

Flood Risk Management Plans 2016-2021



Water Management Directorate
Ministry of Environment and Water



Flood Risk Management

The Assessment and flood risk management in Bulgaria is subject to European Floods Directive (FD), in force from 26.11.2007, transposed into national legislation with the Amendments to the Water Act adopted in August 2010.

Bulgaria implemented the approach of long-term planning, as required by the Directive and as a result for each of 4 river basin districts:

- Preliminary flood risk assessment has been undertaken;
- Areas with potential significant flood risk have been determined;
- Flood hazard maps and Flood risk maps have been prepared;
- Flood risk management plans for the period 2016-2021 have been developed.



Preliminary Flood Risk Assessment (PFRA)

PFRA was made in the period August 2011 – January 2012.

For the implementation of PFRA has been used the developed and approved at national level Methodology for preliminary flood risk assessment:

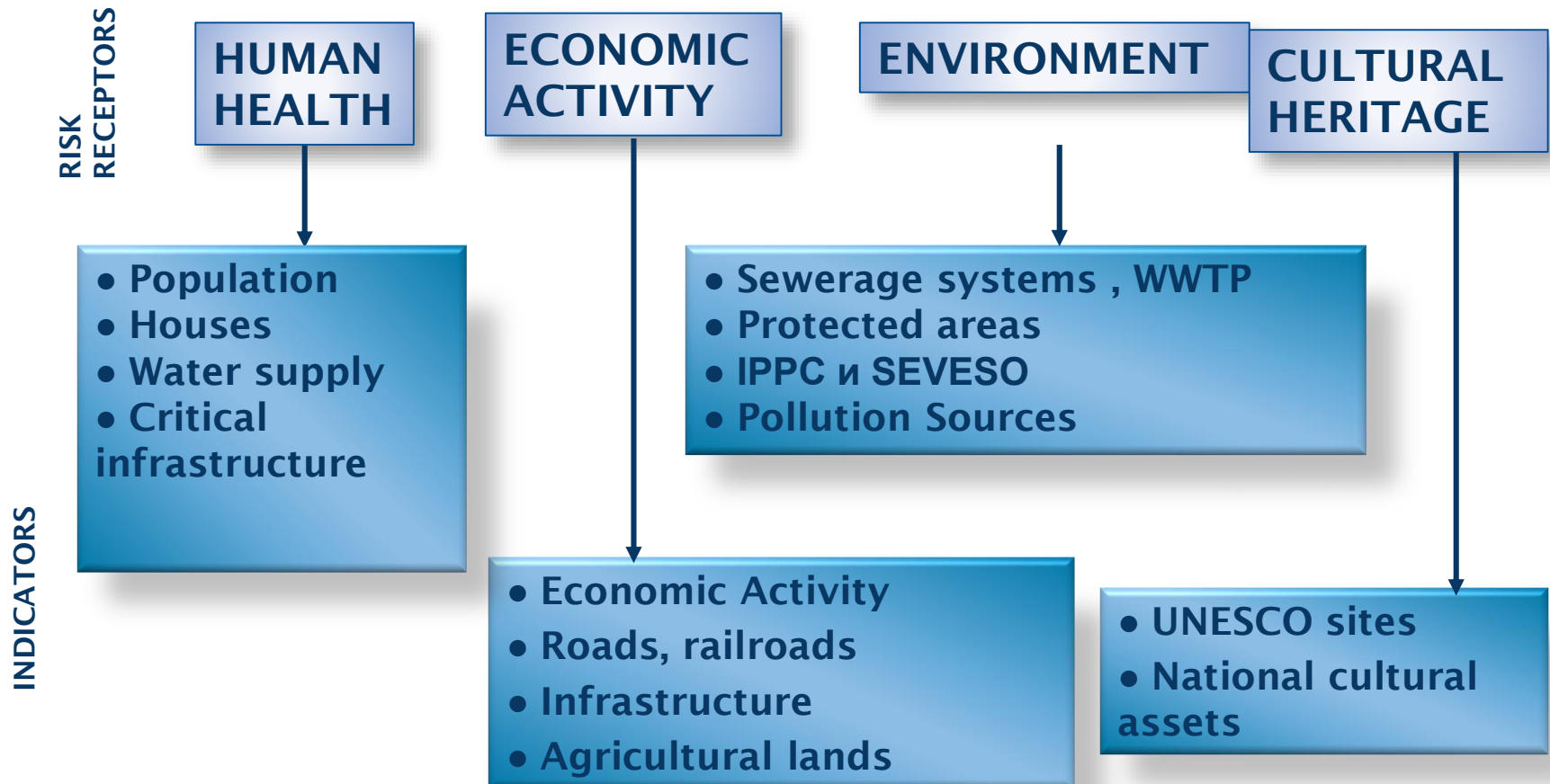
- revision of available and readily derivable information for past floods and adverse impacts they have entailed;
- assessment of the likelihood of recurrence of past floods in the future, incl. potential negative consequences;
- assessment of the potential negative consequences of potential future floods;
- determination of significant past floods and significant potential floods;





CRITERIA per SIGNIFICANCE

FOR THE ASSESSMENT OF CONSEQUENCES OF PAST AND
POTENTIAL FUTURE FLOOD EVENTS





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A total of 1903 past floods have been recorded in the country.

BD	Significant past floods (number)	Significant potential floods (number)
DRBD Danube River Basin Directorate	571	138
BSBD Black Sea Basin Directorate	222	241
EABD East Aegean Basin Directorate	137	153
WABD West Aegean Basin Directorate	98	41
Total	1028	573





Areas with Potential Significant Flood Risk

Delineation of the **Areas with Potential Significant Flood Risk (APSFR)** is based on the results of PFRA and they cover the areas where significant past and potential future floods with significant consequences have been identified.



The APSFRs designated for the country are **116**, with a total length of **3 889 km** incl. 11 regions with a total length of 267 km (sea floods) and the Danube river - 472 km. They cover the territories of **453** settlements and 4 resorts located in 130 municipalities out of a total of 264 or **49 % of the municipalities in the country**, including Sofia.

DRBD → 26 APSFR
L= 1254,5 km

EABD → 31 APSFR
L=1078 km

BSBD → 45 APSFR
L= 915 km

WABD → 14 APSFR
L=641 km



Flood hazard maps and Flood risk maps

Flood hazard maps – covered zones that could be flooded by:

- floods with a low probability, in which the likely recurrence period is greater than or equal to 1000 years;
- floods with a medium probability, in which the likely recurrence period is greater than or equal to 100 years;
- floods with a high probability, in which the likely recurrence period is greater than or equal to 20 years;

Flood risk maps - showing for each flood scenario:

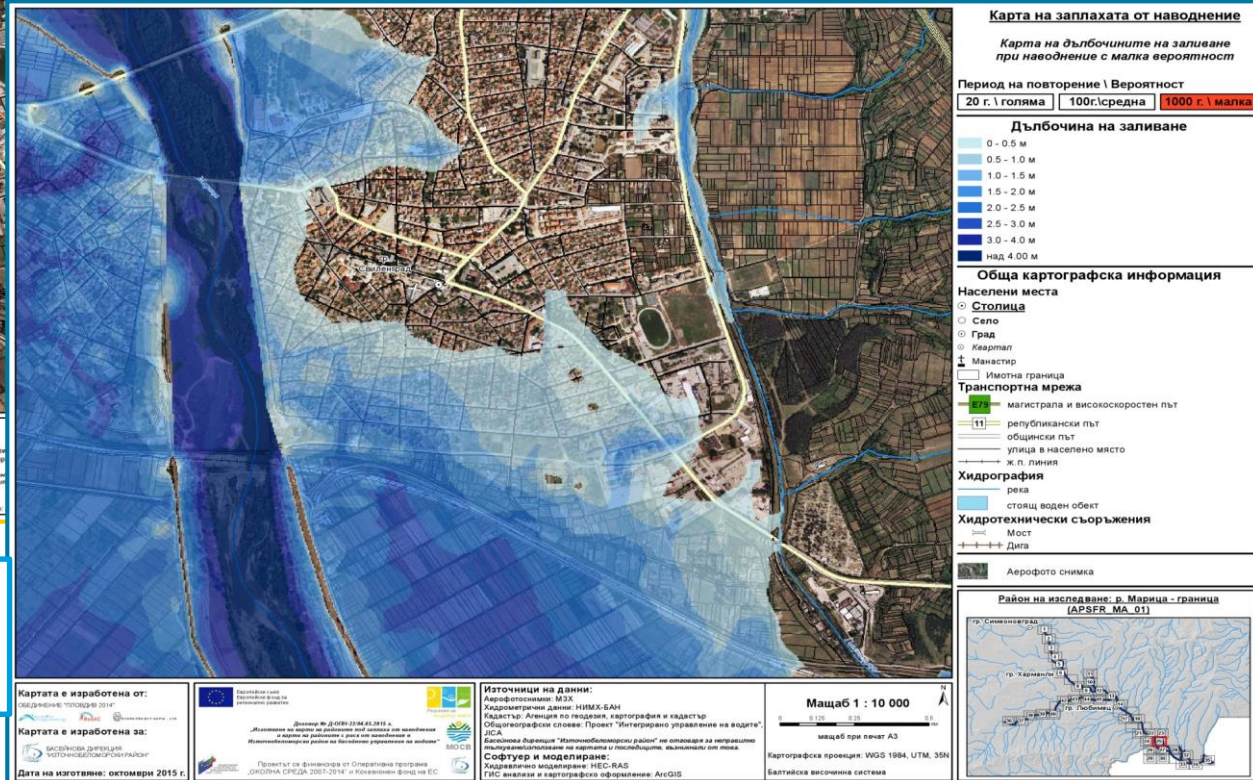
- the indicative number of inhabitants affected;
- the type of economic activity affected;
- location of IPPC installations;
- the impact on WFD protected areas;



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Flood hazard maps

Flood extent for all scenarios with different probabilities – 5%;1%; 0.1%

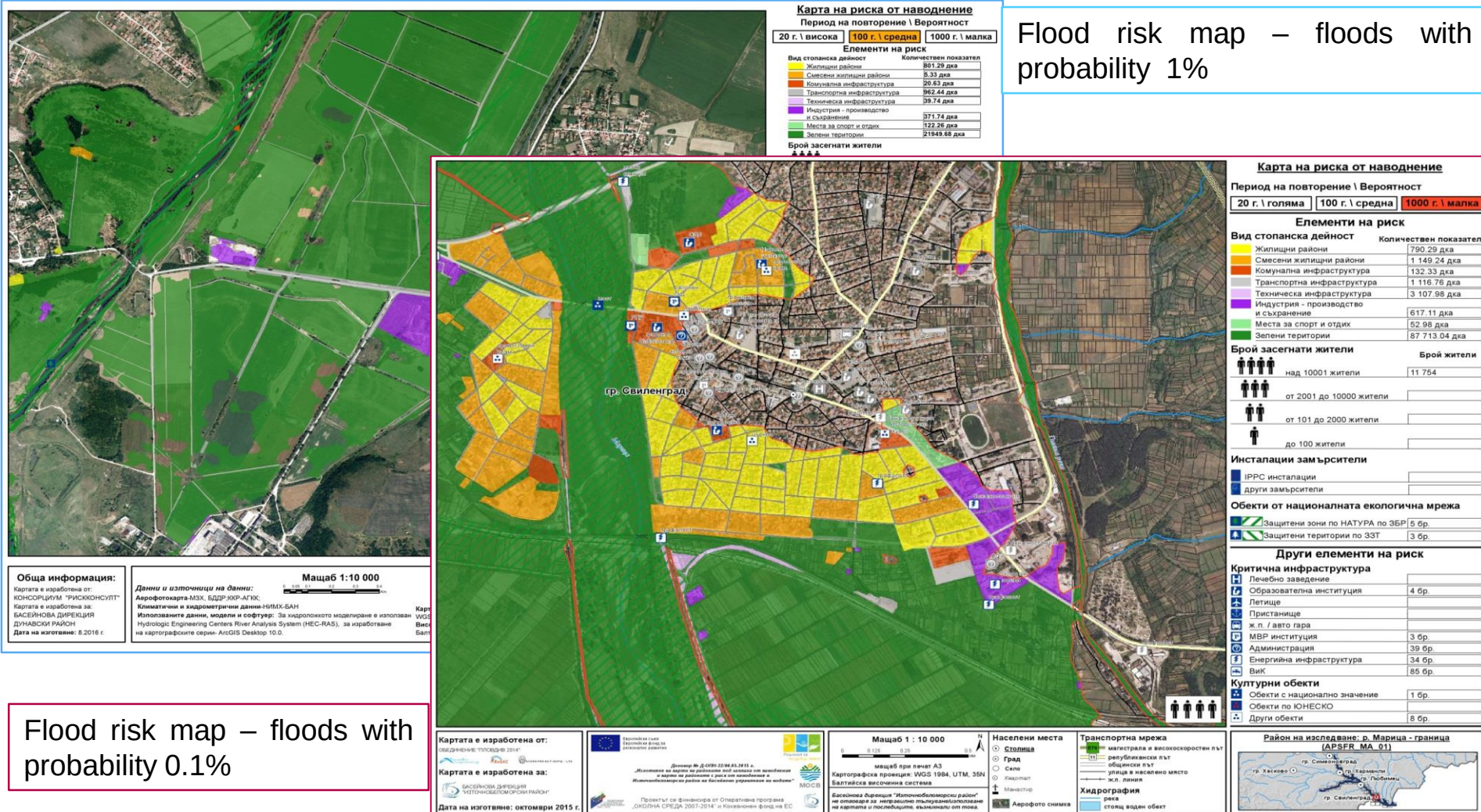


Flood extent and depths for floods with a low probability – 0.1%



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Flood risk maps



Flood risk map – floods with probability 0.1%

30-31 May 2019-Sofia



Flood Risk Management Plans

Flood risk management plans focus:

- Prevention;
- Protection;
- Preparedness, including prediction and early warning system.

By selecting:

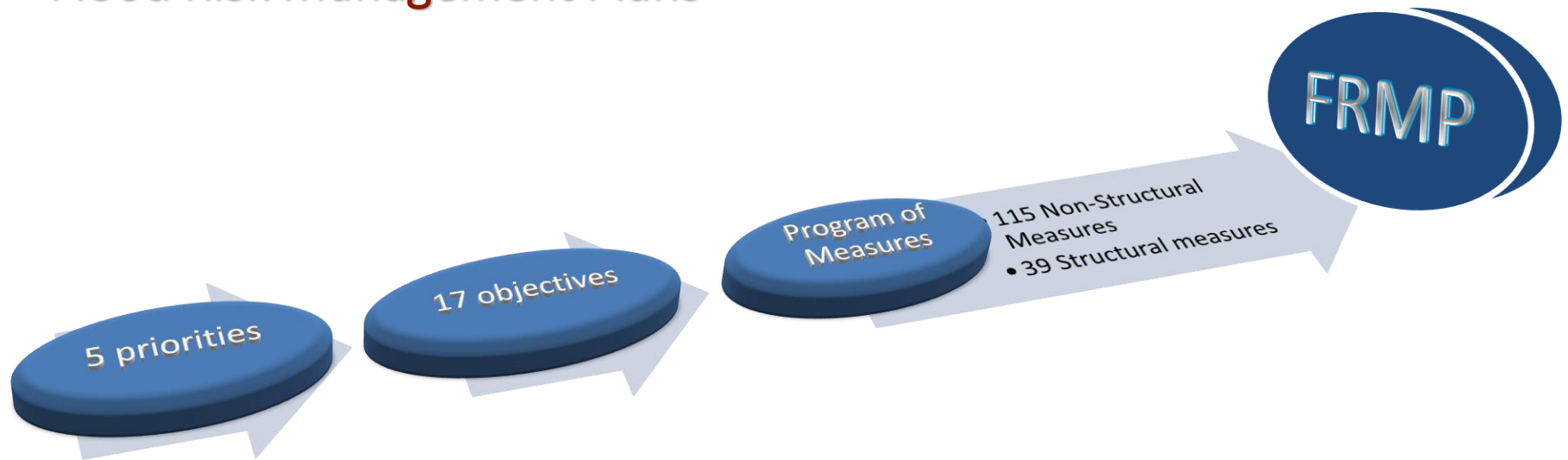
- Suitable priorities and objectives to reduce the potential adverse effects and the likelihood of floods;
- **Measures to achieve the objectives** with focus on reducing the likelihood of flooding and/or on using nonstructural measures, including flood forecasting and raising awareness of flooding
- Prioritization of measures;

Coordination at river basin level including Cross-Border Coordination

The SOLIDARITY principal has been implemented when developing FRMPs – not to include measures which, by their extent and impact, significantly increase flood risks upstream or downstream in the same river basin.



Flood Risk Management Plans



Measures singly or in combination, are used to reduce the flood risk after taking into account the specific conditions in different basin directorates

Priority 1: Protection of human life and public health;

Priority 2: A higher level of protection of critical infrastructure and business;

Priority 3: Increase environmental protection;

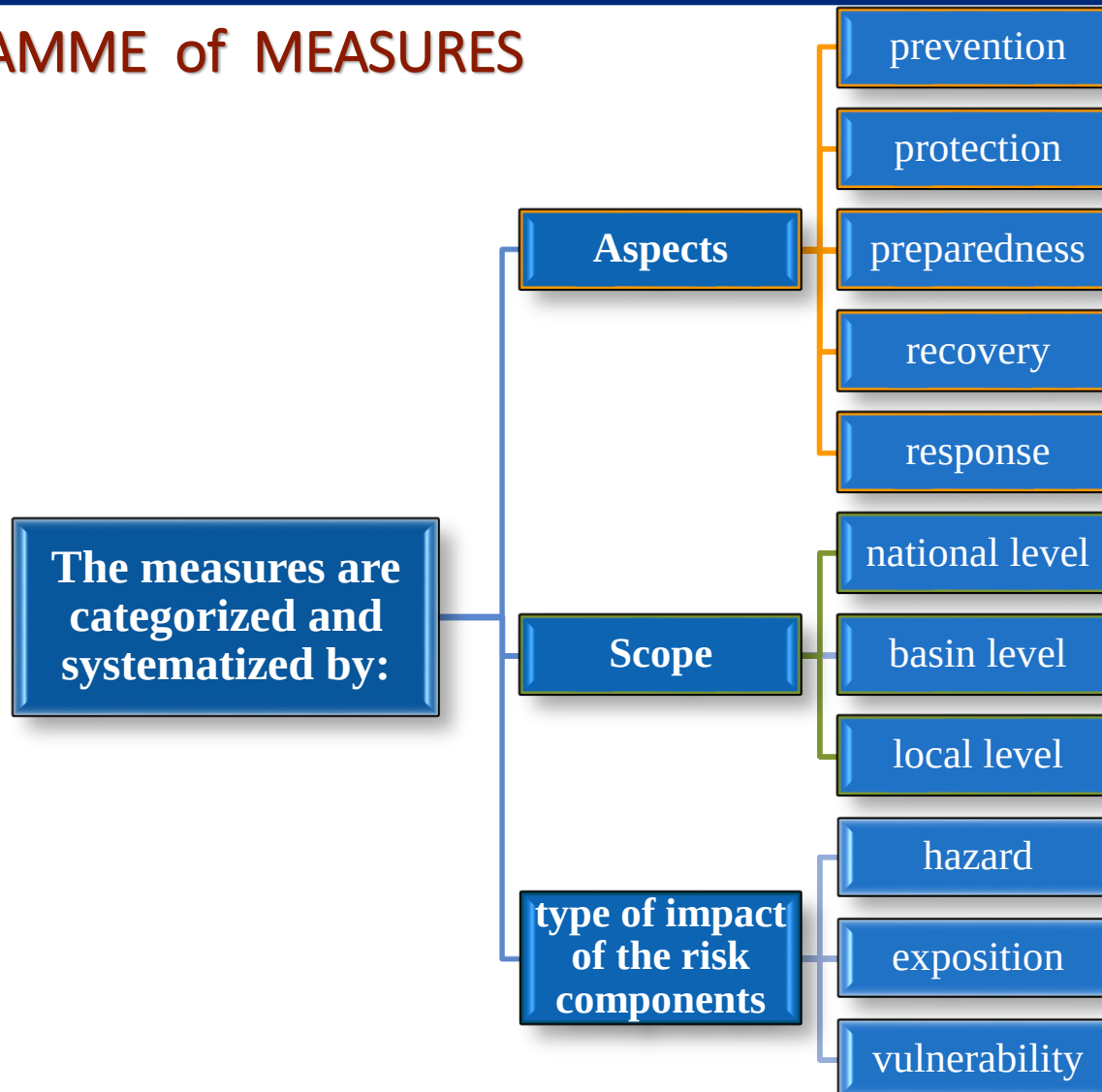
Priority 4: Improve the preparedness and response of the population;

Priority 5: Improve the administrative capacity for FRM.



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PROGRAMME of MEASURES





PROGRAMME of MEASURES – Non-structural Measures

- Design and construction of flood-resilient structures and buildings in flood prone areas
- Monitoring of construction activities in areas at risk, introducing restrictions
- Exchange of knowledge and experience, trainings and information campaigns, building the capacity of competent authorities and communities
- Further development of the meteorological and hydrometric monitoring network
- Efficient management of water levels of dams and retention reservoirs.
- Monitoring and improvement of the management of water retention facilities
- Update of civil protection plans
- Collection of information on floods, assessment of the damages after flood event
- Establishment of a National real time water management system and Flood forecasting and Early Warning Systems
- Improvement of the coordination actions in case of flood risk
- Implementation of requirements for good agricultural practices
- Rising public awareness of the benefits of a flood insurance



PROGRAMME of MEASURES – Structural Measures

- Construction, rehabilitation and maintenance of dikes and river correction works
- Construction of new dikes
- Removing the excessive vegetation (trees, bushes) and accumulated sediment deposits to ensure conveyance capacity of the river beds
- Building small polders for water retention during flood events in riparian zones
- Restoration of old meanders and old river beds
- Afforestation of river banks and catchments before APSFR with appropriate tree species
- Maintenance, reconstruction or construction of sewerage networks and drainage systems
- Construction of new reservoirs
- Maintenance and rehabilitation of existing dams
- Construction of structures to prevent erosion in the catchment area
- Improvement of retention capacity of the slopes
- Recultivation of areas polluted from industrial and mining activities



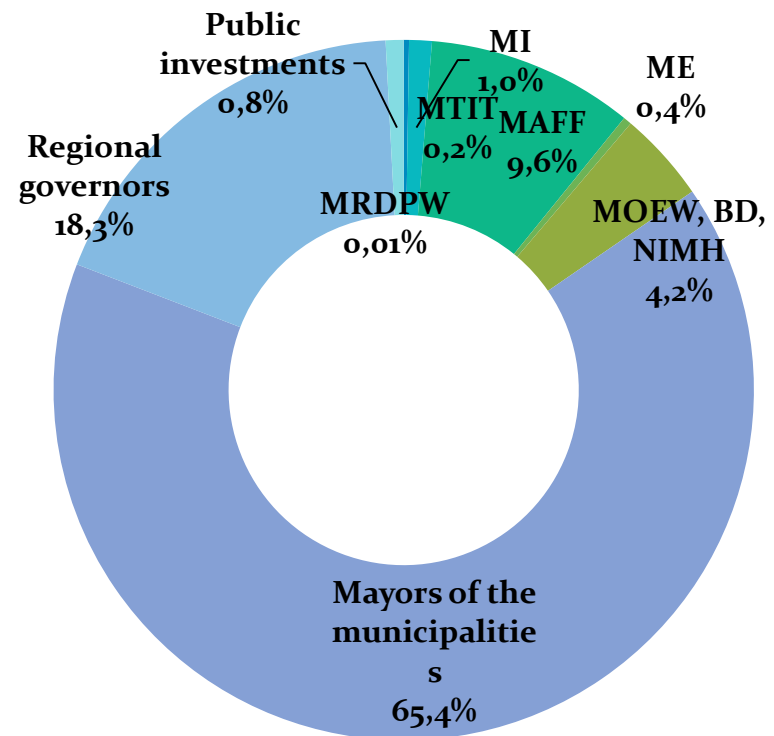
Funding of Programmes of measures

Required financial resources up to 2021 - 860 million BGN

Competent authorities for implementation of the envisaged in FRMP measures:

- mayors of the municipalities;
- regional governors;
- Ministry of agriculture, food and forestry; Ministry of regional development and public works; Ministry of transport, information technology and communications; Ministry of economy; Ministry of interior

Allocation of financial resource needed for implementation of FRMPs



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FOR YOUR ATTENTION!

<http://www.moew.government.bg>



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