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INTEGRATING THE SUSTAINABLE DEVELOPMENT GOALS AND THE NATIONAL DEVELOPMENT STRATEGY INTO THE NATIONAL WATER STRATEGY OF TAJIKISTAN: A METHODOLOGICAL PROPOSAL

This paper proposes a methodology for the integration of the Sustainable Goals and the National Development Strategy into the National Water Strategy of Tajikistan. It builds on a Rapid Integrated Assessment that was produced by UNDP and contains step-by-step guidelines on how to produce analyses of specific issues. This methodology was developed for the National Water Strategy of Tajikistan, but it can be easily adapted and used in other countries and issue areas, provided collaboration is established with UNDP. This paper represents an example of so-called transformational sustainability research and adopts a transdisciplinary research methodology involving both experts and decision-makers. An example of the implementation of this methodology is the paper on "The legal basis and institutional structure of water management" by the same author.

Keywords: *Water Strategy of Tajikistan, water management, sustainable development, transformational sustainability research, transdisciplinary research*

1. The Sustainable Development Goals framework and water-related targets

In 2015, after the end of the implementation period for the 8 Millennium Development Goals, the United Nations adopted the 2030 Agenda for Sustainable Development, with which a new set of 17 Sustainable Development Goals (SDGs) was adopted. Water has its own SDG 6, which is very ambitious: "ensure availability and sustainable management of water and sanitation for all".

Given the importance of water resources for the economic growth and sustainable development of Tajikistan, given the significant part of the population that is currently left behind particularly in rural areas and with regard to safe drinking water supply and sanitation and given the leadership role of Tajikistan on the water agenda at the global level, it is important for the country to make significant progress in the achievement of SDG 6.

In the framework of SGD 6, the United Nations adopted the following eight targets that represent the key elements that contribute to the achievement of SDG 6:

6.1   By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

6.2   By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

6.3   By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

6.4   By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

6.5   By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

6.6   By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

6.A   By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

6.B   Support and strengthen the participation of local communities in improving water and sanitation management.

Moreover, water is a key element for the achievement of many other SDGs (ICSU 2017). There are many water-related targets under other SDGs, such as:

3.3   By 2030 end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases and combat hepatitis, water-borne diseases, and other communicable diseases;

3.9   By 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination;

11.5   By 2030 significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations;

12.4   By 2020 achieve environmentally sound management of chemicals and all wastes throughout their life cycle in accordance with agreed international frameworks and significantly reduce their release to air, water and soil to minimize their adverse impacts on human health and the environment;

15.1 By 2020 ensure conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements;

15.8 By 2020 introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems, and control or eradicate the priority species.

For each target, a system of indicators was developed by the United Nations to keep track of the achievement of the SDGs. For example, the indicators identified for SDG 6 are the following (the agencies responsible for keeping track of the indicator are indicated between brackets:

6.1.1 Proportion of population using safely managed drinking water services (WHO, UNICEF)

6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water (WHO, UNICEF)

6.3.1 Proportion of wastewater safely treated (WHO, UN-HABITAT, UNSD)

6.3.2 Proportion of bodies of water with good ambient water quality (UNEP)

6.4.1 Change in water-use efficiency over time (FAO)

6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources   FAO

6.5.1 Degree of integrated water resources management implementation (UNEP)

6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation (UNESCO, UNECE)

6.6.1 Change in the extent of water-related ecosystems over time (UNEP)

6.A.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan (WHO, UNEP, OECD)

6.B.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management (WHO, UNEP, OECD)

Many countries have already started the implementation process. Tajikistan has been piloting the implementation of the SDGs. It developed and adopted a National Development Strategy 2030 that took into consideration the SDGs during its preparation phase. To contribute to the achievement of SDG 6 and other water-related targets, it is important that Tajikistan aligns its National Water Strategy 2030 with the SDGs and the National Development Strategy.

2. Using a Rapid Integrated Assessment to identify available indicators

To support the implementation of the SDGs, UNDP has started producing a Rapid Integrated Assessment (RIA) in various countries to evaluate the readiness of each country with regard to the implementation of the SDGs and to identify the potential accelerators of SDG achievement, as well as the main gaps. In February 2017, UNDP produced a draft Rapid Integrated Assessment (RIA) and, on its basis, a draft Roadmap for SDG Implementation in Tajikistan.

These reports and their supporting documents have proven to be particularly useful for the integration of SDGs and the National Development Strategy in the drafting process of the National Water Strategy, particularly the SDG Dashboard and the annexed mapping assessment of the alignment of existing policies to the SDGs. In order to produce an SDGs Dashboard for Tajikistan, for each target UNDP identified indicators available from international organizations and national institutions and particularly the Agency on Statistics. Moreover, it mentioned for each indicator whether Tajikistan was performing better, like or worse than average countries and whether there is a positive, stable or negative trend. Moreover, these indicators were aggregated at the goal level. For instance, all eight SDG 6 targets were aggregated to assess the readiness of the country with regard to SDG 6.

For the preparation of the National Water Strategy, we first identified the SDG targets that are relevant for each section of the strategy. It is important that these targets are not limited to SDG 6, given that many water-related targets are found under other SDGs. This allows to obtain a preliminary list of available indicators for Tajikistan, as well as to identify targets for which indicators are not available from international sources. These indicators are important to propose targets for the National Water Strategy that are country-appropriate and evidence-based. Conversely, some targets may be important at the national level, but might lack data for specific indicators. In this case, we request the relevant authorities to provide necessary, useful and accessory data, if available.

Moreover, each target is weighted using the SDG interaction framework that was developed by ICSU. The more the target weights on a scale from -3 to 3 (Figure 3), the more significant is the impact that target is expected to have on the achievement of the SDGs. A proposed score with regard to SDG 6 was included in the cross-reference below (Figure 4). This weighting may be useful as a technical input to the prioritization of strategic goals for the implementation of the National Water Strategy.

Also, the fact that UNDP identified the data codes for the World Bank Data Catalogue (https://data.worldbank.org/indicator/) makes it easy to find the dataset and generate graphics, showing trends for many indicators (Figure 5). The data for some indicators can be found elsewhere, such as the World Bank Worldwide Governance Indicators (https://www.quandl.com/data/WWGI-World-Bank-Worldwide-Governance-Indicators) and few others from FAO, UNEP, etc. These trends are useful to identify tendential scenarios and to assess whether further policy interventions are necessary to modify trends and achieve targets.

# Figure 1: SDG Dashboard for Tajikistan at the goal level

Goal	Status	Green	Yellow	Red	Targets w/o Indicators	%
Goal 1. End poverty in all its forms everywhere	Red	23%	15%	62%	1	14%
Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture	Red	17%	17%	67%	5	63%
Goal 3. Ensure healthy lives and promote well-being for all at all ages	Green	33%	33%	33%	5	38%
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Yellow	26%	48%	26%	2	20%
Goal 5. Achieve gender equality and empower all women and girls	Yellow	26%	47%	26%	2	22%
Goal 6. Ensure availability and sustainable management of water and sanitation for all	Yellow	22%	44%	33%	4	50%
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all	Green	60%	10%	30%	2	40%
Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Red	26%	11%	63%	3	25%
Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Yellow	7%	60%	33%	3	38%
Goal 10. Reduce inequality within and among countries	Green	33%	33%	33%	4	40%
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable	Green	50%	0%	50%	7	70%
Goal 12. Ensure sustainable consumption and production patterns	Green	100%	0%	0%	10	91%
Goal 13. Take urgent action to combat climate change and its impacts b	Green	50%	0%	50%	4	80%
Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Green	50%	25%	25%	9	75%
Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	Red	15%	31%	54%	2	17%
Goal 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development	Green	33%	33%	33%	0	0%

Source: UNDP (2017, draft)

Figure 2: SDG Dashboard for Tajikistan at the target level for SDG 6

Goal 6. Ensure availability and sustainable management of water and sanitation for all

Target	Indicator	Description	Value	Year	Status	Indicator avail.	Target1	Target2	Target3	Trend
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	SH.H2O.SAFE.ZS	Improved water source (% of population with access)	73,8	2015	Red	Yes	98	80		Positive
	SH.H2O.SAFE.RU.ZS	Improved water source, rural (% of rural population with access)	66,7	2015	Red	Yes	98	80		Positive
	SH.H2O.SAFE.UR.ZS	Improved water source, urban (% of urban population with access)	93,1	2015	Yellow	Yes	98	80		Positive
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	SH.STA.ACSN	Improved sanitation facilities (% of population with access)	95,0	2015	Yellow	Yes	95	80		Positive
	SH.STA.ACSN.RU	Improved sanitation facilities, rural (% of rural population with access)	95,5	2015	Green	Yes	95	80		Positive
	SH.STA.ACSN.UR	Improved sanitation facilities, urban (% of urban population with access)	93,8	2015	Yellow	Yes	95	80		Positive
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	No indicators readily ava 6.3.1 Proportion of wastewater safely treated					No	95	80		Positive
	No indicators readily ava 6.3.2 Proportion of bodies of water with good ambient water quality						98	80		Positive
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	ER.GDP.FWTL.M3.KD	Water productivity, total (constant 2010 US$ GDP per cubic meter of total freshwater withdrawal)	0,6	2014	Red	Yes	40	10		Positive
	ER.H2O.FWTL.ZS	Annual freshwater withdrawals, total (% of internal resources)	18,1	2014	Green	Yes	20	40		Negative
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	No indicators readily ava 6.5.1 Degree of integrated water resources management implementation (0-100)					No				
	No indicators readily ava 6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation									
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	No indicators readily ava 6.6.1 Change in the extent of water-related ecosystems over time					No				
	EN.FSH.THRD.NO	Fish species, threatened	14,0	2015						
	ER.MRN.PTMR.ZS	Marine protected areas (% of territorial waters)	0,0	2014						
6.a By 2030, expand international cooperation and capacity-building support to developing countries in water and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	No indicators readily ava 6.a.1 Amount of water and sanitation-related official development assistance that is part of a government-coordinated spending plan					No				
6.b Support and strengthen the participation of local communities in improving water and sanitation management	No indicators readily ava 6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management					No				
	WHO/GLAAS 2014	Extent to which service users participate in planning, Drinking-water, Urban	Moderate	2014	Yellow		High	Moderate	Low	
	WHO/GLAAS 2014	Extent to which service users participate in planning, Drinking-water, Rural	Low	2014	Red		High	Moderate	Low	
	WHO/GLAAS 2014	Extent to which service users participate in planning, Sanitation, Urban	Moderate	2014	Yellow		High	Moderate	Low	
	WHO/GLAAS 2014	Extent to which service users participate in planning, Sanitation, Rural	Low	2014	Red		High	Moderate	Low	

Source: UNDP (2017, draft)

Figure 3: A framework for SDG interaction scoring
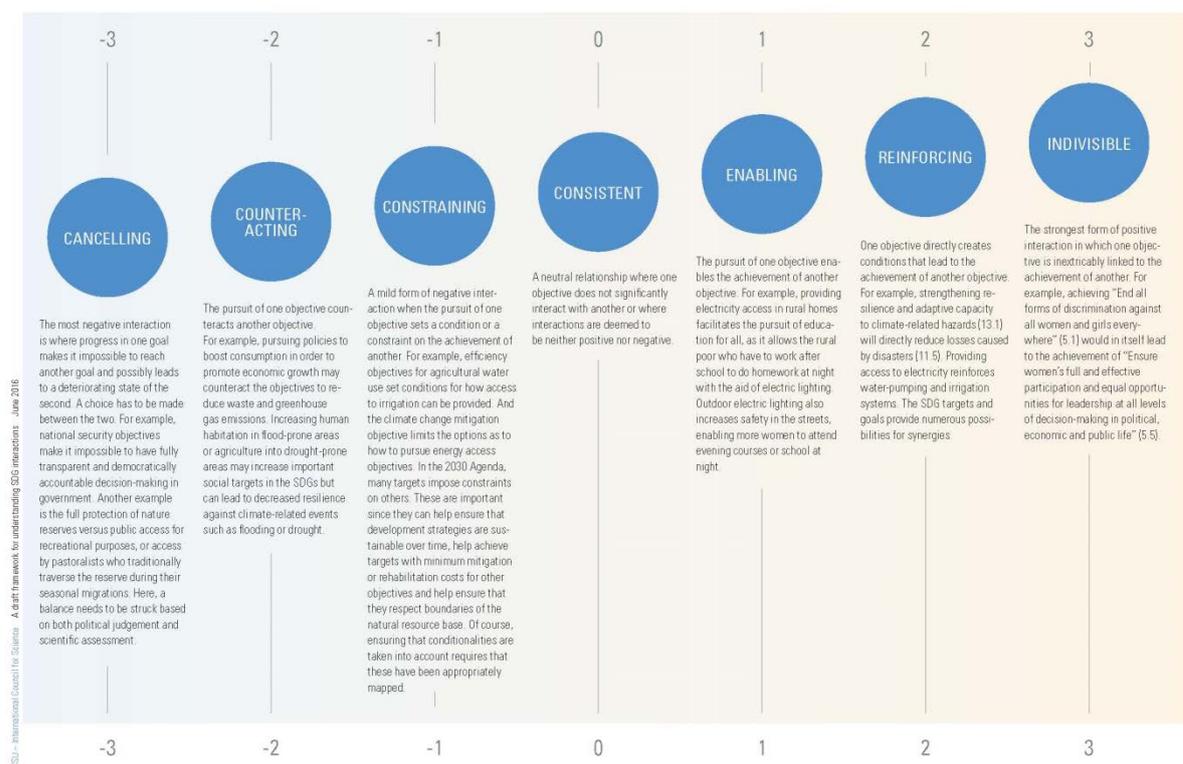
Source: ICSU (2017)

Figure 4: Example of the cross-reference of the contents of the National Water Strategy with SDG targets and indicators

National Water Strategy 2030	SDG Targets 2016-2030	Score (ICSU)	SDG Indicators (Responsible Agencies)	Available Indicators (UNDP)
2/4/5.4.1 Water supply and sanitation	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	3	6.1.1 Proportion of population using safely managed drinking water services (WHO, UNICEF)	SH.H2O.SAFE.ZS Improved water source (% of population with access): 73,8 (2015) [WHO/UNICEF] SH.H2O.SAFE.RU.ZS Improved water source, rural (% of rural population with access): 56,7 (2015) [WHO/UNICEF] SH.H2O.SAFE.UR.ZS Improved water source, urban (% of urban population with access): 93,1 (2015) [WHO/UNICEF]
	6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	3	6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water (WHO, UNICEF)	SH.STA.ACSN Improved sanitation facilities (% of population with access): 95,0 (2015) [WHO/UNICEF] SH.STA.ACSN.RU Improved sanitation facilities, rural (% of rural population with access) 95,5 (2015) [WHO/UNICEF] SH.STA.ACSN.UR Improved sanitation facilities, urban (% of urban population with access) 93,8 (2015) [WHO/UNICEF]

Source: Church (2017)

Figure 5: Example of trend of a water-relevant SDG indicator

Improved water source, rural (% of rural population with access)

WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation (wssinfo.org).
License: Open
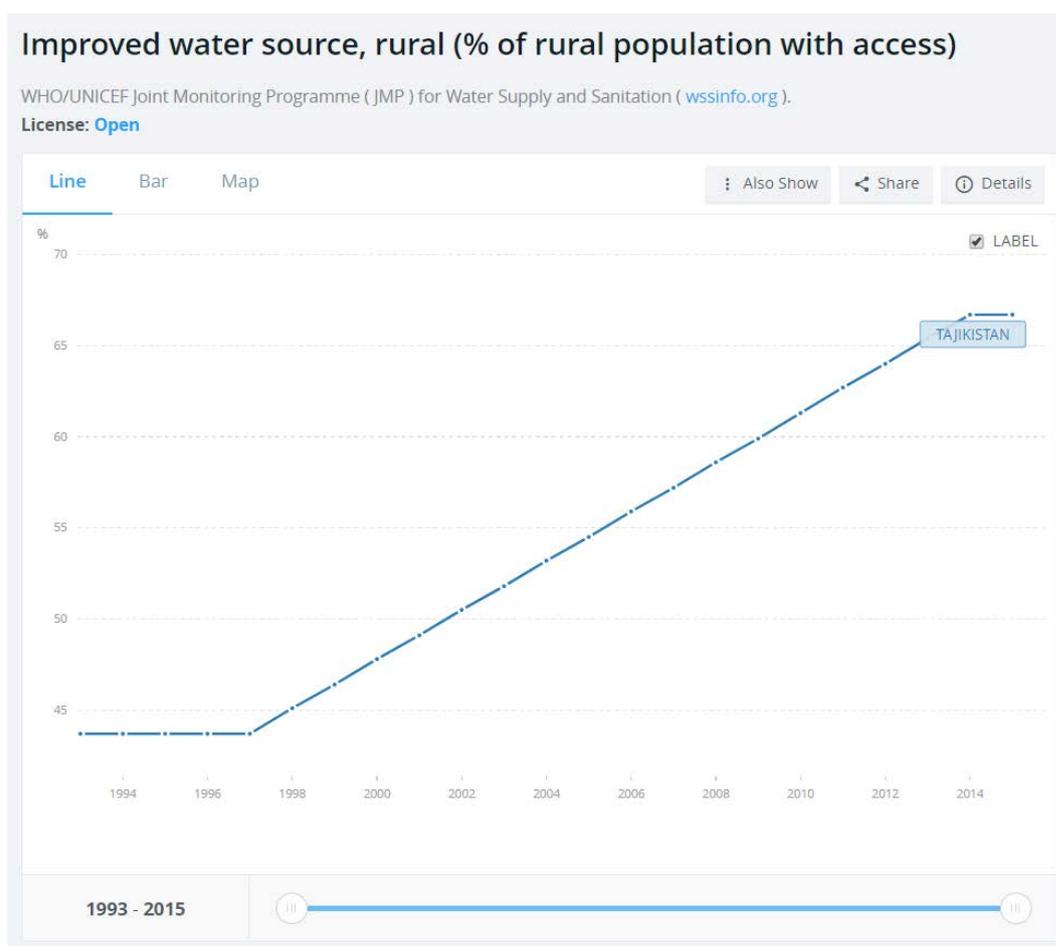
Source: World Bank Data Collection (2017)

3. Water-related targets in the National Development Strategy and other relevant documents

In order to produce a mapping assessment of the alignment of existing policies to the SDGs, UNDP identified for each SDG target the existing strategic goals and targets contained in the following general strategies and sectorial policies that were adopted by Tajikistan (Figure 6):

General strategies

- Mid-term Development Strategy 2016-2020
- National Development Strategy up to 2030

Sectoral policies

- State Ecological Programme 2009-2019
- Agricultural reforms Program 2020
- Labour Market Development Strategy until 2020

- Health Strategy 2012- 2022

- National Strategy for Activization of the Role of Women 2020

- State Program of Prevention of Domestic Violence 2023

- Water Sector Reforms Programme 2016-2025

- Program on Development of Justice System

Once the SDG targets relevant for each section of the National Water Strategy have been identified, it is possible to identify the existing strategic goals and targets that are contained in other strategic documents and that are relevant for SDGs for each section of the National Water Strategy (Figure 7).

This step is important for the development of the National Water Strategy, because it allows identifying the water-related targets that are strategic for the National Development Strategy, as well as potential gaps in the National Development Strategy with regard to high-impact water-related SDG targets, such as ensuring safe drinking water in rural areas, which is important to achieve SDG 6 in Tajikistan, or improving sanitation facilities in schools and hospitals, which is important for other SDGs. Note that in some cases, indicators are also indicated together with targets. It is recommended to distinguish them (Figure 8).

This cross-reference also allows comparing existing and proposed targets. While there may be some gaps, there may also be targets, whose implementation the National Water Strategy can contribute to. In some cases, this may allow to identify inconsistent targets, which this new strategy can contribute to correct. In this regard, a solid evidence-base is fundamental to prove inconsistencies and produce sound targets.

Figure 6: Example of detailed mapping assessment of the alignment of existing policies to the SDGs

SDGs Goals/Targets	Thematic Area/Sector, as Identified in Key Government Planning Documents	Medium term National/Subnational Development Plan Proirity / Goal		References	Identify National Indicators for the Specific Targets	Institution Responsible for Target implementation	Any relevant comment related to this priority target area in the National Development Plan?
6.1. Safe water	Water Sector Reforms Programme 2016-2025	2.1. Issues related to the water supply and sanitation system	38. As part of the transition process from planned economy to market economy, the water supply and sanitation system faced a number of problems, of which the following illustrate the major issues:	38	• Only 51,4% of the population in Tajikistan, with 86,9% in cities, 61,5% in towns and 43,4% in rural areas have access to portable water; and 79,8%, 18,2% and 0,2% of the population, respectively, have access to sewage system and good sanitary condition.		
6.1. Safe water	State Ecological Programme 2009 – 2019	Protection and use of water resources	2. Development, approval and implementation of the «road map» for strengthening resources of drinking water-supply, sanitary and hygiene reflecting data base formulation procedure, tariffs, education, investment attraction(4.7.3.)	4.7.3	Approved and implementation of the «road map» for strengthening resources of drinking water-supply, sanitary and hygiene reflecting data base formulation procedure, tariffs, education, investment attraction	GoT, MHSPP, MEWR	
6.1. Safe water	Mid-term development strategy 2016-2020	Environment					
6.1. Safe water	Mid-term development strategy 2016-2020	Safe water	3. Increase the volume of gross agriculture production to improve food security and nutrition		Increased productivity of agricultural crops and livestock production, including: getting 2-3 crops per year, developing of new lands, cultivating high-yielded and export-oriented crops	MEDT, MOA, MOF, TC, SCLMG	
6.2. Sanitation and hygiene	Water Sector Reforms Programme 2016-2025	2.1. Issues related to the water supply and sanitation system	38. As part of the transition process from planned economy to market economy, the water supply and sanitation system faced a number of problems, of which the following illustrate the major issues:	38	• Only 51,4% of the population in Tajikistan, with 86,9% in cities, 61,5% in towns and 43,4% in rural areas have access to portable water; and 79,8%, 18,2% and 0,2% of the population, respectively, have access to sewage system and good sanitary condition.		
6.2. Sanitation and hygiene	State Ecological Programme 2009 – 2019	Environmental sanitation for health care	3. Adoption of the set of actions to support preventive measures in primary medical and sanitary aid, strengthening the sanitary-and-epidemiologic service of health care (4.1.2.)	4.1.2	Introduced set of actions to support preventive measures in primary medical and sanitary aid, strengthening the sanitary-and-epidemiologic service of health care into the annual reporting system of health care	MHSPP, LCD	
6.2. Sanitation and hygiene	Mid-term development strategy 2016-2020	Environment					
6.3. Water quality	Water Sector Reforms Programme 2016-2025	2.4 Issues related to the Water Delivery For Industries	47. The main problems of industrial water supply are efficient treatments of sewage water, decreasing the water losses, introducing of reverse water systems, efficient monitoring of quantity and quality of sewage water and its conformity to norms and standards.	47			
		Protection and use of water resources	3. Ensuring progress in construction dynamics, rehabilitation of the water-supply system, sanitary and hygiene, in particular on the design basis (4.7.3.)	4.7.3	Investments growth rates in the sector, construction and rehabilitation of the water-supply system, sanitary and hygiene	MHSPP, MEWR, SCISPM	
6.3. Water quality	State Ecological Programme 2009 – 2019						
6.4. Water-use efficiency	Water Sector Reforms Programme 2016-2025	2.1. Issues related to the water supply and sanitation system	38. As part of the transition process from planned economy to market economy, the water supply and sanitation system faced a number of problems, of which the following illustrate the major issues:	38	• Water losses from water supply systems in the large cities makes up to 60%, in medium-size cities and towns 20%		
6.4. Water-use efficiency	Water Sector Reforms Programme 2016-2025	2.2. Issues related to the Irrigation and Drainage	41. … In some cases, the efficiency of irrigation systems of the country is only 40-50%.	41	In some cases, the efficiency of irrigation systems of the country is only 40-50%.		
6.4. Water-use efficiency	Water Sector Reforms Programme 2016-2025	2.4 Issues related to the Water Delivery For Industries	47. The main problems of industrial water supply are efficient treatments of sewage water, decreasing the water losses, introducing of reverse water systems, efficient monitoring of quantity and quality of sewage water and its conformity to norms and standards.	47			
		Protection and use of water resources	2. Development, approval and implementation of the «road map» for strengthening resources of drinking water-supply, sanitary and hygiene reflecting data base formulation procedure, tariffs, education, investment attraction (4.7.3.)	4.7.3.	Approved and implementation of the «road map» for strengthening resources of drinking water-supply, sanitary and hygiene reflecting data base formulation procedure, tariffs, education, investment attraction	GoT, MHSPP, MEWR	
6.4. Water-use efficiency	Agricultural reforms Program 2020	Улучшение доступа к ирригации	Улучшение доступа ирригации разделение ролей и обязанностей по вопросам разработки политики и регулирование на национальном уровне создание бассейнового управления водными ресурсами и Агентства «Мироб»		Улучшение эффективности использования водных ресурсов, водообеспечения хозяйств и состояние ирригационных систем		
6.4. Water-use efficiency	Mid-term development strategy 2016-2020	Environment					
6.4. Water-use efficiency	National Development Strategy upto 2030	NDP Chapter 5 Real sector of economy	5.1. Specific priorities are: (2) In agriculture: - More efficient use of land and water and human resources through better reclamation-irrigation of agricultural lands and productive employment of the rural population;	Page 76			
6.4. Water-use efficiency	National Development Strategy upto 2030	NDP Chapter 5 Real sector of economy	5.1. Specific priorities are: (2) In agriculture: - Reconstruction and rehabilitation of irrigation infrastructure and the introduction of modern technologies of energy-saving irrigation.	Page 76			
		Water-use efficiency	2. Improve the infrastructure and logistics of agriculture		Improved support of agriculture, reduction of the water loss volumes, increased area of irrigated land; Establish the National Council on water resources management	MEDT, MOA, MOF, SCISPM, MEWR, ALRI	
6.4. Water-use efficiency	Mid-term development strategy 2016-2020						

Source: UNDP (2017, draft)

Figure 7: Example of the cross-reference of the contents of the National Water Strategy with the National Development Strategy and other relevant documents

National Water Strategy 2030	SDG Targets 2016-2030	Score (ICSU)	National Development Strategy 2016-2030	Mid-term Development Strategy 2016-2020	Water Sector Reform Programme 2016-2025	Agricultural Reform Programme 2012-2020	State Ecological Programme 2009-2019	Other strategies
2/4/5.4.1 Water supply and sanitation	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	3		**Safe water** 3. Increase the volume of gross agriculture production to improve food security and nutrition **Indicators** Increased productivity of agricultural crops and livestock production, including: getting 2-3 crops per year, developing of new lands, cultivating high-yielded and export-oriented crops (MEDT, MOA, MOF, TC, SCLMG)	**2.1. Issues related to the water supply and sanitation system** 38. As part of the transition process from planned economy to market economy, the water supply and sanitation system faced a number of problems, of which the following illustrate the major issues **Indicators** Only 51,4% of the population in Tajikistan, with 86,9% in cities, 61,5% in towns and 43,4% in rural areas have access to portable water; and 79,8%, 18,2% and 0,2% of the population, respectively, have access to sewage system and good sanitary condition.		**Protection and use of water resources** 2. Development, approval and implementation of the «road map» for strengthening resources of drinking water-supply, sanitary and hygiene reflecting data base formulation procedure, tariffs, education, investment attraction **Indicators** 4.7.3 Approved and implementation of the «road map» for strengthening resources of drinking water-supply, sanitary and hygiene reflecting data base formulation procedure, tariffs, education, investment attraction (GoT, MHSPP, MEWR)	
	6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	3			**2.1. Issues related to the water supply and sanitation system** 38. As part of the transition process from planned economy to market economy, the water supply and sanitation system faced a number of problems, of which the following illustrate the major issues: **Indicators** Only 51,4% of the population in Tajikistan, with 86,9% in cities, 61,5% in towns and 43,4% in rural areas have access to portable water; and 79,8%, 18,2% and 0,2% of the population, respectively, have access to sewage system and good sanitary condition.		**Environmental sanitation for health care** 3. Adoption of the set of actions to support preventive measures in primary medical and sanitary aid, strengthening the sanitary-and-epidemiologic service of health care **Indicators** 4.1.2 Introduced set of actions to support preventive measures in primary medical and sanitary aid, strengthening the sanitary-and-epidemiologic service of health care into the annual reporting system of health care (MHSPP, LCD)	

Source: Church (2017)

Figure 8: Example of targets and indicators from the Midterm Development Strategy 2016-2020

Targets	Indicators
2.1.1. Creating a strategic management system 2.1.1.1. Introduce the system of strategic planning at all levels of public administration 2.1.1.2. Introduce the effective mechanism of anti-crisis management 2.1.1.3. Conclude the process of creating a system of effective coordination and delegation at all levels of public administration and effective collaboration with development partners (action matrix)	- The system of national development is effectively functioning; - The mechanism of anti-crisis management is functioning; - Adoption and implementation functions are effectively separated (EoP MEDT, MoF)

Source: Church (2017)

4. Building on the Sustainable Development Goals, the National Development Strategy and other relevant documents to draft the National Water Strategy

Once the table of contents of the National Water Strategy is agreed upon, working papers are prepared for each draft section or for each group of two or more similar draft sections. For instance, the table of contents for the National Water Strategy of Tajikistan includes sections on the "legal basis for water management" and the "institutional structure of water management". Given that the two topics are very closely related and that the expert who is drafting these sections is the same person, a single working paper can be produced on both the legal basis and the institutional structure of water management in Tajikistan.

The aim of these working papers is to provide the evidence base and analytical background for each section of the strategy. The available indicators and the existing targets are essential to ensure the interlinkage between the working papers and draft sections, on the one hand, and the SDG framework, on the other. Moreover, the general approach that is followed for the National Water Strategy can be divided in three logical steps: first, the assessment of the current situation (problem); second, the identification of strategic goals (solution); third, the proposal of concrete measures that can be proven to be necessary and that are expected to be sufficient for the achievement of the strategic goals (implementation).

Consequently, each substantial issue of the National Water Strategy is in fact dealt with in three different parts of the document:

Part 2: Current status of the water sector

Part 4: The strategic objectives and priorities for the water sector until 2030

Part 5: Measures for the implementation of the National Water Strategy

Part 1 is a general introduction, while Part 3 is an analysis of the water resources in the context of sustainable development that is largely based on the contents of this paper, which aims at explaining how the analysis of the current situation was

performed and how strategic objectives and priorities were derived from it, based on the SDGs, the National Development Strategy and other relevant documents.

The working papers are structured along the following components, which allows the analysis of the current situation, the identification of strategic goals and the proposal of specific measures:

1. Introduction and problem statement

    1.1. Overview of available documentation

    1.2. Existing indicators and targets

2. Diagnostic analysis of current situation and trends

3, Discussion of future scenarios

4. Conclusion and policy recommendations

This is consistent with the TRANSFORM methodological framework that is schematically illustrated below and that is often used in so-called transformational sustainability research (Wiek and Lang 2016).

Figure 9: Transformational sustainability research framework
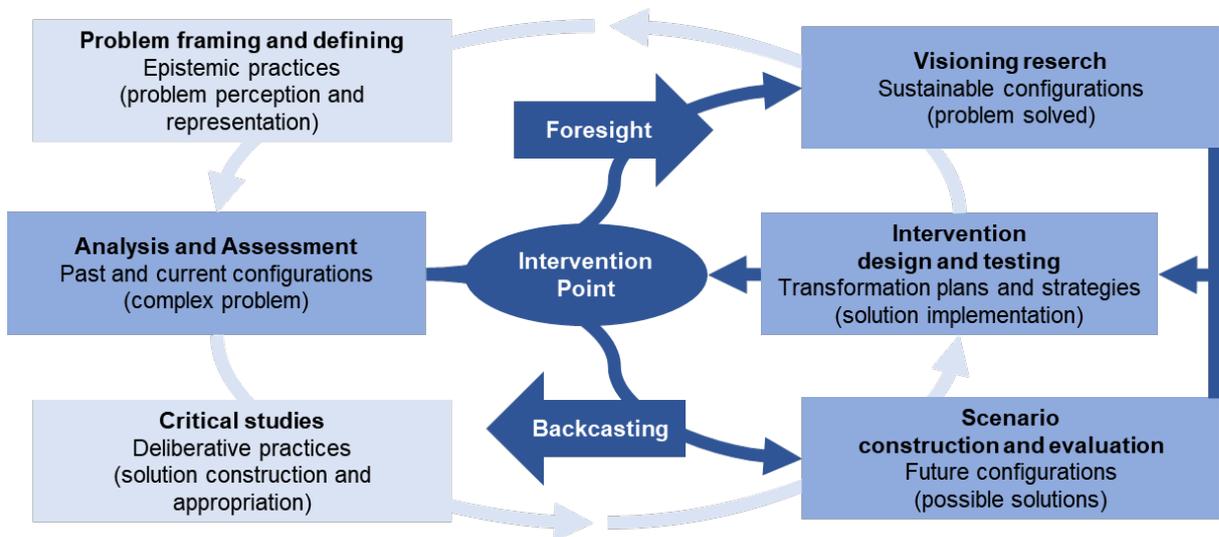
Source: Church (2017, redrawn and improved version of Wiek and Lang 2016)

1. Introduction and problem statement

The first component of the working papers is a generic introduction that highlights the key problems about the water-related issue of the working paper. This is based on an overview of the available documentation from reliable sources

(government, international organizations and scientific publications), as well as on the cross-reference of SDG targets and indicators and on the cross-reference of the National Development Strategy and other relevant documents such as the Water Sector Reform Programme 2016-2025. Concerning the cross-reference of SDG targets and indicators, the indicators that are below global average can be singled out as problematic. Among them, those for whom a negative trend with regard to the achievement of the SDGs can be highlighted as issues of particular concern. These elements are important to substantiate the key problems identified in this item of the working paper. Regarding the cross-reference of the National Development Strategy and other relevant documents, the most relevant targets are identified by the expert for each document, listed in the working paper and clustered around sub-themes. The targets from the National Development Strategy, those where the language is stronger and those that are featured in more than one document denote a certain importance. They also contribute to the substantiation the key problems.

2. Diagnostic analysis of current situation and trends

The second component is trying to understand the causes of these problems and the observable trends. With regard to the National Water Strategy, one way to diagnose the current situation is to produce a gap analysis of the implementation of the Water Sector Reform Program with regard to the specific issue of the working paper, given that it deals with most of the issues covered by the strategy. This allows singling out the achievements, but also qualitatively analyzing the causes of the gaps in the implementation. This can be done through systematically questioning the reasons for a certain gap.

Another diagnostic tool is the general trends identified by available water-related SDG indicators. Positive, constant and negative trends can normally be identified. Of course, negative trends are the ones that should be of most concern. A qualitative analysis of the causes of negative trends can also be useful, if appropriate.

Last but not least, given that there are sometimes emerging issues that are known to the expert, but are not captured by SDG indicators or are too recent to have been included in the programme, they should also be included in the diagnostic with a brief explanation.

3. Discussion of future scenarios

In some cases, the SDG indicators and available data allow to identify trends that can be projected into the future. One way to do this is to assume that the trend will continue in the future. This is called a tendential scenario. Another way to identify scenarios is to assume that endogenous (government intervention, private investment, etc.) or exogenous (global finance, climate change, etc.) causes will alter the observable trend: optimist, realist and pessimist scenarios are often identified. The National Development Strategy identifies three scenarios for Tajikistan:

1. Tendential
2. Industrial development
3. Innovation and industrial development

In the working papers, identified trends are projected based on these three scenarios. Where no trends can be identified, scenarios can also be produced, but in a qualitative manner. For example, it is possible to question the impact of the proposed scenarios on the emerging issues that were identified under the previous item, formulating a number of hypotheses.

4. Conclusion and policy recommendations

Finally, these analyses provide the evidence basis and analytical background for the draft sections. In particular, items 1, 2 and 3 provide the elements to analyze the current status of the water sector (Part 2) and identify the key problems, while items 2 and 3 provide some elements to formulate strategic objectives and priorities for the water sector until 2030 (Part 4), possibly based on identified trends and scenarios and compatibly with SDG targets and indicators.

Within the legal framework of Tajikistan, the measures for the implementation of the National Water Strategy (Part 5) are not a key component for a strategy and are more appropriate for a programme. However, they are useful to illustrate how strategic objectives can be implemented. In this case, they are to be considered as examples of concrete actions. Based on Part 2 and Part 4, they can be produced using a simple logical framework: are these measures proven to be necessary for the achievement of the strategic goals? are they sufficient? These elements can then be easily compiled in the draft sections.

Figure 10: Example of articulation between problems, solutions and instruments

| Current situation (problem)	Existing laws date back to the 2000s and need to be revised and completed with a new Law on Irrigation and Drainage
Strategic objective (solution)	**Revise and update legal instruments for water management by 2020**
Measures (instruments)	Complete the drafting process and adopt the revised Law on WUAs, the revised Law on Drinking Water and Water Resources and the new Law on Irrigation and Drainage; adopt all necessary by-laws for their implementation

Source: Church (2017)

5. From the working papers to the draft strategy

The production of the National Water Strategy consists in a transdisciplinary research processes (Figure 11) involving both experts and decision-makers, scholars and practitioners (Lang et al. 2012). The working papers are produced in ways that address scientific problems, such as exploring the compatibility of the SDG framework with the development of a national-level policy document. The draft sections, instead, are meant to address societal problems, such as ensuring that Tajikistan achieves SDG 6 by 2030. A process of co-creation of solution-oriented transferable knowledge must then be designed. This cannot be linear, but an iterative process, going back and forth between the working papers and the draft sections. It is important to ensure that the future strategy fully addresses SDG targets and indicators, building on existing targets from the National Development Strategy and other documents, contributing to their implementation. This iterative process needs to remain open and flexible and will result in several rounds of revision of the draft sections and the working

papers, with the working papers playing a key role as boundary objects between scientific discourse, on the one hand, and societal discourse, on the other. This process shall include both experts (local practitioners, national experts, international consultants, etc.) and decision-makers (government representatives, donor community, international organizations, etc.). This will facilitate the integration and application of created knowledge and the production of a National Water Strategy that is acceptable for experts and useful for decision-makers.

Figure 11: Transdisciplinary research process
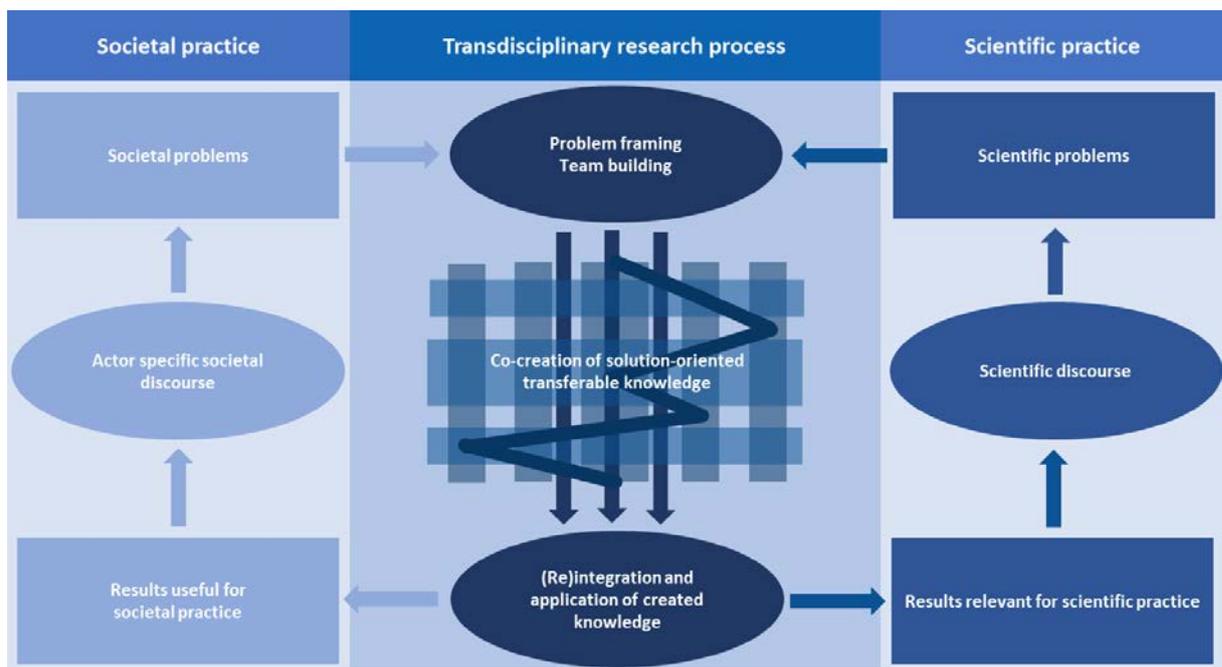
Source: Church (2017, redrawn from Lang 2012)

Figure 12: Production flow of the National Water Strategy

Source: Church (2017)

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Disclaimer

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