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LEARNING AND ACTION ALLIANCES: A TOOL FOR FLOOD RISK GOVERNANCE IN COASTAL AREAS. THE CASE OF RETHYMNO, CRETE

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ABSTRACT

Coastal floods are among the most harmful natural hazards affecting urban areas adjacent to shorelines. Rapid urbanization combined with climate change effects and poor governance structures lead to a significant increase in the risk of coastal communities in terms of their livelihoods, the socio-economic structure and technical infrastructures. Major problems are slow and un-adaptive communication, problem identification, and decision making processes. Hence societies are challenged to reform flood management systems to cope with the altered threats by implementing more efficient decision making processes and – building on this - find and implement preventive solutions. Increased stakeholder involvement is required in order to achieve effective flood risk governance, flexibility in crucial decision making and preparedness of local societies to manage extreme events. Here Learning and Action Alliances (LAAs) - in the literature discussed as supporting building capacity, trust, and legitimacy that are needed to solve wicked problems as flood risk management – have been chose as a suitable tool for stakeholder involvement. Thereby the set-up and facilitation of a LAA goes further than other exercises of that kind. Building on an as normative as possible stakeholder analysis during the scoping phase the development of shared visions among the stakeholders is key to the process. This paper presents the establishment of a Learning and Action Alliance (LAA) in the area of Rethymno city in Crete, Greece, as a tool for supporting, enhancing, and sustaining participatory processes in the context of flood risk governance. The LAA aims at generating and applying knowledge to make the city's community more resilient to flood events. The main corner stones of this process will be intensive work in the fields of capacity building, and the enabling of the engagement of key stakeholders and (members of) the civil society. Finally the establishment of an alternative, and more resilient approach in flood management could be reached. Towards this goal the LAA will be organized on a democratic basis of equity, knowledge sharing and promotion of innovation. Participatory procedure methods (applied during extended workshops) will support the evolvement of the LAA along three axis: establish facts, create common images and set shared ambitions. The final aim of the LAA is the development of a viable roadmap for flood risk management with the consensus of most stakeholders.

Rethymno city is one of the 7 EU case study areas of the PEARL FP7 project (to be completed in 2017) that will examine and apply the method of LAAs in order to strengthen flood risk governance.

Keywords: LAAs, flood risk governance, flood management, participatory process, stakeholder involvement

1. Introduction- background on learning and action alliances

Coastal floods are among the most dangerous and harmful natural hazards affecting urban areas adjacent to shorelines. Rapid urbanization combined with climate change and poor governance means a significant increase in the risk of local surface flooding coinciding with high

water levels in rivers and high tides or storm surges from the sea, posing a greater risk of devastation to coastal communities. The threats posed need to be addressed not just in terms of flood prediction and control, but taking into account governance and socio-economic issues.Ashley R. M. *et al*. (2012) (referring to CEA, 2007, Commission of the European Communities, 2007 and 2009) state that urban floods are increasing across Europe (IPCC 2014). Furthermore, the last years there is an obvious shift in flood management from a technocratic approach to a more social one. A change which is (among others) mentioned as a shift from flood defence to flood risk management (Newman R. *et al*. 2011; Pahl-Wostl C. 2006).More and more scientists and experts highlight that collaborative planning needs to integrate flood risk management and urban planning(Birkmann Jörn *et al*. 2010). To achieve this, there is a need for changing the practices in the culture of engineers, professionals, key stakeholders and decision makers. Here active learning through the establishment of Learning and Action Alliances (LAAs) seems to be an appropriate way to help different stakeholders (individuals or/and organizations) with different perspectives on risk to break their traditional approach and be part of an interactive social learning procedure (Ashley R. M. *et al*. 2012).

Batchelor C. and Butterworth J. (2008) define a Learning Alliance (LA) as "a group of individuals or organizations with a shared interest in innovation and the scaling-up of innovation in a topic of mutual interest". Newman R. *et al*. (2011) add Action as a second core topic to stress that an alliance like this is not just aiming at social learning but also at enabling the group and its members to take targeted action (Van Herk S. *et al*. 2011). The group itself consists of stakeholders who can be considered as "[…] anyone with an interest in a particular decision. This interest can stem from the potential to influence the decision, and/or from the potential to be influenced by the decision. Stakeholders can act as individuals or as representatives of a larger group." (Gardner John *et al*. 2009).Decision makers all over the world have to deal with more and more complex challenges which are often referred to as wicked problems in the literature (Ashley R. M. *et al*. 2012; Lach D. *et al*. 2005). But most decision making processes still exclude people or organizations, who are legally not or just indirectly involved in, from both the process and the decision itself, as also from the urban planning. Taking this into account and open the discussion and decision making process to all entities that are concerned is the target of setting up LAAs. The envisioned result of the work of a stakeholders group coming together under the umbrella of a LAA is clearly summarized by Van Herk S. *et al*. (2011) "[…] The organization of a LAA should enable the development, exchange and application of knowledge". In this context learning as well as knowledge have a very high importance. The traditional approach in terms of knowledge production has been linear, or so called "mode one" type of knowledge production as Lundy Mark *et al*. (2005) state referring to Gibbons M. *et al*. (1994) analysis. Under this analysis, knowledge is produced by researchers or experts and transferred to those who need it in order to innovate or change, by ignoring several aspects like social and institutional learning, capacity development, dynamics of multiple sources of knowledge (Lundy Mark *et al*. (2005) referring to Hall A.J. *et al*. (2004)). Lundy *et al*., based on experience from the Rural Agro-enterprise Development Project of the International Center for Tropical Agriculture (CIAT), argue on the reasons that the above mentioned linear approach in knowledge development fails to deal with complex issues, and it seems unsuitable to give solutions to events, risks or problems that occur in a rapidly changing complex environment. The number one reason of failure seems to be that knowledge is generated by experts or researchers without the involvement of stakeholders who need it or will use it. According to this approach, the Learning Alliances comes to act as a "mode two" type of knowledge production based on "[…] the interaction of multiple actors with multi-layered sources of knowledge to cope with the complexity of fostering continuous technological, social and institutional innovations to respond to rapidly changing contexts and demands" as Lundy Mark *et al*. (2005) states referring to Gibbons M. *et al*. (1994).

2. The Rethymno case study - problem description
Rethymno city in Crete is one of the seven coastal EU case study areas that are examined within the PEARL FP7 project. Part of this is the establishment of a local LAA in order to

strengthen flood risk governance by enabling active learning and involvement of all key stakeholders and civil society. Rethymno city is sited at the Region of Crete in Greece and specifically extends along the north coast of the island, with a population of 32.468 inhabitants (Census 2011), where commercial, administrative, cultural and tourist activities are being developed (Makropoulos C. *et al*. 2015). Multiple stressors have always posed flood threats for the city of Rethymno causing an ongoing risk to its residents, their homes and business, and the public infrastructure. High N-NW winds with great fetches, sea level change and storms surges result in violent wave overtopping of port facilities, erosion and sediment transport. Additionally, the flow of storm water through the city, the large number of streams that cross it and the rapid transition from the steep slopes at the upstream rural areas to the flat urban zone imposed significant pressure to flood defences throughout the years and caused severe damages at the urban functions (Archontakis D. 2006; Archontakis D. 2013).Even though mostly engineering measures have been implemented, so far, as flood defence for Rethymno, multiple forces from the urban and coastal area still result in flood problems. Hence there is a growing realisation of the society that focusing exclusively on engineering mitigation measures and treating problems in an ad hoc, isolated fashion is no longer a viable option. Therefore flood risks need to be addressed not just in terms of prediction and control, but also by taking into account governance and socio-economic issues (Makropoulos C. *et al*. 2015). The LAA in Rethymno will be used as a tool for supporting and enhancing the participatory process in flood risk governance, by enabling the engagement of all key stakeholders including the civil society, aiming to go beyond usual stakeholder involvement. The initiative aspires to generate and apply knowledge towards capacity building for flood resilience of coastal communities, and new alternatives on how this knowledge can be successfully incorporated in urban development procedures (Van Herk S. *et al*. 2011; White I. 2008).

3. Methodology

The emerging concept of LAAs is utilized under several research and development projects the last years (SWITCH, MARE, SAWA, PEARL) and it seems that "[…] LAAs are becoming a very popular vehicle in delivering innovation as they provide new forms of partnerships and they recognize that the challenges faced today require a change in thinking and working" (Dudley E. *et al*. 2013). Analysis of procedures, methodology and results from the several cases (Germany, Netherlands, UK, Norway and Sweden, SAWA and MARE projects cases), where LAAs were established in order to deal with flood risk or Integrated Water Management, proved that actually there is no single and ideal model or form of such an initiative (Ashley R. M. *et al*. 2012). Each LAA itself constitutes a dynamic organization and its evolution depends on the participants' perspectives, the local conditions, the aims and objectives that the LAA will set, the available funds and finally the rewards that participants will gain. Most individuals who participate in LAAs commit their time and skills on voluntary basis without having any direct benefits for themselves. Consequently, their commitment should be clearly rewarded in terms of knowledge and innovation. Following the analysis of MARE and SAWA projects' outcomes Dudley E. *et al*. (2013) identify that although all LAAs are unique and different from each other they all have a three stages life cycle: a. establishment, b. functioning and c. sustainability. In each of these stages, the formal decision making processes play a crucial role and define how effective an LAA will be in terms of innovation and change.In the following these three steps will be outlined and explained against the background of initial work carried out in the context of the Rethymno case study.

3.1. Establishment phase – Stakeholders analysis

This initial stage refers to the LAAs set up. In Rethymno an initial group needed to be formed. The research team went through a thorough stakeholder analysis in order to identify the key decision makers and organizations that are involved in flood management and urban planning in Rethymno. The individuals or / and organizations that are capable and interested at the same time in participating in an alliance should be identified and approached. As a second step targeted interviews with stakeholders have been conducted in order to gain aspects and

opinions from different parties. As a result of the stakeholder analysis and the discussion with stakeholders a Sociogramm of Rethymno was created. It displays the key stakeholders, ways of interaction, and highlights the gaps in communication and knowledge sharing. The main point emerged was exactly the lack of interaction among different stakeholders and barriers derived by different levels of hierarchy or conflicting interests (Figure 1).
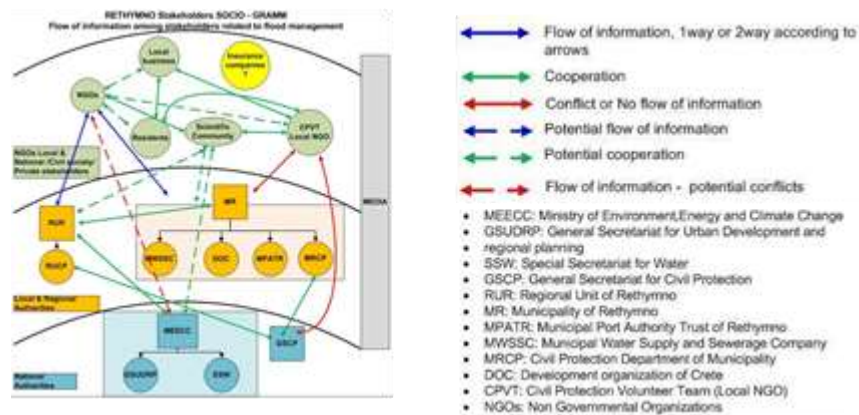
Figure 1: Sociogramm of Rethymno city. Flow of information among stakeholders related to flood management

3.2. Functioning phase

Once the members of the LAA are defined the organization starts to set its own establishment procedure by designating the challenges and interests, the structural function and legitimacy of the alliance, levels of the participants' time and skills commitment, goals in terms of innovation and influence of the standard decision making procedures. The Rethymno LAA is going to be organized on a democratic basis of equity, knowledge sharing and promotion of innovation, while the participants will be both key decision makers and citizens, all involved on a voluntary basis.

Participatory procedure methods will support the evolvement of the LAA along three axis: establish facts, create common images and set shared ambitions (Van Herk S. *et al.* 2011). By establishing facts, coherent knowledge that reduces uncertainty is generated by the parties involved. Creating images supports frame reflection in which parties identify their view of reality and discuss it, look for images or meanings that they share, and create renewed and more creative images as a result of the interaction. Shared ambitions support the negotiations on aspirations of the parties towards implementation.

These will be juxtaposed to the three lines of Kingdon's stream model (Kingdon J.W. 1984) that Van Herk S. *et al.* (2011) propose to understand complex decision making processes related to urban development and planning. It defines decision making as the interconnection of three concurrent streams: problems, policies/solutions and politics or participants. This creates a matrix where the three groups of interactive activities of a LAA can be located in: i) System analysis; ii) Collaborative design and iii) Governance. In conclusion it can be stated that the LAA is organized in order to: i) Analyse and address problems; ii) Develop and propose solutions and iii) Influence politics by seeking political commitment or bringing participants together.

During the functioning phase, a clear common vision is essential to be created in terms of understanding the problem and acting towards the emergence of potential solutions and innovation (Ashley R. M. *et al.* 2012). In this way the participants will be able to commit themselves in a specific goal. Once the LAA is established, clear roles need to be defined within the alliance. Limited time of participants is usually a problem since their avocation and commitment is on voluntary basis. To this point allocation of roles and tasks will help to support an effective function of the alliance. Experience from other projects (MARE, SAWA) has shown that each LAA need to include leaders, facilitators and champions. Leaders are the ones who

will inspire and motivate participants to learn and act in order to deliver the alliance's visions. Facilitators ensure that tasks and activities of the alliance is in a well function mode. Finally, champions are all the members of the LAA and they try to deliver the alliance's vision and innovation message to the wider world, as Dudley E. *et al*. (2013) supports referring to Van Herk S. *et al*. (2011). In addition to the clear allocation of roles there are some key principles or primary characteristics as named that ensure the successful functioning of a LAA: delivering on the visions on terms of legitimacy, mutual respect and trust. Since participants have different backgrounds and represent different organizations, they need to share their knowledge and experience in a free way, out of entrenched positions and negotiation mood (Pahl-Wostl C. *et al*. 2007; Van Herk S. *et al*. 2011). Personal and organizational barriers and conflicts (usually derived by the standardized decision making procedure) need to be overcome so the participants will be enabled to really listen to the others, present their personal opinion and be open to produce new knowledge and finally innovation (Dudley E. *et al*. (2013) based on the experience by the SAWA Wandsee alliance).The main tool for the success of the LAA function will be interactive participatory workshops that will aim at spotting the people and institutions that are affected by the floods, that are responsible for early warning, evacuation, disaster management, etc. and that are in charge of (future) planning processes. The workshops will be structured in a way to enhance the interaction among stakeholders and enable visioning. Several techniques will be used, from round tables and open discussions to interactive social games and role playing in order to gain engagement and commitment of stakeholders and to achieve the final aim which is the creation of a common vision. In order to reach these goals, there is the need of setting up a frank atmosphere where representatives from different organizations will be able to overcome their personal, structural and institutional barriers in order to interact, gain knowledge, share experience and finally create a common vision under a feeling of mutual trust. Workshops need to be attractive and not boring to the participants, especially during the beginning of the LAA functioning. Since participants will be engaged on a voluntary basis, they do not have clear tangible profits from this procedure. All benefits are in terms of knowledge and innovation (Dudley E. *et al*. 2013). Consequently they need to have the feeling "it worth's to spend my time here". Blended workshops with a mix of interactive activities usually are more interesting for participants than plain speeches or presentations (INMARK EMF 2010).At the same time a web based learning and planning platform that will be developed will support the running of the LAA and will enhance the interaction among stakeholders. The members of the LAA will have the opportunity not only to interact and share knowledge but also to investigate/visualize their impacts under different scenarios. What if questions and visualization of effects will support them so they will be able to experiment in a safe environment and finally intervene to flood management and relative decision making process (Makropoulos C. *et al*. 2015).

3.3. Sustainability of the LAA
The sustainability stage substantially refers to the continuation of the LAA function after the official end of a project that supports it. So far the established LAAs were initiatives taken under the framework of a specific project (MARE, SAWA, PEARL, etc.). These LAAs functioned in a more or less successful way during the project's life-cycle but when this was over the alliance's sustainability was not ensured at all. *"Maintaining interest is a major requirement of continuing LAA activity […]"* as stated by Dudley E. *et al*. (2013). Although active learning is a very good motivation and reward at the same time for all professionals and decision makers the experience from past projects has proved that maintaining the participants' interest is best achieved through a project focus, so the participants are committed to specific aims and objectives. The availability of funding is also crucial since it will define the future action of any alliance. To this end the LAA itself at some point and while it has ensured the successful functioning should try to find potential sources of funding in order to ensure sustainability (other research or development projects, private or governmental funds, donations, etc.).

4. Expected outcomes

The Rethymno LAA will attempt to act as a bridge among science, politics and key stakeholders to gain insights into local decision making processes, to communicate the constraints, needs and goals of single stakeholder and to reach finally a surrounding that guarantees decisions that are built on a broad discussion on flood management and relative risks in coastal zones. The final aim is the development of a viable flood risk management roadmap for Rethymno city with the consensus of most stakeholders and civil society. This roadmap will act as a strategic plan for the city and will incorporate both results from PEARL's research activities in Rethymno and outcomes/input/suggestions from the local community and stakeholders as derived from the LAA experience. Interventions in standardized decision making process, present practices and methods and integration of flood management in urban planning with a simultaneous shift from flood defence to flood risk management approach are the upper goals of the initiative.

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