

# Strategic Research and Innovation Agenda

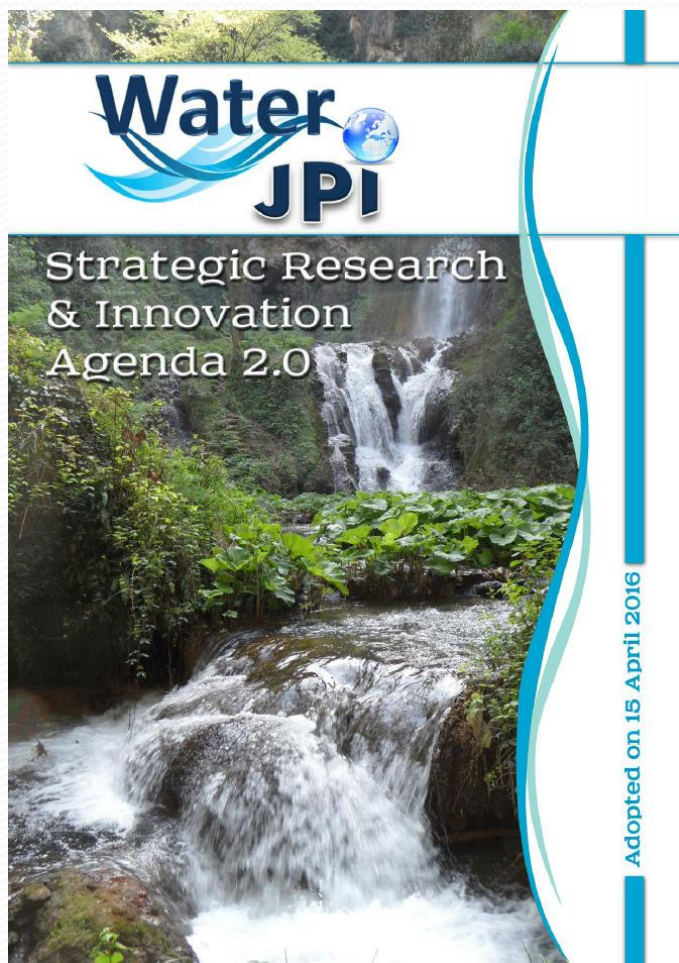


## SRIA 2.0

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# SRIA

## Strategic Research and Innovation Agenda

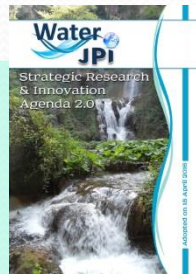


- Conceived as a participatory, inclusive, shared and forward-looking strategic document that lays out Research, Development and Innovation (**RDI**) **needs** in Europe in the field of water
- Conceived as an instrument **to guide European research and innovation**

➔ **Objective: to be the European reference document on water stakes that will framework H2020 calls, etc.**

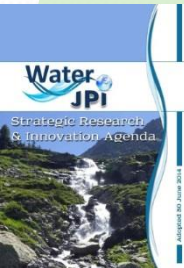


# SRIA process



**SRIA 2.0** ← April 2016

Nov. 2016 → Implementation Plan 2017-2019



**SRIA 1.0** ← June 2014

Oct. 2014 → Implementation Plan 2014-2016

May 2013 → SRIA 0.5

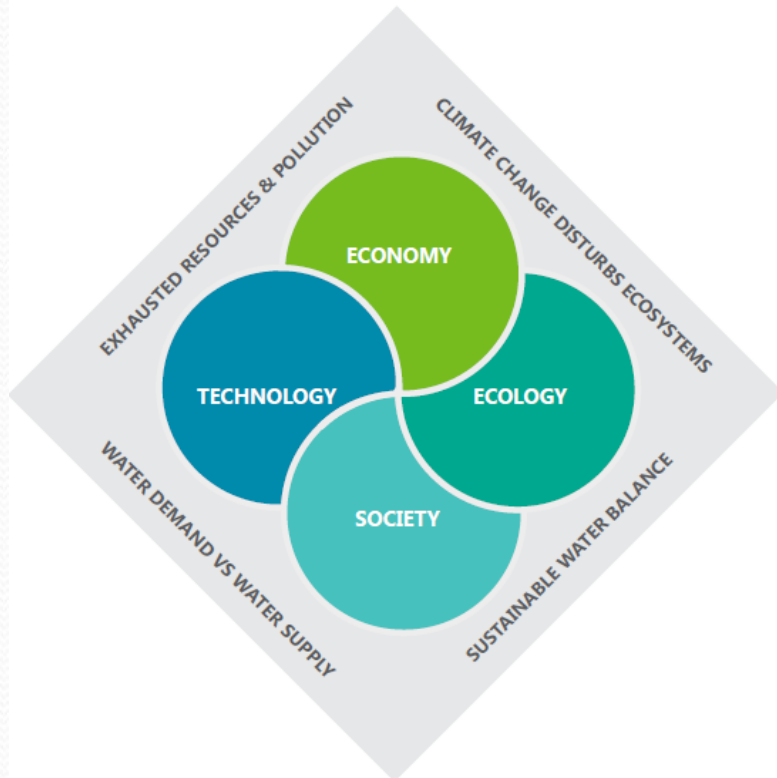


**2011: Vision Document**

# SRIA process

A document built through a **multi-actors** and **transdisciplinary** approach...

... for the use of **all stakeholders**





# SRIA process

## Identification of research gaps and needs

### Selection and review of the relevant documents

- National agendas
- Strategic agenda of the European Innovation Partnership on Water (EIP Water)
- Strategic agendas of relevant European Technology Platforms (ETP): WssTP...
- Relevant policy-oriented documents: Water Blueprint, European roadmaps...
- European programmes (Horizon 2020)
- SRIAs from other JPIs and ERA-Nets in the field of water
- Documents from European associations (European Water Association, Eureau)
- Up to 48 foresight studies

Analysis of more than 130 relevant information sources

### Collection and processing of information about water RDI context and trends

It resulted in a comprehensive overview of water related RDI needs.

# SRIA process

## Consultations

### Stakeholders workshop

#### 1<sup>st</sup> consultative workshop

- ❑ held in Lyon, France, the 3rd and 4th April 2014
- ❑ 54 people participated in the workshop

SRIA 1.0



#### 2<sup>nd</sup> consultative workshop

- ❑ held in Orléans, France, the 8th and 9th October 2015
- ❑ about 40 people attended the event

SRIA 2.0

### Public consultation

#### 1<sup>st</sup> online public consultation

- ❑ first quarter of 2014 (28th March - 30th April)
- ❑ 637 responses were received, mostly coming from research organisations (59%)

#### 2<sup>nd</sup> online public consultation

- ❑ first quarter of 2015 (27th April - 24th May)
- ❑ 390 responses were received, coming mostly from research organisations (68%)
- ❑ Responses were received from 25 countries, including countries not partners in Water JPI



# SRIA 2.0 process

## SRIA 1.0



Complete the identification of potential RDI needs

Selection, Refining and Priorisation of RDI needs

SRIA 2.0 write-up

Finalization of SRIA 2.0

- **2<sup>nd</sup> Public consultation** (May 2015)
- **Advisory Boards** (June 2015)
- **2<sup>nd</sup> Stakeholder consultative workshop** (October 2015)
- **Governing Board** (Nov. 2015)

SRIA 2.0 approved

- **Governing Board** (April 2016)

# SRIA structure

## Vision Document (5 themes)

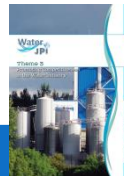
**Theme 1**  
Improving  
Ecosystem  
Sustainability  
and Human  
Well-being



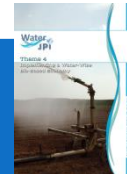
**Theme 2**  
Developing  
Safe Water  
Systems for  
Citizens



**Theme 3**  
Promoting  
Competitiveness in the  
Water  
Industry



**Theme 4**  
Implementing  
a Water-wise  
Bio-based  
Economy



**Theme 5**  
Closing the  
Water Cycle  
Gap  
Improving  
Sustainable  
Water  
Resources  
Management



## SRIA 2.0

(5 themes and 11 sub-themes)



# SRIA structure

For each theme and subtheme:  
identification of expected theme impacts,  
RDI needs and related objectives



## Theme 5 Closing the Water Cycle Gap Improving Sustainable Water Resources Management



### Theme 5. Closing the Water Cycle Gap - Improving Sustainable Water Resources Management

In many regions of Europe, it may be difficult to reconcile water supply and demand in both quantitative and qualitative terms. The aim of RDI actions under this theme is therefore to bridge the gap in "supply-demand" by enabling the sustainable management of water resources. Innovative strategies and approaches will be developed where appropriate.

#### Rationale

Europe is not an arid continent, but water scarcity has become a concern for millions of people. Water scarcity affects at least 11% of the European population and 17% of the territory<sup>27</sup>.

In quantitative terms, the availability of water for different uses is threatened by increasing episodes of drought. According to data provided by the European Commission, droughts since 1980 have cost the European economy about EUR 100 billion. Leakages in the water supply infrastructure, the considerable exploitation of freshwater for agricultural purposes and the lack of appropriate water-saving technologies will increase pressure on limited water resources in many regions. To make matters worse, water consumption for public, industrial and agricultural use is expected to increase by 16% by 2030<sup>28</sup>. Although southern regions are more severely affected, central and northern regions are also affected by droughts.

Chemical by-products poses a serious threat to water availability. Despite the efforts of local authorities to curb water pollution, the concentration of nutrients and heavy metals is high in many watersheds.

In response to this situation, legislative measures have been put in place by the European Commission (WFD, Water Blueprint, Water Scarcity and Drought Strategy). Experience shows that the enforcement of some of the measures and recommendations put forward by these policies is not an easy task (i.e. the case of water pricing in products). Legislative measures need to be coupled with the implementation of measures of appropriate water management, and this is where RDI actions can play a crucial role. As detailed below, there is a need for new integrated concepts relating to water reuse, energy recovery of valuable substances, etc. Observation and modelling of water resources will be required to improve understanding of hydrological processes and to analyse and forecast the effect of management measures. Socio-economic approaches are also necessary to investigate questions of participation, behaviour and the costs and benefits of proposed measures.

This research will need to articulate knowledge of ecology, social sciences, economics, geography, environmental sciences, geosciences and technology in various space-time dimensions and on different scales and by integrating water policy with other public policies (agricultural, industrial, domestic, urban, regional planning, transport, energy, biodiversity). In the context of increasing tensions around water, tools for monitoring, forecasting, providing information and decision-making are needed to anticipate and manage such tensions and avoid conflict.

<sup>27</sup> European Commission Directorate-General for the Environment (2010), Water Scarcity and Drought in the European Union. Available at: <http://ec.europa.eu/environment/water/quantity/pdf/structure.pdf>

This theme is broken down into two subthemes:

- 5.1. Enabling sustainable management of water resources;
- 5.2. Strengthening socio-economic approaches to water management.

The research needs and objectives for each subtheme of Theme 5 are detailed below. It is worth noting that the cross-cutting RDI needs identified in Table 3 are also integral and of relevance to this theme.

#### Expected theme impacts

Impact	Description
Social	The diversity of pressures and impacts on water bodies suggests that water policy can be effective only if it is implemented in a close "horizontal" dialogue with stakeholders interested in clean water and healthy water ecosystems. The impacts of water crises are not equally distributed in society, and they can be a source of conflict between different water users. Improved water management will alleviate societal tensions
Economic	Economic instruments such as taxes and subsidies can act as incentives for prudent water management. They constitute a vital complement to water regulation, and they can assist in allocating water between competing user demands. Mitigation measures and short-term solutions to overcome water scarcity (e.g. water transfers) will be included in the assessment of costs related to scarcity or drought and the assessment of economic vulnerability of users and assets
Technological	Improvement of the techniques for managing of water resources (aquifer recharge, DSSs, inter alia) with interoperability of databases, sensors and combined socio-economic and physical water models
Environmental	Both water quantity and water quality are key factors in aquatic and riparian ecosystems. A decrease in available water resources jeopardises environmental flows as a minimum requirement for a healthy ecosystem. Other impacts include the loss of biodiversity and the degradation of landscape quality
Policy	Regulatory measures are essential tools to ensure compliance with environmental standards for water quality and quantity. Economic policy instruments contribute to supporting these regulations, as expressed in the 2012 EU Water Blueprint. Understanding the mechanisms leading to improved water management will lead to better policy design and adaptation

#### Subtheme 5.1. Enabling sustainable management of water resources

##### Rationale

Enabling sustainable water management is a prerequisite for achieving water systems fit for a sustainable economy in Europe and abroad. From an RDI perspective, this requires improving our understanding of integrated water management through further analysis involving surface water, groundwater and soil management, erosion and pollution control, flood management and wastewater.

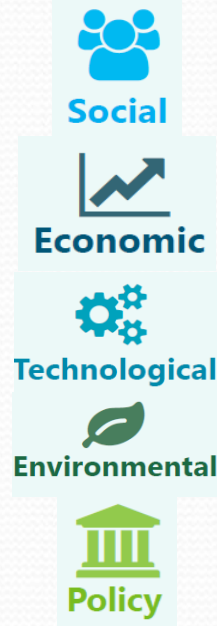
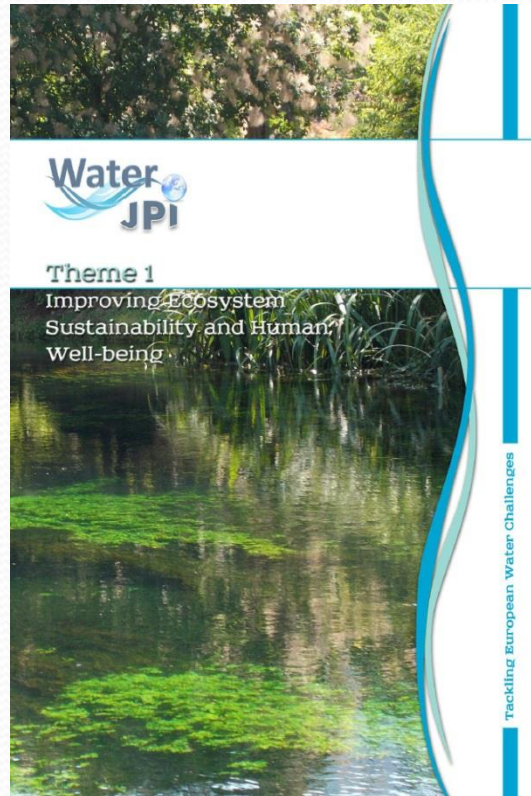
The integrated models of the entire water cycle, including all compartments (surface soil, groundwater) and water use (vegetation, humans), have yet to take into account scenarios of

# Theme 1

## Improving Ecosystem Sustainability and Human Well-being

### Subthemes

- ❑ 1.1 Developing approaches for assessing and optimising the value of ecosystem services
- ❑ 1.2 Integrated approaches: developing and applying ecological engineering and ecohydrology
- ❑ 1.3 Managing the effects of hydro-climatic extreme events



### Expected Impacts on

- Public health and protection from extreme weather events
- Market failures
- Ecological engineering and Early Warning Systems
- Ecosystem services concept and water management...
- Relevant to EU Regulations & Policies (EU Water Blueprint, Water Framework Directive...) and to UN Sustainable Development Goals (6, 2, 14 and 15)

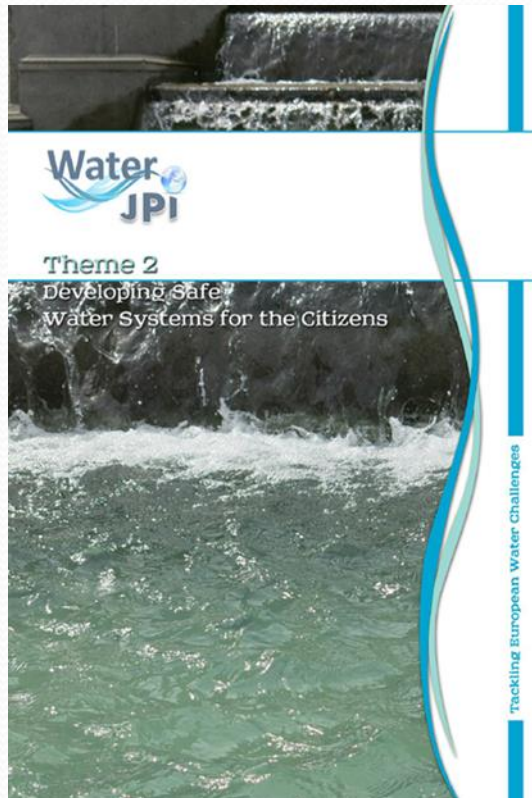


# Theme 2

## Developing Safe Water Systems for Citizens

### Subthemes

- ❑ 2.1 Emerging pollutants and emerging risks of established pollutants: assessing their effects on nature and humans and their behaviour and opportunities for their treatment
- ❑ 2.2 Minimising risks associated with water infrastructures and natural hazards



### Expected Impacts on

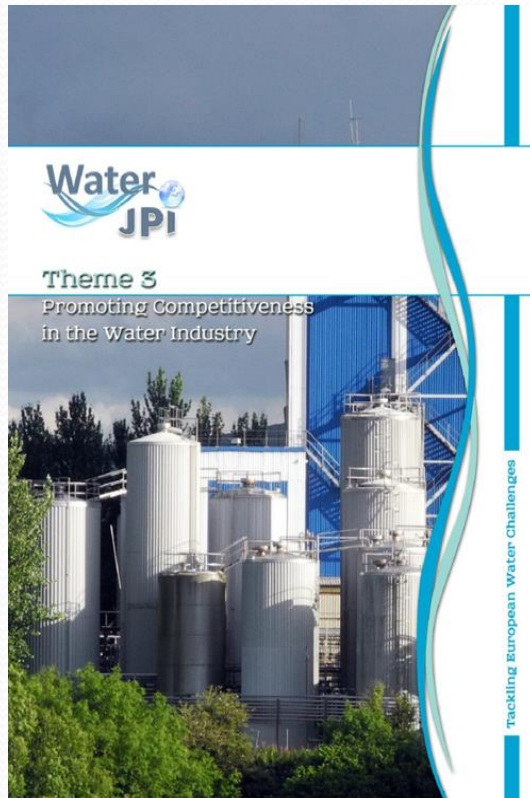
- Protection of human health and of water utilities asset
- Management of urban water systems and water supply and sanitation
- Technological innovation
- Floods & extreme events, risks associated with emerging pollutants
- Relevant to EU Regulations & Policies (REACH Regulation; Environmental Quality Standards Directive...) and to UN Sustainable Development Goals (especially SDG 6)

# Theme 3

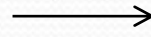
## Promoting Competitiveness in the Water Industry

### Subthemes

- ❑ 3.1 Developing market-oriented solutions for the water industry
- ❑ 3.2 Enhancing the regulatory framework



Social



Water resources available for societal uses



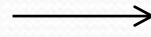
Economic



Energy costs and development of major business opportunities



Technological



Availability of reused wastewater for agricultural and industrial uses



Environmental



Efficient use of our natural resources



Policy



Relevant to EU Regulations & Policies (“Towards a Circular Economy” Communication, Roadmap to a Resource Efficient Europe...) and to UN Sustainable Development Goals (especially sdgs 6 and 9)

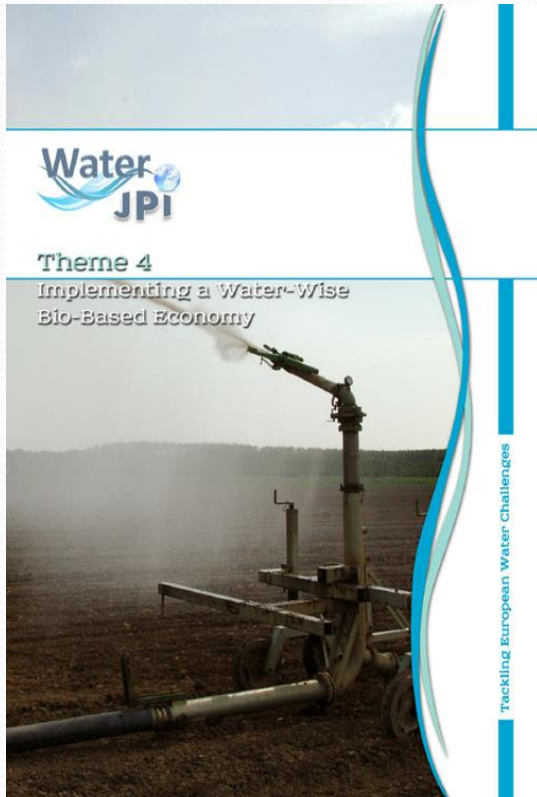


# Theme 4

## Implementing a Water-wise Bio-based Economy

### Subthemes

- ❑ 4.1 Improving the efficiency of water use for a sustainable bio-economy sector
- ❑ 4.2 Reducing soil and water pollution



### Expected Impacts on

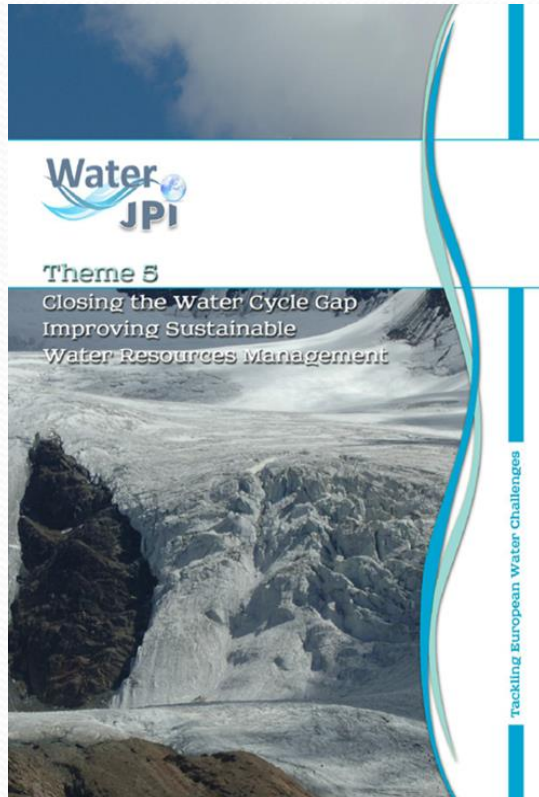
- Environmentally-friendly sustainable farming operations
- Productivity of agriculture, forestry and aquaculture sectors
- Innovation in technologies for more sustainable agricultural and forestry practices
- Use and protection of European natural resources and optimisation of the water-energy nexus
- Relevant to EU Regulations & Policies (Bio-economy Strategy, Common Agricultural Policy, “Maximisation of water reuse in the EU” Roadmap...) and to UN Sustainable Development Goals (2, 6, 9 and 12)

# Theme 5

## Closing the Water Cycle Gap: Improving Sustainable Water Resources Management

### SUBTHEMES:

- ❑ 5.1 Enabling sustainable management of water resources
- ❑ 5.2 Strengthening socio-economic approaches to water management



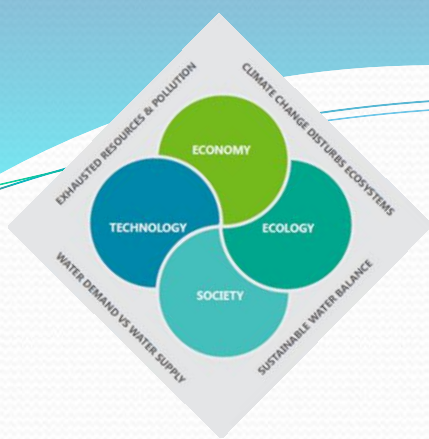
### Expected Impacts on

- Public awareness of water-reuse opportunities
- Allocation of water resources between competing user demands, mitigation measures and short-term solutions to overcome water scarcity
- Development of practical and low-cost technologies treating wastewater
- Balance between water availability & demand
- Relevant to EU Regulations & Policies (7th Environment Action Programme, Water Scarcity & Drought Strategy...) and to UN Sustainable Development Goals (6, 11 and 13)



# Cross-cutting issues

Bringing forward the cross cutting/horizontal issues in the SRIA in a more holistic/integrated manner and highlighting the links/synergies between some of the needs within the SRIA



	Theme 1 Improving Ecosystem Sustainability and Human Well-being	Theme 2 Developing Safe Water Systems for Citizens	Theme 3 Promoting Competitiveness in the Water Industry	Theme 4 Implementing a Water-wise-Bio-based Economy	Theme 5 Closing the Water Cycle Gap
Ecosystems' ecological status, resilience, services and restoration	+++	+	+	+	++
Pollutants: risks and remediation	+	+++	++	++	+
Water and energy	+	+	+++	+	++
Water and agriculture	+	+	+	+++	++
Water and citizens	+	++	+	+	+++
Water and climate	++	++	+	+	++
Water data (monitoring, citizen participative sciences)	++	++	++	++	+++
Sensors, technologies and smart systems	++	++	+++	++	++
Governance and acceptance Removing barriers (legislation, funding schemes, governance, acceptance)	+	+	+++	++	+++
Developing new tools combining in situ and remote sensing data: models	+	+	+	+++	+++
Integration of water policies in the EU	++	++	++	++	++

# SRIA 2.0 publications

- A technical version

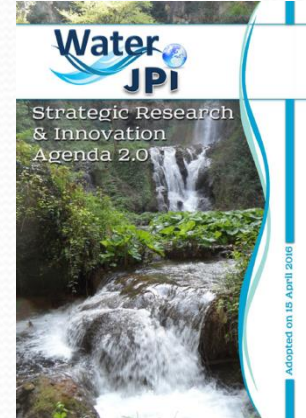
  
Researchers

  
RDI  
Funding  
Bodies &  
Programmes

  
Policy  
Makers

  
Water  
Utilities &  
River Basin  
Management  
Bodies

  
European  
Commission

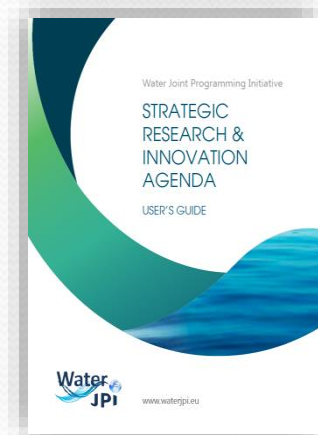


- A public friendly version

« An Introduction to the Strategic Research & Innovation Agenda 2.0 »

  
Enterprises

  
General  
Public



- An interactive glossary (*under progress*)



Thank you for your attention  
and BIG THANKS to all WatEUr WP3  
members for their hard work

