



**TRANSNATIONAL INTEGRATED MANAGEMENT OF WATER
RESOURCES IN AGRICULTURE FOR EUROPEAN WATER
EMERGENCY CONTROL (EU.WATER)**

Priority Axis: Protection and Improvement of the Environment

Area of Intervention: A.O.L. 1.2 Improve integrated water management and flood risk prevention

Project Duration: 36 months

Summary of the Regional Report for the collected information: Odessa region, Ukraine (in English)

WP3: Knowledge capitalization and sensitive area maps

Act 3.2: Organization / rationalization of data concerning the available information, deliverables and guidelines about water management in agriculture (relevant normative frameworks & agronomic features included)

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Odessa region is located on the South-West of Ukraine, and occupies an area 33.3 thousand square kilometers (5.5% of Ukraine). The population is approximately 2.4 million people. At the west side the region borders with Republic Moldova, at the north side with Vinnytsia and Kirovograd regions of Ukraine, at the east side with Mykolaiv region of Ukraine and from the south side with Romania and the Black sea. In terms of physical-geographic zoning of Ukraine the region is located within the Forest-Steppe zone (northern part of the region) and two subzones of Steppe (central and southern parts of the region) physical-geographical zone.

Relief of the territory is flat. The elevations change from 281.3 m in northern part to -4 m on south shore of the Khadzybey estuary of the Black sea (near Odessa city). Greater part of the region (its South and Center) lies within the limits of the Black Sea (Prychernomorska) Lowland. Northwards between the rivers Danube and Dniester there is the spurs of Upland Codry (maximum elevation equals 232 m), and between the rivers Dniester and Tylihul (Tiligul)– spurs of Podolia Upland (with maximum elevation 281.3 m).

The climate is temperate continental with mild winters, hot summers and generally dry, especially in southern parts of the region. The average annual air temperature within the Odessa region increases from 8.1-8.3°C in the north to 10.6-11.1°C in the south. Rainfall amount generally decreases from north to south, reaching the smallest values on the Black Sea coast. According to data of meteorological observations in northern part of the region average for climatic period (1961-1990) annual precipitation equals 525-575 mm, in the central and southern parts - 475-525 mm, in the coastal zone - 400-450 mm. In the region dominated precipitation of warm period. Potential evapotranspiration calculated by the complex method of M.I.Budyko, varies from 800-850 mm in the north to 950-1000 mm in the south. The highest values of potential evapotranspiration are characteristic for the warm period of the year, in the south of the region they are in 2-3 times higher than the corresponding values of precipitation. In this regard, Odessa region is located in the zone of risky agriculture due to droughts.

The soil cover is dominated by black soils (chernozems) of heavy texture (silty clay or sandy clay and clay) on loess, which are characterized by high natural fertility. Besides chernozems within the bottomlands of river valleys meadow-chernozemic, meadow, meadow-boggy and bog and soddy soils are widespread. On the coast of the Black sea solonetz soils occupy considerable areas. Organic matter content in the soils decreases from a north to the south in accordance with the increase of droughty of climate. Within the Forest-

Steppe zone and North-Steppe subzone chernozems medium humus (>6%) are prevailed, on the south of region within the Middle Steppe subzone chernozems meagre (3-6%) and weakly (< 3%) humus are dominated.

The region is characterized by considerable distribution of soil erosion processes. Presently near the half (48% or 1241.5 thousand ha) of agricultural lands of the region are eroded, including 35% of middling and strongly washed off soils. Within limits of the region over 1100 ravines are placed by an area 13.7 thousand ha.

In terms of soil classification USDA, the vast majority of soils of the Odessa region in granulometric composition (texture) belong to the heavy soils (sandy clay, silty clay, clay). On a north-west and, especially, on the south-west of the region, between Danube and Dniester rivers, moderate heavy soils (clay loam, sandy clay loam, silty clay loam) are widespread. More light soils occupy a small area within the bottoms of river valleys and on the coast of the Black sea.

The region belongs to the intensive agriculture area. Of the total area of 3331.3 thousand hectares, agricultural land covers 2661.6 thousand ha or 79.9% of all region's area. In composition of agricultural lands the area of plough-land is 2067.6 thousand ha (62.1% of the region's area and near 78% of agricultural lands), haymakings and pastures – about 408 thousand ha and gardens and vineyards – about 90 thousand ha. Forests occupy 223.9 thousand ha, bogs and boggy lands – 72.2 thousand ha, internal waters – 211.8 thousand ha, built-up lands – 128.2 thousand ha. Agricultural specialization of the area - corn, sunflower and other oilseeds, vegetables, grapes and fruits. Corn cultures (wheat, barley, rye, maize) prevail in the structure of sowing areas.

There are three big rivers within the limits of the region - Danube, Dniester and Southern Buh, about thirty small rivers, 58 reservoirs with a volume of water from 1 to 100 million m³ and the total area of water table of 58,799 ha, 37 lakes with a total water table area of about 73,400 hectares and about 940 ponds with a total water table area more than 12,200 hectares.

In the region there are 58 irrigation systems, most of which was built in 60 th - 80 th years of last century. The total area of irrigation systems equals 226,861 hectares, the total length of irrigation network – 5,388.1 km. Irrigated land almost entirely (95%) are located on the south and south-west of the region. Sprinkler irrigation with using a different sprinkling machines is the predominant method of irrigation in the region, although there are irrigation systems where are used surface irrigation methods. From a total area of irrigated lands, which exceeds 200 thousand hectares, due to economic difficulties in the past two decades in the

m)	16
ation (mm)	14
(°C)	12
	10

country actually are irrigated only 30-50 thousand hectares.

In the hydrogeological relation the region belongs to the north wing of the Black Sea artesian basin, which is characterized by monocline nature of lying of sedimentary rocks of different ages. Ground water is distributed in the deposits of all stratigraphic systems - from Archaean-Proterozoic to modern structures. Unconfined groundwater is contained in rocks of different genesis: alluvial, aeolian-deluvial, alluvial-deluvial, marine, estuary and other. Depth to groundwater in the valleys and floodplains, as a rule, is 0-3 m, on the watersheds – from 3-5 m up to 20 m. Aquifer of eolian-deluvial deposits and aquiferous layer of modern alluvial and alluvial-delyuvial deposits are the largest groundwater aquifers in the region.

In total mineralization and chemical composition the groundwaters of the region is quite diverse. Thus, the total mineralization varies within 0.5-3.0 g/L, and total rigidity - from 8 to 25 mmol/L. By macrocomponent composition along with hydro-sulphate waters frequently are found sulphate and chloride-sulphate calcium-sodium and sodium water.

Groundwater in the region is classified as not protected from surface pollution. They are largely polluted by biogenic substances, pesticides, heavy metals. The most significant is the pollution by nitrogen compounds, especially by nitrates. On the average water of every two wells from five does not meet the current standard by the content of nitrates (not more than 45 mg/L). In some regions, particularly in the southwest part of the region, almost in 85% of the wells the content of nitrate is exceeded the standard. Nitrogen fertilizers as well as the places of storage of fertilizers, livestock farms and complexes and dumps of solid waste are the main sources of nitrogen pollution both groundwater and surface water in the region.