SPICOSA

ACRONYM : **S**cience **P**olicy **I**nterface for **Co**astal **S**ystems **A**ssessment

REPORT

USING SOCIAL TOOLS IN THE SAF OUTPUT STEP

Loraine McFadden and Sally Priest

January 2011
Flood Hazard Research Centre, Middlesex University, London

**Integrated Project funded by The European Community
Under the Sixth Framework Programme
Priority 1.1.6.3
Global Change and Ecosystems**

Purpose: This discussion document was originally produced as part of WP6 (Output Step) to assist SSAs within the SPICOSA project in the identification and use of social tools.

1.   Introduction

There are a number of social tools that have been introduced early in the SAF process (Issue Identification and System Design) that are particularly useful to revisit within the Output step. The tools are clearly useful at the beginning of the Output Step and in early preparations; however they may also be directly used and referred to during the stakeholder and deliberation activities. The first of these social tools is *Institutional Mapping* (McFadden et al, 2010) which is used to explore the governance structure within a study area. In particular it is concerned with understanding the existing distribution of power within the system of interest and the interdependencies of bureaucracy and reform capacity. A second and related tool is *Stakeholder mapping* (Vanderlinden et al., 2011). This process involves the identification of the stakeholders and their relationships to each other and the policy issues of the study site. In some cases individual stakeholders will be involved, but in other parts it will be the relevant institutions (there the close relationship to Institutional Mapping) which they represent. The linkages being explored will provide insight into how the stakeholders perceive and understand the various issues, as well as their potential or actual role(s) in address them. An output of this process will be a map of the underlying issues and conflicts associated with coastal governance with specific relevance to the local issues (and in particular the selected Policy Issue; see McFadden and Priest, 2011) and importantly the ownership of these issues. A third social tool of interest is *Conceptual Modelling.* This tool allows the description of selected features of a system and how each of these aspects interrelate. A conceptual model should include ecological, economic and social components and how each of these is interlinked in relation to the selected Policy Issue including where possible the relevant directions and importance of these interconnections. The final social tools are DPSIR and CATWOE (see McFadden and Priest, 2011). These tools can be used as a basis to further explore the functional relationships between stakeholders and a given problem situation. These tools can be used in conjunction with both *Stakeholder* and *Institutional Mapping* as a structure for exploring the Policy and other system issues from the viewpoints of the different stakeholders. This text focuses on the specific examples of the social tools used in the design step: tools which we believe are useful form a systems perspective. There are clearly a wide range of analytical tools for understanding social behaviour which we have not used in the SAF protocol and you should feel free to integrated these into the output step where and when appropriate.

To best describe the value of social tools in the output step we have organised this discussion by the key roles and advantages which the application of these tools bring this final stage of a SAF process. We have organised the discussion in this way as the various tools are complimentary to each other, bringing different perspectives to bear (e.g. institutional, stakeholder and scientists' pre-judgements and perceptions) in gaining a more comprehensive view of the system. The benefits which they bring are generally thematic in nature and can be thought to reinforce a number of broad objectives. The re-use and where appropriate, redevelopment of these social tools, therefore has a number of general advantages based on three over-arching objectives:

1. **Building continuity of ideas:** Many of these social tools were introduced at the beginning of the SAF process and have been discussed and developed with stakeholders. They can therefore provide a thread of continuity through the SAF process and this has a number of advantages. Building continuity can be used to encourage stakeholders to participate in the output step. The use of concepts and ideas familiar to (or introduced by) the stakeholders in the earlier SAF steps will reinforce their role and ownership within the SAF process and can also reinforce prior learning. This objective might be particularly important if the opportunities for stakeholder engagement within the preceding stages of the SAF (the Formulation and Appraisal step) have been limited. In such instances it is very useful to consolidate and reconnect with ideas and processes shared with stakeholders in the design step.

2. **Creating better organisation: practical benefits:** From a practical perspective, the tools provide a vehicle both for the identification of the range of stakeholders who should be participating in the Output step, as well as building a deeper understanding of their interests and agendas. In addition to helping ensure that the 'right people' are participating in the stakeholder and deliberation activities, another practical benefit come from the fact that increasing knowledge of stakeholders interests and agendas provides the best foundation for the tailoring of presentation materials to fulfil the needs of the audience. Finally, social tools can also be used as a framework for organising the agenda of the stakeholder and deliberation meetings. Mapping of stakeholders and particularly conceptual modelling can provide a useful structure through which to present the simulation modelling and a vehicle for explaining how those aspects that have been able to be modelled interact with the rest of the un-modelled system.

3. **Building more meaningful science:** The key premise of the range of social tools presented for use in the SAF process is to facilitate a collaborative and deliberative approach to science and policy integration and promote the recognition of different constructions and viewpoints of the real world. This premise is very important to the Output Step and promotes ideas that can be used to strengthen the usefulness of the SAF approach to real decision-making. Social tools are not always able to be fully included within a simulation modelling approach. Using approaches which enable these social components to be integrated within the process, for example, using the conceptual model for structuring discussions of the model enables many additional aspects e.g. political pressures, management constraints, policy debates, time pressures to be incorporated. This will ensure that the discussions and deliberations undertaken as part of the Output Step are as close to the real world as possible and may increase the likelihood that decisions are taken and that science will be transferred into policy. Utilising tools that maximise stakeholder engagement and deliberation of the issues can also go some way to ensuring the legitimacy of the process and ensuring a fair and equitable approach.

Each of the tools can be considered as separate entities and a short summary of each of the specific tools in term of roles within the output step, and the key advantages of using the tool, can be viewed in the table provided at the end of this document. The following sections focus on the thematic objectives and benefits from using the 'toolbox' as a series of interrelated tools and approaches.

2. Theme 1: Building continuity of ideas

Many of these social tools were introduced at the beginning of the SAF process and you have been encouraged to discuss and develop these with stakeholders. This stakeholder interaction is vital from a knowledge perspective that is, arguably those working within the different elements of the system have a clearer idea of how these elements functions and it also gives insights into the perceptions and ideas which make the Policy Issue relevant (or not) to the stakeholders. However, most relevant to this theme is the fact that this joint activity provided a focus for initial discussions, and the creation of joint products, provided the beginnings of the ownership of the process amongst the stakeholders. Re-visiting within the Output step and refining these tools which stakeholders have helped to develop (e.g. is there anything missing? Has anything changed? Does it usefully capture all components and viewpoints?) creates incentives which encourage stakeholders to participate in stakeholder and deliberation meetings and other activities. Hence, as discussed in the introduction, the integration into the Output step of concepts and ideas which are familiar to the stakeholders will help to reinforce their role and ownership within the SAF process as well as reinforcing prior learning. You might consider for instance focussing on the key linkages that were identified through the conceptual

modelling or using the stakeholder issue mapping as a focus to re-explore and reinforce the functions and responsibilities of the different actors and their relation to different management options. This reinforcement of ideas is particularly important if the opportunities for stakeholder engagement within the preceding stages of the SAF (the Formulation and Appraisal step) have been limited.

These tools might also be effectively used in the Output Step to encourage new stakeholders to participate or re-engage stakeholders who exited the process. Both institutional mapping and stakeholder-issue mapping should clearly illustrate where these non-engaged stakeholders are situated within the system, how they relate to other stakeholders and the issue and importantly how they might relate to, or have responsibilities for, different management options. By using these mapping tools to focus attention on their position, and the position of stakeholders who are participating, therefore may reinforce their importance to the issue and illustrate how the results of the SAF process might be relevant to them and their activities.

The idea of revisiting and revising the tools is particularly important to the output step: social relationships are not static (so they might have changed since the beginning of the design step) and there might be a real chance that the model itself has changed in the process of moving from the Design through to the Output step and this might in turn require the various social tools to be updated. Ideally scientists should refine the tools throughout the SAF process, for example, updating the conceptual models and if responsibilities have changed or when new information has become available understanding the system and its interconnections better. In these cases it is important that this process of refinement is explained, and where possible undertaken with the input of the stakeholders.

Utilising tools that maximise stakeholder engagement and facilitate effective deliberation of the issues possible can go some way to ensuring the legitimacy of the process and ensuring a fair and equitable approach. It is important to demonstrate the transparency and equability of any approach and the use of these tools enable this to be visualised.

As well as providing reminders and a reinforcement of prior learning, social tools might also be used for structuring parts of the Output Step to show more clearly the relationships and flow of knowledge between the various SAF steps. The conceptual model developed in the Design Step could provide a clear structure and background information for the discussion of the results, scenarios and potential management interventions. A SAF user might use the conceptual model to illustrate those components which have been incorporated within the simulation model, those elements that are outside of it and how they interact. In this way, the model can continue to serve as a linking mechanism between the beginning of the SAF process and the presentation of the outputs.

3.   Theme 2: Practical benefits

From a practical perspective, the tools may assist in a number of areas when preparing for and conducting the Output Step within the SAF. One of the key roles of these tools is the identification and greater understanding of those stakeholders who should be participating at this stage of the SAF. Hence, at the beginning of the Output step stakeholder mapping, institutional mapping and CATWOE/DPSIR provides a basis for the identification of participants within the output step's stakeholder and deliberation forum. Identifying, and importantly, mapping the stakeholders in relation to other stakeholders and the Policy Issue of interest, develops an inclusive picture both of the policy issue and of those stakeholders affected by the coastal problem in question. This permits the clear and early identification of the broadest range of interested parties and provides the best opportunity for the widest range of stakeholders to be represented. Having wide representation of interest

increases the likelihood of effective feedback on research results (whether this is the broadest range of feedback or from the key stakeholders) and a greatest legitimacy of the outputs. Revising and revising the various mapping tools in the Output step allows a process of reflection about the issues likely to be raised in the stakeholder and deliberation meetings and helps to facilitate the process of reconsidering the relationships among stakeholders that have been noticed throughout the process, and about the concepts and language used by different parties. This is very important and helpful preparation.

In addition to the task of identifying who should be now invited to participate in these activities, all of the social tools enable a greater understanding of stakeholders' interests and various agendas. More comprehensive understanding of those with stakes within the coastal zone and to the relevant policy issue enables a deeper appreciation of the inter-relations and agendas of different stakeholders and where conflicts are likely to exist. Without this information the stakeholder meetings will be poorly informed and therefore arguably less effective. For instance, an institutional map focuses on the rules which govern actors (e.g. who does what) and is a guide to action. Differences can be concealed in stakeholder platforms (e.g. a deliberation forum) that are important in political processes of policy-making. The institutional mapping exercise gives those convening the deliberation process important context information regarding stakeholders' and organisations' relationships to each other. Similarly, CATWOE enables a better understanding of different perceptions and different worldviews re-contextualising the engagement process in the Output Step and this tool in particular focuses attention on identifying those stakeholders who have direct interaction with the system and therefore the ability to affecting or veto change.

Within a real-world decision-making situation, institutional and stakeholder mapping might also bring practical advantages from making information on institutional and development history as well as the management legacy accessible. This could help to avoid inefficient use of resources both in meetings and prior to the meetings discussing unfavourable options which may have already been rejected or failed in their implementation. In addition, it should also serve to assist in avoiding the repetition of previous mistakes.

The practical benefits of reengaging with the social tools also relate to the tailoring and presentation of materials for the output step. As described above, greater understanding of the stakeholders' interests and varying agendas provides a useful foundation for the tailoring of presentation materials to fulfil the needs of the audience. The relationships identified using institutional mapping can provide insights into the roles and functions of the different stakeholders and this can assist in the development of presentations or visualisations by taking into account the different ways in which stakeholders learn, absorb and translate information. The stakeholder and institutional mapping can be used to not only identify the needs of the organisations represented, but also identify the backgrounds of the individual representatives so that the preferences of both are represented. The conceptual models may be particularly useful as a structure through which to present results in a deliberation forum. A SAF user might use the existing conceptual model, which provides information about direction and strength of relationships and interconnections between different elements of the system, as a baseline but then create new conceptual models tailored to reflect each of the different management options. This is a very visual way of presenting the impacts of often quite complex results and should enable stakeholders to easily and quickly view the benefits and limitations of any potential management option. Both stakeholder-issue and institutional mapping should permit the identification of different groups of stakeholders, for example, those who undertake scientific research or monitoring, technicians, or stakeholder with policy-making responsibilities but little technical knowledge about the issue. These may have different requirements, not only in terms of the best vehicles for effective knowledge transfer but also in terms of what they hope to achieve from attending the stakeholder forum. Presentations and materials should therefore be produced according to the

audience requirements. Exploring the range of different stakeholder groups and the specific interests and needs of each, might also help decide whether more than one meeting is required to present, explain and discuss results. It is important to bear in mind however that whilst such sub-meetings might be necessary, particularly for political or other sensitivities, they should in no way negate the need to have an inclusive deliberative forum.

4.   Theme 3: Building more meaningful science

Knowledge is mediated, situated, incomplete and contested and in most models of social phenomena, relationships and flows are much more intangible than in economics or in quantitative physical sciences. The social tools presented within the SAF approach support model development by understanding the 'meaningful context' and patterns of social interaction. This is the primary objective of the application of social tools within the SAF process.

In building this meaningful context it is important to recognise that coastal issues and stakeholders' interactions are best viewed like a system: a complex whole (Vanderlinden et al., 2011) comprised of parts that may be individually irrelevant, but which combine and interact to give expression to the meaningful whole. This focus on relationships and interactions is important for effective facilitation of the Output Step and the function of social tools in facilitating knowledge of relationships has been highlighted in previous sections. The introduction summarises the fact that the basis of social tools presented is on a collaborative and deliberative approach and recognition of different constructions and viewpoints of the real world. This premise is very important to the Output Step and promotes ideas that can be used to strengthen the usefulness of the SAF approach to real decision-making.

Institutional mapping has an important role within this context of understanding the interactions within the system which give expression to the meaningful whole. It highlights that certain features of the social system (e.g. rules, policies, laws) will be encountered at one point or another in an impact-response chain of actions and/or a decision-making process. It is these interactions or relations through society's laws, institutions, government, as well as informal structures, which provide insights to the functioning of the 'social system'. In conjunction with other tools such as CATWOE/DPSIR and conceptual modelling, institutional mapping illustrates those actors, activities and environments that a decision may impact and any subsequent impacts, thereby facilitating the selection of a management option. Similarly, these tools might also be used to structure the debate within the deliberation forum and the distributional consequences of the adoption of different measures.

The institutional mapping exercise gives those convening the deliberation process important context information regarding the space that policy-makers have to take action and different organisations' relationships to each other. In addition, identifying the formal power relations and management responsibilities will lead to a better appreciation of the constraints and opportunities for decision-making and management and this leads to more 'meaningful strong science'. For example, identifying who has the ability to influence decisions, who makes decisions and who has right to tell who to do what, allows the presentation and deliberation of options for management to be 'intelligent' to the dynamics of the stakeholder group. Building on this point, institutional maps can be used to identify the specific veto points where necessary change or reform within the system could be blocked or accelerated (Wimmer et al., 2002). Actors sitting at these veto points in the stream of decision making and implementation can re-interpret a decision already taken by redefining the field of application (introducing 'exemptions' etc.) or by giving it another meaning; they can revert a decision by vetoing it formally; they can block effective implementation informally by ignoring the decision, by linking implementation to additional conditions, by delaying action etc. The institutional mapping exercise also allows key institutional changes to be identified which are necessary to prevent

coordination and implementation failure by, for example, improving informational flow and bypassing veto-points through institutional change.

Context and scale are very important when considering the use of the simulation modelling results and selecting management options and the conceptual model is a particular useful tool for embedding the simulation model within its meaningful context. A conceptual model is flexible enough to identify the various scales at which different elements of the system may function and can facilitate a discussion of the influence of scale on the model results. CATWOE is a tool that effectively explores different viewpoints of various stakeholders and how these relate to various functional roles within the system and institutional mapping highlights the interconnections and relationships between these different stakeholders, particularly in terms of the distributions of power. SAF users should therefore return to these tools prior to a deliberation forum as they serve to highlight potential opportunities for change or conflicts and enable a proactive response. The maps or tables produced might also be presented to stakeholders within the deliberation forum to highlight the ranges of opinions and to provide a basis for the discussion of different options and for raising different viewpoints on their suitability for implementation.

The points in the previous paragraph emphasize an important take-home message: social tools should also be seen as a means to an end, which is to have a well-structured and coherent debate about a problem situation in order to improve it. This is highly relevant to the scientist and stakeholder deliberations within the output step. The process of revisiting and revising the conceptual model (or models) in the output step can be particularly useful in this respect. A discussion of conceptual models can be effectively used to discuss what are desirable and feasible changes in human activities for improving the problem situation: thinking about the substance of the intended change itself (i.e. what form of change in the use of the physical environment is required) but also about the additional things you normally have to do in human situations to *enable* change to occur (Checkland, 1981). Therefore the formulation of conceptual models can be used to initiate and orchestrate a discussion about the range of descriptions of plausible futures and the real-world actions that would be required to enable change for such possible future system states.

5.   References

Checkland, P. (1981) Systems Thinking, Systems Practice. John Wiley and Sons; Chichester, UK.

McFadden, L., Priest, S. and Green, C. (2010) Introducing institutional mapping: A guide for SPICOSA scientists, Spicosa Project Report, London, Flood Hazard Research Centre, Middlesex University.

McFadden, L. and Priest, S. (2011) Guidance for identifying the Policy Issue, Spicosa Project Report, London, Flood Hazard Research Centre, Middlesex University.

Vanderlinden, J-P., Stojanovic, T., Schmuëli, D., Bremer, S., Kostrzewa, C. and McFadden, L. (with others) (2011) The SPICOSA Stakeholder-Policy Mapping Users' Manual, Spicosa Project Report, Guyancourt: Paris, Université de Versailles-Saint-Quentin-en-Yvelines.

Wimmer, A., de Soysa, I. and Wagner, C. (2002) Political Science Tools for Assessing Feasibility and Sustainability of Reforms, A research paper prepared for the Independent Evaluation Office of the International Monetary Fund, Center for Development Research, University of Bonn, Bonn, May 29, 2002.

Institutional mapping	
Role within the output step	Your institutional map focuses on the **rules** which govern actors (e.g. who does what) and is a **guide to action**: therefore it should play an important role in the output step which focuses on tackling the coastal system and **returning to the 'real world'**. In conjunction with stakeholder mapping, at a basic level revisiting institutional mapping enables those with **prescribed roles and responsibilities** in the coastal zone to be **identified** for the purpose of participating in the stakeholder The map is a **prediction tool**; highlighting that certain features of the social system (e.g. rules, policies, laws) will be encountered at one point or another in an impact-response chain of actions and/or a decision-making process. It can also be viewed as a **prescriptive tool** assisting the identification of those aspects of the system that can be changed more easily by policy making and the variables which are more difficult to influence; thereby identifying quick changes and those where long-term planning is required. This is important information for discussing and agreeing most **feasible** management and governance option scenario(s). The map can provide some perspective on **differences** between the documented policies or the **model generated policies** and how these policies will likely be implemented in the **real world**. For example, the analysis of informal rules (e.g. cultural views of justice, equity) shows how well formal rules operate in practice. This provides a clearer basis for identifying **best options** for action and change in the system towards more sustainable coastal management.
Value/Key advantages of including the tool.	**Differences and areas of common ground** which are potentially concealed in stakeholder or deliberation forums and which are important in the political process of policy-making may be identified by utilising the maps. The institutional mapping exercise gives those convening the deliberation process **important context information** regarding the space that policy-makers have to take action and different organisations' **relationships** to each other. Identifying the formal **power relations** and **management responsibilities** will lead to a better appreciation of the **constraints and opportunities** for decision-making and management and this leads to more 'meaningful strong science'. For example, identifying who has the ability to influence decisions, who makes decisions and who has right to tell who to do what, allows the presentation and deliberation of options for management to be 'intelligent' to the dynamics of the stakeholder group. A better understanding of the stakeholders and **their roles and functions** assists in the tailoring of presentational materials within the output step and thereby helps the team developing the presentation to take into account different ways in which stakeholders learn, absorb and translate information. Information on **institutional and development history** as well as the **management legacy** helps to avoid **inefficient use of resources** both in meetings and prior to the meetings discussing unfavourable options which may have already been rejected or failed in their implementation. In addition, it should also serve to assist in avoiding the **repetition of previous mistakes**.

Stakeholder mapping	
Role within the output step	At the stage of the Output step stakeholder mapping provides the basis of the **identification of participants** within the output step's stakeholder and deliberation forum. This should be used in conjunction with the institutional mapping and CATWOE/DPSIR to **understand fully those with stakes** within the coastal zone and to the relevant policy issue; gaining a deeper understanding of the **inter-relations** and **agendas of different** stakeholders and where conflicts are likely to exist. Without this, information the meetings are poorly informed and therefore less effective.
Value/Key advantages of including the tool.	Utilising tools which permit the **clear** and **early identification** of the broadest range of people will provide the best opportunity for the widest range of stakeholders to be represented, thereby increasing the **likelihood of effective feedback** on the research results (whether this is the broadest range of feedback or from the key stakeholders) and a **greatest legitimacy** of the outputs Similarly, using the tools to identify all those with relevant interests (and subsequent representation within the process) may lead to **decision-making occurring** and the **policy utilisation** of the research findings. Has the practical advantage of enabling the **targeting of presentations** to all stakeholders – and the identifying the need for more than one meeting if deemed necessary.
Selection of the Policy Issue	
Role within the output step	An understanding of how the policy issue was selected (in terms of both who was involved and how the selected issue interacts with other issues in the coastal zone) provides essential **background information for discussing the research outputs**. This will also return the discussion back to the original aims of the SAF and the ecological dysfunction of interest and therefore 'close the loop' and may enhance the transference of the project findings and recommendations into policy and action. Recognition of the **impact that the choice of the Policy Issue** has had upon the **modelling results**, especially in relation to the different ESE components that have been able to be modelled. The PI selected may mean that **different elements of the system may be emphasised** over others and therefore this needs to be understood when delivering the SAF output.
Value/Key advantages of including the tool.	Re-discussion of the PI (and its selection) should maximise engagement in the Output Step as it reinforces **the prior role of the stakeholders** in this selection and their **place as decision-makers** (assumes that they were effectively integrated at the beginning) thereby **reinforcing prior learning and prior engagement.** For those stakeholders who were not effectively integrated at the beginning or interested parties who have subsequently become involved, explaining the reasons for the selection of the PI (especially when the priorities may overlap with theirs) not only provides **essential background information**, but may be used to **attract interest and participation** within the output step – thereby **broadening engagement.** Reflection on the influence of the Policy Issue on the outcomes of the SAF provides both a **context**, and in some cases a **justification**, for the decisions made when modelling. **Explaining and justifying** the choice of the policy issue and its **boundaries** may help to manage the **expectations of stakeholders** about study outputs and decisions able to be made from these results.

Conceptual modelling	
Role within the output step	The conceptual model developed in the Design Step should provide a **clear structure** for the discussion of the results, scenarios and potential management interventions (e.g. scientists can use the conceptual model to illustrate those components which have been incorporated within the simulation model, those elements that are outside of it and how they interact). It can therefore be used to **structure the debate within the deliberation forum**. The model can serve as a **linking mechanism** between the beginning of the SAF process and the presentation of the outputs. In some instances scientists may have selected to refine their original conceptual models throughout the SPICOSA process and in particular on reaching the Output step. In these cases it is important that this **process of refinement is explained**, and where possible undertaken with the input of the stakeholders. A conceptual model is flexible enough to **identify the different scales** at which different elements of the system may function. This permits a discussion of these scales and their **influence alongside the model results.**
Value/Key advantages of including the tool.	If stakeholders were actively involved in the production and validation of the conceptual modelling then the use of the conceptual model may **legitimise the process as well as reinforcing prior learning.** The model should provide the **background information** for the introduction of different management options (e.g. what action is required; who needs to take these actions and what attitudes might need to alter in order to achieve these changes). Using the conceptual model that has been developed can clearly illustrate those actors, activities and environments that a decision may impact and any subsequent impacts, thereby **facilitating the selection of a management option**. The inclusion of scale is valuable to the Output step as for deliberation to be most effective and for management options to be adopted, the different **geographical and temporal scales of management need to be recognised.**
CATWOE/DPSIR	
Role within the output step	CATWOE enables a **better** understanding of different perceptions and different worldviews re- contextualising the engagement process in the Output Step This tool in particular focuses on those stakeholders who have **direct interaction with the system** and therefore on **affecting change**.
Value/Key advantages of including the tool.	Understanding the different subsections of opinions better both prior to and during a deliberation forum, may serve to highlight **potential opportunities for change or conflicts and enable a proactive response**. It is useful when **identifying the problem**, prompting thinking about what might be achieved and also when seeking to implement the solution, assisting consideration of the impacts on the people involved.

Table 1:   A short summary of the roles and advantages of specific social tools used in System Output.