Preliminary set of Mission Soil Research and Innovation Key Performance Indicators

KPI	Type	Class	Description	Importance	Level	How to measure
Integration of early-career researchers into project activities	Impact	Academic	Number of early-career (5 years after PhD) researchers integrated into project activities	Integrating early-career researchers into project activities fosters knowledge exchange, promotes innovation, and cultivates future research talent. This KPI will allow to track this integration.	EU	Horizon dashboard
MS introducing policy changes aiming to improve soil health	Impact	Enabling conditions	Number of MS introducing soil health-related legislation or specific regulations in their regulatory bodies.	Assessment of Mission Soil's impact on MS policies and regulations	MS	MS reporting Consulting
Proportion of non-permanent researchers in academic careers	Impact	Enabling conditions	Proportion of non-permanent researchers (at the time of funding) that stayed in academic institutions 10 years after the first project funding	Assessment of the impact over time of the Mission Soil in the career development of European young researchers	MS	Survey
Number of strategic partnerships established	Impact	Enabling conditions	Number of strategic partnerships formed during the course of funding by Mission Soil funded projects	This KPI measures the project's ability to establish strategic partnerships with relevant stakeholders in the soil health research and innovation domain. It can be measured by the number of partnerships formed during the project.	EU	Project reporting
Awareness of land managers with regard to soil health challenges	Impact	Literacy	Percentage of land managers aware of soil health challenges	Evaluate the contribution of R&I to the information outreach of the Mission Soil to land managers	NUTS level 3	Project reporting Survey Living Labs
Soil health awareness amongst European citizens	Impact	Literacy	Percentage of European citizens aware of soil health related issues discriminated in within country administrative regions	Evaluate the contribution of R&I to the information outreach of the Mission Soil to European citizens	NUTS level 2	Project reporting Survey
Amount of time needed to transfer research-innovation outputs into the market.	Impact	Market take-up	Amount of time (in months) that takes to adopt a specific innovation by the target audience, starting from the initial publication or concept to the launch of a marketable product or service.	Evaluation of the efficiency of the innovation process in the context of the Mission Soil	EU	Project reporting European Innovation Council
Innovation adoption rate by	Impact	Market take-up	Number of innovation outputs that manage to reach and are being adopted	It helps to gauge the market acceptance and impact of the innovation produced by the project	EU	Project reporting European

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the target audience.			by the target audience of the project.			Innovation Council
% of land managers having changed or adopted one or more of their practices in a direction improving soil health	Impact	Practice take-up	Number of land managers that changed farming practices towards soil health per total number of land managers	Assessment of the Mission Soil impact in agricultural practices, specifically identification of capacity building and knowledge transfer pathways from research to practice. These pathways can be direct (through direct knowledge transfer mechanisms) or indirect through legislation.	NUTS level 3	Project reporting Survey
Evidence-based legislation	Impact	Public take-up	Number of regulations or specific legislation on soil related topics (direct or indirect) with demonstrable use of scientific evidence	Assessment of the of Mission Soil's scientific outputs and outcomes introduction into policy making and legislation. The scientific evidence can come directly from Mission Soil funded projects, or from scientific initiatives that have gained from the Mission Soil activities.	MS	MS reporting Consulting
MS contribution to EU financed R&I projects related to the Mission Soil	Input	Enabling conditions	Euros invested (in percentage of GDP) by MS on European Mission Soil projects	Assess the level of MS co-investments on R&I related to the Mission Soil objectives	MS	Horizon dashboard LIFE reporting Biodiversa+
MS R&I funding related to the Mission Soil	Input	Enabling conditions	Euros invested (in percentage of GDP) by MS for national Mission Soil related projects	Assess the level of funding by MS to R&I national activities related to the Mission Soil objectives	MS	MS
Number of "new commers" in Mission Soil projects	Input	Enabling conditions	Number of currently funded researchers that haven't received European funding in the past 10 years	Evaluate the attraction and involvement of new participants in Mission Soil projects	EU	REA
Number of Mission Soil projects coordinated by partners from peripherical regions	Input	Enabling conditions	Number of Mission Soil projects coordinated by partners from peripherical regions as identified by the European Council of Regions	Assess the leading involvement of peripherical regions on Mission Soil projects	EU	Horizon dashboard
Number of partners from peripherical regions involved in the Mission Soil projects	Input	Enabling conditions	Number of partners from peripherical regions involved in the Mission Soil projects	To show the integration across European regions	EU	Horizon dashboard

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Number of partners involved in the Mission Soil projects	Input	Enabling conditions	Number of partners involved in the Mission Soil projects	To show the dispersal of R&I funds	EU	Horizon dashboard
Number of research organizations involved in the Mission Soil projects	Input	Enabling conditions	Number of research organizations involved in the Mission Soil projects	Assess the involvement and funding of the academic-research sector on Soil Mission projects	NUTS level 3	Horizon dashboard
Proportion of female researchers involved in Mission Soil projects	Input	Enabling conditions	Proportion of female researchers involved in Mission Soil projects relative to the total number of researchers involved.	Assess gender balance in Mission Soil R&I projects	MS	Horizon dashboard
Number of reviewers from peripherical regions involved in the project review process	Input	Governance structures	Number of reviewers from peripherical regions involved in the project review process	Assess the geographic equity in the distribution of scientific reviewer roles in the context of the Mission Soil	EU	REA
Number of stakeholders involved in Mission Soil projects per type	Input	Governance structures	Number of stakeholders involved in Mission Soil projects per type (e.g., researchers, farmers, land owners, industry, companies, NGOs)	Assess the multisectoral involvement of different partners in projects or activities related to the Mission Soil	NUTS level 3	Project reporting
Number of private companies involved in the Mission Soil projects	Input	Market take-up	Number of private companies involved in the Mission Soil projects	Assess the involvement and funding of the private sector on Soil Mission projects	NUTS level 3	Horizon dashboard
Number of NGOs involved in the Mission Soil projects	Input	Practice take-up	Number of NGOs involved in the Mission Soil projects	Measure the level of NGOs involvement in Soil Mission projects	NUTS level 3	Horizon dashboard
Field-Weighted Citation Index of peer-reviewed Publications resulting from the Mission Soil projects	Outcome	Academic	Number of peer-reviewed scientific publication in indexed journals attributable to the Member State by corresponding author	Measure the impact of Soil Mission projects in producing relevant scientific knowledge and its impact on the scientific community	NUTS level 2	Scopus

KPI	Type	Class	Description	Importance	Level	How to measure
% of open-access research outputs resulting from the Mission Soil projects	Outcome	Academic	Number of open access publications, datasets or other scientific outputs openly available (at least CCBY) to be used in public repositories in comparison to the total number of scientific outputs developed by the Mission Soil projects	Assess the level of open R&I promoted by the Mission Soil	EU	Project reporting Horizon dashboard Google scholar
Ratio of research expenditures and outputs per project	Outcome	Academic	Evaluating the ratio of research output (such as publications, patents, or innovations) to the amount of funding invested in research activities	It helps to measure the efficiency of the research expenditure	EU	Horizon dashboard
Number and share of upskilled researchers involved in Mission Soil projects with increased individual impact in their R&I field	Outcome	Capacity building	Number of researchers engaged with the Mission Soil R&I projects that by the end of funding, have completed an academic degree (Master, PhD, or post-graduation) and/or have increased their individual citation score.	Measure the level of excellence in Soil Mission projects in terms of expertise, improving the scientific community and developing academic careers	MS	MS reporting Horizon dashboard
Active soil monitoring systems	Outcome	Enabling conditions	Number of Soil Monitoring systems actively used	Assess the level of soil health monitoring capacity across Member States that can be used in support of soil health related R&I activities	MS	MS reporting
Number of soil health indicators included in soil monitoring systems	Outcome	Enabling conditions	Number of soil health indicators included in national soil monitoring systems	Assess the maturity and completeness of soil monitoring systems in support of R&I activities. Also it allows to assess how the Mission Soil R&I activities have influenced the development of such monitoring systems	MS	MS reporting EUSO
Percentage of Mission Soil funded projects which have citizen and end-users' engagement mechanisms in place after the end of project funding	Outcome	Literacy	Number of Mission Soil funded projects which have citizen and end-users' engagement mechanisms in place after the end of project funding in comparison with the total number of projects with such activities planned.	Assess the level of post-project continuity and societal/market impact. This is also important to evaluate the permanence of capacity building and public engagement activities with continuity beyond the Mission Soil	MS	Project reporting
Member States introducing a soil health certificate	Outcome	Market take-up	Number of MS with a soil health certificate	Assess the level of market integration of soil health requirements	MS	MS reporting

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Number of businesses and companies developing or implementing science-based strategies for valorizing soils in their production and supply chains	Outcome	Market take-up	Number of businesses and companies developing or implementing science-based strategies for valorizing soils in their production and supply chains. Ideally, the specific scientific contributions should be track by survey.	Assess the capacity of Soil Mission outcomes in providing evidence-based instruments to be directly or indirectly used by the market in production and/or supply chain solutions	MS	MS reporting Survey
Number of patents and intellectual property rights (IPR) applications	Outcome	Market take-up	Number of innovations from awarded IPRs resulting from the projects funded by the Mission Soil project	Measure the applied impact of Soil Mission projects in market and society and to monitor the increase in the number of invention disclosures after the common IPR strategy is piloted.	EU	Project reporting
Number of research and innovation roadmap milestones achieved	Outcome	Practice take-up	Based on the Mission Soil R&I roadmap developed, number of milestones achieved	This KPI tracks the progress of the Mission Soil in achieving the milestones defined in the research and innovation roadmap.	EU	Project reporting Mission Secretariat
Number of Mission Soil project researchers involved in national or regional advisory boards	Outcome	Public take-up	Number of Mission project researchers involved in national or regional advisory boards	Evaluate the influence, in terms of consultancy, of Soil Mission project members in regional decision making	MS	Project reporting MS reporting
Number of municipalities and regions pursuing citizen-identified R&I activities related to the Mission Soil	Outcome	Public take-up	Number of municipalities and regions pursuing citizen-identified R&I activities related to the Mission Soil objectives. These activities may include local soil monitoring programs, citizen driven environmental assessments or experiments, or other R&I activities.	Assess the impact of Soil Mission R&I activities on enabling authorities to act towards soil health at a local/regional level	NUTS level 3	MS reporting Reporting through the Council of Cities Living Labs
Co-creation of R&I outputs in Mission Soil projects	Output	Academic	Proportion of projects funded by the Mission Soil where European citizens and end-users contribute to the co-creation of R&I outputs	Assess the R&I capacity building potential developed by the Mission Soil projects	EU	Project reporting

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Number of co-creation or capacity building events related to soil health	Output	Capacity building	Number of co-creation or capacity building events related to soil health (since September 2019)	Assess the R&I capacity building potential developed by the Mission Soil projects	NUTS level 3	MS reporting Project reporting
Number of Mission Soil Communities of practice created	Output	Capacity building	Number of Mission Soil Communities of practice created	Reflect the engagement of multiple sectors on the Mission soil objectives and R&I activities	MS	MS reporting ESP
Number of soil health related trainings	Output	Capacity building	Number of training sessions on soil health with a breakdown by stakeholder type as main target (e.g., researchers, farmers, land managers)	Assess the capacity of the Mission Soil R&I funded projects to transfer knowledge across sectors	NUTS level 2	Project reporting Living Labs
Number of experimental facilities, living labs and lighthouses created in the context of the Mission Soil	Output	Enabling conditions	Number of experimental facilities, living labs and lighthouses created in the context of the Mission Soil	Assess the capacity of MS to implement and maintain experimental facilities in support of R&I activities. Given the local expression of such activities, a sub-national level of representation is required.	NUTS level 2	Project reporting MS reporting Living Labs
Number of soil monitoring systems with open access policies implemented and accessible data	Output	Enabling conditions	Number of soil monitoring systems (out of the total number of national soil monitoring systems) with open access policies implemented and accessible data	Assess the capacity of researchers to access the data produced by soil health monitoring systems	EU	MS reporting EUSO
Open access datasets related to soil health indicators from MS R&I projects	Output	Enabling conditions	Number of soil health indicators covered by accessible spatially explicit and quantitative open access datasets resulting from Member State R&I initiatives or projects related to the Mission Soil	Assess the capacity of researchers to access the data produced by soil health monitoring systems	MS	Survey
Number of soil health and sustainability educational materials developed in the context of Mission Soil projects	Output	Literacy	Number of educational materials including courses/modules in soil health education for primary and secondary schools, farmers and land managers, as well as for universities and the general public	Assess the capacity of European education institutions to integrate knowledge related to soil health in their curriculums and how this knowledge is being updated by using new research.	EU	Project reporting MS reporting Living Labs European Universities initiative European University Association