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für Umwelt, Naturschutz  
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### **Lithuanian National flooding action plan**

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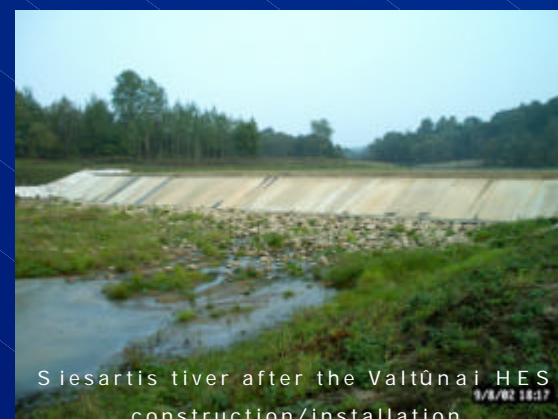
# Lithuanian National flooding action plan

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# 1. National facts on hydrographic network , dams, flooded areas (1)

- 22.2 thous. rivers and streams, total length 76.8 thous.km, 17 rivers > 100 km
- the main rivers
  - the Nemunas -  $Q_{av} = 665 \text{ m}^3/\text{s}$ , RB area  $97.928 \text{ km}^2$
  - the Neris -  $Q_{av} = 189 \text{ m}^3/\text{s}$
- 440 dams with surface area > 5 ha,
- 25 artificial WB with surface area > 100 ha,
- 20 dams included into World Dams Register
- 50 hydroelectric power stations
- Kaunas HE power station&dam - the biggest,  
 $H=20.5\text{m}$ ,  $Q_{av}=287\text{m}^3/\text{s}$ ,  
 $Q_{max \text{ flood}} = 2810 \text{ m}^3/\text{s}$  (once per 100 yr),  
 $Q_{max \text{ flood}} = 4160 \text{ m}^3/\text{s}$  (once per 1000 yr)





# 1. Flooded areas (2)

- Nemunas delta region approx. 40 000 ha (max 60 000ha or 0.92% LT territory) flooded yearly (from Sovietsk, 57km from the mouth), approx. 4000 inhabitants (40 settlements, 700 homesteads) are in danger due to flooding. One of the main reasons of flooding - narrow Klaipeda straight
- Minija RB and other smaller rivers (Sysa, Leite, Gege etc.)
- Some upper parts of the Nemunas river (at Birstonas, Prienai), Neris river (at Vilnius, Jonava), Nevezis (at Kedainiai)
- History of flooding:
  - flooding carries local character only
  - up till now - no serious accidents due to existing polder system
  - the last biggest flooding was in 1958 (1 per 100 yr), with  $Q_{max}=6580 \text{ m}^3/\text{s}$ , and flooded area of  $1300\text{km}^2$



# 1. Flooding in LT (3)

- Flooding causes

- increase of the sediment bed level



cause problems of  
migratory fish,  
navigation

- Measures to avoid flooding

- to regulate depth of river bed/channel
- to build polders
- to determine / delineate dangerous zones by making maps of these zones
- to decrease / regulate economic activity
- to deepen Delta's stretches of the Nemunas river



## 2. National flood forecasting, control and prevention programmes (1)



- Complex programme on water resources for protection and rational use for lower-course of the Nemunas RB and Curonian lagoon (in Klaipeda and Taurage Counties), MoE No.323 of 2002-06-14
- Programme on measures for prevention of flooding and measures to overcome the consequences due to flooding, GR No.1485 of 2002-09-19

## 2. National flood forecasting, control and prevention programmes (2)



- **Complex programme on rational use and protection of water resources of the lower-course of the Nemunas RB & Curonian Lagoon (in Klaipeda & Taurage counties), MoE, No.323 of 2002-06-14**
  - The object: the large Nemunas delta (1075 km<sup>2</sup> incl. Curonian Lagoon, and all potentially flooded areas, polder system exists)
  - Activity programme includes:
    - characterisation of the object of study
    - measures for reduction of pollution
    - measures for problems solving caused by flooding, i.e.
      - delineation of flooded areas by making zoning scheme
      - to set up/definition of the rules for economic activity in the potential flooded zones according the zoning scheme
    - to make monitoring of migratory fish
    - to coordinate economic activities in potential flooded areas
    - to execute public information and awareness programmes

## 2. National flood forecasting, control and prevention programmes (3)



- **Programme of measures for prevention of flooding and measures to overcome the consequences due to flooding, GR No.1485 of 2002-09-19**
  - Responsible institutions - Klaipeda & Taurage County administrators
  - The aim (plan for years 2002-2006): by using legal, technical measures (15 measures)
    - to decrease the damage and economic losses caused by flooding event
    - to preserve human health & welfare
    - to protect the environment from negative impact
  - The tasks:
    - to develop technical and legal basis for the reduction of of damage and impact from flooding
    - to oversee measures to eliminate in a complex (interdisciplinary way the after-effect of flooding)

# 3. National action plan against flooding (1)



- National action plan against flooding, GR No.133 of 2000-02-07, i.e. "State plan for organisation of safety measures and liquidation on causes from flooding in Klaipeda County"
- National Civil safety and rescue system in case of danger of flooding in the lower course of the Nemunas, and the time schedule of actions in the case when flooding occur, O MoD No.1785 of 2002-12-17

# 3. National action plan against flooding (2)



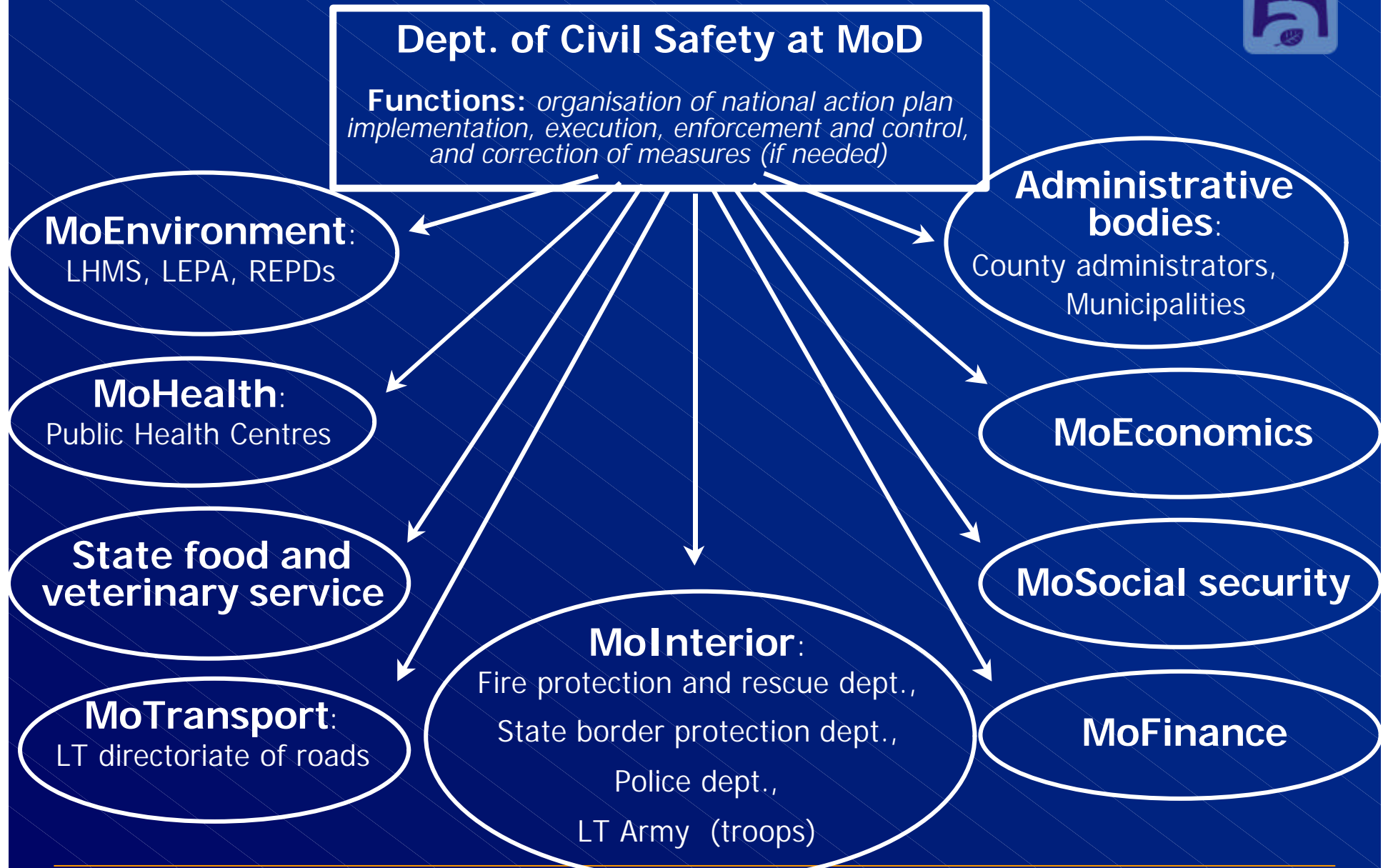
- **National action plan against flooding, GR No.133 of 2000-02-07, "State plan for organisation of safety measures and liquidation of causes from flooding in Klaipeda County"**
  - The aim
    - to foresee protection measures to prepare inhab. and institutions for flooding
    - to use in a rational way the resources and techniques for prevention and stopping of flooding, and if it occurs, - for liquidation/elimination and first aid support to the inhabitants
    - to determine precisely functions and responsibilities of municipalities, county administrators and other responsible governmental institutions in case of flooding event
  - Four stages of action/reaction to flooding are foreseen:
    - preventive measures
    - readiness for flooding
    - actions during the flooding event
    - reconstructive works after the flooding event



### 3. National action plan against flooding (3)

- **National civil safety and rescue plan in case of danger of flooding in the lower course of the Nemunas RB, and the time schedule of actions in the case when flooding occur, MoD No.1785 of 2002-12-17**
  - Responsible institution - Dept. of Civil Safety, MoDefence
  - Action plan (47 detailed actions)
    - actions divided into 3 parts
      - before flooding occur (preparatory work)
        - » signal "P" danger of flooding; 19 actions; ["P"+1 day] - ["P"+4 days]
      - during flooding period
        - » signal "K" critical water level; 18 actions; ["K"] - ["K"+5 days]
      - after flooding
        - » signal "K"; 10 actions; ["K"] - ["K"+70 days]

### 3. Institutions for flood management (4)



### 3. Institutions for flood management (5)



- Department of Civil Safety at Ministry of Defence - to organise prevention of extreme situations
- State fire and rescue Department at Ministry of Interior - to organise of safety and help measures, evacuation inhabitants and their goods from flooding
- LHMS at MoE - to forecast of floods and droughts, and info on water levels
- LEPA at MoE - monitoring of surface water quality and pollution level control
- Public Health Centre at MoH & State food and veterinary inspection - monitoring on drinking water and food safety

# 3. National action plan against flooding (6)



- **Before flooding**

- LHMS, and Silute HM station, at MoE:
  - » check out of techniques/instruments on water level measurement; info on water level
- Dept. Of Civil safety, MoD:
  - » distribution of measures on civil safety from State reserve
- Media (radio, TV):
  - » info on flood prediction data,
  - » info on advises on the use of civil safety measures
- Counties, municipalities & Mo Interior:
  - » transport, spec. inventory&techniques on rescue and for evacuation of inhabitatnts
  - » organise supply of food, drinking water, medicine, and fodder suply to animals
  - » distribution of advisory information on preparatory activities for each inhabitant
  - » organisation and set up of radio forecasting system
- MoTransport:
  - » transport preparation
- LT Army (troops):
  - » to establish contact with the region/county adminsitration
- Klaipeda Public health centre at MoHealth & State food and veterinary service:
  - » to prepare for food and drinking water control

# 3. National action plan against flooding (7)



- **During the flooding - Management centre for extreme situations**
  - LHMS, and Silute HM station, at MoE:
    - » water level measurements 4 times/day
  - Dept. Of Civil safety, MoD & Counties, municipalities :
    - » public info through radio&TV on status and flooding development
    - » information to organisations on flood level, decision on preventive measures planned to be taken
  - LT Army (troops) at Mo Interior:
    - » look/check of flooded areas and indicate what help needed
  - Fire protection and rescue Dept. at MoInterior & MoTransport:
    - » organisation of transportation for evacuation of inh. and their goods from flooded areas
  - LEPA at MoE:
    - » control of water and wastewater quality (control of pollution level)
  - State food and veterinary service:
    - » control and protection from diseases caused by flooding & control of food products
  - Klaipeda Public health centre at MoHealth:
    - » execution of epidemiology control and protection measures
    - » control of drinking water quality
    - » control of actions of health centres
  - MoEconomy: » organisation of food and other goods supply in flooded areas

# 3. National action plan against flooding (8)



## • After the flooding

- Counties, municipalities & Mo Social security and labour:
  - » estimation of material losses due to flooding, estimation of damage costs
  - » calculations of damage costs caused by flooding
  - » social help for people affected by flooding
- MoTransport, Lithuanian directorate of roads:
  - » reconstruction and control of roads after flooding
- MoFinance:
  - » estimation/analysis of proposals on costs needed for compensation of damage caused by flooding
- MoE:
  - » estimation on EIA and damage to environment and supply of money from State reserve
- Klaipeda Public health centre at MoHealth:
  - » chlorination of dug wells after flooding, and
  - » execution of bacteriological and chemical monitoring for drinking water
- MoEconomy & MoTransport & Dept.of Civil safety at MoD:
  - » organisation of reconstruction of electric supply, radio forecasting, water supply and wastewater network systemreconstruction/repairation, polder system development and rehabilitation of transport systems
- Meeting of responsible inst-ions on damage estimation &further reconstructative actions



## 4. International agreements on flood control and forecasting

- Gov. agreement between POL & LT on collaboration and help in case of accidents, disasters, and other emergency cases (*where countries collaborate in case of flooding and droughts forecasting, prevention, control, and overcoming damage caused by the latter*)
- Gov. agreement between LV & LT on collaboration and help in case of natural disasters, accidents and other big emergency situations (Dept. of Civil Safety - responsible)
- Institutional agreement between RUS & LT on monitoring data exchange on the state of water bodies (signed 2002)



The Nemunas river at Kaunas city...

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