

# **NATO NATO CCMS Pilot Study Meeting**

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# Geographical Peculiarities of Moldova

- Geographic coordinates: 45°28' - 48°28' N, 26°40' - 30°06' E

## Area:

total: 33,843 sq. km

land: 33,371 sq. km

water: 472 sq. km (main rivers: Danube, Nistru, Prut, Raut; main lakes: Beleu, Bic, Dracele)

Population: 4,264,300 inh. (126,2 inh./1 sq. Km)

Land boundaries: total: 1,389 km

border countries: Romania 450 km, Ukraine 939 km

# LAND USE

arable land:	53%
permanent crops:	14%
permanent pastures:	13%
forests and woodland:	9%
others:	11%

**Soils:** chernozemic (black soil), podzolic (forester soil)

**Flora:** 2300 species of wild plants (oak, beech, maple, linden)

**Fauna:** 68 species of mammals (fox, roe buck, deer, wild boar),  
270 species of birds and more than 10 thousand species of  
invertebrates

**CHISINAU Capital Of the Country:**



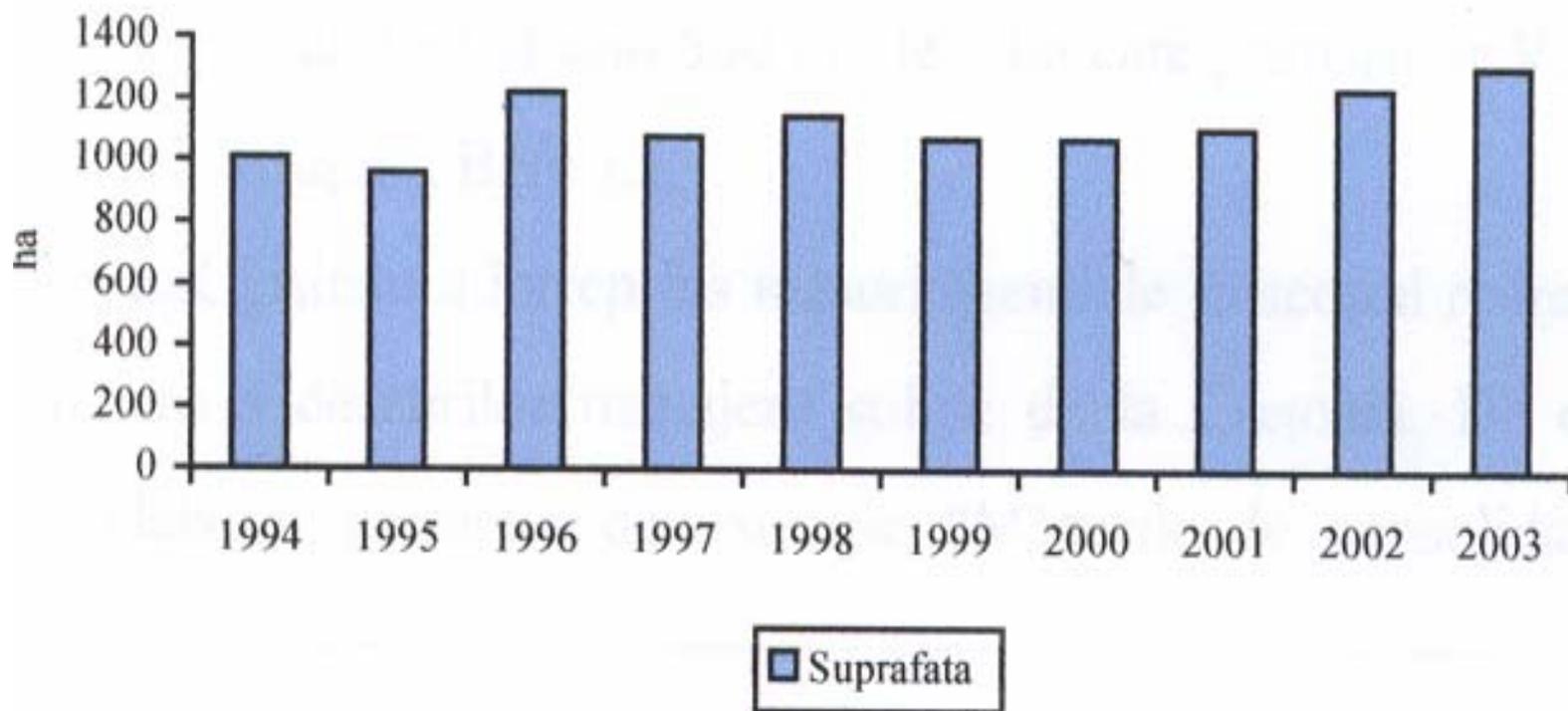
# CHISINAU-THE CAPITAL OF THE REPUBLIC OF MOLDOVA

- *Geographic position: latitude 47<sup>0</sup>2<sup>1</sup> North and longitude 28<sup>0</sup>50<sup>1</sup> East.*
- Chisinau is a significant administrative, political, economic, scientific, cultural and touristic centre of the Republic of Moldova. The first historic record of the name Chisinau goes back to July 17 1436. The name derives from a word meaning "spring, pump, pipe".  
The city is located on seven hills and stretches over 120 km<sup>2</sup>. The population of Chisinau is over 752 thousand. Chisinau is crossed by two rivers - the Bic and Isnovat. The climate is moderate continental. The City is divided into 5 sectors: Centre, Buiucani, Botanica, Riscani and Ciocana. The Greater Chisinau area comprises 18 territorial administrative areas: 1 municipality, 6 towns, 8 communities and 3 villages. The local administrative state body is the City Hall of Chisinau.

# Waste , Noxious Substance Management.

- For domestic waste neutralization the Republic of Moldova has 43 dumps with total surface (in conformity with inventory work accomplished by Ecological Agencies) around 1304 ha. Total volume of domestic wastes compile roughly 25 ml. tons.
- Non authorized waste dumping 1077 sites covering in total on surface around 661,35 ha. compiling approximately 62 % from total existed dumping sites in Moldova.
- Among toxic residuals with diverse compounds and origin the following should be listed:

## Surface Dynamic of Waste Dumping in Moldova tons per year.



**Fig. 5.10. Dinamica suprafețelor rampelor de depozitare, (ha)**

# Toxic Residuals

**Among toxic residuals with diverse compounds and origin the following should be listed:**

- I class of toxicity – wastes containing cyanide – 6372,9 tons,
- II class of toxicity- wastes containing vanadium – 657,7 tons,
- containing petroleum products – 396,0 tons,
- III class of toxicity –oil products residuals – 320, 1 tons,
- IV class of toxicity containing heavy metals (electro plating industry) –1506,4 tons
- Etc.

**Compiling around 12 000 tons.**

## *The major disadvantages of landfill :*

- The major potential risks for polluting water resources
- The potential risks of contaminating the soil
- The generation of landfill gas i.e. methane and carbon dioxide
- Potential human exposure to volatile chemicals
- Smell, vermin and fire
- Destruction of natural /virgin sites
- Long term and cost intensive clean- ups remediation and monitoring (aftercare, close –up)

# Advantages

➤ *Meanwhile landfill in our conditions has several advantages:*

- **It is not unduly capital intensive disposal method**
- **It is widely available**
- **It is comparatively insensitive to day –to day variations in the quantity and nature of the wastes deposited.**
- **It is appropriate in a wide range of circumstances (equipment, technology and skills are available virtually at the local levels).**

## OPERATIONAL GUIDELINES FOR LANDFILL SITE

- As a result of serious environmental and health Moldova Government have introduced the specially engineered landfill concept as follows:

Proper site selection, design of the landfill, control and management of operations, control on input wastes, installation of appropriate means for avoiding leachate outside the fill and reducing escape of landfill gas would be necessary to minimize the potential harmful effects of a land filling on public health and the environment and minimization of free liquids placed in the landfill as well as minimization of precipitation and run –on into the fills.

# Tintareni Landfill Cap Pilot Study

*Period of operation* – 1990 till present day,

*Location* – Anenii Noi

**History :** At the end of 1998 – first decade of 1999 in the result of abundant rainfalls the accumulated moisture have activated landslides process that crushing 200m of protective dams heavily polluting adjacent soil and underground water resources.

As a result by the municipality was launched on research remediation study and

## *Regulatory Requirements established :*

The following soil proprieties were used to evaluate performance: soil moisture, soil temperature, runoff and erosion, percolation and inter-flow, meteorology, and vegetation.

As a result landfill cover designs was established , a geosynthetic clay liner cover and 259 m drainage systems were provided. Around 55 thousands m<sup>3</sup> of soil were removed and on reservoir 50 m<sup>3</sup> for filtrate accumulation was built up.

For rain fall and surface water evacuation technical measures were provided,

For supervision and control of underground water quality on comprehensive monitoring system was established..

## POSITIVE ACHIVEMENTS

- As stated earlier , that landfill is used as a disposal option for selected hazardous
- wastes providing adequate safety measures including preventive selection and pre-treatment of wastes for minimization of hazard to the environment and human health protection. The minimization of precipitation and run – on into the fills is achieved.

# Bring Your Solutions



# Adequate Safety Measures

- There are , however , a number of hazardous wastes for which mentioned landfill disposal is not appropriate and cannot be recommended for dumping;
- - liquids and materials containing free liquids;
- - highly volatile and flammable liquid wastes;
- - wastes containing mineral oils;
- - strongly oxidizing /reducing wastes;
- - persistent organo-halogen compounds;
- - clinical wastes;
- - shock sensitive explosives;
- - compressed gases
- - highly reactive wastes;
- - volatile materials of significant toxicity;
- - concentrated acids, alkalis; etc.

## End Result and Needs for Technical Cooperation

*Costs: 2 mln 274 thousands Lei or roughly 200 000 USD.*

**Note:** Sadly because lack of money all kind of preventive measures were not finished at the moment.

**Conclusions :** Moldova have faced with great difficulties in ensuring sound and efficient disposal of municipal wastes.

Cooperation among countries is seen as on essential element to aim at the environmentally sound management of landfills.

Training and exchange, sharing of experience, and in particular providing technical and financial assistance to developing countries are considered as an important part of immediate and more long term measures to take.