**Annex\_3**

**4.1 Monitoring and evaluation methodology related to:**

**a) reducing climate impacts, vulnerabilities, risks, and increasing adaptive capacity;**

**An overview of existing monitoring systems in the Slovak Republic relevant to obtaining information on the implementation of selected adaptation actions**

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| **Sector/ monitoring systems** |
| **Agriculture and food** |
| [**Partial Monitoring System - SOIL**](http://www.podnemapy.sk/portal/prave_menu/cms_p/cms_p.aspx)  Institution / Ministry: NPPC – VÚPOP / MPRV SR  The subject of monitoring: Organic carbon in the soil, Soil erosion, Salinisation induced by anthropogenic activity.  Relation to NAS adaptation measures: Preservation and increase of organic carbon in the soil. Measures to eliminate soil erosion. Salt elimination measures (salt-loving plants, phytoremediation – except for selected habitats of European and national importance associated with the salty environment). |
| **Biodiversity** |
| [**Complex information and monitoring system ŠOP SR**](http://www.biomonitoring.sk/)  Institution / Ministry: ŠOP SR / MŽP SR  The subject of monitoring: The subject of monitoring is 66 types of habitats, 146 species of animals and 49 species of plants of European importance. Monitoring takes place at more than 10,000 monitoring sites throughout Slovakia.  Relation to NAS adaptation measures: Obtaining information for evaluating the effectiveness of implementing adaptation measures concerning biodiversity, assessing the structure, stability and resilience of biodiversity (ecosystems, habitats, species and their communities) and the overall adaptive capacity of the natural environment. |
| **Energy sector** |
| [**Energy Efficiency Monitoring System**](https://www.siea.sk/monitorovaci-system/)  Institution / Ministry: SEIA / MH SR  The subject of monitoring: Primary and final energy consumption in sectors according to the Integrated National Energy and Climate Plan for the years 2021 – 2023 and evaluation of measures in the field of energy efficiency for the purpose of proving the fulfillment of the energy saving plan until 2030.  Relation to NAS adaptation measures: Reducing energy consumption and promoting cost-effective measures in the field of energy efficiency in the Slovak Republic following relevant plans and strategies focusing on energy efficiency, implementation of energy labelling, which will contribute to consumers' orientation towards more energy-efficient appliances. |
| **Forest management** |
| **National forest inventory and monitoring**  Institution / Ministry: NLC / MPRV SR  Alongside the Forest Care Programs, this is another important data system on the state of Slovakia's forests, which enables more reliable monitoring of changes in the state of forests. It is a sampling method that uses direct measurement with modern technologies on representatively distributed inventory areas in designed 10-year intervals, while ascertaining the condition of all forests, even outside forest land and thus without forestry management. The main goal of NFIM SR is to monitor the strategic goals of forestry, especially the preservation of the forest as a permanently renewable resource. Relation to NAS adaptation measures: Obtaining information for evaluating the effectiveness of implementation of adaptation measures in relation to forests and forest management.  [**Partial Monitoring System Forests**](https://www.forestportal.sk/odborna-sekcia-i/ekologia-a-monitoring/monitoring-lesov-cms-lesy/)  Institution / Ministry: NLC / MPRV SR  The subject of monitoring: The forest monitoring system provides reliable and comparable data on forests within Europe. Primary measured data are often used for scientific analysis or the validation of forest development models from various aspects (including climate change and adaptation). It is part of the European forest monitoring system, which also contributes to the objective of the EU Forest Action Plan: "To maintain and improve biodiversity, carbon sequestration, integrity, health and resilience of forest ecosystems".  Relation to NAS adaptation measures: Obtaining information for evaluating the effectiveness of the implementation of adaptation measures concerning forests and forestry. |
| **Water management** |
| [**State Hydrological Service**](https://www.shmu.sk/sk/?page=946)  Institution / Ministry: SHMÚ / MŽP SR  The subject of the monitoring: Surface water quantity and quality monitoring in the monitoring stations of the State Hydrological Network. Groundwater quantity and quality monitoring in the monitoring stations of the State Hydrological Network. The data is collected in the database Central Water Register (SeoV). SEoV contains registers of data obtained from monitoring stations of State Hydrological Network, as well as registers of data on surface water and groundwater use and quality.  Relationship to NAS adaptation measures: Monitoring of hydrological characteristics relevant to the assessment of the hydrological regime, flood risk, drought risk and water retention in the country.  [**Framework Program for Monitoring the Waters of Slovakia for the period 2016-2021**](https://www.vuvh.sk/rsv2/default.aspx?pn=RPMV2PO)  [**Framework Program for Monitoring the Waters of Slovakia for the period 2022-2027**](https://www.minzp.sk/files/sekcia-vod/ramcovy-program-monitorovania-vod-slovenska-obdobie-2022-2027.pdf)  Institution / Ministry: SHMÚ, VÚVH, SVP, ŠGÚDŠ, ŠOP SR / MŽP SR  The subject of the monitoring: Surface water and ground water monitoring.  Relationship to NAS adaptation measures: Monitoring of hydrological characteristics relevant to the assessment of the hydrological regime, flood risk, drought risk and water retention in the country.  [**Drought monitoring**](http://www.shmu.sk/sk/?page=2166)  Institution / Ministry: SHMÚ / MŽP SR  Institution / Ministry: VÚPOP /MPRV SR  The subject of the monitoring: Meteorological, hydrological and soil drought monitoring, groundwater and drought occurrence monitoring.  Relationship to NAS adaptation measures: Monitoring of meteorological, soil and hydrological characteristics relevant to the assessment of drought risk and water retention in the country.  [**Flood Warning and Forecasting System (POVAPSYS )- Hydrological warnings**](http://www.shmu.sk/sk/?page=32)  Institution / Ministry: SHMÚ / MŽP SR  The subject of the monitoring: POVAPSYS is an integrated flood forecasting system that promptly informs users about current flood forecasts and warnings. Its output are also hydrological warnings published on the SHMÚ website.  Relationship to NAS adaptation measures: Monitoring and presentation of hydrological characteristics relevant to flood risk assessment. |
| **Rock environment and geology** |
| [**Partial Monitoring System Geological Factors**](https://www.geology.sk/geoinfoportal/mapovy-portal/tematicke-aplikacie/ciastkovy-monitorovaci-system-geologicke-faktor/)  Institution / Ministry: ŠGÚDŠ / MŽP SR  The subject of monitoring: Landslides and other slope deformations.  Relation to NAS adaptation measures: Stabilising urbanised areas and areas of interest potentially prone to slope movements. |

**Overview of the main existing information systems or other information sources in the Slovak Republic relevant to obtaining information on the implementation of selected adaptation measures**

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| **Sector**/ **Information system or other information source** |
| **Biodiversity** |
| [**Complex information and monitoring system ŠOP SR**](http://www.biomonitoring.sk/)  Institution / Ministry: ŠOP SR / MŽP SR  The subject of the Information system / Information source: The information system provides monitoring data concerning individual species' status and habitats of European importance from permanent monitoring sites. It includes information on 66 habitat types, 146 animal species and 49 plant species of European importance.  Relation to NAS adaptation measures: Providing information for evaluating the effectiveness of implementing adaptation measures about biodiversity, providing information for assessing the state of structure, stability and resilience of biodiversity (ecosystems, habitats, species and their communities) and overall adaptive capacity the natural environment.  [**Indicator set of the Biodiversity state and protection**](https://www.enviroportal.sk/indicator/301?langversion=sk)  Institution / Ministry: SAŽP / MŽP SR  The subject of the Information system / Information source: Biodiversity indicators are information tools that summarise data across a complex of environmental variables to indicate the overall state and trends in biodiversity changes and the factors that affect this state. They are an essential tool in assessing the state and development of the environment towards meeting the goals of sustainable development.  Relation to NAS adaptation measures: Provision of information for evaluating the effectiveness of adaptation measures concerning biodiversity. |
| **Forest management** |
| [**Forest management information system**](https://gis.nlcsk.org/islhp/#lesnictvo)  Institution / Ministry: NLC / MPRV SR  The subject of the Information system / Information source: Data on forest management - the area of forests, the trees that grow in them, their health condition. They are based on forest management plans, which are renewed every year on one tenth of the forest area of the SR. Additional information is obtained through various specialized surveys and forest monitoring. Various forestry reports and statistics are also an important source. Relation to NAS adaptation measures: Provision of information for evaluating the effectiveness of implementation of adaptation measures in relation to forestry. [**Forest protection information system**](http://www.e-los.sk) Institution / Ministry: NLC / MPRV SR  The subject of the Information system / Information source: Information about forest protection – about pests, an overview of their occurrence, integrated forest protection and related issues. Relation to NAS adaptation measures: Provision of information for evaluating the effectiveness of implementation of adaptation measures in relation to forestry.  [**Forestportal – Forests and climate change**](https://www.forestportal.sk/odborna-sekcia-i/ekologia-a-monitoring/klimaticke-zmeny/)  Institution / Ministry: NLC / MPRV SR  The subject of the Information system / Information source: Information on the impacts of climate change on forests, on the production of main trees, on forest pests, climate development, including adaptation measures and support activities. Relation to NAS adaptation measures: Provision of information for evaluating the effectiveness of implementation of adaptation measures in relation to forestry. |
| **Water management** |
| **State Hydrological Service**  [Monitoring and assessment of surface water quantity and regime](https://www.shmu.sk/sk/?page=1830)  [Processing of surface water quality and status outputs](https://www.shmu.sk/sk/?page=1776)  [Groundwater quantity monitoring](https://www.shmu.sk/sk/?page=24)  [Groundwater quality monitoring](https://www.shmu.sk/sk/?page=22)  [Groundwater quality monitoring results](https://www.shmu.sk/sk/?page=2451)  [Operational data of groundwater observation facilities and assessment of drought occurrence](https://www.shmu.sk/sk/?page=1364)  [Water management balances of quantity and quality of surface and groundwater](https://www.shmu.sk/sk/?page=1834)  Institution / Ministry: SHMÚ / MŽP SR  The subject of the information system/ Information sources: Surface water quantity and quality monitoring in the monitoring stations of the State Hydrological Network. Groundwater quantity and quality monitoring in the monitoring stations of the State Hydrological Network.  Relationship to NAS adaptation measures: Monitoring of hydrological characteristics relevant to the assessment of the hydrological regime, flood risk, drought risk and water retention in the country.  [**Drought monitoring**](http://www.shmu.sk/sk/?page=2166)  Institution / Ministry: SHMÚ / MŽP SR  Institution / Ministry: VÚPOP / MPRV SR  The subject of the information system/ Information sources: Meteorological, hydrological and soil drought monitoring, groundwater and drought occurrence monitoring.  Relationship to NAS adaptation measures: Monitoring of meteorological, soil and hydrological characteristics relevant to the assessment of drought risk and water retention in the country.  [**Flood hazard maps and flood risk maps of water courses of the Slovak Republic**](http://mpompr.svp.sk/)  Institution / Ministry: SVP / MŽP SR  The subject of the information system/ Information sources: Flood maps are the tools for integrated flood risk management and landscape planning aimed at reducing of adverse floods impacts on human health, the environment, cultural heritage and economic activity.  Relationship to NAS adaptation measures: Monitoring and presentation of hydrological characteristics relevant to flood risk assessment. |
| **Rock environment and geology** |
| [**Environmental Burden Information System**](https://envirozataze.enviroportal.sk/)  Institution / Ministry: SAŽP / MŽP SR  The subject of the information system/ Information sources: Information on-site risk, information about on-site remediation  Relation to NAS adaptation measures: Reduce the risk of contamination of the area, e.g. by spreading contaminated material from environmental pressures, mining waste repositories and rocks containing sulphidic rock-forming minerals, To support technologies enabling sustainable remediation of ecological pressures in the changing conditions accompanying climate change.  [**Mining Waste Management Information System**](https://app.sazp.sk/odpady_tp/)  Institution / Ministry: SAŽP / MŽP SR  The subject of the information system/ Information sources: Inventory of heaps and sludges, determination of their risk  Relation to NAS adaptation measures: Reduce the risk of contamination of the area, e.g. distribution of contaminated material from environmental loads, deposits of mining waste and rocks containing sulphidic rock-forming minerals, Carry out a qualitative inventory of heaps and sludge from the point of view of ongoing climate change and identify the riskiest objects to ensure the reduced release of heavy metals into the environment. |

**List of abbreviations**

MH SR Ministry of Economy of the Slovak Republic

MPRV SR Ministry of Agriculture and Rural Development of the Slovak Republic

MŽP SR Ministry of Environment of the Slovak Republic

NAS National Adaptation Strategy

NFIM SR National forest inventory and monitoring

NLC National Forest Centre

NPPC National Agricultural and Food Centre

VÚPOP Soil Science and Conservation Research Institute

VÚVH Water Research Institute

SAŽP Slovak Environment Agency

SEIA Slovak Innovation and Energy Agency

SEoV Central Water Register

ŠGÚDŠ State Geological Institute of Dionyz Stur

SHMÚ Slovak Hydrometheorological Institute

ŠOP SR State Nature Conservancy of the Slovak Republic

SVP Slovak Water Management Enterprise