

Supplementary Materials:

Supplementary Material 1. Goal, target and indicators of sustainable development bases for the sub-indicators used for the groundwater resilience assessment method (GRAM).

No	SDGs	Target	SDGs Indicator	Sub-indicator GRAM
1	End poverty in all its forms everywhere.	1.2 By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.	1.2.1 Proportion of population living below the national poverty line, by sex and age.	Water rate
2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture.	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.	2.4.1 Proportion of agricultural area under productive and sustainable agricultural practices.	Agriculture area
3	Ensure healthy lives and promote well-being for all at all ages.	3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.	3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services).	Freshwater quality monitoring
4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.	4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.	4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment.	Knowledge transfer
5	Achieve gender equality and empower all women and girls.	5.1 End all forms of discrimination against all women and girls everywhere.	5.1.1 Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex.	Management and community structure of water system
		5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.	5.5.1 Proportion of seats held by women in national parliaments and local governments.	Management and community structure of water system
			5.5.2 Proportion of women in managerial positions.	Management and community structure of water system
		5.c Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.	5.c.1 Proportion of countries with systems to track and make public allocations for gender equality and women's empowerment.	Management and community structure of water system

6	Ensure availability and sustainable management of water and sanitation for all.	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.	6.1.1 Proportion of population using safely managed drinking water services.	Water access
		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.	6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water.	Water use
		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.	6.3.1 Proportion of wastewater safely treated.	Wastewater management
			6.3.2 Proportion of bodies of water with good ambient water quality.	Freshwater quality monitoring
				Water estimation
				Ecosystem extent
		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.	6.4.1 Change in water-use efficiency over time.	Water estimation
			6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources.	Water use
				Water rate
				Evapotranspiration/precipitation
				Water rationing
7	Ensure access to affordable, reliable, sustainable and modern energy for all.	6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.	6.6.1 Change in the extent of water-related ecosystems over time.	Ecosystem extent
		6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.	6.a.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan.	Water estimation
				International alliances
		6.b Support and strengthen the participation of local communities in improving water and sanitation management.	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.	Intercultural relations
				Water quality
7	Ensure access to affordable, reliable, sustainable and modern energy for all.	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.	7.2.1 Renewable energy share in the total final energy consumption.	Management and community structure of water system
				Energy sources

9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.	9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.	9.4.1 CO2 emission per unit of value added.	Monitoring of particulate matter
10	Reduce inequality within and among countries.	10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality.	10.4.1 Labour share of GDP, comprising wages and social protection transfers.	Wastewater management
11	Make cities and human settlements inclusive, safe, resilient and sustainable.	11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.	11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically.	Community participation
		11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the economic losses relative to gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.	11.5.1 Number of deaths, missing people, and persons affected by disaster per 100,000 people.	Population affected by natural disasters
			11.5.2 Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters.	Water rationing
		11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities.	Wastewater management
			11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted).	Monitoring of particulate matter
		11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning.	11.a.1 Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city.	Development plans
12	Ensure sustainable consumption and production patterns.	12.2 By 2030, achieve the sustainable management and efficient use of natural resources.	12.2.1 Material footprint, material footprint per capita and material footprint per GDP.	Water use
			12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP.	
		12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce	12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment.	Wastewater management

		their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.		
13	Take urgent action to combat climate change and its impacts.	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.	13.1.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population.	Population affected by natural disasters
			13.1.3 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies.	Population affected by natural disasters
		13.3 Improve education, awareness- raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.	13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula.	Education
			11.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions.	Knowledge transfer
				Energy sources
		13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries, including focusing on women, youth and local and marginalized communities.	13.b.1 Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalized communities.	Hydrological culture
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.	14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.	14.5.1 Coverage of protected areas in relation to marine areas.	Financial support
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.	15.1 By 2020, ensure the 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.	15.1.1 Forest area as a proportion of total land area.	Protection areas
			15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type.	Ecosystem extent
		15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.	15.2.1 Progress towards sustainable forest management	Protection areas
		15.3 By 2020, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land- degradation-neutral world.	15.3.1 Proportion of land that is degraded over total land area.	Ecosystem extent

		15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.	15.4.1 Coverage by protected areas of important sites for mountain biodiversity.	Protection areas
			15.4.2 Mountain Green Cover Index.	Protection areas
		15.5. Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity, and, by 2020, protect and prevent the extinction of threatened species.	15.5.1 Red List Index.	Protection areas
		15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products.	15.7.1 Proportion of traded wildlife that was poached or illicitly trafficked.	Protection areas
		15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.	15.b.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems.	Academic support
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.	16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels.	16.7.2 Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group.	Cultural diversity
				Cultural holidays
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development.	17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism.	17.6.1 Number of science and/or technology cooperation agreements and programs between countries, by type of cooperation.	International alliances
				Intercultural relations

