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Stakeholders Committee recommendations for building the Feasibility Study -1

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Top picture: SWAN Central Seminar in the Department of Hydrology and Water Resources (University of Arizona, USA)
Franck Poupeau

Bottom picture: Horseshoe Bend, Arizona, USA
Franck Poupeau

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1. INTRODUCTION – THE SWAN PROJECT

SWAN (Sustainable Water ActioN: Building Research Links between EU and US), is a four-year International Cooperation Project granted by the European Commission (FP7-INCOLAB-2011). Its main goal is to reinforce links between EU and US research in the field for sustainable water management. The project promises to develop a transatlantic dialogue in response to the need for interdisciplinary and multiregional collaboration regarding water issues in the 21st Century. International collaboration is a must to find sustainable solutions to the twin threats of socioeconomic development (with increases in anthropogenic demands on the environment) and climate change (which is changing the resources availability and the nature and persistence of environmental risk and hazard).

The SWAN project involves five European Union Member States (Bulgaria, France, Netherlands, Spain and United Kingdom) and the USA. The European teams belong to the *National Institute of Geophysics, Geodesy & Geography* (NIGGG; Bulgaria), the *Centre National de la Recherche Scientifique* (CNRS, France), the *UNESCO-IHE Institute for Water Education* (Netherlands), the *Universidad de Sevilla* (US; Spain), and the *University of the West of England* (UWE; United Kingdom). The American team is from the *University of Arizona*.

The SWAN project is coordinated by the French CNRS (Centre National de la Recherche Scientifique) which created an International Joint Unit (UMI3157) in collaboration with the University of Arizona (UA) in 2008[1]. This extension of the UMI broadens its current activities from a bi-national focus to one that incorporates ideas, disciplines and methods from across Europe and therefore it marks an important evolution of the UMI concept. By connecting the USA with Europe, scientific cooperation has the mission to enhance on-going activities, bring new projects, and establish a foundation for future collaboration. In order to explore how the UMI will promote the development of a transatlantic dialogue on water, a “Feasibility Study” into the establishment of some sort of enduring institutional structure is included among the planned outputs of the SWAN project. Another key component of SWAN is the development of research stays for the European team researchers at the iGlobes-UMI (the successor to UMI3157, reauthorized by CNRS and UA in 2013) located in the UA.

[1] A “UMI” is a thematically focussed CNRS-led research institute embedded at a university or institute outside of France. Another example is CIRHUS (UMI 3199 CNRS-NYU) the Center for International Research in the Humanities and Social Sciences, whose goal is to foster collaboration between CNRS and New York University.

The need for an integrated European dialogue with the USA has become urgently apparent. On one hand, Europe is a leading world player in water science, policy and management (institutional, scientific and technological innovation, leading water sector private companies, significant investment capabilities, etc.). Moreover, water sustainability research in Europe represents a critical mass of infrastructure and human resources that has had a significant influence on the development and implementation of water management models including advanced hydrological modeling, participatory decision-making, integrated water resources management (IWRM), and the currently ongoing scientific debates about their potentialities and limitations (See Deliverable 3.1: ”Key data and information requirements in the context of current debates on water management”, by USE team for a critical approach of these models). On the other hand, various US institutions, the UA paramount among them, have shown innovative leadership in searching for new water resources (reclaimed, recycled, desalinization) and addressing the influence of climate change on water sustainability.

Moreover, the USA and Europe appear to represent two very different models of what might be called “hydro-citizenship”. While the European model is centrally mandated, and in some cases overlies pre-existing national models as is the case of Holland’s Watterschappen, the American one is more democratically based (e.g. CAP public engagement process). By working together with US institutions, Europe’s influence will increase and the quality of its achievements will improve. The European experience in building an integrated approach of water management to ensure water use sustainability (i.e. Water Framework Directive, water agencies at river basin scale, etc.) has much to offer to the USA with regard to water policies, all the more since the USA is known to have entered a phase of necessary change regarding their national water management systems. In particular, the arid Southwest region is severely challenged as water resources have been compromised (qualitatively and quantitatively) by population growth and urban expansion. Therefore, an EU/USA alliance can prove mutually profitable as knowledge and expertise are shared between and within regions.

These goals will be achieved through collaboration on comparative analysis of water management issues in different case study locations in the EU and the USA (see Deliverable 2.1 by UWE team – "Water security and sustainability EU/USA”). The uncertainty of model predictions implies the necessity of opening scientific outcomes to public validation. Furthermore, the involvement of stakeholders implies that the scientific activities must integrate with public participation. The elaboration of both geo-spatial databases and visualization tools is

linked to the perspective of participatory planning of water resources use. Therefore, any case study based research must be necessarily built on collaboration with stakeholders who are experts in the water management challenges of their region at different scales, and on broader public participation.

2. INVOLVEMENT OF STAKEHOLDERS IN THE SWAN PROJECT

2.1. Goals of the SWAN project: from a Sustainable Water Center to an Organization for a Transatlantic Water Dialogue

The SWAN project constitutes the door that the existing UMI iGLOBES (CNRS/Univ. of Arizona) has opened to European partners in response to the urgent and increasing demand for high quality interdisciplinary and multiregional collaboration, which can serve as models for research and development in diverse domains of water sustainability. This opening aims to expand the current bi-national (US-France) focus, extending the actual research field and function. The goals of the SWAN consortium are to develop joint research activities and prepare the project for an institutional collaboration, in synergy with scientists and stakeholders engaged in all aspects of strategic planning. The SWAN work plan has been organized in three phases: i) opening the activities; ii) increasing scientific cooperation; iii) preparing the institutional arrangement.

European partners – scholars, students and stakeholders – have to develop joint research activities within four work packages and achieve deliverables (reports, publications, international conferences) on integrative hydrological modelling, social and natural sciences interface, data, information and knowledge for water risks management and land use processes related to urban water cycle. These research themes can be developed in a comparative and interdisciplinary perspective. This goal has been mainly achieved during the Period 1 of the Project (March 2012 – August 2013), through the contributions in the progress meetings of all the SWAN teams and through the research stays of several European students to the UMI iGLOBES (CNRS/UoA).

The second period (which started in September 2013) is marked by four major activities: scientific meetings, SWAN central seminar, research stays of students to work in the Tucson case study, and stakeholders workshops, which will contribute to further integrate the partners and foster joint research activities. At the same time, partners have to contribute to the development of the Feasibility Study led by the UMI iGLOBES. This phase of the project enhances the current activity in the USA and disseminates the project in Europe, looking for potential new members to expand the activity during the four years. At the end of the fourth year, a well-defined framework of organization for scientific collaboration will be presented. This project will have a multidisciplinary approach covering fields from physical and natural sciences

to social sciences and will be connected to major research centers in the USA and in the EU. It aims to function as a major international network for scientists, students and also stakeholders and communities. This framework will constitute the basis of the Feasibility Study that SWAN aims at submitting to the European Community at its conclusion in 2016. The Feasibility Study is necessary to expand the UMI 3157 (CNRS / UA) into a European platform for scientific collaboration and potential training in the USA. Based on the four years of experience of joint research, a Final Strategic Report on the vision, scope and structure of this research organization, necessary to start its implementation, will be produced. The report will include a short list of potential new partners, and criteria to enhance the process of scientific and institutional integration.

One of the main obstacles to the international circulation of ideas is the existence of national schemes of perception and analysis that shape the world vision of the scientists. Thus, concepts may have different meaning depending of their national context of emergence, which leads to misunderstandings when it comes to scientists defining alternative ways of organizing scientific collaboration. Therefore, the notion of “research center” might differ between the SWAN partners. This notion is indeed a good example of how different national visions are competing in choosing an appropriate denomination for creating an administrative structure oriented towards international scientific collaboration. While a center in most of European countries (and especially in France) is a permanent institution characterized by its areas of research, a center in the USA refers to one or several specific projects with their own funds. Conceived in Europe a general condition for the development of research activities, a center can appear as a binding structure in the American context, as its creation is the result of fundraising and targeted research activities.

From an academic point of view, discussions among the SWAN partners (and outside experts) during the first phase of the project regarding the definition of the Sustainable Water Center (as the format for scientific collaboration was defined in the SWAN proposal) appeared thus to be very “Euro-centric”: in the United States a “center” mostly refers to the existence of funded research projects around a central scientific goal. Even the existence of a French CNRS institution like the UMI on the American territory is based in an agreement that has to be renewed every 4 years. Those first statements imply the necessity to reinforce the academic belonging of UMI to the UA, and to study furthermore the American academic organization: there are already a great number of water-related research centers, on a supra-national level

(United Nations, NGOs, etc.), and on an international level (in European or American academic fields). As a consequence, the feasibility of an institutional arrangement should be innovative but also adjusted to local possibilities inside the UA and USA.

The goal of building an institution for international scientific collaboration, originally denominated "Sustainable Water Center", and now reformulated as an "Organization for a Transatlantic Dialogue on Water", has sense only if it is related to the research practices led by each team and developed in mutual collaboration. The researchers participating in the SWAN project have generated internal debates and raised suggestions related to innovative and stimulating forms of international collaboration. A balanced view of institutional and research directions within the SWAN Project can rely on several observations:

- The independence and autonomy of national scientific programs has to be reaffirmed, in a context of increasing political, economical and social demands of expertise coming from international funding agencies that work towards finding solutions to environmental, health and security issues. In water issues, the call for stakeholders and, more generally, "democratic participation" and responses to "social demand", can sometimes appear as an attempt to build a political and scientific legitimacy in the institutional struggles for the definition of managerial practices rather than a will to satisfy the "public" or the "users". The institutional characteristics and the role of stakeholders have to be carefully defined and incorporated to a new kind of scientific practice in order to avoid the suspicion of political "instrumentalization" of public participation processes.
- From a material point of view, even the most "virtual" scientific network requires some key staff and an institutional and a physical place to do research work, as the UMI iGLOBES provides at the UA. But beyond these conditions, the issue of a scientific leadership remains crucial and the goal, therefore, is to define the optimal *organizational structure for scientific collaboration* that would be the most efficient and adapted to the SWAN objectives in order to study water issues. This organizational structure will have to deal with uncertainty and complexity, and it will require interdisciplinary research and comparative approaches besides specific engineering and management capacities. In that perspective, the consolidation of a scientific network appears as a condition for the eventual institutionalization of a scientific collaboration.
- One of the final proposals might be for a continued round of "networking and capacity

building" embedded within the UMI iGLOBES, that might be in charge of a secretariat based at the UA, and of the construction of a mechanism for student and staff mobility between SWAN partners. The development of this exchange mechanism can build from the positive experience of scholar exchanges within the context of SWAN. The confluence of PhD, post-doctoral and other scholars from different countries, disciplines and conceptual approaches (both SWAN members and others) conducting research stays at the UA for extended periods of time (1 to 6 months) enabled SWAN hosts at UA to establish weekly meetings where visiting scholars discuss their work and attend and discuss presentations from local water managers. Given SWAN's goal to develop collaborative research frameworks, the weekly meetings have had tangible and positive results: a working paper that attempts to provide an integrated framework for water resources research and the development of a common case study site for comparative research: the TAMA (Tucson Active Management Area) Case Study, where scholars will develop part of their work.

To resume the former achievements, three key deliverables are already taking shape:

i. The emergence of *a de facto* "secretariat" within UMI 3157/iGlobes to coordinate collaboration amongst a growing global network of water researchers and students.
ii. A better understanding of how to facilitate academic mobility between partner institutions, including academic calendars, visa rules, logistical arrangements for credit accumulation by visiting students, etc.
iii. SWAN project has enabled the emergence of entirely new networks linking water scholars from around the world. One such is the International Water Security Network (IWSN), based at the University of the West of England and with significant funding "*to explore emergent water security complexes at local, regional and global scales in four broadly conceived world regions: Europe and North America, Sub-Saharan Africa, Latin America and Asia*". The IWSN has already indicated its desire to link to the SWAN project in mutually beneficial ways, some of which will be discussed at SWAN project meetings in Seville, Spain in June 2014.

2.2. Stakeholders participation as a means to achieve SWAN goals

SWAN's scientific approach is taking into account the critics of the traditional ways of studying environmental problems, inspired by "post-normal science" theories, in order to support dialogue between scientists, engineers or modelers of very different backgrounds and different levels of

interest on epistemological issues. This approach is meant to be used in fields such as water resources management, emphasizing the uncertainty of model predictions in complex issues and poses the necessity of opening scientific outcomes to public validation. Therefore, the early involvement of "stakeholders" (that is, those with a stake or interest in the issue being analyzed or discussed) in the design and development of research projects, who are experts in aspects of the water management challenges in their region, is needed to explore new scientific practices that respond appropriately and creatively to current epistemological challenges: they can be experts, or lay people involved in the water management challenges in their region, but they can also deal with environmental issues on multiple scales and areas, such as international policies, climate change, biodiversity, etc.

If the SWAN project intends to take into account the arguments advanced by the critics of the traditional expertise of scientists, it must develop its own methodology in a non-dogmatic way: in order to build an interdisciplinary research that is led by the SWAN European students conducting stays at the UA, the collaborative approach to the scientific work through the involvement of stakeholders and researchers from the outset is a defining characteristic of the SWAN project, and it underlines its commitment to:

- Support actions and collaborative research.
- Transparency.
- Extensive and effective communication.
- Active dissemination and product information.
- Intra-project as well as external educational activities.

During the first phase of the project (proposal and early development) a preliminary list of stakeholders was developed by all partners in order to implement scientific collaborations (see table 1 below). However, it became apparent early on that a more focused definition of scientific activity (thematically, at different scales and geographical regions) was necessary before it was possible to clearly identify the stakeholders that were relevant and involve them effectively in scientific work.

2.3. Difficulties of the participatory research process

Stakeholders' participation is considered a major contribution to the SWAN project: it involves various institutions to contribute to the Feasibility Study (WP5) on a future international scientific

collaboration on water issues. In the context of the SWAN Project, three stakeholder workshops have to be organized on months 12, 24 and 36 of the project. These meetings constitute the basis of the Deliverables 5.2 (month 18), 5.3 (month 24) and 5.4 (month 26), which are the Recommendations realized by the International Stakeholders Advisory Board to build the Feasibility Study.

SWAN project partners worked on the project objectives and tasks during the 2nd Progress Meeting organized in Tucson from April 29th to May 3rd of 2013, and during the 3rd Progress Meeting organized in Tucson from October 20th to 31st. The Short Report on the Action Plan for the Feasibility Study (Deliverable 5.1), delivered after the 2nd Project Meeting (May 2013) details how the partners plan to reach a new and sustainable institutional arrangement for further collaboration on water-related research between American and European partners. It includes:

- A scoping of both the scientific objectives and contents of the SWAN project, an overview of its practical realization and the definition of eventual new tasks resulting from this evolution. This prioritization obeys to the necessity of thinking together the scientific and institutional dimensions of the project without concealing the autonomy of scientific research.
- The short report determines an action plan based on the identification of tasks, capacities and risks required to build the feasibility study.
- Other US-European networks in this area.

The various progress meetings and research conducted independently by the national teams have led us all to question the original framework proposed in the DOW ("Description of Work", Annex 1 of the Grant Agreement), regarding the involvement of stakeholders. Indeed, the recommendations of stakeholders are supposed to strengthen one of the main challenges of SWAN: the articulation between the scientific and the institutional dimensions of the project, through the elaboration of an organization what we now call a "Transatlantic dialogue on Water Management", rather than a "Sustainable Water Centre". However, several challenges have arisen during the configuration of the the International Stakeholders Advisory Board:

1. Ambiguous meaning of the 'stakeholder' notion: stakeholders are so diverse that they are often difficult to identify in the research context. They can be persons, entities, organizations, groups inside of an organization, etc. The notion of ''stakeholder'' is a relative term since it makes reference to interests around particular issues. In other words, some groups or organizations may exist over time but become stakeholders only in reference to a

specific issue. Moreover, these issues may be as local as flooding problems in a particular street or as global as climate change or inequality of water services provision in developing nations. Therefore, involvement of stakeholders in a research process must take into account a sociology of the position they have in their context of action, as well as their institutional and economic characteristics, in order to understand their involvement (and their interests) in the water issues analyzed in the project.

2. Stakeholders mapping: as has been discussed throughout this document, SWAN's institutional and scientific objectives are closely related and constantly evolving. As a result, the identification of relevant stakeholders is an ongoing and slow process since several tasks need to be completed: first, specify the research questions; secondly, define what is expected by the research teams from the stakeholders, and conversely, what is expected by the stakeholders from the research teams. This is particularly important from the point of view of the fact that many potential stakeholders have little time and resource to devote to long-term engagement with a project like SWAN. Furthermore, and in addition to the requirement for stakeholder input on the creation of an organization for a transatlantic dialog on water issues, evolving scientific work has resulted in the development of a local case study in the Tucson area to focus the work of visiting researchers and to facilitate collaboration and trans-disciplinary work. As a result, a new typology of stakeholders has been proposed (see Section 2 below) that will be developed in the next phase of the project.
3. Temporality of the research process: it has been difficult to build the collaboration with stakeholders without having a common research goal from the beginning. The relationship with stakeholders is built over time with continuous collaboration in cases of common interest. To this aim, SWAN project has started to incorporate case studies, such as TAMA (Tucson Active Management Area), that allows to build long-term relationships between scientist and stakeholders.
4. Financial challenges: participation of stakeholders in the meetings are important in order to get their point of view and advice on the current study issue. Nevertheless, although the partner institutions have agreed to participate, involving their stakeholders, the organization of the International Stakeholders Advisory Board (composed of American and European members) has been complicated due to the distances and the difficulty to finance the mobility. EU funds cannot be used to pay travel arrangements of stakeholders, since this issue was not included in the initial financial project design. However, the International Stakeholders Advisory Board will be regularly consulted on the base of texts and reports.

In conclusion, the original identification of potential members for the Stakeholder Committee by SWAN partners in the SWAN Agreement has proven to be inadequate for the range of scientific and institutional issues that are the focus of SWAN work. Although the stakeholders' workshops have been incorporated to the research tasks of the SWAN teams, the originally proposed members of the Committee may not be the most relevant with respect to the evolution in long-term objectives outlined above. The involvement and commitment of stakeholders to SWAN's work therefore requires the implementation of a new strategy. One of the challenges is to build new modes of participation included in scientific work.

To this aim, WP5 has been extended by including new tasks related to the participation of stakeholders and its consequences in terms of organization of scientific work. The research conducted up to now in the framework of WP2 and WP3 by Partner 3 (University of West England) and Partner 4 (University of Seville), respectively, refers to water as a complex and uncertain object that is built from various social, political and economical perspectives, and therefore, several multidimensional issues need to be addressed:

- Incommensurability and legitimacy of several positions, which requires to clearly defining explicit choice of narratives and external references.
- Contextuality, transparency and expression of implicit positions, values and interests.
- Integration of skills, sectors, policy, experts and different perspectives into the project.

All those elements imply different approaches to make and perceive science working towards a field of applied research where the stakeholders are known to play a key role. A decision was made to strengthen the analysis on both the specificity of addressing water issues and the involvement of stakeholders into a common organization for a transatlantic dialog on water issues.

Collaboration between stakeholders and researchers requires a risk assessment analysis in order to avoid failure of the feasibility study (Cf. Deliverable 5.3, by the CNRS team). An identification of evaluation criteria will be made in order to provide the basis for an objective assessment of the alignment of project developments with the stated objectives and to take measures to suppress or mitigate the effects of the risks identified (tools to be developed, actions to be undertaken, etc.).

3. ARTICULATION OF THE DIFFERENT LEVELS OF STAKEHOLDERS

3.1. Stakeholders' typology

As pointed out in section 1.3, 'stakeholders' is not a homogeneous or simple category since they are in different institutional levels and, therefore, it is not possible to talk of 'stakeholders' in general terms without defining the specific field of action in which they are involved. One of the main results of the first period of work is the decision of the SWAN participants to identify a typology of stakeholders and differentiate the levels of work with different categories of stakeholders. Three levels have been defined:

- Level 1: *International Stakeholders Advisory Board* for the SWAN feasibility study in order to organize a transatlantic water dialogue network. 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 a new research network.
- 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 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.

The development of the feasibility study needs a specific strategy and more inputs from the stakeholders, in conformity with the main developments of the SWAN Project and the differentiation of the three levels of stakeholders. Although there are no explicit criteria to draw the line between the different levels of stakeholders, each team defines them in function of its affinities, its research tasks and its own vision of water management. The challenge is thus to articulate these different levels beyond the national differences, despite the lack of space and time for discussion and dialogue between them. Therefore, the opportunity provided by a transatlantic dialogue comes from the necessity to articulate the local studies of the level 3 and to take the concerns and findings from the case studies to an international exchange, and

sharing the knowledge that is coming from different experiences and apply it to a national level (see figure 1).

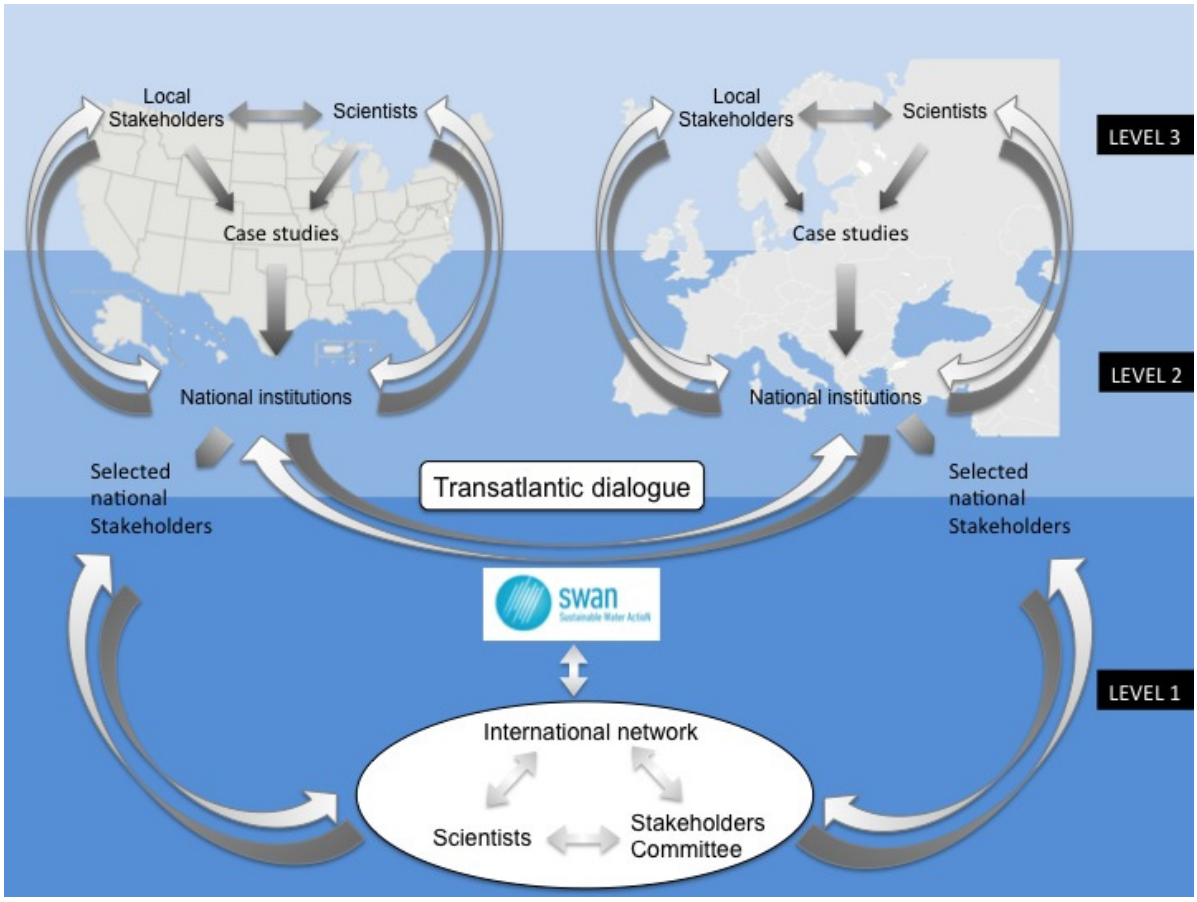

Figure 1. Articulation of the 3 levels of stakeholders

The International Stakeholders Advisory Board (Level1) will advise on issues related to the development of the international institution for scientific collaboration on water issues (Sustainable Water Center as originally proposed in the SWAN DOW, or the Institute for Transatlantic Water Dialogues, as currently envisioned). Owing to the material difficulties arising from bringing together American and European stakeholders, the strategy of the Feasibility study (WP5) is to develop a short survey focused on international scientific collaboration, and send it to the international stakeholders advisory board (levels 1) in order to receive their recommendations for the future scientific organization. This “institutional survey” will benefit from both the experience of the stakeholders’ workshops organized in Bristol (2012) and Tucson (2013), and the contributions of all the SWAN partners (especially the documents established by

the University of West England and the University of Seville teams for a common methodology). This survey will contribute to define a better strategy to develop the transatlantic dialog on water issues (see section 2.2.). In parallel, this new differentiated strategy will have to be connected with the research activities led by each team:

- Level 1 stakeholders: dissemination of the "institutional survey" to the Stakeholders Advisory Committee by the SWAN coordination and/or by each national team when they are already in contact with them.
- Level 2 stakeholders: collaboration with the national stakeholders which might be invited to the next stakeholders' workshops, starting from Seville, June 2014.
- Level 3 stakeholders: participatory and interdisciplinary research process on the case studies as a way to implement dialogue between different research teams and stakeholders.

Table 1 (next page) shows the proposed list of members of the (1) International Stakeholders Advisory Board; (2) National Stakeholders and (3) Local stakeholders. Members of the different levels of stakeholders can coincide. Some were proposed from the outset. Only those stakeholders that have agreed to participate and who are already collaborating with SWAN are included in this list. It would be necessary to include names of specific people, not only institutions.

3.2. International Stakeholders Advisory Board: institutional recommendations

As we pointed out in the previous section, the International Stakeholders Advisory Board (Level 1) has to be questioned less about water issues than about the building of an international scientific organization. Valuable information will be obtained by questioning them about the viability, relevance and potential contributions of a new international scientific organization on water issues. Some of the key issues to be addressed are:

- How could a new centre/network improve the way in which they obtain water-related data and information, information analysis and practical solutions?
- What are the specific areas of water-related research areas that require more attention from the scientific community?
- How could a collaborative approach to scientific work between scholars and stakeholders from both Europe and the United States help improve water governance?

Table 1: Stakeholder classification proposal

Stakeholder level	Goals & responsibilities	Members	Team
LEVEL 1: International Stakeholders Advisory board	Advise on the structure, goals and operation of the Transatlantic Water Dialogue Network (TWDN). This consultation will be done either in writing, by phone, electronically, or personally by each member who will report back to SWAN.	Anne Le Strat, **Compagnie des eaux de Paris** Olivier Bommelaer, **OCDE** Pierre Bauby, **Association européenne du service public** Jean-Claude Deutsch, **Association des acteurs de la region Ile-de-France** Traci Case & Rob Renner, **American Waterworks Association**	CNRS
		To be determined	UA
		Mark Everard, **Environment Agency of Bristol** Patric Bulmer, **Bristol Water**	UWE
		Francesc La Roca, **University of Valencia & Foundation for a New Water Culture** Josefina Maestu, **UN Water Decade** Alberto Garrido, **Technical University of Madrid, CEIGRAM and Water Observatory of the Botín Foundation**	USE
		Geographica LTD	BAS-NIGGG
		To be determined	UNESCO-IHE
LEVEL 2: National Stakeholders	Advise on TWDN and on SWAN scientific output (Deliverables and research)	To be determined	CNRS
		David Brookshire, **University of New Mexico** Chris Scott, **University of Arizona**	UA
		Mark Everard, **Environment Agency** Patric Bulmer, **Bristol Water**	UWE
		Francesc La Roca, **University of Valencia & Foundation for a New Water Culture** Luis Babiano, **Spanish Association of Public Water Utilities**	USE
		Maya Drianovska, **Ministry of Environment and Water** Vanya Yoncheva, **National Institute of Meteorology and Hydrology** Albena Vatralova**, Bulgarian Water Association** Teodora Todorova, **Sofia Water** Veselina Kolesheva**, Geographica LTD**	BAS-NIGGG
		To be determined	UNESCO-IHE
LEVEL 3: Local stakeholders	Advise and comment on case study work both in TAMA and in partner research areas.	Ed Curley, **Pima Association of Governments** Claire Zucker, **Pima Association of Governments**	CNRS
		To be determined	UA
		To be determined	UWE
		Alfonso Cárdenas, **EMASESA** (Sevilla Metropolitan Area Water Utility) José Manuel Moreira, **Consejería de Agricultura, Pesca y Medio Ambiente** (Andalucía)	USE
		Ralitsa Kukova, **West Aegean basin Directorate** Kamelia Djanabetska, **Regional Inspectorate of Environment and Water, Veliko Tarnovo** Teodora Todorova, **Sofia Water**	BAS-NIGGG
		To be determined	UNESCO-IHE

This questionnaire also will explore questions on an innovative organization for a transatlantic academic training on interdisciplinary research of water issues. This training could be provided by European and American scholars, and it could lead to the institutionalization of a *certificate* implemented by the CNRS team inside the UA, with the contribution of the affiliated institutions of each SWAN partner. The academic activities (research, classes, etc.) led by the European visiting students and scholars in the UMI and in the UA would be recognized by their affiliated institutions. The training should also be supported by a digital platform, in order to facilitate communication between several international teams: the model of the MOOCS (Massive Open Online Classes), developed in several American universities, might constitute a new model to implement. Further discussion on the subject will take place during the SWAN progress meeting n°4 that will be held in Seville (Spain) in June 12th-13th, 2014.

3.3. Stakeholders Recommendations for the definition of scientific issues

The institutional level concerning the organization of a transatlantic dialog must include scientific issues to achieve the goals of the Feasibility Study. This level includes the stakeholders that each SWAN partner identified and contacted at the outset of the project. They contribute to the scientific work of SWAN, reviewing deliverables and other scientific outputs and participating in progress meetings. They can also provide feedback (via questionnaire or in person) to the Feasibility Study proposals. Given the financial constraints for stakeholders' mobility within the SWAN project (no allocated funds), they tend to participate in the Progress Meetings organized in each country.

3.4. Stakeholders Recommendations for the development of the local case studies

One of the most significant achievements of the SWAN Period 1 is the involvement of each team in a common case study in the Tucson area (Arizona). Students from the partner teams are recruited by the SWAN project as visiting scholars for several months at The UA. This activity, led by team 1 (CNRS) and team 2 (UA), presents several important added values:

- The case study allows linking the activities conducted inside the research Work Packages (1 to 4) by involving the partners in a practical, collaborative, and interdisciplinary work focused on water management in the local area.

- The idea of a research organization focused on the analysis of a specific case study can be developed as a basis for an international scientific collaboration, in order to bridge the gap between the recommendations of the stakeholders' committee, and the "science in practice" oriented on case studies.
- The case study initiated in the Tucson area opens new perspectives for the feasibility study, by presenting an innovative model of organization of scientific work between universities and research centres from EU and USA. This model is based on the exchange of students from different countries and disciplinary backgrounds and their collaborative participation to a common research.
- Until now, this common research has been led by scholars from the CNRS and The UA, with the participation of European students. What is at stake for the SWAN project is a stronger integration of all the other SWAN partners in this research activity, as it has been already initiated with the stakeholders' workshop on the Tucson case study in October 2013.
- The elaboration of other case studies in Europe, involving CNRS and UA scholars might be a way to strengthen the international scientific collaboration between the SWAN partners. However, it must be pointed out that SWAN funds are meant to support the visits of the European students to the UMI CNRS/UA leading to an asymmetric situation, so that additional funds should be collected in order to organize the case studies outside of the USA.

In the context of SWAN's 4th Progress Meeting, a Stakeholders' Workshop was organized at the UA in October 30th (see Stakeholder workshop report, Annex 2). Local experts, members of the UA academic community and SWAN researchers were invited to attend. The goals of the workshop were to identify key management challenges in the Tucson basin region, to evaluate and prioritize the pre-defined research questions, to identify knowledge gaps and propose new research questions, to map a list of relevant stakeholders for Tucson basin region and finally to propose a roadmap for future collaboration. Stakeholder participation did not meet expectations. However, the small turnout together with the presence of UA scholars with significant experience in the TAMA region, allowed for in-depth discussions of the different items proposed. Given the high level of satisfaction of meeting participants, a decision was made to approach future stakeholder interaction following the same model, that is, small groups of stakeholders that represent similar interests in order to allow for an open, frank and in-depth discussion of the different issues.

Stakeholders and researchers participating to SWAN identified a number of water management challenges in the Tucson basin, being some of them of common interest by both groups such as management of water demand under population growth and sustaining both human and natural systems with extremely variable water inputs. Other uncertainties like the shortages of water transfers in the CAP (Central Arizona Project) due to runoff decrease and the influence of changes in societal demand towards achieving safe yield were also remarked. In this framework, several gaps have been identified, and one of the main results of the workshop was the decision to prioritize some research questions about the emerging water management challenges in the Tucson area, the most adequate methodological tools to handle them and the major uncertainties for water management. Other research gaps that should be addressed are related to:

- Hydrology and water availability: impact in natural areas of changes in precipitation, water demand, land use, and water dynamics in TAMA system, environment and ecosystems water needs.
- Socio-ecological modelling: water management and urban needs, groundwater credit system, and connection of private well owners into water management.
- Institutional and policy analysis: format of water management in Tucson under the actual State laws and within the private/public providers' network, development of green infrastructures.
- Water food security and environmental justice: water needs for local food production, rainwater harvesting, and differences between communities.
- Communication between public and administration: institutional changes in function of water needs.
- Potential future pathways in water management and future uncertainty of the water availability.
- One of the main outcomes of this workshop was the mapping of relevant stakeholders for Tucson basin region that should be consulted for the case study.