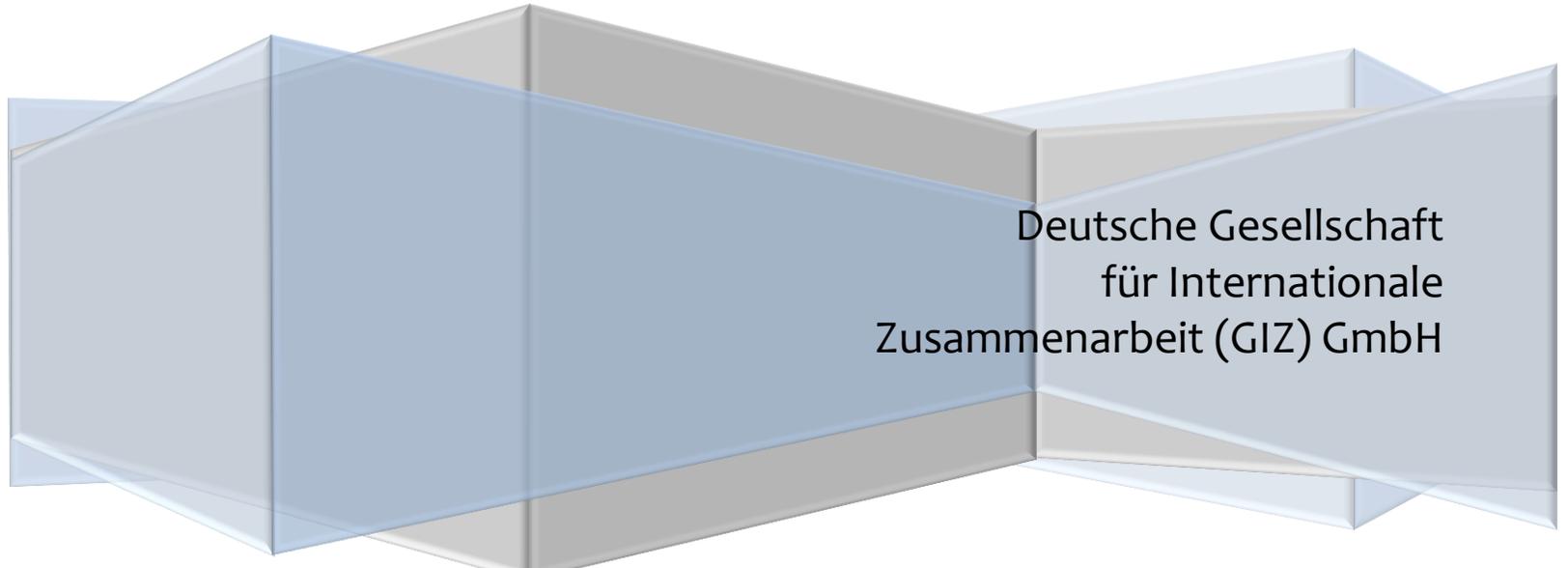**KNOWLEDGE MANAGEMENT AS A TOOL FOR SOCIAL LEARNING: THE ROLE OF THE GIZ REGIONAL PROGRAMME 'ADAPTION TO CLIMATE CHANGE IN THE WATER SECTOR IN THE MENA REGION' (ACCWAM)**

THE ARAB REGIONAL CLIMATE CHANGE KNOWLEDGE HUB

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Abstract

In this paper I will examine multi-loop learning within the context of virtual learning tools. I will analyze the different learning loops, and explore what it means for social learning in the context of climate and water governance. I will first look at the Regional Knowledge Hub (RKH) and assess whether the aims and assumption of the hub are contributory to creative and critical reflection. Secondly, I will examine the role of boundary organization in the learning cycle, in this case the ACCWaM program. Finally, I argue that in order to foster innovation and multi-loop learning in climate and water governance, facilitation is needed by knowledge brokers and cannot be done alone with a single tool such as virtual platforms.

Background

During periods of abrupt change, adaptive governance and social learning have been identified as necessary for governing social ecological system (Folke et al. 2005; Pahl-Wostl 2007b; Pahl-Wostl 2009). Social learning is thus a reflexive process of learning and interacting that occurs both vertically and horizontally across different networks, resulting in transformation of the system. Taking a systems thinking approach, we see that decision made at one level irrevocably affect the outcomes on another level since no decision is made in a vacuum. Therefore by including all effected members in the discussion early on, new innovation and modes of thinking can occur that go beyond the scope of "what's right or "doing the thing right" which appears in single and double loop learning; but rather questioning the foundation of how one thinks. This leads to a process of reshuffling of the actors involved in the network, to produce innovate ideas by experimenting with new measures (Pahl-Wostl 2009). An effective management practice is required to effectively handle the acquisition, storage and transfer of knowledge that occurs within and between networks. I would argue that this systematic approach could come in the form of knowledge management practices with the added facilitation of knowledge brokers.

Learning levels can be divided into three main stages; the micro-level (single loop learning), the meso-level (double-loop learning), the macro-level (multi-loop learning). As shown in Figure 1, single loop learning can be defined as a process of incremental learning where you're learning to do 'what's right' without questioning the underlying beliefs and assumptions (Medema, Wals & Adamowski, 2014; Pahl-Wostl 2009). Double-loop learning involves creative and critical reflection but "within a value-normative framework" (Pahl-Wostl 2009). In contrast, multi-loop learning "refers to a transformation of the structural context and factors that determine the frame of reference" and involves a multitude of actors that goes beyond the resource governance regime (Pahl-Wostl 2009).

This paper will examine the MENA region's Regional Knowledge Hub (RKH), which is an interactive virtual hub that sets out to store and relay information gathered during the RICCAR process (see footnote next page). It does this by looking at the GIZ program ACCWaM (Adaptation to Climate Change in the Water Sector in the MENA Region), which is tasked with assisting in the dissemination of information generated by RICCAR. Through a process oriented approach, this paper examines the

assumptions set out in RKH, and how through the use of multi-loop learning, will examine the role ACCWaM currently plays and could play in the learning cycle.

Figure 1: Learning Cycles
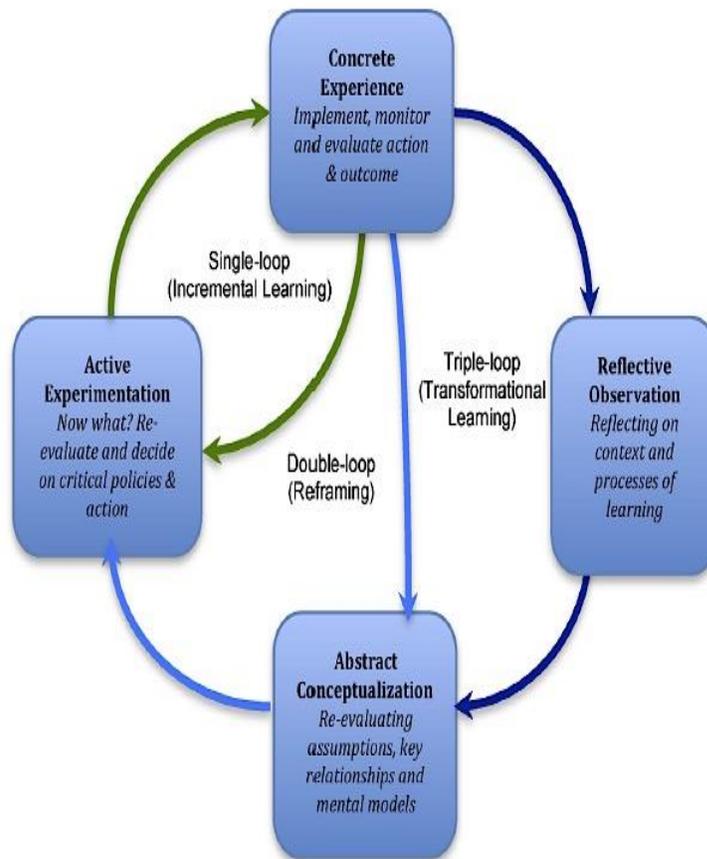
Source: Medema, Wals & Adamowski (2014)

What is the RKH? What are the aims and assumptions behind it?

During the RICCAR process working-groups were established to create a virtual space, which is to be the Regional Knowledge Hub (RKH)[1]. The idea is to build an interactive online platform to relay climate

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[1] RICCAR is an initiative, commissioned by various inter-governmental fora, the main theme was collaboration between regional and national ministries, international agencies and scientific institutions to discuss and forecast impacts of climate change in the water sector and its implications for socio-economic vulnerabilities. RICCAR is the Regional Initiative on Assessment of the Impact of Climate Change on Water Resource and Socio-Economic Vulnerability in the Arab Region. This was a five-year collaborative process with six expert group meetings aimed at

change related analysis to help inform decision makers in the Arab region to adapt to and plan for climate change impacts on water resources. The main objective is to provide access to information; the secondary objectives were to facilitate cooperation, enhance coordination and dialogue among organizations and stakeholders in the Arab region. It is expected that the RKH will support regional networking and knowledge exchange and serve as an early warning platform. Early during the RICCAR process it was agreed to establish a knowledge hub to store the outputs from the RICCAR initiative so that academics, practitioners and policy makers could access the information produced.

What type of learning does the RKH encourage?

The RKH working groups envisaged concepts for 'KH working group' knowledge to be show cased on the RKH. Moreover, functionality and design of the website are being considered, as the intent is to produce a knowledge portal that can be accessible to a variety of users outside the targeted audience. Thus, the expectation is to set up multi-loop learning in the water and climate change sector, and thereby foster innovation activities and cross-disciplinary communication. Outputs as well as hotspots from the vulnerability assessment report with socio-economic vulnerability indicators are to be integrated into the maps present on the RKH. The program will have an interactive tool that simulates different climate change scenarios so that users could potentially perform analysis on geographically delineated areas. The portal is to also host a library of information, containing case studies, policy briefs and best practices from the Arab region. The intent is that the RKH becomes a science policy interface to support regional networking. User feedback would allow future knowledge exchange, co-production of knowledge and innovation.

Why is a knowledge portal alone not effective?

One assumes that a knowledge portal such as the RKH could be a fundamental tool for multi-loop learning. However, without an appropriate knowledge management framework, a knowledge portal alone is not sufficient for enhancing knowledge transfer and exchange needed for multi-loop learning. Knowledge management consists of knowledge creation, acquisition, dissemination and storage to enhance organizations' capabilities (Lai et al. 2014). The creation of a knowledge portal as a common communication tool can be seen as a holistic approach to knowledge management; that is, when knowledge is acquired to be effectively disseminated to create new products or outputs of data. Thus, if done effectively, knowledge management can serve as a mediator for collaboration and future innovations for climate change adaptation. To develop and manage adaptive policies to climate change in the water sector, it has become evident that integration of knowledge from various disciplines,

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building consensus among regional stakeholders on four key pillars. Which are gathering and vetting baseline information, vulnerability assessments and impact analysis, information dissemination and awareness raising processes, capacity building and institutional strengthening? For more information refer to https://www.unescwa.org/climate-change-water-resources-arab-region-riccar

organization and civil society is "not a one-off exercise but rather part of a continuous knowledge acquisition processre(Mauelshagen et al. 2014).

Ison, Collins and Wallis (2015) posit that social learning is a process of co-creation necessary to transform a system[2]. Participation and co-production alone does not necessarily equate social learning is taking place (Medema, Wals and Adamowski 2014:24). Social learning might be stimulated but it requires a framework or strategy to ensure its effectiveness. The framework I refer to is knowledge management that can be facilitated by boundary organization. Knowledge management is a tool in the basket of tools to ensure the retention, dissemination and acquisition of knowledge. However, in order for concerted action to take place, a process of knowing/understanding must also occur (Ison, Collins and Wallis 2015). Therefore I would argue that boundary organizations are needed to effectively design governance systems based on information gathering, co-production of knowledge to build on for reframing of current policies and practices. By way of a dynamic environment, proper facilitation methods, and efficient institutional structures the process of multi-loop social learning can be harnessed for adaptive governance with the assistance of knowledge brokers (Ison, Collins and Wallis 2015).

What is the role of boundary organizations and knowledge brokers?

A knowledge broker engages in a two way facilitative process between the user and producer of knowledge to "encourage policy makers to be open to making use of research findings and to encourage researchers to undertake policy relevant research and to communicate with policy-makers such that policy-makers value the findings" (Michaels 2009). A boundary organization as defined by Michaels (2009), therefore has the daunting task for filling the gap between science and policy, by undertaking a myriad of knowledge brokering activities[3]. These activities include, disseminating content, seeking out experts to advise on problem delineated by party seeking counsel, identify what expertise is needed; who can provide it and the best ways to make the connections (Michaels 2009:997). Knowledge brokers can also use other strategies to engage different parties to one another, for collaboration or to build capacities (Michaels 2009)

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[2] Medema, Wals and Adamowski (2014) define social learning as a change in understanding that takes place among individual within a group and diffused within a wider social unit of a community. Ison, Collin and Wallis (2015), describe social learning as a process of co-creation of knowledge, which is needed for concerted action to occur, as it is not just a process of understanding but also the subsequent change of behavior and action that occurs as a result.

[3] A boundary organization is defined as an organization that facilitates the transfer of policy relevant information between researchers and policy makers. Examples of boundary organization include U.S. Sea Grant colleges and The Health Effects Institute (Michaels 2009:996).

What role has ACCWaM played as a knowledge broker?

ACCWaM (Adaptation to Climate Change in the Water Sector in the MENA region) is a regional program of GIZ that aims at improving capacities within the water sector to adapt to climate change. Since its inception in 2011, ACCWaM has been working in cooperation with the League of Arab States (LAS), the Arab Ministerial Water Council (AMWC), the Arab Centre for the Study of Arid Zones and Dry Lands (ACSAD), and the United Nation's Economic and Social Commission for Western Asia (ESCWA). The objective of these institutions is to increase the overall strategies for adapting to climate change. The ACCWaM program has set itself four main indicators for achieving this. One of these refers to the usage of the Regional Knowledge Hub (RKH) by decision makers and practitioners as a tool to develop adaptive policies. Although the website is yet to be launched; I would like to argue that ACCWaM has taken other steps to ensure the upscaling and usage of knowledge that was developed in RICCAR. Namely by cooperating with FAO on their manual for policy makers called "Climate Change and Adaptation Solutions for Green Sectors of Selected Zones in the NENA Region" as well as assisting ACSAD in writing the UNDA 'Agriculture' manual. These two efforts are major steps in paving the way for the utilization of the RKH upon its launch as potentially beneficiaries are able to observe how RICCAR outputs can be made more salient for decision makers.

Green Sector

ACCWaM and FAO have partnered up to cooperate on the measure "Climate Change and Adaptation Solutions for Green Sectors of Selected Zones in the NENA Region" which sets out to complement and consolidate current cooperation initiated in the Arab Region such as RICCAR. The objective of this cooperation is to aid the Arab region in becoming more resilient in the 'green sector' under different climate scenarios. Green sector, in this case, refers to the agriculture, forestry, rangeland land and fishery sector and its associated development implication on food security, livelihoods, and water resources.

In the terms of reference between GIZ and FAO it explicitly states one of the two objectives being "upgrading the RICCAR framework for an improved performance of climate change impact assessment in the agriculture sector and on food security by adopting an innovative platform to include FAO AquaCrop". This measure is able to build on the existing knowledge that was co-produced during the extensive RICCAR process by making it more salient to policy makers.

ACSAD as the regional service provider has been mandated to provide maps with impacts in correlation to the climate change scenarios for selected time horizons. FAO has been assigned the task of developing adaptation measures for the green sector as well as the dissemination of findings. The FAO AquaCrop model is being used in assessing the impact of climate change on crop yield. Outputs obtained for climate change impact assessment from the RICCAR initiative specifically the RCP 4.5 (with ambitious emission reduction) and RCP 8.5 (no policy change to reduce emissions) emission scenarios are being used as inputs for the AquaCrop model. RCP stands for representative concentration pathways; this is the newest scenarios that provide input on climate models.

This partnership capitalizes on the existing networks between FAO and the agriculture ministries to disseminate the outputs of the project to target decision makers effectively. By assisting in the development of such a study, ACCWaM fills the role of knowledge broker by bridging the gap between knowledge production through RICCAR and facilitating knowledge utilization. In addition, the manual was created to assist decision makers in adapting to climate change in the water sector by using climate scenario projections to implement adaptive policies.

UNDA

ACCWaM has also assisted the United Nations Development Account Project (UNDA) on "Developing the Capacities of the Arab Countries for Climate Change Adaptation by Applying Integrated Water Resource Management (IWRM) Tools" by recruiting Prof. Dr. Dieter Prinz to support and advise ACSAD with the writing of the 'Agriculture Manual. The aim of this manual is to integrate sector relevant outputs of RICCAR for the purpose of identifying appropriate adaptation measures and tools for policy makers in the MENA region. In the terms of reference contract between Prof Prinz and the ACCWaM program, it specifies that Prinz was recruited as an expert to support ACSAD in writing the chapter "Climate Change Adaptation in Agriculture, Forestry & Fisheries by Applying Integrated Water Resources Management Tools", as well as assisting in its dissemination by way of mapping out a list of beneficiaries in the region. We see here that ACCWaM is yet again providing both technical and financial support for the upscaling and utilization of the knowledge that is being produced through RICCAR. Moreover, ACCWaM is coordinating with regional networks to generate increased collaboration with the hope of increasing knowledge retention and utilization in the policy sphere.

What phase of the learning loop is the RKH currently at?

Yeboah-Assiamah, Muller and Domfeh (2016) identify engagement, communication, mediation, scoping, stakeholder analysis, defining a sense of community with the actors involved and visioning as key factors for collaborative processes. ACCWaM in its assistance to the RICCAR initiative and the RKH working group has helped with covering the factors that Yeboah-Assiamah et al. have mentioned. They are 'sense making' and 'visioning' exercises as occurred in the working groups a collaborative knowledge brokering strategy[4]. An open and inclusive group mapping exercise also took place during the RICCAR Vulnerability Assessment working group to allow both experts and policy makers to joint frame the "interaction and negotiated the substance to be addressed" (Adelle 2015:322). In the case of the green sector report and the UNDA manual, the "starting point of the knowledge brokering process was scientific expertise, in the form of tool development, in search of a policy problem" (Adelle 2015:322). One could argue that this was a knowledge driven process and not a policy driven process. Adelle (2015) posits that the greater the involvement of policy makers in the modeling or framing process, the greater

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[4] Sense making as defined by Michaels (2009:1007) is an important social learning tool that knowledge brokers should engage in when facilitating to differentiate known from knowable and to distinguish "what can be used immediately and what is needed for spending resources finding out". The group mapping exercise that took place during RICCAR can be seen as an example of sense making. For a deeper understanding of different knowledge brokering strategies and tools see article by Michaels (2009).

the impact of the research or output on policymaking. Michaels (2009) asserts that the practice of collaborating involves all stakeholders jointly framing and negotiating the process and scope of the problem to be tackled. On this point, a joint framing and scoping process was implemented in both VA working group and RKH working group. The knowledge broker in this case plays the crucial role of facilitating this collaboration and in the requirement and engagement of appropriate experts to policy makers (Michaels 2009). However, it appears that, currently, the learning cycle is still stuck in the single and double-loop learning, due to a lack of critical self-reflection beyond the normative framework / learning that challenge the current paradigms. The why question, which is necessary for triple/multi-loop learning to take place and which would seek to challenge current governing structures and values hasn't been asked. But, rather, we observe a learning process that involves learning 'what is right' which takes place in single loop learning and 'doing it right' or the how aspect which is needed for double-loop learning.

Conclusion

Although substantial efforts have been made to invest in the RKH as a tool for regional stakeholders to assist in planning and managing for climate change, I have argued that virtual learning tools alone are not sufficient in enabling and continuing social learning practices. It requires a direct link to face-to-face interactions to maintain continuous knowledge exchange and therefore should not replace existing systems but rather serve as an additional tool (Medema, Wals & Adamowski 2014). A knowledge portal such as the RKH is one tool in the basket of knowledge management tools for social learning activities. Establishing such portals allows networks to combat against loss of knowledge through staff turnover. By setting up a website that can store the knowledge that is being produced, others can than make use of this information to engage in innovation activities. However, as this paper has shown, this needs to be done in conjunction with a knowledge broker or boundary organization. They can facilitate and mediate the process through effective brokering practices to increase acquisition, creation and dissemination of knowledge. A reliance on technology alone for multi-loop social learning to transform the current governance structures will not be adequate to deal with challenges such as organizational cultures that are not conducive to collaboration and sharing, as well as communicating uncertainty.

Concerns and Future Research Questions

Before examining structural constraint, it is important to note that "changing formal governance structures, macro-level decision-makers may have the power to change these structures", even though cultural structures are produced and reproduced on the local level through people interaction, norms and practices (Medema, Wals & Adamowski 2014:27).

The social fabric also needs to be considered, such as the existing culture and if it's welcoming to collaboration and sharing amongst individuals and organizations. As well as observing the learning structures in place, as to whether members are welcoming to double and triple-loop learning or stagnate at single-loop learning and are not ready to call into questions their basic assumptions and

routines. Pahl-Wostl (2009) stipulates that "a lack of critical self-reflection is a severe constraint for societal learning and transitions to more sustainable resource governance approaches", since people are still stuck at doing things right and not doing the right things. The structural or institutional constraint should also be considered as it could impede change if management practices are still based on the command and control paradigm (Pahl-Wostl, 2009). As Duffield and Whitty pointed out, the current challenges for organizational learning is not identifying or storing lesson learned but in fact applying the lesson learned into projects. Through their experiments they found that the cultural and people aspect

where the greatest impediments to applying lesson learned within organizations (Duffield & Whitty 2016). They noted that the key element for high reliability organizations, such as aviation organizations, displayed "safety culture is the reporting culture where people are prepared to report their errors and near misses" (Duffield & Whitty 2015)5. Whereas it has been observed in other non-high reliability organizations, that a general trend exists of reporting 'the least-threatening lessons' (Duffield & Whitty 2015). Duffield and Whitty (2016) stressed the importance of having a culture and reporting system that encourages members to catalog mistakes without fear of retribution.

Looking ahead, it would be interesting to see how knowledge portals or the RKH in particular impacts decision for water governance. What are our current metric systems or indicators in place to measure impact or effectiveness of such knowledge portals? Are our current indicator sets for measuring impacts sufficient or are they mainly focused on acquisition or engagement metrics? How do social practices and routines affect the acquisition and utilization of knowledge from portals? Does trust play a part in the acquisition of and exchange of knowledge? What can boundary organization, like GIZ do to enhance trust between and within networks?

Mrs. Ikram Ali completed this paper as part of her three-months internship with GIZ ACCWaM in 2016 and while studying for a Master's of Science in Environmental Governance at the University of Freiburg, Germany.

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