Persons
Total population	3 580 000
Children age 0-14	646 000
Rural children (2/3 of total)	431 000

	Scenario 1: Partial targeting Half group = 50 percent of villages 20 days per month for 4 months	Scenario 2: Full targeting Ages 0-14 years = 100% of rural children 20 days per month
Target group	215 000	431 000
Months	4	6
Meals per month	20	20
Cereal in gms/meal	150	150
Food in kgs/person/month	645 000	1 293 000
Food in tonnes for all months	2 580	7 758

Risks and Assumptions

The programme would be run during school days. Winter holidays, when home food reserves may be at their least, excluded. It is assumed all school age children attend school. Food should consist of locally acceptable traditional two course meals (soup and meal). It is assumed food will be available for purchase at Raion markets.

Inclusion/Exclusion Error

All school going children are included. Selective feeding within a school creates problems. It would be more prudent to select villages based on severity of drought impact. Infants and pre-kindergarten ages are included in the calculations. Children who can not attend school due to illness or special needs would be excluded.

Project Profile: Public Works

Situation Analysis

The drought has caused failed crops. This has reduced both on farm and off farm labour requirements. Families relying on casual labour have lost a major source of their livelihood. Such labour normally comes from able bodied persons who do not qualify as pensioners, elderly or other vulnerable groups. They are too young to qualify for Social Canteen and too old for School Feeding. This group requires work opportunities to make up for loss of employment, especially during the winter season when heating costs are extensive and incentive to cut forests for wood is maximum.

Implementation

Raion authorities should prepare public works programmes to engage available unemployed or underemployed personnel in rural areas.

Target Group

Able-bodied, casual labourers in rural areas between ages 20 and 50 who have no land and no work.

Population	Persons
Total population	3 580 000
Rural population	2 310 000
Ages 20-59	1 516 000
Rural population ages 20-59 (2/3 of total)	1 010 000

Rural unemployed population ages 25-49 2.2 percentage**

Rural unemployed (pre-drought) 22 220

**Source: Table 3.1.3, Statistical Yearbook, 2006.

	Scenario 1: Partial targeting Pre-drought figures = 22 000 persons	Scenario 2: Full targeting Drought impact: Unemployment x 2 =44 000 persons
Target group	22 000	44 000
Months	2	2
Wages per month (Lei)	500	500
Total wages per person	1 000	1 000
Total wages for whole group	22 000 000	44 000 000
Inputs for public works	5 500 000	11 000 000

Risks and Assumptions

Soviet era public works programmes left a poor impression where State demanded labour and provided little or no compensation. Remuneration levels should be well communicated and paid on time. There is a self targeting element especially during cold winters when only those in need of work will accept. It is assumed food will be available for purchase at Raion markets. Actual numbers of unemployed and underemployed are very difficult to get. Therefore the self targeting approach is useful.

Inclusion/Exclusion Error

People with adequate food security may sign on for extra cash. To avoid this scenario, the wage is set much below normal which is 1 500 lei per month. Members of vulnerable groups eligible to other assistance should not sign up for these programmes.

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