

Innovative indicators and monitoring concepts to support achieving SDG 6 in an integrated manner

In 2015, UN-Water launched the Integrated Monitoring Initiative for Sustainable Development Goal (SDG) 6 to support countries in monitoring and reporting on SDG 6 related progress. This international monitoring effort provides immense opportunity for establishing new global standards and datasets for improved water management. However, achieving SDG 6 and related SDGs requires sound management and planning at the national and sub-national level – and thus appropriate monitoring concepts and indicators to support decision making at these levels.

Within the research, programme “Water as a Global Resource” (GRoW), which was funded by the German Federal Ministry of Education and Research, professionals active in research, business and practice from 90 institutions worked together in more than 40 case studies around the world to develop new solutions in support of achieving SDG 6. This policy brief has been developed within a working group on the GRoW cross-cutting topic ‘SDG6 – Hitting the target’. In this paper, GRoW experts argue that SDG monitoring can be coupled with cutting edge science-based approaches to improve achievement of the ambitious SDGs targets at the national and sub-national level. It provides examples on how the current global SDG monitoring could be complemented at national and sub-national level by innovative monitoring concepts and integrated indicators that help to improve:

- water management systems and SDG implementation,
- understanding of cross-sectoral interdependences to harness synergies to achieve more efficiently multiple SDGs
- water governance, as a prerequisite for SDG implementation,

SDG 6 monitoring as an opportunity

Monitoring of water-related variables has a long tradition in existing national monitoring schemes, and international or global monitoring systems (such as the Joint Monitoring Programme, Global Environment Monitoring System for freshwater (GEMS/Water), the Ramsar convention on Wetlands, or overarching monitoring of the Millennium Development Goals (MDGs)). In the past, these monitoring systems have helped to assess the actual dimension of the respective issue at hand and thus to raise awareness of its importance. For example, monitoring of the MDGs target 7.C on water and sanitation helped to close the hitherto existing gap in knowledge about access to sanitation, enabled to more accurately understand the complexity of the issue, and defined new monitoring needs.

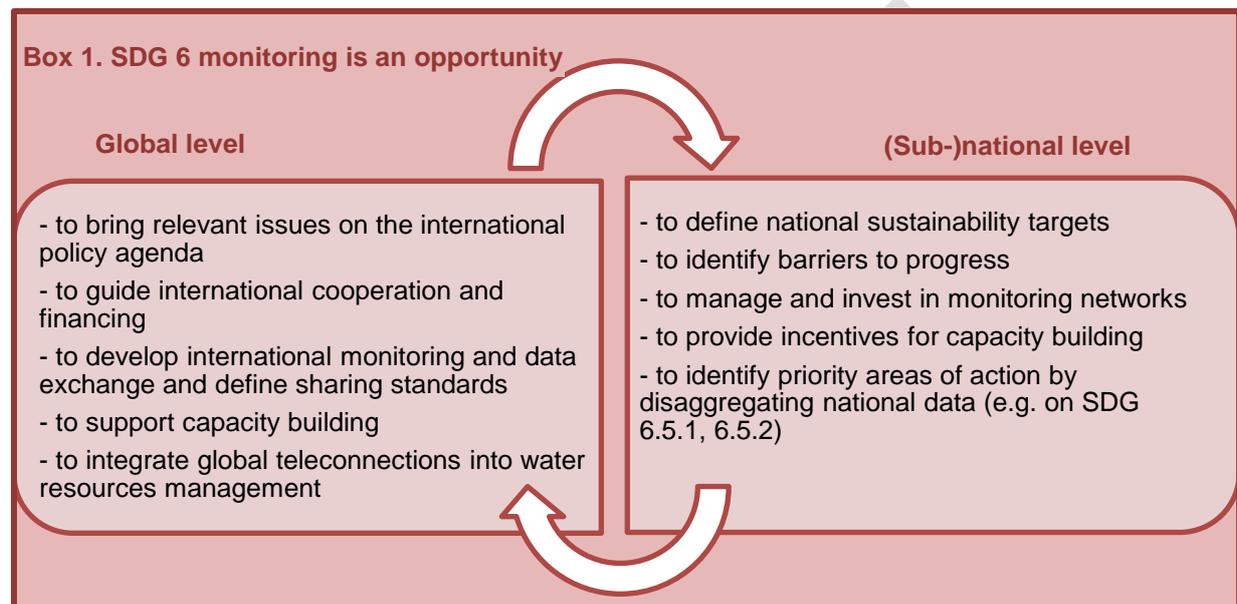
Eight United Nations organizations have been formally mandated to compile country data on the SDG 6 global indicators. Together they launched the UN-Water Integrated Monitoring Initiative for SDG 6 with an ultimate aim to accelerate the achievement of SDG 6 through evidence-based policies, regulations, planning and investments. The comprehensive and concerted SDG 6 monitoring effort sets new standards to existing monitoring:

- Countries have committed to monitor a broader spectrum of water-related variables than before, possibly down to basin level. This helps to recognize sustainability challenges at (sub-)national level.



- The SDGs require monitoring of previously unconsidered water-related issues, such as water quality, water-related ecosystems, water governance (integrated water resources management and transboundary water cooperation).
- National capacities to sustain SDG 6 monitoring are being strengthened and focus is given to institutional processes and linkages between monitoring and decision-making.
- Data collected in SDG monitoring can potentially be coupled with science-based technologies (e.g., hydrological models) to support SDG implementation

By this means, improved monitoring entails a number of opportunities at global, national and sub-national level (see Box 1).



Challenges related to SDG 6 monitoring

SDG 6 monitoring undoubtedly is a great opportunity to improve evidence-based policy and decision making towards reaching sustainability targets at global to (sub-)national levels. However, multiple challenges in monitoring and implementing SDG became evident during the first phase of the integrated monitoring initiative: (See Box also 2):

- **Disaggregation:** national level indicators do not provide accuracy needed for decision making and disaggregated data relevant for subnational level are often missing
- **Interlinkages:** national sustainable development strategies need to address conflicting targets; trade-offs between SDGs manifest differently depending on scale and region; indicators to measure progress towards interlinked goals are missing
- **Environmental data:** lacking / limited monitoring underrepresents environmental issues relevant to sustainability, which limits application of global datasets
- **Governance:** inadequate monitoring of governance systems and lacking coordination between governance structures to address SDGs,

- **Capacity:** limited human and technical capacity to collect and process data (e.g., river discharge, water quality), data sources are scattered between institutions, barriers to data sharing exist

Moreover, in efforts to implement the SDGs, the global SDG targets are to be considered as aspirational and have to be translated into national priorities, planning processes, policies, and strategies. Governments are expected to set their own targets guided by the global level of ambition but taking into account national circumstances. It must also be recognized that the global SDG indicators have been selected for the purpose resp. feasibility of global monitoring and may not fully reflect all aspects of the SDG targets. They thus need to be complemented by additional national, regional and thematic indicators, to be developed by Member States based on their priorities for sustainable development in their specific context. Translating SDGs into appropriate national priorities and developing related monitoring systems still poses challenges to SDG implementation.

Innovative monitoring concepts and indicators to support achieving SDG 6

Several of the GRoW projects are working on solutions that provide good starting points for addressing the challenges identified (see Box 2). Below we present three examples that have been developed:

- approaches to provide modelled interim data where no monitoring schemes were set up so far;
- indicators that allow to measure progress towards multiple interlinked SDGs, especially those related to water (SDG 6) and energy (SDG 7);
- indicators for governance approaches for better coordination and cooperation to achieve SDGs in a harmonised way.

Interlinked model and data chains to fill existing monitoring gaps at basin level

In river basins where no or only limited observations are available, relevant information for SDG 6 indicators can be provided by research projects applying modelling and regionalization approaches that make use of freely available global hydrometeorological products. Besides the knowledge gain in such un- or sparsely gauged areas, this allows to identify critical areas and variables to inform decisions on where to focus crucial in-situ monitoring efforts.

The **SaWaM** project¹ developed an approach to monitor and predict freshwater availability across several semi-arid river basins in Iran, Brazil, Sudan/Ethiopia, West Africa and Peru/Ecuador. The approach involves the regionalization of global seasonal forecasts of water availability and the post-processing through hydrological and ecosystem models for predicting crucial variables and drought indicators for the regional water management for the coming six months. This forecast horizon enables reservoir managers to sustain domestic water supply, irrigation for food production, and energy production. By combining this information with near-real-time monitoring from remote-sensing approaches and providing the derived products through an online platform, SaWaM offers a full-fledged decision support and monitoring system for semi-arid river basins. The close interaction with stakeholders and water experts in the study regions further allows tailoring the developed methods and products to regional requirements. This pro-active and integrated water management is crucial particularly during droughts or other climatically extreme conditions. By this, **SaWaM** allows for an interlinked water management in support of achieving SDGs 6, 7, and 2. Based on the findings of GRoW projects, further attempts should be made to cross-check monitoring requirements stemming from implementing the SDGs and possible support by cutting-edge research in the immediate future

¹ <http://www.grow-sawam.org/>



Measuring progress towards interlinked SDGs through integrated indicators

When different SDGs are addressed in isolation, this may result in trade-offs where the activities of one sector have negative impacts on other sectors, thus hampering the achievement of related SDGs. This situation is commonly known while implementing the SDGs and hence, research findings in place to inform policy makers in this respect should be used as a priority. The **WANDEL** project², for example, has developed a set of indicators that allows assessing water security and energy security in combination, recognising that both are intractably linked to each other. The indicators cover not only quantitative, physical aspects related to water and energy, but also the relevant regulatory context. In this way, deficits can be identified that hamper the coordinated governance of both resources. The indicator set allows addressing trade-offs between SDG 6 (clean water and sanitation) and SDG 7 (affordable and clean energy). To identify the trade-offs, the relationship between water and energy security was translated into six main indicators and 16 sub-indicators that reflect the DPSIR framework (Drivers, Pressures, State, Impact, Response) whilst trying to answer key questions assigned to them. While the indicator set has been developed to support institutes, NGOs, companies and administrations, which deal with water and energy security at national and sub-national levels, it can also be adapted to support the analysis of water security and energy security trade-offs at the global level.

Assessing governance systems to better understand challenges in achieving interlinked SDGs

Achieving integrated water resources management (IWRM) (SDG target 6.5.1) requires a profound governance setting that enables amongst others subsidiarity, horizontal and vertical coordination as well as stakeholder participation. The STEER project³, analysed existing governance settings (e.g. legal framework) and governance in practice in case studies with distinct environmental and socio-economic contexts. The aim was to identify governance approaches that support implementation of an integrated water resources management, matching the specific conditions of the respective regional problem constellation.

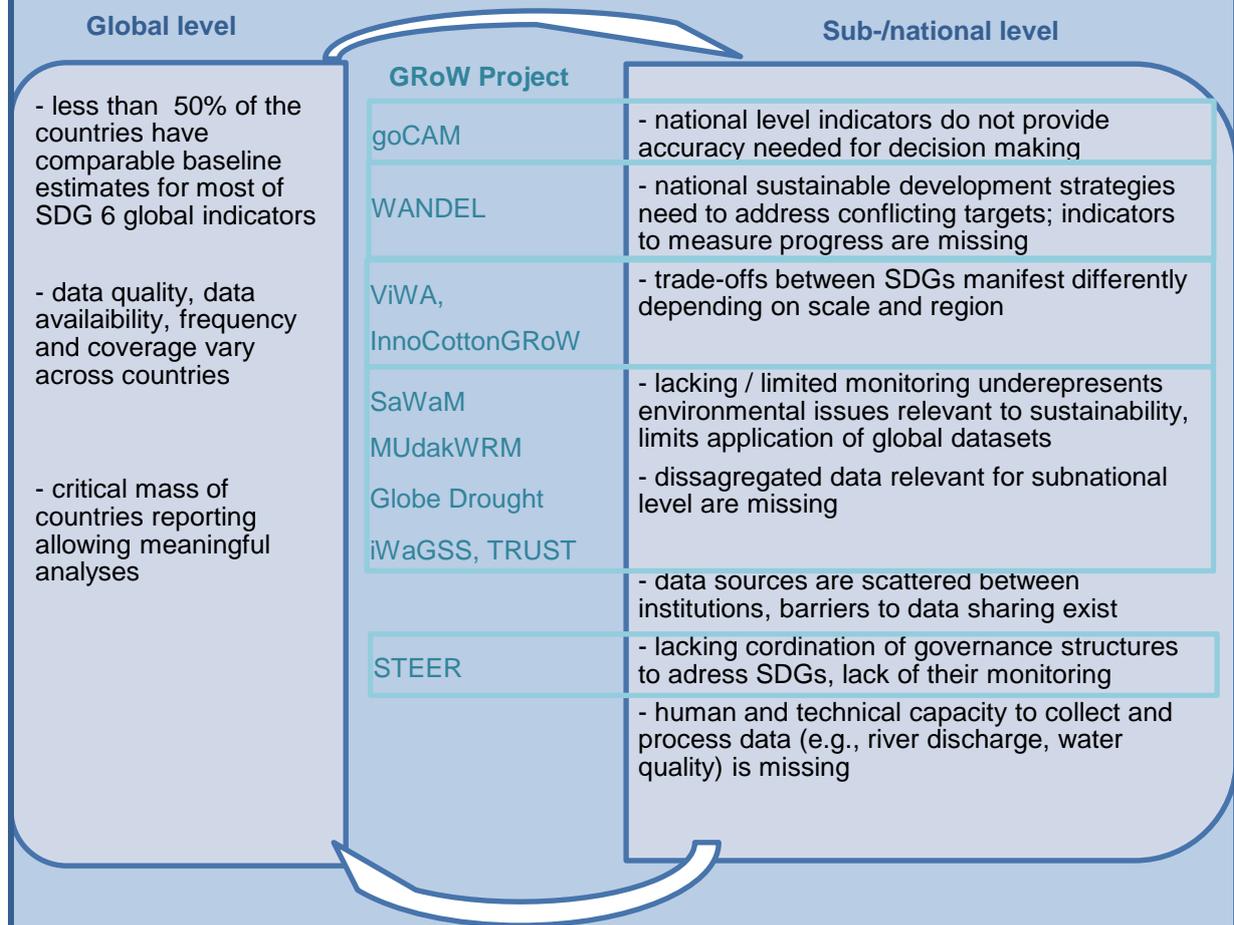
STEER found that in the majority of cases in the SDG region⁴ 'Europe and North America' with governance structures that provide for vertical or horizontal coordination, coordination in practice also results in observable changes in plans and policies. In other SDG regions, STEER found that the existence of provisions for coordination did not necessarily translate into successful or effective coordination in practice. The results were compared with similar governance sub-indicators of the UN baseline assessment of SDG target 6.5.1 on IWRM (UN Environment 2018). Although the general picture represented in STEER data confirms the UN assessment, for several cases STEER observed significant deviations from national reports submitted for the SDG 6.5.1 IWRM assessment. One reason for the deviations is that the current IWRM assessment deals with coordination and cooperation problems rather superficially. Furthermore, the assessment is not fully neutral as in the majority of cases office bearers who are responsible for the implementation of SDG 6.5 also fill out the 6.5.1 IWRM survey. Hence, the rigorous scientific approach applied in STEER provides independent and more in-depth insights into the implementation of IWRM and hence helps providing a more sound basis for progress towards SDGs on the ground.

² <https://wandel.cesr.de/en/>

³ <https://www.steer.uni-osnabrueck.de/>

⁴ See [regional groupings for the SDG report and database](https://unstats.un.org/sdgs/indicators/regional-groups/) <https://unstats.un.org/sdgs/indicators/regional-groups/>

Box 2. Challenges in SDG6 monitoring and GRoW projects working to address them to



Conclusions

With the Agenda 2030 and its SDGs, the international community has initiated an important process towards more sustainable water resources management. The first round of review has shown that challenges remain in data availability and translating SDG 6 into national strategies and respective indicators to measure progress towards national priorities. Based on lessons learned and results of the GRoW projects, GRoW experts recommend that in setting up and monitoring national /sub-national water-related strategies towards achieving SDGs and SDG 6 in particular, policy and decision makers should take action based on science and utilize latest developments:

- *make use of innovative approaches to fill existing data gaps through integrated modelling approaches building on existing global and regional data sets, remote sensing and stakeholder knowledge, while complementing these through further investment and capacity development in in-situ monitoring systems;*
- *support combining technologies (e.g. remote sensing) and new monitoring strategies (e.g. crowdsourced monitoring) to simplify data acquisition on multiple levels and scales, and hence strongly expand data availability;*



- *develop and combine indicators based on recent scientific advancements in assessing SDG interlinkages in order to measure progress towards multiple interlinked SDGs and to identify trade-offs on different scales.*
- *include assessments of governance in different sectors into monitoring efforts and analyse how sectoral approaches affect the achievement of SDGs in other sectors. Sound cross-sectoral monitoring paves the way for better coordination, reduces trade-offs, supports synergies, and facilitates the simultaneous achievement of multiple SDGs.*

The GRoW Program

The research programme “Water as a Global Resource” (GRoW) was set up by the German Federal Ministry of Education and Research (BMBF) to help achieve SDG 6. In twelve joint research projects, over 90 institutions active in research, business and practice collaborated with partners in over 20 countries around the world to develop new approaches for improving sustainable water resources management and water governance. The projects examined local and regional solutions, and produced improved global information and forecasts about water resources and demand. This policy brief has been developed within a working group on the GRoW cross-cutting topic ‘SDG6 – Hitting the targets’. For more information and contact details, see: www.bmbf-grow.de

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