

Slutrapportering to Riksbanken Jubileumsfond

Project: CADWAGO - Climate change adaptation and water governance - reconciling food security, renewable energy and the provision of multiple ecosystem services

October 2012 – March 2016

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Led by: Stockholm Environment Institute, Sweden

Partners:

- Sustainability Research Centre – University of the Sunshine Coast, Australia
- Environmental Sustainability Research Centre – Brock University, Canada
- Open Systems Research Group – Open University, United Kingdom
- Griffith Centre for Coastal Management, – Griffith University, Australia
- Institute for Marine and Antarctic Studies – University of Tasmania, Australia
- Nucleo di Ricerca sulla Desertificazione (NRD UNISS) – University of Sassari, Italy
- Environmental Communication – Swedish University of Agricultural Sciences, Sweden
- Oak Ridge National Laboratory (ORNL), USA
- Social Sciences Group – Wageningen University, the Netherlands

Purpose of the project

The aim of CADWAGO (Climate change adaptation and water governance: reconciling food security, renewable energy and the provision of multiple ecosystem services) was to address the global challenge of water security through enabling appropriate responses to the impacts of climate change on water resources. In so doing CADWAGO promoted systemic and adaptive transformations in water governance by developing knowledge to support conceptual, institutional and practice based innovations. It is by way of these transformations in governance that CADWAGO intended to support the forms of multi-level and multi-stakeholder collective action that will improve climate change adaptation responses, from a water security perspective. Through this approach it was envisaged that both the livelihoods of communities and the ecosystem services that are dependent on water will be enhanced.

The three most important results from the project

1) Conflicts of interest were a key consideration in the conceptual framework applied by CADWAGO to examine the performance of different modes of governance. Findings growing out of the application of an intersectional lens, including gender equity, revealed that further attention needs to be given to the role of power, particularly in terms of distorting the outcomes of deliberative and systemic processes intended to address the controversies that underpin water governance. A revised conceptual framework was subsequently applied that included both interest and agency conflicts and the role these play as a barrier to equitable transformation and change within the water governance sector. These findings find fertile ground in understanding why recent assessments of prioritised actions under the river basin management plans (RBMPs) - EU Water

Framework Directive - exhibit little or no coherence with the needs and priorities of river basin stakeholders. Complementary results from work undertaken in the UK case study, point at the importance of institutionalising community actions at catchment scale and re-framing the enactment of the Directive, via the RBMPs as part of an iterative social learning system.

2) Extreme events, such as floods and drought, and their increasing frequency and intensity in times of climate change, feature as the water dilemma in several CADWAGO case studies. Findings suggest that crises can serve as a catalyst for self-organised change in governance. Crisis exposes the framing of ecosystems and actor's preferences in terms of roles and responsibilities and horizontal pathways emerge allowing for collaborative actions across sectors and new stakeholder constellations that are otherwise constrained under normal conditions, by pre-existing bureaucratic norms and routines. Results from the Canadian and Australian cases suggest that strongest support was given to state or state citizen hybrid constellations and away from the dominant neo-liberal governance paradigm. These lessons are important for European water governance where market based governance instruments and ecosystem services are gaining increasing traction.

3) The governance learning process enacted in numerous workshops and events created a space for performative practice of co-production of knowledge. This process went beyond traditional processes of learning and rather supported co-learning across the science-society interface, respecting and building on the diversity of participants. The ensuing insights on governance transformations and new or strengthened networks appear to be a lasting result from the project.

New research issues that have been generated through the project

In the latter part of 2015, as Europeans struggled to make sense of mass migration and terrorism, climate change was evoked as a "convenient truth" to fill the void created by the tumultuous European Autumn. It has unleashed an unprecedented process of governance reforms that are curbing civil liberties and transparency, legitimized under the pretext of safeguarding national security. Moreover, the narrative clearly contributed to precipitating the long awaited collective agreement at COP21. CADWAGO seized the opportunity to examine what we understood to be the successful securitization of climate change. Climate change is referred to as a threat multiplier in the water discourse. Findings suggest that water is increasingly being mediated by a security narrative; an interest-centric narrative that is devoid of equity considerations and explicit acknowledgment of the real issues that mediate the underlying power brokering processes. The governance actions emerging from a securitization discourse reproduce pre-existing norms and structures, amplify inequities, and thereby nurture fertile ground for the conflation of violent conflict.

Many of the results from CADWAGO point at the need to transcend normative governance space in order to reconcile water dilemmas. Here findings suggest that crisis, power/agency, and securitization, open up post-normal space and redefine operating conditions. These findings have led to an emerging counter narrative that we refer to as "coexistence". In contrast to the collective action narrative, the presence of diverse and often irreconcilable governance pathways is embraced. Diversity enhances adaptive capacity in the face of uncertainty and controversy. Co-existence is made possible because the post normal provides space to navigate (creep around, and under obstacles) past barriers within the normative setting. Our findings also suggest that the "post normal" is a risky place. Hence the present water security narrative should be replaced by a water

equity narrative where both interest (bio-physical material stakes) and positions (space for human agency) are deliberated upon. In so doing, different constellations of stakeholders, who operate outside the pre-existing structures will be empowered. This could pave the way for water governance transformations that lead to new modes of climate change adaptation.

International connections of the project

37 researchers from Sweden, Italy, Netherlands, UK, Canada, USA, and Australia collaborated in CADWAGO. The case study approach added additional international connections with practitioners, decision-makers, and local communities. Through the governance learning events and the case studies CADWAGO connected with a large number of academics and practitioners around the world. Overall 51 external participants attended the governance learning events from different scales of governance and sectors (e.g. energy, drinking water, agriculture, conservation) from Australia, Denmark, Germany, Italy, Netherlands, Poland, Sweden, Tunisia, and the UK. The interim governance learning events in the final year of the project engaged with Sustainable development coordinators from the Baltic Sea region, academics and practitioners from the UK and the OECD, and with students from Uppsala University and local stakeholders as part of the ReSolve project. Presentations at conferences meant that CADWAGO research was also presented in France, Germany, Australia, Sweden, Canada, Italy, South Africa, leading to collaborations in the Miracle project and China. Another result is the research MoU between Brock University and the University of the Sunshine Coast that aims to support further research of relevance to CADWAGO. The University of the Sunshine Coast has committed funding to a PhD scholarship focused on the social dimensions of global change to further this relationship.

Research communication measures outside the academic community

CADWAGO adopted a co-learning approach throughout the project, working with (non-)academic stakeholders within the case studies and throughout all of the governance learning events. The success of adopting a collaborative approach with stakeholders outside the academic community is illustrated by the influence researchers have had on the OECD principles of good water governance. The work done within the CADWAGO UK case study created the opportunity to influence this process and resulted in changes in the documentation of the principles. The head of the Water Governance Programme presented her work during the event at the Royal Society, London, and a researcher presented CADWAGO in Paris at the OECD water governance group.

The website www.cadwago.net and a newsletter were more passive forms of communication. Newsletter statistics showed engagement with (non-)academic stakeholders. Researchers created videos and used twitter. Articles in local media in the case-study countries offered additional ways to communicate. A list of these are available on the website.

The two most important publications from the project

Westberg, L. & Powell, S. Participate for Women's Sake? A Gender Analysis of a Swedish Collaborative Environmental Management Project. *Society & Natural Resources* 1–16 (2015).

Contributing to effective water governance in times of complexity and change are issues associated with perceptions of resilience, institutional arrangements, praxis, and learning. The special Issue

“Water Governance in Times of Change: Perceptions, Institutions, Praxis and Learning” in the open access international journal *Water* aims to contribute knowledge on these issues of water governance through place-based case studies throughout the world, and, in particular, lessons for water governance in Europe. This issue is edited by CADWAGO researchers and will include 12 CADWAGO papers.

The publication strategy of the project

All peer reviewed articles that have been or will be published will be open access (OA) by paying a fee for each publication. All the papers going into the special issue of the OA journal *Water* will be open access. A request for funds to RJ to cover these costs will help to ensure that publications published after the end of the project will also be fully OA.

Publication list

Peer reviewed articles – Published

Baird, J. *et al.* Ecosystem Perceptions in Flood Prone Areas: A typology and its Relationship to Preference for Governance *Water* 8, 5, 191 (2016) Special issue: Water Governance in Times of Change: Perceptions, Institutions, Praxis and Learning.

Baird, J., *et al.* Contemporary water governance: navigating crisis response and institutional constraints through pragmatism. *Water* 8, 6, 224 (2016) Special issue: Water Governance in Times of Change: Perceptions, Institutions, Praxis and Learning.

de Lourdes Melo Zurita, M. *et al.* Reframing water: Contesting H₂O within the European Union. *Geoforum* 65, 170–178 (2015)

Powell, N. S., Larsen, R. K. & van Bommel, S. Meeting the ‘Anthropocene’ in the context of intractability and complexity: infusing resilience narratives with intersubjectivity. *Resilience* 2, 135–150 (2014)

Westberg, L. & Powell, S. Participate for Women’s Sake? A Gender Analysis of a Swedish Collaborative Environmental Management Project. *Society & Natural Resources* 1–16 (2015)

Ruiu M.L., Maurizi S., Nguyen Thi P.L., Roggero P.P. & Seddaiu G. Looking for ‘win-win’ responses for the water governance: “action research in the Arborea district (Oristano). *Agriregionieuropa* 10, (2014). (In Italian)

Papers to be published in the special issue of open access journal *Water*

Blackmore, C. P. *et al.* Designing for learning for transformation of water governance in the context of climate adaptation. *Water* (2016).

de Lourdes Melo Zurita, M., Munro, P., Smith, T. F., Thomsen, D. C. & Lyth, A. Beyond Hegemony in the European Union: insights from (de)constructed water governance dilemmas around the world. *Water* (2016).

de Lourdes Melo Zurita, M. *et al.* Water governance and climate change: Identifying innovative arrangements for transformation. *Water* (2016).

Foster, N. M., Collins, K. B., Ison, R. L. & Blackmore, C. P. Water governance in England: Improving understandings and practices through systemic co-inquiry. *Water* (2016).

Maurizi, S., Ruiu, M. L., Seddaiu, G., Sassu, S. & Roggero, P. P. 'La Rasgioni': Lessons learned from a creative re-interpretation of traditional practices to mediate conflicts between formal institutions and farmers interested in the context of water pollution issues. *Water* (2016).

Nguyen, T. P. L., Seddaiu, G. & Roggero, P. P. Perceptions of present and future climate change impacts on water availability for agriculture. A case study on four Western Mediterranean farming systems. *Water* (2016).

Powell, N. S. & Elrick-Barr, C. Challenges for sustainable development: Reconciling climate, energy and water security in the Baltic Sea Region. *Water* (2016).

Smith, T. F., Plummer, R., Ison, R. L. & Powell, N. S. Water governance in times of change: perceptions, institutions, Praxis and learning. *Water* (2016).

van Bommel, S., Blackmore, C. P., de Vries, J. & de Bruin, A. Performing and orchestrating co-production of knowledge at the science-policy interface. *Water* (2016).

Zuin, O., de Lourdes Melo Zurita, M. & Powell, N. S. Defining and managing water in the Italian Legislation. *Water* (2016).

Peer reviewed articles – submitted

Plummer, R., Baird, J., Bullock, R., Dupont, D., and Renzetti, S. (in review). Probing the relationship between ecosystem perceptions and approaches to environmental governance: an exploratory content analysis of seven water dilemmas. *Resilience: International Policies, Practices and Discourses*

Plummer, R., Baird, J., Bullock, R., Dzyundzyak, A., Dupont, D., Gerger Swartling, Å., Johannessen, Å., Huitema, D., Lyth, A., Melo Zurita, MdL., Munaretto, S. Smith, T. Thomsen, D. (in review).

Stakeholder insights into flood governance: an international multiple case comparative study of flood prone areas. *Journal of Flood Risk Management*

Plummer, R., Renzetti, S., Bullock, R., Melo Zurita, MdL., Baird, J., Dupont, D., Smith, T., and Thomsen, D. (submitted). Evolving water paradigms: the roles of capitals in building capacity to address urban flooding. *Environment and Planning C*

de Lourdes Melo Zurita M, Cook B, Thomsen D, Munro P, Smith TF & Gallina J, (in review), 'Living with Disasters: Emerging Governance Frameworks in Queensland', *Disasters*

Ruiu ML, Seddaiu G, Roggero PP (in review). Developing adaptive responses to contextual changes for sustainable agricultural management: the role of social capital in the Arborea district (Sardinia, Italy), *International Journal of Sustainable Development*

Reports, book chapters and conference papers

Powell N, Klöcker Larsen R, De Bruin A and Elrick Barr C "Vatten, rättvisa och hållbar fred", i Jenny Björkman & Arne Jarrick (red.), Från krig till fred. RJ:s årsbok 2016/2017, Göteborg & Stockholm: Makadam förlag (2016)

Zuin O "La società e l'acqua ad Arborea. Etnografia delle percezioni di rischio in un paese sardo dalle

origini venete. (Society and water in Arborea. Ethnography of risk perceptions in a Sardinian town with Venetian origins)", MSc thesis, Venice University, Venice, Italy (2016)

Dzyundzyak A, Baird J, Plummer R, Bullock R, Dupont D, 2015a, "A survey of stakeholders about flooding and governance: The Red River, Canada", Environmental Sustainability Research Centre, Brock University

Dzyundzyak A, Baird J, Plummer R, Bullock R, Dupont D, 2015b, "CADWAGO Cross-case Report", Environmental Sustainability Research Centre, Brock University

Dzyundzyak A, Baird J, Plummer R, Bullock R, Dupont D, Gerger Swartling A, Johannessen A, 2015a, "A survey of stakeholders about flooding and governance: Kristianstad, Sweden", Environmental Sustainability Research Centre, Brock University

Dzyundzyak A, Baird J, Plummer R, Bullock R, Dupont D, de Lourdes Melo Zurita M, Lyth A, Smith T F, Thomsen D C, 2015b, "A survey of stakeholders about flooding and governance: Southeast Queensland, Australia", Environmental Sustainability Research Centre, Brock University

Dzyundzyak A, Baird J, Plummer R, Bullock R, Dupont D, Munaretto S, 2015c, "A survey of stakeholders about flooding and governance: Venice, Italy", Environmental Sustainability Research Centre, Brock University

Dzyundzyak A, Baird J, Plummer R., Bullock R, Dupont, D., Huitema D, 2015, "A survey of stakeholders about flooding and governance: Meuse River, The Netherlands", Environmental Sustainability Research Centre, Brock University

Mula L, Dono G, Cortignani R, dell'Unto D, Doro L, Lacetera N, Pasqui M, Seddaiu G, Roggero P P, 2015, "Integrated assessment of the CC impact on rainfed and irrigated forage cropping systems", in Proceedings of the XLIV of the Italian Society of Agronomy Conference (Bologna, Italy)

Ison R L, 2015, "Governing in the Anthropocene: what future systems thinking in practice?", in Proceedings of the 59th Annual Meeting of the ISSS (Berlin, Germany)

Foster, N., Collins, K., Ison, R., Blackmore, C. Water governance in the UK and EU: So far, so what and what next? Royal Society, London, 16th September 2015. Symposium report (Open University, Milton Keynes, 2015)

Foster, N., K. Collings, C. Blackmore & R. Ison. Water governance in England: Improving understandings and practices through systemic co-inquiry. Workshop report. (Open University, Milton Keynes, 2015)

Nguyen T.P.L., Seddaiu G., Tidore C. & Roggero, P. P. Adaptation to climate change of Italian agricultural systems: the analysis of explorative scenarios. (2014)

UK Catchment System Group. Response to OECD Draft Principles of Water Governance. (Open University, Milton Keynes, 2015)

de Lourdes Melo Zurita, M., 2014. Climate change adaptation and water governance: an institutional and organisation analysis of nine case studies. Presented at the Australian National Climate Change Adaptation Research Facility (NCCARF), Gold Coast, Australia.

Blackmore, C., 2014. Learning to change farming and water managing practices in response to challenges of climate change and sustainability. Presented at the European Farming Systems

Research Conference, Berlin, Germany.

K. Lonsdale, R. Ison, K. Collins, C. Blackmore, 2014. WP3 case study report. Open University, Milton Keynes, UK.

M Melo Zurita, T Smith, D Thomsen, A Lyth, S Baum, B Preston, 2014. Climate Change Adaptation and Water Governance: First Phase Case Study Report. USC, Queensland, Australia.

Plummer, R., Baird, J., Bullock, R., Dupont, D., Renzetti, S., Morris, S., Krievins, K., Pickering, K., 2013. Work Package One Cross-Case Report. Environmental Sustainability Research Centre, Brock University, St Catherines, Canada.

CADWAGO team, 2013. Global challenges. Climate Adaptation and Water Governance. Presented at the Europe and Global Challenges, Herrenhausen Palace, Hannover.

Catchment Systems Group, 2013. Challenges and Choices – National Consultation. A response by the Catchment Systems Group. Open University, Milton Keynes, UK.

WP 1 team, 2013. WP1 Project brief “Ecological components of ecosystems.” BESRC, Brock University, St Catherines, Canada.

WP2 team, 2013. WP2 Project brief “Climate change adaptability in water governance institutions and organisations.” USC, Queensland, Australia.

WP3 team, 2013. WP3 Project brief “Systemic governance practices.” Open University, Milton Keynes, UK.

WP4 team, 2013. WP4 Project brief “Governance learning.” WUR, Wageningen, the Netherlands.

Project website and online presence

The project website is www.cadwago.net. On Twitter people have tweeted using: ‘#cadwago’ and ‘cadwago’. We also developed several movies for further outreach.

Youtube video ‘MusicAcqua: variazioni (musicali) sul clima - eng subtitles’, cinearena, 2015.

<https://youtu.be/Cijz0lb7X0M>

Youtube video ‘Interviews about water governance in Sardinia and especially in Arborea’, cinearena, 2015. https://youtu.be/gB94nO_eIVg

Youtube video ‘La canzone di Arborea (The song of Arborea)’, cinearena, 2015.

<https://youtu.be/Przfv0Sp2VA>

Youtube video ‘Climate Adaptation and Water Governance (CADWAGO), Neil Powell, Tim Smith, Neil Holbrook, Julia Baird, Ryan Bullock, Dana Thomsen, Rodger Tomlinson, and Maria de Lourdes Melo Zurita, 2015. <https://youtu.be/54OL13PSww0>

Digital story ‘A tale of navigating messiness with diverse constellations of stakeholders’, Neil Powell and Annemarieke de Bruin, 2015. http://www.cadwago.net/?page_id=737