

ASSESSMENT

OF THE NEGATIVE IMPACT OF THE 2000 DROUGHT

IN THE REPUBLIC OF MOLDOVA

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Prologue & Disclaimer

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Work was carried out in Moldova by the Center for Strategic Studies and Reforms (CISR) and the Center for Private Business Reform (CPBR), the EWMI presence in Moldova implementing the National Land Program (farm privatization and debt restructuring). The data and opinions contained herein are the sole responsibility of the authors and do not necessarily reflect opinion or policy of the USAID, the Government of the United States, nor the Government of the Republic of Moldova.

The field surveys were completed in late June – early July, before the recent heavy rains, hail and wind. Therefore, none of the data or recommendations consider that additional losses, substantial in some parts, were caused by the most recent weather phenomena. CPBR will undertake another field survey in mid- to late-August to up-date the crop situation in a CISR-CPBR report to be issued in early September 2000.

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Introduction and Summary

The present study was performed at the request of USAID-Moldova to provide an independent evaluation of losses caused by the spring drought, its potential economic and social consequences, and recommend short-term actions to ameliorate the impact of the drought.

The work was carried out by the Center for Strategic Studies and Reforms (CISR) and the Center for Private Business Reform (CPBR), from June 20th to July 12th.

In addition to official statistical data obtained from the Ministry of Economy and Reforms, Ministry of Agriculture and Food Industry, Department of Statistical Analysis and Sociology, and the Metrology Service "Hidrometeo", field surveys were performed throughout the country by CPBR monitoring and polling specialists working on the National Land Program. Interviews with private farmers, rural residents and representatives of local government were conducted in all 10 counties and TAU "Gagauzia" (275 mayoralities in total). Individuals and/or focus groups from six hundred seventy eight (678) agricultural enterprises were surveyed, including 460 peasant farms, 188 limited liability firms, 20 cooperatives and associations, and ten joint-stock companies. This represented 15.4% of the planted area of the country, or approximately 207,500 hectares.

The drought commenced in the Republic of Moldova during the most important period for the new harvest, May-June, 2000 and is an extraordinarily negative factor that impacts the economic and social processes in the country at a very critical time; just as the National Land Program is ending. Thus, not only the current food supply is at risk, but also there is likely to be a serious negative impact on all business related to agricultural and livestock production, and the state as a whole. The drought will also have a serious impact on next year's harvest since farmers will have lost a significant percentage of their seeds (already low quality) and incomes to purchase additional production inputs, including quality seeds, fertilizers and fuel for autumn planting and complete soil preparation to maximize collection of snow for moisture entrapment. On the scale of the national economy the drought will increase food prices (to the extent the government does not somehow put strict price controls in place), making it more difficult for the average Moldovan to purchase adequate food. Furthermore, the drought will reduce the ability of the government to pay salaries, pensions and provide assistance to the poorest segments of the population due to lost tax revenues. Lost tax revenues will also cause more difficulties for rebuilding state reserves of wheat, depleted in June and July 2000 as a result of the current bread crisis in Chisinau and some other urban centers.

The Government of the Republic of Moldova has performed a preliminary assessment of the loss incurred by the country, and it appealed for assistance from the international community. Possibilities to provide such assistance are apparently being considered by FAO/UN, European Commission (Food Security Program), USAID, Swiss Agency for Development and Cooperation, and others.

Notwithstanding the emergency and the extremely low average per capita income, certain segments of the population have the economic wherewithal to pay higher percentages of their income for food. Therefore emergency assistance, including government actions, should not result in general subsidies to all Moldovans at the cost of depressed farm gate prices. Assistance should be targeted to: a) assist private farmers prepare for and plant this fall's grain crop and undertake proper fall soil preparation; b) assist private farmers plant certain spring 2001 crops such as grain and legumes; and

c) provide targeted food and possibly income supplements to the most vulnerable segments of the population, i.e., persons on fixed incomes such as pensioners, institutionalized children and adults (orphanages, homes for handicapped, old age homes), pregnant and nursing mothers without adequate means of support, persons in public hospitals, etc.

To be effective, the “drought relief” assistance should be provided substantially through private non-governmental organizations which should operate under conditions of maximum flexibility without Moldovan governmental interference, dominance or control. However, the Government of Moldova and corresponding state agencies and ministries, e.g., Ministries of Agriculture, Health, The Social Fund, etc., must be kept informed of progress and should develop a forum (drought coordination commission or committee) such that reasonable overall or regional implementation targets and goals are set together with the NGO’s performing the work. Drought relief assistance should be programmed on an emergency basis for a 12 – 18 month period and should commence not later than September 1st in order to be in a position to procure and deliver fertilizers, seeds, fuel and other assistance in time for fall 2000 planting. This is doable if NGO’s are enlisted within the next several weeks to carry-out the work on some sort of cost-reimbursable grant basis. To the extent feasible and practicable, as much as possible of the assistance should be procured in a very transparent process in Moldova first, the near-Moldova region (Ukraine, Romania, Bulgaria, Belarus, Poland) second, and lastly, imported from the West. If a significant amount of disaster assistance is procured locally and regionally through a private sector, transparent process, it will have the added benefit of providing a stimulus to the economies of Moldova and neighboring countries.

The official strategic reserve of grains needs replenishing in the amount of approximately 60-80 thousand tons of wheat, but the 2000 budget does not contain budget allocations to replenish this reserve. In addition, recent experience has demonstrated that the Government needs assistance managing the strategic reserve to ensure there is no loss of quality (or volume) and to ensure reasonable bread price stability, particularly in urban centers such as Chisinau, without depressing farm gate prices of wheat or causing other major market distortions.

Lastly, this drought experience has demonstrated amply that the capacity to accurately forecast crop production and obtain and report reasonable agricultural statistics is seriously lacking as a result of the privatization of the collective farms throughout the country and the breakdown of government command and control over farming enterprises. The ability to accurately forecast and issue timely agricultural production estimates is necessary for ensuring food security throughout the country and may aid private farmers make planting and marketing decisions. Assisting the establishment and sustainability of such a system, as a public or private undertaking, should be a donor and Government of Moldova short-term priority.

Taking into account that in July 2000, on the contrast to the previous two months drought, in some areas of the Republic of Moldova heavy rains have occurred in line with hail stones and tornadoes, that caused a considerable damage, in particular to vineyards, orchards and vegetables, it is recommendable to carry out an additional assessment of the situation, in the first half of August. The fieldwork should be carried out in the same “spots” where similar work has been performed with regard to drought.

1. Moldovan agriculture: natural risk factors

Traditionally the Republic of Moldova is situated in a zone of risky dry-land farming. The meteorological data for a period over 150 years, and statistical data, show that the country is periodically subjected to natural disasters – droughts, frosts (late spring and early autumn), hail storms, floods, torrential rains and landslides. To alleviate the consequences of those natural calamities always implied conducting measures to adapt crop location, technology and work organization.

1.1. General statistical statements on natural factors

For successful agriculture, climate conditions, quality of land resources and water supply are vital.

Climate in the Republic of Moldova is moderately continental and is characterized by a mild and short winter with little snow and warm, long summers, with insufficient precipitation. The thermal values during recent years are represented in the Annex 1. The yearly average temperature is $+10^{\circ}\text{C}$ and oscillates between -3°C , the average in January, and $+22^{\circ}\text{C}$, the average in July. The absolute yearly maximum reaches $40-42^{\circ}\text{C}$. The maximum daytime temperature at soil surface is $22-25^{\circ}\text{C}$. In terms of climate, the territory comprises three zones – North, Center and South, each of them having several sub-zones: (See Annex 1, Table 1.1).

The vegetation period increases from 200 days in the northern part to 240 days in the south. The observations carried out during many years have demonstrated that the period with daily average temperature above 5°C in the spring is between 29 March to 4 April in the northern zone and between 22 to 27 March in the south. In the fall, the period with daily average temperature above 5°C in the north is between 1-6 November and in the south between 10-14 November. Sunshine period varies between 2060 hours in the North to 2330 hours in the South. The annual balance of radiation (Annex 1, Table 1.2) is $47-53\text{ Kkal/cm}^2$.

Land resource is the main natural resource of the country. About 80% of the all agricultural land is black soil. The total land area is 3,384.4 thousand hectares, while the agricultural area is 2,550.3 thousand hectares. In private ownership, at the beginning of 2000, there were 1,923.6 thousand hectares, or 75% of the overall agricultural land. The area of the arable land is 1,813.8 thousand hectares, or 53.6% of the total land area. Vineyards cover 168.9 thousand hectares and orchards 170 thousand hectares, which accounts for about 10% of the total land area. Unfortunately in the 90's vineyard and orchard areas shrunk by 23.6% and 18.2% respectively.

Relief – in the north and south steppe prevails, and in the center of the country – hills. Slopes account for about 57% of the territory, and about 1/3 of them are of over 6° .

Forest resources – 422.7 thousand hectares or 12,5% of the total land area.

Water resources available for usage amounts to 7.21 km^3 on average per annum – for the population, national economy and irrigation purposes. Water accumulation in the soil depends on atmospheric precipitation. The average precipitation oscillates from 350 mm to 600 mm per annum. However, deviation from the norms varies from 150-200 mm/year. Even in the northern zone the

average precipitation is 750-800 mm, although in some years only 400-450 mm is received. Most atmospheric precipitation occur during the warm period (April-November) as rains. Atmospheric precipitation and available water resources are insufficient to meet the needs of most crops cultivated in the country. This situation, in line with other issues, generates uncertainty and risk for agriculture.

1.2. Contingencies and risks in agriculture

Moldovan agriculture is subject to several common disasters or risks, as follows:

late spring and early autumn frosts – during the first decades of September, March, and early May, there is substantial risks of frost. Thus, the first frosts in the central zone in 1990-1993 were in the first decade of September, while the last spring frost occurred in early May;

land slides and soil deterioration – occur due to natural circumstances (hard rains, storms and inappropriate technology applications, particularly on sloped areas). Agricultural land deteriorated by erosion amounted to 23.6% in 1965, 32.9% in 1997, and about 35% now. Annual losses of fertile soil due to erosion are reportedly 26 million tons. During the past 25 years the areas affected by soil slides amounted to 62,600 hectares;

atmospheric precipitation – the most dangerous period for hard rain storms that cause substantial damage to crops is during the summer. For example, on June 10th and July 9th, 1948, the Chisinau area received 220 mm and 184 mm of rain during each of these 24 hour periods, which amounted to half the yearly norm. Hard showers, often with hail, are recorded yearly, which destroy plantations, greenhouses, and wash out the soil. The ratios of precipitation and air temperature, as well as the degree of soil moisture accumulation are extremely important for proper plant growth. Historical data is presented in various tables in Annex 1, Tables 1.1 – 1.7.

drought – one of the typical natural occurrences for Moldova, particularly in the southern zone, is frequent droughts, particularly during the 90's. Agri-meteorological peculiarities of the droughts are shown in Annex 1. Often droughts occur two years consecutively, for example: in 1952-1953, 1982-1983, 1986-1987, 1989-1990. Most dramatic was a three years drought from 1945-47, which produced a famine and many victims. Drought frequency has increased recently, for example: in 1945-1970 there were 7 drought-affected years, in 1971-1996 – 9 droughts. Starting from 1982 droughts repeat each third year, and since 1989 – each second year.

2. The natural conditions for agricultural sector in the first half of 2000.

Official forecasts for 2000 comprise macroeconomic indices and forecasts of certain agricultural crops. Proceeding from the macroeconomic forecast of the Ministry of Economy and Reforms (MER), the agricultural outputs in 2000 was anticipated to be 7.3 bln. MD lei (while actual output in 1998 was 4.8 bln. MD lei and in 1999 5.4 bln. MD lei), and produce an added value worth 3.7 bln. lei (while actual added value in 1998 was 2.4 and in 1999 2.7 bln. lei). Given that 1999 was unfavorable for sugar beet, fruits and other crops, in 2000 the structure of fields was changed (share of cereals, tobacco and others' have increased), and a 9% growth in agricultural outputs was anticipated (while there was a decline of 11% in 1998 and an 8% decline in 1999). See Table 1.

The official 2000 crop forecasts of the Ministry of Agriculture and Processing Industry (MAPI) for certain crops was for a 50% increase as compared to actual 1999 harvests. The forecasts of the private farms interviewed were also optimistic – about 20% growth.

Table 1

Output of main agricultural products in all categories of farms (thou tons)					
	Crops	1999	Average for 1994-1999	Planned for 2000	
				Ministry of Agriculture and Food	Agricultural enterprises
1	Winter wheat	797.8	881.9	1171.0	980.8
2	Barley	182.6	235.4	233.0	226.8
3	Maize	1140.3	1096.1	1620.0	1231.2
4	Leguminous plants	58	54.5	165.0	79.2
5	Sugar beet	1008.8	1556.5	1725.0	1257.4
6	Sunflower	285.6	212.1	340.0	291.9
7	Soy-bean	13.7	5.2	24.0	21.5
8	Tobacco	22.4	26.3	48.0	33.0
9	Potatoes	329.5	373.4	400.0	490.1
10	Vegetables	488.8	434.9	600.0	436.9
11	Fruits and berries	136.3	518.4	600.0	458.3
12	Grapes	464.9	560.1	600.0	467.7

Source: Information note on drought impact (MAPI)

The prices used by the MAPI in making their 2000 forecasts (Table 2) are substantially higher than actual prices on the domestic market. The increase in prices used in the official forecasts also exceed considerably the index of inflation stipulated in the macroeconomic forecast of the MER. This is why the MAPI's forecast of crops output using planned tons from Table 1 and 2000 forecast prices from Table 2 amounts 11 bln MD lei, whereas the MER's forecast for the whole 2000 output in agriculture was only 7.3 bln. MD lei.

Table 2

Producer's prices of 1999 and prices used by Ministry of Agriculture and Food for 2000 forecasting

	Crops	1999		2000 - forecast	
		In MDL	In USD*	In MDL	In USD*
1	Winter wheat	584	56	1850	148
2	Barley	584	56	1355	108
3	Maize	603	57	1200	96
4	Leguminous plants	1300	124	2600	208
5	Sugar beet	170	16	480	38
6	Sunflower	1298	124	1700	136
7	Soy-bean	1300	124	1700	136
8	Tobacco	6907	658	8000	640
9	Potatoes	1469	140	2500	200
10	Vegetables	907	86	2000	160
11	Fruits and berries	1113	106	1200	96
12	Grapes	1222	116	2000	160

*exchange rate – 10.5 MDL per USD for 1999 and 12.5 MDL per USD for 2000

Source: Information note on drought impact (MAPI)

Thus, an inconsistency occurred between the macroeconomic forecast and the prognosis of certain agricultural outputs, which has been admitted and is due to a too optimist estimation of the forthcoming harvest (See Table 3). Therefore when projecting losses due to the drought, initial estimates were based on the inflated 2000 prognosis, which had no basis in science other than estimates made by local officials which were channeled through official sources to MAPI.

Table 3

Yield of main agricultural crops of all categories of farms, centner/ha						
	Crops	Average for 1971-1980	Average for 1981-1990	Average for 1991-1999	Planned for 2000	
					Ministry of Agriculture and Food	Agricultural enterprises
1	Winter wheat	32.8	34.4	29.4	33.0	28.8
2	Barley	37.4	30.5	25.1	23.5	22.5
3	Maize	35.7	37.7	32.2	36.0	29.0
4	Leguminous plants	15.6	16.5	12.3	20.0	13.2
5	Sugar beet	278	267	228	230.0	193.5
6	Sunflower	17.1	18.8	12.8	17.0	14.5
7	Soy-bean	8.8	10.7	9.6	12.0	12.6
8	Tobacco	13.9	17	14.2	16.0	15.0
9	Potatoes	83	87	66	100.0	74.3
10	Vegetables	145	157	77	109.0	89.2
11	Fruits and berries	66.9	73	38	42.0	32.7
12	Grapes	61.3	64	39.2	42.0	33.4

Source: Information note on drought impact (MAPI)

Unfortunately, the difficult conditions in the spring, followed by the “heat shock” and the lack of rain after the Easter, during May-June, entailed considerable adjustments of the expectations. According to “Hidrometeo” Service the air temperature exceeded the norm during April by 2.5 – 4.0°C, reaching 12.5 – 14.0°C, in May respectively by 1 – 2°C and reaching 16.5 – 17.5°C and in June it being about the norm 18.5 – 20.50°C. The maximum temperature of dry air in April rose to 25 – 29°C, May to 29 – 32°C and June to 32 – 35°C. The water reserves accumulated in the soil were rather poor and atmospheric precipitation were extremely low. The amount of precipitation during April equaled only 30 to 90% of the multi-year average values, in May by only 2 to 20% of the multi-year average and in June from 10 to 25%.

For instance, the meteorological station in Chisinau recorded precipitation (rains) in May of only 5mm, which was lower than any year since 1995. This year in the Chisinau area only 6% as much rain fell compared to 1998. The station in Briceni recorded respectively 85.7% of the 1995 rainfall and 33% of the 1998 amount, the Cahul station reported 16.7% and 9.6% respectively. In territorial terms, the poorest precipitation of only 4 mm were registered in May in the Lapushna county. Consequently the reserves of productive humidity in a layer of 1 m of soil of the fields planted by cultivated crops on 28 June amounted to only 40-65% of the norm. The amount of water flowing in the Nistru and Prut rivers as well as in small rivers during June accounted for 40% - 55% of the multi-year average.

Table 4

Precipitation amounts vs. average multi-annual level per counties of the Republic of Moldova, 2000

A	B	Edinets	Soroca	Baltsi	Ungheni	Orhei	Chisinau	Lapusna	Tighina	Cahul	Taraclia	Gaguzia	Moldova- total
		1	2	3	4	5	6	7	8	9	10	11	
1	January, mm	26	31	25	39	33	41	44	59	46	35	42	38
	as % to normal level	81	106	78	101	100	130	145	191	131	109	131	118
2	February, mm	33	28	31	42	34	28	25	26	25	26	26	29
	as % to normal level	106	102	104	113	100	84	88	82	71	68	73	90
3	March, mm	25	29	31	41	25	22	16	16	18	11	12	22
	as % to normal level	82	108	105	141	87	74	61	62	69	41	47	80
4	April, mm	38	48	44	66	25	24	14	45	16	44	27	36
	as % to normal level	86	131	106	150	59	62	39	138	40	113	46	88
5	May, mm	24	13	13	7	8	6	4	17	7	16	13	12
	as % to normal level	39	22	22	11	14	11	7	31	13	29	18	20
6	June, mm	57	38	37	18	33	11	17	27	17	22	22	27
	as % to normal level	79	55	53	23	47	16	25	42	26	34	32	39

Source: Hidrometeo data

Table 4, developed on the data provided by the “*Hidrometeo*” log shows that in February-April the amount of precipitation vs. the normal level amounted to only 8 - 90% in the various stations, and in May, 20% and June, 39% respectively. The graphs 1 and 2 show an extraordinary spring and early summer of 2000, in terms of precipitation.

3. Official assessment of the situation in agriculture as on the end of June 2000

The official assessment of the drought impact and consequences has been carried out by those two ministries mentioned above – MER and MAPI. Macroeconomic forecast losses are estimated to be worth 1.2 bln MD lei in terms of agricultural products and 0.6 bln. MD lei added value. This is caused the MER to adjust their growth forecasts for 2000 from a two percent (2%) growth to an expected further decline of between four and five percent (4 - 5%).

The negative impact of the drought, carried out by MAPI since the second half of June, have been increasing: initially losses were estimated as being worth 2.157 bil. MD lei, then 3.315 bln. MD lei. In some statements in the press and on TV, even greater amounts of alleged losses were mentioned. Table 5 below for presents official figures as prepared by the MAPI. The Prime-minister, however, never officially reported more than 2.2 bln. MD lei (See his report on national meeting the mayors, from 6 July, 2000).

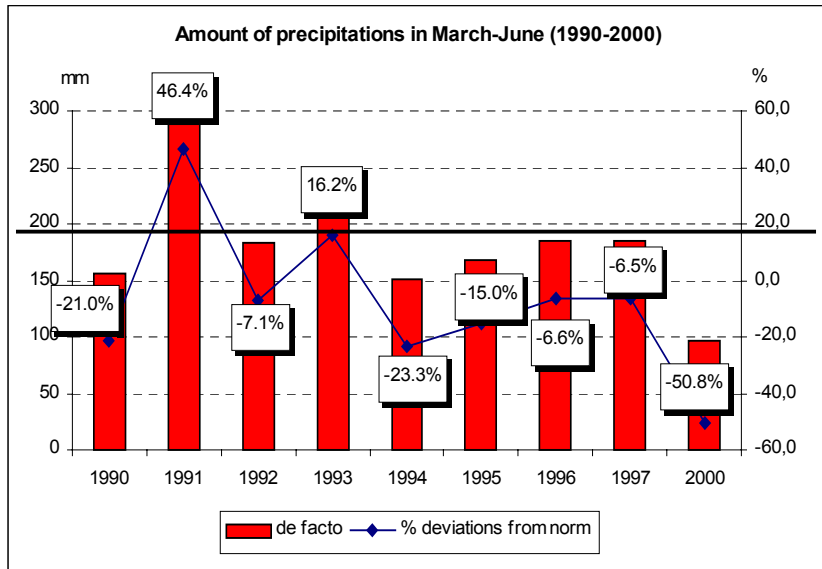
Table 5

Assessment of agricultural output losses due to 2000 drought registered by MAPI

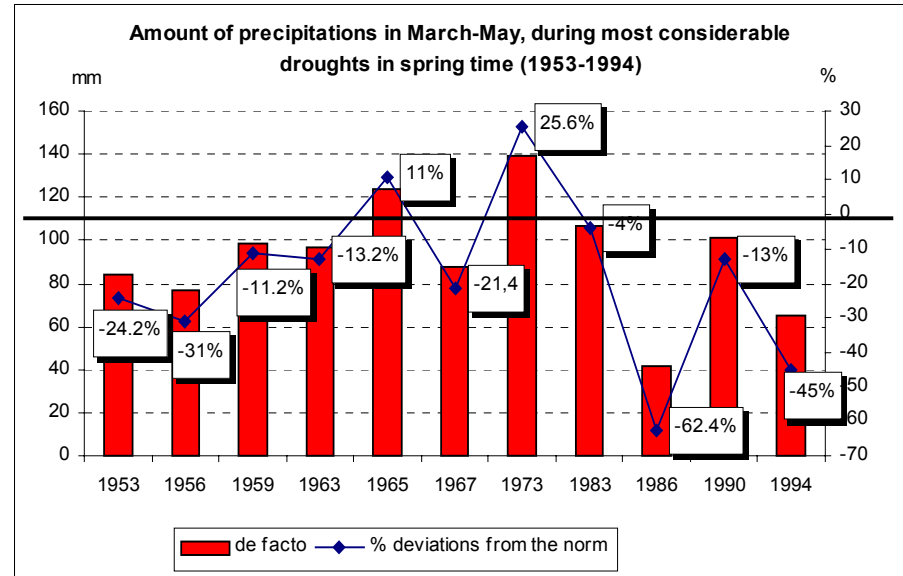
Crops	Forecast of the Ministry of Agriculture and Food				
	Total harvest planned for 2000, thou tons	Total harvest expected in 2000, thou tons	Average market price for 2000, MD lei per ton	Shortage in harvest, thou tons	Shortage in income, mln MD lei
B	1	2	3	4	5
Winter wheat	1171	576	1850	-595	-1101
Barley	233	71	1355	-162	-220
Maize	1620	1042	1200	-578	-694
Leguminous plants	165	45	2600	-120	-312
Sugar beets	1725	966	480	-759	-364
Sunflower	340	224	1700	-116	-197
Soybeans	24	19	1700	-5	-9
Tobacco	48	22	8000	-26	-208
Potatoes	400	400	2500	0	0
Vegetables	600	490	2000	-110	-220
Fruits	600	449	1200	-151	-181
Grapes	600	420	2000	-180	-360
<i>Total annual plants</i>					-3324
<i>Total perennial plants</i>					-541
Total crops					-3865

Source: Information note on drought impact (MAPI)

Graph 1



Graph 2



4. Fieldwork: evaluation of the economic impact of the drought

In the framework of the present study, the evaluation of the drought consequences has been performed in terms of an analysis of the data collected from interviews conducted by CPBR monitoring and polling specialists on randomly selected agricultural businesses: 460 peasant farms, 188 limited liability firms, 20 production cooperatives and associations, 10 joint-stock companies (678 units in all).

The survey comprised all 10 counties (Judets) and the autonomous territorial unit of Gagauzia and included farms located in 275 mayoralties (primării). The overall surveyed planted area represented 207,490 hectares, which accounts for approximately 15,4% of the total sown area of the country (See Table 6).

Table 6

Number of the surveyed agricultural enterprises by judetses										
Judets	Total number of the surveyed city halls	Number of the surveyed agricultural enterprises	Including					Total sown area (excluding fobber crops), thou ha	Surveyed sown area (excluding fobber crops), thou ha	Share of the surveyed sown area in the total sown area, %
			Peasant farms	Limited liability firms	Joint-stock company	Cooperatives	Kolkhozes and agricultural firms			
1 Edinets	23	56	31	24		1		149,1	17,12	11,5
2 Soroca	33	94	64	27	1	2		139,1	20	14,4
3 Baltsi	25	56	35	21				220,2	14,6	6,6
Total in Northern zone	81	206	130	72	1	3	0	508,4	51,72	10,2
1 Ungheni	19	47	40	7				75,8	4,69	6,2
2 Orhei	45	100	65	32		3		161	24,04	14,9
3 Chisinau	41	104	74	26	1	2	1	97,3	19,12	19,7
4 Lapusna	22	73	55	17		1		124,5	24,5	19,7
Total in Central zone	127	324	234	82	1	6	1	458,6	72,35	15,8
1 Tighina	23	51	31	19		1		141,7	26,01	18,4
2 Cahul	25	66	53	11			2	129,7	22,72	17,5
3 Taraclia	4	5	1		2	1	1	29,6	9,2	31,1
4 Gagauzia	15	26	11	4	6	2	3	78	25,49	32,7
Total in Southern zone	67	148	96	34	8	4	6	379	83,42	22,0
Moldova	275	678	460	188	10	13	7	1346	207,49	15,4

According to the results of the survey three drought development variants were calculated by CISR considering the drought consequences. The *optimistic variant* is the most important variant, proceeding from the assumption that since the beginning of the rain in first half of July and relatively better conditions thereafter, the losses caused by the drought will not be enhanced and prices will maintain at the level of those considered in the computation.

Pessimistic – 1 scenario assumes increasing losses per crops to be harvested in late fall.

Pessimistic – 2 variant relies on the assumption that demand of agricultural products will sharply increase (particularly of wheat), and prices will also increase (See Tables 9, 10 and 11).

Losses estimate: optimistic scenario – 1.9 bln. MD lei which accounts for 25% of the crop volumes envisioned by the prognosis of the farms interviewed during the fieldwork survey.

Losses according to pessimistic – 1 variant is worth 2.6 bln. MD lei, or 34.5% of the crop volumes envisioned by the prognosis of the farms interviewed during the fieldwork survey, and pessimistic – 2 variant is 3.2 bln. MD lei, or 34,4% of the crop volumes envisioned by the prognosis of the forms interviewed. These forecasts do not factor in recent losses due to torrential rain and some flooding the week of July 10th in some regions of Moldova.

According to the basic variant most losses are forecasted in terms of cereals production, e.g., winter wheat - 29.5%, barley - 36.8%, maize-36.6%, leguminous plants - 51.9%, and in terms of fruit production -52.9%.

Territorial aspect. Typically in case of droughts the losses increase from North to South due to zonal differences of precipitation. In 2000, according to field work estimates, losses were determined not only by the natural factors but also by the quality of agri-technologie, i.e., autumn soil preparation, seed quality, crop rotation, fertilization, etc.

The aggregate evaluation of the agricultural output losses due to 2000 drought, proceeding from the surveyed agricultural businesses, are presented in Table 7:

Table 7

Crops	Surveyed agricultural enterprises				
	Total harvest planned for 2000, thou t	Total harvest expected in 2000, thou t	Average market price for 2000 (M D L/ton)	Shortage in harvest (thou t.)	Shortage in income (m in M D L)
B	6	7	8	9	10
W inter wheat	981	691	1000	-290	-290
B arley	227	143	870	-83	-73
M aize	1231	781	900	-451	-406
L eguminous plants	79	38	1800	-41	-74
S ugar beets	1257	1062	275	-196	-54
S unflower	292	233	1700	-59	-100
S oybeans	21	19	1800	-3	-5
T obacco	33	26	10000	-7	-66
P otatoes	490	392	3000	-98	-295
V egetables	437	384	1700	-53	-90
F ruits	458	217	1800	-241	-435
G rapes	468	457	1800	-11	-20
<i>Total annual plants</i>					-1451
<i>Total perennial plants</i>					-454
Total crops					-1906

Based on those circumstances, and according to the data from the field survey, winter wheat recorded the most losses (30-34%) and these are anticipated in Ungheni, Orhey, Tighina and Cahul counties, and Lapushna – 44%. In terms of barley most losses are expected in the Tighina county - 41%, Chisinau county and Gagauzia about 50%. In terms of maize the southern zone was hardest hit – Cahul, Tighina, Gagauzia – 45-50%, Lapushna - 57% and Taraclia - 65%. In terms of fruits most losses are forecasted in the central zone, county Orhey, and in the all Southern counties – Tighina, Gagauzia, Taraclia, Cahul (65-80%).

As Table 8 illustrates, losses as a result of the drought vary from north to south, with general impact being greater in the south. However, even in Edinet, Soroca and Balti, some farmers suffered substantial losses in one crop. Grape growers in Edinet, for example, reported losses of about 45.5 percent while vegetable losses in Soroca were in the neighborhood of 70 percent. Meanwhile, barley losses in Balti were in the neighborhood of 30 percent.

Table 8 presents an illustration of losses at the 20, 30 and 40 percent levels.

Table 8

Summary of losses by Judet due to drought

Losses >40% of Crop	Edinet	Soroca	Balti	Ungheny	Orhey	Chisinau	Lapushna	Tighina	Cahul	Taraclia	Gagauzia
Winter Wheat							43.9				
Barley						50.8		40.7			50.8
Maize							57.2	44.0	47.0	64.7	49.1
Leguminous Plants					45.0		48.6		47.0	50.5	65.3
Sugar Beets					44.4				48.0		
Sunflower							43.6				
Soybeans									62.0		62.0
Tobacco									50.0		50.0
Potatoes											
Vegetables		70.0									
Fruits					71.4	57.5	42.9	75.0	80.0	66.7	66.7
Grapes	45.5					50.0					

Losses >30% of Crop	Edinet	Soroca	Balti	Ungheny	Orhey	Chisinau	Lapushna	Tighina	Cahul	Taraclia	Gagauzia
Winter Wheat				34.0	32.8		43.9		33.0		32.7
Barley			30.0		34.0	50.8	32.6	40.7	37.5	37.6	50.8
Maize				39.0	32.5		57.2	44.0	47.0	64.7	49.1
Leguminous Plants					45.0		48.6		47.0	50.5	65.3
Sugar Beets					44.4				48.0		
Sunflower				32.7			43.6			35.0	
Soybeans				30.8					62.0		62.0
Tobacco									50.0		50.0
Potatoes											
Vegetables		70.0							30.0	30.0	33.0
Fruits					71.4	57.5	42.9	75.0	80.0	66.7	66.7
Grapes	45.5					50.0					

Losses >18-20% of Crop	Edinet	Soroca	Balti	Ungheny	Orhey	Chisinau	Lapushna	Tighina	Cahul	Taraclia	Gagauzia
Winter Wheat	23.2	28.7	25.1	34.0	32.8	23.2	43.9		33.0	29.3	32.7
Barley	19.1	21.4	30.0	18.7	34.0	50.8	32.6	40.7	37.5	37.6	50.8
Maize				39.0	32.5		57.2	44.0	47.0	64.7	49.1
Leguminous Plants	22.5				45.0	25.3	48.6	22.3	47.0	50.5	65.3
Sugar Beets		19.5			44.4			28.0	48.0		
Sunflower				32.7	26.4		43.6		27.1	35.0	
Soybeans				30.8		25.0			62.0		62.0
Tobacco					25.7			20.0	50.0	27.6	50.0
Potatoes					21.7		24.8	24.8			
Vegetables		70.0							30.0	30.0	33.0
Fruits		28.0	20.0	26.7	71.4	57.5	42.9	75.0	80.0	66.7	66.7
Grapes	45.5	28.0				50.0					

Table 9

Optimistic scenario

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Moldova**, according to extraordinary study, as on 1.07.2000

	Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield (ton/ha)	Total area, thou ha	Total harvest, thou t.		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %
			Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000					
A	B	1	2	3	4	5	6	7	8	9	10	11	12
1	Winter wheat	87.5	2.88	2.03	-0.85	341	980.8	691.2	-289.6	1000	980.8	-289.61	-29.5%
2	Barley	14.5	2.25	1.42	-0.83	101	226.8	143.4	-83.3	870	197.3	-72.51	-36.8%
3	Maize	36.9	2.90	1.84	-1.06	424	1231.2	780.6	-450.7	900	1108.1	-405.59	-36.6%
4	Leguminous plants	7.81	1.32	0.63	-0.68	60	79.2	38.1	-41.1	1800	142.5	-73.98	-51.9%
5	Sugar beets	9.69	19.35	16.34	-3.01	65	1257.4	1061.8	-195.7	275	345.8	-53.80	-15.6%
6	Sunflower	39.13	1.45	1.16	-0.29	201	291.9	233.2	-58.8	1700	496.3	-99.88	-20.1%
7	Soybeans	2.74	1.26	1.10	-0.16	17	21.5	18.7	-2.8	1800	38.6	-5.04	-13.1%
8	Tobacco	5.83	1.50	1.20	-0.30	22	33.0	26.4	-6.6	10000	329.8	-65.70	-19.9%
9	Potatoes	0.61	7.43	5.93	-1.49	66	490.1	391.7	-98.5	3000	1470.4	-295.38	-20.1%
10	Vegetables	2.78	8.92	7.84	-1.08	49	436.9	384.0	-52.9	1700	742.7	-89.92	-12.1%
11	Fruits	21.2	3.27	1.55	-1.72	140	458.3	216.8	-241.5	1800	824.9	-434.64	-52.7%
12	Grapes	18.61	3.34	3.26	-0.08	140	467.7	456.7	-10.9	1800	841.8	-19.69	-2.3%
	<i>Total annual plants</i>	207.49				1346.0					5852.2	-1451.4	-24.8%
	<i>Total perennial plants</i>	39.81				280.0					1666.7	-454.3	-27.3%
	Total crops	247.30				1626.0					7519.0	-1905.7	-25.3%

Table 10

Pessimistic scenario-1

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Moldova**, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield area, thou ha	Shortage in (ton/ha)	Total area, thou ha	Total harvest, thou t.		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %
		Planned for 2000	Expected in 2000				Planned for 2000	Expected in 2000					
A	B	1	2	3	4	5	6	7	8	9	10	11	12
1	Winter wheat	87.5	2.88	2.03	-0.85	341	980.8	691.2	-289.6	1000	980.8	-289.61	-29.5%
2	Barley	14.5	2.25	1.42	-0.83	101	226.8	143.4	-83.3	870	197.3	-72.51	-36.8%
3	Maize	36.9	2.90	1.50	-1.40	424	1231.2	636.0	-595.2	900	1108.1	-535.69	-48.3%
4	Leguminous plants	7.81	1.32	0.63	-0.68	60	79.2	38.1	-41.1	1800	142.5	-73.98	-51.9%
5	Sugar beets	9.69	19.35	12.70	-6.65	65	1257.4	825.5	-431.9	275	345.8	-118.78	-34.4%
6	Sunflower	39.13	1.45	1.00	-0.45	201	291.9	201.0	-90.9	1700	496.3	-154.61	-31.2%
7	Soybeans	2.74	1.26	1.10	-0.16	17	21.5	18.7	-2.8	1800	38.6	-5.04	-13.1%
8	Tobacco	5.83	1.50	1.00	-0.50	22	33.0	22.0	-11.0	10000	329.8	-109.77	-33.3%
9	Potatoes	0.61	7.43	5.00	-2.43	66	490.1	330.0	-160.1	3000	1470.4	-480.39	-32.7%
10	Vegetables	2.78	8.92	6.70	-2.22	49	436.9	328.3	-108.6	1700	742.7	-184.55	-24.8%
11	Fruits	21.2	3.27	1.45	-1.82	140	458.3	203.0	-255.3	1800	824.9	-459.54	-55.7%
12	Grapes	18.61	3.34	2.90	-0.44	140	467.7	406.0	-61.7	1800	841.8	-110.98	-13.2%
<i>Total annual plants</i>		207.49				1346.00					5852.2	-2024.9	-34.6%
<i>Total perennial plants</i>		39.81				280.00					1666.7	-570.5	-34.2%
Total crops		247.30				1626.00					7519.0	-2595.5	-34.5%

Table 11

Pessimistic scenario-2

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Moldova**, according to extraordinary study, as on 1.07.2000

	Crops	1	Yield (ton per ha)		4	5	Total harvest, thou t.		8	9	10	11	12
			2	3			6	7					
		Surveyed area, thou ha	Planned for 2000	Expected in 2000	Shortage in yield (ton/ha)	Total area, thou ha	Planned for 2000	Expected in 2000	Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %
A	B												
1	Winter wheat	87.5	2.88	2.03	-0.85	341	980.8	691.2	-289.6	1250	1226.0	-362.01	-29.5%
2	Barley	14.5	2.25	1.42	-0.83	101	226.8	143.4	-83.3	1125	255.1	-93.77	-36.8%
3	Maize	36.9	2.90	1.50	-1.40	424	1231.2	636.0	-595.2	1125	1385.1	-669.61	-48.3%
4	Leguminous plants	7.81	1.32	0.63	-0.68	60	79.2	38.1	-41.1	2250	178.1	-92.47	-51.9%
5	Sugar beets	9.69	19.35	12.70	-6.65	65	1257.4	825.5	-431.9	370	465.3	-159.82	-34.4%
6	Sunflower	39.13	1.45	1.00	-0.45	201	291.9	201.0	-90.9	2065	602.9	-187.80	-31.2%
7	Soybeans	2.74	1.26	1.10	-0.16	17	21.5	18.7	-2.8	2250	48.3	-6.30	-13.1%
8	Tobacco	5.83	1.50	1.00	-0.50	22	33.0	22.0	-11.0	12500	412.2	-137.22	-33.3%
9	Potatoes	0.61	7.43	5.00	-2.43	66	490.1	330.0	-160.1	3000	1470.4	-480.39	-32.7%
10	Vegetables	2.78	8.92	6.70	-2.22	49	436.9	328.3	-108.6	2500	1092.1	-271.39	-24.8%
11	Fruits	21.2	3.27	1.45	-1.82	140	458.3	203.0	-255.3	2300	1054.1	-587.19	-55.7%
12	Grapes	18.61	3.34	2.90	-0.44	140	467.7	406.0	-61.7	2300	1075.6	-141.81	-13.2%
	<i>Total annual plants</i>	207.49				1346.00					7135.5	-2460.8	-34.5%
	<i>Total perennial plants</i>	39.81				280.00					2129.7	-729.0	-34.2%
	Total crops	247.30				1626.00					9265.2	-3189.8	-34.4%

5. Assessment of the social impact of the drought

Social consequences of low production and yields are obvious: prices of basic food products are rising resulting in less consumption by major segments of the population, particularly those persons with fixed incomes, unemployed poor, pregnant and lactating mothers, and institutionalized persons (orphanages, old persons' homes, handicapped persons, hospital patients). Amongst other segments of the population, increasing shares of their incomes are being spent on food which potentially may result in worsening of the already deficient nutritional state of another large segment of the population, particularly during the upcoming winter-spring periods.

Taking into account that according to the evaluation of poverty (1999) in Moldova, incomes of less than \$1/day are received by 21% of the population and under \$2 a day by 78% of the population, the problem of poverty due to increasing prices may worsen. This is why, potential humanitarian assistance on behalf of international organizations (flower, wheat, macaroni, etc.) should be targeted towards poorest segments of population.

One could anticipate that the movement of able population to earn their living in Western and Southern Europe (Greece, Italy, Turkey, Portugal, Ireland) and Russia, given that even the low-quality labor payment in those countries is higher than the average incomes in Moldova, will increase. By transferring cash payments worth approximately \$150-170 million on yearly basis, "gastarbeiters" from Moldova considerably alleviate the social position of their families left behind.

6. Possible short-term action to reduce the drought negative impacts

The preliminary evaluation of the situation emerged due to the problem "drought-2000", will allow to conclude, that the Government in the near future will encounter two problems.

Firstly. It is necessary to create state reserve of wheat (about 60-80 thousand tons), in order to provide for adequate strategic reserves and maintain a semblance of control over the price of bread, a very important social and dietary indicator in Moldova. However, recent events have amply demonstrated that the State needs assistance planning, financing and managing the strategic reserve of grains so that reasonable price stability is maintained at the farm gate and bread price increases do not place this vital commodity out of reach of major segments of the population. It is also important to note that a large portion of the population does have the economic wherewithal to pay higher percentages of their incomes for food and food security programs should be tailored so that subsidies are not available for these people. This implies some other mechanisms rather than merely controlling the price of wheat and bread through such actions as prohibiting the export of wheat or freezing the bread price.

While forecasting a harvest of 600-650 thousand tons of wheat, the problem of famine will not emerge, however, low-income large families and pensioners, other persons with low fixed incomes, unemployed poor, pregnant and lactating mothers, and institutionalized persons (orphanages, old persons' homes, handicapped persons, hospital patients) will need humanitarian assistance. The problem may aggravate if a considerable share of local wheat is exported from the country. This is why the State, in order to replenish the state reserves, should establish a worthy market price – \$80 to \$100 USD/ton for the local producers. Moreover it is not recommended and might be considered even dangerous the suggestion, emerged in the Government in the end of June, of allowing farm

enterprises pay their debts to the State with grain. In such a case farmers and agribusinesses will remain both without wheat and without money.

Secondly. The main concern is preparation for the next agricultural year. The stocks of qualitative seeds are missing in the country. Traditionally the problem of adequate diesel fuel for tractors is one of the major reasons autumn work (planting and plowing to trap snow and winter moisture) that is supposed to complete by November 1st are not completed or are late. Likewise, due to lack of financial resources mineral fertilizers are also not being used in Moldova to any significant degree. Therefore with crop losses likely according to the projections from the survey work and official estimates, farmers are likely to have even less ability to properly prepare the land and plant this fall's grain crop. Of course this will aggravate the overall food balance next year as well. Besides, proceeding from the experience of the 1994 drought, one could expect considerable breakage of plows and respectively additional costs.

According to the field estimates, the priority needs of the agricultural sector are grouped in the Tables 12 and 13.

Table 12

Required inputs for re-seeding areas due to drought,
per all categories of farms, as on 1.07.2000

Crops	Area, thou ha	Input needs		
		Seeds, t	Diesel oil, t	Mineral fertilizers, t
1 Maize for grain	17,7	425	750	1770
2 Maize for silage	57,0	1710	2394	5700
3 Annual plants for forage	1,5	300	50	150
4 Sugar beets	5,0	50	350	500
5 Buckwheat	4,7	500	188	470
6 Mangel	8,0	80	560	800
7 Sunflower	0,4	3	28	40
Total	94,3	4320	9430	9430

Table 13

Needed inputs until the end of 2000 by all categories of farms.

Inputs	Needs for harvesting and autumn	Available on 01.07.2000	Necessary to acquire
1 Diesel oil, t.	68850	4800	64050
2 Gasoline, t.	7000	850	6150
3 Oils, t.	2300	1050	1250
4 Mineral fertilizers, t.	153000	1220	151780
5 Pesticides, thou MDL	150000		150000
6 Seeds of the winter crops, t.			
winter wheat	81600	7800	73800
winter barley	8000	1200	6800
7 Seeds of the spring crops for the 2001 spring sowing			
maize	10900	1500	9400
spring barley	10800		10800
sunflower	2000	900	1100
sugar beets	700	250	450
soybean	1800	320	1480
peas	17500	1600	15900

Of course, avoiding the consequences of drought is a task not only for certain farms and agricultural enterprises but are also a task for the Government and State as a whole.

Year by year farmers operate in a cyclical environment; drought - too much rainfall, spring frost - early frost before harvest time, as well as in a cyclical economic environment. Yet the trees give fruit each year, the cows must be milked daily, and once wheat (or tomatoes) has been planted it cannot be shut-down like an assembly line in a manufacturing facility.

The cyclical economic environment is usually caused by factors beyond the control of farmers; e.g., devaluation of the national currency drives up factor costs of production since Moldova does not manufacture fertilizers or agro-chemicals. High inflation caused by Government overspending or low tax collection rates causes all costs to increase, except output prices which consistently remain depressed because of low aggregate demand caused by miniscule purchasing power of the vast

majority of population. Regional-scale financial crises result in lost markets (e.g., the Russian financial crisis in 1998), etc.

In addition to these negative impacts and risks Moldovan farmers face other market distortions caused by overt local and national government actions. Actions such as the recent prohibition to export wheat depress prices. Government importation of large amounts of certain agricultural commodities may also depress prices farmers receive for their crops, e.g., the recently announced “donation” of 20,000 tons of American wheat (or flour) in the middle of the harvest season may negatively impact local wheat prices.

This year, due to the drought, some farmers who manage to get a crop – perhaps because they were able to irrigate or they received enough rainfall in their specific area – may have an opportunity to make decent money after years of negative or declining incomes due to the difficult economic situation. Therefore, well intentioned foreign assistance to ameliorate the impact of any drought or other natural calamity affecting Moldova must be orchestrated in such a way so as to minimize the negative impact on Moldovan farmers, who through whatever means have managed to bring some crop to market. In addition, there are segments of the population who have the means to pay higher food prices or the ability to feed themselves, like most rural inhabitants (unless disabled, institutionalized or simply too old to be an agricultural or livestock producer) and the growing middle class. These people should not be subsidized, instead, they should be expected to pay higher food costs as a result of the drought.

In addition to above mentioned, the following are several suggestions for *short-term actions* to reduce the drought impact:

- (i) Increase in-kind humanitarian assistance to vulnerable groups who are unable to purchase food products (bread, macaroni) due to scarcity or high prices caused by the drought until the next harvest is due, i.e., until the end of August 2001. These groups would include institutionalized persons (disabled, orphans, elderly, prisoners, etc.), pensioners who do not have access to land plots or other means of support, unemployed poor such as women and children with no means of support, etc. If this recommendation is accepted by donors, then it needs to be complemented with answers to the following questions: How much of what kinds of foods? When? How to distribute? What about cash so they can buy food?
- (ii) Additional supplies of coal should be distributed to those people able to use it to heat homes, schools, hospitals and institutions where vulnerable persons are housed. This is presumably necessary due to increased cost of living as a result of higher food costs caused by the drought. The coal should be distributed as in the past, only in larger quantities.
- (iii) Fuel for fall ploughing and planting (presumably because farmers lost their grain crop and the income from this crop). If this recommendation is accepted by donors, the following questions must be answered: How to select the eligible farmers? How much fuel to give? How should it be acquired and distributed? When? By whom?
- (iv) Grain seeds for fall planting (presumably because farmers lost their grain crop due to the drought and have no seeds to replant the fall crop). If this recommendation is accepted by donors, the following questions must be answered: How to select the eligible farmers? How much seed to give? How and from where should it be acquired and distributed? When? By whom?
- (v) Fertilizer for fall planting of grains. If this recommendation is accepted by donors, the following questions must be answered: How to select the eligible farmers? How much of what kinds of fertilizer to give? How and from where should it be acquired and distributed? When? By whom?

- (vi) Small cash grants to machinery firms and tractor/equipment owners to undertake urgent repairs so that the maximum machinery pool is available in time for fall planting. If this recommendation is accepted by donors, the following questions must be answered: How much money should be given? How to select the beneficiaries? How should money be distributed? When? How to monitor use of money to ensure it is used to repair equipment and make ready for fall planting?
- (vii) Adopt a crop insurance program to protect farmers signing-up for the insurance program. This might be undertaken for the fall grain crop and require co-payment by the farmers participating in the program. The authors believe such a plan should be designed with assistance from foreign experts and should operate in the private sector with possibly GOM re-insurance in case of national-level disasters.

In the *long-term perspective*, the following issues are actual – formation of adapting system of agriculture, at both local and regional levels; restoration of irrigation systems, implementation of post-privatization program, including the formation of associations of farmers and cooperatives, creation of an effective infrastructure for technical, agri-chemical, transport services, water supplying; creation of an extension service/consulting centers for farmers, etc.

The combination of properly focused short-term drought assistance and long-term actions, will allow releasing the social tensions and in the future enhance the sustainability of the agricultural sector and food security of the country.

Annexes: Statistical measurement, analytical and forecast tables

I. Natural peculiarities

Table 1.1

Main characteristics of climate in the Republic of Moldova

Indices	Northern zone		Central zone		Southern zone	
	Sub-zone of Northern Moldova plateau	Sub-zone of Northern Moldova plain, up Nistru Hills	Sub-zone of Central Moldova plateau or Codrii (Forest)	Sub-zone Nistru, Prut, Bic, Raut, Botna and other rivers	Plain of Southern Moldova, Embankment of Prut and Nistru, Tigheci Hills	
Judet (Region)	Edinet	Balti, Soroca	Ungheni, Lapusna, Orhei and Chisinau		Thighina, Cahul, Taraclia, U.T.A.G.	
General characteristics	warm	warm	hot		hot	
Solar period, days	280-290	290-300	290-300	300-310	310-320	
Average annual temperature	.7-8	8 - 8.5	8.5 - 9	9 - 9.5	9.5 - 10	
Sum of temperature	> 5°	3100 - 3400		3400 - 3600		
	> 10°	2750-2850	2750-3050	3000-3150	3000-3250	3100-3350
Duration of period, days	for vegetation	66-167	167-176	178-182	177-182	179-187
	without frost	163-179	163-179	175-188	174-188	175-195

Table1.2

Radiation balance in the Republic of Moldova , among zones, kcal/cm2

Zone	Wineter	Spring	Summer	Autumn	Per year
Northern	0.6	16.2	23.4	6.8	47.1
Central	0.9	16.5	25.8	8.1	51.3
South	1.2	17.4	25.8	8.4	52.8

Source: "Ecological agriculture and production of fodder in the Republic of Moldova" Mihai Lupasco, Chisinau, 1998, p.26

Table 1.3

Dynamics of land plots exposed to land slides on agricultural areas, ha per year

Zone	1970	1975	1980	1985	1989	1995
North	6295	10330	12790	17688	20803	21033
Center	11229	23143	27113	40372	42218	43484
South	3577	5562	8327	13210	15120	15265
South-East	137	329	375	970	1123	1182
Total	21238	39364	43065	43065	79264	80964

Source: Pedo-erosional monitoring Bulletin , 1996

Table 1.4

Dynamics and structure of agricultural land plots exposed to erosion

Level of soil erosion	Years of periodical research							
	1965		1975		1995		1997	
	thous ha	%	thous ha	%	thous ha	%	thous ha	%
Total agricultural land	2521	100	2522	100	2556.7	100	2555.5	100
Erosive area	594.2	23.6	634.4	25.9	824.1	32.2	839.7	32
including eroded:								
-slight	302.4	12	341.9	13.6	485.3	19	490.5	19.2
-moderately	195.6	7.8	213	8.4	244.6	9.6	246.7	9.5
-significantly	96.2	3.8	99.5	3.9	94.2	3.7	102.5	4
Non-eroded area	1926.8	76.4	1867.6	74.1	1732.6	67.8	1715.8	67

Source: General land cadastre of the Republic of Moldova 1.01.1997, Volume 1, Chisinau

Table 1.5

Average indices of arable land slope.

Angle of land, degree	Land on the degree of angle, compared to the territory of the zone.				
	North	Center	South-East	South	Average for Moldova
<1°	10.8	18.9	48.9	23.2	20.2
1°-5°	72.1	50.4	44.4	56.7	60.6
5°-8°	13.4	22.6	5.7	15.6	14.8
>8°	3.7	8.1	1	4.5	4.4
Average values of angle:					
Land:					
arable	3°54'	4°00'	2°06'	3°36'	3°30'
total	4°30'	5°24'	3°54'	4°18'	4°12'

Source: Pedo-erosion monitoring Bulletin, 1996

Table 1.6

Annual soil and fruitfulness components caused by erosion

Pedo-climatic zones	Area under research, thous ha	Annula losses, thousand tones					production, nutritive units
		fertile soil	humus	ayot	phosphor	potassium	
1. Arable land							
Northern zone	652.4	3880	115	8	5	102	262.5
Central zone	289.9	9828	255	17	13	230	99.9
South-East Zone	103.6	741	21	2	1	17	35.6
Southern zone	248.9	7695	215	16	9	179	126.8
Total for the Republic	1394.8	22144	606	43	28	528	524.8
2. Orchards and vineyards							
Northern zone	84	893	12.3	0.9	0.6	9.1	(grape and fruits) 14.3
Central zone	127	1220	32.7	2.4	2.2	24.2	19
South-East Zone	25.6	251	7.2	0.5	0.5	4.7	3.7
Southern zone	113.9	1401	38.6	2.7	2.7	25.5	19.7
Total for the Republic	350.5	3765	90.8	6.5	6	63.5	56.7
3. Caused by ravines							
Northern zone	1.61	18.88	0.56	0.05	0.03	0.41	-
Central zone	1.96	25.88	0.74	0.05	0.05	0.48	-
South-East Zone	0.43	5.82	0.16	0.01	0.01	0.11	-
Southern zone	1.78	24.96	0.71	0.05	0.05	0.46	-
Total for the Republic	5.78	75.54	2.17	0.16	0.14	1.46	-

Note: Southern-Eastern zone is mostly included

Source: Pedo-erosion monitoring Bulletin, 1996

Table 1.7

Cadastral card of land fund on January 1, 2000 thousand hectares

Categories of plots	Total area	Agricultural land						Forest plantations	Marsh	Waters	Including lakes
		Total	Arable	Perennial plantations	out of which:		Pasture				
					Orchards	Vine-yard					
Total	3384.4	2550.3	1813.8	352.3	170.8	168.9	373.9	422.7	19.9	75.6	40
for agricultural use	2087.2	1987.2	1641.4	295.5	155.8	133.6	43.4	22.5	3	9.9	7.3
-public property	72.4	63.6	48.4	10.4	6.6	3.2	4.8	1.9	0.4	0.6	0.3
-private property	2014.8	1923.6	1593	285.1	149.2	130.4	38.6	20.6	2.6	9.3	7
including farms	576.4	568.8	460.3	103.6	52.3	50.3	1.6	0.6	0.2	0.1	0.1
within dwelling area	299.8	190.4	138.2	48.7	14.3	33.9	3.2	5.7	0.1	0.8	0.3
for industrial, transport and other special use	58.6	7.1	1.8	0.1	-	-	5	5.2	-	1.2	1.1
environment use	0.9	0.2	0.1	-	-	-	0.1	0.2	-	-	-
forestry fund	353.5	4.7	1.2	1.3	-	-	1.8	335.1	1	1.7	0.5
water fund	35.3	0.2	-	-	-	-	0.2	0.4	1.1	32.8	11.4
fund	548.1	360.6	31.1	5.7							

II. Main indicators of agricultural sector

Table 2.1

Crop production area in all categories of farms (thou ha)

	Crops	1995	1996	1997	1998	1999	Average for 1995-1999	2000
1	Grains and leguminous plants -total	827.2	819.7	950.9	937.4	935.7	894.2	926
	winter wheat	346.4	335.0	355.4	356.2	340.0	346.6	341
	winter barley	62.8	47.4	48.0	42.0	41.3	48.3	40
	spring barley	48.6	42.3	58.0	65.7	66.7	56.3	61
	maize	307.0	339.4	431.2	399.5	403.2	376.1	424
	leguminous plants	48.6	41.1	43.0	54.1	59.4	49.2	60
2	Industrial crops - total	255.0	300.0	269.6	309.1	313.4	289.4	305
	sugar beet	82.2	77.0	70.7	71.5	61.1	72.5	65
	sunflower	142.9	198.4	174.3	204.3	216.7	187.3	201
	soy-bean	3.3	2.3	2.3	6.3	17.0	6.2	17
	tobacco	20.0	16.3	17.2	21.8	18.6	18.8	22
3	Vegetables, melons and gourds - total	125.7	119.3	124.4	117.8	123.6	122.2	115
	potatoes	56.2	59.1	61.9	61.9	66.5	61.1	66
	vegetables	59.3	51.4	53.6	49.0	47.8	52.2	49
4	Fodder crops	321.7	290.7	190.9	162.6	157.8	224.7	184
	Total sown area	1529.6	1529.7	1535.8	1526.9	1530.5	1530.5	1530
5	Fruits (in mature plantation)	144.7	147.7	150.3	147.5	142.0	146.4	140
6	Grapes (in mature plantation)	173.2	169.7	165.3	158.7	148.0	163.0	140
	Total perennial plant area	317.9	317.4	315.6	306.2	290.0	309.4	280.0
	Total used area for agriculture	1847.5	1847.1	1851.4	1833.1	1820.5	1839.9	1810.0

Source: Agriculture of Republic of Moldova. Department of Statistics, 1999.

Table 2.2

Output of main agricultural products in all categories of farms (thou tons)

	Crops	1995	1996	1997	1998	1999	Average for 1995-1999	Planned for 2000	Expected in 2000-optimist.	Expected in 2000-pesimist.
1	Winter wheat	1126.4	673.4	1152.6	951	797.8	940.2	980.8	691.2	691.2
2	Barley	337.6	117.7	233.4	215.6	182.6	119.5	226.8	143.4	143.4
3	Maize	908.2	988.6	1717	1239	1140.3	1198.6	1231.2	780.6	636.0
4	Leguminous plants	50	29	58.2	71.2	58	53.3	79.2	38.1	38.1
5	Sugar beet	1916	1807.1	1748.5	1451.9	1008.8	1586.5	1257.4	1061.8	825.5
6	Sunflower	203.4	276.7	175.3	199.4	285.6	228.1	291.9	233.2	201.0
7	Soy-bean	2.9	2.4	2.7	5.9	13.7	5.5	21.5	18.7	18.7
8	Tobacco	27	19.3	23.6	24.5	22.4	23.4	33.0	26.4	22.0
9	Potatoes	383	343.4	391.2	371.9	329.5	363.8	490.1	391.7	330.0
10	Vegetables	486	319.1	354.8	500.9	488.8	429.9	436.9	384.0	328.3
11	Fruits and berries	528.2	521.3	946.6	367.2	136.3	590.8	458.3	216.8	203.0
12	Grapes	852.2	767.3	300.8	342.7	464.9	545.6	467.7	456.7	406.0

Source: Agriculture of Republic of Moldova. Department of Statistics, 1999.

Table 2.3
Yield of main agricultural crops of all categories of farms, centner/ha

	Crops	Average for 1971-1980	Average for 1981-1990	Average for 1991-1999	Planned for 2000	Expected in 2000- optimist.	Expected in 2000- pessimist.
1	Winter wheat	32.8	34.4	29.4	28.8	20.3	20.3
2	Barley	37.4	30.5	25.1	22.5	14.2	14.2
3	Maize	35.7	37.7	32.2	29.0	18.4	15.0
4	Leguminous plants	15.6	16.5	12.3	13.2	6.3	6.3
5	Sugar beet	278	267	228	193.5	163.4	127.0
6	Sunflower	17.1	18.8	12.8	14.5	11.6	10.0
7	Soy-bean	8.8	10.7	9.6	12.6	11.0	11.0
8	Tobacco	13.9	17	14.2	15.0	12.0	10.0
9	Potatoes	83	87	66	74.3	59.3	50.0
10	Vegetables	145	157	77	89.2	78.4	67.0
11	Fruits and berries	66.9	73	38	32.7	15.5	14.5
12	Grapes	61.3	64	39.2	33.4	32.6	29.0

Source: Agriculture of Republic of Moldova. Department of Statistics, 1999..

Table 2.4
Yield of the main agricultural crops of all categories of farms

	Crops	1995	1996	1997	1998	1999	Planned for 2000	Expected in 2000-optimist.	Expected in 2000-pesimist.
1	Winter wheat	32.5	20.1	32.4	26.7	23.5	28.8	20.3	20.3
2	Barley	25.8	13.1	22.0	20.0	16.9	22.5	14.2	14.2
3	Maize	29.4	29.1	39.7	31.0	28.3	29.0	18.4	15.0
4	Leguminous plants	10.3	7.0	13.1	12.8	9.5	13.2	6.3	6.3
5	Sugar beet	233.0	228.0	247.0	203.0	165.1	193.5	163.4	127.0
6	Sunflower	14.2	14.0	10.1	9.8	13.2	14.5	11.6	10.0
7	Soy-bean	8.6	10.3	11.8	9.4	8.1	12.6	11.0	11.0
8	Tobacco	13.5	11.9	13.8	11.2	12.0	15.0	12.0	10.0
9	Potatoes	68.0	58.0	63.0	60.0	49.6	74.3	59.3	50.0
10	Vegetables	77.0	58.0	60.0	92.0	94.8	89.2	78.4	67.0
11	Fruits and berries	36.5	35.3	63.0	24.9	9.6	32.7	15.5	14.5
12	Grapes	49.2	45.2	18.2	21.6	31.4	33.4	32.6	29.0

Source: Agriculture of Republic of Moldova. Department of Statistics, 1999.

III. Assessment made by surveyed agricultural enterprises

Table 3.1
Structure of the sown areas by judeteses,

	Edinet SorocaBalti Ungheeni Orhei Chisina Lapusn TighinaCahulTaracli Gaguzi											Moldova total
A	1	2	3	4	5	6	7	8	9	10	11	12
B												
1 Winter wheat	36.3	38.5	42.1	12.4	36	32.8	40.4	33.3	30.5	11	27.7	341
2 Barley	26.3	3.5	12.4	2.7	6.1	4.3	9.2	9.6	17.8	3.1	6	101
3 Maize	23.3	37.7	78.9	38.3	63.7	23.6	45.7	43.3	44.4	6.3	18.9	424.1
4 Leguminous	1.5	2.7	7.2	0.3	1.6	1.7	3.3	18.7	10	4	9	60
5 Sugar beet	12.6	17.1	25.9	2.5	5.3	0.5		0.5	0.6			65
6 Sunflower	19.7	22.3	24.5	9.7	24.6	18.2	19.4	26.5	20.1	4.2	11.8	201
7 Soy-bean	6	2.4	4.6	0.6	0.8	0.5		0.6	0.9		0.6	17
8 Tobacco	1.3	2.8	4.8	1.1	5	1.6	1	1	0.6	0.6	2.2	22
9 Potatoes	15.4	5.5	11	5.5	14.3	3.3	3.3	6.6	1.1			66
10 Vegetables	6.8	6.6	8.8	2.7	3.6	10.8	2.2	1.6	3.7	0.4	1.8	49
11 Fodder crops	18.7	10.9	30.8	2.3	10.8	20.9	49.9	6	11.4	7.7	14.6	184
Total	167.8	150	251	78.1	171.8	118.2	174.4	147.7	141.1	37.3	92.6	1530

Table 3.2

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Edineț** judets, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield (ton/ha)	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %	
		Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000						
A	B	1	2	3	4	5	6	7	8	9	10	11	12
1	Winter wheat	6.8	2.80	2.15	-0.65	36.3	101.6	78.0	-23.6	1000	101.6	-23.60	-23.2%
2	Barley	1.4	2.20	1.78	-0.42	26.3	57.9	46.8	-11.0	870	50.3	-9.61	-19.1%
3	Maize	1.9	3.00	2.98	-0.02	23.2	69.6	69.1	-0.5	900	62.6	-0.42	-0.7%
4	Leguminous plants	0.2	1.20	0.93	-0.27	1.5	1.8	1.4	-0.4	1800	3.2	-0.73	-22.5%
5	Sugar beets	2.2	20.00	18.00	-2.00	12.6	252.0	226.8	-25.2	275	69.3	-6.93	-10.0%
6	Sunflower	3.3	1.40	1.27	-0.13	19.7	27.6	25.0	-2.6	1700	46.9	-4.35	-9.3%
7	Soybeans	0.8	1.20	1.12	-0.08	6.0	7.2	6.7	-0.5	1800	13.0	-0.86	-6.7%
8	Tobacco	0.2	1.50	1.40	-0.10	1.3	2.0	1.8	-0.1	10000	19.5	-1.30	-6.7%
9	Potatoes	0.02	12.00	11.60	-0.40	15.4	184.8	178.6	-6.2	3000	554.4	-18.48	-3.3%
10	Vegetables	0.3	12.00	11.50	-0.50	6.8	81.6	78.2	-3.4	1700	138.7	-5.78	-4.2%
11	Fruits	1.7	2.00	2.80	0.80	10.0	20.0	28.0	8.0	1800	36.0	14.40	40.0%
12	Grapes	0.3	2.20	1.20	-1.00	1.0	2.2	1.2	-1.0	1800	4.0	-1.80	-45.5%
<i>Total annual plants</i>		17.12				149.10					1059.62	-72.06	-6.8%
<i>Total perennial plants</i>		2.00				11.00					39.96	12.60	31.5%
Total crops		19.12				160.10					1099.58	-59.46	-5.4%

Table 3.3

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Soroca** judets, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield (ton/ha)	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mil MDL)	Share of shortage in plan, %
		Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000					
A	1	2	3	4	5	6	7	8	9	10	11	12
1 Winter wheat	9.6	3.00	2.14	-0.86	38.5	115.5	82.4	-33.1	1000	115.5	-33.11	-28.7%
2 Barley	1.5	2.10	1.65	-0.45	3.5	7.4	5.8	-1.6	870	6.4	-1.37	-21.4%
3 Maize	1.9	3.30	3.16	-0.14	37.7	124.4	119.1	-5.3	900	112.0	-4.75	-4.2%
4 Leguminous plants	0.2	2.00	1.70	-0.30	2.7	5.4	4.6	-0.8	1800	9.7	-1.46	-15.0%
5 Sugar beets	2.2	20.50	16.50	-4.00	17.1	350.6	282.2	-68.4	275	96.4	-18.81	-19.5%
6 Sunflower	3.3	1.60	1.42	-0.18	22.3	35.7	31.7	-4.0	1700	60.7	-6.82	-11.3%
7 Soybeans	0.8	1.30	1.15	-0.15	2.4	3.1	2.8	-0.4	1800	5.6	-0.65	-11.5%
8 Tobacco	0.2	1.70	1.56	-0.14	2.8	4.8	4.4	-0.4	10000	47.6	-3.92	-8.2%
9 Potatoes	0.3	12.00	11.60	-0.40	5.5	7.4	6.9	-0.6	3000	22.3	-1.65	-7.4%
10 Vegetables	1.7	4.00	1.20	-2.80	6.6	26.4	7.9	-18.5	1700	44.9	-31.42	-70.0%
11 Fruits	1.7	4.00	1.20	-0.70	15.6	39.0	28.1	-10.9	1800	70.2	-19.66	-28.0%
12 Grapes		2.50	1.80	-0.70	0.3	0.8	0.5	-0.2	1800	1.4	-0.38	-28.0%
<i>Total annual plants</i>	20.00				139.10					521.01	-103.96	-20.0%
<i>Total perennial plants</i>	1.70				15.90					71.55	-20.03	-28.0%
Total crops	21.70				155.00					592.56	-123.99	-20.9%

Table 3.4

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Bălți** judets, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield (ton/ha)	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %
		Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000					
A	1	2	3	4	5	6	7	8	9	10	11	12
1 Winter wheat	5.5	2.95	2.21	-0.74	42.1	124.2	93.0	-31.2	1000	124.2	-31.15	-25.1%
2 Barley	0.7	2.20	1.54	-0.66	12.4	27.3	19.1	-8.2	870	23.7	-7.12	-30.0%
3 Maize	2	3.30	3.00	-0.30	78.9	260.4	236.7	-23.7	900	234.3	-21.30	-9.1%
4 Leguminous plants	0.2	1.50	1.30	-0.20	7.2	10.8	9.4	-1.4	1800	19.4	-2.59	-13.3%
5 Sugar beets	2.7	21.00	20.30	-0.70	25.9	543.9	525.8	-18.1	275	149.6	-4.99	-3.3%
6 Sunflower	2.4	1.60	1.45	-0.15	24.5	39.2	35.5	-3.7	1700	66.6	-6.25	-9.4%
7 Soybeans	0.4	1.50	1.30	-0.20	4.6	6.9	6.0	-0.9	1800	12.4	-1.66	-13.3%
8 Tobacco	0.5	2.00	2.00	0.00	4.8	9.6	9.6	0.0	10000	96.0	0.00	0.0%
9 Potatoes	0.2	12.00	11.60	-0.40	11.0	132.0	127.6	-4.4	3000	396.0	-13.20	-3.3%
10 Vegetables	1.5	4.00	3.20	-0.80	8.8	79.2	76.6	-2.6	1700	134.6	-4.49	-3.3%
11 Fruits	0.11	2.50	2.20	-0.30	16.1	64.4	51.5	-12.9	1800	115.9	-23.18	-20.0%
12 Grapes	0.11	2.50	2.20	-0.30	4.4	11.0	9.7	-1.3	1800	19.8	-2.38	-12.0%
<i>Total annual plants</i>	14.60				220.20					1256.97	-92.75	-7.4%
<i>Total perennial plants</i>	1.61				20.50					135.72	-25.56	-18.8%
Total crops	16.21				240.70					1392.69	-118.31	-8.5%

Table 3.5

Assessment of agricultural output losses due to 2000 drought registered by the farms of *Ungheni* judets, according to extraordinary study, as on 1.07.2000

	Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield in thou ha	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %
			Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000					
A	B	1	2	3	4	5	6	7	8	9	10	11	12
1	Winter wheat	1.8	3.00	1.98	-1.02	12.4	37.2	24.6	-12.6	1000	37.2	-12.65	-34.0%
2	Barley	0.3	1.50	1.22	-0.28	2.7	4.1	3.3	-0.8	870	3.5	-0.66	-18.7%
3	Maize	0.8	3.00	1.83	-1.17	38.3	114.9	70.1	-44.8	900	103.4	-40.33	-39.0%
4	Leguminous plants	0.05	2.00	1.98	-0.02	0.3	0.6	0.6	0.0	1800	1.1	-0.01	-1.0%
5	Sugar beets	0.44	22.00	21.40	-0.60	2.5	55.0	53.5	-1.5	275	15.1	-0.41	-2.7%
6	Sunflower	1	1.50	1.01	-0.49	9.7	14.6	9.8	-4.8	1700	24.7	-8.08	-32.7%
7	Soybeans	0.07	1.30	0.90	-0.40	0.6	0.8	0.5	-0.2	1800	1.4	-0.43	-30.8%
8	Tobacco	0.11	1.40	1.30	-0.10	1.1	1.5	1.4	-0.1	10000	15.4	-1.10	-7.1%
9	Potatoes	0.12	12.00	11.60	-0.40	5.5	66.0	63.8	-2.2	3000	198.0	-6.60	-3.3%
10	Vegetables	0.4	11.00	10.40	-0.60	2.7	29.7	28.1	-1.6	1700	50.5	-2.75	-5.5%
11	Fruits	0.4	6.00	4.40	-1.60	11.0	66.0	48.4	-17.6	1800	118.8	-31.68	-26.7%
12	Grapes	0.4	5.00	4.80	-0.20	12.0	60.0	57.6	-2.4	1800	108.0	-4.32	-4.0%
	<i>Total annual plants</i>	4.69				75.80					450.37	-73.03	-16.2%
	<i>Total perennial plants</i>	0.80				23.00					226.80	-36.00	-15.9%
	Total crops	5.49				98.80					677.17	-109.03	-16.1%

Table 3.6

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Orhei** judets, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield (ton/ha)	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %	
		Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000						
A	B	1	2	3	4	5	6	7	8	9	10	11	12
1	Winter wheat	10.1	2.50	1.68	-0.82	36.0	90.0	60.5	-29.5	1000	90.0	-29.52	-32.8%
2	Barley	1.4	1.50	0.99	-0.51	6.1	9.2	6.0	-3.1	870	8.0	-2.71	-34.0%
3	Maize	3.6	2.80	1.89	-0.91	63.7	178.4	120.4	-58.0	900	160.5	-52.17	-32.5%
4	Leguminous plants	0.4	1.00	0.55	-0.45	1.6	1.6	0.9	-0.7	1800	2.9	-1.30	-45.0%
5	Sugar beets	1.6	16.00	8.90	-7.10	5.3	84.8	47.2	-37.6	275	23.3	-10.35	-44.4%
6	Sunflower	5	1.40	1.03	-0.37	24.6	34.4	25.3	-9.1	1700	58.5	-15.47	-26.4%
7	Soybeans	0.4	1.20	1.04	-0.16	0.8	1.0	0.8	-0.1	1800	1.7	-0.23	-13.3%
8	Tobacco	1.1	1.40	1.04	-0.36	5.0	7.0	5.2	-1.8	10000	70.0	-18.00	-25.7%
9	Potatoes	0.04	6.00	4.70	-1.30	14.3	85.8	67.2	-18.6	3000	257.4	-55.77	-21.7%
10	Vegetables	0.4	8.00	6.60	-1.40	3.6	28.8	23.8	-5.0	1700	49.0	-8.57	-17.5%
11	Fruits	2.4	3.50	1.00	-2.50	13.7	48.0	13.7	-34.3	1800	86.3	-61.65	-71.4%
12	Grapes	0.7	3.00	2.50	-0.50	7.5	22.5	18.8	-3.8	1800	40.5	-6.75	-16.7%
<i>Total annual plants</i>		24.04				161.00					721.32	-194.08	-26.9%
<i>Total perennial plants</i>		3.10				21.20					126.81	-68.40	-53.9%
Total crops		27.14				182.20					848.13	-262.48	-30.9%

Table 3.7

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Chişinău** judets, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield (ton/ha)	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mil MDL)	Share of shortage in plan, %
		Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000					
A	1	2	3	4	5	6	7	8	9	10	11	12
1 Winter wheat	7.4	3.10	2.38	-0.72	32.8	101.7	78.1	-23.6	1000	101.7	-23.62	-23.2%
2 Barley	1.6	2.50	1.23	-1.27	4.3	10.8	5.3	-5.5	870	9.4	-4.75	-50.8%
3 Maize	3.7	3.00	2.54	-0.46	23.6	70.8	59.9	-10.9	900	63.7	-9.77	-15.3%
4 Leguminous plants	0.36	1.50	1.12	-0.38	1.7	2.6	1.9	-0.6	1800	4.6	-1.16	-25.3%
5 Sugar beets	0.1	16.50	14.20	-2.30	0.5	8.3	7.1	-1.2	275	2.3	-0.32	-13.9%
6 Sunflower	3.8	1.50	1.38	-0.12	18.2	27.3	25.1	-2.2	1700	46.4	-3.71	-8.0%
7 Soybeans	0.11	1.00	0.75	-0.25	0.5	0.5	0.4	-0.1	1800	0.9	-0.23	-25.0%
8 Tobacco	1.6	1.60	1.40	-0.20	1.6	2.6	2.2	-0.3	10000	25.6	-3.20	-12.5%
9 Potatoes	0.05	16.00	15.10	-0.90	3.3	52.8	49.8	-3.0	3000	158.4	-8.91	-5.6%
10 Vegetables	0.4	15.00	13.00	-2.00	10.8	162.0	140.4	-21.6	1700	275.4	-36.72	-13.3%
11 Fruits	2.3	2.00	0.85	-1.15	18.0	36.0	15.3	-20.7	1800	64.8	-37.26	-57.5%
12 Grapes	2	2.00	1.00	-1.00	19.1	38.2	19.1	-19.1	1800	68.8	-34.38	-50.0%
<i>Total annual plants</i>	19.12				97.30					688.32	-92.38	-13.4%
<i>Total perennial plants</i>	4.30				37.10					133.56	-71.64	-53.6%
Total crops	23.42				134.40					821.88	-164.02	-20.0%

Table 3.8

Assessment of agricultural output losses due to 2000 drought registered by the farms of *Lăpușna* judets, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield in (ton/ha)	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %
		Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000					
A	1	2	3	4	5	6	7	8	9	10	11	12
1 Winter wheat	11.4	2.80	1.57	-1.2	40.4	113.1	63.4	-49.7	1000	113.1	-49.69	-43.9%
2 Barley	1.5	1.90	1.28	-0.6	9.2	17.5	11.8	-5.7	870	15.2	-4.96	-32.6%
3 Maize	3.8	2.50	1.07	-1.4	45.7	114.3	48.9	-65.4	900	102.8	-58.82	-57.2%
4 Leguminous plants	0.4	1.05	0.54	-0.5	3.3	3.5	1.8	-1.7	1800	6.2	-3.03	-48.6%
5 Sugar beets	0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	275	0.0	0.00	
6 Sunflower	6.3	1.40	0.79	-0.6	19.4	27.2	15.3	-11.8	1700	46.2	-20.12	-43.6%
7 Soybeans	0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	1800	0.0	0.00	
8 Tobacco	0.3	1.55	1.39	-0.2	1.0	1.6	1.4	-0.2	10000	15.5	-1.60	-10.3%
9 Potatoes	0.5	6.50	4.89	-1.6	3.3	21.5	16.1	-5.3	3000	64.4	-15.94	-24.8%
10 Vegetables	0.3	6.00	5.50	-0.5	2.2	13.2	12.1	-1.1	1700	22.4	-1.87	-8.3%
11 Fruits	4.8	3.50	2.00	-1.5	11.0	38.5	22.0	-16.5	1800	69.3	-29.70	-42.9%
12 Grapes	0.3	3.50	3.60	0.1	24.5	85.8	88.2	2.5	1800	154.4	4.41	2.9%
<i>Total annual plants</i>	24.50				124.50					385.85	-156.03	-40.4%
<i>Total perennial plants</i>	5.10				35.50					223.65	-25.29	-11.3%
Total crops	29.60				160.00					609.50	-181.32	-29.7%

Table 3.9

Assessment of agricultural output losses due to 2000 drought registered by the farms of *Tighina* judets, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield in (ton/ha)	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %	
		Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000						
A	B	1	2	3	4	5	6	7	8	9	10	11	12
1	Winter wheat	9.5	3.00	2.54	-0.46	33.3	99.9	84.6	-15.3	1000	99.9	-15.32	-15.3%
2	Barley	2.5	2.80	1.66	-1.14	9.6	26.9	15.9	-10.9	870	23.4	-9.52	-40.7%
3	Maize	5.6	3.00	1.68	-1.32	43.3	129.9	72.7	-57.2	900	116.9	-51.44	-44.0%
4	Leguminous plants	0.2	1.30	1.01	-0.29	18.7	24.3	18.9	-5.4	1800	43.8	-9.76	-22.3%
5	Sugar beets	0.15	1.50	1.08	-0.42	0.5	0.8	0.5	-0.2	275	0.2	-0.06	-28.0%
6	Sunflower	7	1.50	1.39	-0.11	26.5	39.8	36.8	-2.9	1700	67.6	-4.96	-7.3%
7	Soybeans	0.06	1.30	1.20	-0.10	0.6	0.8	0.7	-0.1	1800	1.4	-0.11	-7.7%
8	Tobacco	0.5	1.50	1.20	-0.30	1.0	1.5	1.2	-0.3	10000	15.0	-3.00	-20.0%
9	Potatoes	0.5	6.50	4.89	-1.61	6.6	42.9	32.3	-10.6	3000	128.7	-31.88	-24.8%
10	Vegetables	0.5	10.20	8.80	-1.40	1.6	16.3	14.1	-2.2	1700	27.7	-3.81	-13.7%
11	Fruits	1.8	4.00	1.00	-3.00	8.4	33.6	8.4	-25.2	1800	60.5	-45.36	-75.0%
12	Grapes	2.1	3.00	3.00	0.00	10.4	31.2	31.2	0.0	1800	56.2	0.00	0.0%
<i>Total annual plants</i>		26.01				141.70					524.58	-129.85	-24.8%
<i>Total perennial plants</i>		3.90				18.80					116.64	-45.36	-38.9%
Total crops		29.91				160.50					641.22	-175.21	-27.3%

Table 3.10

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Cahul** judets, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield (ton/ha)	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %	
		Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000						
A	B	1	2	3	4	5	6	7	8	9	10	11	12
1	Winter wheat	8.7	2.70	1.81	-0.89	30.5	82.4	55.2	-27.1	1000	82.4	-27.15	-33.0%
2	Barley	1.5	2.00	1.25	-0.75	17.8	35.6	22.3	-13.4	870	31.0	-11.61	-37.5%
3	Maize	5.6	3.00	1.59	-1.41	44.4	133.2	70.6	-62.6	900	119.9	-56.34	-47.0%
4	Leguminous plants	1.3	1.00	0.53	-0.47	10.0	10.0	5.3	-4.7	1800	18.0	-8.46	-47.0%
5	Sugar beets	0.3	15.00	7.80	-7.20	0.6	9.0	4.7	-4.3	275	2.5	-1.19	-48.0%
6	Sunflower	4.9	1.40	1.02	-0.38	20.1	28.1	20.5	-7.6	1700	47.8	-12.98	-27.1%
7	Soybeans	0.1	1.00	0.38	-0.62	0.9	0.9	0.3	-0.6	1800	1.6	-1.00	-62.0%
8	Tobacco	0.12	1.00	0.50	-0.50	0.6	0.6	0.3	-0.3	10000	6.0	-3.00	-50.0%
9	Potatoes		6.50	4.89	-1.61	1.1	7.2	5.4	-1.8	3000	21.5	-5.31	-24.8%
10	Vegetables	0.2	6.00	4.20	-1.80	3.7	22.2	15.5	-6.7	1700	37.7	-11.32	-30.0%
11	Fruits	2.2	3.00	0.60	-2.40	6.8	20.4	4.1	-16.3	1800	36.7	-29.38	-80.0%
12	Grapes	4.1	3.50	3.90	0.40	19.6	68.6	76.4	7.8	1800	123.5	14.11	11.4%
	<i>Total annual plants</i>	22.72				129.70					368.33	-138.38	-37.6%
	<i>Total perennial plants</i>	6.30				26.40					160.20	-15.26	-9.5%
	Total crops	29.02				156.10					528.53	-153.64	-29.1%

Table 3.11

Assessment of agricultural output losses due to 2000 drought registered by the farms of *Taraclia* judets, according to extraordinary study, as on 1.07.2000

Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield (ton/ha)	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %	
		Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000						
A	B	1	2	3	4	5	6	7	8	9	10	11	12
1	Winter wheat	3.8	3.00	2.12	-0.88	11.0	33.0	23.3	-9.7	1000	33.0	-9.68	-29.3%
2	Barley	0.7	2.50	1.56	-0.94	3.1	7.8	4.8	-2.9	870	6.7	-2.54	-37.6%
3	Maize	2	3.00	1.06	-1.94	6.3	18.9	6.7	-12.2	900	17.0	-11.00	-64.7%
4	Leguminous plants	0.9	1.05	0.52	-0.53	4.0	4.2	2.1	-2.1	1800	7.6	-3.82	-50.5%
5	Sugar beets				0.00		0.0	0.0	0.0	275	0.0	0.00	
6	Sunflower	1.6	1.20	0.78	-0.42	4.2	5.0	3.3	-1.8	1700	8.6	-3.00	-35.0%
7	Soybeans				0.00		0.0	0.0	0.0	1800	0.0	0.00	
8	Tobacco	0.2	1.05	0.76	0.00	0.6	0.6	0.5	-0.2	10000	6.3	-1.74	-27.6%
9	Potatoes				0.00		0.0	0.0	0.0	3000	0.0	0.00	
10	Vegetables		6.00	4.20	-1.80	0.4	2.4	1.7	-0.7	1700	4.1	-1.22	-30.0%
11	Fruits	0.4	3.00	1.00	-2.00	1.4	4.2	1.4	-2.8	1800	7.6	-5.04	-66.7%
12	Grapes	1.9	4.20	4.01	-0.19	5.1	21.4	20.5	-1.0	1800	38.6	-1.74	-4.5%
	<i>Total annual plants</i>	9.20				29.60					83.26	-32.99	-39.6%
	<i>Total perennial plants</i>	2.30				6.50					46.12	-6.78	-14.7%
	Total crops	11.50				36.10					129.38	-39.78	-30.7%

Table 3.12

Assessment of agricultural output losses due to 2000 drought registered by the farms of **Găgăuzia** judets, according to extraordinary study, as on 1.07.2000

	Crops	Surveyed area, thou ha	Yield (ton per ha)		Shortage in yield in judet, thou ha	Total area in judet, thou ha	Total harvest in judet (thou t.)		Shortage in harvest (thou t.)	Average market price for 2000 (MDL/ton)	Planned for 2000 mil. MDL	Shortage in income (mln MDL)	Share of shortage in plan, %
			Planned for 2000	Expected in 2000			Planned for 2000	Expected in 2000					
A	B	1	2	3	4	5	6	7	8	9	10	11	12
1	Winter wheat	12.9	3.00	2.02	-0.98	27.7	83.1	56.0	-27.1	1000	83.1	-27.15	-32.7%
2	Barley	1.4	2.60	1.28	-1.32	6.0	15.6	7.7	-7.9	870	13.6	-6.89	-50.8%
3	Maize	6	2.65	1.35	-1.30	18.9	50.1	25.5	-24.6	900	45.1	-22.11	-49.1%
4	Leguminous plants	3.6	1.50	0.52	-0.98	9.0	13.5	4.7	-8.8	1800	24.3	-15.88	-65.3%
5	Sugar beets				0.00		0.0	0.0	0.0	275	0.0	0.00	
6	Sunflower	0.53	1.50	1.29	-0.21	11.8	17.7	15.2	-2.5	1700	30.1	-4.21	-14.0%
7	Soybeans		1.00	0.38	-0.62	0.6	0.6	0.2	-0.4	1800	1.1	-0.67	-62.0%
8	Tobacco	1	1.30	0.65	-0.65	2.2	2.9	1.4	-1.4	10000	28.6	-14.30	-50.0%
9	Potatoes				0.00		0.0	0.0	0.0	3000	0.0	0.00	
10	Vegetables	0.06	6.00	4.02	-1.98	1.8	10.8	7.2	-3.6	1700	18.4	-6.06	-33.0%
11	Fruits	2	3.00	1.00	-2.00	5.0	15.0	5.0	-10.0	1800	27.0	-18.00	-66.7%
12	Grapes	6.7	3.50	3.50	0.00	15.0	52.5	52.5	0.0	1800	94.5	0.00	0.0%
	<i>Total annual plants</i>	25.49				78.00					244.18	-97.27	-39.8%
	<i>Total perennial plants</i>	8.70				20.00					121.50	-18.00	-14.8%
	Total crops	34.19				98.00					365.68	-115.27	-31.5%