Food and Agriculture Organization of the United Nations

SPECIAL REPORT

FAO CROP AND FOOD SUPPLY ASSESSMENT MISSION (CFSAM) TO THE REPUBLIC OF MOLDOVA

22 November 2022

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ABBREVIATIONS AND ACRONYMS

AIPA	Agency for Interventions and Payments in Agriculture
ASF	African swine fever
CFSAM	Crop and Food Supply Assessment Mission
CIAT	International Centre for Tropical Agriculture
CGIAR	Grantmakers Concerned with Immigrants and Refugees
COVID-19	coronavirus disease 2019
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	gross domestic product
GIEWS	Global Information and Early Warning System on Food and Agriculture
HTC	hydrothermal coefficient
IFAD	International Fund for Agricultural Development
kg	kilogrammes
MARDE	Ministry of Agriculture, Regional Development and Environment
ME	Ministry of Economy
MIRD	Ministry of Infrastructure and Rural Development
MLD	Moldovan leu
NBM	National Bank of Moldova
NBS	National Bureau of Statistics of the Republic of Moldova
NFSA	National Food Safety Agency
SCPESD	State Civil Protection and Exceptional Situations Department
SHS	State Hydrometeorology Service
UNCCD	United Nations Convention to Combat Desertification
UNHCR	United Nations High Commissioner for Refugees
USD	United States dollar
WB	World Bank
WFP	World Food Programme

HIGHLIGHTS

➤ Moldovan agriculture was affected by multiple shocks in 2021–2022, namely a very severe drought, record high fertilizer prices and agriculture credit interest rates, high diesel prices and a loss of access to markets in the Russian Federation, Belarus and Ukraine.

➤ Based on the national State Hydrometeorology Service's (SHS) drought definition, the 2022 summer drought is categorized as strong to very strong with catastrophic consequences. Small farmers and household backyard producers have been the most affected.

➤ The 2022 cereal production is forecast at 1.76 million tonnes, over 45 percent below the past five year average. Maize production is estimated to be the most affected, about 60 percent below the average, while wheat production is down by about 24 percent.

➤ Production of oil crops is estimated to drop to 644 200 tonnes, with sunflower being the most affected, about 26 percent below the past five-year average. Production of pulses is estimated at 53 600 tonnes, about 45 percent below average.

➤ In the most drought-affected areas, animal fodder is likely to be insufficient to adequately feed livestock until the spring of 2023 and destocking is anticipated this winter. In 2022, the population of cattle, pigs, sheep and goats is expected to decline between 7 and 11 percent compared to 2021.

➤ Prices of agricultural inputs (mainly fertilizers and diesel) surged since mid-2021. However, farm gate prices increased comparatively less, due to export difficulties following the start of the war in Ukraine and consequent disruptions of trade with the Russian Federation, Ukraine and Belarus. This has significantly affected farmers' crop gross margins. By contrast, retail food prices sharply

increased in 2022 compared to a year before, reflecting rising transportation and energy costs.

➤ Concerns exist for the forthcoming 2022/23 cropping season. Persisting moisture deficits in lower soil layers throughout the country may adversely impact the sector's performance. The prices and availability of fertilizers and phytosanitary products remain a challenge, while bank credit interest rates are expected to remain at very high levels next year.

➤ With an estimated domestic utilization of 2.1 million tonnes of cereals and potatoes (in cereal equivalent), the anticipated commercial exports are estimated at 95 000 tonnes of maize, 290 000 tonnes of wheat and 30 000 tonnes of barley, mostly drawing from last year's bumper harvest stocks. These volumes are substantially below the past five-year averages.

➤ To compensate the losses in local production quality (wheat for bread preparation) and quantity (barley and potatoes), commercial imports are anticipated at 55 000 tonnes of maize, 50 000 tonnes of wheat, 3 000 tonnes of barley and 25 000 tonnes of potatoes (in cereal equivalent). The mission does not forecast

any uncovered food deficits for the marketing year 2022/23.

➢ In the short-term, the mission recommends providing urgent support with targeted subsidies to the agriculture sector at least until the next harvest in 2023. In the mid-term, the mission recommends implementing measures to strengthen agriculture resilience to climate risks.

At the request of the government, an FAO Crop and Food Supply Assessment Mission (CFSAM)[i] visited the country from 10 to 28 October 2022 to estimate the 2022 crop production and forecast the country's import requirements during the 2022/23 marketing year (July/June). The mission's aim was to provide an accurate picture of the severity and extent of the drought and high agriculture input prices that affected the agriculture sector in 2022 and to identify the support requirements to the sector until the next harvest in 2023 as well as the medium-term needs to strengthen agriculture resilience.

The mission held extensive discussions with staff of various relevant government institutions, in particular the Ministry of Agriculture and Food Industry (MAFI), the National Bureau of Statistics (NBS), the State Hydrometeorology Service (SHS), the Ministry of Economy (ME), the National Food Safety Agency (NFSA), the Agency for Interventions and Payments in Agriculture (AIPA), the National Agency for Rural Development (ACSA) as well as with some farmers' federations and associations (National Federation of Moldovan Farmers, Federation of Agricultures from the Republic of Moldova-FARM, Association of Fruit Producers and Exporters), traders and agriculture input importers, farm machineries and equipment enterprises, agriculture insurance companies and representatives of commodity producers' groups at the joint "Moldagrotech" and Farmer's agriculture exhibition in Chisinau. In addition, the mission held extensive consultations with staff of the European Union (EU) and the United Nations High Commissioner for Refugees (UNHCR).

Organized in two teams, the mission visited 24 *rayons* (districts) and one region with special status (Gagauzia).[1] The *rayons* were selected to cover most,

as well as least, drought-affected areas in the three agroclimatic regions of the country. At *rayon* level, the mission held meetings with the District Councils' presidents and/or vice-presidents, the Agriculture and Food Industry directorates' teams, the Statistic Bureaus' teams, selected communes' presidents and cadastral engineers, traders and inputs suppliers. The mission visited large, medium and small crop, and livestock farmers and agriculture enterprises as well as household backyard producers. Field observations and crop cuttings were conducted on fields along transect roads at *subrayon* level. The mission also visited local wholesale and retail markets.

Local agriculture was affected by multiple shocks in 2021/22, namely a very severe drought, record high fertilizer prices and agriculture credit interest rates, high diesel prices and the loss of access to markets in the Russian Federation, Belarus and Ukraine (Figure 1). Based on the SHS drought classification, the 2022 summer drought is categorized as strong to very strong with catastrophic consequences. The mission observed that all *rayons* in the country have been

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[1] Team 1: Anenii Noi, Nisporeni, Orhei, Telenesti (Centre), Balti, Briceni, Drochia, Edinet, Falesti, Floresti, Riscani, Singerei (North) Cimislia, (South). Team 2: Calarasi, Criuleni, Hinsesti, Ialoveni, Straseni (Centre), Basarabeasca, Cahul, Cantemir, Causeni, Leova, Stefan Voda, Utag Comrat (South). The mission held meetings with local authorities and Agriculture and Food Industry Directorates in 19 *rayons* and Utag Comrat.

Figure 1: Republic of Moldova – Multiple shocks affecting agriculture sector in 2021/22
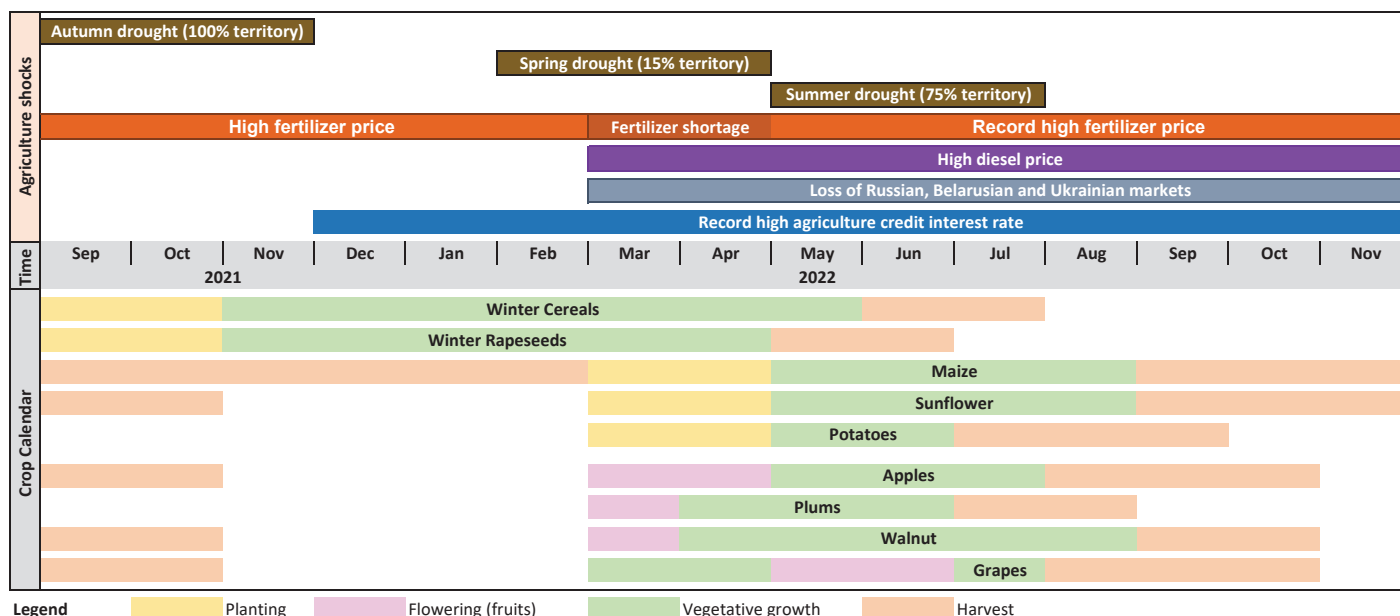
Source: FAO Crop and Food Supply Assessment Mission (CFSAM), 2022

affected. These shocks occurred after a record high bumper cereal and oil crops' harvest in 2021. Household backyard producers and small farmers have been most affected by the drought.

The aggregate 2022 cereal production is forecast at 1.76 million tonnes, over 45 percent below the past five-year average. Maize production is estimated at 760 700 tonnes, about 60 percent below the average, while wheat production is estimated at 872 000 tonnes, over 23.5 percent below the average. Production of oilseed crops is estimated at 644 200 tonnes, with sunflower being the most affected crop output of which was about 26 percent below the average. Pulses area cultivated is very limited and in decline over the past years. In 2022, the production is estimated at 53 600 tonnes, about 45 percent below the past five-year average. Production of potatoes and vegetable was also affected, but to a lower extent owing to irrigation and their outputs were 20 and 25 percent, respectively, below the average. Production of both potatoes and vegetables was already on a declining trend over the past years.

Apple production is forecast at 405 100 tonnes, a 30 percent decrease compared to the past five-year average. Plum production is forecast at 85 700 tonnes, a decrease of 28.2 percent. Owing to its deep rooting system, walnut was less affected by the drought

and production is forecast at 15 400 tonnes, a 12.2 percent decrease. Table grape production is forecast at 81 100 tonnes, 22.2 percent lower than the past five-year average. The drought-affected fruits calibre of apples, plums, walnuts and table grapes, with an additional negative impact on producers' income. However, wine producers are anticipating a particularly good vintage in 2022 as the weather was favourable for the ripening and accumulation of sugar in grapes. Production of wine grapes is forecast at 380 000 tonnes, a 11.4 percent decrease compared to the past five-year average.

In most drought-affected areas, animal fodder is likely to be insufficient to adequately feed livestock during the coming winter. For the first time, cattle population is expected to fall under 100 000 heads, while the pig population is forecast about 316 000 and sheep and goats at 534 000 by the spring of 2023. This represents a decline of about 11, 9 and 7 percent, respectively, compared to 2021. Milk production is expected to decrease in 2022 by 11 percent for cattle milk and by 15 percent for sheep and goat milk. Sheep and goat milk production was particularly affected during the dry and hot summer months as this subsector relies more on fodder from pastures, compared to cattle.

Prices of agricultural inputs (mainly fertilizers and diesel) surged since mid-2021. However, farm gate

prices increased comparatively less, due to export difficulties following the start of the war in Ukraine and consequent disruption of trade with the Russian Federation, Ukraine and Belarus. This significantly affected farmers' crop gross margins. By contrast, retail food prices sharply increased in 2022 compared to a year before, reflecting rising energy costs.

Between March and July 2022, the national average retail prices of maize flour and wheat flour rose by about 10 percent and remained overall stable in August and September, but at levels about 30 percent higher than a year earlier, mostly on account of rising transportation, packaging and other transaction costs. Farm gate prices for wheat and maize also increased since mid-2021 and, as of August 2022, were about 15 percent higher year-on-year, amid a reduced output obtained in 2022 and higher production costs. Retail prices of potatoes followed seasonal trends over the last two years and, in September 2022, were higher than a year before, due to reduced domestic production and elevated transportation costs. Following similar trends as other staple food products, meat farm gate and retail prices increased year-on-year, due to higher prices for feed, phytosanitary products and energy. Chicken and pork meat retail prices increased both on average by about 25 percent in the third quarter of 2022 compared to a year before, while the average farm gate price of poultry and pigs increased by 13 and 23 percent, respectively.

Concerns exist for the forthcoming 2022/23 cropping season. The 2022 drought is not over yet, while agricultural input prices and bank credit interest rates are expected to remain at very high levels. Favourable rainfall in August and September 2022 helped to restore the productive moisture reserves in the arable layer of the soil, improving planting conditions for the 2023 winter crops in most parts of the territory. However, severe moisture deficits persist in lower soil layers throughout the country which may have an adverse impact on 2022/23 crop production.[2] Rainfall amounts in October 2022 were below average in most parts of the country and next year's performance will depend, amongst others, on quantity and quality of precipitations during the coming winter months. Regarding agricultural inputs, imports of fertilizers and phytosanitary

products will remain a challenge in 2023. Fertilizers' prices are expected to remain at very high levels in the coming months. Similarly, bank credit interest rates are expected to remain at record high levels due to inflation driven by the energy crisis. Due to the increased frequency of shocks affecting the agriculture sector in the past years, including the COVID-19 pandemic, farmers are shifting towards lower risk strategies that include lower use of inputs, particularly fertilizers. Without additional support to the sector, some farmers may cease their activities entirely, particularly in the livestock sector. The national crop insurance market is nascent with only slightly more than 5 000 hectares of crops insured against climate risks this year. The combination of these factors is expected to have a negative impact on the 2022/23 cropping season.

With an estimated utilization of 2.1 million tonnes of cereals and potatoes (in cereal equivalent), the anticipated commercial export is estimated at 95 000 tonnes of maize, 290 000 tonnes of wheat and 30 000 tonnes of barley, mostly drawing from last year's bumper harvest stocks. These volumes are 87, 45 and 67 percent, respectively, below the past five-year averages for maize, wheat and barley. To compensate the losses in local production quality (wheat for bread preparation) and quantity (barley, potatoes), commercial imports are anticipated at 55 000 tonnes of maize, 50 000 tonnes of wheat, 3 000 tonnes of barley and 25 000 tonnes of potatoes (in cereal equivalent). The mission does not forecast any uncovered food deficits for the marketing year 2022/23.

In the short-term, the mission recommends providing urgent support to the agriculture sector at least until the next harvest in 2023. In the mid-term, the mission recommends implementing measures to strengthen agriculture resilience in view of mitigating the impact of climate risks, particularly drought, while promoting sustainable agriculture intensification. These measures shall also include backyard producers and small farmers, considering their crucial contributions to the national food security, particularly in the livestock sector. The recommendations build on the well-established support mechanisms to agriculture producers through AIPA and MAFI and promote low carbon agriculture.

[2] SHS conduct soil moisture measurements at 0.5 and 1 metre.

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SOCIOECONOMIC CONTEXT

Macroeconomic situation

The Republic of Moldova is a landlocked, middle-income economy country, bordered by Romania to the west and Ukraine to the north, east and south. It gained independence from the ex-Soviet Union on 27 August 1991 and was a co-founder of the post-Soviet Commonwealth of Independent States (CIS). The area of the country is 33 847 km², with agricultural land covering nearly three-quarters of it. According to the World Bank, the average per capita gross domestic product (GDP) was estimated at USD 5 315 in 2021[ii] and, according to the NBS, the agricultural sector accounts for about 10 percent of the GDP. Between 1990 and 2021, the human development index (HDI) value rose from 0.690 to 0.767 and currently the country ranks 80th out of 191 countries, United Nations Development Programme (UNDP).[iii]

Despite a solid economic performance over the past two decades, with a growth model reliant on remittance-induced consumption generating high growth and reducing poverty, the country has still one of the lowest per capita GDPs in Europe. Just as the country was emerging from the severe impact of the COVID-19 pandemic and the 2020 drought on the economy, the start of the war in Ukraine put the recovery process at risk. The war is affecting the economy through trade, the influx of refugees and remittance channels as well as through price and financial uncertainties.

Remittances account for about 16 percent of the GDP[iv] and account for at least half of the income of receiving households, especially in rural areas.[v] Although remittances do not necessarily translate into investments, they are an important support for consumption.

According to the International Monetary Fund (IMF), the national economic growth was stable at about 4 percent between 2016 and 2019 (Figure 2).

Figure 2: Republic of Moldova – GDP growth, 2015–2022
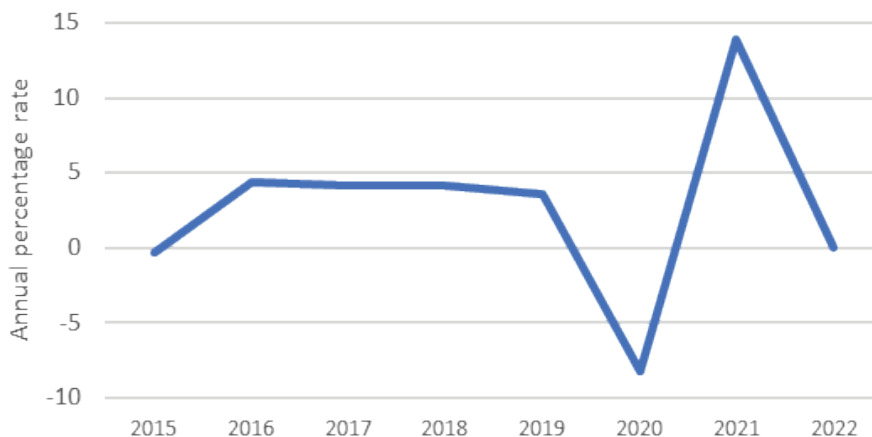
Sources: International Monetary Fund (IMF), 2022. *World Economic Outlook Database.* Wolrd Economic and Financial Survey. https://www.imf.org/en/Publications/WEO/weo-database/2022/October.

**Figure 3: Republic of Moldova – Inflation trends, 2021–2022
(corresponding month of previous year=100)**
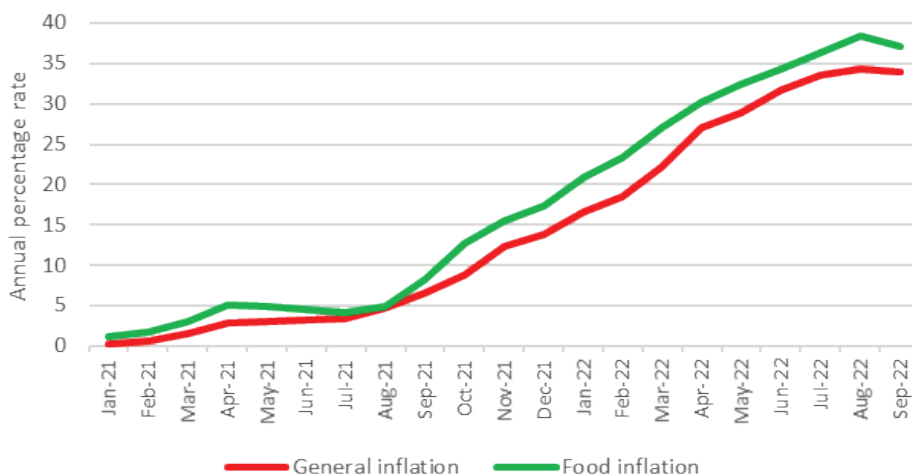
In 2020, the restrictions implemented to control the COVID-19 pandemic resulted in losses of jobs, incomes and remittances, coupled with the effects of the 2020 drought on the agricultural output, had severely affected the economy, particularly the sectors of trade, agriculture and tourism, leading to a GDP contraction of 8.3 percent. In 2021, growth reached a peak of 13.9 percent, mainly driven by investments and private consumption stimulated by high wages, social transfers, remittances and a bumper harvest. The GDP is expected to contract in 2022, due to high energy and food prices as well as trade disruptions (especially exports of agrifood products), high budgetary costs to support Ukrainian refugees as well as a declining flow of remittances, dampening consumer incomes and spending.[vi]

On 2 June 2021, an Economic Recovery Plan was launched by the European Commission to mobilize about EUR 600 million between 2021 and 2024 in macro-financial assistance, grants and investments to stimulate long-term socioeconomic recovery in the country.[vii] Currently, the country's economy is facing a four-fold crisis related to (i) post-COVID-19 recovery challenges, (ii) energy price increases, (iii) the impact of the war in Ukraine, which caused a substantial influx of refugees into the country and disrupted trade with the Russian Federation, Ukraine and Belarus and (iv) a very severe drought affecting the 2022 agricultural production.

In April 2022, the government revised its budget for the current year and allocated an additional MDL 6.9 billion (about USD 357 million) for expenditures in order to cope with the impact of the war in Ukraine and with the accelerating inflation. The government increased public spending to support households, business and the agriculture sectors. The largest increases in expenditures were directed towards payments of energy bills by public institutions and subsidies for households.[viii,ix]

According to the NBS, the general annual inflation rate was 34 percent in September 2022, over 27 percentage points higher than the rate of 12 months before, mostly reflecting the increase in prices of natural gas: 395.47 percent, electricity: 59.80 percent, fuel: 48.21 percent and food: 37.12 percent (Figure 3). In addition, the depreciation of the Moldovan leu, which lost 10 percent of its value against the United States dollar between September 2021 and September 2022, generated further inflationary pressure (Figure 4).[x]

Administration

The administrative territorial organization of the country is on two levels: the first level is constituted by communes, sectors and small cities (municipalities), while the second level by districts and large municipalities. The country is composed of 39 second level units: 32 districts (*rayons*), two regions with

Figure 4: Republic of Moldova – Exchange rate, 2021–2022

Sources: International Monetary Fund (IMF), 2022. *World Economic Outlook Database.* Wolrd Economic and Financial Survey. https://www.imf.org/en/Publications/WEO/weo-database/2022/October.

special status (Gagauzia and Transnistria) and five municipalities (Chisinau, Balti, Tighina, Tiraspol and Comrat). Demographic and economic data do not include the breakaway Transnistria Region.

Population and refugees

In 2022, the resident population is officially estimated at 2.60 million. Over the past five years (2018–2022), the population has decreased by 125 800[xi] due to negative population growth and emigration, amid low living standards and lack of jobs and income-generating opportunities. These demographic dynamics have led to an average annual population decline of 0.93 percent. Large-scale out-migration is mostly originating from rural areas (95 percent of migrants) where 58 percent of the population lives (about 1.5 million). The result is a shrinking and aging labour force in the agriculture

sector. About 23 percent of the population is above 60 years old. Considering the past five years' negative growth rate, the 2023 resident population is forecast at about 2.58 million.

Since the start of the war in Ukraine in February 2022, the influx of refugees into the country has been substantial, totalling 670 158 people crossing the border as of 25 October 2022,[xii] the equivalent of roughly 25 percent of the national population. Although most refugees have transited to other European countries, 95 728 were registered in the country at the end of October 2022. On average, between March and October 2022, about 91 000 Ukrainian refugees were present in the country. Assuming that about the same number of refugees will remain in the country next year, the total population in 2023 is forecast at 2.67 million.

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AGRICULTURE

General overview

Agriculture contributes 10.2 percent of the country's total GDP and is the backbone of the rural economy. The sector accounts for up to 32.7 percent of the GDP in the South Region.[xiii] Approximately 22 percent of the formally employed population works in agriculture,[xiv] but informal employment is predominant, particularly in smallholder farming. The national industry depends on agricultural products. The production value of the food industry accounted for 35 percent of the total manufacturing industry in 2021.[3]

Agriculture accounts for roughly 45 percent of the country's total exports (2021). Leading agricultural unprocessed export commodities are: sunflower seeds and oil, maize, fruit (apples, pears, peaches, cherries and grapes) and fruit juices, wine and walnuts. Imports of wheat (flour), meat, dairy, vegetables (tomatoes) used for both human and animal consumption compensate for the agricultural production deficit. Heavy reliance on unprocessed/primary agriculture and lack of compliance with international quality standards affects exports and opportunities for adding value in-country.

The country is located within two major river basins: Dniester and Prut. The topography is mainly characterized by hilly plains, sloping from the northwest to the southeast, with an average elevation of around 147 metres above the sea level. There are about 3 500 small and medium reservoirs, and ponds for irrigation purposes, flow regulation and fishing. About 75 percent of the country is covered by fertile black soil, called chernozem, and about 80 percent of the agricultural lands is situated on slopes. Soil fertility is gradually worsening due to intense soil tillage, inadequate crop rotations and poor landscape management.

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The agricultural area, which is the sum of arable land, permanent crops and permanent meadows and pastures, is estimated at about 2.5 million hectares, equivalent to 74 percent of the national territory. The forest area accounts for only 11.8 percent of the national territory,[xv] part of which is degraded. In 2021, temporary crops were cultivated on an estimated 1.42 million hectares, while permanent crops and pastures were on 0.28 and 0.35 million hectares, respectively. The main annual crops are maize, wheat, sunflowers and barley. One-fifth of the cereal crops is planted in the spring to replace compromised autumn crops. Vineyards and fruit trees (apples, plums) are the main permanent crops.[xvi]

The land and post-land reforms implemented in the country led to a profound transformation of local agriculture systems through the consolidation of fragmented agricultural land into larger plots[4] by rural entrepreneurs, locally referred as "leaders",who rent or procure land from rural residents. Leasing agreements are either verbal or registered at the communal level and fees are paid through the

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[3] SHS Processing and canning of meat and meat products, fruits and vegetables, production of dairy products, pastry; fodder, bread and baked products, confectionary, sugar, alcoholic drinks, wine, beer, etc. National Bureau of Statistics of the Republic of Moldova (NBS), 2021.

[4] Plots of >60 hectares are common.

provision of agreed quantities of crop production (about 10–20 percent of average harvest yields) or monetary value. The "leaders" are the major economic driving force in rural areas, accounting for a significant portion of the investments in the sector and being also the main beneficiaries of government subsidies. The land consolidation process resulted in a dual agricultural structure: on the one hand, a large number of household backyard producers and small registered farmers with less than 10 hectares of agricultural land (>99 percent of all farming units) and, on the other hand, a relatively small number of large corporate farms (<1 percent have more than 50 hectares and some >10 000 hectares). Most of the country's poorest households are the backyard producers and small farmers.

Household backyard farming and small-scale farms are mainly subsistence and semi-subsistence in nature. They have limited or no access to loans[xvii] and government subsidies. They sell their products directly on the local markets and add value by integrating the value chain vertically through small-scale cottage industry, which is ubiquitous and based on local traditions (cheese, sour cream, meat, sausages, honey, food preserves, pickles, dry plums, etc.). Households' backyard farming and smallholders generate a very important share of some agriculture produces such as milk: 93 percent, forage crops: 72 percent, eggs: 60 percent and cattle and poultry for slaughter: 40 percent,

substantially contributing to the national food security situation.[xviii]

In 2020, livestock accounted for 30 percent of the total agriculture production value. In early 2022, the livestock population was estimated at 612 000 sheep and goats, 348 000 pigs and 107 000 cattle. About 80 percent of the livestock are owned by rural households,[xix] which have few animals in their household backyard: a few sheep, up to two cows, three to five pigs and birds (chicken, ducks and geese). Backyard livestock are fed with cereals and grass during the summer period, but also with households' food and kitchen waste. They often represent the most important, if not the only, source of meat and livestock product for the rural population and generate some valuable cash income. Over the past decade, the population of all types of livestock has continuously decreased, with a reduction of over half a million ovine, porcine and bovine since 2011.[xx] Recurrent droughts are accelerating this trend.

At the national level, about 36 percent of agricultural holdings are headed by women. Men administer a larger land area than women: on average, men manage 1.21 hectares each, compared to 0.86 hectares for women. There is a significant gender gap related to the possession of agricultural machinery and equipment, with women's holdings owning less than 12 percent of the total number of farming machinery.

Box 1: Republic of Moldova - Land Consolidation Example from Iezarni Vechi Commune (Singerei District)

In 2001, by the end of the land and post-land reform, Iezarni Vechi Commune registered some 800 households engaged in backyard farming on 290 hectares of land located within the villages' boundaries and 730 hectares of vineyards and orchards outside the villages' boundaries. Some 86 farmers were cultivating some 1 300 hectares of agriculture land outside the villages' boundaries (former Kolkhoz land).

Two decades later, in 2022, the commune is populated with 523 households with many of its members living abroad. All resident households are engaged in backyard farming, mostly within the villages' boundaries. The number of small farmers decreased to eight units still in operation, each cultivating 1–1.5 hectares, while six agriculture corporate farms, operating across several communes and districts, are cultivating the rest of the 1 300 hectares of agriculture land.

Source: FAO Crop and Food Supply Assessment Mission (CFSAM), 2022

Climatic conditions, droughts and climate change

Climatic conditions

The country's climate is characterized by warm summers and dry and mild winters. The average annual precipitation is estimated at 500 mm, concentrated between May and October, with a peak in June or July. The occurrence of both intense rains and long dry spells is common in the summer. About 75 percent of the national territory relates to dry, subhumid and semiarid lands, with high frequency of drought events. As described in Map 1 and Table 1, the country is divided in three agroclimatic zones: North, Centre and South with a rainfall gradient decreasing from north to south (Map 2).

Maps 1 and 2: Republic of Moldova - Agroclimatic zones and precipitation deficits with UNCCD land classes
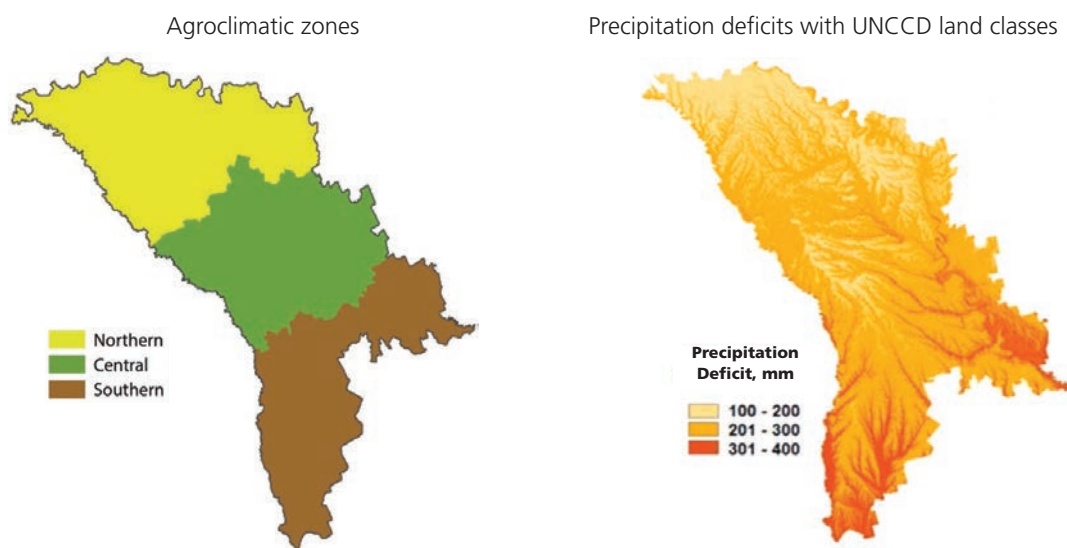
Agroclimatic zones

Precipitation deficits with UNCCD land classes

Northern
Central
Southern

Precipitation Deficit, mm

100 - 200
201 - 300
301 - 400

Disclaimer: *The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.*

Sources: World Bank - Reducing the Vulnerability of Moldova's Agricultural Systems to Climate Change, Impact Assessment and Adaptation Options, 2013; United Nations Convention to Combat Desertification (UNCCD): Daradur, M., Chirica, L., Cazac, V., Pandey, R. 2015. 'New Drought Products: Transforming Drought Information to Facilitate Decision Making. Chisinau, Research and Project Centre 'Eco Logistica', 2015. https://documents1.worldbank.org/curated/en/514581468062063065/pdf/Reducing-the-vulnerability-of-Moldovas-agricultural-systems-to-climate-change-impact-assessment-and-adaptation-options.pdf. https://eco-logistica.org/wp-content/uploads/2019/03/NewDroughtProducts.pdf.

Table 1: Republic of Moldova - Agroclimatic characteristics

Indicators	North (Moderately hot, semi-humid)	Centre (Hot, semi-humid)	South (Hot, arid)
Average annual temperature (Celsius)	7–8.5	8.5–9.5	9.5–10
Annual rainfall (mm)	550–600	500–550	450–550
Potential evaporation (mm)	650–800	800–850	850–900
Moisture coefficient (K)	0.7–0.9	0.6–0.8	0.5–0.6
No drought in ten years[1]	1–2	2–3	5–6
Dominant soils	Chernozem and brown soils	Brown and chernozem	Carbonated chernozem
Typical agriculture crops	Cereals, sunflower, sugar beets, orchards, hazelnuts, vegetables	Cereals, sunflower, vineyards, orchards, walnuts, vegetables	Vineyards, kernel orchards, cereals, vegetables

[1] Republic of Moldova's Intended National Determined Contributions, Government of the Republic of Moldova, 2015.
Source: Adapted from International Fund for Agricultural Development (IFAD). 2015, *The Strategy for Implementation of Climate Resilience through Conservation Agriculture by Consolidated Unit for Implementation of IFAD Projects, financed by GEF.* NGO BIOS. Chisinau. Data provided by FAO Moldova Office. 2022.

Drought

Every ten years, on average, drought events typically occur one to two times in the northern part of the country, two to three times in the central part and five to six times in the south. Drought is the main risk to the agriculture sector and can compromise progress in health and nutrition, due to the dependency of the majority of the country's rural population on agriculture income. Over 90 percent of crop production in the country is rainfed, which makes the agriculture sector highly vulnerable to climate variability, creating wide amplitude in production volumes. The most widespread irrigation system in the country is by canals and sprinklers. In 2021, the total area equipped for irrigation was estimated at 218 000 hectares, about 11 percent of the arable land and 4.7 percent of permanent crops.[xxi] Yet, all newly established intensive orchards are drip irrigated. Since the turn of the millennium, the country experienced seven severe droughts (2000, 2003, 2007, 2012, 2015, 2020 and 2022) that had a severe negative impact on both crop and livestock sectors. Figure 5 shows that crop production is more affected by climate hazards than livestock.

Based on time series analysis, SHS has defined agriculture drought severity and consequences (Box 2), using precipitation, temperature and hydrothermal coefficient (HTC) indicators.[5, xxii]

The 2007 catastrophic drought was the driest year in the history of the country with a return period of more than 200 years.[xxiii] About 86 percent of the country's territory and 80 percent of the rural population that relied on agriculture were affected by the reduced harvest. Cereal production was down by 70 percent compared to the previous five years.[xxiv] Bovine livestock diminished by one-quarter, pigs by almost 50 percent, sheep and goats by 10 percent and the number of poultry by 25 percent. By January 2008, many families had to liquidate their entire livestock because of the lack of fodder. The savings and incomes of the rural population were slashed, with total losses amounting to USD 1 billion.[xxv]

The 2012 drought severely affected crop production in central and southern agroclimatic zones: wheat, maize and sunflower crop production decreased on average by about 40, 60 and 30 percent, respectively, compared to the previous year.[xxvi] MAFI estimated the total economic loss at USD 200 million.[xxvii] In 2015, drought affected wheat, maize and sunflower crop production with a decrease of about 15, 30 and 10 percent, respectively, compared to the previous year.[xxviii]

The 2020 drought severely affected crop production in central and southern agroclimatic

Table 2: Republic of Moldova - Impact area, duration and economical losses from droughts, 2000–2022

Year	Affected area (percent)	Seasons	Economic losses (million USD)
2000	75	Spring–Autumn	169.7
2003	86	Summer–Autumn	-
2007	78	Summer–Autumn	987.0
2012	80	Summer–Autumn	400.0[1/]
2015	6	Summer–Autumn	13.8
2020	100	Autumn–Summer	328.0
2022	100	Autumn–Spring–Summer	-

[1/] Government of the Republic of Moldova, 2015.

Sources: 2000–2012, Adapted from Drought conditions and management strategies in the Republic of Moldova Cazac and Daradur, 2014; 2015–2020: Cu privire la aprobarea Programului de gestionare a districtului bazinului hidrografic Dunărea-Prut şi Marea Neagră, ciclul II (2023–2028), p. 12, Republic of Moldova, 2015; 2022: http://old.meteo.md/newsait/primavara2022.htm, SHS, 2022 and CFSAM, 2022.

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[5] The HTC is calculated as: HTC = P/ 0.1ΣT≥ 10° C, where P and T mean the consecutive daily precipitation and air temperature above 10 °C, respectively.

Figure 5: Republic of Moldova - Production volume indices for plant and animal production (previous year = 100)
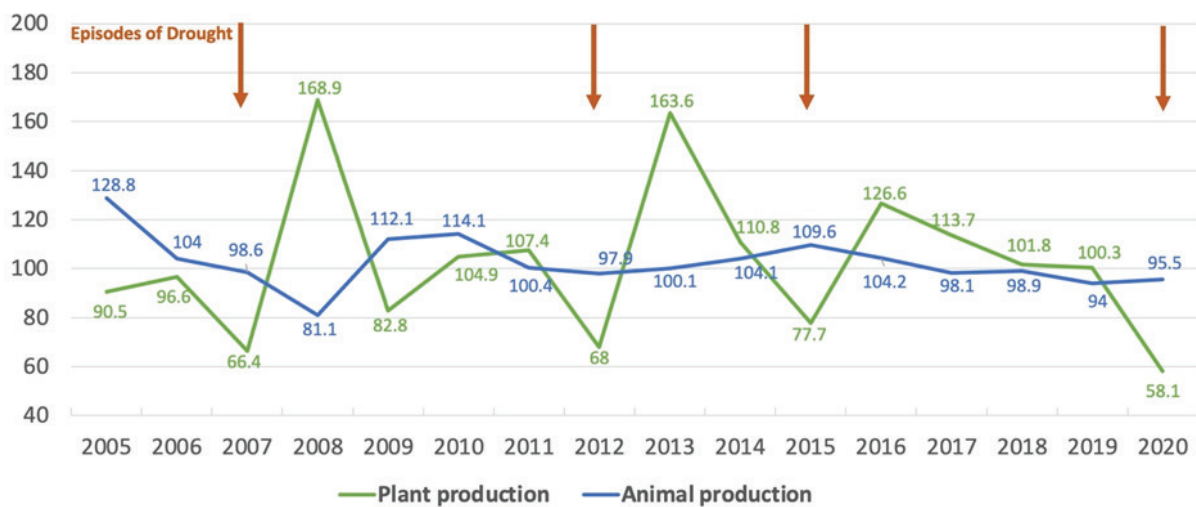
Source: National Bureau of Statistics of the Republic of Moldova (NBS), 2021. Yearbooks 2014–2021. Chisinau https://statistica.gov.md/ro

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Box 2: Republic of Moldova - Drought definitions

Very strong droughts are reported when during a vegetation period less than 50 percent of the normal precipitation and the average air temperature exceeds the climatic average by 3–4 °C, or the HTC is <0.4. Strong droughts occur when the amount of precipitation is 60–70 percent of the norm and the average air temperature during this period exceeds the norm by 2 °C or the HTC is 0.41 to 0.5. Moderate droughts are signaled when 70–80 percent of the precipitation norm falls and the positive temperature anomaly is 1.0–1.5 °C or HTC is 0.51 to 0.6.

The consequences of the drought are determined both by the degree of intensity and duration as well as by the affected territory. Droughts covering an area of up to 10 percent of the territory of the Republic of Moldova is evaluated as local; 11–20 percent is considered as vast; 21–30 percent is very large; 31–50 percent is extreme and above 50 percent is considered as catastrophic droughts, because they cause great losses to the national economy.

Source: State Hydrometeorology Service of the Repulbic of Moldova (SHS). The risk of drought in the Republic of Moldova "Riscul Secetelor În Republica Moldova". National Drought Plan of the Republic of Moldova: http://old.meteo.md/hazard/secetele.htm, 2019.

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zones: wheat, maize and sunflower crop yields decreased on average by 50, 63 and 39 percent, respectively, compared to the previous year. Vegetable production decreased by 26 percent, while fruits and grapes decreased by 22 and 30 percent, respectively.[xxix] The drought caused shortage of alfalfa, grass and hay as well as crop residues, while feed concentrates were prohibitively expensive and inaccessible to many households. In the most affected areas, this resulted in distress livestock sales.

Other climate risks include torrential rains, hail and heavy winds. Frost is a common problem for farmers in the spring and autumn. Weather-related plant health issues include outbreaks of cereal and dry bean pests, western corn rootworm and Mediterranean fruit fly.[xxx]

Climate change
Climate models predict further mean temperature rises and more variable rainfall with anything from a slight increase to a significant decline in total precipitation. Even under scenarios with an increase in mean rainfall, however, water availability will decrease due to increased temperatures and rates of evapotranspiration. Agricultural productivity will significantly decrease due to increasing water stress on crops, even without accounting for the increasing impact of extreme weather events, i.e., hailstorms and late frosts, major floods and droughts, or changes in patterns of pests and diseases).[xxxi]

CROP PRODUCTION IN 2022

Rainfall conditions

The State Hydrometeorology System of the Ministry of Environment is the main institution that carries out monitoring and provides most of the early warning services for drought risk management in the country. Currently, the monitoring of key meteorological parametres for drought assessment (precipitation, temperature, soil moisture on topsoil and at 1 metre and HTC) is carried out on 13 meteorological stations and 16 agrometeorological posts.

Autumn–Winter 2021/22

Autumn 2021 was particularly dry with precipitation not exceeding 15–35 percent of the long-term average over 95 percent of the territory (Figure 6 and Map 3). The resulting low reserves of productive moisture in the soil restrained the emergence,

growth and development of winter cereals, leading to a 1–1.5-month delay in the development of winter crops, compared to the average.

Figure 6: Republic of Moldova - Rainfall and temperatures, September 2021–2022 and comparison with long-term average
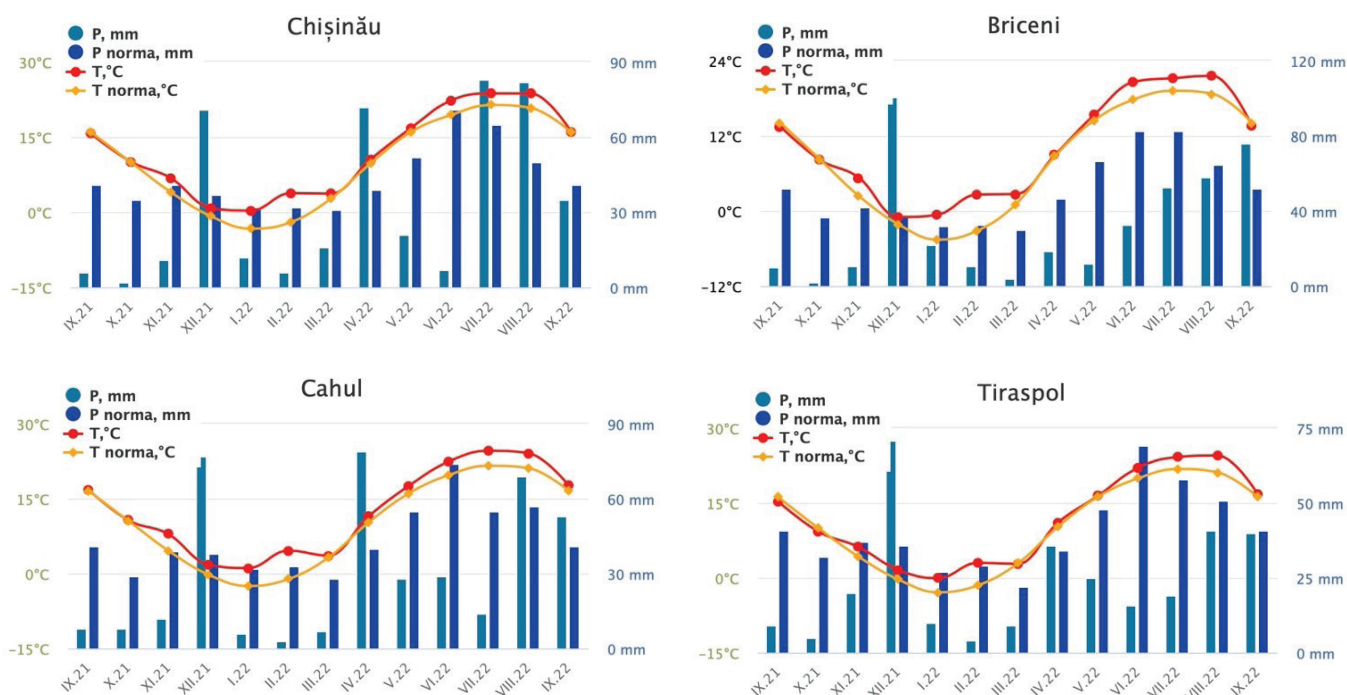
Source: State Hydrometeorological Service of the Republic of Moldova (SHS): http://old.meteo.md/mold/grafice/temp_medie_lunara.htm, 2022.

However, large amounts of precipitation were recorded in December (230–340 percent of the monthly norm) over most of the country, restoring soil moisture (Figure 6). This was followed by warmer-than-normal winter months (3.0–3.9 °C higher than the norm). As a result, the growth and wintering process of autumn crops went well over. However, some limited crop failures due to winter frosts were reported to the mission in some *rayons* in the North (Drochia).

Spring 2022
The amount of precipitation during the spring season was average (80–120 percent of the norm) in most of the south, central and part of the northern regions (Map 5). Above-average rainfalls were recorded in April in these regions. Yet, in most of the north, precipitations were well below average (50–75 percent of the norm), while in the northernmost districts (15 percent of the territory) rainfall did not exceed 35–55 mm (25–45 percent of

Maps 3 to 6: Republic of Moldova - Rainfall variations in percent from long-term average
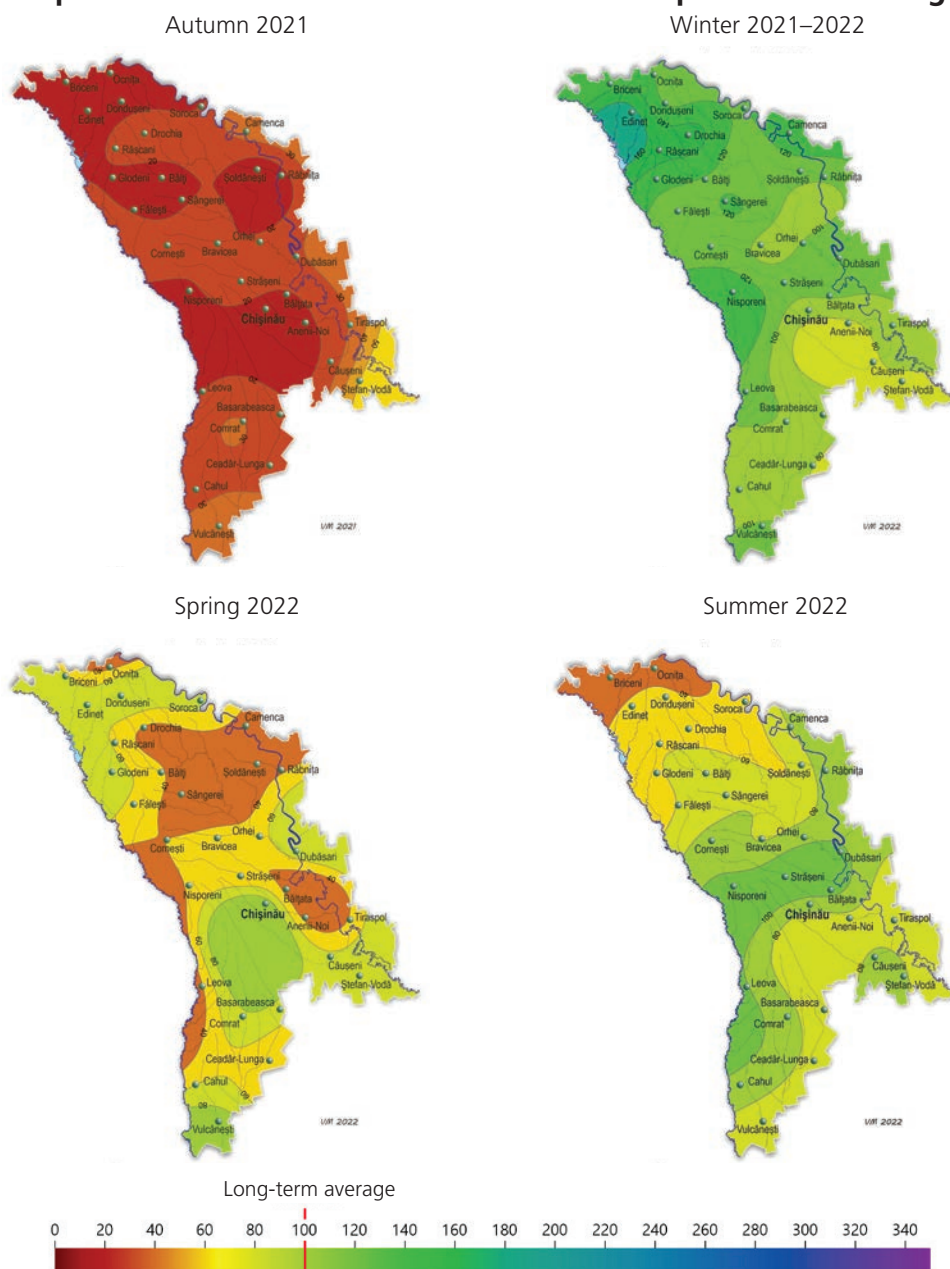
Autumn 2021

Winter 2021–2022

Spring 2022

Summer 2022

Long-term average

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340

Disclaimer: *The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.*

Source: State Hydrometeorological Service of the Republic of Moldova (SHS): Autumn 2021: http://old.meteo.md/newsait/toamna202. htm; Winter 2021–2022: http://old.meteo.md/newsait/iarna2021-2022.htm; Spring 2022: http://old.meteo.md/newsait/primavara2022.htm; Summer 2022: http://old.meteo.md/mold/nssezon.htm, Accessed in October 2022.

the norm), which in the spring season is reported on average once every 20–30 years.

In the north, very low precipitation amounts caused the decrease of moisture reserves in the soil. Drying of the top layer of the soil affected the growth and development of winter and permanent crops, and delayed soil preparation, sowing and the growth of spring crops. In the centre and south regions, weather conditions until May 2022 were satisfactory for the growth and development of agricultural crops as well as for the preparation of the soil and the sowing of spring crops.

Summer 2022

Most parts of the country experienced lack of precipitation and a particularly high thermal regime from May to July. The amount of precipitation during the summer did not exceed 55–130 mm (25–65 percent of the norm) on 75 percent of the territory. Across the country, the summer average air temperature was +2.0–3.2 °C higher than the norm. Particularly hot weather conditions were reported in the first decade of July, when the average decadal air temperature exceeded the norm by 3–5 °C and in the third decade of August, when the average decadal air temperature exceeded the norm by 5–6 °C. The HTC was below 0.4 in 20 out of 28 reporting meteorological stations and posts (Table 3).

These conditions caused a severe agriculture drought over 75 percent of the territory, affecting particularly spring cereals, maize, sunflower, sugar beets as well as potatoes and vegetable crops. As an illustration, by the end of July 2022, soil moisture at 1 metre in maize fields was on average:

➤ North: 10–20 mm (15–20 percent of the norm)

➤ Centre: 14–35 mm (15–40 percent of the norm)

➤ South: 10–15 mm (10–20 percent of the norm)

In some areas of the central and southern regions, torrential rains and hailstorms were reported on 6, 8 and 27 July, 9, 16 and 30 August 2022, causing localized damages to agricultural crops.

Table 3: Republic of Moldova - Hydrothermal coefficient (HTC), average May–July 2022

Location[1]	HTC Average May–July	Location[1]	HTC Average May–July	Location[1]	HTC Average May–July
NORTH		**CENTRE**		**SOUTH**	
1. (AP) Ocniţa	0.36	12. (AP) Şoldăneşti	0.19	21. (AP) Anenii-Noi	0.32
2. (MS) Briceni	0.53	13. (AP) Teleneşti	0.20	22. (AP) Căuşeni	0.38
3. (AP) Donduşeni	0.56	14. (MS) Bravicea (Călăraşi)	0.37	23. (MS) Ştefan-Vodă	0.57
4. (AP) Edineţ	0.50	15. (AP) Orhei	0.13	24. (MS) Leova	0.34
5. (MS) Soroca	0.46	16. (MS) Corneşti (Ungheni)	0.35	25. (AP) Basarabeasca	0.53
6. (AP) Drochia	0.26	17. (AP) Străşeni	0.17	26. (MS) Comrat	0.32
7. (AP) Floreşti	0.19	18. (AP) Nisporeni	0.51	27. (MS) Cahul	0.38
8. (AP) Glodeni	0.40	19. (MS) Bălţata (Criuleni)	0.21	28. (AP) Vulcăneşti	0.70
9. (MS) Bălţi	0.36	20. (MS) Chişinău	0.24		
10. (AP) Sîngerei	0.19				
11. (MS) Făleşti	0.33				

[1] Meteorological stations (MS), Agrometeorological posts (AP).
Source: Data provided by State Hydrometeorological Service of the Republic of Moldova (SHS) to the FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Based on the SHS drought classification, the 2022 summer drought is categorized as strong to very strong with catastrophic consequences (Table 4). The mission found that the SHS drought classification could be fine-tuned to better reflect agroclimatic zones and enhance agrometeorological analysis.[6]

Autumn 2022

Favourable rainfall from August to September 2022 helped to restore moisture reserves in the arable layer of the soil, improving planting conditions for winter crops in most parts of the country. However, severe moisture deficits still persist throughout the country in lower soil layers which may adversely impact 2023 production.[7] The quantity of precipitation during the coming winter will be crucial for the performance of 2023 crops. Unfortunately, rainfall amounts in October 2022 were well below the average in most parts of the territory. However, harvesting of the 2022 summer crops was conducted under favourable conditions.

Frost

No major frost damages occurred in 2022. Some spring frost damages were reported in the north (Briceni, Drochia, Edinet) and centre (Nisporeni) of the country, occurring during the month of April 2022 and affecting mainly early apple varieties and plums cultivated in lower lands. No frost damages were reported on emerging spring crops or on autumn fruits.

Crop damages and losses assessment by the Commission for Emergency Situation

Institutional arrangement

The Republican Commission for Emergency Situations is the main entity responsible for managing major emergencies, including drought. The Commission structure is replicated at *rayon* and commune levels. Depending on the intensity and foreseen consequences of shocks, the activation of the Commissions is escalated. The Head of the Republican Commission is the Prime Minister; the Deputy Head is the Director of the State Civil Protection and Exceptional Situations Department (SCPESD), which is responsible for disaster prevention, response, relief and recovery. SCPESD is also responsible for water-related hazard warning and emergency declaration. The Ministry of Infrastructure and Rural Development (MIRD), the Ministry of Agriculture, Food and Industry (MAFI) and ME are members of the Commission. MIRD is responsible for the implementation of the United Nations Convention to Combat Desertification (UNCCD). The SHS is the main institution that carries out monitoring and provides most of the drought early warning services.[xxxii]

Table 4: Republic of Moldova - Spring and summer drought classification based on SHS drought definition, 2022

Vegetation period	Intensity	Consequences
Spring	Very strong	Vast
Summer	Strong to very strong	Catastrophic

Source: FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

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[6] A 50 percent rainfall decrease compared to the long-term average does not have the same impact on crops in the more arid south than in the wetter northern agroclimatic zone.

[7] SHS conduct soil moisture measurements at 0.5 and 1 metre.

Activation of the commissions and crop damages and losses assessment

By the time of the mission, the Republican Commission for Emergency Situations had not been activated for the 2022 drought. At decentralized level, local commissions for emergency situations were established in 25 *rayons* (out of 32), two municipalities (Chisinau and Balti) and one administrative region (Gagauzia) and 537 local commissions at commune level (out of 879 communes). In total, 3 002 applicants reported crop losses due to the drought. Table 5 summarizes the crop affected area as reported by local commissions.

The *rayons* and communes' commissions use the 2007 "methodological guidelines to assess the level of damages to agriculture crops due to natural disasters". The methodology is implemented with various degrees of adherence to the guidelines. The methodology is based on visual estimations of the proportion of plants affected by drought in the affected fields. Given the wide geographical extent of the drought, *rayon* agriculture directorates reported to be constrained by the lack of agriculture technicians to conduct expert visual estimation of the affected fields.[8] The physical estimation of damages through crop cuttings were conducted only in fields where drought risks were covered by insurance companies. In past droughts, e.g., 2015, 2020, the commissions' assessments were not followed by compensations to applicants. Consequently, some *rayon* councils did not establish a Commission in 2022, while many farmers did not apply to report crop losses. The mission observed that small farmers are underrepresented, while the mechanism entirely ignores household backyard producers. As a result, the commissions estimates do not cover all damages and losses incurred by the 2022 drought. The approach is more suitable to assess the damages and losses of rapid onset shocks with localized impacts, such as flood or frosts. Challenges in implementing the methodology emerge with shocks with slow-onset and wide extent impacts, such as droughts, where very large portions of the national territory are typically affected.

Table 5: Republic of Moldova - Summary of crop affected area by local commissions of emergency situation

Annual crops	Affected area (hectares)	Permanent crops	Affected area (hectares)
Maize	589 365	Apple	8 710
Sunflower	248 267	Plums	3 191
Sugar beets	68 006	Alfalfa	932
Winter wheat	50 588	Perennial herbs	332
Soybeans	8 638	Vetch	84
Sorghum	2 772	Blackberries	20
Winter barley	1 353	Walnuts	15
Rapeseeds	1 190		
Mustard	265		
Peas	115		
Kidney bean	94		
Total	**970 653**		**13 284**

Source: Local Commission of emergency situation data summarized by the FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

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[8] The number of full time agriculture staff in *rayons* visited by the mission varied from one to seven.

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OTHER FACTORS AFFECTING AGRICULTURE IN 2022

Seeds

Prices and access to seeds and planting material have not been a constraint in 2022. Import volumes of seeds, mostly from Europe, were near average. This year, an estimated 4 percent of wheat and 14 percent of barley seeds were imported. For maize and sunflower, hybrid seeds were widely used. An estimated 97 percent of maize seeds and 59 percent for sunflower seeds were imported. For potatoes, only 1 percent of the planting material was imported. The mission noted variations in drought resistance among different varieties of maize hybrid seeds. Some high-yielding maize seeds varieties entirely failed, while other imported hybrids fared better during the drought. The implementation of a systematic testing of high-yielding hybrids varieties, before importing them, would reduce risks to farmers.

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Fertilizers

Over the past two decades, in farms with crop lands larger than 50 hectares, the share of the area treated with mineral fertilizers increased sharply: from just about 20 percent in 2000 to over 80 percent in 2021. According to the NBS, in 2021, the average use of mineral fertilizers was 103.4 kg/hectare for maize, 77.8 kg/hectare for sunflower, 256.2 kg/hectare for potatoes, 81.9 kg/hectare for vegetables and 21.9 kg/hectare for forage crops. By contrast, the share of land where organic fertilizers are used has not been varying widely during the past years and, in 2021, it amounted to only about 1 percent, with an average use estimated at a suboptimal level of 129.8 kg/hectare, reflecting the declining trend of the livestock population in the country.

Mineral fertilizers are mostly imported, mainly from the Russian Federation and domestic prices reflect trends in the international market (figures 7 and 8).

International prices of fertilizers soared in 2021, particularly phosphates and urea, driven by strong international demand and by the high input costs. Prices of phosphates raw materials, particularly sulphur and ammonia, have increased sharply in 2021 as refinery curtailments due to COVID-19 restrictions limited supplies. Urea feed stock producing costs have also risen, including natural gas prices, which surged in early 2021. Prices continued to increase through April 2022, reaching near-record high levels and declined afterwards, but remaining at very high levels. This is due to surging input costs, supply disruptions caused by sanctions imposed to the Russian Federation and Belarus, amid the war in Ukraine, and the suspension of exports from China (mainland) until June 2022. All three are key fertilizer exporting countries.[xxxiii]

Due to high international prices and trade disruptions, import volumes of fertilizers dropped in the first semester of 2022, compared to previous years (Figure 9). In particular, with the outbreak of the war in Ukraine, imports of fertilizers from the Russian Federation, which previously took place mostly via railways, were redirected to Romania through the Black Sea (from the port of Constanta

Figure 7: Republic of Moldova – Domestic fertilizer prices, 2020–2022
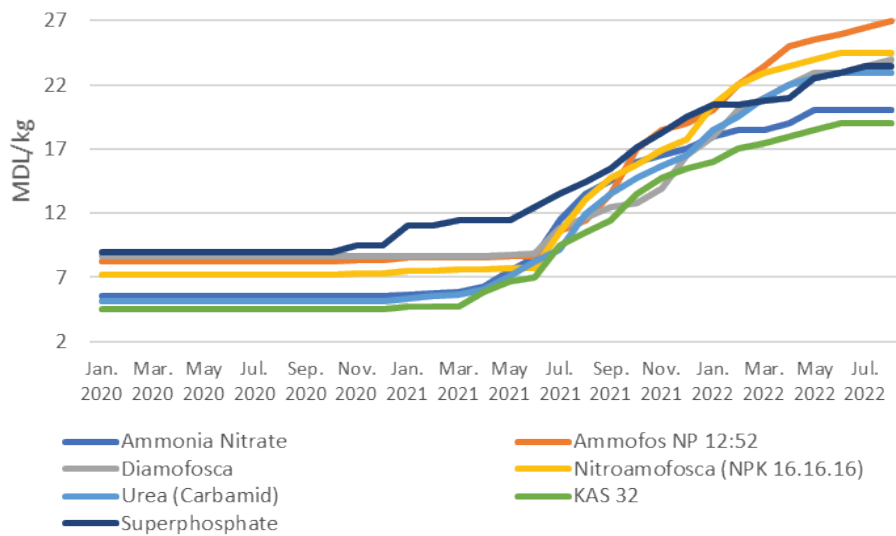
Source: FAO Crop and Food Supply Assessment Mission (CFSAM) 2022.
Compiled by CFSAM member Dr. Anatolie Fala, from input suppliers.

Figure 8: Republic of Moldova - International fertilizer price indices, 2007–2022 (based on nominal USD, 2010=100)
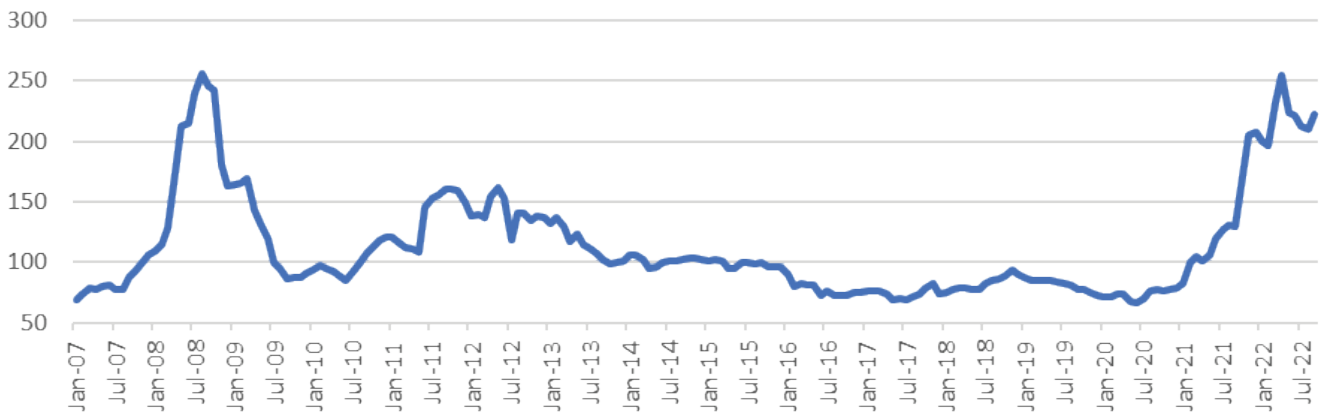
Source: World Bank, 2022. *Latest Commodity Prices Published.* Comodity Markets data. https://www.worldbank.org/en/research/commodity-markets.

Figure 9: Republic of Moldova – Fertilizer imports, 2019–2022
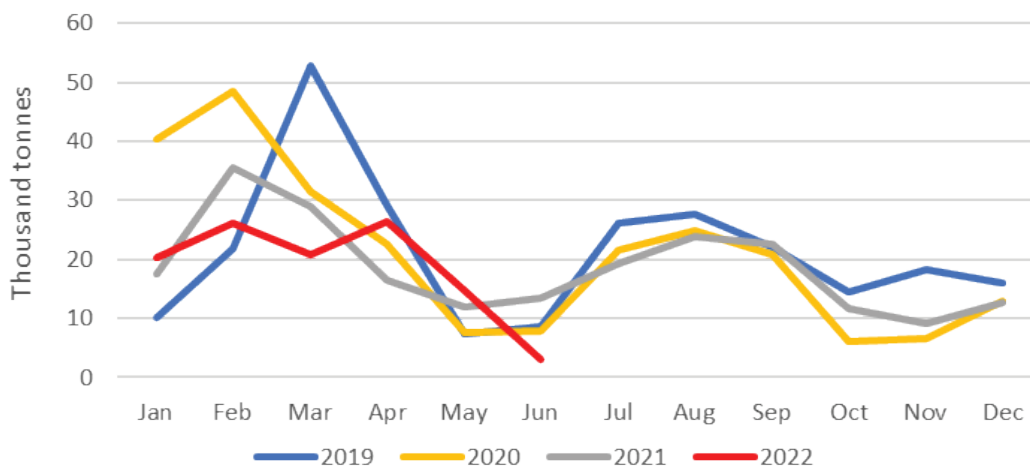
Source: Trade Data Monitor (TDM), 2022. https://www.tdmlogin.com/tdm/index.htm.

to Galati and then via truck to Giurgiuliesti, in the Cahul District of Moldova) and through the Danube River port of Giurgiuliesti. The increased logistics difficulties delayed delivery times and payments, considerably raising import costs. *Agrostoc*, one of the main agriculture input importing cooperatives, informed the mission that shipping times more than doubled with the switch from railway to sea and river ports: from about two weeks to over one month. Limited local availability and high prices resulted in low or delayed use of fertilizers in some areas, negatively affecting yields of 2022 crops. In addition, several farmers interviewed by the mission declared their intention to further reduce the use of fertilizers in the coming season, due to the high prices and climate-hazard risks.

Fuel

Domestic prices of fuel mirror trends of international crude oil quotations (Figure 10), as diesel and gasoline are largely imported from the Russian Federation and Romania. Prices of diesel, an important input in local agriculture, after relative stability in 2020, followed an upward trend in 2021 and surged by 64 percent in the first six months of 2022. In June 2022, corresponding to harvesting time for winter cereals, diesel prices peaked at about MDL 32/litre (about USD 1.66/litre), a level almost twice as high as in the same month a year before (MDL 16.2/litre). By September 2022, when the harvest of the spring

crops began, prices had declined but remained at elevated levels. High fuel prices resulted in a decline in the area harvested in the zones most affected by the drought, where some farmers interviewed by the mission declared their preference to plough the land for planting the 2023 winter crops without harvesting the standing spring crops as the benefits would not offset the cost of using combine harvesters.

Bank loans interest rates

As shown in Figure 11, the base rate applied to the main short-term monetary policy operations increased sharply in the second half of 2021 and in 2022. Following a few months of stability, between November 2020 and June 2021, where the rate was fixed at 2.65 percent,[9] the Executive Board of the National Bank of Moldova (NBM) implemented subsequent increases as part of efforts to rein in inflationary pressures and, in August 2022, the rate reached the record high level of 21.5 percent. This marks a four-fold rise compared to the same period a year earlier. The agricultural credit interest rate can be partially reimbursed to agricultural producers by the AIPA.

In 2022,[10] the agriculture sector was granted about percent of the banking sector credit portfolio, with about 11 percent of the agriculture credit portfolio classified as "substandard" or "compromised", against an average of 7 percent in the other sectors, thus flagging agriculture as a risky sector.

Figure 10: Republic of Moldova – Fuel prices and international average prices of crude oil, 2020–2022
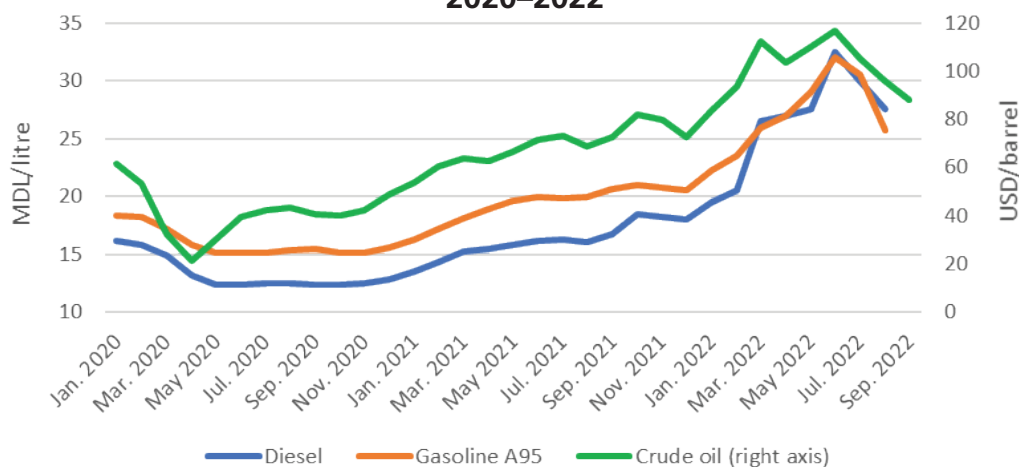
Sources: World Bank, 2022. *Latest Commodity Prices Published.* Comodity Markets data. https://www.worldbank.org/en/research/commodity-markets. National Agency for Energy Regulation (ANRE). 2022. *Petroleum Products.* Chisanau. https://www.anre.md/rapoarte-de-monitorizare-3-102.

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[9] Data available from February 2001 through September 2022.
[10] Data available from January through September 2022.

Figure 11: Republic of Moldova – Agriculture credit interest rate, 2021–2022 (percent)
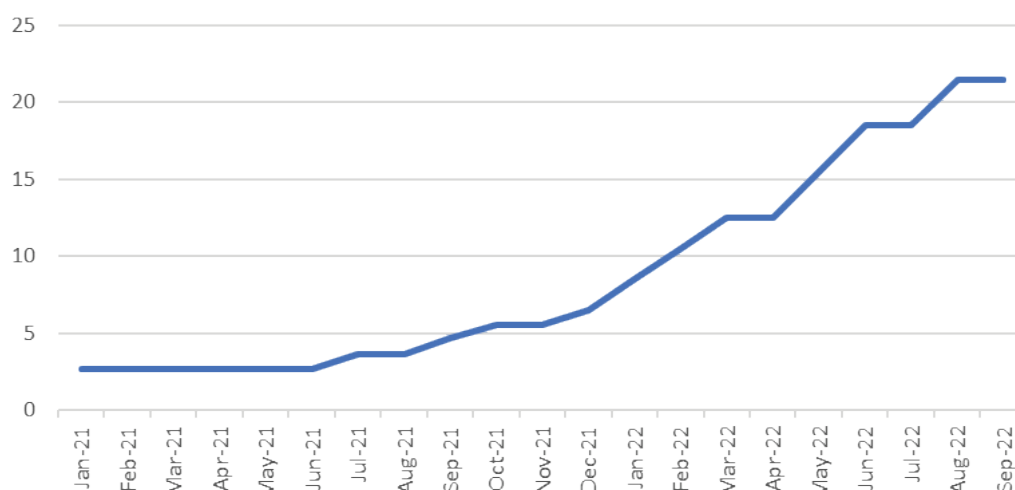
Source: National Bank of Moldova (NBM), 2022. *NBM Interest rates*. Chisinau. https://www.bnm.md/en/content/nbm-interest-rates?base_rates_full.

Pests and diseases

No major outbreak of pests and diseases on crops and livestock were reported in 2022. Dryer than-average weather conditions reduced the pressure of diseases on crops. Yet, higher-than-usual aphids' infestations were reported on apple trees, sunflowers, peas and vegetables (Edinet, Briceni, Cahul *rayons*). The mission frequently observed the presence of western corn rootworm (Singerei, Stephan Voda, Causeni *rayons*) and European corn borer in the field. Codling mouth infestation remained within normal occurrences for both walnuts and apples.

In 2022, sporadic outbreaks of Avian Flu (H5N1) affected household backyard producers in three *rayons*; Hiriseni Village in Telenesti *rayon*, Rezina Village in Unghen *rayon* and Albinetul Vechi Village in Falesti *rayon*. Approximately 7 000 birds died. Stamping out measures were implemented.

African swine fever (ASF) was notified for the first time in September 2016. In 2022, three outbreaks of ASF were registered: the first cases refer to wild boars in the area of Bulboaca, Anenii Noi *rayon*; the second case to domestic pigs in a household in the village of Ciutulesti, Floreşti *rayon* and a third case in the village of Zirnesti, Cahul *rayon*. According to NFSA, mitigation measures were rapidly implemented in accordance with the EU's directives and the situation is under control.

Rearing livestock in households' backyard is common in villages. Backyard pigs are usually slaughtered at home. Backyard pig meat shall enter the national market only when brought to a slaughterhouse. However, local markets and backyard farms visited by the mission indicate that meat of home slaughtered pigs is, at times, traded in the domestic market. The backyard livestock sector represents a significant biosecurity challenge.

Area planted and harvested

The area planted and harvested is estimated by the NBS. The methodology differs depending on the producers' category. For larger farmers (>10 hectares) and agriculture enterprises, the area planted is estimated through self-reporting on a quarterly basis. For smallholder farmers (<10 hectares) and household backyard garden, the area planted is estimated through quarterly sample survey conducted by the NBS enumerators at the *rayon* level.[11] A questionnaire is administered to a sample of small farmers and households' backyard producers drawn from the 2011 agriculture census list. Since then, this list has not been updated and, therefore, it does not capture the profound shift of farm structures resulting from the land consolidation

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[11] Sample size: 1 840 producers for crops and 2 100 for livestock sampled from the 2011 agriculture census list.

Table 6: Republic of Moldova - Annual crop area planted and changes compared to the past five-year average, 2017–2022 ('000 hectares)

	2017	2018	2019	2020	2021	Five-year average	2022	Percent change
Wheat[1/]	335.6	373.1	352.7	311.4	340.9	342.7	329.8	-3.8
Barley[1/]	80.7	65.0	53.1	54.3	64.9	63.6	54.6	-14.2
Maize	481.4	491.4	495.3	546.4	518.1	506.5	526.2	3.9
Total cereals	**897.7**	**929.5**	**901.1**	**912.1**	**923.9**	**912.9**	**910.6**	**-0.2**
Legumes[2/]	34.6	41.2	39.8	32.0	31.1	35.7	32.7	-8.5
Soybeans	34.0	28.0	37.3	29.0	23.2	30.3	24.9	-17.8
Total pulses	**68.6**	**69.2**	**77.1**	**61.0**	**54.3**	**66.0**	**57.6**	**-12.8**
Sunflowers	384.9	364.2	358.6	387.3	389.1	376.8	434.1	15.2
Rapeseeds[1/]	28.9	43.0	38.2	24.4	33.0	33.5	33.5	0.0
Total oil crops	**413.8**	**407.2**	**396.8**	**411.7**	**422.1**	**410.3**	**467.6**	**14.0**
Sugarbeets	23.6	19.8	15.3	13.5	16.3	17.7	11.9	-32.8
Potatoes	19.7	19.0	18.5	22.9	22.2	20.5	22.9	11.9
Vegetables	28.8	28.6	37.0	39.7	37.5	34.3	38.1	11.0

Note: Figures may not add up due to rounding.
[1/] Winter and spring crops.
[2/] Mainly peas.

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chisinau. https://statistica.gov.md/ro. Data provided by NBS to the FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

process (Box 1). As a result, a positive bias is observed on the small farmers' contribution to overall agriculture activities. The NSB provided the mission with the official annual crops planted area estimates for the 2021/22 season (Table 6).[12]

Table 6 compares the 2022 planted area with the five-year average for main annual crops. The total cereal planted area is forecast at 910 600 hectares, at the same level as the past five-year average. Pulses have decreased by minus 12.8 percent with a total planted area forecast at 57 600 hectares. Oil crops have increased by 14 percent compared to the past five-year average with forecast planted area at 467 600 hectares. The reduction in wheat and barley, mostly planted in autumn, reflects the dry conditions of the topsoil layer in most parts of the country during the planting period in September and October 2021. More land than average was, therefore, available for summer crops to be planted in the spring of 2022, mainly maize and sunflowers. The total cereal planted area remained stable (minus 0.2 percent). The higher-than-average price paid for sunflowers in the winter of 2021 led to a 15.2 percent increase in sunflowers planted area compared to the past five-year average. Pulses planted area decreased by 12.8 percent. The decrease in sugar beet and soybean planted areas reflects the reduced demand for these commodities from the processing industry. Table A1a, Annex I presents the changes between 2021 and 2022.

Factors affecting yields

Crop yields are estimated by the NBS, following a similar methodology as for the area planted. For producers' categories, including small farmers (< 10 hectares) and agriculture enterprises, the NBS does not conduct field measurements (crop cuttings) and exclusively relies on yields reported by producers. The methodology is likely to underestimate yields and production. As harvesting of the summer crops typically continues well into the winter,[13] the calendar for the release of the NBS annual agriculture statistics is March of the following year.

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[12] These data are yet to be published and some adjustments are possible.

[13] With a bumper production, the 2021 maize harvesting continued until March 2022, due to a combination of insufficient machinery capacity (combine harvesters) to harvest the bumper crops and wet conditions following above-average rainfall in December 2021.

The Agriculture and Food Industry Directorate in each *rayon* also collate operational estimates from producers and commune administration on crop area planted/harvested, yields and production during the agriculture season. The mission solicited the consolidation of these estimates for all *rayons* and Gagauzia special region. Hence, in order to establish the 2022 crop yields forecasts, the mission triangulated the *rayon* agriculture directorate estimates with field observations, crop cuttings, semi-structured interviews with stakeholders, mid-year projections by the SHS and reports by the *rayon* commissions for emergency situation. Table 7 presents the forecast average yield for annual crops and the changes compared to the past five-year average, while maps in Annex IV present the yield changes between 2022 and 2021 by *rayon*.[xxxiv]

In the spring of 2022, the drought affected the growth of the winter crops in the northernmost areas of the country (15 percent of the territory). In these areas, desiccation of the topsoil layer affected the growth and development of winter crops and delayed soil preparation, sowing and growth of spring crops. In other parts of the country (85 percent of the territory), weather conditions remained satisfactory until May 2022 for the growth and development of agricultural crops as well as for the sowing of spring crops.

In the summer of 2022, the severe lack of precipitation affecting over 75 percent of the territory, coupled with high temperatures in May and June during the crop growth and pollination stages, led to drastic decreases in crop yields in all 32 *rayons* and Gagauzia Region. Maize and sunflower crops were particularly affected, with stunted plant development in the best scenarios and entire crop failures in the worst affected areas. Particularly high temperatures in July coincided with maize panicle formation, flowering and cob formation and affected pollination. Poor cob pollination as well as the absence or stunted cob formation were observed by the mission in all areas visited. In sunflower, stunted growth and poor flowers' formation were often observed. Soybeans and other legumes (peas) were also severely affected. The drought severely dwarfed the growth of sugar beet tubers in the summer. Yet, favourable precipitations in August and September slightly improved the conditions for sugar beet and forage roots.

Winter cereals were also affected, albeit to a lesser extent, during the grain filling period at the end of May and June when the drought was just building up. Overall, the harvest of the 2022 winter cereals was ere conducted in June/July under favourable dry weather conditions. Winter rapeseed was the least affected crop as it reached maturity by early June

Table 7: Republic of Moldova - Annual crop area planted and changes compared to the past five-year average, 2017–2022 ('000 hectares)

	2017	2018	2019	2020	2021	Five-year average	2022	Percent change
Wheat[1/]	335.6	373.1	352.7	311.4	340.9	342.7	329.8	-3.8
Barley[1/]	80.7	65.0	53.1	54.3	64.9	63.6	54.6	-14.2
Maize	481.4	491.4	495.3	546.4	518.1	506.5	526.2	3.9
Total cereals	**897.7**	**929.5**	**901.1**	**912.1**	**923.9**	**912.9**	**910.6**	**-0.2**
Legumes[2/]	34.6	41.2	39.8	32.0	31.1	35.7	32.7	-8.5
Soybeans	34.0	28.0	37.3	29.0	23.2	30.3	24.9	-17.8
Total pulses	**68.6**	**69.2**	**77.1**	**61.0**	**54.3**	**66.0**	**57.6**	**-12.8**
Sunflowers	384.9	364.2	358.6	387.3	389.1	376.8	434.1	15.2
Rapeseeds[1/]	28.9	43.0	38.2	24.4	33.0	33.5	33.5	0.0
Total oil crops	**413.8**	**407.2**	**396.8**	**411.7**	**422.1**	**410.3**	**467.6**	**14.0**
Sugar beets	23.6	19.8	15.3	13.5	16.3	17.7	11.9	-32.8
Potatoes	19.7	19.0	18.5	22.9	22.2	20.5	22.9	11.9
Vegetables	28.8	28.6	37.0	39.7	37.5	34.3	38.1	11.0

Note: Figures may not add up due to rounding.
[1/] Winter and spring crops.
[2/] Mainly peas.

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*.Chisinau. https://statistica.gov.md/ro. Data provided by the State Hydrometeorological Service of the Republic of Moldova (SHS) to the FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

when the drought started building up. As potatoes and vegetables are mostly irrigated, these were, therefore, less affected by the drought. However, potato yields have been on a decreasing trend over the past five years.

Torrential rains and hailstorms in July and August caused localized damages to agricultural crops, particularly south of Chisinau. In other parts of the country, abundant rains slightly improved growth and development conditions for most crops. However, at this time, most of the drought damages on summer crops had already been done.

Other key drivers of yield variations in 2022 include land tillage practices and irrigation. Intensive land tillage (ploughing and harrowing) increases water evaporation from the topsoil. The practice also exposes the arable layer of the soil to erosion from runoffs and thus reduces rainwater infiltration. Chernozem's soils have an excellent water holding capacity up to deep soil layers, which constitutes a crucial asset to agriculture drought resilience. Intensive tillage wastes this potential and exacerbates the negative impacts of droughts. In Edinet, one of the least affected areas, the mission observed well established rainfed Conservation Agriculture fields,[14] which achieved an astounding 8 tonnes/hectare yield in 2022. In comparison, yields measured by the mission through crop cuttings

ranged from 1.9 to 2.8 tonnes/hectare in fields where traditional land tillage practices was applied. This is between three and four times lower than in fields with conservation agriculture.

According to the WB, CIAT and CGIR (2016),[xxxv] irrigation is a valuable measure to mitigate drought risk in the country, increasing yields by 25–50 percent in normal years compared to rainfed cereals, while avoiding losses in drought years. The mission observed that, in 2022, irrigation improved average maize yields by a factor of four in the least affected areas and up to eight in the most affected *rayons*. In one occasion, in Anenii Noi, the mission observed good irrigated commercial maize fields with yields estimated at about 10 tonnes/hectare standing next to entirely failed rainfed crops. Planting distances were also observed to influence yields in 2022. Fields where maize plant density was higher than recommended (70 cm between rows) were more affected due to increased water competition during the driest periods of the year.

Production estimates for the main crops

The aggregated 2022 cereal production is forecast at 1.76 million tonnes, about 45 percent below the past five-year average. Maize production is

Table 8: Republic of Moldova - Annual crop yields and changes compared to the past five-year average, 2017–2022 (tonnes/hectare)

	2017	2018	2019	2020	2021	Five-year average	2022	Percent change
Wheat[1/]	3.73	3.13	3.26	1.90	4.60	3.32	2.6	-20.5
Barley[1/]	3.09	2.73	3.17	2.09	3.90	3.00	2.3	-23.2
Maize	3.70	4.24	4.33	1.87	5.74	3.98	1.4	-63.6
Legumes[2/]	2.00	1.16	1.31	1.04	1.32	1.37	0.9	-35.9
Soybeans	1.40	2.12	1.73	1.26	2.37	1.78	1.0	-43.4
Sunflowers	2.09	2.17	2.27	1.32	2.59	2.09	1.3	-36.1
Rapeseeds[1/]	2.48	2.00	2.03	1.95	2.74	2.24	1.9	-13.2
Sugar beets	36.95	37.29	40.03	32.58	47.84	38.94	22.8	-41.5
Potatoes	10.00	9.22	9.77	7.62	7.51	8.82	5.8	-33.9

Note: Figures may not add up due to rounding.
[1/] Winter and spring crops.
[2/] Mainly peas.
Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

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[14] Thirteen consecutive years with no-tillage.

Table 9: Republic of Moldova - Annual crop production and changes compared to the past five-year average, 2017–2022 ('000 tonnes)

	2017	2018	2019	2020	2021	Five-year average	2022	Percent change
Wheat[1]	1 250.7	1 162.8	1 147.5	569.7	1 565.2	1 139.2	872.0	-23.5
Barley[1]	248.8	175.3	168.1	106.8	253.4	190.5	125.6	-34.0
Maize	1 772.5	2 073.8	2 129.9	785.2	2 792.7	1 910.8	760.7	-60.2
Total cereals	**3 272.0**	**3 411.9**	**3 445.5**	**1 461.7**	**4 611.3**	**3 240.5**	**1 758.3**	**-45.7**
Legumes[2]	69.0	45.6	50.9	27.0	38.8	46.3	28.6	-38.1
Soybeans	46.5	57.7	64.2	33.3	50.5	50.4	25.0	-50.4
Total pulses	**115.5**	**103.3**	**115.1**	**60.3**	**89.3**	**96.7**	**53.6**	**-44.5**
Sunflowers	803.8	788.7	811.4	492.5	1 007.8	780.8	579.0	-25.8
Rapeseeds[1]	71.4	85.6	77.3	47.1	92.3	74.7	65.2	-12.8
Total oil crops	**875.2**	**874.3**	**888.7**	**539.6**	**1 100.1**	**855.6**	**644.2**	**-24.7**
Sugar beets	876.3	707.2	607	423.2	757.8	674.3	271.0	-59.8
Potatoes	197.0	174.8	176.9	171.9	171.9	178.5	133.6	-25.1
Vegetables	309.5	283.3	307.2	226.8	232.0	271.8	215.8	-20.6

Note: Figures may not add up due to rounding.
[1] Winter and spring crops.
[2] Mainly peas.

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*.Chisinau. https://statistica.gov.md/ro. Data provided by the State Hydrometeorological Service of the Republic of Moldova (SHS) to the FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

estimated at 760 700 tonnes, about 60 percent below the average, while wheat production is estimated at 872 000 tonnes, over 23.5 percent below the average. Oilseeds crop production is estimated at 644 200 tonnes, with sunflowers being the most affected crop output of which was about 26 percent below the average. Pulses area cultivated is very limited and in decline over the past years. In 2022, the production is estimated at 53 600 tonnes, about 45 percent below the past five-year average. Potatoes and vegetables production were also affected, but to a lower extent owing to irrigation, and their output were 20 and 25 percent, respectively, below the average. Both potatoes and vegetables production were already on a declining trend over the past years. Table A1c in Annex 1 presents the production changes between 2022 and the 2021 bumper harvest.

Orchards and vineyards

Areas with apples, wine grapes and table grapes have been in continuous contraction over the past five years. The main reason includes the clearing of old and unproductive plantations, which have been replaced by field crops or intensive and super intensive orchards. AIPA provide subsidies for clearing and ploughing old and unproductive orchards and vineyards. The loss of the Russian market for apples is accelerating this trend. Tables 10 to 12 present the forecast average area, yield and production for orchards and vineyards, and the changes compared to the past five-year average. Maps in Annex IV present changes in yields at *rayon* level between 2022 and 2021.

As all intensive and super intensive orchards and vineyards (table and wine grapes) are irrigated, they have been less affected by the drought. Higher than-average temperatures between June to August led to significant dropping of immature fruits. On the other hand, extensive areas of non-irrigated, less intensive apple orchards where significantly affected by the drought. Apple production is forecast at 405 100 tonnes, about 30 percent below the past five-year average.

Plum orchards have been particularly affected as these are more sensitive to high temperatures, with significant immature fruits droppings. Plum production is forecast at 85 700 tonnes, about 30 percent below the past five-year average. Owing to its deep rooting system, walnuts were less

Table 10: Republic of Moldova - Fructiferous orchards and vineyards area and changes compared to the past five-year average, 2017–2022 ('000 hectares)

	2017	2018	2019	2020	2021	Five-year average	2022	Percent change
Apples	52.7	51.1	51.1	50.4	48.5	50.8	46.6	-8.2
Plums	19.1	19.6	19.8	20	19.6	19.6	19.2	-2.0
Walnuts	17.7	18.9	19.1	20.4	21.8	19.6	20.9	6.9
Wine grapes	85.9	92.9	85.0	80.9	74.6	83.9	77.2	-8.0
Table grapes	17.4	17.0	16.8	16.6	14.9	16.5	15.0	-9.4

Note: Figures may not add up due to rounding.
Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Table 11: Republic of Moldova - Fructiferous orchards and vineyards yield and changes compared to the past five-year average, 2017–2022 (tonnes/hectare)

	2017	2018	2019	2020	2021	Five-year average	2022	Percent change
Apples	9.07	12.87	11.83	9.43	13.23	11.3	8.7	-23.0
Plums	4.74	6.65	6.57	5.13	6.88	6.0	4.5	-25.6
Walnuts	0.94	0.96	0.94	0.63	0.75	0.8	0.7	-13.0
Wine grapes	5.34	5.48	5.36	3.77	4.34	4.9	4.9	1.4
Table grapes	5.91	6.93	6.21	4.82	5.75	5.9	5.4	-8.6

Note: Figures may not add up due to rounding.
Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Table 12: Republic of Moldova - Fructiferous orchards and vineyards production and changes compared to the past five-year average, 2017–2022 ('000 tonnes)

	2017	2018	2019	2020	2021	Five-year average	2022	Percent change
Apples	487.2	665.2	610.9	480.4	647.7	578.3	405.1	-30.0
Plums	93.2	132.8	131.9	103.2	136.1	119.4	85.7	-28.2
Walnuts	18.5	20.2	17.8	14.6	16.4	17.5	15.4	-12.2
Wine grapes	457.7	478.4	434.9	462	310.3	428.7	380.0	-11.4
Table grapes	108.7	125.9	111.9	84.4	90.2	104.2	81.1	-22.2

Note: Figures may not add up due to rounding.
Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

affected by the drought and production is forecast at 15 400 tonnes.

The drought-affected fruits calibres of apples, plums and walnuts. Apple producers from extensive orchards have been severely affected and their reduced harvest had insufficient quality to be commercialized for the consumption. For some producers, the loss of income has been significant as the price of apples paid by the juice industry to producers was three to three and a half times lower than what is paid by wholesalers for the retail market. The mission observed low grade harvested apples to be dumped for composting due to lack of market options.

On a positive note, wine producers are anticipating a particularly good vintage in 2022. Indeed, lower-than-average precipitation and high thermal regime during the summer of 2022 were favourable

for the ripening and accumulation of sugar in grapes. Wine grape yields are forecast to be near the average of the past five-years (plus 1.4 percent), but 22.5 percent higher than the 2021 yields (Table A2b, Annex II). Wine grape production is forecast at 380 000 tonnes, over 10 percent below the past five-year average.

Table grape production is forecast at 81 100 tonnes, over 22 percent lower than the past five-year average. The quality of production has been negatively affected by the low calibre of grapes. As a result, a higher proportion than normal of table grapes was sold at discounted prices to vineries.

Livestock and pastures

The mission found pasture lands in poor conditions due to overgrazing and the absence of adequate pasture management across the country. The national legislation includes a ban on pasture land grazing from 8 October 2021 to 6 May 2022. However, cattle, sheep, goats and large birds (geese and ducks) are free range grazing on pasture lands most of the year, except when land is covered by snow. As a result, pasture lands are widely degraded, yielding low quantities of poor-quality biomass, due to limited plant diversity. The mission observed that encroachments of pastures in favour of field crops are further reducing the availability of feed for livestock. The lack of land demarcation is contributing to these conversions of pasture lands. In 2022, the summer drought has exacerbated an already strained situation.

About 72 percent of forage crops are cultivated on small farms and backyard gardens inside[xxxvi] or in proximity of villages. Forage crops are generally not part of the large farms crop rotation system. The mission estimates that alfa-alfa production in 2022 decreased by 44 percent compared to the previous year. The map in Annex IV presents yields of alfa-alfa in 2022 compared to 2021 by *rayon*.

At the time of the mission, most livestock owners had still adequate stocks of animal feeds from the 2021 bumper harvest. In addition, some of the failed maize fields were either harvested for silage or livestock were allowed to graze on drying plants. Favourable precipitations in August and September slightly improved pasture conditions. In this context, most livestock owners have not experienced animal feed shortages by October 2022. However, in most affected areas, animal fodder is likely to be insufficient to cover the needs until the spring and destocking is anticipated this winter. Forage carried over from 2021 has also lower quality due to the long, and sometimes, inadequate storage. Fodder and animal feed prices have increased prohibitively over the past months.

The number of cattle, pigs, sheep and goats has steadily decreased over the past five years. As 80 percent of livestock are kept in backyards and on small farms, migration and aging of the resident rural population are the main structural drivers of this decline. Considering these factors, the mission anticipates that cattle population may fall for the first time under 100 000 heads by the spring of 2023, while the population of pigs, sheep and goats are forecast at about 316 000 and 534 000, respectively. This represents an annual decline of 10.5, 9.3 and 7 percent, respectively, compared to early 2022 (Table 13).

Table 13: Republic of Moldova - Number of livestock, early 2018–early 2023 and changes compared to early 2022 ('000 heads)

	Early 2018	Early 2019	Early 2020	Early 2021	Early 2022	Early 2023	Percent change compared to early 2022
Cattle	167	145	124	109	107	95.4	-10.5
Pigs	406	397	397	340	348	315.6	-9.3
Sheep and goats	843	770	677	617	613	533.8	-7.0

Note: Figures may not add up due to rounding.
Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Milk production

Following the trend of the livestock population, milk production is expected to decrease in 2022. Production is expected to decline further by the end of the year and in 2023. Sheep and goat milk production was affected during the dry and hot summer months as they rely more on fodder from pastures.

Table 14: Milk production, early 2018–early 2023 and changes compared to early 2022 ('000 litres)

	Early 2018	Early 2019	Early 2020	Early 2021	Early 2022	Early 2023	Percent change compared to early 2022
Cattle milk	442.7	373.1	331.7	290.5	264.9	236.0	-10.9
Sheep and goat milk	42.5	38.6	35.6	31.2	27.4	23.2	-15.3
Sheep and goats	843	770	677	617	613	533.8	-7.0

Note: Figures may not add up due to rounding.

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica. gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

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MOST AFFECTED PRODUCERS

The drought affected particularly household backyard producers and small farmers. To cultivate their land, they typically obtain mechanization services from large farmers for major cropping operations, such as ploughing and seeding, while weeding and harvesting are usually done manually. Due to land fragmentation, small and obsolete equipment is often used, resulting in inadequate seed bed preparation and suboptimal seed germination and early plant growth. Shortage of labour force and low use of herbicides often result in widespread presence of weeds that severely affect crop yields, particularly in drought years. Backyard producers and small farmers also lack some basic equipment, such as spray pumps that ensure a safe and proper application of pesticides. Their apple and plum orchards are generally not irrigated and, therefore, bore the brunt of fruit losses. Without proper agriculture extension services, household backyard producers and small farmers continue to lack the appropriate knowledge about production technology and use of agriculture inputs, such as fertilizers.

FOOD SUPPLY/DEMAND SITUATION

Market analysis

Despite the surge in agriculture input prices, mainly fertilizers and diesel, since mid-2021, farm gate prices increased comparatively less, due to increased export difficulties following the start of the war in Ukraine in March 2022 and consequent disruption of trade with the Russian Federation, Ukraine and Belarus. This has significantly affected farmers' crop gross margins. During the past years, the Russian Federation was one of the main importing countries for national agricultural products, mainly apples, plums and grapes. However, on 15 August 2022, the Russian government suspended imports of agricultural products several *rayons*, as well as from the special region of Gagauzia and the municipalities of Chisinau and Balti. By contrast, retail food prices sharply increased in 2022 compared to a year before, reflecting rising transportation and energy costs.

Cereals

Processed products of maize and wheat flour, including *mamaliga* (a porridge made out of yellow maize flour) and bread, are among the main staple foods both in rural and urban areas. Maize consumption is entirely covered by domestic

production, while wheat flour is both locally produced and imported, mostly from Ukraine.

National average retail prices of maize flour and wheat flour, both packaged and non-packaged, increased slightly between January 2021 and February 2022, as ample supplies from the bumper 2021 harvests offset the upward pressure exerted by increasing producing and transportation costs. Between March and July 2022, prices rose by about 10 percent, following the start of the war in Ukraine, which resulted in transportation

Figure 12: Republic of Moldova – Retail and farm gate prices of wheat, 2021–2022
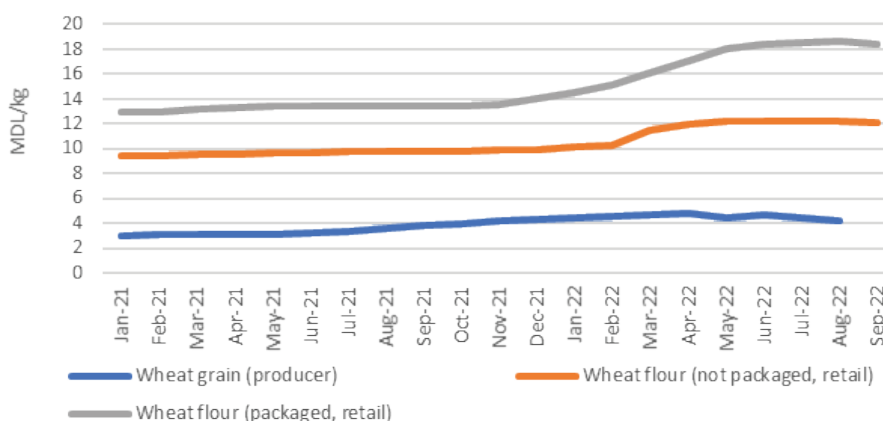
Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

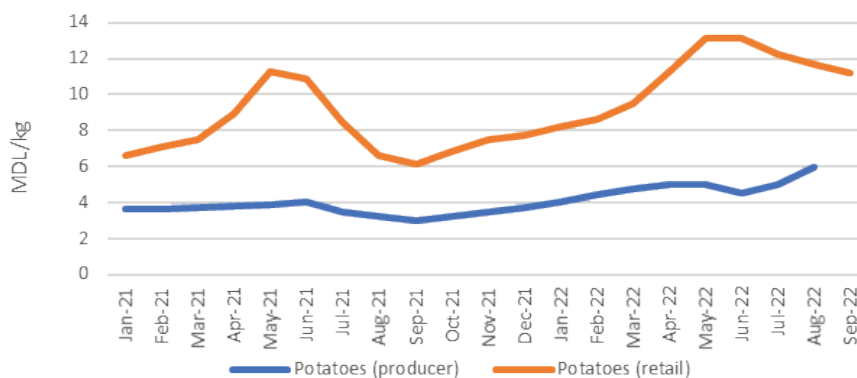**Figure 13: Republic of Moldova – Retail and farm gate prices of maize, 2021–2022**
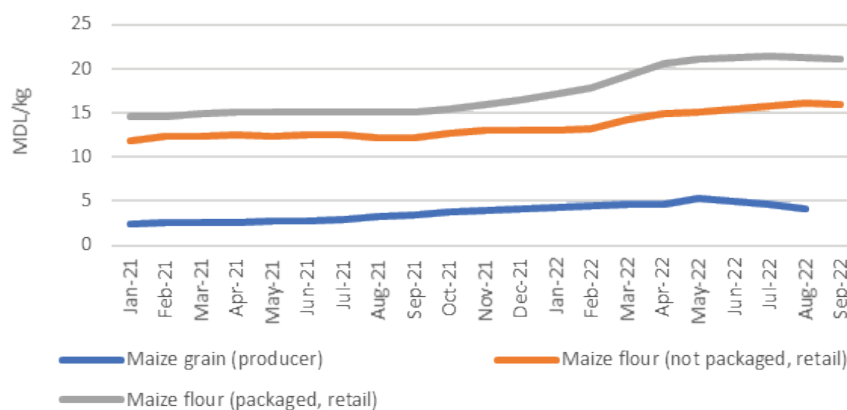
Figure 14: Republic of Moldova – Retail and farm gate prices of potatoes, 2021–2022

disruptions, further increases in fuel prices and fears of imported wheat flour supply shortages, as well as it contributed to the global increase in wheat flour export quotations. In August and September, wheat and maize flour prices remained overall stable, but at levels about 30 percent higher than a year earlier. The yearly increase is mostly on account of rising transportation, packaging and other transaction costs. Indeed, as shown in the figures, price increases for packaged wheat and maize flour accelerated earlier than non-packaged flour, showing the impacts of rising processing costs on retail prices.

Farm gate prices for wheat and maize also increased since mid-2021, and as of August 2022 they were about 15 percent higher year-on-year, amid a reduced output obtained in 2022 and higher production costs.

Potatoes

In general, prices of potatoes, another staple food in the country, show seasonal increases between September and May, before the start of the main harvest, and then begin to decline when the newly harvested tubers arrive on the markets. As shown in Figure 14, between September 2021 and May 2022, the national average retail prices of potatoes rose from about MDL 6/kg to MDL 13/kg, marking an increase of 18 percent compared to May 2021. Prices were stable in June and declined from July onwards, remaining at year-on-year higher levels. Potatoes are mostly produced in northern Briceni *rayon* and are transported to the rest of the country. The reduced domestic production in 2022, due to the drought, and the high transportation costs pushed prices to particularly high levels in 2022. Although farm gate

prices of potatoes also follow seasonal patterns, they are less volatile than the retailer prices. For potatoes, the gap between farm gate and retail prices are particularly ample around harvest time, when retail prices sharply increase before the commercialization of the new tubers, while producer prices show only slight variations.

Meat

Farm gate prices of pigs and poultry have been constantly rising in 2021 and 2022 and increased particularly in the second quarter of 2022, amid high prices of inputs as feed and phytosanitary products. Similarly, retail prices of pork and chicken meat showed

Figure 15: Republic of Moldova – Retail pork meat prices, 2021–2022
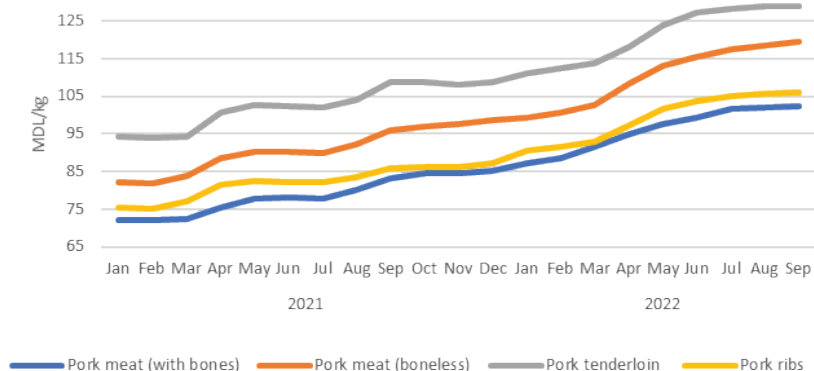
Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Figure 16: Republic of Moldova – Retail chicken meat prices, 2021–2022
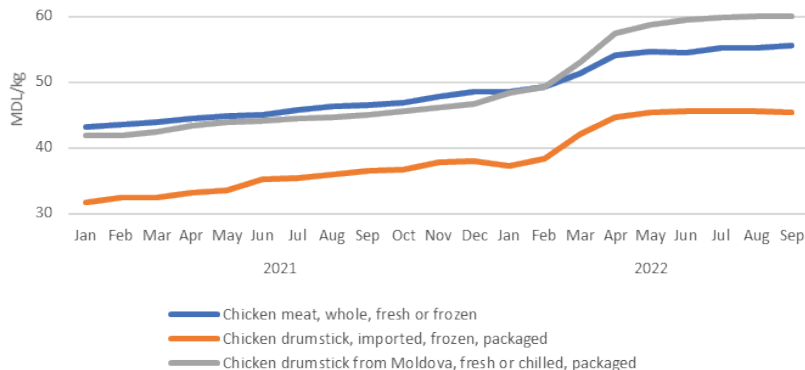
Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Figure 17: Republic of Moldova – Pigs farm gate prices, 2021–2022

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Figure 18: Republic of Moldova – Poultry farm gate prices, 2021–2022

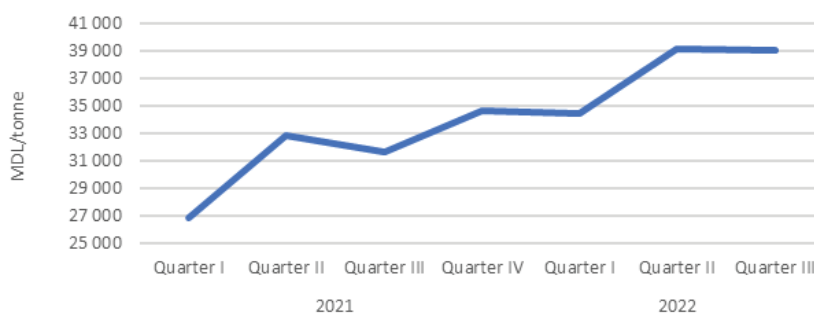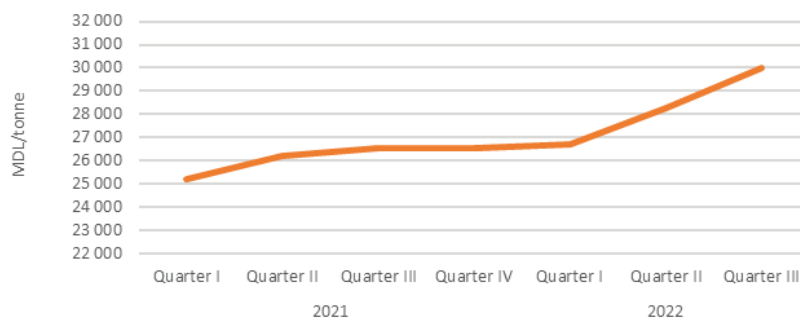an increasing trend since early 2021, reflecting rising producer prices. Higher energy quotations, especially electricity, also contributed to the upward pressure on retail prices. Chicken and pork meat retail prices increased both on average by about 25 percent in the third quarter of 2022, compared to the same period a year before, while the average producer price of poultry and pigs increased by 13 and 23 percent, respectively.

Food supply/demand balance sheet

The national food crop supply/demand balance for marketing year 2022/23 (July/June) is summarized in Table 15. It considers wheat, barley, maize and potatoes (in cereal equivalent) and pulses.

In drawing up the national food crop balance, the following assumptions were made:

➢ **Total food production** is estimated at 1 792 000 tonnes of cereals and potatoes (in cereal equivalent) and 96 700 tonnes of pulses.

➢ **Food use:** Cereals and potatoes consumption is estimated at 552 000 tonnes, using the projected 2023 mid-year population of 2.67 million and a per capita average consumption of about 206 kg of cereals and potatoes, which includes 173.1 kg of wheat, 3.4 kg of barley, 10.9 kg of maize and 18.5 kg of potatoes (in cereal equivalent) as estimated by the NBS for the year 2020.[xxxvii] Pulses consumption is estimated at 21 000 tonnes, using a per capita consumption of 6 kg of legumes and 1.7 kg of soybeans.

➢ **Seed requirements** for the 2022/23 marketing year are estimated at

129 000 tonnes, assuming a similar area planted in 2022/23 as in 2021/22 (slight increase of winter crops) and using an average seed rate of 240 kg/hectare for wheat, 190 kg/hectare for barley, 20 kg/hectare for maize, 750 kg/hectare for potatoes (in cereal equivalent), 300 kg/hectare for legumes (peas) and 100 kg/hectares for soybeans.

➢ **Feed use** is estimated at 1 148 tonnes, mostly maize, wheat and barley, according to the NSB food balance sheet time series.[xxxviii]

➢ **Processing for non-food purposes** was estimated on the basis of the NSB food balance sheet time series[xxxix] and bioethanol export data.[xxxx]

➢ **Stocks:** The mission estimated the opening and closing stocks on the basis of production and trade data (differential between July 2021/June 2022 imports and exports by commodity)[xxxxi] and the NSB food balance sheet time series. Harvesting the 2021 bumper crop lasted until March 2022 for some crops (maize in particular) and, therefore, opening stocks are estimated at a significantly higher level than the forecast closing stocks in mid-2023.

➢ **Post-harvest losses** (from harvesting to processing and during storage) are estimated at 95 000 tonnes, with rates of 5 percent for all crops but potatoes (7 percent).

The anticipated commercial export for the 2022/23 marketing year (July/June) is estimated at 95 000 tonnes of maize, 290 000 tonnes of wheat and 30 000 tonnes of barley, mostly drawing from last year's bumper harvest stocks. These represent

-87, -45 and -67 percent decreases compared to the past five-year averages for maize, wheat and barley, respectively. The anticipated commercial import is 55 000 tonnes of maize, 50 000 tonnes of wheat, 3 000 tonnes of barley and 25 000 tonnes of potatoes (in cereal equivalent) to compensate for the losses in local production quality (wheat for bread preparation) and quantity (barley, potatoes). The mission does not forecast any uncovered food deficits for marketing year 2022/23.

Table 15: Republic of Moldova - Food supply/demand balance sheet, July 2022–June 2023 (in tonnes)

	Wheat	Barley	Maize	Potatoes[1/]	Total	Legumes	Soybeans	Total pulses
Total Availability	**962**	**176**	**1 181**	**58**	**2 377**	**39**	**35**	**74**
Opening stocks	90	50	420	25	585	10	10	20
Production	872	126	761	33	1 792	29	25	54
Total utilization	**722**	**148**	**1 141**	**82**	**2 093**	**37**	**21**	**58**
Food use	462	9	29	50	550	16	5	21
Seed	79	10	11	17	117	10	2	12
Animal feed	102	80	950	6	1 138	4	2	6
Processing for non-food purposes	-	22	1	-	23	-	-	0
Losses	49	9	58	4	120	2	2	4
Closing stocks	30	18	92	5	145	5	10	15
Anticipated commercial exports	290	30	95	1	416	4	15	19
Anticipated commercial imports	50	3	55	25	133	2	1	3
Uncovered deficit	0	0	0	0	0	0	0	0

Note: Figures may not add up due to rounding.
[1/] In cereal equivalent.
Source: FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

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The mission recommends the implementation of a set of four measure, one urgent measure to support the agricultural sector at least until the next harvest in 2023 and three additional mid-term measures to strengthen the resilience of agriculture in the context of mitigating the impact of climate-related risks, particularly droughts, while promoting sustainable agricultural intensification. These measures shall include backyard producers and small farmers, considering their critical national contributions to food security, particularly the livestock sector. The recommendations build on the well-established support mechanisms to agricultural producers through AIPA and MAFI and promote low carbon agriculture.

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Measure 1: Provide urgent and targeted support to secure the next cropping season in the wake of a very severe drought and record high agricultural input prices and credit interest rates:

➢ *Provide temporary and targeted subsidies for critical agricultural inputs, fertilizers in particular.* In the country, the application of 30–40 kg of fertilizers generates on average one additional tonne of cereal yield per hectare. The application of 200 kg of fertilizer per hectare (NPK 16:16:16 and Urea) currently costs about MDL 4 800/hectare, approximately 40 percent of the total crop production cost. The anticipated decrease in fertilizer use in 2022/23 can have a substantial impact on next year's agricultural performance. A switch from the current diesel subsidy would reorient resources to higher impact interventions. Table 16 below suggests that current diesel subsidies may promote unsustainable, high carbon agriculture practices. The mission recommends conducting a feasibility analysis of the fertilizer subsidy scheme to identify adequate modalities.

➢ *Increase the financial support to smallholder farmers and households* owning large livestock to avoid destocking this winter and later introduce milk subsidies as of 2023 to stimulate productivity of the subsector.

➢ *Provide forage crops' seeds to livestock producers before the spring of 2023* to increase feed availability next year.

➢ *Increase subsidies to reduce interest rates for bank credits to the agricultural sector.* AIPA's current reimbursement of 8.4 percent of agriculture credits is insufficient to address the rise in interest rates in the agricultural sector.

Measure 2: Scale up Climate Smart Agriculture technologies and practices that keep water in the soil and promote sustainable intensification:

➢ *Gradually switch to climate smart support*, conditional to crop rotation with at least a minimum percentage of nitrogen fixing pulses[15] and forage crops, and provide bonuses for no-till land preparation and maintaining crop residues on the soil surface.

➢ *Promote Conservation Agriculture through Farmer Field Schools.* No-till agriculture has a high potential. Specific equipment includes

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[15] Nitrogen fixing crops add an extra 10 to 35 kg of nitrogen in the soil for the next crop in the rotation.

conservation agriculture seeders and knife rollers (used only after sunflower crops to chop crop residues before seeding).

➢ *Promote rotational grazing and pasture improvement,* targeting small livestock owners willing to implement climate smart pasture management. Inputs required are low cost and include improved pasture seeds and mobile electric fencing for strip grazing with solar charger.

➢ *Re-establish wind breaks on large plots* to reduce evaporation and wind erosion.

Measure 3: Improve the country's agricultural information systems to provide timely and accurate advisory service to producers and agricultural statistics to decision makers:

➢ *Strengthen the agricultural statistical system toward a more agile and accurate performance measurement.* This includes the implementation of an "area frame" to accurately measure area planted and crop cuttings to independently estimate yields. The current 'list frame' methodology implemented by the NSB is outdated and inept in adapting to rapid changes in the sector. System improvements also include the creation of a farmers' registry that includes small and household backyard producers and the implementation of a complete livestock registry.

➢ *Strengthen the SHS Drought Early Warning System to provide timely and accessible advisories to all producer categories.* This includes the calibration and adoption of drought indicators and models that integrates crop calendars, crop coefficient for phenological phases, satellite imageries and crop forecasts.[16] It also includes an analysis of 30 years climatic of data time series using calibrated drought indicators. This would provide the necessary evidence to fine-tune drought definitions at country level and thresholds by agroclimatic zones. Agrometeorology information dissemination could use various media channels to reach all producers' categories.

Measure 4: Support small farmers and household backyard producers to facilitate their integration to the production, cottage industry processing and marketing systems:

➢ *Promote formal cooperation between small farmers/household backyard producers by subsector/commodity* to facilitate capacity building and resource transfers.

➢ *Provide technical assistance to associated farmers to improve, amongst others,* fodder production and storage, including silage, feed blend production, improved grazing practices, animal biosecurity, cottage industry food processing (dairy, vegetable and traditional products) and linkage services to farmers' markets.

Table 16: Republic of Moldova – Estimated diesel consumption and cost per hectare for various land preparation technologies – without transportation costs to/from agriculture plots (litre/hectare)

	Traditional ploughing/ heavy tillage	Disk ploughing	Conservation agriculture (no-till)
Ploughing/disk ploughing	28–35	20	
Rolling[1/]			5
Harrowing	5	5	
Seeding	5–7	5–7	5–10
Herbicides/pesticides applications (two passages)	3–4	3–4	5
Fertilizer applications (two or three passages)	2	2	2
Harvesting	12–15: maize, 10–12: wheat, 10: sunflower		
Total diesel consumption	**55–65**	**45–50**	**25–35**
Total diesel cost at MDL 27/litre	**1 485–1 755 MDL/hectare**	**1 215–1 350 MDL/hectare**	**675–945 MDL/hectare**

[1/] Only after sunflower.
Source: FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

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[16] FAO developed an agriculture drought monitoring and early warning tool (ASIS-Agriculture Stress Index System).

ANNEXES

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ANNEX 1
Annual crops area planted, yield and production, 2017–2022 and changes compared to 2021

Table A1a: Republic of Moldova - Annual crops area planted, 2017–2022 and changes compared to 2021 ('000 hectares)

	2017	2018	2019	2020	2021	2022	Percent change 2022/2021
Wheat[1]	335.6	373.1	352.7	311.4	340.9	329.8	-3.3
Barley[1]	80.7	65.0	53.1	54.3	64.9	54.6	-15.9
Maize	481.4	491.4	495.3	546.4	518.1	526.2	1.6
Total cereals	**897.7**	**929.5**	**901.1**	**912.1**	**923.9**	**910.6**	**-1.4**
Legumes[2]	34.6	41.2	39.8	32.0	31.1	32.7	5.1
Soybeans	34.0	28.0	37.3	29.0	23.2	24.9	7.3
Total pulses	**68.6**	**69.2**	**77.1**	**61.0**	**54.3**	**57.6**	**6.1**
Sunflowers	384.9	364.2	358.6	387.3	389.1	434.1	11.6
Rapeseeds[1]	28.9	43.0	38.2	24.4	33.0	33.5	1.5
Total oil crops	**413.8**	**407.2**	**396.8**	**411.7**	**422.1**	**467.6**	**10.8**
Sugar beets	23.6	19.8	15.3	13.5	16.3	11.9	-27.0
Potatoes	19.7	19.0	18.5	22.9	22.2	22.9	3.2
Vegetables	28.8	28.6	37.0	39.7	37.5	38.1	1.6

Note: Figures may not add up due to rounding.
[1] Winter and spring crops.
[2] Mainly peas.

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*.Chisinau. https://statistica.gov.md/ro. Data provided by the State Hydrometeorological Service of the Republic of Moldova (SHS) to the FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Table A1b: Republic of Moldova - Annual crops yield, 2017–2022 and changes compared to 2021 (tonnes/hectare)

	2017	2018	2019	2020	2021	2022	Percent change 2022/2021
Wheat[1]	3.73	3.13	3.26	1.90	4.60	2.6	-42.5
Barley[1]	3.09	2.73	3.17	2.09	3.90	2.3	-41.0
Maize	3.70	4.24	4.33	1.44	5.74	1.4	-74.8
Legumes[2]	2.00	1.16	1.31	1.04	1.32	0.9	-33.7
Soybeans	1.40	2.12	1.73	1.26	2.37	1.0	-57.6
Sunflowers	2.09	2.17	2.27	1.32	2.59	1.3	-48.5
Rapeseeds[1]	2.48	2.00	2.03	1.95	2.74	1.9	-29.0
Sugar beets	36.95	37.29	40.03	32.58	47.84	22.8	-52.4
Potatoes	10.00	9.22	9.77	7.62	7.51	5.8	-22.3
Vegetables	28.80	28.60	37.00	39.7	37.50	38.1	1.6

Note: Figures may not add up due to rounding.
[1] Winter and spring crops.
[2] Mainly peas.

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

ANNEX 1 *cont'd.*

Annual crops area planted, yield and production, 2017–2022 and changes compared to 2021

Table A1c: Republic of Moldova - Annual crops production, 2017–2022 and changes compared to 2021 ('000 tonnes)

	2017	2018	2019	2020	2021	2022	Percent change 2022/2021
Wheat[1/]	1 250.7	1 162.8	1 147.5	569.7	1 565.2	872.0	-44.3
Barley[1/]	248.8	175.3	168.1	106.8	253.4	125.6	-50.4
Maize	1 772.5	2 073.8	2 129.9	785.2	2 792.7	760.7	-72.8
Total cereals	**3 272.0**	**3 411.9**	**3 445.5**	**1 461.7**	**4 611.3**	**1 758.3**	**-61.9**
Legumes[2/]	69.0	45.6	50.9	27.0	38.8	28.6	-26.2
Soybeans	46.5	57.7	64.2	33.3	50.5	25.0	-50.5
Total pulses	**115.5**	**103.3**	**115.1**	**60.3**	**89.3**	**53.6**	**-39.9**
Sunflowers	803.8	788.7	811.4	492.5	1007.8	579.0	-42.5
Rapeseeds[1/]	71.4	85.6	77.3	47.1	92.3	65.2	-29.4
Total oil crops	**875.2**	**874.3**	**888.7**	**539.6**	**1 100.1**	**644.2**	**-41.4**
Sugar beets	876.3	707.2	607	423.2	757.8	271.0	-64.2
Potatoes	197.0	174.8	176.9	171.9	171.9	133.6	-22.3
Vegetables	309.5	283.3	307.2	226.8	232.0	215.8	-7.0

Note: Figures may not add up due to rounding.
[1/] Winter and spring crops.
[2/] Mainly peas.

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

ANNEX 2
Fructiferous orchards and vineyards area planted, yield and production, 2017–2022 and changes compared to 2021

Table A2a: Republic of Moldova - Fructiferous orchards and vineyards area, 2017–2022 and changes compared to 2021 ('000 hectares)

	2017	2018	2019	2020	2021	2022	Percent change 2022/2021
Apples	52.7	51.1	51.1	50.4	48.5	46.6	-3.9
Plums	19.1	19.6	19.8	20.0	19.6	19.2	-1.9
Walnuts	17.7	18.9	19.1	20.4	21.8	20.9	-4.0
Wine grapes	85.9	92.9	85.0	80.9	74.6	77.2	3.4
Table grapes	17.4	17.0	16.8	16.6	14.9	15.0	0.6

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Table A2b: Republic of Moldova - Fructiferous orchards and vineyards yield, 2017–2022 and changes compared to 2021 (tonnes/hectare)

	2017	2018	2019	2020	2021	2022	Percent change 2022/2021
Apples	9.07	12.87	11.83	9.43	13.23	8.7	-34.3
Plums	4.74	6.65	6.57	5.13	6.88	4.5	-35.2
Walnuts	0.94	0.96	0.94	0.63	0.75	0.7	-2.1
Wine grapes	5.34	5.48	5.36	3.77	4.34	4.9	13.5
Table grapes	5.91	6.93	6.21	4.82	5.75	5.4	-5.9

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Table A2c: Republic of Moldova - Fructiferous orchards and vineyards production, 2017–2022 and changes compared to 2021 ('000 tonnes)

	2017	2018	2019	2020	2021	2022	Percent change 2022/2021
Apples	487.2	665.2	610.9	480.4	647.7	405.1	-37.5
Plums	93.2	132.8	131.9	103.2	136.1	85.7	-37.0
Walnuts	18.5	20.2	17.8	14.6	18.4	15.4	-16.5
Wine grapes	457.7	478.4	434.9	462	310.3	380.0	22.5
Table grapes	108.7	125.9	111.9	84.4	90.2	81.1	-10.1

Sources: National Bureau of Statistics of the Republic of Moldova (NBS). *2021 Statistical Yearbook of the Republic of Moldova*. Chinasau. https://statistica.gov.md/ro. FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

ANNEX 3
Summary of crop affected areas assessed by the local commissions of emergency situation

Table A3a: Republic of Moldova - Summary of crop affected areas assessed by the local commissions of emergency situation
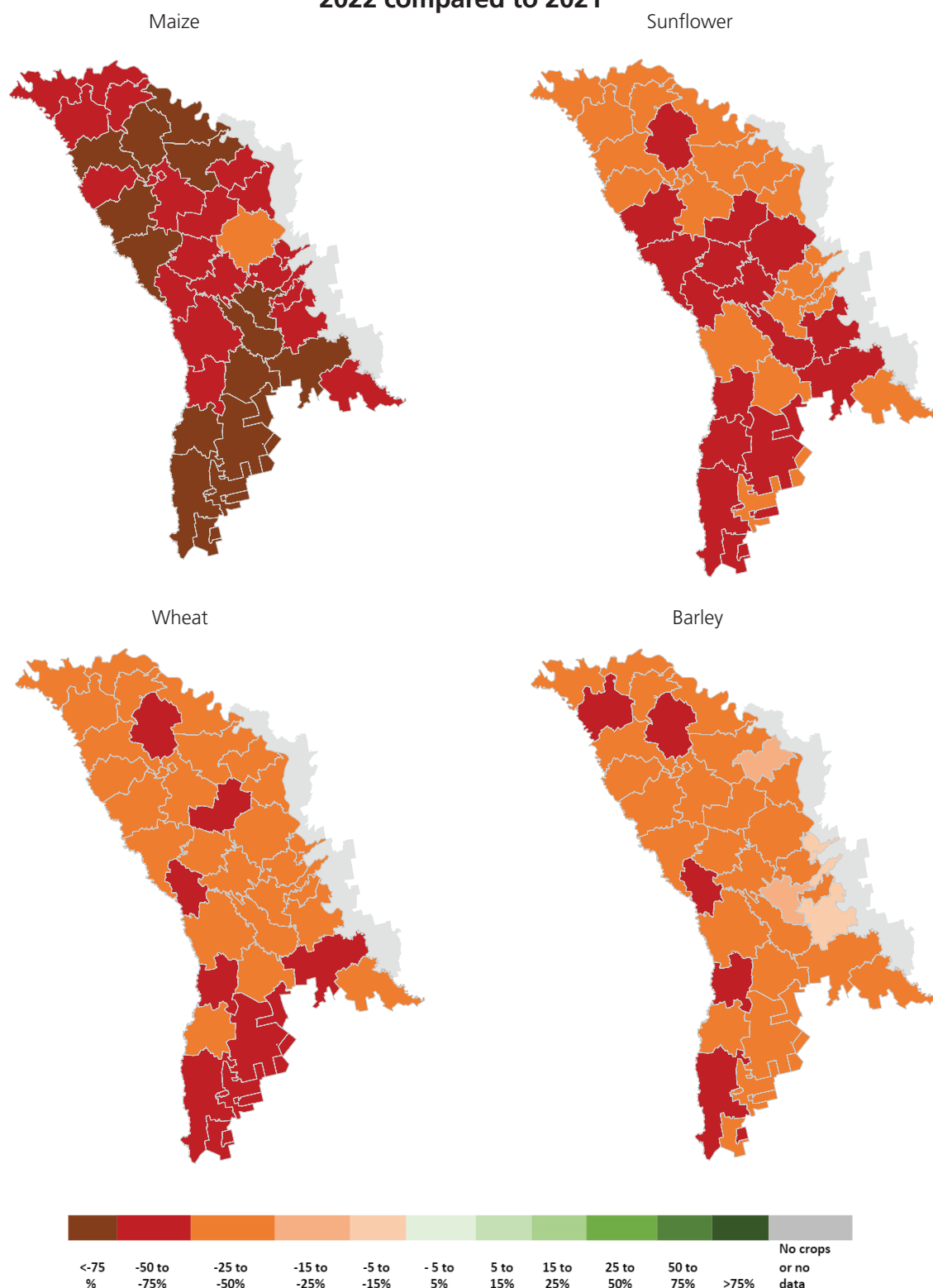
Municipalities/districts	Number of local commissions established (commune level)	Affected area (hectares)
Mun. Balti	1	160
Briceni	0	0
Donduseni	11	3 304
Drochia	16	9 987
Edinet	6	0
Falesti	31	22 745
Floresti	37	16 437
Glodeni	18	12 513
Ocnita	2	1 469
Riscani	22	9 358
Singerei	20	8 258
Soroca	6	1 763
NORTH	**170**	**85 994**
Mun. Chisinau	4	884
Anenii Noi	9	4 906
Calarasi	3	725
Criuleni	7	1 390
Dubasari	0	23
Hincesti	18	7 384
Ialoveni	20	4 850
Nisporeni	2	0
Orhei	13	6 308
Rezina	24	11 193
Straseni	0	0
Soldanesti	20	6 381
Telenesti	19	6 373
Ungheni	26	16 159
CENTRE	**165**	**66 576**
Basarabeasca	5	1 422
Cahul	37	27 615
Cantemir	25	20 393
Causeni	27	24 777
Cimislia	23	24 396
Leova	24	16 351
Stefan Voda	20	16 524
Taraclia	15	5 591
U.T.A Gagauzia	26	34 461
SOUTH	**202**	**171 530**
TOTAL	**537**	**324 100**

Source: Local commissions of emergency situation data summarized by the FAO Crop and Food Supply Assessment Mission (CFSAM), 2022.

Maps A4a: Republic of Moldova - Yield changes (maize, sunflower, wheat and barley), 2022 compared to 2021

Maize

Sunflower

Wheat

Barley

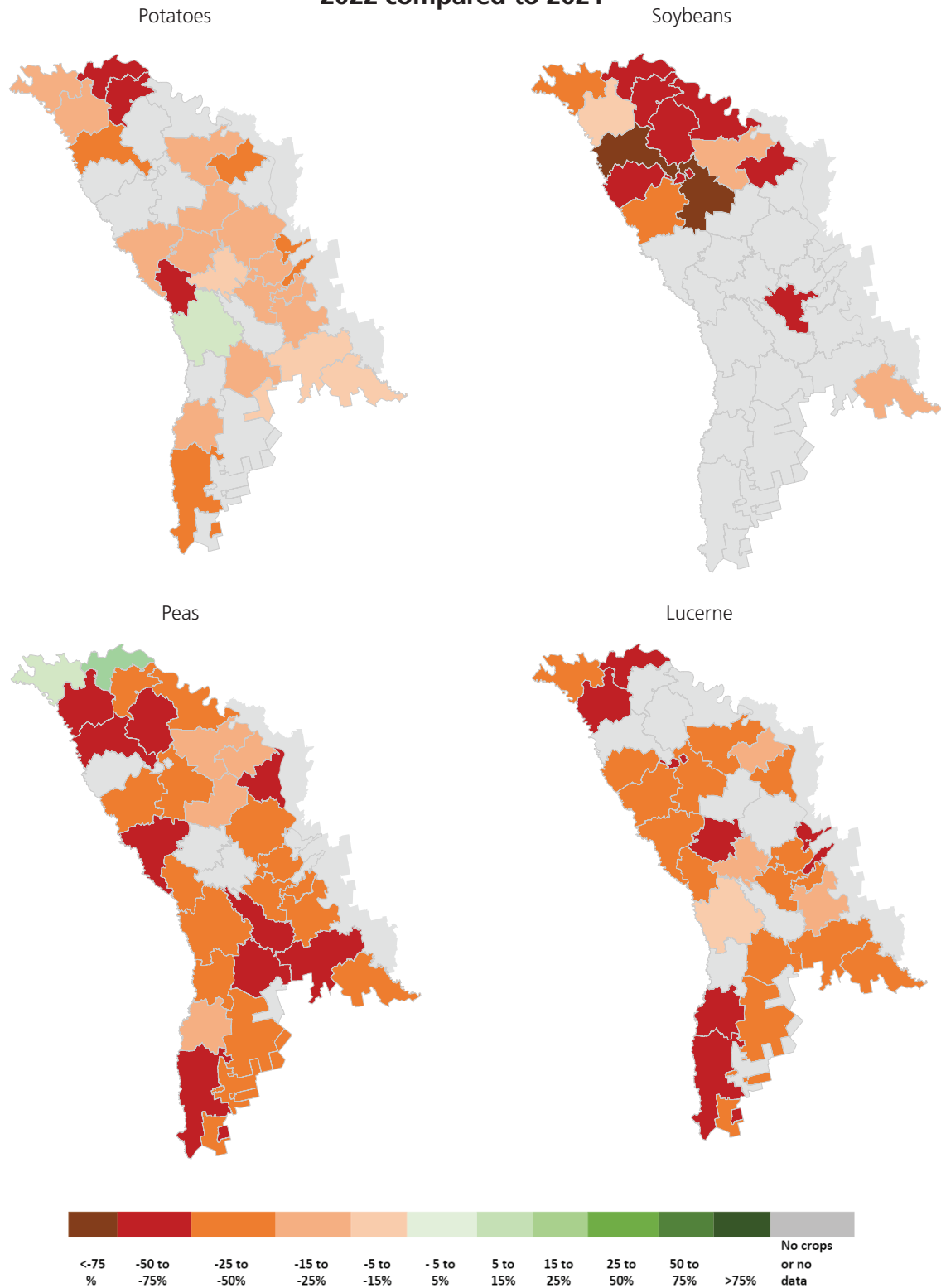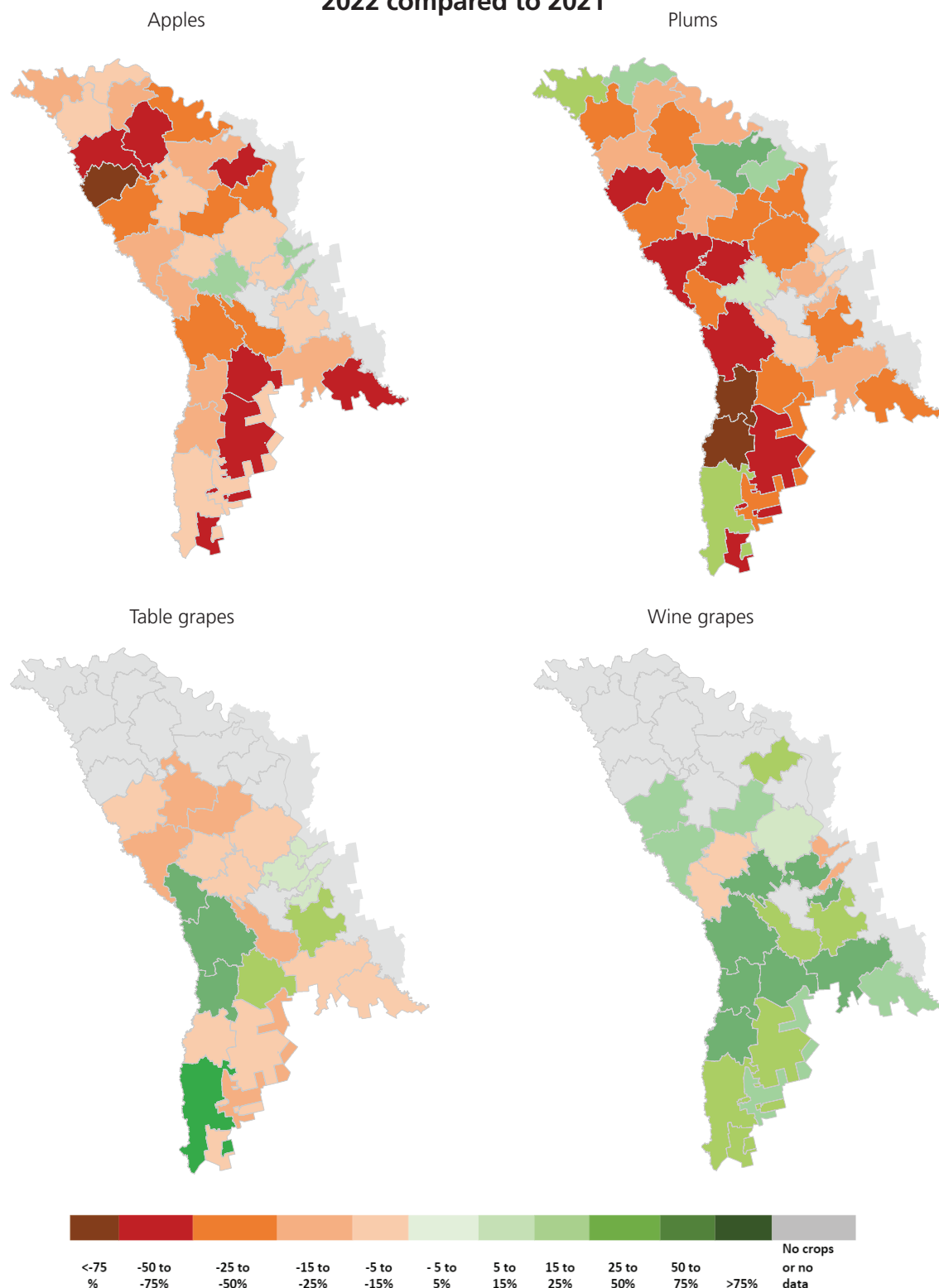| <-75 % | -50 to -75% | -25 to -50% | -15 to -25% | -5 to -15% | -5 to 5% | 5 to 15% | 15 to 25% | 25 to 50% | 50 to 75% | >75% | No crops or no data |

Disclaimer: *The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.*

Sources: Agency of Land Relations and Cadaster of the Republic of Moldova. *National Geospatial Data Fund*. 2019. https://geoportal.md/, cited 15 November 2022. FAO/GIEWS Crop and Food Supply Assessment Mission to the Republic of Moldova (CFSAM), 2022.

Maps A4b: Republic Moldova - Yield changes (potatoes, soybeans, peas and lucerne), 2022 compared to 2021

Potatoes

Soybeans

Peas

Lucerne

| <-75 % | -50 to -75% | -25 to -50% | -15 to -25% | -5 to -15% | -5 to 5% | 5 to 15% | 15 to 25% | 25 to 50% | 50 to 75% | >75% | No crops or no data |

Disclaimer: *The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.*

Sources: Agency of Land Relations and Cadaster of the Republic of Moldova. *National Geospatial Data Fund*. 2019. https://geoportal.md/, cited 15 November 2022. FAO/GIEWS Crop and Food Supply Assessment Mission to the Republic of Moldova (CFSAM), 2022.

**Maps A4c: Republic of Moldova - Yield changes
(apples, plums, table grapes and wine grapes),
2022 compared to 2021**

Apples

Plums

Table grapes

Wine grapes

<-75 %	-50 to -75%	-25 to -50%	-15 to -25%	-5 to -15%	- 5 to 5%	5 to 15%	15 to 25%	25 to 50%	50 to 75%	>75%	No crops or no data

Disclaimer: *The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.*

Sources: Agency of Land Relations and Cadaster of the Republic of Moldova. *National Geospatial Data Fund*. 2019. https://geoportal.md/, cited 15 November 2022. FAO/GIEWS Crop and Food Supply Assessment Mission to the Republic of Moldova (CFSAM), 2022.

ANNEX 5
CFSAM to the Republic of Moldova - Crop and livestock checklist

Region/*Rayon* Format

Sample multidisciplinary interview guide and data recording format

Season: 2021 / 2022	Winter crops **X** / Spring Crops **X**

1. General Information

Rayon (Region):	Key Informants (list):
of households interviewed:	of fields visited:

2. Growing Conditions (Information from Region/Rayon Agriculture Section, farmers, traders and other key informants)

Rainfall

Start (Spring 2022)		**Dry spells / High T°**		**Rainfall amount**	**Compared previous year**
Early ☐	Date	Month	Number of weeks	Below average ☐	Better ☐
Normal ☐				Average ☐	Same ☐
Late ☐				Above average ☐	Lower ☐

Description of the Winter 2021/22, Spring 2022 and Summer/Autumn 2022 seasons:

Field observations:

Irrigation

Type	**Compared to previous year** (amount regularity, timing, costs)	**Observations on the irrigation status**
Canal ☐	Better ☐	
Sprinkler ☐	Same ☐	
Other ☐	Lower ☐	
Field observations:		

3. Most seriously affected areas by drought and other shocks (Information from Region/*Rayon* Agriculture Section and other key informants) - (severity damages: 5 = very severe; 1 = mininimal damages)

Locations	Type of damage (drought, other shocks: (frost, flood, strong wind, etc.)	Total acreage of agriculture land affected (hectare)	Acreage of main crops affected (hectare)	Yield reduction (percent)	Severity of the damages (scale 1 to 5)	Remarks
1.						
2.						
3.						
4.						
5.						

4. Agriculture inputs supply (Information mainly from Region/*Rayon* Agriculture Section, farmers, traders and other key informants).

	Availability			Price/cost			Remarks
	Below normal	Normal	Above normal	Below normal	Normal	Above normal	
Seeds	☐	☐	☐	☐	☐	☐	
Fertilizers	☐	☐	☐	☐	☐	☐	
Agric. Machinery/ mechanisation service	☐	☐	☐	☐	☐	☐	
Fuel	☐	☐	☐	☐	☐	☐	
Labour	☐	☐	☐	☐	☐	☐	
Access to credit/ grants	☐	☐	☐	☐	☐	☐	
Other	☐	☐	☐	☐	☐	☐	

5. Area, yield and production (Information mainly from Region/Rayon Agriculture Section, farmers, traders and other key informants)

Staple Crops		Wheat (Winter/Spring)	Barley	Maize	Sunflower	Potatoes	Pulses
Planted area (hectare)	Current year						
	Last year						
Harvested area (hectares)	Current year						
	Last year						
Yield (kg/hectare)	Current year						
	Last year						
Production (tonnes)	Current year						
	Last year						
Percent losses	Current year						
	Last year						
Factors that affected area, yield and losses (Where this is different by crop, please specify):							

Orchards and Vineyard		Apple	Walnut	Wine Grape	Table Grape	Other	Other
Harvested area (hectares)	Current year						
	Last year						
Yield (kg/hectare)	Current year						
	Last year						
Production (tonnes)	Current year						
	Last year						
Percent losses	Current year						
	Last year						
Factors that affected area, yield and losses (Where this is different by crop, please specify):							

ANNEX 5 *cont'd*
CFSAM to the Republic of Moldova - Crop and livestock checklist

6. Pests and crop diseases (Information from farmers, Agriculture Directorate staff and other key informants)

Specify	Crop affected	Level of damage		
		Mild	**Average**	**Serious**
Remarks (comparison with last year):				

7. Livestock   (Condition: 1 = very poor; 5 = very good. Information from farmers, Agriculture Directorate staff and other key informants)

	Numbers		Condition (1 to 5)	Remarks (specify condition and reasons if decrease/ increaser compared to last year, type of diseases, etc.)
	2021	**2022**		
Cattle				
Pigs				
Sheep and goats				
Horses				
Poultry				

8. Pasture and water for livestock   (Condition: 1 = very poor; 5 = very good. Information from farmers, Agriculture Directorate staff and other key informants)

	Condition (1 to 5)	Compared to previous year (improved/same/worse)	Remarks
Pasture			

MARKET CHECK LIST

Market status and trends
(Collected from traders, retailers and wholesalers and observations at local/nearby markets)

General Information

Rayon (Region):	Key Informants (list):
of traders interviewed:	of markets/selling points visited:

1. Selling price of main staple foods (MDL/kg) compared to a year before

	Wheat flour	Maize	Barley	Potatoes	Sunflower oil	Pig meat	Chicken meat
Trader No. 1	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?
Trader No. 2	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?
Trader No. 3	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?
Trader No. 4	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?	YOY change: Why?

2. Traders' observations: Current (2022/23) marketing season compared with last year (2021/22)

Lately, have you faced reduced availability of any commodity compared to last year? If yes, which ones?
What are the main reasons for this lack of availability?
Do you foresee shortages of any commodity for the coming 6 months? If yes, do you have any plan to cover these shortages?

ANNEX 5 *cont'd*
CFSAM to the Republic of Moldova - Market checklist

Rayon:		City:	

	DAILY/FARMERS/CITY market/store:	
	List most important items sold in the market and their price/unit

List of items *(list any other items as well)*	Availability • Below Average = **BA** • Average = **A** • Above Average =**AA**	Price	Unit
Wheat flour			
Maize			
Buckwheat			
Potatoes			
Sunflower oil			
Pig meat			
Chicken meat			
Pulses			
Apples			
Walnuts			
Table grapes			
Wine grapes			

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