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Stakeholders Committee Recommendations for Building the Feasibility Study 3

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1. INTRODUCTION – THE SWAN PROJECT AND THE FEASIBILITY STUDY

SWAN is an international cooperation project granted by the European Commission under the FP7, as INCOLAB Action. The SWAN project involves five European Union Member States (Bulgaria, France, Netherlands, Spain and United Kingdom) and the USA. The European teams are: The National Institute of Geophysics, Geodesy & Geography-Bulgarian Academy of Sciences (NIGGG-BAS; Bulgaria), Centre National de la Recherche Scientifique (CNRS, France), UNESCO-IHE Institute for Water Education (IHE; Netherlands), Universidad de Sevilla (USE; Spain), and University of the West of England (UWE; United Kingdom). The USA team is The University of Arizona. The SWAN project is coordinated by the French CNRS (Centre National de la Recherche Scientifique) that created a Joint International Research Unit (UMI 3157) in collaboration with the University of Arizona in 2008.

The principal objective of SWAN project is to reinforce collaboration between EU and US research in the field of sustainable water action. Since the beginning of the project, the original idea of a “Sustainable Water Center” has been defined and developed as an organization for a Transatlantic Dialogue on Water (TDW). The TDW might constitute a platform that will bring together multidisciplinary research, education and knowledge exchange at both national and international level. Working towards understanding/solving water issues, physical/natural sciences will tightly collaborate with social sciences with the close collaboration of the institutional figure through the involvement of key stakeholders in academic, government, industry and communities. The work of the future TDW will be articulated around the integration of skills, policy, experts and different disciplinary perspectives into the project. This articulation will require the involvement and commitment of stakeholders to SWAN's work at different levels through the development of effective modes of participation. A strategy for effective stakeholder involvement will be developed building from the experience of SWAN's work.

The forms and modalities of the TDW have to be defined from scientific, legal and financial points of view. In this context, one of the main outputs of the SWAN project is a Feasibility Study into the establishment of an enduring institutional structure as a framework to develop this international collaboration. The aims of this Feasibility Study are to determine the steps for building a lasting cooperation between US and European institutions, private and public, but also industries, to open the activities of the joint research unit iGLOBES (“International and Global

Environmental Studies", UMI 3157 CNRS/University of Arizona) to researchers from other European countries as well as increase the scientific cooperation in ongoing research activities in preparing new joint projects, organizing of joint seminars, summer schools and similar activities, giving access to data bases or methodologies in the field.

Given the necessity of close collaboration with stakeholders as a bridge between academia and other institutions, and their important role as experts in different water management issues, their input in the constitution of the TWD is very valuable. During 2014, one of the main outcomes of the first period of SWAN project was the differentiation of stakeholders in three levels of action and collaboration (Figure 1):

- Level 1: *International Stakeholders Advisory Board* for the SWAN Feasibility Study in order to organize the TDW. Its role is to provide advice and insights on how academia and managers can work together to better inform management challenges and relevant research. The identification of this level of stakeholders is one of the main challenges of the feasibility study coordinated by the CNRS team: they do not necessarily come from national stakeholders groups but from international institutions (research, governance) that might have a specific view on the shape, role and content of a new research network dedicated to supporting a Transatlantic dialogue on topics related to sustainable water action.
- Level 2: *National Stakeholders* that regularly collaborate with the corresponding participating teams in the SWAN project, collaborating in their ordinary activities of research and dissemination, even outside of SWAN.
- Level 3: *Local Stakeholders* that are involved in each local or topical case study and work together with the researchers. The list of stakeholders involved in each case study can be very extensive, with stakeholders engaged at different levels.

In the framework of the Feasibility Study, during the 12 month cycle between April 2014 and April 2015, a surveys were sent to level's 1 and 2 stakeholders as noted in Figure 1 This deliverable will analyze the results of this survey.

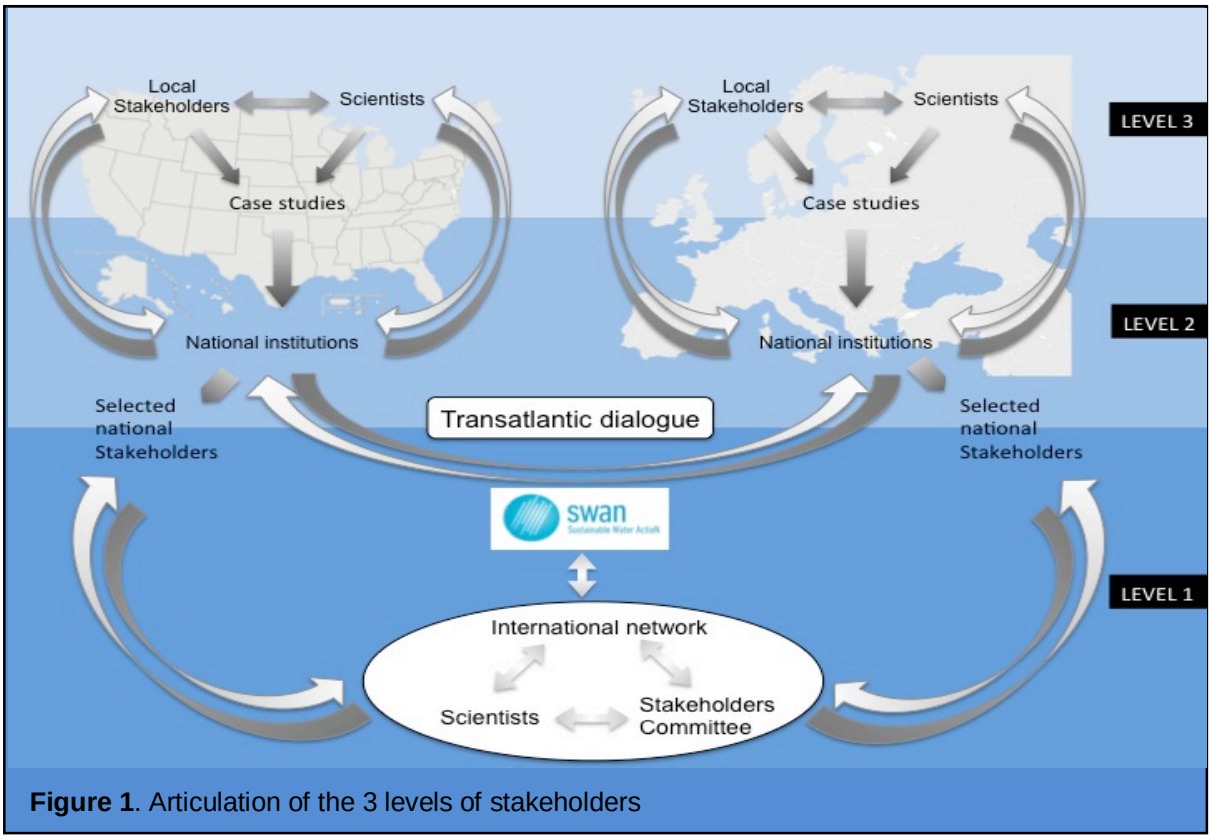

Figure 1. Articulation of the 3 levels of stakeholders

2. MEETING THE SUSTAINABLE WATER RESEARCH NEEDS OF DIVERSE STAKEHOLDERS

2.1. The survey

Starting in early 2015, the UWE SWAN team, led by Professor Chad Staddon, distributed a survey (Annex 1) among stakeholders of levels 2 and 3 of different countries (Bulgaria, UK, Spain, The Netherlands) in order to investigate:

- Stakeholders water related challenges
- How their organizations are addressing the challenges
- Role of academia in solving the challenges
- How academia and industry can work together to solve these challenges

This survey was part of an on-going monitoring and evaluation effort designed to ensure that university-based water sustainability and security research is responsive to both changing topical needs and also changing needs related to engagement and dissemination mechanisms. Thus the UWE team were seeking to consult with a cross-section of people and organisations with whom we work and with whom we would like to work (our “stakeholders”) to ensure that we are topically “on-target” and also as efficient and impactful as possible.

The UWE survey was the second such survey launched from within SWAN, following on from a much larger survey led by University of Seville in early 2014. Not all teams implemented both surveys, but did one or the other.

The analytical objectives of this survey were:

- A comparison of stakeholder challenges across Europe and America.
- Identify similarities and challenges.
- Sharing of best practice or researching solutions together through a Transatlantic Dialogue.
- Developing a Network for a Transatlantic Dialogue on Water at a global level in addressing water challenges.

The survey had three sections:

- About You & Your Organisation
- Identifying Key Issues for Sustainable and Secure Water Management
- Challenges of Working Collaboratively

2.2. Results

2.2.1 About you & your Organization

The stakeholders selected for this survey come from a wide cross-section of government, academic, public and private sector institutions that the SWAN teams engage with.

2.2.2. Identifying Key Issues for Sustainable and Secure Water Management

The **results from the first wave of the Survey** were presented by **Prof. Chad Staddon** (UWE) during the 6th SWAN Progress Meeting held in Bulgaria in April of 2015.

The key issues for sustainable and secure water management differed between countries. Below there is a list of the key issues considered by the stakeholders per country:

Bulgaria:

- In terms of water-energy-food nexus respondents identified two key problems, the first problem hydropower plant construction and destruction of natural rivers; and the second problem the restoration of wetlands which can bring food and energy resources. These respondents considered that academic organizations could be very useful with their scientific knowledge in these areas.
- Discrepancy in the legislation that leads to a tangible lack of a relationship between the water related units (e.g., the Ministry of Energetics, Ministry of Agriculture and Food, and Ministry of the regional planning and the development are all in charge of the stewardship of several dams). Moreover Bulgarian society faces a serious need of education about water and water related infrastructure

The Netherlands

- Water governance, multilevel safety approach, building with nature, innovation, early contractor involvement, stakeholder consultation etc. Cooperation with private sector and knowledge institutes.

United Kingdom

- The key issues are related to water supply, demand and management of public water at a cost effective price, whilst also sustainable planning for the future:
    - To ensure a consistent and effective delivery of drinking water and waste water for the public.
    - The management and delivery of a public water utility to ensure there is available resources, infrastructure whilst also planning for 20-50 years in the future.
- Another challenge for the water industry is the shortage of qualified water related professionals that are in high demand within the sector.
- In terms of energy and water, water availability is seen as another constraint on future thermal power generation, including on waste incinerators. Academic organizations could usefully undertake further research on the problem of 'locking in' not only low levels of recycling but high rates of water use where waste to energy plants are developed. There is concern about such plants being developed in India, China and south Eastern Europe. Research is urgently needed to explore whether such capital intensive investments really are the most appropriate approach from a societal perspective.
- The stakeholders find difficulty in addressing these practical challenges and balancing sustainability to ensure the public have a cost effective but high quality water supply.

2.2.3. Role of Academia in solving these challenges

The overall results of the survey showed that all stakeholders value the role academia plays in addressing the water industry's challenges especially in attaining baseline data, undertaking independent research that provides evidence to influence communications and decision making, assisting industry in obtaining better technical solutions to problems across the water sector, and influencing the direction of the future water industry. Therefore, it is of great importance that the results from the academic research reach other communities, such as stakeholders and general public. The mechanisms for doing so are not clear yet and need to be studied. It was noticed that

from the point of view of managers and practitioners, academia generally has a very low Technology Readiness Level (TRL).

Stakeholders from different countries showed different point of views in their answers. While in some countries, such as Netherlands it seems that academia and practice are tightly linked; in other countries, such as Bulgaria, there is a "wall" between academic research and "real world" practice, effectively preventing productive partnerships. The opinion of the UK stakeholders interviewed is that the role of academia is to build knowledge base which gets implemented by the stakeholders. Doctorate and postgraduate degrees need to be appropriately positioned between academia and the water industry to address the scarcity of academic qualified water experts in the industry. UK academics often work with non-academics, while in Bulgaria this is very rare, except for with the NGO sector. There is also a practice in UK, unlike Bulgaria, of postgraduate (and sometimes undergraduate) students undertake a placement with a relevant water organization to produce their thesis and sometimes get paid to do so. Such trust has been built for many years and an effort for long-term participation is needed.

Below are listed the main views of stakeholders on how academia and industry can work together:

- By investing time in communicating with each other, finding common objectives, and sharing of best practice to improve efficiency and success in building long term working partnerships. This requires at least some structures of interaction (workshops, seminars, regular meetings, etc.) and organizations to support them (such as a TDW or "network"). Successful examples of this type of partnership research include the Scottish Government's Centre of Expertise for Water, and the International Water Security Network (www.watersecuritynetwork.org) both of which have the strategic aim of connecting academic research and policy.
- Balancing postgraduate degrees between academia and the water industry. As a transatlantic dialogue we need to think what goes into a new kind of water education. Could we do more than sharing students between institutions? How could we build a common interdisciplinary and international training? For which level (post-doctorates, PhD, undergraduate students)? There is a considerable appetite for multidisciplinary, problem-based learning opportunities that can help shape and mould the next generation of water professionals, in all countries around the world.

- Open IT platform for offline and online discussion; but there are few incentives for collaboration between the different areas of activity (academia, utilities, administrations, etc.) and nobody to lead.
- In some countries universities host well-developed water research centres; in other countries universities pay more attention to the educational activities, and the main water research work is implemented at scientific institutes outside the universities. In both cases there are/might be failures in engaging with "research/knowledge users" in the above two aspects for reasons not necessarily to do with the research institution but with the "research users". Some stakeholders think that:
    - "Research has a huge role in contributing to organisations by gathering base line information/data, and research supporting communications to relevant parties. Research is at the heart of managing water for sustainability and security. Research has a valuable place in finding better technical solutions." (Government Respondent).
    - "Academic organisations could assist in helping to develop the evidence base in respect of the effectiveness of water fountains in bringing about behaviour change. Research is also urgently needed to explore whether capital intensive investments (in India, China and South Eastern Europe) really are the most appropriate approach from a societal perspective." (Principal Consultant)
- "Universities and research institutes have local and foreign partners, so there is no need for newly established research institutions. Instead, what is needed are flexible research focal points based on project collaboration to achieve the same goals." (Bulgarian Stakeholder). Can this flexibility be translated into the proposed Transatlantic Dialogue? It could be, but should also reflect in the way of educating under/post/graduate students.

2.2.4. Challenges of Working Collaboratively

There were several collaboration/cooperation vehicles proposed:

- Stakeholders are very receptive of events like workshops, little less receptive to external advisory bodies (many citing time constraints)
- They are also interested in participation in water research directly

- They also show interest in the increased participation of journalists, since they are important in reporting new knowledge of sustainable/secure water to the public. Because journalists are under a lot of pressure with very time limited, flexible networks/virtual approach and cultivate interactions in order to communicate with them. We need to think how to transmit our information.
- Low interest in external advisory bodies and participation in a virtual platform for water research and action

In general, stakeholders view dialogue as an important player in collaboration, since it helps to understand each other's respective motivations/objectives and to develop trust between stakeholders and researchers. Moreover, long-term partnerships grow from the ambition of the original partnership itself. Bringing together various agencies and organisations, to work towards the same goal, means aligning a range of ambitions, organisational cultures, and ways of working – something that is not always easy. Sharing of best practice across academia and industry around successful student engagement and education could help improve effectiveness in this area.

When asked about how a TDW between Europe and the USA (the goal of SWAN 2) would help to improve water-related research, no one showed interest in the creation of a new research centre *per se*. Instead, the feeling was that it should be developed as a virtual network – a platform for offline and online discussion; something flexible and responsive

The interest was focused on:

- Creating an international scientific network involved in policy debates on water governance: economic stakeholders are not keen of centres, they prefer consulting that they can pay to legitimate their decision making. On the other hand, the attempt to build a new kind of training/water education needs a clear organizational structure and alignment with relevant policies (e.g. EU Bologna Process)
- Developing doctorates and postgraduate studies that benefit both academia and the water industry.
- Developing an international exchange program of researchers and students
- Organizing regular interdisciplinary workshops on water issues

- Creating an information hub that systematically organizes information and links to the work of already existing centres and initiatives.
- Creating a virtual platform for easy access to international research centres.

The stakeholders also agreed that most of the topics that could be the focus for a Transatlantic Water Dialogue (listed below) require a multidisciplinary approach:

- Water quality
- Risk management (climate change, droughts, floods) and resilience engineering
- Water engineering to include physical assets, policies, behaviours
- Integrated assessment tools for water socio-ecosystems
- Water data and information generation and management technologies
- Economic instruments for water management (prices, connection fees, etc.)
- Water governance (laws, institutions, administration)
- Conflict resolution
- Democratization and transparency of decision making processes

While some stakeholders think that a Transatlantic Water Dialogue should be created and that it would be more appropriate to develop soft collaborations, networks and joint projects, other think that the creation of such an organization should be conceived as an open process, starting as a scientific network and evolving to "harder" institutional designs if necessary.

This organization might impact international and national water policies by:

- Counterbalancing the present corporation biased research and policy agenda.
- Through cutting-edge publications and workshops, including technical reports, etc.

2.3. The role of academia in our societies and decision-making processes for sustainable/secure water

What is the role of academia in modern society and in the decision-making process? Is it to provide consultancy? And, to who and for what? Is it for policy or practice? The national institutional background and the culture of relationships between institutions is very different between SWAN member countries. Very often the position that academia takes is tactical – looking for realization on the places where the academic skills are applicable. But there are

contradictory demands to academia and very often there is the need to adapt in order to get funding. Up to what extend can this adaptation continue and how much is acceptable? Scientists should be objective, they are not stakeholders. They should provide objective information in the search for the truth. Still, depending on the perspective, the base is different. For example, in USA there are a lot of funds for scientists to support decision-making and to solve presented problems. In this sense, the US context is very different from the European one. Moreover, there are differences within the EU states as within US states. A main target for the development of multi- and trans- disciplinary research within the countries is ***education***. At the moment, university education is in many countries still focused on the "former paradigm" of training students to become narrow specialists in a particular discipline able to apply their knowledge for solving problems only within narrow confines and in "specialist" mode. There is not enough training on the understanding of the "bigger picture" – realizing the background of the problems and the consequences that its solution (or lack of solution) might bring. UofA and UWE, Bristol are currently developing such platforms for education of students. At UWE, Bristol the suite of undergraduate and postgraduate courses integrate both holistic and specialist perspectives in ways that are both flexible and are recognized by relevant professional bodies (e.g. Chartered Institutes, whose approval is required for career development). At the UNESCO-IHE, the first week of the students' education provides broad information on water issues in general, in multiple perspectives, even if the students go there to get very specialized knowledge. For France, Spain and Bulgaria such trend is still not well distinguishable.

2.4. Key themes for future work

- To develop a climate change services market, there is a need to strengthen the provider-user interface (e.g. the University of Seville Drought Monitor).
- Stakeholders recommended to maintain and expand observation and monitoring systems….including crowd source and citizen science. There are problems with the resolution of the data, matching datasets of different resolutions. One of the solutions to this is to rethink creatively the relations between "data", "research" and "policy" (see, for example, special issue of Water International, edited by colleagues from University of Seville).
- Moving from wastewater treatment to resource recovery; especially energy, carbon compounds, nutrients and, of course, water. Ultimately this means "closing the water

services loops", and already there are leaders in this area, including Beijing, China and Maricopa, Arizona

- Eco-design was also seen by several stakeholders as a critical element to make eco-innovative products attractive and re-usable.
- Blue-green cities: thinking about the way that urban form and morphology can work with natural water flows rather than seeking only to control and subjugate them.
- Resilience of hydrosocial cycle to chronic stresses and acute shocks.
- Better, more embedded public participation and stakeholder engagement.

2.5. Next steps

Survey

- Follow-on survey waves (internal governance of SWAN and related projects, plus informing new work)
- Specific targeting of educational establishment (statement of standards in "sustainable water education"?
- Capturing engagement as "impact". In the British system, there is an imperative need to document impact of research in society.

Mechanisms

- Embedding in new projects (e.g. IWSN)
- Newly submitted bids – e.g. WaVES, KEWA as in UK
- New H2020 Work Programme

ANNEX 1 - 2015 SURVEY

SURVEY: Meeting the Sustainable Water Research Needs of Diverse Stakeholders

"SWAN" (www.swanproject.arizona.edu) is a university-based network of water research groups in Europe and the USA.

This survey is part of an on-going monitoring and evaluation effort designed to ensure that our work is responsive to both changing topical needs and also changing needs related to engagement and dissemination mechanisms. Thus we are seeking to consult with a cross-section of the people and organisations with whom we work and with whom we would like to work (our "stakeholders") to ensure that we are topically "on-target" and also as efficient and impactful as possible.

Survey participants may benefit by access to water knowledge already available through our networks, the possibility of routing specific queries to nearly anywhere on the globe and through giving us the opportunity of building new research around the issues of most concern to them.

This survey is designed to be either self-completed (and returned to NATIONAL TEAM EMAIL) or completed by one of our team during an in-person or teleconference interview context, according to whichever you find more convenient.

Please don't worry if you don't feel you can answer all questions equally or fully or indeed if you prefer to leave some out. We very much value your opinions and so hope to hear as much from you as possible (text boxes should expand to accommodate text).

Results from this survey will be used only in anonymised formats and participants can withdraw at any time.

About You & Your Organisation

1. You and your organisation (*name and position entirely optional*)

2. Primary aim/mission statement of your organisation

3. Scope and scale of activity (*# employees, geographical area of operation, etc.*)

Identifying Key Issues for Sustainable and Secure Water Management

4. What are the main water-related challenges faced by your organisation or department? And what is the role of your organisation in addressing them? Please indicate where you think that academic organisations could usefully contribute.

5. Is public education part of your organisation's activity? If so, please indicate where you think that academic organisations could contribute.

6. Are the links between water and food or water and energy production (*the so-called "water-energy-food nexus"*) of importance to your organisation? If "yes", then what is the role of your organisation in addressing these? Please indicate where you think that academic organisations could contribute.

7. What "big ideas" are available to help us better manage water? And what is the role of your organisation in developing them and promoting them? Please indicate where you think that academic organisations could contribute.

Challenges of Working Collaboratively

8. What research organisations/institutions do you currently work with to address the above sorts of questions? Are there gaps in the "research landscape" that you would like to see addressed and what might be the best sorts of new institutions for so doing?

9. How can university-based water researchers improve engagement with "research users" both in the framing of the research questions they investigate and in the dissemination of the outputs of their research?

10. What are do you see as the key success factors for building productive, long-term research partnerships between the "real world" and academia and how do these vary across sectors, disciplines or countries?

11. How effective are current incentives, policies and funding streams for promoting this type of collaboration? How could these be improved in order to scale up the range and impact of collaborations being undertaken?

14. Please indicate which of the following you or your organisation would be willing to consider in order to assist us in better meeting the aim of developing relevant, impactful and timely water research:

- ☐ Participating in an external advisory body or steering group for university-based water researchers
- ☐ Participating in public events, workshops, etc. on a relevant aspect of "water"
- ☐ Participating in water research, through active co-development of projects (your water questions matched to our research capacities)
- ☐ Participating in a virtual platform for water research and action
- ☐ Participating in university-based water education, through hosting placement students, offering guest lectures (*in-person or virtual*), etc.

Thank you for taking the time to complete this questionnaire survey. If you wish us to send you an anonymised summary of results obtained please provide a preferred email contact.

Email: _____

If you have any questions or wish to follow up on this initiative, please contact the Project Lead as noted below.