SYNERGIES BETWEEN THE WATER JPI
AND
OTHER RELEVANT INITIATIVES

Synergies between the Water JPI and Other Relevant Initiatives

Since 2014, the Water JPI has included international partners to better address global research and innovation priorities, and identification of knowledge gaps with respect to the UN SDGs and thematic priorities for Joint Transnational Calls. The launch of the Coordination and Support Action programme, IC4WATER, which is dedicated to international cooperation, has boosted its implementation plan at a global scale. The Water JPI also engages in alignment activity in order to address duplication of research, such as the coordination effort between the Water JPI and other initiatives. The Water JPI therefore seeks to enhance synergies with other JPIs as well as European and international initiatives in order to establish common activities.

As part of the process to update the Water JPI's Strategic Research and Innovation Agenda (SRIA) 2025 between 2019 and early 2020, synergies have been identified between the Water JPI SRIA Sub-themes and Research Priorities and the core theme/research areas of other initiatives and their SRIAs/SRAs (Strategic Research Agendas). Together these can contribute to tackling the societal challenges also being addressed by other initiatives.

The table below identifies key relevant EU and international initiatives that have synergies with the Water JPI.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
BiodivERsA	**Core Theme 1: Biodiversity: a fundamental asset for the functioning and resilience of ecosystems, provision of ecosystems goods and services, and improvement of well-being.** **Sub-theme A.1:** Developing approaches for assessing and optimising the structure and function of ecosystem services. *RDI priority A.1.1:* Assessing the functioning of ecosystems, ecosystem goods and services, and human wellbeing associated with ecosystems. *RDI priority A.1.4:* Adapting and integrating aquatic and artificial (e.g. designer ecosystems, such as rain gardens and ponds) ecosystem services into management of water resources, including analysing trade-offs and synergies between water quality objectives, targets and land use planning and governance systems, by utilising better environmental data and information. **Sub-theme B.4:** Assessing and evaluating the sustainable interaction between different users (people, agriculture, industry and nature) and their water demands to promote a coordinated resource management strategy. *RDI priority B.4.1:* Understanding of the links between water, NBS and ecosystem services to assess and evaluate ecosystem change on human wellbeing. *(Link with A.1.1).* **Core Theme 2: Better knowledge on biodiversity, its dynamics and its adaptation capacity to global change: a basis for supporting conservation and restoration.** **Sub-theme A.1:** Developing approaches for assessing and optimising the structure and function of ecosystem services. *RDI priority A.1.1:* Assessing the functioning of ecosystems, ecosystem goods and services, and human wellbeing associated with ecosystems. **Sub-theme A.3:** Managing and adapting ecosystem services to the effects of hydro-climatic extreme events. *RDI priority: A.3.1:* Determine the pressures on biodiversity and ecosystem services, and genetic resources, in a global change context. *RDI priority A.3.3:* Developing of prediction models of ecosystem "tipping points" to categorise hydro-climatic extreme events and their system-specific effects on different ecosystems considering the various parameters (physical and bio-geochemical, as well as sociological and economical). **Core Theme 3: Biodiversity, a fundamental asset for nature-based solutions to pressing societal issues and for promoting transition towards sustainable socio-economic pathways.** **Sub-theme C.2:** Water smart-circular economy and societies.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
	RDI priority C.2.1: Advancing in water resources efficiency and allocation across sectors for increasing climate change resilience.
	RDI priority C.2.3: Developing and testing scalable and affordable solutions for cities and rural/decentralised areas to allow the prioritisation of investments and increasing climate change resilience. *(Link with D.4.4).*
	RDI priority C.2.4: The development and optimisation of technologies to recover and valorise products from waste water, brines and sludges.
	RDI priority C.2.6: Developing innovative water allocation policies and management practices that ensure increased water use, economic efficiency, social justice and environmental sustainability.
	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.5: Developing methods for more efficient citizen and wider stakeholder engagement (improved communication, public perception and responsibility and awareness) for sustainable management of water resources, and developing the sensors and digital solutions that will enable integrated water management in an optimal and transparent manner.
JPI Oceans	**Strategic Area 4: Linking Oceans, Human Health and Wellbeing.**
	Sub-theme B.1: Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans.
	RDI priority B.1.3: Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens.
	RDI priority B.1.4: Develop methodologies and strategies to remediate and reduce contaminants of concern [e.g. disinfection by-products, micro- and nano-plastics and pathogens] at point (e.g. waste water treatment plants, farmyards, domestic waste water treatment systems) and non-point sources [e.g. land spreading of biosolids, fertiliser (organic and inorganic) applications, run-off from agricultural lands, pollution from transport, run-off from agricultural lands], including their environmental effects in water, soil, sediment and sludge.
	Sub-theme B.4: Assessing and evaluating the sustainable interaction between different users (people, agriculture, industry and nature) and their water demands to promote a coordinated resource management strategy.
	RDI priority B.4.1: Understanding of the links between water, NBS and ecosystem services to assess and evaluate ecosystem change on human wellbeing. *(Link with A.1.1).*
	Strategic Area 5: Interdisciplinary Research for Good Environmental Status.
	Sub-theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.
	RDI priority A.3.3: Developing of prediction models of ecosystem "tipping points" to categorise hydro-climatic extreme events and their system-specific effects on different ecosystems considering the various parameters (physical and bio-geochemical, as well as sociological and economical).
	Sub-theme C.1: Future-proofed water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.1: Developing more efficient, cost-effective and easier-to-implement technological solutions, including drinking water and waste water treatment and water catchments, with a particular focus on solutions for emerging contaminants and emerging risks of established contaminants.
	Strategic Area 7: Climate Change Impact on Physical and Biological Ocean Processes.
	Sub-theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.
	RDI priority A.3.3: Developing of prediction models of ecosystem "tipping points" to categorise hydro-climatic extreme events and their system-specific effects on different ecosystems considering the various parameters (physical and bio-geochemical, as well as sociological and economical).

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
	Strategic Area 9: Food Safety and Security Driving Innovation in a Changing World.
	Sub-theme A.1: Developing approaches for assessing and optimising the structure and function of ecosystem services.
	RDI priority A.1.2: Understanding and predicting multiple pressure–impact–response relationships in all types of aquatic ecosystems (surface waters – rivers, from springs to transitional waters – wetlands and lakes/lagoons, as well as groundwater) in the global biogeochemical (and sediment and rock interaction) cycle. This may include risk assessments and linking these relationships to the ecological and social resilience of ecosystems. *(Link with Theme B - Health and Wellbeing).*
	Sub-theme C.2: Water smart-circular economy and societies.
	RDI priority C.2.2: Developing a water quality fit-for-use concept for water-dependant sectors, to allow resources recovery and water reuse in different sectors (development of the circular economy), including risk assessment, acceptance, holistic costs analysis and decision support systems. *(Link with D.1).*
EIP Water **European Innovation Partnership (EIP) Water**	**Priority Area 4.1: Water reuse and recycling**
	Sub-theme C.1: Future-proofed water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.6: Developing methodologies to organise effectively the replacement and large-scale renovation of water infrastructure, and how to implement these in a cost-effective and energy-neutral manner while safeguarding the continuation of the water network and water system.
	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.1: Developing integrated transboundary and adaptive water resource management systems for the economic sectors, in particular the agriculture, forestry, aquaculture and energy production sectors, that are currently the largest water consumers.
	RDI priority D.3.4: Integrating and connecting economic aspects, ecological issues and social analyses into decision-making processes. Promoting new governance, knowledge and cross-sectoral management approaches.
	RDI priority D.3.5: Developing methods for more efficient citizen and wider stakeholder engagement (improved communication, public perception and responsibility and awareness) for sustainable management of water resources, and developing the sensors and digital solutions that will enable integrated water management in an optimal and transparent manner.
	Priority Area 4.2: Water and wastewater treatment, including recovery of resources.
	Sub-theme C.1: Future-proofed water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.1: Developing more efficient, cost-effective and easier-to-implement technological solutions, including drinking water and waste water treatment and water catchments, with a particular focus on solutions for emerging contaminants and emerging risks of established contaminants.
	RDI priority C.1.3: Developing circular economy approaches to waste water treatment plants (e.g. production of energy and nutrients, molecules); zero greenhouse gas emissions from new generation treatment plants.
	Priority Area 4.3: Water-energy nexus
	Sub-theme D.1: Optimising the Nexus approach.
	RDI priority D.1.1: Investigating and devising new approaches to address the Nexus, namely on sustainability and efficiency (environment, health, economy) using a multi-disciplinary approach.
	RDI priority D.1.4: Developing, optimising and testing innovative solutions for achieving water, sediment, energy resources sustainability and food security and safety linked to environment using a holistic approach.
	Priority Area 4.4: Flood and drought risk management.
	Sub-theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
	RDI priority A.3.1: Determine the pressures on biodiversity and ecosystem services, and genetic resources, in a global change context.
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.
	Sub-theme D.3: Enabling sustainable management of water resources
	RDI priority D.3.3: Developing integration models of high-resolution temporal and spatial data on the water cycle, ecosystems and economic systems to address water resource management. This includes the impacts of climate and global changes to geochemical fluxes (due to climate and global changes) on water ecosystems from the critical zone.
	<u>Priority Area 4.5: Ecosystem services</u>
	Sub-theme A.1: Developing approaches for assessing and optimising the structure and function of ecosystem services.
	RDI priority A.1.1: Assessing the functioning of ecosystems, ecosystem goods and services, and human wellbeing associated with ecosystems. This may include reinforcing the knowledge on causal links (including synergies and trade-offs) between biodiversity and ecosystem functioning, and the other systems present in catchments (geosystems and atmospheric systems).
	RDI priority A.1.3: Developing evaluation and prediction methodologies to assess the economic and social value of ecosystem services and biodiversity, considering all aspects of ecosystems in a context that includes geosystems and atmospheric systems (from the visible to the unseen, i.e. groundwater features/flows).
	RDI priority A.1.4: Adapting and integrating aquatic and artificial (e.g. designer ecosystems, such as rain gardens and ponds) ecosystem services into management of water resources, including analysing trade-offs and synergies between water quality objectives, targets and land use planning and governance systems, by utilising better environmental data and information.
BONUS — SCIENCE FOR A BETTER FUTURE OF THE BALTIC SEA REGION — **Joint Baltic sea Research and Development Programme (BONUS)**	<u>**Strategic Area 1: Understanding the Baltic Sea ecosystem structure and functioning (Theme 1.1 Ecosystem resilience and dynamics of biogeochemical processes, including cumulative impacts of human pressures).**</u>
	Sub-theme A.1: Developing approaches for assessing and optimising the structure and function of ecosystem services.
	RDI priority A.1.1: Assessing the functioning of ecosystems, ecosystem goods and services, and human wellbeing associated with ecosystems. This may include reinforcing the knowledge on causal links (including synergies and trade-offs) between biodiversity and ecosystem functioning, and the other systems present in catchments (geosystems and atmospheric systems).
	<u>**Strategic Area 4: Improving the capabilities of societies to respond to the current and future challenges directed to the Baltic Sea region (Theme 4.2 Linking ecosystem goods and services to human lifestyles and well-being).**</u>
	Sub-theme A.1: Developing approaches for assessing and optimising the structure and function of ecosystem services.
	RDI priority A.1.1: Assessing the functioning of ecosystems, ecosystem goods and services, and human wellbeing associated with ecosystems. This may include reinforcing the knowledge on causal links (including synergies and trade-offs) between biodiversity and ecosystem functioning, and the other systems present in catchments (geosystems and atmospheric systems).
	Sub-theme B.1: Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans.
	RDI priority B.1.4: Develop methodologies and strategies to remediate and reduce contaminants of concern [e.g. disinfection by-products, micro- and nano-plastics and pathogens] at point (e.g. waste water treatment plants, farmyards, domestic waste water treatment systems) and non-point sources [e.g. land spreading of biosolids, fertiliser (organic and inorganic) applications, run-off from agricultural lands, pollution from transport, run-off from agricultural lands], including their environmental effects in water, soil, sediment and sludge.

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	Sub-theme B.4: Assessing and evaluating the sustainable interaction between different users (people, agriculture, industry and nature) and their water demands to promote a coordinated resource management strategy.
	RDI priority B.4.1: Understanding of the links between water, NBS and ecosystem services to assess and evaluate ecosystem change on human wellbeing. *(Link with A.1.1).*
Partnership for Research and Innovation in the Mediterranean Area (PRIMA)	**Thematic Area 1: Aquifer modelling (storage, depletion trajectory)** **Sub-theme A.1:** Developing approaches for assessing and optimising the structure and function of ecosystem services. *RDI priority A.1.2:* Understanding and predicting multiple pressure–impact–response relationships in all types of aquatic ecosystems (surface waters – rivers, from springs to transitional waters – wetlands and lakes/lagoons, as well as groundwater) in the global biogeochemical (and sediment and rock interaction) cycle. This may include risk assessments and linking these relationships to the ecological and social resilience of ecosystems. *(Link with Theme B - Health and Wellbeing).* **Thematic Area 1: Sea water intrusion and salinization** **Sub-theme A.3:** Managing and adapting ecosystem services to the effects of hydro-climatic extreme events. *RDI priority A.3.3:* Developing of prediction models of ecosystem "tipping points" to categorise hydro-climatic extreme events and their system-specific effects on different ecosystems considering the various parameters (physical and bio-geochemical, as well as sociological and economical). **Sub-theme C.1:** Future-proofed water technologies, infrastructures and systems for developing climate change resilience. *RDI priority C.1.5:* Developing smart monitoring and control systems, from assets to water supply, and reclaimed water networks, from catchment to water production sites, and developing methodologies for extending the technological and functional lifespan of water infrastructures. **Thematic Area 1: Contamination of the water cycle** **Sub-theme B.1:** Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans. *RDI priority B.1.4:* Develop methodologies and strategies to remediate and reduce contaminants of concern [e.g. disinfection by-products, micro- and nano-plastics and pathogens] at point (e.g. waste water treatment plants, farmyards, domestic waste water treatment systems) and non-point sources [e.g. land spreading of biosolids, fertiliser (organic and inorganic) applications, run-off from agricultural lands, pollution from transport, run-off from agricultural lands], including their environmental effects in water, soil, sediment and sludge. **Sub-theme C.1:** Future-proofed water technologies, infrastructures and systems for developing climate change resilience. *RDI priority C.1.1:* Developing more efficient, cost-effective and easier-to-implement technological solutions, including drinking water and waste water treatment and water catchments, with a particular focus on solutions for emerging contaminants and emerging risks of established contaminants. *RDI priority C.1.3:* Developing circular economy approaches to waste water treatment plants (e.g. production of energy and nutrients, molecules); zero greenhouse gas emissions from new generation treatment plants. **Thematic Area 1: Water-energy-food synergies** **Sub-theme D.1:** Optimising the Nexus approach. *RDI priority D.1.1:* Investigating and devising new approaches to address the Nexus, namely on sustainability and efficiency (environment, health, economy) using a multi-disciplinary approach. RDI priority D.1.4: Developing, optimising and testing innovative solutions for achieving water, sediment, energy resources sustainability and food security and safety linked to environment using a holistic approach. **Thematic Area 1: Transboundary cooperation**

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	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.1: Developing integrated transboundary and adaptive water resource management systems for the economic sectors, in particular the agriculture, forestry, aquaculture and energy production sectors, that are currently the largest water consumers.
	Thematic Area 1: Irrigation water productivity.
	Sub-theme C.2: Water smart-circular economy and societies.
	RDI priority C.2.1: Advancing in Water resources efficiency and allocation across sectors for increasing climate change resilience.
	Thematic Area 1: Water re-use
	Sub-theme C.2: Water smart-circular economy and societies.
	RDI priority C.2.1: Advancing in Water resources efficiency and allocation across sectors for increasing climate change resilience.
	RDI priority C.2.2: Developing a water quality fit-for-use concept for water-dependant sectors, to allow resources recovery and water reuse in different sectors (development of the circular economy), including risk assessment, acceptance, holistic costs analysis and decision support systems. *(Link with D.4.4)*.
	Sub-theme D.2: Adapting water resources management to deal with increased uncertainty.
	RDI priority D.2.2: Innovations on practical, low-cost technologies treating waste water to produce resources that are safe (for the environment and health) for direct and indirect (i.e. management aquifer recharge) reuse.
	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.1: Developing integrated transboundary and adaptive water resource management systems for the economic sectors, in particular the agriculture, forestry, aquaculture and energy production sectors, that are currently the largest water consumers.
	RDI priority D.3.5: Developing methods for more efficient citizen and wider stakeholder engagement (improved communication, public perception and responsibility and awareness) for sustainable management of water resources, and developing the sensors and digital solutions that will enable integrated water management in an optimal and transparent manner.
	Thematic Area 1: Intermittent streams
	Sub-theme A.2: Developing and applying an approach to ecological engineering and ecohydrology.
	RDI priority A.2.1: Understanding, managing improving and restoring hydro-morphological alterations, to restore the ecological and sediment flows (E- and S-flows), and thus restore hydrological connectivity and continuity, to satisfactory conditions. *(Link to priority A.1.1 on understanding ecosystem functioning)*.
	Thematic Area 1: Technologies and governance models (including constraints).
	Sub-theme C.1: Future-proofed water technologies, infrastructures and systems for developing climate change resilience
	RDI priority C.1.1: Developing more efficient, cost-effective and easier-to-implement technological solutions, including drinking water and waste water treatment and water catchments, with a particular focus on solutions for emerging contaminants and emerging risks of established contaminants.
	RDI priority C.1.2: Optimising risk-based solutions by combining conventional and innovative solutions, and technological and NBS approaches to develop resilient water territories (in urban, rural and coastal areas).
	RDI priority C.1.4: Developing innovative approaches to assets management (including replacement/renewal of ageing infrastructure, dealing with leakages) to improve its performance and security. This also includes the security of critical infrastructure (in the context of climate change and cybersecurity). *(Link with B.3.2)*.

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JPI for "More Years, Better Lives" (MYBL)	**Research Topic 1: Quality of life, wellbeing and health (Physical environment)** **Sub-theme B.1:** Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans. *RDI priority B.1.3:* Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens. *RDI priority B.1.4:* Develop methodologies and strategies to remediate and reduce contaminants of concern [e.g. disinfection by-products, micro- and nano-plastics and pathogens] at point (e.g. waste water treatment plants, farmyards, domestic waste water treatment systems) and non-point sources [e.g. land spreading of biosolids, fertiliser (organic and inorganic) applications, run-off from agricultural lands, pollution from transport, run-off from agricultural lands], including their environmental effects in water, soil, sediment and sludge. **Sub-theme B.2:** Water dimension of Anti-Microbial Resistance; 'One health approach'. *RDI priority B.2.1:* Understanding the role of the environment in the selection and spread of AMR genes; transmission mechanisms. **Sub-theme B.3:** Understanding and minimising the risks associated with water infrastructures and climate change effects. *RDI priority B.3.3:* Developing *in situ* biosensor/monitoring network systems with a low environmental impact that can complement current biological effects-based monitoring infrastructures and early warning systems for water sustainability and water quality. *(Link with C.1.4).* *RDI priority B.3.4:* Understanding the disaster management cycle in the face of climate change, effects on society and mitigation measures.
JPI for "A healthy diet for a healthy life" (HDHL)	**Research Area 2: Diet and food production- Developing healthy, high-quality, safe and sustainable foods** **Sub-theme A.3:** Managing and adapting ecosystem services to the effects of hydro-climatic extreme events. *RDI priority A.3.1:* Determine the pressures on biodiversity and ecosystem services, and genetic resources, in a global change context. **Sub-theme D.1:** Optimising the Nexus approach. *RDI priority D.1.1:* Investigating and devising new approaches to address the Nexus, namely on sustainability and efficiency (environment, health, economy) using a multi-disciplinary approach. *RDI priority D.1.2:* Developing methodologies to assess how water resources, ecosystems and human actions in a complex interconnected system (Nexus) will respond to a changing climate and global changes through participatory scenario development and integrated modelling approaches. *RDI priority D.1.4:* Developing, optimising and testing innovative solutions for achieving water, sediment, energy resources sustainability and food security and safety linked to environment using a holistic approach. **Research Area 3: Diet-related Chronic diseases- preventing diet-related chronic diseases and increasing the quality of life** **Sub-theme B.1:** Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans. *RDI priority B.1.3*: Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens. *RDI priority B.1.4:* Develop methodologies and strategies to remediate and reduce contaminants of concern [e.g. disinfection by-products, micro- and nano-plastics and pathogens] at point (e.g. waste water treatment plants, farmyards, domestic waste water treatment systems) and non-point sources [e.g. land spreading of biosolids, fertiliser (organic and inorganic) applications, run-off from agricultural lands, pollution from transport, run-off from agricultural lands], including their environmental effects in water, soil, sediment and sludge.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
JPI for Agriculture, Food Security and Climate Change (FACCE)	**Core Theme 1.1: Identifying key vulnerabilities of the European food system to climate change** **Sub-theme D.1:** Optimising the Nexus approach. *RDI priority D.1.1:* Investigating and devising new approaches to address the Nexus, namely on sustainability and efficiency (environment, health, economy) using a multi-disciplinary approach. *RDI priority D.1.4:* Developing, optimising and testing innovative solutions for achieving water, sediment, energy resources sustainability and food security and safety linked to environment using a holistic approach. **Core Theme 3.1: Assessing and valuing ecosystem services and their resilience in agricultural systems and landscape under climate change** **Sub-theme A.1:** Developing approaches for assessing and optimising the structure and function of ecosystem services. *RDI priority A.1.1:* Assessing the functioning of ecosystems, ecosystem goods and services, and human wellbeing associated with ecosystems. This may include reinforcing the knowledge on causal links (including synergies and trade-offs) between biodiversity and ecosystem functioning, and the other systems present in catchments (geosystems and atmospheric systems). *RDI priority A.1.3:* Developing evaluation and prediction methodologies to assess the economic and social value of ecosystem services and biodiversity, considering all aspects of ecosystems in a context that includes geosystems and atmospheric systems (from the visible to the unseen, i.e. groundwater features/flows).
JPI for Antimicrobial Resistance (AMR)	**Theme 1: Optimisation of surveillance systems to understand the drivers and burden of antimicrobial resistance in a One Health perspective** **Sub-theme B.1:** Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans. *RDI priority B.1.2:* Develop new tools to measure and evaluate chemical mixtures, transformation products and environmental exposure effects (the cocktail effect). **Sub-theme B.2:** Water dimension of anti-microbial resistance; "one health approach". *RDI priority B.2.2:* Developing new tools for monitoring AMR genes and use of surveillance of AMR data in aquatic environments. **Theme 2: Understanding and preventing the transmission of antimicrobial resistance** **Sub-theme B.1:** Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans. *RDI priority B.1.1:* Developing analytical techniques and appropriate matrices (human and animal) with a focus on substances of emerging concern. **Sub-theme B.2:** Water dimension of Anti-Microbial Resistance; 'One health approach'. *RDI priority B.2.1:* Understanding the role of the environment in the selection and spread of AMR genes; transmission mechanisms. *RDI priority B.2.3:* Developing technologies and innovative interventions that rapidly reduce and control AMR in wastewater treatment to reduce the introduction to the environment. **Theme 3: The role of the environment in the selection and spread of antimicrobial resistance** **Sub-theme B.1:** Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans. *RDI priority B.1.3:* Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens. *Sub-theme B.2:* Water dimension of Anti-Microbial Resistance; 'One health approach'. *RDI priority B.2.1:* Understanding the role of the environment in the selection and spread of AMR genes; transmission mechanisms.

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	RDI priority B.2.3: Developing technologies and innovative interventions that rapidly reduce and control AMR in wastewater treatment to reduce the introduction to the environment.
	Theme 4: Investigation and improvement of infection prevention and control measures in One Health settings
	Sub-theme B.1: Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans.
	RDI priority B.1.1: Developing analytical techniques and appropriate matrices (human and animal) with a focus on substances of emerging concern.
	RDI priority B.1.3: Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens.
	RDI priority B.1.5: Understanding and predicting opportunistic pathogens in water due to more favourable climate change conditions.
JPI Climate	**Module 1: Moving towards decadal climate predictions (adaptation and mitigation, improvement of climate models and better understanding of key climate processes)**
	Sub-theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.
	RDI priority A.3.1: Determine the pressures on biodiversity and ecosystem services, and genetic resources, in a global change context.
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.
	RDI priority A.3.3: Developing of prediction models of ecosystem "tipping points" to categorise hydro-climatic extreme events and their system-specific effects on different ecosystems considering the various parameters (physical and bio-geochemical, as well as sociological and economical).
	Sub-theme C.1: Future-proofed water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.2: Optimising risk-based solutions by combining conventional and innovative solutions, and technological and NBS approaches to develop resilient water territories (in urban, rural and coastal areas).
	Sub-theme C.2: Water smart-circular economy and societies.
	RDI priority C.2.3: Developing and testing scalable and affordable solutions for cities and rural/decentralised areas to allow the prioritisation of investments and increasing climate change resilience.
	Module 3: Understanding sustainable transformations of societies under climate change (stimulate innovations to achieve climate friendly and climate proof Europe)
	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.4: Integrating and connecting economic aspects, ecological issues and social analyses into decision-making processes. Promoting new governance, knowledge and cross-sectoral management approaches.
	RDI priority D.3.5: Developing methods for more efficient citizen and wider stakeholder engagement (improved communication, public perception and responsibility and awareness) for sustainable management of water resources, and developing the sensors and digital solutions that will enable integrated water management in an optimal and transparent manner.
	Sub-theme C.3: Empowering the public, water users and stakeholders in valuing water.
	RDI priority C.3.1: Developing a bottom-up approach for co-design and co-construction of solutions for water users, in a framework of a shared water stewardship of catchments.
	RDI priority C.3.4: Developing participatory foresight approaches to raise stakeholders' awareness of the long-term value of water resource protection.

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	RDI priority C.3.7: Developing methodologies of accounting for natural capital as a way of helping to ensure that ecosystems and the services they provide are not diminished by human activities.
	Module 4: Improving models and scenario-based tools for decision-making under climate change. (Policy developments, integrated assessment models, guidance tools)
	Sub-theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.
	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.4: Integrating and connecting economic aspects, ecological issues and social analyses into decision-making processes. Promoting new governance, knowledge and cross-sectoral management approaches.
JPI for Urban Europe (UE)	**Theme 3: Environmental Sustainability and Resilience in Urban Areas**
	Sub-theme B.3: Understanding and minimising the risks associated with water infrastructures and climate change effects.
	RDI priority B.3.1: Progressing towards more water-resilient cities and communities in the face of climate change and increasing natural hazards and the issues associated with older and ageing infrastructure.
	RDI priority B.3.3: Developing *in situ* biosensor/monitoring network systems with a low environmental impact that can complement current biological effects-based monitoring infrastructures and early warning systems for water sustainability and water quality. *(Link with C.1.4).*
JPI Culture Heritage	**Theme 3: Safeguarding our cultural heritage resources- Conservation, Adaptation and Mitigation (vulnerability to climate change)**
	Sub-theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.
	Sub-theme C.1: Future-proofed water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.4: Developing Innovative approaches to assets management (including replacement/ renewal of ageing infrastructure, dealing with leakages, etc.) for improving their performance and security. This includes also the security of critical infrastructure (in the context of climate change and cybersecurity). *(Link with B.3.2)*
	Sub-theme C.3: Empowering the public, water users and stakeholders in valuing water.
	RDI priority C.3.4: Developing participatory foresight approaches to raise stakeholders' awareness of the long-term value of water resource protection.
EurAqua	**RDI area: Environmental quality and human well-being under climate change**
	Sub theme A.1: Developing approaches for assessing and optimising the structure and function of ecosystem services.
	RDI priority A.1.1: Assessing the functioning of ecosystems, ecosystem goods and services, and human wellbeing associated with ecosystems.
	Sub theme A.2: Developing and applying an approach to ecological engineering and ecohydrology.
	RDI priority A.2.2: Developing NBS for the scaling-up of restoration and improvement actions and mitigation of degraded water bodies and aquatic ecosystems (from local to landscape, across gradients such as upstream and downstream effects and degrees of degradation).
	RDI priority A.2.3: Developing NBS and linking measures to their effects and their societal impacts in terms of risks reduction, climate change mitigation, and water and associated ecosystems preservation.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
	Sub theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.
	RDI priority A.3.1: Determine the pressures on biodiversity and ecosystem services, and genetic resources, in a global change context.
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.
	Sub theme B.1: Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans.
	RDI priority B.1.5: Understanding and predicting opportunistic pathogens in water due to more favourable climate change conditions.
	Sub theme B.2: Water dimension of anti-microbial resistance; "one health approach"
	RDI priority B.2.1: Understanding the role of the environment in the selection and spread of AMR genes; transmission mechanisms.
	Sub-theme B.4: Assessing and evaluating the sustainable interaction between different users (people, agriculture, industry and nature) and their water demands to promote a coordinated resource management strategy.
	RDI priority B.4.1: Understanding of the links between water, NBS and ecosystem services to assess and evaluate ecosystem change on human wellbeing.
	<u>**RDI area: Climate change and natural hazards**</u>
	Sub theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.2: Optimising risk-based solutions by combining conventional and innovative solutions, and technological and NBS approaches to develop resilient water territories (in urban, rural and coastal areas).
	RDI priority C.1.4: Developing innovative approaches to assets management (including replacement/renewal of ageing infrastructure, dealing with leakages) to improve its performance and security. This also includes the security of critical infrastructure (in the context of climate change and cybersecurity).
	Sub theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.1: Advancing water resources efficiency and allocation across sectors for increasing climate change resilience.
	RDI priority C.2.2: Developing a water quality fit-for-use concept for water-dependant sectors, to allow resources recovery and water reuse in different sectors (development of the circular economy), including risk assessment, acceptance, holistic costs analysis and decision support systems.
	RDI priority C.2.3: Developing and testing scalable and affordable solutions for cities and rural/decentralised areas to allow the prioritisation of investments and increasing climate change resilience.
	RDI priority C.2.5: Developing a new water demand management approach, targeting water conservation.
	Sub theme D.1: Optimising the Nexus approach.
	RDI priority D.1.2: Developing methodologies to assess how water resources, ecosystems and human actions in a complex interconnected system (Nexus) will respond to a changing climate and global changes through participatory scenario development and integrated modelling approaches.
	RDI priority D.1.4: Developing, optimising and testing innovative solutions for achieving water, sediment, energy resources sustainability and food security and safety linked to environment using a holistic approach.
	Sub theme D.2: Adapting water resources management to deal with increased uncertainty.
	RDI priority D.2.4: Developing new tools and mechanisms for continuous monitoring, accurate data collection and analyses in order to attain reliable outcomes from modelling studies.
	Sub theme D.3: Enabling sustainable management of water resources.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
	RDI priority D.3.3: Developing integration models of high-resolution temporal and spatial data on the water cycle, ecosystems and economic systems to address water resource management. This includes the impacts of climate and global changes to geochemical fluxes (due to climate and global changes) on water ecosystems from the critical zone.
	RDI priority D.3.6: Improving the understanding of the water–energy nexus, particularly developing a better awareness of the role of water in energy production. This should include understanding the influence of climate change on the water–energy nexus.
	<u>RDI area: Emerging digital technologies and research and innovation</u>
	Sub theme B.2: Water dimension of anti-microbial resistance; "one health approach"
	RDI priority B.2.3: Developing technologies and innovative interventions that rapidly reduce and control AMR in waste water treatment to reduce the introduction to the environment.
	Sub theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.1: Developing more efficient, cost-effective and easier-to-implement technological solutions, including drinking water and waste water treatment and water catchments, with a particular focus on solutions for emerging contaminants and emerging risks of established contaminants.
	RDI priority C.1.2: Optimising risk-based solutions by combining conventional and innovative solutions, and technological and NBS approaches to develop resilient water territories (in urban, rural and coastal areas).
	Sub theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.4: The development and optimisation of technologies to recover and valorise products from waste water, brines and sludges.
	Sub theme D.2: Adapting water resources management to deal with increased uncertainty.
	RDI priority D.2.2: Innovations on practical, low-cost technologies treating waste water to produce resources that are safe (for the environment and health) for direct and indirect (i.e. management aquifer recharge) reuse.
Water Europe	<u>Key component 1: The value of water</u>
	Sub theme A.1: Developing approaches for assessing and optimising the structure and function of ecosystem services.
	RDI priority A.3.1: Determine the pressures on biodiversity and ecosystem services, and genetic resources, in a global change context.
	Sub theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.2: Developing a water quality fit-for-use concept for water-dependant sectors, to allow resources recovery and water reuse in different sectors (development of the circular economy), including risk assessment, acceptance, holistic costs analysis and decision support systems.
	RDI priority C.2.3: Developing and testing scalable and affordable solutions for cities and rural/decentralised areas to allow the prioritisation of investments and increasing climate change resilience.
	RDI priority C.2.4: The development and optimisation of technologies to recover and valorise products from waste water, brines and sludges.
	RDI priority C.2.5: Developing a new water demand management approach, targeting water conservation.
	RDI priority C.2.6: Developing innovative water allocation policies and management practices that ensure increased water use, economic efficiency, social justice and environmental sustainability.
	Sub theme D.3: Enabling sustainable management of water resources.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
	RDI priority D.3.3: Developing integration models of high-resolution temporal and spatial data on the water cycle, ecosystems and economic systems to address water resource management. This includes the impacts of climate and global changes to geochemical fluxes (due to climate and global changes) on water ecosystems from the critical zone.
	Key component 2: Technologies
	Sub theme B.1: Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans.
	RDI priority B.1.4: Develop methodologies and strategies to remediate and reduce contaminants of concern [e.g. disinfection by-products, micro- and nano-plastics and pathogens] at point (e.g. waste water treatment plants, farmyards, domestic waste water treatment systems) and non-point sources [e.g. land spreading of biosolids, fertiliser (organic and inorganic) applications, run-off from agricultural lands, pollution from transport, run-off from agricultural lands], including their environmental effects in water, soil, sediment and sludge.
	Sub theme B.2: Water dimension of anti-microbial resistance; "one health approach"
	RDI priority B.2.3: Developing technologies and innovative interventions that rapidly reduce and control AMR in waste water treatment to reduce the introduction to the environment.
	Sub theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.1: Developing more efficient, cost-effective and easier-to-implement technological solutions, including drinking water and waste water treatment and water catchments, with a particular focus on solutions for emerging contaminants and emerging risks of established contaminants.
	RDI priority C.1.2: Optimising risk-based solutions by combining conventional and innovative solutions, and technological and NBS approaches to develop resilient water territories (in urban, rural and coastal areas).
	RDI priority C.1.5: Developing smart monitoring and control systems, from assets to water supply, and reclaimed water networks, from catchment to water production sites, and developing methodologies for extending the technological and functional lifespan of water infrastructures.
	Sub theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.4: The development and optimisation of technologies to recover and valorise products from waste water, brines and sludges.
	D.2: Adapting water resources management to deal with increased uncertainty.
	Key component 3: Hybrid grey and green infrastructure
	Sub-theme B.3: Understanding and minimising the risks associated with water infrastructures and climate change effects.
	RDI priority B.3.1: Progressing towards more water-resilient cities and communities in the face of climate change and increasing natural hazards and the issues associated with older and ageing infrastructure.
	RDI priority B.3.3: Developing *in situ* biosensor/monitoring network systems with a low environmental impact that can complement current biological effects-based monitoring infrastructures and early warning systems for water sustainability and water quality.
	Sub theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.4: Developing innovative approaches to assets management (including replacement/renewal of ageing infrastructure, dealing with leakages) to improve its performance and security. This also includes the security of critical infrastructure (in the context of climate change and cybersecurity).
	RDI priority C.1.5: Developing smart monitoring and control systems, from assets to water supply, and reclaimed water networks, from catchment to water production sites, and developing methodologies for extending the technological and functional lifespan of water infrastructures.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
	RDI priority C.1.6: Developing methodologies to organise effectively the replacement and large-scale renovation of water infrastructure, and how to implement these in a cost-effective and energy-neutral manner while safeguarding the continuation of the water network and water system.
	Sub theme D.2: Adapting water resources management to deal with increased uncertainty.
	RDI priority D.2.3: Building a better understanding of socio-hydrological processes at different scales, i.e. critical zone observatories, including watersheds and catchments, to understand changes with time, considering anthropic activities and solutions while promoting the use of existing and new water RDI infrastructures.
	Key component 4: Governance
	Sub-theme C.3: Empowering the public, water users and stakeholders in valuing water.
	RDI priority C.3.5: Exploring possible routes to conduct paradigm changes, and understanding brakes and levers, in order to be innovative for water governance.
	Sub theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.4: Integrating and connecting economic aspects, ecological issues and social analyses into decision-making processes. Promoting new governance, knowledge and cross-sectoral management approaches.
	Key component 5: Living lab pilots
	Sub theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.2: Enhancing practical solutions for water and integrating social acceptance (working in living laboratories and with demonstration sites).
	RDI priority D.2.2: Innovations on practical, low-cost technologies treating waste water to produce resources that are safe (for the environment and health) for direct and indirect (i.e. management aquifer recharge) reuse.
Future Earth	**Research Agenda 1: Delivering water, energy, and food for all**
	Sub-theme A.1: Developing approaches for assessing and optimising the structure and function of ecosystem services.
	RDI priority A.1.1: Assessing the functioning of ecosystems, ecosystem goods and services, and human wellbeing associated with ecosystems. This may include reinforcing the knowledge on causal links (including synergies and trade-offs) between biodiversity and ecosystem functioning, and the other systems present in catchments (geosystems and atmospheric systems).
	Sub theme B.4: Assessing and evaluating the sustainable interaction between different users (people, agriculture, industry and nature) and their water demands to promote a coordinated resource management strategy.
	RDI priority B.4.1: Understanding of the links between water, NBS and ecosystem services to assess and evaluate ecosystem change on human wellbeing.
	Sub theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.6: Developing methodologies to organise effectively the replacement and large-scale renovation of water infrastructure, and how to implement these in a cost-effective and energy-neutral manner while safeguarding the continuation of the water network and water system.
	Sub theme D.1: Optimising the Nexus approach.
	RDI priority D.1.2: Developing methodologies to assess how water resources, ecosystems and human actions in a complex interconnected system (Nexus) will respond to a changing climate and global changes through participatory scenario development and integrated modelling approaches.
	RDI priority D.1.3: Identifying and investigating not only drivers and pathways, but also nature and types of barriers of such complex systems.

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	RDI priority D.1.4: Developing, optimising and testing innovative solutions for achieving water, sediment, energy resources sustainability and food security and safety linked to environment using a holistic approach.
	Sub theme D.2: Adapting water resources management to deal with increased uncertainty.
	RDI priority D.2.2: Innovations on practical, low-cost technologies treating waste water to produce resources that are safe (for the environment and health) for direct and indirect (i.e. management aquifer recharge) reuse.
	RDI priority D.2.5: Integrating decision-support systems into various types of models of hydro-ecosystems and monitoring networks in order to strengthen the study outcomes and better define the measures and actions to be taken. Developing new strategies for water capture and storage (in surface and subsurface), including socio-economic and environmental aspects.
	Sub theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.1: Developing integrated transboundary and adaptive water resource management systems for the economic sectors, in particular the agriculture, forestry, aquaculture and energy production sectors, that are currently the largest water consumers.
	RDI priority D.3.6: Improving the understanding of the water–energy nexus, particularly developing a better awareness of the role of water in energy production. This should include understanding the influence of climate change on the water–energy nexus.
	<u>Research Agenda 2: Decoupling carbon emissions from economic growth</u>
	Sub theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.3: Developing circular economy approaches to waste water treatment plants (e.g. production of energy and nutrients, molecules); zero greenhouse gas emissions from new generation treatment plants.
	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.3: Developing integration models of high-resolution temporal and spatial data on the water cycle, ecosystems and economic systems to address water resource management. This includes the impacts of climate and global changes to geochemical fluxes (due to climate and global changes) on water ecosystems from the critical zone.
	RDI priority D.3.4: Integrating and connecting economic aspects, ecological issues and social analyses into decision-making processes. Promoting new governance, knowledge and cross-sectoral management approaches.
	<u>Research Agenda 3: Safeguarding land, freshwater and marine natural assets</u>
	Sub theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.4: Developing innovative approaches to assets management (including replacement/renewal of ageing infrastructure, dealing with leakages) to improve its performance and security. This also includes the security of critical infrastructure (in the context of climate change and cybersecurity).
	RDI priority C.1.5: Developing smart monitoring and control systems, from assets to water supply, and reclaimed water networks, from catchment to water production sites, and developing methodologies for extending the technological and functional lifespan of water infrastructures.
	<u>Research Agenda 4: Building healthy, resilient and productive cities</u>
	Sub-theme B.3: Understanding and minimising the human health risks associated with water infrastructures deficits, including the effects of climate change effects.
	RDI priority B.3.1: Progressing towards more water-resilient cities and communities in the face of climate change and increasing natural hazards and the issues associated with older and ageing infrastructure.

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	Sub-theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.3: Developing and testing scalable and affordable solutions for cities and rural/decentralised areas to allow the prioritisation of investments and increasing climate change resilience.
	Research Agenda 5: Promoting sustainable rural futures
	Sub theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.2: Optimising risk-based solutions by combining conventional and innovative solutions, and technological and NBS approaches to develop resilient water territories (in urban, rural and coastal areas).
	Sub-theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.3: Developing and testing scalable and affordable solutions for cities and rural/decentralised areas to allow the prioritisation of investments and increasing climate change resilience.
	Research Agenda 6: Improving human health by incorporating global change concerns
	Sub-theme B.1: Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans.
	RDI priority B.1.1: Developing analytical techniques and appropriate matrices (human and animal) with a focus on substances of emerging concern.
	RDI priority B.1.2: Developing new tools to measure and evaluate chemical mixtures, transformation products and environmental exposure effects (the "cocktail effect").
	RDI priority B.1.3: Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens.
	RDI priority B.1.4: Develop methodologies and strategies to remediate and reduce contaminants of concern [e.g. disinfection by-products, micro- and nano-plastics and pathogens] at point (e.g. waste water treatment plants, farmyards, domestic waste water treatment systems) and non-point sources [e.g. land spreading of biosolids, fertiliser (organic and inorganic) applications, run-off from agricultural lands, pollution from transport, run-off from agricultural lands], including their environmental effects in water, soil, sediment and sludge.
	RDI priority B.1.5: Understanding and predicting opportunistic pathogens in water due to more favourable climate change conditions.
	RDI priority B.1.6: Multi-disciplinary studies on the effect of land use (taking into account irrigation and fertilisers, as well as the possible remediation of nitrate contamination in situ) on the maintenance of healthy groundwater resources (aquifers) and links to climate change.
	Sub-theme B.2: Water dimension of Anti-Microbial Resistance; 'One health approach'
	RDI priority B.2.1: Understanding the role of the environment in the selection and spread of AMR genes; transmission mechanisms.
	RDI priority B.2.2: Developing new tools for monitoring AMR genes and the use of surveillance of AMR data in aquatic environments.
	Research Agenda 7: Encouraging sustainable consumption and production patterns
	Sub-theme C.3: Empowering the public, water users and stakeholders in valuing water.
	RDI priority C.3.6: Developing holistic and sustainable water footprint production and consumption systems.
	Sub theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.5: Developing methods for more efficient citizen and wider stakeholder engagement (improved communication, public perception and responsibility and awareness) for sustainable management of water resources, and developing the sensors and digital solutions that will enable integrated water management in an optimal and transparent manner.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
	Research Agenda 8: Improving governance and early warning systems to respond to complex future threats **Sub-theme B.3:** Understanding and minimising the human health risks associated with water infrastructures deficits, including the effects of climate change effects. *RDI priority B.3.3:* Developing *in situ* biosensor/monitoring network systems with a low environmental impact that can complement current biological effects based monitoring infrastructures and early warning systems for water sustainability and water quality. **Sub-theme C.3:** Empowering the public, water users and stakeholders in valuing water. *RDI priority C.3.5:* Exploring possible routes to conduct paradigm changes, and understanding brakes and levers, in order to be innovative for water governance. **Sub theme D.3:** Enabling sustainable management of water resources. *RDI priority D.3.4:* Integrating and connecting economic aspects, ecological issues and social analyses into decision-making processes. Promoting new governance, knowledge and cross-sectoral management approaches.
BELMONT FORUM **Belmont Forum**	**Collaborative research Actions (CRA): Climate, Environment and Health** **Sub-theme A.1:** Developing approaches for assessing and optimising the structure and function of ecosystem services. *RDI priority A.1.1:* Assessing the functioning of ecosystems, ecosystem goods and services, and human wellbeing associated with ecosystems. This may include reinforcing the knowledge on causal links (including synergies and trade-offs) between biodiversity and ecosystem functioning, and the other systems present in catchments (geosystems and atmospheric systems). **Sub-theme A.3:** Managing and adapting ecosystem services to the effects of hydro-climatic extreme events. *RDI priority A.3.1:* Determine the pressures on biodiversity and ecosystem services, and genetic resources, in a global change context. **Sub-theme B.1:** Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans. *RDI priority B.1.1:* Developing analytical techniques and appropriate matrices (human and animal) with a focus on substances of emerging concern. *RDI priority B.1.2:* Developing new tools to measure and evaluate chemical mixtures, transformation products and environmental exposure effects (the "cocktail effect"). *RDI priority B.1.3:* Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens. *RDI priority B.1.4:* Develop methodologies and strategies to remediate and reduce contaminants of concern [e.g. disinfection by-products, micro- and nano-plastics and pathogens] at point (e.g. waste water treatment plants, farmyards, domestic waste water treatment systems) and non-point sources [e.g. land spreading of biosolids, fertiliser (organic and inorganic) applications, run-off from agricultural lands, pollution from transport, run-off from agricultural lands], including their environmental effects in water, soil, sediment and sludge. *RDI priority B.1.5:* Understanding and predicting opportunistic pathogens in water due to more favourable climate change conditions. **Sub-theme B.4:** Assessing and evaluating the sustainable interaction between different users (people, agriculture, industry and nature) and their water demands to promote a coordinated resource management strategy. *RDI priority B.4.1:* Understanding of the links between water, NBS and ecosystem services to assess and evaluate ecosystem change on human wellbeing. *RDI priority B.4.3:* Advancing a holistic approach in the WEFE Nexus to also include health.

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	Sub-theme D.1: Optimising the Nexus approach.
	RDI priority D.1.2: Developing methodologies to assess how water resources, ecosystems and human actions in a complex interconnected system (Nexus) will respond to a changing climate and global changes through participatory scenario development and integrated modelling approaches.
	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.3: Developing integration models of high-resolution temporal and spatial data on the water cycle, ecosystems and economic systems to address water resource management. This includes the impacts of climate and global changes to geochemical fluxes (due to climate and global changes) on water ecosystems from the critical zone.
	<u>**CRA: Disaster Risk, Reduction and Resilience**</u>
	Sub-theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.
	RDI priority A.3.3: Developing of prediction models of ecosystem "tipping points" to categorise hydro-climatic extreme events and their system-specific effects on different ecosystems considering the various parameters (physical and bio-geochemical, as well as sociological and economical).
	Sub-theme B.3: Understanding and minimising the risks associated with water infrastructures and climate change effects.
	RDI priority B.3.4: Understanding the disaster management cycle in the face of climate change, effects on society and mitigation measures.
	Sub-theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.2: Optimising risk-based solutions by combining conventional and innovative solutions, and technological and NBS approaches to develop resilient water territories (in urban, rural and coastal areas).
	Sub-theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.3: Developing and testing scalable and affordable solutions for cities and rural/decentralised areas to allow the prioritisation of investments and increasing climate change resilience.
	Sub-theme D.2: Adapting water resources management to deal with increased uncertainty.
	RDI priority D.2.4: Developing new tools and mechanisms for continuous monitoring, accurate data collection and analyses in order to attain reliable outcomes from modelling studies.
Global Water Research Coalition (GWRC)	<u>**Research Agenda 1: Water Quality and Health**</u>
	Sub-theme B.1: Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans.
	RDI priority B.1.1: Developing analytical techniques and appropriate matrices (human and animal) with a focus on substances of emerging concern.
	RDI priority B.1.2: Developing new tools to measure and evaluate chemical mixtures, transformation products and environmental exposure effects (the "cocktail effect").
	RDI priority B.1.3: Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens.
	RDI priority B.1.4: Develop methodologies and strategies to remediate and reduce contaminants of concern [e.g. disinfection by-products, micro- and nano-plastics and pathogens] at point (e.g. waste water treatment plants, farmyards, domestic waste water treatment systems) and non-point sources [e.g. land

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	spreading of biosolids, fertiliser (organic and inorganic) applications, run-off from agricultural lands, pollution from transport, run-off from agricultural lands], including their environmental effects in water, soil, sediment and sludge.
	RDI priority B.1.5: Understanding and predicting opportunistic pathogens in water due to more favourable climate change conditions.
	RDI priority B.1.6: Multi-disciplinary studies on the effect of land use (taking into account irrigation and fertilisers, as well as the possible remediation of nitrate contamination in situ) on the maintenance of healthy groundwater resources (aquifers) and links to climate change.
	Sub-theme B.2: Water dimension of anti-microbial resistance; "one health approach".
	RDI priority B.2.1: Understanding the role of the environment in the selection and spread of AMR genes; transmission mechanisms.
	RDI priority B.2.2: Developing new tools for monitoring AMR genes and the use of surveillance of AMR data in aquatic environments.
	Research Agenda 2: Wastewater Management and Resource Recovery
	Sub-theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.1: Developing more efficient, cost-effective and easier-to-implement technological solutions, including drinking water and waste water treatment and water catchments, with a particular focus on solutions for emerging contaminants and emerging risks of established contaminants.
	RDI priority C.1.3: Developing circular economy approaches to waste water treatment plants (e.g. production of energy and nutrients, molecules); zero greenhouse gas emissions from new generation treatment plants.
	Sub-theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.2: Developing a water quality fit-for-use concept for water-dependant sectors, to allow resources recovery and water reuse in different sectors (development of the circular economy), including risk assessment, acceptance, holistic costs analysis and decision support systems.
	Research Agenda 3: Asset Management/Resilient Infrastructure
	Sub-theme B.3: Understanding and minimising the risks associated with water infrastructures and climate change effects.
	RDI priority B.3.1: Progressing towards more water-resilient cities and communities in the face of climate change and increasing natural hazards and the issues associated with older and ageing infrastructure.
	RDI priority B.3.1: Studying the effects of mass migration due to climate change on existing water infrastructure and water resources knowledge (currently and in the future) by developing sociological and anthropological long-term approaches and measures, to be resilient and ensure security of water supply.
	Sub-theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.4: Developing innovative approaches to assets management (including replacement/renewal of ageing infrastructure, dealing with leakages) to improve its performance and security. This also includes the security of critical infrastructure (in the context of climate change and cybersecurity).
	RDI priority C.1.5: Developing smart monitoring and control systems, from assets to water supply, and reclaimed water networks, from catchment to water production sites, and developing methodologies for extending the technological and functional lifespan of water infrastructures.
	RDI priority C.1.6: Developing methodologies to organise effectively the replacement and large-scale renovation of water infrastructure, and how to implement these in a cost-effective and energy-neutral manner while safeguarding the continuation of the water network and water system.
	Research Agenda 4: Sustainable Water Cycle
	Sub-theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.

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	Sub-theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.2: Developing a water quality fit-for-use concept for water-dependant sectors, to allow resources recovery and water reuse in different sectors (development of the circular economy), including risk assessment, acceptance, holistic costs analysis and decision support systems.
	RDI priority C.2.5: Developing a new water demand management approach, targeting water conservation.
	RDI priority C.2.6: Developing innovative water allocation policies and management practices that ensure increased water use, economic efficiency, social justice and environmental sustainability.
	Sub-theme C.3: Empowering the public, water users and stakeholders in valuing water.
	RDI priority C.3.2: Understanding and assessing the values of water for the public and stakeholders in order to guarantee sustainability of water and limit use conflicts.
	Sub-theme D.2: Adapting water resources management to deal with increased uncertainty.
	RDI priority D.2.4: Developing new tools and mechanisms for continuous monitoring, accurate data collection and analyses in order to attain reliable outcomes from modelling studies.
	RDI priority D.2.5: Integrating decision-support systems into various types of models of hydro-ecosystems and monitoring networks in order to strengthen the study outcomes and better define the measures and actions to be taken. Developing new strategies for water capture and storage (in surface and subsurface), including socio-economic and environmental aspects.
	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.1: Developing integrated transboundary and adaptive water resource management systems for the economic sectors, in particular the agriculture, forestry, aquaculture and energy production sectors, that are currently the largest water consumers.
	RDI priority D.3.5: Developing methods for more efficient citizen and wider stakeholder engagement (improved communication, public perception and responsibility and awareness) for sustainable management of water resources, and developing the sensors and digital solutions that will enable integrated water management in an optimal and transparent manner.
CHINA EUROPE Water Platform **China Europe Water Platform Partnership (CEWP)**	**Theme 2.2: Survey the state of degraded water resources systems; Studying and modelling the transfer of contaminants** **Sub-theme B.1:** Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans. *RDI priority B.1.1:* Developing analytical techniques and appropriate matrices (human and animal) with a focus on substances of emerging concern. *RDI priority B.1.3:* Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens. **Sub-theme B.2:** Water dimension of Anti-Microbial Resistance; 'One health approach'. *RDI priority B.2.1:* Understanding the role of the environment in the selection and spread of AMR genes; transmission mechanisms. *RDI priority B.2.2:* Developing new tools for monitoring AMR genes and use of surveillance of AMR data in aquatic environments. *RDI priority B.2.3*: Developing technologies and innovative interventions that rapidly reduce and control AMR in wastewater treatment to reduce the introduction to the environment. **Theme 3.1: Develop tools and new technologies for adaptation to floods and droughts - Early Warning Systems** **Sub-theme A.3:** Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.
	Theme 4.2: Ecological engineering and Ecohydrology: research on restoration methodologies of aquatic systems
	Sub-theme A.2: Developing and applying an approach to ecological engineering and ecohydrology.
	RDI priority A.2.1: Understanding, managing improving and restoring hydro-morphological alterations, to restore the ecological and sediment flows (E- and S-flows), and thus restore hydrological connectivity and continuity, to satisfactory conditions. *(Link to priority A.1.1 on understanding ecosystem functioning).*
	RDI priority A.2.2: Developing NBS for the scaling-up of restoration and improvement actions and mitigation of degraded water bodies and aquatic ecosystems (from local to landscape, across gradients such as upstream and downstream effects and degrees of degradation).
	Theme 4.3: Nature Based Solutions: use of new natural materials
	Sub-theme A.2: Developing and applying an approach to ecological engineering and ecohydrology.
	RDI priority A.2.2: Developing NBS for the scaling-up of restoration and improvement actions and mitigation of degraded water bodies and aquatic ecosystems (from local to landscape, across gradients such as upstream and downstream effects and degrees of degradation).
	RDI priority A.2.3: Developing NBS and linking measures to their effects and their societal impacts in terms of risks reduction, climate change mitigation, and water and associated ecosystems preservation.
The Global Framework on Water Scarcity in Agriculture (WASAG)	**Working Group: Water and Migration**
	Sub-theme B.3: Understanding and minimising the risks associated with water infrastructures and climate change effects.
	RDI priority B.3.2: Studying the effects of mass migration due to climate change on existing water infrastructure and water resources knowledge (currently and in the future) by developing sociological and anthropological long-term approaches and measures, to be resilient and ensure security of water supply.
	Working Group: Drought Preparedness
	Sub-theme A.3: Managing and adapting ecosystem services to the effects of hydro-climatic extreme events.
	RDI priority A.3.2: Developing innovative (or improved) tools for adaptation to hydro-climatic extreme events, especially floods and drought in a catchment context.
	Sub-theme B.3: Understanding and minimising the risks associated with water infrastructures and climate change effects.
	RDI priority B.3.3: Developing *in situ* biosensor/monitoring network systems with a low environmental impact that can complement current biological effects-based monitoring infrastructures and early warning systems for water sustainability and water quality.
	Sub-theme C.1: Future-proof water technologies, infrastructures and systems for developing climate change resilience.
	RDI priority C.1.5: Developing smart monitoring and control systems, from assets to water supply, and reclaimed water networks, from catchment to water production sites, and developing methodologies for extending the technological and functional lifespan of water infrastructures.
	Sub-theme C.2: Water-smart circular economy and societies.
	RDI priority C.2.1: Advancing water resources efficiency and allocation across sectors for increasing climate change resilience.
	RDI priority C.2.5: Developing a new water demand management approach, targeting water conservation.
	Sub-theme D.2: Adapting water resources management to deal with increased uncertainty.
	RDI priority D.2.1: Develop and test robust decision-making and adaptative management approaches.

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	RDI priority D.2.4: Developing new tools and mechanisms for continuous monitoring, accurate data collection and analyses in order to attain reliable outcomes from modelling studies.
	Sub-theme D.3: Enabling sustainable management of water resources.
	RDI priority D.3.1: Developing integrated transboundary and adaptive water resource management systems for the economic sectors, in particular the agriculture, forestry, aquaculture and energy production sectors, that are currently the largest water consumers.
	RDI priority D.3.3: Developing integration models of high-resolution temporal and spatial data on the water cycle, ecosystems and economic systems to address water resource management. This includes the impacts of climate and global changes to geochemical fluxes (due to climate and global changes) on water ecosystems from the critical zone.
	Working Group: Water and Nutrition
	Sub-theme B.1: Emerging contaminants and associated risks: monitoring, remediation and assessing their effects and behaviour on nature and humans.
	RDI priority B.1.3: Understanding and predicting the environmental occurrence (in soil, sediment and water), behaviour and effects of transformation products, contaminants and pathogens.
	Sub-theme B.2: Water dimension of anti-microbial resistance; "one health approach".
	RDI priority B.2.1: Understanding the role of the environment in the selection and spread of AMR genes; transmission mechanisms.
	Sub-theme B.4: Assessing and evaluating the sustainable interaction between different users (people, agriculture, industry and nature) and their water demands to promote a coordinated resource management strategy.
	RDI priority B.4.1: Understanding of the links between water, NBS and ecosystem services to assess and evaluate ecosystem change on human wellbeing.
	Sub-theme D.1: Optimising the Nexus approach.
	RDI priority D.1.2: Developing methodologies to assess how water resources, ecosystems and human actions in a complex interconnected system (Nexus) will respond to a changing climate and global changes through participatory scenario development and integrated modelling approaches.
	Working Group: Sustainable Agriculture Water Use
	Sub-theme B.4: Assessing and evaluating the sustainable interaction between different users (people, agriculture, industry and nature) and their water demands to promote a coordinated resource management strategy.
	RDI priority B.2.4: Developing an integrated water exposure model which considers social impacts (such as on air, sediment, water, food, social and psychological effects and stressors).
	Sub-theme D.2: Adapting water resources management to deal with increased uncertainty.
	RDI priority D.2.4: Developing new tools and mechanisms for continuous monitoring, accurate data collection and analyses in order to attain reliable outcomes from modelling studies.
	Sub-theme D.3: Enabling sustainable management of water resources
	RDI priority D.3.1: Developing integrated transboundary and adaptive water resource management systems for the economic sectors, in particular the agriculture, forestry, aquaculture and energy production sectors, that are currently the largest water consumers.
	Working Group: Saline Agriculture
	Sub-theme B.4: Assessing and evaluating the sustainable interaction between different users (people, agriculture, industry and nature) and their water demands to promote a coordinated resource management strategy.

Name of Initiative	Identified Synergies between SRIAs/SRAs and the Water JPI SRIA 2025 Sub-themes and Research Priorities	
	RDI priority B.4.1: Understanding of the links between water, NBS and ecosystem services to assess and evaluate ecosystem change on human wellbeing. **Sub-theme D.3:** Enabling sustainable management of water resources. *RDI priority D.3.1:* Developing integrated transboundary and adaptive water resource management systems for the economic sectors, in particular the agriculture, forestry, aquaculture and energy production sectors, that are currently the largest water consumers.	
UN WATER **UN Water**	**Theme A. Ecosystems** **SDG 2:** Zero hunger **SDG 3:** Good health and wellbeing **SDG 6:** Clean water and sanitation **SDG 11:** Sustainable cities and communities **SDG 12:** Responsible consumption and production **SDG 13:** Climate action **SDG 14:** Life below water **SDG 15:** Life on land **Theme B. Health and Wellbeing** **SDG 2:** Zero hunger **SDG 3:** Good health and wellbeing **SDG 5:** Gender equality **SDG 6:** Clean water and sanitation **SDG 8:** Decent work and economic growth **SDG 9:** Industry, innovation and infrastructure **SDG 10:** Reduced inequality **SDG 11:** Sustainable cities and communities **SDG 12:** Responsible consumption and production **SDG 13:** Climate action	**SDG 14:** Life below water **SDG 15:** Life on land **Theme C. Water Value and Usage** **SDG 2:** Zero hunger **SDG 6:** Clean water and sanitation **SDG 7:** Affordable and clean energy **SDG 9:** Industry, innovation and infrastructure **SDG 10:** Reduced inequality **SDG 13:** Climate action **SDG 14:** Life below water **SDG 15:** Life on land **Theme D. Sustainable Water Management** **SDG 2:** Zero hunger **SDG 6:** Clean water and sanitation **SDG 7:** Affordable and clean energy **SDG 8:** Decent work and economic growth **SDG 9:** Industry, innovation and infrastructure **SDG 10:** Reduced inequality **SDG 11:** Sustainable cities and communities **SDG 13:** Climate action