ISRIC Strategy
2021 – 2023

Contents

1. Vision

A world where **reliable** and **relevant** soil *data*, *information* and *knowledge* is **freely available** and **properly used** to address global environmental and societal challenges.

2. Purpose

Our mission is to **increase the availability and use of quality assessed soil data, information and knowledge** to enable better **decision making** for **sustainable land management** around the world.

Together with our partners we produce, gather, compile and serve quality-assured soil information at global, national and regional levels. We stimulate the proper use of this information in cooperation with users and clients. Through these activities we contribute to solving societal challenges such as sustainably intensifying food production, climate change adaptation and mitigation, and biodiversity conservation.

3. Our context

The landscape

Soil provides food, clean water and habitats for biodiversity while contributing to climate change adaptation and mitigation. In addition, it stores our cultural heritage and supports our landscapes. Consequently, good soil quality is fundamental towards achieving the Sustainable Development Goals (SDGs). But soil is a fragile resource and soil formation is a very slow process; it can take thousands of years to form a soil, whereas it can be destroyed in few years. Therefore, soil is a non-renewable resource that needs to be carefully managed and safeguarded for future generations.

Soils, however, are under threat. Global developments such as increase in population and decrease in resource availability (e.g., water, land, nutrients) lead to unsustainable use of soils. Increasing demand for land for urban development is consuming our most fertile soils. Simultaneously, human-induced land degradation such as soil erosion, organic matter loss and biodiversity destruction put further

pressure on soil health. And climate change threatens the land-based livelihoods of millions of people around the world.

The Status of the World Soil Resources Report (FAO, 2015) states that the majority of the world's soil resources are in only fair, poor or very poor condition. The most significant threats to soil functions at the global scale are soil erosion, soil organic carbon loss, and nutrient imbalance. The report concludes that sustainable soil management, restoration of soil carbon stocks, improved nutrient use efficiency are key interventions to restore soil quality. It also emphasises the need to monitor soil quality. The Intergovernmental Panel on Climate Change (IPCC) has a similar view. In its report 'Climate change and Land' (IPCC, 2019) it concludes that sustainable land management is key to reducing land degradation, maintaining land productivity, and reversing the adverse impacts of climate change on land. The report states that for limiting global warming to 1.5ºC, land-based mitigation and land-use change is required in all emission scenarios. It is also concluded that along with technical interventions in the field, improved policies are important. Both reports conclude that sustainable soil and land management are important instruments for reaching many of the SDGs defined by the United Nations.

Sustainable management of the land is best implemented when considering the local conditions of the soil. This underlines the need for quality-assessed information products on soil properties and soil functions. In-depth soil knowledge is required to develop these high-quality products for people to make informed decisions about how to manage land sustainably.

However, data and information on soils is often outdated, fragmented, inaccessible, and not comparable. Concerted, efforts are needed to collate, standardise/harmonise and serve the available information to the international community, using consistent standards and approaches. This requires international, domain-specific collaboration within the framework working groups of the International Union of Soil Sciences (IUSS), the Global Soil Partnership (GSP), Open Geospatial Consortium (OGC), and similar. ISRIC pro-actively contributes to many of these international efforts.

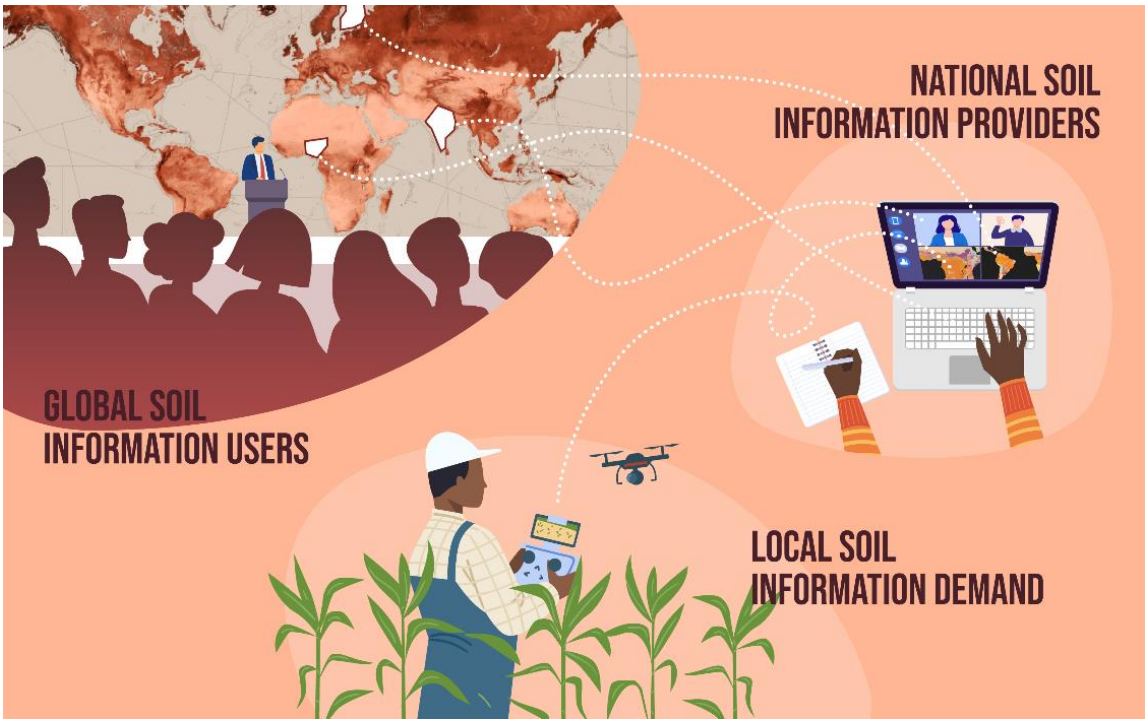
Who are the users of soil information?

At the ***global*** level, UN organisations need soil information to support their analyses, projections and interventions. The United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) need soil information to develop predictions of climate change and scenarios for mitigation. The United Nations Convention to Combat Desertification (UNCCD) needs similar information to support global analysis of land degradation using the concept of Land Degradation Neutrality (LDN) to identify hotspots of degradation and areas with high potential for sustainable land management interventions. To support global food and nutrition security the Food and Agriculture Organization (FAO) set up the Global Soil Partnership aiming at increasing soil knowledge and availability of soil information at the global level. Various non-governmental organisations (NGOs) active at global level (e.g. The Nature Conservancy) aim at increasing awareness about soil and land degradation and its impacts on nature, climate and food production. To this end they need information on global trends on soil health and soil functions. The Group on Earth Observation's Biodiversity Observation Network (GEO BON) aims to improve acquisition, coordination and delivery of biodiversity observations and related services to users including decision makers and the scientific community. This includes soil biodiversity observations.

At the ***national*** level, decisions made by those involved with sustainable land management (SLM) and nature conservation (such as land use planners and managers, investors, donors and NGOs) improve when supported by adequate information on land and soils. Global soil information is often not adequate to address these needs because of its limited accuracy and resolution. For these purposes national soil information is required, based on national datasets produced by national soil information institutions. After many years of limited interest by governments in national soil resource assessments, various governments are now again starting to invest in their national soil agencies.

At the ***sub-national*** level, input providers and service providers in the agricultural sector realise that in order to support farmers in sustainable intensification they need to provide site-specific services and products. For this, high accuracy and high resolution soil information is important.

At ***all scales and resolutions***, scientists around the world need soil information to feed into physically-based models to generate insight in a wide range of disciplines.



4. Our position

Legal

ISRIC is an independent foundation by Dutch law. We are based on the campus of Wageningen University and Research (WUR). We have a service-level agreement with Wageningen University providing operational support to ISRIC in the departments of finance, legal and human resources. Our presence on the WUR campus provides ample opportunities for strategic project cooperation with WUR research groups.

World Data Centre for Soils

ISRIC is a regular member of the World Data System (WDS) and accredited as the World Data Centre for Soils (WDS-Soils). The World Data System (WDS) is an Interdisciplinary Body of the International Science Council (ISC, formerly ICSU). The mission of the WDS is to promote "long-term stewardship of, and universal and equitable access to quality-assessed scientific data and data services, products, and information across a range of disciplines in the natural and social sciences, and the humanities." In its capacity as World Data centre for Soils, ISRIC is the focal point for soil-related collections and information services, as custodian and creator of global soil information. Most of our activities are designed to contribute to our role as World Data Centre for Soils. In this role we are a service provider to international science communities, policy communities, NGOs and the private sector dealing with issues including food production, land and water management, climate change, environmental quality, land use planning, and biodiversity.

Open data, open source, open science

WDS Members are the building blocks of a searchable common infrastructure, from which a data system that is both interoperable and distributed can be formed. As such, member organizations of ISC-WDS have a strong and tangible commitment to *open data* sharing, data and service quality, and data preservation. As WDC-Soils we strive to democratise the world of soil information. We believe it is important and ethical that everybody interested in soils and the use of soil information has full access to our products at no cost. Therefore, all our results (data and source code) that are generated with the core funding will be made freely available. Reproducibility of results is fundamental and therefore we always publish our code and results in open access journals. We exclusively use open source software so that our users do not need to invest in proprietary software licences. We underline the importance of sharing data according to the FAIR principles (Findable, Accessible, Interoperable and Reusable). In cases when a project is financed by a third party, we try to negotiate open publication of all results, although this is not always feasible.

Science-based

ISRIC is a science-based organisation, meaning that the approaches, methods and data we use to build our products are based on sound science. ISRIC funds a special professorship 'Pedometrics and Digital Soil Mapping' at Wageningen University, to stimulate further research in this field. In the framework of this program various PhD students perform research in support of long term methodology development. In addition, our regular staff participates in scientific research in the fields of soil measurement, soil mapping, application of soil information, pedometrics and soil information standards, aiming to generate knowledge and promote innovation. This way we maintain a deep understanding of soil assessment, soil analysis and soil data handling,

Partners

For products at global level, we cooperate with academia in the field of soil science and data and information science as well as with UN organisation dealing with land, soil and food production, such as FAO and UNCCD. For products and services at national and sub national level, we typically cooperate with local institutions dealing with soil knowledge and information. Our geographic focus is the globe. We do not pro-actively pursue activities in Europe, as Europe has a strong soil information community coordinated by the Joint Research Centre of the European Commission. However, we will align methods and tools as a good as possible with those developed by our European colleagues.

5. Our focus

Global-level soil information production

ISRIC is in a good position to develop soil information products for global users because of its long reputation for providing global information products on soils and land, its technical capacities and its infrastructure. WoSIS/SoilGrids remains our tool to develop global soil information. However, global users such as the IPCC are not always using WoSIS/SoilGrids outcomes because it does not provide the information they need and/or the products are not presented in the appropriate resolution and form. Therefore, we will start producing targeted products for global users, satisfying the needs of specific high-level and high-impact global users. We will perform a thorough analysis of potential users and design our global information provisioning activities to their needs. WoSIS/SoilGrids will be the main source of information to develop these products.

In the meantime, we will continue to serve the results of WoSIS/SoilGrids as open data for the global community. We anticipate WoSIS/SoilGrids use by the scientific community for a variety of purposes: use at supranational level (e.g river basin planning) and use at national level if national products are not available. Application of WoSIS/SoilGrids at field level is not our goal and will be discouraged. We will continue to increase accuracy and resolution (if needed) by introducing new methodologies and scientific insights. Data from our national cooperation program (Community of Practice, see below) can be used to improve accuracy. Methods developed for SoilGrids can be used to produce national

products. In this way, WoSIS/SoilGrids will remain a core activity but it becomes a tool to various ends rather than an end in itself.

National-level soil information production

National governments prefer to rely on nationally-produced information. Only the least developed countries with no or very limited access to soil data will rely on an international product such as SoilGrids. In addition, national soil information providers are better positioned to develop high-resolution, high-accuracy national products as they have more data available and specific soil expertise. Therefore, we believe that capacity development of national soil information institutes is a sustainable and ethical way to build on the availability of soil information worldwide. It is important to see these institutes thrive so that soil information users within their country can make well-informed decisions. These institutes are also highly valued partners for international collaborators, like ISRIC, to compile regional and global datasets and other global soil information products. We will cooperate with national institutions in the production of national products to be used by national stakeholders. In this context ISRICs role is twofold: (i) providing standards for collection, harmonisation, production and serving of (spatial) soil data and (ii) capacity building for national and regional institutions who produce soil information. These activities can be financed by international donors, donors active at national levels and funders stimulating capacity building in developing countries.

Local-level (sub-national) soil information production

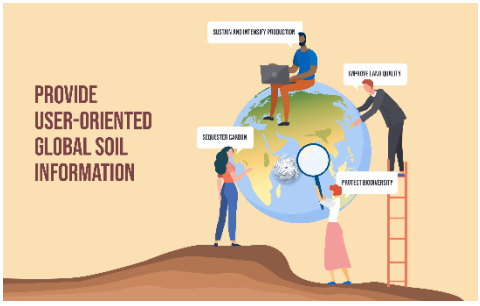
On demand, we can produce high-resolution maps of smaller geographies, such as supranational regions, countries or provinces. We expect these requests to come from, amongst others, on-going SLM projects. Our strategy is to do this in cooperation with national soil institutes and scientists in those regions to ensure local relevance, include local data, knowledge and expertise (to guarantee maximum quality) and combine this with capacity building, preferably through the Community of Practice. We will not pursue the development of high-resolution global or continental products for local use because the accuracy will not allow for application at the field level.

Application of soil information in sustainable land management (SLM)

The soil information developed by ISRIC and its partners becomes impactful when used in sustainable land management (SLM). SLM comprises all possible measures and practices aimed at the protection, conservation and sustainable use of land and the restoration of degraded land, including soil fertility management. SLM is the most important impact pathway for soil information. Therefore, we actively stimulate and showcase the use of soil information in SLM. The focus will be on national- and subnational-level products and services. Our approach will be to combine spatial soil information with spatial data on various other environmental aspects such as terrain, crops and climate, in operational platforms. Information services (e.g., models, apps, websites) that use these data will be developed aiming to support decision making in SLM. These activities will be carried out in cooperation with users and experts in the respective fields. The permanent presence of ISRIC (as opposed to projects with a limited life span) gives ample possibilities to host and maintain these services over a longer period of time and beyond the lifetime of the projects in which these services were developed. This way they will remain available for the user community for a long period of time.

6. Targets for the period 2021-2024

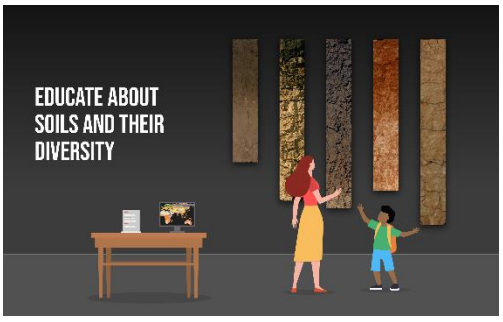
1. We are a recognised provider of ***user-oriented global-level soil information*** to support global modellers and the implementation of multilateral environmental agreements, like the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention on Biological Diversity (CBD), and United Nations Convention to Combat Desertification (UNCCD). Outcomes of WoSIS/SoilGrids, possibly in combination with other data sources, will be used to develop these products.



2. We facilitate a ***Community of Practice (CoP) of soil information providers*** (primarily focussing on Africa) building on ongoing projects. The CoP will help partners at regional and national levels to develop and maintain their soil information systems, products and services using agreed upon standards. The CoP will focus on steps of the workflow, including soil description, soil sampling, soil analysis, database development, mapping and web-based exchange.

3. To generate societal impact, we actively engage with actors in the field of sustainable land management (SLM) to ***develop information products and services in support of SLM***. These are typically services based on soil data and other spatial data combined with modelling which provide land management decision-making support.

4. We continue to ***educate about the nature and the diversity of soils of the world*** and their impact on society and science. Our World Soil Museum provides an excellent setting for this, and we further develop our global soil reference collection for research and education.



5. We start with ***Soil Dialogues***: conversations with different stakeholder groups to help them to apply our products and to learn about their perceptions and needs related to soil knowledge and information.

7. Approach to achieve these targets

To implement this strategy, ISRIC's work is subdivided into 4 work streams (WSs). A workstream consists of a set of projects (funded from core funding and/or from external funding) that jointly contribute to a predefined workstream target, which is directly contributing to the ISRIC strategy. Each workstream is led by one or two workstream facilitators who have two tasks. Firstly, they help focussing the acquisition activities. Proposals can only be submitted if they contribute to the targets of one or more workstreams. This ensures our acquired externally funded projects always contribute to our strategy. Secondly, the workstream facilitators are responsible for integration of the outcomes of the various projects part of their workstream where possible. The four workstreams are described below.

WS 1: Development of harmonised global soil information products (Target 1)

This workstream focusses on the development of targeted information products for specific high-level global institutions, such as IPCC, UNCCD, CBD, etc. To this end, we will further develop and maintain our global soil information systems by standardising and harmonising available global soil information (WoSIS) and developing gridded soil information (SoilGrids). The results are served to be used by the global community in general, but they are also used to develop the user-targeted information products for specific global users.

We see this workstream as our innovation lab for soil data production, storage, mapping and serving. A major topic for innovation is the development of methods to further combine in-depth pedological and soil classification knowledge with data-driven approaches, potentially resulting in enriched soil information products with higher accuracy. Besides our efforts to improve global predictions of basic soil parameters, we will focus on information layers for soil functional parameters, such as carbon stocks, water holding capacity and land degradation indicators. This also implies we will include a broader variety of parameters in our systems, such as parameters dealing with soil biology and micronutrients.

In this work stream we will also work on innovations in soil data collection, production, storage and serving. An important innovation for us will be deriving soil information from a combination of remote sensing, soil spectroscopy and possibly citizen science, support space-time predictions of soil qualities. We contribute to the improved use of soil spectral libraries and information around the world.

While working on the development of global products de-facto or formal standards for data management and soil mapping will be developed. In addition, this workstream includes specific activities targeting the development of ontologies, standards for soil sampling and soil analysis (both wet chemistry and spectroscopy), soil data standards and soil data exchange standards. Currently ISRIC staff participates in relevant working groups of the International Union of Soil Sciences (IUSS) and the Global Soil Partnership. Through these participations ISRIC can help formalise developed standards at international level. Developed standards will be used in WS 2 to guide the development of national products.

WS 2: A community of practice for soil information providers (Target 2)

For the big environmental issues of our time--sustainable land management, sustainable intensification of agricultural production, climate change adaptation and mitigation, water management and biodiversity conservation--soil information services on national level are extremely relevant and important. Currently global datasets are often used on national or sub-national level, but due to low resolution and/or low accuracy these datasets are often inappropriate for this purpose. National-level soil information services are best placed to develop high-resolution and high-accuracy soil information products for their territories, since they: (i) can build proper information systems with accuracy assessments rooted in real understanding of the soil and landscape; (ii) often have access to large quantities of underutilized legacy data; (iii) have the ability to generate new data through soil

monitoring and can undertake soil monitoring with relative efficiency, and; (iv) are connected to end-users in their countries and therefore have the best understanding of what is needed.

ISRIC aims to assist national partners in their efforts to build national- and regional-level soil data and information systems through facilitating a community of practice (CoP) for soil information providers. The CoP will cover all aspects of soil information management and provisioning, from soil description and sampling all the way to soil data exchange. We hope to link the CoP with a platform for structured global soil monitoring. Once the CoP is established, we can broaden the focus based on the needs of the participants. Potential additional topics are the development of physical soil archives, soil monoliths and soil museum, rescue and archiving of soil reports, setting up a soil library and others.

We will follow a two-pronged focus on formal training and social learning. Formal training is the passing of knowledge through structured programming such as our Spring School or training courses, and social learning occurs through community interaction and networking. Through community building, we will create opportunities that deepen connections and expand the professional network for our peers in soil information. The CoP will also serve as platform for the development and formalisation of standards for soil assessment, soil sampling, data gathering, data harmonisation and standardisation, open data exchange and data provisioning.

For formal training we will use a flexible mix of training on location, peer-to-peer learning, and distance learning technologies. We have the expertise needed to train on many of the mentioned topics including soil sampling in the field, soil assessment and classification, data collation into quality-assessed databases, data standardisation, data analysis, modelling, and publication of the data. The ISRIC World Soil Museum, the World Soil Reference Collection and our expertise in the World Reference Base for soil classification will be key resources to draw upon, especially related to the competency of assessing and understanding soils as they occur in the landscape. Also, our expertise in soil knowledge is crucial to the quality assessment and interpretation of digital maps and models. To enhance social learning, we will emphasize the “community” element of a community of practice, and support relationship building and peer-to-peer learning between soil information professionals.

WS 3: Products and services to assist decision making for SLM (Target 3)

In this work stream we develop information services (models, apps, websites) to support decision making in SLM. Recognising that SLM is a container term that might include a wide array of applications, ISRIC will focus on the application areas of land degradation, food security, climate adaptation and mitigation, and land use planning. We will combine spatial soil information with spatial data on various other aspects of land, crop and climate in operational platforms. Examples of such information services are services to develop fertiliser-use recommendations based on soil, crop and climate data, to determine soil and land capability in support of land use planning, to support implementation of Climate-Smart Agriculture (including carbon sequestration), and to advise on which SLM interventions work best where in the landscape and what will be their likely impact. World Overview of Conservation Approaches and Technologies (WOCAT) will be used as a resource to select SLM measures for specific situations.

Acknowledging the often limited accuracy and/or resolution of available soil information, we will focus on improving these services by blending local information uploaded by users with available information to hyper-localise the information in support of local advisories. Existing data platforms that already serve non-soil data will be used. Our role is to insert and integrate soil information in these platforms and participate in developing the services mentioned.

Typically, these products are made on request, based on user needs and (co-) financed by the client. Attracting external funding requires the ability to assess and articulate the benefits of SLM interventions beyond biophysical impacts and including ecosystem services and social and economic outcomes to people. This requires broadening skills of the ISRIC SLM staff to be able assess SLM effects on soils and vice versa. For assessing the impacts and benefits of SLM interventions on social and economic outcomes we will use the expertise of partner institutions.

WS 4: Awareness, Education and Soil Dialogue (Target 4 and 5)

We will continue to run education and awareness programs for scientists, policy makers and general interest groups to increase awareness of the role soils and soil information play in societal challenges. The World Soil Museum is an important instrument for these activities. It is also a place where students and the public are informed about the nature, geographic distribution, management challenges, and beauty of soils. At the World Soil Museum, people learn about the important role soils play in addressing many of the environmental challenges facing the world.

Through Soil Dialogues with users of soil information (policy makers, private sector, NGOs and donors) we provide information to users and learn about their needs for soil knowledge and information. Through these programs we build an engaged user community that is able to use our products in an effective way, and who can specify their needs for additional soil information resulting in co-creation. This helps us fine-tune product design and develop services with high application possibilities for our users. We will also monitor use of our data and services through these dialogues to be able to explain ISRICs societal impact to our stakeholders.

Synergy between workstreams

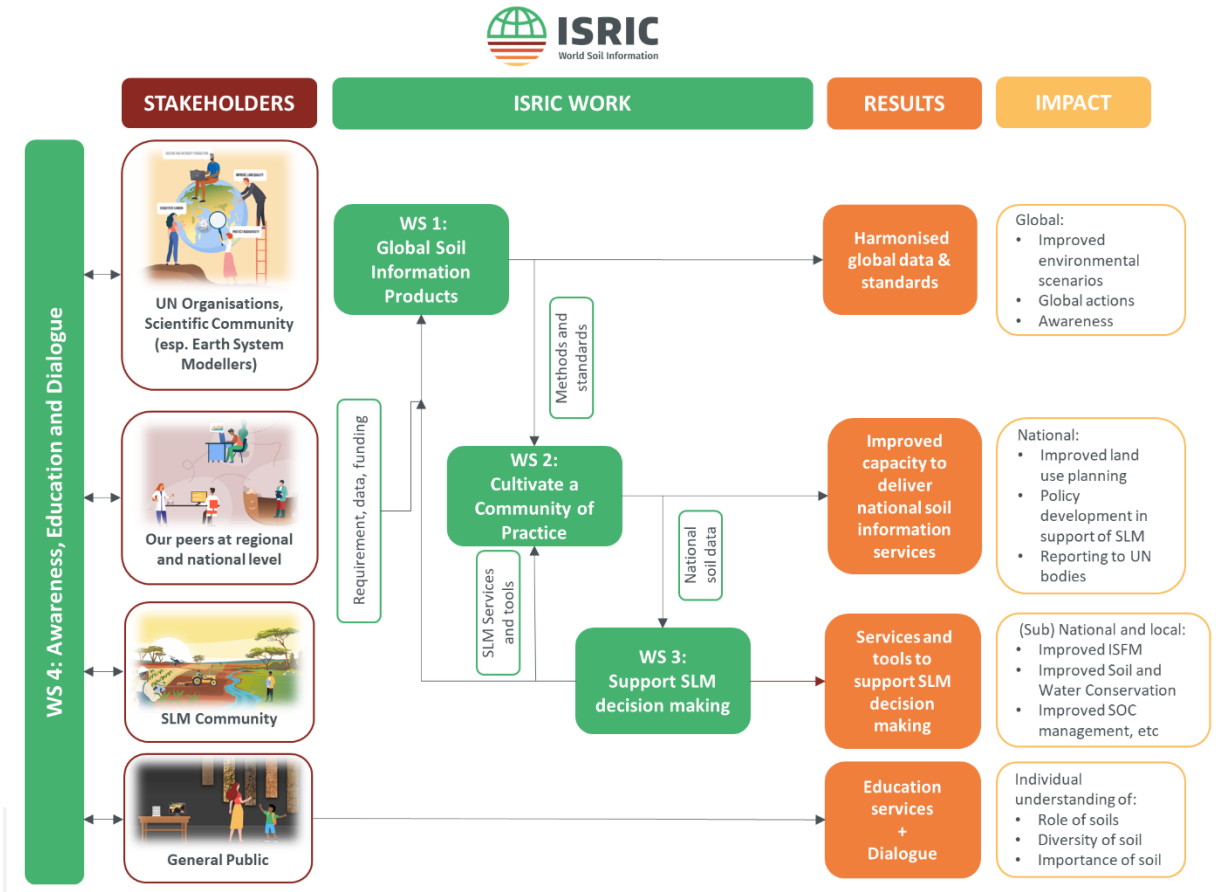


Fig 1: Synergies and Interdependencies between the workstreams.

The results of the global data workstream (WS1) can be used as a first approximation for data-scarce areas. Cost-effective sampling schemes for generating new soil data can be designed using this global product to identify areas with highest uncertainty. WS 1 will also yield up-to-date methodologies,

standards and workflows that can be used in WS 2 when working with national institutions on national products. The data resulting from national efforts in WS 2 can serve as input to improve the global system. National or regional maps can be merged with the global information to increase its accuracy and value.

The development of data and information services for SLM (WS 3) will profit from the increased availability of quality soil information at national level. On the other hand, while engaging with actors in SLM we will receive feedback on the quality and applicability of the available soil information, stimulating quality improvement of the soil information products developed in WS 1 and WS 2. SLM activities may also lead to more basic soil data shared with ISRIC (or generated by ISRIC in the context of the SLM projects), improving our own products such as SoilGrids. Methods developed in the SLM workstream can be used for capacity building in the CoP (WS 2) to assist development of national-level SLM information products. SLM products will be used in education programs and Soil Dialogues as part of WS 4. Lastly through SLM we will engage with funders in the field of SLM and we anticipate that funding for SLM services can also be used to fund ('the upstream') soil information development.

8. Supporting processes

World Data Centre for Soils

ISRIC is a regular member of the World Data System (WDS) and has been accredited as the World Data Centre for Soils (WDC-Soils) since 1989. For 2023 we have the following ambition. We will continue to be an active member of the World Data System (WDS), an Interdisciplinary Body of the International Science Council (ISC, formerly ICSU). Certification as the World Data Centre for Soils provides a mandate for ISRIC to work on soil information globally, as a trustworthy provider of soil information. Regular WDS re-accreditation helps us to review and improve the quality and transparency of our processes as well as services to the international community.

We will apply for continued certification as a trusted data repository in accord with the '2020-2022 requirements for CoreTrustSeal Trustworthy Data Repositories' (CTS), this as a first step in the review process towards our 3-yearly re-accreditation as WDS regular member in 2023.

Scientific research to support methodology development

Our scientific research program contributes to the development of new and innovative methodologies for the generation of soil data and information products. For this program we have the following ambitions for 2023:

- Continue special professorship 'Pedometrics and Digital Soil Mapping' at Wageningen University, to stimulate further research in this field and collaboration with Wageningen University.
- Have continuously 4 PhD candidates working on methodological innovations that on the long-term have the potential to enhance and improve our operational workflows. We aim for PhD-candidates on the following topics: soil data quality, digital soil mapping and application of soil information in sustainable land management.
- A minimum of two peer reviewed articles by ISRIC staff published in high-quality scientific journals per year.
- Active participation in relevant international scientific conferences and communities.

Spatial Data Infrastructure (SDI)

In order to deliver soil data and soil information products we maintain the ISRIC Spatial Data Infrastructure (SDI). ISRICs SDI serves and /or provides access to: (i) our global harmonised information products (WS 1), (ii) soil reference collection and World Soil Museum (WS4), (iii) data and information products produced in the past, (iv) tools and services developed to support SLM decision making (WS 3) and (v) information products from third parties.

We maintain strong ties with WUR IT facilities and collaborate with various WUR departments. However, we strive to make generic cloud unaware deployments that suits the needs of various partners. Our software stacks are mainly based on Free and Open Source Software and we aim to develop generic solution to address multiple SDI needs. Front-end and app solutions are outsourced out to third parties. We work as much as possible with a single, dedicated service provider for this.

We are facing rapid technological developments in the field of data infrastructures with the increasing demands for their functionality and services. Therefore, we acquire latest knowledge in SDI development and maintenance through research and development strategy. Since our partners and peers need similar technologies, we share our experience in capacity development projects and the Community of Practice (WS 2).

Reference Collection and Library

ISRIC will consolidate its position as a global reference centre for soil information by strategically improving and unlocking the current World Soil Reference Collection. In the period up to 2023 the reference collection will not be actively expanded. The focus will be on enhancing quality of the collection, which includes maintenance, organisation, documentation, digitization and data verification, and improving online accessibility.

Operational

- We have effective internal processes: we implement professional and effective project management and we make use of modern tools for communication and cooperation. A dedicated operational manager will be responsible for this task.
- We make optimal use of all facilities at the Wageningen Campus to reduce costs and increase efficiency.
- We are financially independent and healthy, meaning that we have positive financial results every year as a result of targeted acquisition and effective project management; we have a reasonable financial buffer.
- We minimise our own ecological footprint as much as we can, meaning that air travel is limited, and CO2 compensated. We minimize waste streams e.g. through a paperless office and carbon compensation for cloud services.

9. Core values and competences

Core values

- Integrity and respect are important values at ISRIC. Respect for each other's function, professional qualities and personalities.
- We work with passion to achieve the goals of this strategy. Working with passion goes hand in hand with showing initiative and being pro-active, irrespective of our position and role in the organisation.
- Work satisfaction and work pleasure is important for us, and this can only be achieved if we have the right balance between work and private life. Work may never undermine our physical and mental health.
- ISRIC is a transparent organisation, and we share all information on projects and the institution (including financial information) with all employees, unless this interferes with the privacy of individuals.
- We are cooperative and coach each other on content and behaviour. We provide positive feedback to colleagues in order to provide them with learning opportunities.

Competences

The above-mentioned high ambitions for 2021-2023 can only be realised with effective cooperation, effective organisation of our work, and optimal tuning of our work to international developments. To this end the following competences are to be further developed in the team:

- For increased personal effectivity and cooperation: empathy and self-reflection;
- For effective teamwork: organisational sensitivity, planning and organisation, cooperation;
- For effective leadership: binding leadership and delegating;
- For market orientation and impact: networking skills, negotiating, and entrepreneurship.