



## **Audit Conclusion**

**19/04**

### **Aid for Flood Control Measures**

The audit was included in the audit plan of the Supreme Audit Office (hereinafter the “SAO”) for 2019 under number 19/04. The audit was managed and the Audit Conclusion was drawn up by SAO member RNDr. Petr Neuvirt.

The aim of the audit was to verify whether the funds allocated to flood control measures were being spent effectively, economically and in compliance with legal regulations.

The audit was conducted with the audited entities between March 2019 and September 2019.

The period under review was 2016-2018; both the previous and subsequent periods were also considered for contextual reasons.

#### **Audited entities:**

Ministry of Agriculture (hereinafter the “MoA”); Ministry of the Environment (hereinafter the “MoE”); State Environmental Fund of the Czech Republic, Prague (hereinafter the “SEF”); Povodí Labe, state enterprise, Hradec Králové (hereinafter “Povodí Labe”); Povodí Moravy, s.p., Brno (hereinafter “Povodí Moravy”); Povodí Odry, state enterprise, Ostrava (hereinafter “Povodí Odry”); Povodí Vltavy, state enterprise, Prague (hereinafter “Povodí Vltavy”).

The **Board of the SAO** at its 2nd session held on 10 February 2020

**approved**, by Resolution No. 6/II/2020,

the **Audit Conclusion** as follows:

# Floods

for the Czech Republic, the greatest direct threat in the field of natural disasters<sup>1</sup>

**10**

major floods  
in the years 1997 to 2013<sup>2</sup>

**123 to 135**

human victims  
in the years 1997 to 2013

**CZK 186.4**

**billion**  
quantified property damage  
in the years 1997 to 2013

**CZK 4.2 billion**

MoE and MoA estimate of  
average annual financial needs  
for the adoption of technical and  
nature-based flood control  
measures

**CZK 1.4 billion**

yearly average of funds  
allocated by the MoE and MoA  
on flood prevention  
programmes in the years 2016  
to 2018

**CZK 245 million**

Audited volume of aid  
beneficiaries' funds  
(11 audited projects)

## Extent of areas with a significant flood risk according to currently valid *Flood Risk Management Plans* published in 2015

Czech part of international river basins	Areas with a significant flood risk			Number of inhabitants at an unacceptable risk of flood threat
	Length of watercourses (km)	Number of municipalities	Number of inhabitants	
Danube	617.30	216	1,531,539	106,545
Elbe	2,047.00	705	3,973,130	56,112
Oder	295.20	69	901,206	14,347
<b>Total</b>	<b>2,959.50</b>	<b>990</b>	<b>6,405,875</b>	<b>177,004</b>

**Source:** *Flood Risk Management Plan in the Danube river basin for the period 2015-2021, Flood Risk Management Plan in the Elbe river basin for the period 2015-2021, Flood Risk Management Plan in the Oder river basin in the period 2015-2021* (hereinafter "Flood Risk Management Plans" or "FRMP")

<sup>1</sup> According to the MoE, floods represent the greatest direct threat in the area of natural disasters for the Czech Republic and cause serious crisis situations, which are accompanied not only by extensive material damage but also by loss of lives in the affected areas and extensive devastation of the cultural landscape including ecological damage (*Flood Risk Management Plans*, p. 5).

<sup>2</sup> According to the flood classification as part of a preliminary flood risk assessment.

## I. Summary and Evaluation

The SAO audited the setup of the aid system for flood control measures (hereinafter “FCM”). The audit concerned the provision of funds from the state budget and from European Union resources, namely the Operational Programme *Environment*<sup>3</sup> 2014-2020, provided by the Ministry of the Environment and the Ministry of Agriculture in support of flood control measures. The audit focused on assessing whether the funds provided for flood control measures were being spent efficiently, economically and in accordance with legal regulations, and whether the flood control measures implemented created preconditions for preventing floods and minimising the damage caused by floods.

**In the course of the audit of the MoE, the MoA and four state river basin enterprises, the SAO identified systemic shortcomings in the aid for flood control measures. In the Czech Republic, there are no preconditions for preventing floods and minimising the damage caused by them as required by conceptual and strategic documents. The SAO finds the main causes in a delayed implementation of flood control measures, the enforcement of nature-based measures only to a small extent, and development in active zones of flood areas.**

- **More than 50% of the specific measures proposed by the MoE and the MoA in the *Flood Risk Management Plans* for the period of 2015-2021 will not even be launched by the end of this period.**
- **In the case of development projects, mainly technical measures aided under the state budget chapter 329 – *Ministry of Agriculture* were implemented, while nature-based flood control measures (hereinafter “NBFCM”) aided under European funds through the MoE were implemented minimally.**
- **In 2016-2018, the MoE and the MoA spent an average of CZK 1.4 billion on flood control measures per year, which, however, represents only one-third of the anticipated needs of financial resources.**
- **The Water Act<sup>4</sup> prohibits to place, permit and carry out development in defined active zones of flood areas but development in these areas is still in progress.**

**In the case of the audited projects focused on flood protection, the SAO did not find any violations of legal regulations or inefficient and uneconomical use of funds. A total of 11 projects were audited, of which 8 were projects financed from the state budget chapter 329 – *Ministry of Agriculture* and 3 were projects financed under the OPE 2014-2020. The audited volume of funds was CZK 245 million.**

The evaluation is based on the following identified shortcomings:

### **1. Implementation of specific FCM does not take place in accordance with the approved FRMP**

For areas with a significant flood risk, 135 specific measures are proposed in the FRMP approved by the Government of the Czech Republic for the period of 2015-2021. The audit found that at least 68 of the proposed measures would not even be launched by the end of this period, which is more than 50% of the total number of proposed measures.

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<sup>3</sup> Hereinafter the “OPE”.

<sup>4</sup> Act No. 254/2001 Coll., on Waters and on Amendments to Some Acts (the Water Act).

## **2. Nature-based flood control measures are implemented only to a small extent**

In the years 2010-2018, the audited state enterprises implemented 166 FCM, of which 145 FCM (87%) were of a technical nature and only 6 FCM (4%) were NBFCM. The remaining 15 FCM (9%) were combined (a combination of technical measures and NBFCM).

Povodí Labe, Povodí Moravy, Povodí Odry and Povodí Vltavy (hereinafter the “audited state river basin enterprises”) did not implement NBFCM and did not use co-financing from the funds of the OPE 2014-2020 for the implementation of FCM of a construction character in the period under review. In the years 2016-2018, the audited state river basin enterprises spent CZK 2.1 billion on the implementation of FCM of a construction character, of which 83% were funds provided from the budget of the MoA chapter, 14% were the state enterprises’ own funds and 3% consisted in the participation of third parties, mainly of local self-governing units. The data on the drawing of funds for flood protection and documents on the implementation of FCM in the years 2010-2018 show that the implementation of technical FCM prevails in the Czech Republic. The MoE has not been able to promote a higher rate of implementation of NBFCM in the long term. From the perspective of the European Environment Agency (hereinafter the “EEA”), NBFCM constitute a cost-effective reduction of flood risk<sup>5</sup>.

## **3. The volume of funds spent by the MoE and the MoA on FCM is significantly lower than the needs for financial resources specified by the MoE and the MoA in the FRMP**

In 2010, the MoE and the MoA estimated the average annual financial needs for the adoption of technical and nature-based flood control measures during the implementation of the FRMP totalling CZK 4.2 billion. In 2015, the MoE and the MoA specified the estimated costs for the implementation of 130 specific measures indicated in the FRMP at CZK 29 billion<sup>6</sup>; for the estimated costs of CZK 27 billion for the implementation of 120 measures, the expected source of financing was specified. In fact, the MoE and the MoA spent, on average, only CZK 1.4 billion annually, i.e. one-third of the estimated need for financial resources, to aid flood protection in the years 2016-2018 under review.

At present, the pressure on the implementation of FCM in the Czech Republic is decreasing even though floods represent the greatest direct threat in the field of natural disasters and have been identified as one of the main manifestations of climate change for the Czech Republic<sup>7</sup>.

## **4. Measures in support of revitalisation approaches to watercourses are not being fulfilled**

The issue of flood protection is also closely related to revitalisation approaches to watercourses near settlements that increase the protection of the settlements against floods and, at the same time, improve the ecological state of watercourses and their floodplains. A comprehensive revitalisation<sup>8</sup> of watercourses and floodplains and support for spontaneous

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<sup>5</sup> EEA Report No14/2017 – *Green Infrastructure and Flood Management – Promoting cost-efficient flood risk reduction via green infrastructure solutions.*

<sup>6</sup> For the 5 remaining specific measures out of the total of 135 measures, implementation costs have not been estimated.

<sup>7</sup> According to the *Comprehensive Study on Impacts, Vulnerability and Risks Sources Connected to Climate Change in the Czech Republic.*

<sup>8</sup> Revitalisation – a water management activity aimed at the restoration of natural forms and functions of watercourses and their floodplains.

renaturation<sup>9</sup> are the only two adaptation measures defined in the *National Action Plan on Adaptation to Climate Change* (hereinafter the “NAP”) to achieve the objective of increasing the natural retention capacity of watercourses and floodplains. The analysis of needs<sup>10</sup> indicates that the total length of watercourses suitable for revitalisation measures is approximately 9 thousand kilometres. According to the OPE indicators monitored<sup>11</sup>, watercourses totalling 245.69 kilometres in length had been revitalised from EU funds as of 23 July 2019. In the years 2010-2018, the audited state river basin enterprises carried out a total of 48 acts of revitalisation of watercourses with a total length of 61.3 kilometres, for which they spent a total of CZK 0.7 billion, representing an average annual expenditure of only CZK 78 million.

The NAP also defines a specific task of “*implementing a pilot project of renaturation of the watercourse in each sub-basin*” with a deadline for implementation in 2017. The task is the responsibility of the MoA together with the river basin administrators. The audit revealed that Povodí Labe had completed renaturation on 14 stretches of watercourses with a total length of 14.4 kilometres; on another 13 stretches of watercourses with a total length of 9.4 kilometres, renaturation is underway. Within the competence of Povodí Moravy, renaturation is underway on one stretch of the watercourse but no renaturation has been carried out or is underway within the competence of Povodí Odry and Povodí Vltavy. This means that the MoA, Povodí Odry and Povodí Vltavy failed to meet one of the defined tasks of the NAP in the required scope and within the set deadline.

#### **5. On some stretches of watercourses in areas with a significant flood risk, flood areas or their active zones have not yet been identified**

An important aspect of flood protection is also the identification of flood areas and their active zones, in which new development is prohibited by the Water Act in order not to increase the number of people at risk and the value of endangered property in risk areas. Based on the information presented by the audited state river basin enterprises, it was found that in at least four municipalities with an unacceptable flood risk in the territorial competence of Povodí Labe flood areas including active zones had not been identified before the completion of the audit, and in 36 municipalities with an unacceptable flood risk in the territorial competence of Povodí Moravy flood areas have been identified but so far there are no defined active zones to restrict the permitting of new development there<sup>12</sup>.

#### **6. New development continues in the active zones of flood areas**

The audit also focused on the issuance of opinions by river basin administrators concerning the development plans in watercourse flood areas. The objective of the FRMP is to prevent

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<sup>9</sup> Renaturation – a mostly spontaneous restoration of natural forms and functions of watercourses and their floodplains, gradual or flood-related. Renaturation involves a spontaneous disintegration of technical fortifications, erosion, clogging and overgrowth of riverbeds. Renaturation processes can be facilitated by partial revitalisation measures and appropriately oriented management and maintenance of watercourses.

<sup>10</sup> The results of a project conducted by the T. G. Masaryk Water Research Institute, public research institution, completed in 2015, include, among other things, proposals of nature-based measures including the revitalisation of watercourses and floodplains in areas with a very high degree of vulnerability, the length of the watercourses totalling 8,838 kilometres.

<sup>11</sup> Achieved value of indicator 250300 *Total length of the revitalised watercourse* (OPE 2007-2013): 236.92 km; achieved value of indicator 46505 *Length of revitalised watercourses* (OPE 2014-2020) as of 23 July 2019: 8.77 km (target value of the indicator: 202.08 km).

<sup>12</sup> Neither the MoE nor the MoA has the competence to influence that finding.

the emergence of new risks and reduce the areas with an unacceptable flood threat. However, the audit revealed that new development still takes place in the active zones of flood areas. On a sample of 40 constructions completed in the years 2015-2018, the audit of the issuance of opinions by river basin administrators found, among other things, that:

- In 9 cases, the river basin administrator had not even been asked for an opinion on the plans for buildings situated wholly or partially in the active zone of a flood area;
- In 3 cases, the construction had been carried out despite the disagreement or non-recommendation of the river basin administrator;
- In 2 cases, the river basin administrator had merely pointed out that the project under consideration placed the construction in the active zone of a flood area or an area with a high or medium flood risk but had not explicitly given a non-recommendation;
- In 11 cases, at the time of the issuance of the river basin administrator's opinion, the flood area including the active zone had not been established; in two of these cases, the flood area including the active zone had not even been defined in the given municipality before the completion of the audit;
- In 6 cases, there was a discrepancy in the map identification of the active zone of the flood area between the documentation defining flood areas issued by the competent water authority<sup>13</sup> and the maps published in the *Flood Information System* (hereinafter "POVIS"). The MoE thus does not publish accurate geospatial data identifying flood areas and active zones in POVIS although it is obliged, under the Water Act, to keep documentation on identified flood areas in the Czech Republic provided by water authorities and to ensure their registration in the public administration information system.

## **7. The implementation of FCM is delayed by the land consolidation process**

Land consolidation contributes to flood protection solutions, helps to organise ownership of land, and allows the construction of flood protection structures; however, if the owners of more than 40% of the land area disagree, land consolidation is not possible at all<sup>14</sup>. In 2008, an amendment to the Water Act came into effect<sup>15</sup>; it provided river basin administrators with the possibility of withdrawing or limiting the rights to land and structures necessary for the execution of publicly beneficial flood protection structures in accordance with the Expropriation Act<sup>16</sup>. According to the explanatory memorandum to that amendment to the Act, the MoA anticipated the construction of about 10 thousand hectares of land intended for controlled flooding by 2015. However, information from the MoA shows that, by 1 January 2019, only about 3 thousand hectares of these flooding areas emerged.

## **8. The MoA does not monitor the fulfilment of the statutory condition for the payment of damages caused by controlled flooding**

In order to cover damage caused by controlled flooding on soil, field crops, forest growth and structures in areas designated for controlled flooding, the MoA keeps a *list of dry reservoirs in the Czech Republic for the purpose of damage claims*. However, the audit revealed that the

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<sup>13</sup> Unless otherwise stipulated by the Water Act, the powers vested in water authorities are exercised by the municipal authorities of municipalities with extended powers.

<sup>14</sup> Section 11(4) of Act No 139/2002 Coll., on Land Consolidation and Land Authorities, and on Amendment to Act No 229/1991 Coll., on the Regulation of Ownership of Land and Other Agricultural Property, as amended.

<sup>15</sup> Act No 181/2008 Coll., amending Act No 254/2001 Coll., on Waters and on Amendments to Some Acts (the Water Act), as amended.

<sup>16</sup> Act No 184/2006 Coll., on the Withdrawal or Limitation of Title to Land or Structures (the Expropriation Act).

MoA did not monitor and verify the statutory condition for claiming damages, i.e. whether the registered areas designated for controlled flooding were defined in the issued land-use planning documents as publicly beneficial structures for flood protection.

**Note:** All the laws and regulations cited in this Audit Conclusion apply as amended for the period under review.

## II. Information on the Audited Area

Since the beginning of the 1990s, the Czech Republic and other European countries have been hit by an increased number of extreme floods. The basic types of floods that endanger the territory of the Czech Republic include summer, flash, winter and spring floods, floods caused by ice phenomena and special floods (caused e.g. by artificial phenomena during the construction or operation of water works).

The primary legislative documents for the management of flood protection at the national level are the Water Act and its implementing legislation. Pursuant to the Water Act, floods are defined as a temporary intensive increase in the level of watercourses or other surface waters, during which water floods over the land outside the watercourse bed and may cause damage. Flood protection includes activities and measures to prevent and manage flood risk in vulnerable areas. This is ensured by systematic prevention and operational measures.

Flood prevention measures constitute the most effective form of protection but floods cannot be completely prevented. When designing FCM, according to the principles of flood prevention<sup>17</sup> it is necessary to look for a suitable combination of measures in the landscape and in the urbanised area increasing the natural accumulation and retardation of water in the area and technical measures affecting the flow and volume of flood waves.

Preventive measures to protect against floods are aided mainly from the European Union funds, i.e. from Priority Axis 1 (hereinafter "PA 1") of the OPE 2014-2020, within specific objectives (hereinafter "SO") 1.3 and 1.4, and at the same time they are aided from the state budget (MoA chapter), namely programme 129 260. The approved allocation of funds for SO 1.3 and 1.4 under PA 1 of the OPE 2014-2020 totalled, as of 30 June 2019, CZK 4.91 billion and the approved financial framework of programme 129 260 in the amount of CZK 4.65 billion was valid as of the same date.

In the period from 1997 to 2013, the Czech Republic was hit by 10 major floods according to the flood classification as part of a preliminary flood risk assessment. At least 123 human victims are known as a result of these floods. Property damage caused by these floods amounted to CZK 186.4 billion. An overview of major floods is given in Annex 1 to this Audit Conclusion.

Due to the geographical location of the Czech Republic, flood protection is carried out in an international context. The territory of the Czech Republic belongs in three international river basin districts: the Elbe international river basin district, the Oder international river basin district and the Danube international river basin district. The Czech Republic is a member of international commissions for the protection of the Danube, the Elbe and the Oder.

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<sup>17</sup> Principles of flood prevention formulated in the *Strategy for Protection against Floods in the Czech Republic* dated 2000.

The Czech legal rules also include requirements of EU legislation. In the area of water policy, these are, in particular, Directive 2000/60/EC<sup>18</sup> of the European Parliament and of the Council (hereinafter the “Water Framework Directive”) and Directive 2007/60/EC<sup>19</sup> of the European Parliament and of the Council (hereinafter the “Flood Directive”). Although the Water Framework Directive was adopted, inter alia, to contribute to mitigating the effects of floods, limiting the risk of floods is not one of the main objectives of the Directive. Therefore, the Flood Directive was subsequently adopted, following the Water Framework Directive. The purpose of the Flood Directive is to establish a framework for the assessment and management of flood risks in order to reduce the adverse effects associated with floods. According to the Flood Directive, flood risk means a combination of the probability of floods occurring and their possible adverse effects on human health, the environment, cultural heritage and economic activities.

The water planning process is carried out in six-year cycles. After the Flood Directive came into force, two types of plans were prepared. The first type is the so-called “river basin management plans” under the Water Framework Directive<sup>20</sup>; the second type involves the Flood Risk Management Plans prepared under the Flood Directive. FRMP are tools to achieve the mitigation of possible adverse effects of floods in areas with a significant flood risk, and are based on flood hazard maps and flood risk maps. FRMP are procured by the MoE and the MoA in cooperation with the competent river basin administrators and locally competent regional authorities. The basis for the FRMP was the so-called *documentation of areas with significant flood risk* (hereinafter “DASFR”) containing the sheets of individual proposed measures. The documentation is part of the sub-basin management plans that are drawn up by the river basin administrators according to their competence in cooperation with the relevant regional authorities and in cooperation with the central water authorities<sup>21</sup>.

The procurement of the FRMP is preceded by the process of preliminary flood risk assessment, which results in the identification of the so-called areas with a significant flood risk<sup>22</sup>. For these areas, flood hazard maps are subsequently elaborated, including scenarios of possible flooding, and flood risk maps indicating potential adverse consequences associated with floods. The FRMP then include, in particular, measures aimed at achieving the objectives set to mitigate the possible adverse effects of floods.

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<sup>18</sup> Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

<sup>19</sup> Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks.

<sup>20</sup> River basin management plans are elaborated on three levels: *international river basin management plans* (for international river basin districts), *national river basin management plans* (for parts of international river basin districts in the Czech Republic) and *sub-basin management plans*. The Elbe river basin comprises five sub-basins: the *Upper and Middle Elbe* sub-basin, the *Upper Vltava* sub-basin, the *Berounka* sub-basin, the *Lower Vltava* sub-basin and the sub-basin of *Ohře, Lower Elbe and other tributaries of the Elbe*; the Oder river basin comprises two sub-basins: the *Upper Oder* sub-basin and the sub-basin of the *Lusatian Neisse and other tributaries of the Oder*; the Danube river basin comprises three sub-basins: the sub-basin of the *Morava and tributaries of the Váh*, the *Thaya* sub-basin and the sub-basin of *other tributaries of the Danube*.

<sup>21</sup> Unless stipulated otherwise by the Water Act, the powers of the central water authority are exercised by the MoA; pursuant to Section 108(3)o) of the Water Act, the MoE exercises the competence of the central water authority in the field of flood protection.

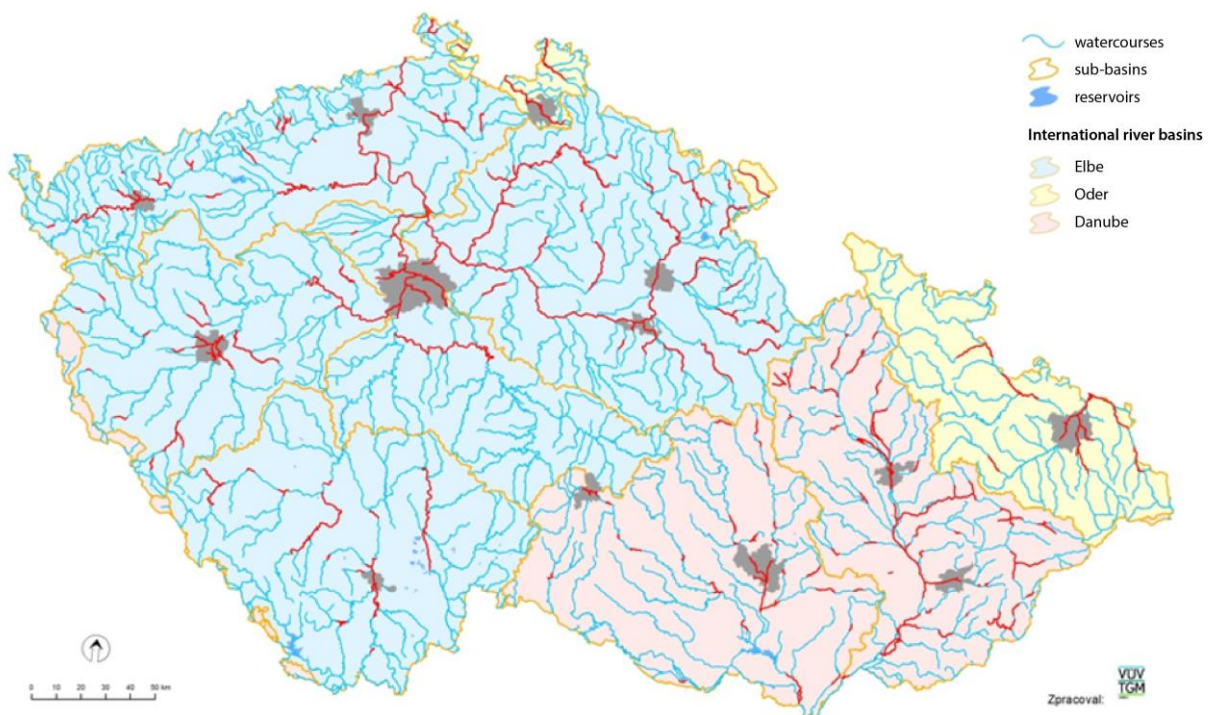
<sup>22</sup> Areas where it is concluded that potentially significant flood risks exist or are likely to occur.



The total length of watercourses in the Czech Republic is about 98,900 kilometres (with a basin above 5 km<sup>2</sup>), of which 16,762 kilometres are the so-called major watercourses defined by Decree No 178/2012 Coll.<sup>23</sup> As part of the preliminary flood risk assessment, 2,959.50 kilometres of areas with a significant flood risk were identified in the Czech Republic in 2011. For the selection of areas with a potentially significant flood risk, two basic criteria were used for each municipality under assessment: the number of inhabitants of the municipality affected by the flood hazard per year and the value of property affected by the flood hazard per year. In 2018, an update of the preliminary flood risk assessment was published. A total of 2,827.4 kilometres of watercourses with a significant flood risk were newly identified in the Czech Republic.

The FRMP were approved by Government Resolution No 1082 of 21 December 2015. The MoE subsequently issued the FRMP as a general measure in accordance with the provisions of the Water Act. The FRMP maintain the validity of the framework objectives defined by the previous documents, as well as the principles of good practice already formulated in the *Flood Protection Strategy* of 2000<sup>17</sup>; the FRMP address only areas with a significant flood risk. For other vulnerable areas not identified as areas with a significant flood risk, measures and objectives are set out in the sub-basin management plans.

### Stretches of watercourses in areas of significant flood risk (identification in 2017)



**Source:** Update of preliminary flood risk assessment for the Czech Republic, 2018, version 1.0.

<sup>23</sup> Decree No 178/2012 Coll., establishing a list of major watercourses and the manner of carrying out activities related to watercourse management.

### **III. Scope of Audit**

The aim of the audit was to verify whether the funds allocated to flood control measures had been spent effectively, economically and in compliance with legal regulations. The audit focused on setting up and implementing subsidy programmes for flood control measures financed from the MoA chapter and from the Operational Programme *Environment 2014-2020*. The fulfilment of measures and tasks in the field of flood protection in the competence of the MoE, the MoA and the audited state river basin enterprises was also audited. The period under review covered the years 2016-2018 and also, where relevant, the period immediately before that and the period up to the completion of the audit.

At the system level, the audit focused, among other things, on examining the provision of funds for specific projects from the level of aid providers. The audit sample consisted of 20 projects aided from the OPE 2014-2020 and audited at the SEF as an intermediate body of the OPE 2014-2020 and 10 projects from the programme *Support for flood prevention III* managed by the Ministry of Agriculture. At the level of providers of aid for FCM, the audit examined funds totalling CZK 861.17 million, of which CZK 648.59 million for the SEF and CZK 210.52 million for the MoA. An overview of audited projects at the level of aid providers is given in Annexes 2 and 3 to this Audit Conclusion.

At the level of aid beneficiaries (audited state river basin enterprises), 11 projects and funds totalling CZK 245 million were audited, of which CZK 200.82 million from the state budget subsidies, CZK 4.24 million from the EU, funds from the audited state river basin enterprises' own resources in the amount of CZK 32.63 million and funds provided for the implementation of FCM from third parties (local self-governing units) in the amount of CZK 7.31 million. The audit examined public contracts in the total amount of CZK 356.93 million exclusive of VAT. An overview of projects audited at the level of aid beneficiaries is given in Annex 4 to this Audit Conclusion.

The scope of the audit made it possible to analyse data and information on the implementation of flood control measures in the territories falling within the territorial competence of the audited state river basin enterprises, covering 85% of the length of major watercourses and 41% of the length of minor watercourses. These stretches of watercourses also include 88% of the length of identified areas with a significant flood risk. The audit thus enabled to verify the state of implementation of 126 out of the 135 proposed specific measures under the FRMP, i.e. 93% of the proposed specific measures.

### **IV. Detailed Facts Ascertained by the Audit**

#### **1. Implementation of specific FCM does not take place in accordance with the approved FRMP**

For the period of 2015-2021, the MoE issued the FRMP in the form of measures of a general nature; their binding part includes the set objectives and summaries of measures listed in Annexes 1 and 2 to the issued measures of a general nature. The following three objectives in the area of flood prevention and preparedness were set for the period of validity of the FRMP:

- 1) Avoiding the emergence of new risk and reducing the areas at unacceptable risk;
- 2) Reduction of flood hazard;

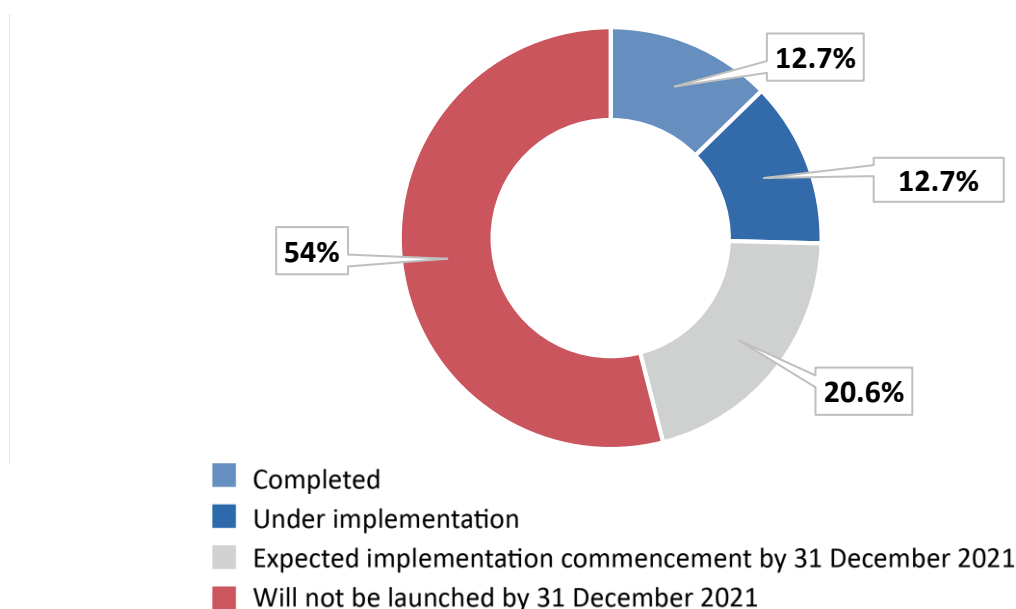
3) Increasing the preparedness of the population and the resilience of buildings, infrastructure objects and economic and other activities to the negative effects of floods.

General and specific measures based on the knowledge of risks and impact of flood situations in individual areas with a significant flood risk were proposed in the FRMP to fulfil these objectives.

A total of 75 general measures were proposed in the FRMP for nine sub-basins<sup>24</sup>, of which a set of seven general measures was identical for these sub-basins. Only eight general measures out of the total number of 75 were estimated for their implementation costs, amounting to CZK 76.5 million.

A total of 135 specific measures were proposed for implementation. Costs were estimated for 130 out of the 135 specific measures, totalling CZK 29 billion. The audit of four state river basin enterprises enabled to verify the state of implementation of 126 specific measures. The results are shown in the following chart.

**Chart 1:** State of implementation of 126 specific measures (as of 30 June 2019)



**Source:** information of audited state river basin enterprises.

Of the total of 126 specific measures proposed in the FRMP for the Elbe, the Oder and the Danube river basins in the territorial jurisdiction of the audited state enterprises, 16 proposed measures (12.7%) had been completed as of 30 June 2019, the same number of proposed measures was under implementation on the same date, and 26 proposed measures (20.6%) are planned for implementation commencement by 31 December 2021, i.e. by the end of the FRMP planning period. This implies that at least 68 of the proposed measures will not even be launched by the end of the planning period, which is more than 50% of the total number of 135 proposed specific measures.

<sup>24</sup> A total of ten sub-basins are defined in the Czech Republic. There is no significant flood risk area in the sub-basin of the *other tributaries of the Danube*.

On the other hand, in areas with a significant flood risk, FCM which are not included in the approved FRMP are being implemented mainly at the proposal of the municipalities and with their financial participation. In addition to the FRMP, some of the audited state river basin enterprises (Povodí Labe and Povodí Vltavy) carried out a total of 20 FCM in areas with a significant flood risk, of which 18 are not even included in the *documentation of areas with significant flood risk* that forms part of the sub-basin management plans and served as a basis for the FRMP.

The audit also focused on the method of selection of specific measures and the method of determining responsibility for the implementation of individual measures. The content of river basin management plans and flood risk management plans is laid down in Decree No 24/2011 Coll.<sup>25</sup> The main basis for the preparation of the FRMP is the *documentation of areas with significant flood risk*, which is, according to Annex 3 to Decree No 24/2011 Coll., part of the sub-basin management plans and contains, inter alia, sheets of the individual measures. The sheets of the measures contain a detailed description of the measures, including the lead entity, the priority, the state of implementation (preparation) of the measure and, in most cases, also an estimate of costs. The DASFR and especially the sheets of the measures proposed in the FRMP are not part of the approved FRMP issued in the form of measures of a general nature, and neither the Water Act nor Decree No 24/2011 Coll. states that the DASFR is part of the FRMP.

Furthermore, the audit verified whether the FRMP contained all the particulars in accordance with Decree No 24/2011 Coll. The audit found that the MoE had not proceeded in accordance with Section 18(2) of Decree No 24/2011 Coll., as it had not stipulated an estimate of costs for all measures proposed in the Flood Risk Management Plans and had not provided an assessment of the effectiveness and an estimation of the expected time of preparation and implementation for all proposed specific measures in the FRMP.

The progress monitoring system for the implementation of the FRMP is set so that the effectiveness of the implemented measures is evaluated in individual areas with a significant flood risk in the framework of the review of flood hazard maps and flood risk maps at the end of the planning period (2020-2021).

## **2. Nature-based flood control measures are implemented only to a small extent**

One of the main instruments to support the implementation of NBFCM is the OPE 2014–2020, namely Priority Axis 1: *Improving water quality and reducing the risk of floods* and its specific objective 1.3 *Ensure flood protection of urban areas and rain water management* and specific objective 1.4 *Promote preventive flood control measures*. SO 1.3 is mainly focused on measures that will be implemented in urban and rural areas<sup>26</sup> of municipalities and will have a positive effect on reducing the extent of flooded areas in municipalities and reducing the number of flooded real property and thus reducing flood damage. In particular, activities of

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<sup>25</sup> Decree No 24/2011 Coll., on river basin management plans and flood risk management plans.

<sup>26</sup> Urban area – built-up area of the municipality (usually defined by land-use planning documentation); rural area – collective designation for undeveloped part of the municipality or undeveloped part of its cadastral territory. The rural area usually includes forests, fields, meadows, pastures etc. The outer boundary of the rural area is the cadastral boundary of the municipality.

a construction character are aided under SO 1.3<sup>27</sup>. In contrast, SO 1.4 is aimed at supporting preventive flood control measures and protecting the population against the effects of floods. The area of support is focused primarily on improving the knowledge of flood threat and flood risks in the population, state administration and local government; it is a support for a set of non-structural measures.<sup>28</sup>

The original allocation of funds from the EU contribution for SO 1.3 and 1.4 was EUR 307.51 million. This allocation was changed (or decreased) twice to the current value of EUR 190.02 million in the period under review, which represents a 38.2% reduction in the EU contribution to aid the FCM. The 30% reduction was mainly due to low interest from the applicants<sup>29</sup> since the beginning of the programming period. The allocation of funds earmarked for FCM divided by SO and information on the ongoing drawing as of 30 June 2019 are shown in the following table.

**Table 1:** Overview of EU subsidy drawing for OPE 2014–2020 as of 30 June 2019

Specific goal	Total allocation	Funds in registered aid applications			Funds in legal acts on aid provision/transfer			Funds reimbursed through payment applications	
	million CZK	million CZK	% in relation to total allocation	number of projects	million CZK	% in relation to total allocation	number of projects	million CZK	% in relation to total allocation
SC 1.3	2,923.38	1,662.51	56.87	212	940.43	32.17	105	344.24	11.78
SC 1.4	1,984.76	1,816.63	91.53	648	1,251.69	63.07	454	641.66	32.33
<b>Total</b>	<b>4,908.14</b>	<b>3,479.14</b>	<b>70.88</b>	<b>860</b>	<b>2,192.12</b>	<b>44.66</b>	<b>559</b>	<b>985.90</b>	<b>20.09</b>

Source: monitoring system MS2014+, SEF data.

As of 30 June 2019, within the aid provided through SO 1.3, only 32% of the current allocation of funds was reserved for projects with an issued legal act granting aid, and the allocation was also reduced in the period under review due to lack of applicants' interest. As of 30 June 2019, 68% of the current allocation of funds for SO 1.3 was not committed. As of the same date, projects with registered aid applications covered 57% of the allocation. According to the OPE 2014-2020 programming document, at least half of the amount allocated for SO 1.3 should be allocated to activity 1.3.1 *Increasing the retention potential of watercourse beds and adjacent floodplains, improving natural floods*. However, the documents of the SEF and MS2014+ indicate that, as of 30 June 2019, only 6 projects were aided under this activity with a total

<sup>27</sup> Aided activities under SO 1.3 are: 1.3.1 *Increasing the retention potential of watercourse beds and adjacent floodplains, improving natural floods*; 1.3.2 *Management of rain water in urban areas and its further use instead of rapid drainage into sewers*; 1.3.3 *Restoration, construction and reconstruction or modernisation of flood protection works*; 1.3.4 *Stabilisation and rehabilitation of slope instabilities threatening the health, property and safety resulting from the "Register of slope instabilities"*.

<sup>28</sup> Aided activities under SO 1.4 are: 1.4.1 *Analysis of runoff conditions including proposals for possible flood control measures*; 1.4.2 *Building, enhancing and improving national alert, reporting, forecasting and warning systems, digital flood plans*; and 1.4.3 *Building and enhancing local alert, reporting, forecasting and warning systems, digital flood plans*.

<sup>29</sup> The main target group consists of the public sector, organisations providing technical measures on watercourses (watercourse administrators), the Czech Republic – through organisational units of the state and their semi-budgetary organisations and, in the case of activity 1.3.3, also individual entrepreneurs (building or reconstruction of safety spillways).

allocated EU contribution of CZK 377.5 million, which represents only 13% of the funds allocated to SO 1.3.

**Table 2:** Selected indicators of output SC 1.3 and 1.4 OPE 2014–2020 as of 30 June 2019

SC	Code	Name of indicator	Target value	Achieved value	Beneficiaries' commitment	Measurement unit	% fulfilment (DH/CH)	% fulfilment (commitment /CH)	
1.3 1.4	43200	Number of inhabitants protected by flood protection measures	65,637	145,256	241,268	persons	221.30 %	367.58 %	
		of which:	SC 1.3	20,637	1,249	4,616	persons	6.05 %	22.37 %
			SC 1.4	45,000	144,007	236,652	persons	320.02 %	525.89 %
1.3	43300	Length of watercourse kilometres addressed	236.00	0.23	4.96	km	0.10 %	2.10 %	

**Source:** MS2014+.

**Note:** TV = target value of indicator, AV = achieved value of indicator.

In order to evaluate the implementation of the OPE 2014-2020, an output indicator of 43300 *Length of watercourse kilometres addressed* with target value of the indicator of 236 km was set for SO 1.3. According to MS2014+, the value of 0.23 km (fulfilment at 0.1%) was reached as of 30 June 2019 and the value of the beneficiaries' commitment on the same day was 4.96 km, which represents 2.1% of the target value of the indicator.

In addition, for evaluating the implementation of the OPE 2014-2020, a common indicator 43200 *Number of inhabitants protected by measures against floods* with a target value of 65,637 inhabitants was set for SO 1.3 and 1.4. According to MS2014+, the value of 145,256 inhabitants (fulfilment at 221%) was reached as of 30 June 2019 and the value of the beneficiaries' commitment on the same day was 241,268 inhabitants, which represents a 368% fulfilment of the target value of the indicator. However, the audit revealed that SO 1.3 accounted for only 1% of the value of this indicator as of 30 June 2019, and SO 1.4 is responsible for 99% of the indicator value (as of 30 June 2019, SO 1.3 represents only 2% and SO 1.4 provides for 98% of the total value of the indicator commitment).

13 specific measures were proposed in the annexes to the FRMP, for which the OPE 2014 2020 is listed as the source of funding. The cost of these measures was estimated at more than CZK 7 billion. The documents of the SEF and MS2014+ show that, as of 31 August 2019, only 2 projects corresponding to the proposed measures with a total eligible expenditure of only CZK 384.39 million had been implemented with the support of the OPE.

The following facts are evident from the data on ongoing drawing and from the development of the set indicators:

- In the case of the OPE 2014-2020 funds earmarked for the implementation of NBFCEM, the absorption capacity has not been fulfilled in the long term. SO 1.3 shows a very low value of funds in aid decisions issued (only 32% of the allocation of funds for SO 1.3), so there is a risk that the funds under this objective will not be exhausted and the resulting effects under specific objective 1.3 set by the programming document will not occur.
- Some of the specific measures proposed in the FRMP, which were expected to be financed from the OPE 2014-2020, have not been implemented yet, and there is a risk that the OPE 2014-2020 will not significantly contribute to the fulfilment of the objectives 1 and 2 of the FRMP, in particular the reduction of areas at unacceptable risk and the reduction of flood hazard.

The SAO also found that the audited state river basin enterprises had not implemented NBFCM and had not used co-financing from the funds of SO 1.3 under the OPE 2014-2020 for the implementation of FCM of a construction character in the period under review. In the years 2016-2018, the audited state river basin enterprises spent CZK 2.1 billion on the implementation of FCM of a construction character, of which 83% were funds provided from the budget of the MoA chapter, 14% were their own funds and 3% consisted in the participation of third parties, mainly of local self-governing units.

In the years 2010-2018, the audited state enterprises implemented 166 FCM, of which 145 FCM (87%) were of a technical nature and only 6 FCM (4%) were NBFCM. The remaining 15 FCM (9%) were combined (a combination of technical and nature-based flood control measures).

### 3. The volume of funds spent by the MoE and the MoA on FCM is significantly lower than the needs for financial resources specified by the MoE and the MoA in the FRMP

The *Concept of flood protection in the Czech Republic with the use of technical and nature-based measures* (hereinafter "Concept 2010") was approved by Government Resolution No799 of 10 November 2010. The Concept 2010 set out a financial strategy (including financial requirements) with a timeframe of two six-year periods for the implementation of the Flood Risk Management Plans by 2027. The MoA, in cooperation with river basin and watercourse administrators, estimated the need for financial resources in its department at CZK 25 billion. The MoE anticipated the same financial requirements for the introduction of the NBFCM. Overall, the estimate for the period amounted to CZK 50 billion, which represents an average annual financial requirement for the introduction of FCM in the total amount of approximately CZK 4.2 billion. In 2015, the MoE and the MoA specified in the first Flood Risk Management Plans for the period of 2015-2021 an estimate of the costs of implementing 130 out of 135 specific measures proposed at CZK 29 billion, which represents roughly the same average annual financial demands, approximately CZK 4.14 billion. The following table summarises the funds actually spent by the MoE and the MoA on FCM in the years 2016-2018.

**Table 3: Funds spent on FCM in the years 2016-2018 (in CZK million)**

Source of support	Name of support area	2016	2017	2018	Total
OPE 2007–2013 PA 1	1.3 <i>Limiting the risk of floods</i>	16.30	x	x	16.30
OPE 2007–2013 PA 6	6.4 <i>Water regime optimisation in landscape</i>	31.90	x	x	31.90
OPE 2014–2020 PA 1	1.3 <i>Ensure flood protection of urban areas and rain water management</i>	3.40	125.04	169.19	297.63
	1.4 <i>Promote preventive flood control measures.</i>	1.69	227.78	350.99	580.46
OPE 2014–2020 PA 4	4.3 <i>Strengthen natural functions of landscape</i>	1.87	26.45	74.98	103.30
Programme funding from MoE chapter	115180 <i>Information aid on adaptation measures to counter extreme hydrometeorological phenomena – floods and water quality (ADAPT)</i>	1.70	X	X	1.70
Total funds from MoE chapter		56.86	379.27	595.16	1,031.29
Programme funding from MoA chapter	129 260 <i>Support for flood prevention III</i>	491.59	655.29	817.98	1,964.86
	129 280 <i>Support for landscape water retention – ponds and reservoirs</i>	X	30.85	154.26	185.11
	129 290 <i>Support for measures on small watercourses and small reservoirs</i>	120.33	518.93	479.71	1,118.97
Total funds from MoA chapter		611.92	1,205.07	1,451.95	3,268.94
<b>TOTAL funds spent on FCM</b>		<b>668.78</b>	<b>1,584.34</b>	<b>2,047.11</b>	<b>4,300.23</b>

**Source:** programme documentation, *Subsidy Registration System* (hereinafter "SRS"), MS2014+ monitoring system.

In order to take into account the funding cycles, i.e. the termination of old subsidy programmes and the launch of new subsidy titles, a wider time period from 2014 to 30 June

2019 was also monitored. In that period, the MoE and the MoA spent funds totalling CZK 8 billion<sup>30</sup> on measures related to flood protection, of which CZK 4.5 billion was spent by the MoE and CZK 3.5 billion by the MoA. The MoE and the MoA spent CZK 1.6 billion on average per year between 2014 and 2018.

In 2014, a financial framework totalling CZK 4.65 billion was approved for the programme of the Ministry of Agriculture 129 260 *Support for flood prevention III*. The programme documentation and the SRS show that, based on the actions included in the programme, the approved initial financial framework of the programme and some of the initially set binding values of the programme parameters will not be met according to the final evaluations of actions and issued subsidy decisions. As of 30 June 2019, funds in the total amount of CZK 2.2 billion were provided under this programme and the estimated drawing under programme 129 260 is approximately CZK 2.8 billion<sup>31</sup>.

The FRMP state that floods represent the greatest direct threat to the Czech Republic in the field of natural disasters, and the *Comprehensive Study on Impacts, Vulnerability and Risks Sources Connected to Climate Change in the Czech Republic*<sup>32</sup> identified floods and flash floods as one of the main manifestations of climate change in the Czech Republic<sup>33</sup>. Despite the above facts, data on the use of funds for FCM compared to the quantified needs indicate that the passage of time since the last major flood in 2013 shows the “short-term memory” of the society regarding the consequences of a particular flood, and the pressure to implement FCM is decreasing.

#### **4. Measures in support of revitalisation approaches to watercourses are not being fulfilled**

The *National Action Plan on Adaptation to Climate Change* was approved by Government Resolution No 34 of 16 January 2017, which obliged the members of the Government to implement the tasks contained in the NAP and in the implementing document entitled *Strategy on Adaptation to Climate Change in the Czech Republic*. For the main identified manifestations of climate change in the Czech Republic, the NAP defines relevant specific objectives and measures to achieve those objectives. The measures set out are divided into specific tasks. For each task, the deadline and the entity responsible for its fulfilment are set. One of the main identified manifestations of climate change in the Czech Republic consists in floods and flash floods, for which the specific objectives of “*stopping soil degradation by excessive erosion, nutrient depletion, loss of organic matter and compaction*” (SO 5) and “*increasing the natural retention ability of watercourses and floodplains*” (SO 11) are relevant, among others. For SO 5, the NAP provides, inter alia, for the measure “*reduction of water and wind erosion of agricultural land*” (o5\_1); for SO 11, the NAP provides for the measure “*comprehensive revitalisation of watercourses and floodplains and support for spontaneous renaturation*” (o11\_1).

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<sup>30</sup> In addition to the subsidy titles listed in Table 3, this amount also includes previous programmes of the MoA 129 120 *Support for flood prevention II* and 129 130 *Support for restoration, mud removal and reconstruction of ponds and construction of reservoirs*.

<sup>31</sup> The estimate is based on the issued subsidy decisions and their amendments as of 30 June 2019. Registration of investment projects for inclusion in the programme has already been completed.

<sup>32</sup> The *Comprehensive Study on Impacts, Vulnerability and Risks Sources Connected to Climate Change in the Czech Republic* was prepared by the Centre for environment and land assessment (EKOTOXA s.r.o.) based on an order from the MoE in 2015.

<sup>33</sup> Other identified major manifestations of climate change in the Czech Republic include long-term drought, temperature increases, extreme meteorological phenomena and natural fires.



The SAO's audit found that the current state of fulfilment of some of the tasks set to meet the relevant specific objectives 5 and 11 deviated from the predefined desired outcome with respect to the set deadline. An overview of these tasks and their evaluation is given in the following table.

**Table 4:** Overview and evaluation of selected relevant NAP tasks

Code	Task	Entity	Deadline	Evaluation
5_1.1	Prepare and put into practice an erosion control ordinance as a comprehensive tool for qualitative land protection	MoE	2017	Erosion control ordinance was not approved before audit completion (September 2019)
11_1.1	Draw up a methodology for overcoming difficulties while implementing revitalisation and renaturation of watercourses and floodplains	MoE	2017	Methodology was not drawn up before audit completion (September 2019)
11_1.2	Draw up a methodology for selecting stretches of watercourses and floodplains suitable for spontaneous or initiated renaturation			
11_1.3	Implement a pilot project of watercourse renaturation in each river basin	MoA, river basin managers	2017	Task performed in a small extent
11_1.5	Support comprehensive revitalisation and spontaneous renaturation of watercourses and floodplains	MoE	Continuously	Task performed in a small extent
11_1.7	Update methodology guideline on flood inspections and on the rectification of flood damages	MoE	2018	Methodology guideline was not updated before audit completion (September 2019)

**Source:** NAP, materials of MoE, SEF, MoA and audited state river basin enterprises, MS2014+.

As regards tasks 11\_1.3 and 11\_1.5, for which the SAO assessed that they were being fulfilled only to a small extent, the SAO states:

- In 2015, the project entitled *Strategy for protection against the negative impacts of floods and erosion phenomena by nature-based measures in the Czech Republic*, conducted by the T. G. Masaryk Water Research Institute, public research institution, was completed. The project was implemented to fulfil a significant part of the tasks set out in Concept 2010 and proposed nature-based measures involving the revitalisation of watercourses and floodplains for areas with a very high level of vulnerability over a total length of 8,838 kilometres of watercourses.
- According to the monitored OPE indicators, watercourses in total length of 245.69 kilometres had been revitalised from EU funds as of 23 July 2019, of which 236.92 kilometres were the achieved value of indicator 250300 *Total length of the revitalised watercourse* (OPE 2007-2013) and 8.77 kilometres were the achieved interim value of indicator 46505 *Length of revitalised watercourses* as of 23 July 2019 (OPE 2014-2020).
- As of 23 July 2019, the relevant OPE 2014-2020 indicator showed low performance in relation to the target value. Indicator 46505 *Length of revitalised watercourses* showed 4% of the target value and the beneficiaries' commitment was 17% of the target value of this indicator.
- In the years 2010-2018, the audited state river basin enterprises carried out a total of 48 acts of revitalisation of watercourses with a total length of 61.3 kilometres, for which

they spent a total of CZK 0.7 billion, representing an average annual expenditure of only CZK 78 million.

- As of 30 June 2019, only two projects aimed at spontaneous renaturation had been aided under the OPE 2014-2020.
- Povodí Labe completed renaturation on 14 stretches of watercourses with a total length of 14.4 kilometres; on another 13 stretches of watercourses with a total length of 9.4 kilometres, renaturation is underway. Within the competence of Povodí Moravy, renaturation is being implemented on one stretch of the watercourse but no renaturation has been carried out or is underway within the competence of Povodí Odry and Povodí Vltavy.

It follows from the above that the MoE, the MoA, Povodí Odry and Povodí Vltavy did not meet the selected NAP tasks to the required extent and by the set deadline, or performed the relevant tasks only to a small extent.

##### **5. On some stretches of watercourses in areas with a significant flood risk, flood areas or their active zones have not yet been identified**

Flood areas are administratively designated areas that can be flooded with water when natural floods occur. According to the Water Act, their scope must be determined by the water authority (municipality with extended powers) on the proposal of the watercourse administrator<sup>34</sup>. The water authority is also obliged to identify, on the proposal of the watercourse administrator, the so-called active zone of the flood area depending on the dangerousness of the flood water discharge in developed areas, areas intended for development according to land-use planning documentation or in other territories as needed. Flood areas and their active zones are determined by measures of a general nature. Pursuant to the Water Act, the active zones of flood areas must not permit the placement or construction of any structures with the exception of those that are exhaustively delimited, e.g. water works implementing flood protection measures.

According to the MoE, a total of 13,800 kilometres of watercourses are currently administratively designated as flood areas, of which approximately 12,100 kilometres are on stretches of major watercourses, of which there are a total of 16,762 kilometres in the Czech Republic pursuant to Decree No 178/2012 Coll. The total length of watercourses in the Czech Republic with a river basin of more than 5 km<sup>2</sup> is about 98,900 kilometres. Flood areas are thus administratively determined for 72% of the length of major watercourses, i.e. for 14% of the total length of watercourses in the Czech Republic. In 2017, the administratively determined flood areas affected the area of municipalities with 88 % of the population of the Czech Republic.

The audit revealed that in at least four municipalities with an unacceptable flood risk of flood threat on the Šembera watercourse within the competence of Povodí Labe, the flood areas including active zones had not been identified before the end of the audit even though the flood area had been defined by Povodí Labe and submitted to the water authority. In 36 municipalities with an unacceptable flood risk of flood threat on the Kyjovka, Svatka – Bílý potok, Morava in the Olomouc Region, Rožnovská Bečva, Vsetínská Bečva and Senice

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<sup>34</sup> Watercourse management is carried out mainly by river basin administrators (the state river basin enterprises of Povodí Labe, Povodí Moravy, Povodí Odry, Povodí Ohře and Povodí Vltavy). The state enterprise Lesy ČR is also an important administrator of minor watercourses.

watercourses in the competence of Povodí Moravy, flood areas have been identified but no active zones restricting the permission of new development have not yet been defined there. According to Povodí Moravy, preparations are being made for their definition. Determination of flood areas, including the definition of active zones of flood areas, is the responsibility of the competent water authorities; the MoE or the MoA cannot influence the findings.

The FRMP also focus on the issue of restricting development in flood areas. Flood hazard and flood risk maps were prepared for areas with a significant flood risk. The flood hazard maps show three basic flood characteristics, namely the extent of the flood, the depth of flooding and the flow velocity for the selected flood scenarios (by default for recurrence intervals of 5, 20, 100 and 500 years). These maps serve as the basis for flood threat and flood risk maps. The flood threat is determined across the entire flood area regardless of the activity taking place there. The threat level is expressed in a four-stage colour scale for high, medium, low and residual threat. The assessment of the flood risk consists in linking information on the level of flood threat and the level of vulnerability of the territory. The basis for determining the vulnerability was information on the manner of land use from the land-use planning documentation. To compile the flood risk map, vulnerability categories were defined and acceptable flood threat levels assigned to them. The flood risk maps show areas of individual categories of use where the acceptable flood threat is exceeded. The aim of the FRMP is to reduce the extent of areas at an unacceptable risk of flood threat.

The FRMP provide recommended rules for land use according to the level of threat. For areas with a high level of threat, they recommend not to allow new or expand the existing development. In areas with a medium level of threat, the reduction of new development is recommended based on a detailed assessment of the necessity of the function of the objects in the endangered area and the extent of their threat by floods. According to the Water Act, the FRMP form a basis for the performance of public administration, especially for land-use planning and water management proceedings. The resulting threat maps, i.e. flood areas classified according to the colour scale in terms of flood threat, serve to assess the suitability of the existing or future functional use of the areas and serve as a recommendation regarding the restriction of potential activities in the given localities. An overview of recommended rules is given in Annex 5 to this Audit Conclusion.

New Decree No 79/2018 Coll.<sup>35</sup> established a uniform approach to the identification of flood areas and their active zones, based on the principles used in flood mapping according to the Flood Directive. The newly defined active zones of the flood area also include other areas defined in the flood threat map as a high-threat area or a medium-threat area, in places where some of the conditions laid down by the Decree are met.

The SAO found that 99% of the flood areas in the territorial jurisdiction of the audited state enterprises were determined according to previously valid legislation, as a result of which the current flood areas and their active zones may not meet the requirements for the determination of active zones of flood areas according to the currently applicable legislation newly based on the drawn up flood hazard and flood threat maps. Within the scope of their competences, the audited state river basin enterprises continually submit proposals to the relevant water authorities to identify or update flood areas.

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<sup>35</sup> Decree No 79/2018 Coll., on the manner and scope of drafting and designation of flood areas and their documentation.

In defined areas with a significant flood risk in the Czech Republic, floods with a medium probability of occurrence ( $Q_{100}$ ) affect 233 km<sup>2</sup> of built-up area in urban areas, while 122 km<sup>2</sup> of built-up area are at an unacceptable risk of flood threat. Floods with a medium probability of occurrence ( $Q_{100}$ ) affect a total of 313 thousand inhabitants, representing 5% of the population living in these areas<sup>36</sup>. 177 thousand inhabitants (3%) permanently live in areas with an unacceptable flood threat. The extent of built-up areas at risk of floods and the number of inhabitants at risk of floods broken down by individual river basins are given in Annexes 6 and 7 to this Audit Conclusion.

The evaluation and updating of data on defined areas with a significant flood risk in the Czech Republic will be carried out in connection with the update of the flood hazard and flood risk maps in 2021, i.e. in a regular six-year cycle based on the legislative requirements of the Flood Directive.

## **6. New development continues in the active zones of flood areas**

The SAO also focused on reviewing opinions issued on development projects by the audited state river basin enterprises (as river basin administrators) under the Water Act, which were related to development completed between 2015 and 2018. For the purpose of selecting an audit sample, the SAO prepared a *Flood Area Analysis*. The analysis was based on data provided in the *Register of territorial identification of addresses and real property* (RÚIAN) as of 1 June 2019, in particular on information on structures. Geospatial data identifying flood areas and active zones were taken from POVIS as of 30 March 2019 (layer used for active areas). The audit revealed that new development was still underway in the active zones of flood areas, increasing the number of people at risk and the value of property in areas with an unacceptable risk of flood threat. Examination of the cases of 40 constructions completed in 2015-2018, which according to the SAO analysis are located in the active zones of flood areas, revealed the following:

- In 9 cases (22.5%) of structures situated wholly or partially in the active zone of the flood area, the river basin administrator had not been asked for an opinion on the given development project and the development had been carried out in the active zones of flood areas.
- In 3 cases (7.5%), the construction had been carried out despite the disagreement or non-recommendation of the river basin administrator.
- In 2 cases (5%), the river basin administrator had merely pointed out that the project under consideration placed the construction in the active zone of a flood area or an area with a high or medium flood risk but had not explicitly given a non-recommendation.
- In 1 case (2.5%), the structure is currently located in the active zone of a flood area but it is not possible to check with the river basin administrator whether, at the time of issuing the opinion, the project was situated in the identified active zone because the audited entity was not the administrator of the relevant watercourse at that time.
- In 4 cases (10%), the investor had documented that the new building would be above the level of the n-year flow rate relevant for the determined active zone of the flood area.

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<sup>36</sup>  $Q_{100}$  - indicates a flood whose peak flow (level in the bed axis at flow) is reached or exceeded once every 100 years in the long-term average; the same applies to  $Q_5$ ,  $Q_{20}$ ,  $Q_{500}$ .

- In 4 cases (10%), it had been a reconstruction or other construction modification of an existing building in the original ground plan, which increased the value of assets in the active zones of flood areas.
- In 6 cases (15%), the construction had been executed outside the active zone of the flood area defined by a measure of a general nature but according to data in POVIS the buildings are located in the active zones of flood areas.
- In 11 cases (27.5%), the flood area including the active zone had not been determined at the time of issuing the opinion of the river basin administrator; of these, in 9 cases the flood area including the active zone was determined in the period after the river basin administrator's opinion had been issued and in 2 cases it was not determined before the completion of the audit; however, according to POVIS, the buildings are located in the active zone.

The *Spatial Development Policy of the Czech Republic as amended by Update 1* (hereinafter the "SDP CR") was approved by Government Resolution No 276 of 15 April 2015. The national priorities also include the identification of built-up areas in flood areas and placing public infrastructure there only in very exceptional and especially justified cases, and defining and protecting built-up areas in order to relocate development from areas with a high risk of flood damage.

The most frequently represented categories of functional land use at an unacceptable risk of flood threat are areas for housing (32.5%) and production and storage areas (25.3%), which together make up almost 58% of all areas at an unacceptable flood risk. The data provided in the FRMP indicate that if local self-governing units do not reassess the current projects (listed in the land-use planning documents) to use the areas with a significant flood risk in the future, expanding areas at an unacceptable risk of flood threat may be expected by approximately 32%<sup>37</sup>.

## **7. The implementation of FCM is delayed by the land consolidation process**

The relevant national priorities listed in the SDP CR include creating conditions for preventive protection of the territory and population from potential risks and natural disasters in the territory in order to minimise the extent of potential damage. In particular, it is necessary to ensure territorial protection of areas needed for the placement of buildings, areas for flood protection measures and areas intended for controlled floods, and to create conditions for increasing natural retention of rain water in the areas with regard to settlement structure and cultural landscape as alternatives to artificial water accumulation.

Land consolidation contributes to flood protection, organises ownership relations to land and allows the construction of flood protection structures and the implementation of plans for common facilities, which also implement water management and erosion control measures<sup>38</sup>. However, if the owners of more than 40 % of the land area disagree, land consolidation including proposed common facilities is not possible at all.

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<sup>37</sup> The projected expansion of areas at an unacceptable flood risk is represented by projected and prospective areas, see Annex 8 to this Audit Conclusion.

<sup>38</sup> E.g. grassing of valleys on erosion-threatened slopes, construction or reconstruction of water reservoirs and dry retarding basins, revitalisation of minor watercourses.

On 1 July 2008, an amendment to the Water Act came into effect<sup>15</sup>; it provided river basin administrators with the possibility of withdrawing or limiting the rights to land and structures necessary for the execution of publicly beneficial flood protection structures in accordance with the Expropriation Act<sup>16</sup>, among other things. Until then, the legislation had not consistently addressed the possible enforcement of flood protection in the public interest.<sup>39</sup> In the explanatory memorandum to the amendment, it is estimated that around 10 thousand hectares of land intended for controlled floods will be ready by 2015. However, data from the MoA show that in the period from the effective date of the amendment to the Water Act until 1 January 2019, only about 3 thousand hectares of such flood areas were built.

By 31 December 2018, Povodí Vltavy, Povodí Odry and Povodí Moravy had completed a total of 6 areas designated for controlled flood discharges with a total retention volume of 211 thousand m<sup>3</sup> and a total area of 10 hectares. The total amount of funds spent on these territories for controlled flooding is CZK 75.81 million (of which CZK 70.97 million from the subsidy), of which the cost of limiting the ownership of land is CZK 9.19 million (CZK 8.5 million from the subsidy).

In 2019, Povodí Vltavy and Povodí Odry were completing modifications of four areas designated for controlled flood discharges with a total retention volume of 1,058 thousand m<sup>3</sup> and a total area of 93 hectares. The estimated amount of funds for implementation amounts to CZK 260.25 million (of which CZK 225.63 million from the subsidy), of which the estimated cost of limiting the ownership of land is CZK 4.13 million (payment from own resources only).

Before the completion of the audit, Povodí Labe was the only one of the state river basin enterprises which used the possibility of expropriation of land, in connection with the implementation of areas designated for controlled flooding with a planned retention volume of 12,144 thousand m<sup>3</sup> and a planned area of 521 hectares. The ownership right was limited to land with a total area of 0.3 hectares.

The territorial competence of Povodí Labe, Povodí Vltavy, Povodí Odry and Povodí Moravy includes a total of 339 dry reservoirs, of which 85 dry reservoirs are owned by these enterprises.

#### **8. The MoA does not monitor the fulfilment of the statutory condition for the payment of damages caused by controlled flooding**

According to the Water Act, land designated for controlled floods is considered to be the land necessary for the diversion or accumulation of surface water by publicly beneficial structures for flood protection, to which ownership rights were restricted by agreement or under the Expropriation Act. Damage caused by a controlled flooding over land, field crops, forest growth and structures in areas designated for controlled flooding shall be compensated to the injured party, provided in monetary form by the state represented by the Ministry of Agriculture. According to the transitional provisions of Act No 181/2008 Coll., the injured party is also entitled to compensation in the case of damage caused to agricultural land in the flooding of dry reservoirs used to protect the territory of the municipality, region or state,

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<sup>39</sup> The legislation did not offer appropriate instruments in situations where the owners of the land in question disagreed to a private solution; in such cases there was virtually no possibility of acquiring the land (except for an agreement, there was only the option of land exchange under land consolidation) for building a flood control measure in the public interest.

built before the date of entry into force of this Act (1 July 2008). For the purpose of damages settlement, the MoA maintains a *list of dry reservoirs in the Czech Republic to claim damages*.

The audit revealed that the MoA did not monitor or verify the statutory condition for claiming damages, i.e. whether the registered areas designated for controlled flooding built after the entry into force of Act No 181/2008 Coll. were defined in the issued land-use planning documents as publicly beneficial structures for flood protection. Information on whether these are publicly beneficial structures is monitored by Povodí Labe and Povodí Odry only for dry reservoirs owned by them. Povodí Vltavy has stated that this parameter is not monitored and that its monitoring has not been requested so far. Povodí Odry has stated that the MoA does not require this information from the river basin.

For the purposes of assessing claims for compensation for damage caused by controlled floods, the MoA considers all areas designated for controlled flooding as given in the *list of dry reservoirs in the Czech Republic to claim damages* as publicly beneficial structures. The MoA has entrusted the state river basin enterprises with updating this list annually. However, the MoA does not check the list. The MoA has not set up a control system for monitoring the fulfilment of this statutory requirement even in the process of accepting applications for compensation of damage caused by controlled flooding.

As of 17 September 2019, the MoA had provided a total of nine compensations of damage to crops in areas designated for controlled flooding in the total amount of CZK 6.92 million, for which the statutory requirements had been met. The SAO did not find any payment of damages in violation of the Water Act but draws attention to the shortcoming in the control system of the MoA, as the *list of dry reservoirs in the Czech Republic to claim damages* in territories intended for controlled flooding pursuant to Section 68 of the Water Act valid as of 1 January 2019 and published on the website of the MoA contains at least one dry reservoir built by Povodí Vltavy and two dry reservoirs built by Povodí Moravy after the entry into force of Act No 181/2008 Coll. which are not identified in the valid land-use planning documentation as publicly beneficial structures.

## List of abbreviations and terms

CR	Czech Republic
DASFR	documentation of areas with significant flood risk
SRS	<i>Subsidy Registration System</i>
EEA	European Environment Agency
EU	European Union
Concept 2010	<i>Concept of flood protection in the Czech Republic with the use of technical and nature-based measures</i>
audited state river basin enterprises	Povodí Labe, state enterprise; Povodí Moravy, s.p.; Povodí Odry, state enterprise; Povodí Vltavy, state enterprise
MS2014+	monitoring system of the European Funds for the programming period of 2014-2020
MoA	Ministry of Agriculture
MoE	Ministry of the Environment
NAP	<i>National Action Plan on Adaptation to Climate Change</i>
SAO	Supreme Audit Office
OPE	Operational Programme <i>Environment</i>
NBFCM	nature-based flood control measures
PA	priority axis/area
POVIS	<i>Flood Information System</i> , public administration information system
Povodí Labe	Povodí Labe, state enterprise
Povodí Moravy	Povodí Moravy, s.p.
Povodí Odry	Povodí Odry, state enterprise
Povodí Vltavy	Povodí Vltavy, state enterprise
FCM	flood control measures
FRMP	Flood Risk Management Plans
SDP CR <i>Update 1</i>	<i>Spatial Development Policy of the Czech Republic as amended by Update 1</i>
RÚIAN	<i>Register of territorial identification of addresses and real property</i>
SO	specific objective (in the OPE)
SEF	State Environmental Fund of the Czech Republic

**Flood Directive** – Directive 2007/60/EC of the European Parliament and of the Council

**Water Framework Directive** – Directive 2000/60/EC of the European Parliament and of the Council



**Annex 1: Overview of significant floods and their known consequences in the years 1997-2013**

Flood	Property damage (CZK billion)	Human victims
July 1997	62.6	50–60
July 1998	1.8	6
March 2000	3.8	2
August 2002	73.1	17–19
March/April 2006	6	9
June 2006	Not available	Not available
June/July 2009	8.5	15
May/June 2010	5.1	3
August 2010	10.1	5
June 2013	15.4	16
<b>Total</b>	<b>186.4</b>	<b>123–135</b>

Source: Update of preliminary flood risk assessment for the Czech Republic, 2018, version 1.0.

**Annex 2: Projects audited at the SEF (CZK)**

SC	Project registration number	Applicant	EU contribution	Paid out to applicants
1.3	CZ.05.1.24/0.0/0.0/16_034/0002108	Municipality Otaslavice	5,630,901.50	5,630,901.44
	CZ.05.1.24/0.0/0.0/16_034/0002319	Municipality Vratěšín	2,732,988.25	2,732,988.24
	CZ.05.1.24/0.0/0.0/16_034/0002335	Town of Aš	4,392,794.91	4,392,692.91
	CZ.05.1.24/0.0/0.0/17_062/0005927	Municipality Zašová	1,481,957.82	1,481,957.82
	CZ.05.1.24/0.0/0.0/17_062/0005935	Town of Chodov	1,739,327.22	1,739,327.22
	CZ.05.1.24/0.0/0.0/16_034/0002269	Municipality Rapotín	326,054,453.36	90,873,313.78
	CZ.05.1.24/0.0/0.0/17_074/0006441	Nature Conservation Agency of the Czech Republic	41,844,426.62	0
	CZ.05.1.24/0.0/0.0/17_062/0005901	Town of Semily	11,968,041.03	0
	CZ.05.1.24/0.0/0.0/17_074/0007051	Municipality Cehnice	13,558,657.70	2,238,728.30
	CZ.05.1.24/0.0/0.0/17_074/0006995	Municipality Zlobice	12,916,166.59	8,927,548.39
<b>Total SC 1.3</b>			<b>422,319,715.00</b>	<b>118,017,458.10</b>
1.4	CZ.05.1.24/0.0/0.0/15_004/0000544	Municipalities for Baťa canal	18,416,470.10	18,416,469.40
	CZ.05.1.24/0.0/0.0/16_035/0002105	Statutory town of Zlín	10,729,864.60	10,729,864.46
	CZ.05.1.24/0.0/0.0/15_004/0000769	Town of Nymburk	9,385,271.00	9,341,565.80
	CZ.05.1.24/0.0/0.0/15_004/0000708	South Moravian Region	3,695,400.50	3,695,400.50
	CZ.05.1.24/0.0/0.0/15_004/0000274	Municipality Mikulovice	3,199,989.80	3,199,989.80
	CZ.05.1.24/0.0/0.0/18_096/0007472	Povodí Moravy, s.p.	33,395,208.00	0
	CZ.05.1.24/0.0/0.0/17_064/0005338	Povodí Labe, state enterprise	32,760,504.50	4,191,426.50
	CZ.05.1.24/0.0/0.0/17_064/0005368	Povodí Vltavy, state enterprise	28,045,738.10	51,013.60
	CZ.05.1.24/0.0/0.0/17_063/0005242	Statutory town of Olomouc	52,422,028.33	762,744.50
	CZ.05.1.24/0.0/0.0/18_096/0008315	Povodí Moravy, s.p.	34,219,034.61	0
<b>Total SC 1.4</b>			<b>226,269,509.54</b>	<b>50,388,474.56</b>
<b>Total SC 1.3 and 1.4</b>			<b>648,589,224.54</b>	<b>168,405,932.66</b>

Source: MS2014+, SEF documents.

**Annex 3: Projects audited at the MoA (CZK)**

Programme	Audit No	Applicant	MoA contribution	Paid out to applicants
129 260	129D262009020	Povodí Moravy	1,905,650.00	1,905,650.00
	129D263009016	Povodí Moravy	7,790,000.00	7,790,000.00
	129D264004002	Povodí Vltavy	70,626,089.10	70,626,089.10
	129D264005667	Povodí Odry	47,946,690.00	47,946,690.00
	129D264006002	Povodí Labe	4,433,203.00	4,433,203.00
	129D264009018	Povodí Moravy	4,141,083.00	4,141,083.00
	129D265004503	Povodí Vltavy	30,100,000.00	30,100,000.00
	129D265006002	Povodí Labe	16,774,222.00	16,774,222.00
	129D265005659	Povodí Odry	15,142,000.00	15,142,000.00
	129D265009502	Povodí Moravy	11,661,413.71	11,661,413.71
<b>Total</b>			<b>210,520,350.81</b>	<b>210,520,350.81</b>

Source: SRS, MoA documents.

**Annex 4: Projects audited on the part of aid beneficiaries**

(in CZK)

Audited entity	Project number	Project name	Audited volume	Budgeted funds <sup>1</sup>
Povodí Labe	129D265006002	Jizera, Turnov, increasing town protection by reconstructing the watercourse bed	20,840,419.60	20,837,688.08
	129D264006002	Waterwork Neškaredice, increasing retention function by reconstructing outlets	6,491,955.20	6,333,569.03
	CZ.05.1.24/0.0/0.0/17_064/0005338	Analysis of areas with a significant flood risk in the territorial competence of state enterprise Povodí Labe including suggestions for possible flood prevention measures	4,931,090.00	38,541,770.00
Povodí Vltavy	129D264004002	Waterwork Klabava – increasing retention and securing the waterwork against flood effects	70,652,375.67	117,943,828.07
	129D265004503	Flood prevention measures of the town of Písek, the left bank of the Otava river, housing estate Portyč – delta of the Jiher stream	43,491,991.56	55,553,519.68
	CZ.05.1.24/0.0/0.0/17_064/0005368	Analysis of areas with a significant flood risk in the territorial competence of state enterprise Povodí Vltavy including suggestions for possible flood prevention measures (source material of the Plan for managing flood risks in the Labe river basin)	60,016.00	32,994,986.00
Povodí Odry	129D265005659	Ostravice, dike in km 0,0–3,0	17,888,772.35	17,844,106.92
	129D264005667	Waterwork Olešná, cleaning up sediments	52,436,793.19	51,837,791.75
Povodí Moravy	129D264009018	Polder Mysločovice	4,472,708.00	4,472,708.00
	129D265009502	Flood prevention measures in Přerov at the Dr. E. Beneš embankment	13,020,968.40	13,793,431.11
	CZ.05.1.24/0.0/0.0/18_096/0007472	Analysis of areas with a significant flood risk in the territorial competence of Povodí Moravy, state enterprise, including suggestions for possible flood prevention measures	10,724,036.40	39,288,480.00
<b>Total</b>			<b>245,011,126.37</b>	<b>399,441,878.64</b>

**Source:** documentation of audited projects.

<sup>1</sup> Budgeted funds according to issued decisions on subsidy provision.

## Annex 5: Threat categories and recommended rules for land use

Threat category / acceptable threat	Recommendation for given threat category	Functional use of land according to acceptable level of flood threat
(4) High (red colour)	It is recommended <b>not to allow</b> new or <b>expand</b> the existing development where people are staying or animals are placed. In the case of existing development it is necessary to carry out suggested flood protection measures which will ensure a corresponding decrease of risk, or draw up a programme of resiting development.	Green vegetation
(3) Medium (blue colour)	New development is <b>possible with restrictions</b> based on a detailed assessment of the necessity of the function of the buildings in the endangered area and the extent of their threat by floods. The construction of sensitive buildings is unsuitable (e.g. health facilities, fire stations etc.). It is not recommended to extend existing areas designated for development.	Recreation and sports <sup>1</sup>
(2) Low (orange colour)	Development is <b>possible</b> , however the owners of the affected land and buildings must be notified of the threat of potential flood danger. In the case of sensitive buildings it is necessary to take special measures, e.g. a traumatological plan in the sense of crisis management.	Housing, public amenities, mixed-use development, technical amenities, transport, production and storage facilities
(1) Residual (yellow colour)	It is usually recommended to deal with flood protection issues through long-term land-use planning aimed at particularly sensitive buildings (health facilities, cultural sites etc.). Avoid buildings and facilities with increased damage potential.	Not available

Source: Flood Risk Management Plans – tables 4.1 and 4.2.

<sup>1</sup> The *recreation and sports* category comprises areas such as e.g. open-air sports grounds, public campsites, allotment gardens etc. Sports facilities (indoor swimming pools, ice-skating stadiums, sports halls and others) belong to the *public amenities* category.

## Annex 6: The extent of areas affected by flood and areas at an unacceptable risk (November 2015)

River basin	Sub-basin	Developed areas and areas intended for development affected by floods in N-years (km <sup>2</sup> )				Area at an unacceptable risk (km <sup>2</sup> )
		Q <sub>5</sub>	Q <sub>20</sub>	Q <sub>100</sub>	Q <sub>500</sub>	
Elbe	Upper and Middle Elbe	17.20	38.42	64.71	108.13	37.56
	Upper Moldau	2.53	6.28	12.00	19.46	5.83
	Berounka	1.93	4.17	7.92	12.54	3.89
	Lower Moldau	5.04	9.45	14.27	26.79	9.47
	Ohře, Lower Elbe and other tributaries of the Elbe	7.67	14.65	26.13	44.62	20.02
	<b>Total for the Elbe river basin<sup>1</sup></b>	<b>34.31</b>	<b>72.13</b>	<b>123.37</b>	<b>207.52</b>	<b>76.03</b>
Oder	Upper Oder	1.20	3.09	9.95	37.45	4.13
	Lusatian Neisse and other tributaries of the Oder	2.94	6.07	8.94	10.95	5.44
	<b>Total for the Oder river basin</b>	<b>4.14</b>	<b>9.16</b>	<b>18.90</b>	<b>48.39</b>	<b>9.57</b>
Danube	Morava	6.07	28.55	66.41	88.71	24.88
	Dyje	1.50	5.61	24.06	32.69	11.77
	<b>Total for the Danube river basin</b>	<b>7.57</b>	<b>34.16</b>	<b>90.47</b>	<b>121.41</b>	<b>36.66</b>
<b>Total</b>		<b>46,03</b>	<b>115,45</b>	<b>232,73</b>	<b>377,32</b>	<b>122,25</b>

Source: Flood Risk Management Plans – table 4.3.

<sup>1</sup> The entry “Total” does not correspond with the sum of entries for each sub-basin, since the affected areas and affected inhabitants of the confluence area of the Elbe and the Moldau overlap.

### Note:

Q<sub>N</sub> = N-year flowrate – is defined as the overland flow which occurs once in N years on average

**Annex 7: Number of inhabitants affected by floods and number of inhabitants at an unacceptable risk (November 2015)**

River basin	Sub-basin	Number of municipalities	Total number of inhabitants	Number of inhabitants affected by flood in N-years				Number of inhabitants at an unacceptable risk
				Q <sub>5</sub>	Q <sub>20</sub>	Q <sub>100</sub>	Q <sub>500</sub>	
Elbe	Upper and Middle Elbe	330	971,905	2,607	12,736	44,371	139,955	22,611
	Upper Moldau	77	308,870	331	2,085	13,170	33,950	6,136
	Berounka	69	359,009	268	1,768	6,964	18,309	3,087
	Lower Moldau	104	1,438,663	306	2,102	8,074	69,646	5,013
	Ohře, Lower Elbe and other tributaries of the Elbe	137	922,837	1,113	7,941	32,655	66,819	20,730
	<b>Total for the Elbe river basin<sup>1</sup></b>	<b>705</b>	<b>3,973,130</b>	<b>4,616</b>	<b>26,232</b>	<b>103,104</b>	<b>323,942</b>	<b>56,112</b>
Oder	Upper Oder	42	679,894	138	1,581	21,327	93,089	8,211
	Lusatian Neisse and other tributaries of the Oder	27	221,312	813	4,331	8,359	11,797	6,136
	<b>Total for the Oder river basin</b>	<b>69</b>	<b>901,206</b>	<b>951</b>	<b>5,912</b>	<b>29,686</b>	<b>104,886</b>	<b>14,347</b>
Danube	Morava	135	772,538	4,176	37,215	128,951	182,119	74,874
	Dyje	81	759,001	1,241	3,972	51,603	74,709	31,671
	<b>Total for the Danube river basin</b>	<b>216</b>	<b>1,531,539</b>	<b>5,417</b>	<b>41,187</b>	<b>180,554</b>	<b>256,828</b>	<b>106,545</b>
<b>Total</b>		<b>990</b>	<b>6,405,875</b>	<b>10,984</b>	<b>73,331</b>	<b>313,344</b>	<b>685,656</b>	<b>177,004</b>

Source: Flood Risk Management Plans – table 4.4.

<sup>1</sup> The entry “Total” does not correspond with the sum of entries for each sub-basin, since the affected areas and affected inhabitants of the confluence area of the Elbe and the Moldau overlap.

**Note:**

Q<sub>N</sub> = N-year flowrate – is defined as the overland flow which occurs once in N years on average

**Annex 8: The extent of areas at an unacceptable risk classified according to individual categories of functional land use (November 2015)**

River basin	Categories of functional land use	Areas at an unacceptable risk (km <sup>2</sup> )		
		Current state	Proposal areas	Outlook areas
Elbe, Oder, Danube	Housing	39.74	8.58	0.86
	Production and storage facilities	30.97	7.86	0.97
	Recreation and sports	16.60	3.98	0.57
	Mixed-use development	12.22	3.14	0.28
	Public amenities	10.79	5.82	0.48
	Transport infrastructure	6.46	4.84	0.45
	Technical infrastructure	5.48	1.68	0.06
	<b>Total</b>	<b>122.26</b>	<b>35.90</b>	<b>3.67</b>
Of which:	Elbe	76.03	18.87	2.00
	Danube	36.66	16.10	0.99
	Oder	9.57	0.93	0.68

Source: Flood Risk management plans – table 4.5.