The AquaticPollutants TAP Action

Final report

Cluster: RedCoPollutants
Duration: 24 months - January 2022 to December 2023
Main activities: Biannual working meetings, online forum, online platform for sharing documents, remote interaction, public dissemination.
Main theme: Measuring inputs and taking actions to reduce CEC in aquatic ecosystems (inland and marine) and subsequent impacts on human, animal, plants and ecosystems.

Main fields:

- Clean and healthy aquatic ecosystems (freshwater, groundwater, marine).
- Risk management of contaminants of emerging concern (CEC)
- Control of CEC spread in the environment “from the source to the mouth”.

Funders involved in the Steering Committee:
Czech Republic, France, Ireland, Spain and Sweden

Other countries represented in the cluster:

Denmark, Vietnam, Bangladesh, South Africa

Cluster members:
The cluster was chaired by a Scientific Coordinator, Prof. Angeles Blanco, Complutense University of Madrid, Spain, selected among the TAP Action members at the Kick-Off meeting in January 2022.

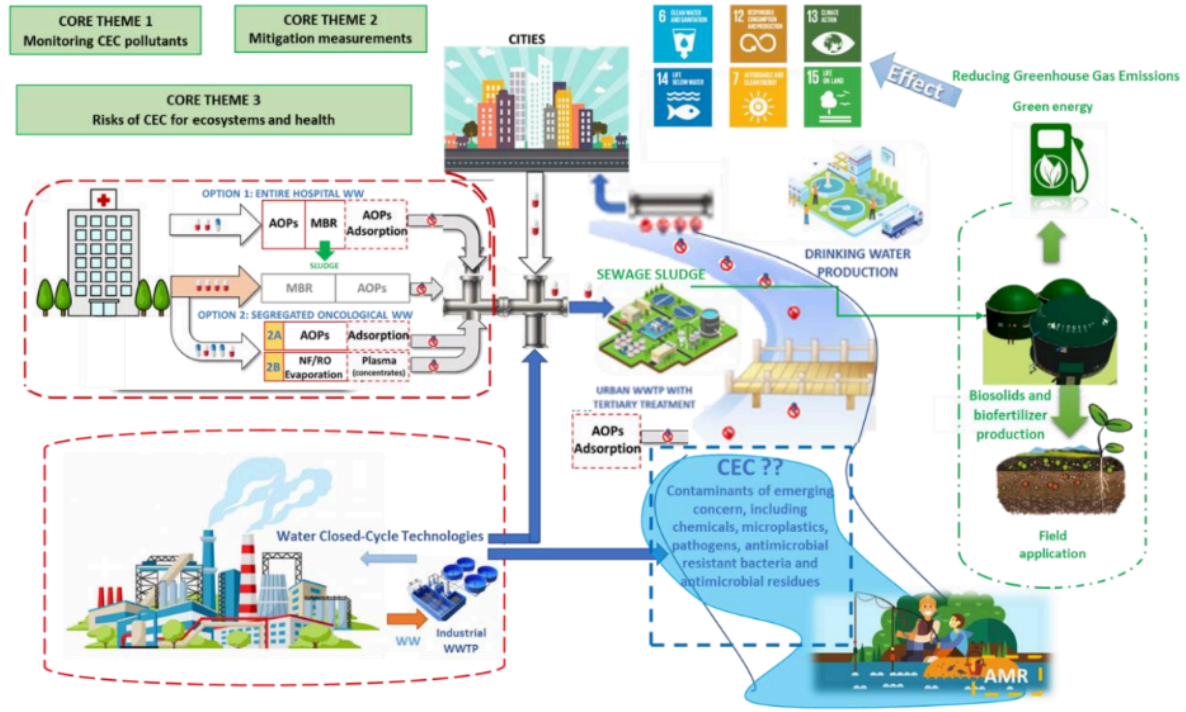
Nine nationally-funded projects were initially invited and joined the cluster in january 2022:

- ANTARES, Universidad de Compostela, Spain by Francisco Omil (drop out after the Kick-off meeting)
- ARG Tech, University of Chemistry and Technology, Prague, Czech Republic by Jan Bartáček
- CATAD3.0, Universidad Complutense-CyPS Group, Madrid, Spain by Juan García Rodriguez (hopped on after a drop out of ANTARES)
- Change4Water, T. G. Masaryk Water Research Institute, Czech Republic by Lada Stejskalová
- CYTOSREMOVAL, Complutense Univer
- CHYPSTER, INRAE, UR RiverLy, Villeurbanne, France by Marina Coquery (drop out after the first half of the Action)sity of Madrid, Spain by Angeles Blanco
- HOPEM T. G. Masaryk, Water Research Institute, Czech Republic by Přemysl Soldán
- Pharma_CARE, LIEC Lorraine University, CNRS, France by Laetitia Minguez
- PIER, National University of Ireland Galway, Ireland by Dearbháile Morris and Liam Burke
- Mic Giver, CEDRE, France by Stephane Le Floch

Encouraged by the RedCopollutants, in September 2022, the Swedish Research Council nominated three additional projects:

- I-CRECT - Interventions to decrease CRE colonization and transmission between hospitals, households, communities and domesticated animals.
- APRIAM V - Antibiotic resistance: Preventative measures and minimising consequences through risk mitigation and targeted interventions in the context of India.
- ABRA - Antibiotic resistance: The role of chemical pollution in urban wastewater.

Scope of the TAP Cluster



Based on national activities the CEC research areas have been grouped into 3 main core topics (CT):

- CT1- Monitoring aquatic pollutants: characterization (methodologies, practices, new approaches to detect sources, data management, monitoring, ..).
- CT2- Mitigation measurements: technologies, best practices, limitations, barriers, recommendations.
- CT3- Risks of aquatic pollutants for different water uses: long term effects on health, ecotoxicity, hazards; water soil interactions.

The attached RedCoPollutants Inventory-Expertise and infrastructure presents the resources made commonly available to the involved projects.

Cluster goals:

- Broaden and/or transfer knowledge on the characterization and transformation of CECs (physical, chemical, or biological);

- Harmonize methodologies and strategies to monitor, remediate or reduce CECs in aquatic ecosystems;
- Alignment between the individual projects, looking for synergies and avoiding duplication across Europe;
- More robust results. greater impact at the European level, and beyond;
- Identifying research gaps.

Expected outputs:
Following the TAP general output, the Cluster members have defined the following RedCopollutant activities:

- Alignment of the language in the field of CEC;
- Discuss on common methodologies and protocols for CEC monitoring;
- International discussion of preliminary outputs of ongoing national research to reduce the content of CECs;
- Discussion on the research priorities in different countries and regions;
- Exchange of knowledge on Best Available Technologies and Practices (BAT/BAP)) for CEC mitigation;
- Share knowledge and data including good and bad experiences;
- Prepare joint publications;
- Bring together expertise from different disciplines (chemistry, chemical engineering, biology, environment, toxicology, ...) and areas (water, soil, ecosystems);
- Align approaches of the different projects maintaining its diversity;
- Exchange of knowledge on assessment of CEC risks;
- Promoting interaction with international researchers in the field;
- Identifying new knowledge gaps;
- Identification of pillars for a long term network for future cooperation at senior and PhD level;
- Mobility as a networking tool.

The attached Table 1 presents the status of the specific outputs, activities and indicators identified in the RedCoPollutants Implementation plan.

Most notably, the cluster achieved to put together the following outputs:

- 10 disciplines and 5 areas/topics as opposed to the original 4 were connected in multidisciplinary cooperation;
- initially 7 projects, later 11: with 1 additional from Spain and 3 additional projects when Sweden hopped on the Action bringing projects that ended up connecting more countries (Denmark, Vietnam, Bangladesh, South Africa). A significant increase of projects beyond original expectations created necessary critical mass and impact;
- more than 120 cooperating researchers, 6 times the original expected number, got involved;
- 34 (13 young researchers, 15 PhDs, 6 Master thesis actively participating early career researchers leveraging mobility options) got involved in the works;
- expertise inventory of all originally joined projects was compiled;
- networking opportunities were created resulting in:

    - transfer of knowledge through 4 alignment meetings, 20 technical meetings, 11 training activities, countless internal and 3 external webinars, technical visits, continuous discussions, 3 mobility actions, 6 align approaches of different projects maintaining its diversity and extending their limits (gave foundation to sustainability activities, experiments to go beyond the state of the art have been planned between UCM, Gotemborg university, Lund university and Linköping University), 3 workshops on research priorities aimed at developing a review paper and formulation of alignment glossary.
    - transfer of results (included good and failed practice) and data in all disciplines through presentations of results at two on-site meetings and online meetings (each project presented different results 2-3 times), 10 cohesive protocols (as opposed to originally planned 3) for methodologies and experiments, formulated good practices and failed practices, 20 technical online meetings (on monitoring, mitigation and risks), 4 technical visits.
    - exchange of samples and 5 infrastructure sharing activities;
    - extension of knowledge on new contaminants beyond the internal original studied compounds;
    - visibility and knowledge transfer via an external event (CECs session in the WCCE11-IICIBIQ 2023 Congress in Buenos Aires, Argentina) and more.
- information dissemination via a **policy brief, stakeholder brief and a position paper on scientific and technological challenges and gaps to provide inputs for further Horizon Europe Work Programmes and Water4All Partnership Strategic Agendas and further joint calls, 5 joint scientific publications, a scientific paper "Review of Risk Assessment as a Tool to Improve Water Resource Management". Participation in water associations for knowledge transfer and advising on best technologies.**

In addition, the cluster prepared further outputs such as a review paper on assessment of CEC quantification in different countries and regions or an internal report on conducted infrastructure, knowledge and sample sharing activities.

Finally, as part of its sustainability plan, the cluster submitted a joint proposal to the Water4All joint call 2023, results pending.

Conclusions

The TAP Action enabled national projects to establish an international network, "cluster of excellence", focussed on a specific RDI priority topic to create a targeted critical mass in Europe. Participation in a TAP topic was on a voluntary basis in order to integrate and share knowledge, infrastructure, data and modeling tools, training and capacity building, as well as improved communication and networking with stakeholders and the scientific community. Coordination between the individual projects was to lead a greater impact at the European level, addressing research gaps and avoiding duplication.

The cluster completed all expected outputs listed in the Implementation plan and exceeded expectations by multiplying the number of outputs in several categories. The cluster also successfully formulated and executed a sustainability plan.

Lessons learned

It is essential that nominated projects find common grounds to build on. At the beginning of the AQTP TAP Action, projects were running into large gaps in their areas of focus, knowhow and goals. The core of the problem was a fairly wide thematic focus of the Action.
The problem was solved by adding more projects that filled those gaps. In order to do that, the Steering Committee Chair contacted other partner countries from the 3 JPIs involved and motivated them to join. These efforts were mirrored by the cluster members, who searched for more projects in their own communities. To the next endeavors, we recommend these strategies:

- to narrow down the thematic focus. It can be problematic, because the narrower the focus, the harder it is for the countries to find matching projects. However, the wider the focus, the harder it is for the projects to define common direction and activities.
- to finalize the nomination process as fast as possible and communicate as much information as possible about already nominated projects to the countries that haven't nominated yet. Hopefully, the remaining countries can try to match their later nominations to the earlier ones.
- to involve at least 5 FPOs, possibly more. Allow them to hop on during the TAP Action. Communicate about the Action regularly.

It would be helpful to establish the role of an executive assistant to the Scientific coordinator (SC). The AQTP SC was very skilled in human resource management and leadership in addition to her scientific capacities and project management abilities. However, leading the cluster required her to also perform administrative tasks such as organization of online meetings, minutes taking or endless sending or reminders. In the midterm and final review she mentioned that help with these tasks would be lifting a significant burden that would enable her to be more effective in her other obligations as a SC. We recommend the following strategies:

- adding an official administrative support role to the portfolio and assigning a small honorary fee to the taker.
- dividing the Scientific Coordinator honorary fee into 2 parts such as 8.000 EUR to the SC and 2.000 EUR to the administrative support role.
- requiring the SC to take on an internal assistant such as a PhD student, and exchange the work for another incentive such as credit, additional mobility (which can be facilitated by the FPOs), internship etc.

On site meetings enable the cluster to make major progress compared to regular online meetings. We recommend organizing at least 3 such meetings.

Despite the who-is-who brochure and efforts by the FPOs to pass down the information, many researchers were not familiar with the concept of the TAP Action when attending the Kick-off meeting or even several months after. The Kick-off meeting took an online form due to the pandemic. We recommend the following strategies:

- At the Kick-off meeting dedicating extra time to explain the idea of the TAP Action, requirements and expectations of all parties.
- Requiring the FPOs to dedicate sufficient time and effort to the same before the kick-off meeting. Providing them with useful materials and information to do so.
- In case the Kick-off meeting is online, hosting an on-site event closely after.

Due to budgetary restrictions we were limiting the number of attendees of on site meetings to 3 reps per project. Another reason was to ensure a balanced group for debates. We do not recommend this, as it discourages some projects to attend. Some projects were composed of representatives residing in different countries and they were intending to use the opportunity to also meet and organize a back to back project meeting. The costs of on site events turned out to be lower than expected due to in-kind contributions of the FPOs, so in the end we regretted not hosting more people.

Motivating projects to involve young researchers was a successful exercise for all involved parties. Those that participated in mobility actions were mostly young researchers. They also had an opportunity to observe and work with senior researchers, practice their skills and express their positions. In that spirit we also joined forces with the AQTP PhD Forum.

Another successful step was directing the cluster to other more advanced sources of international funding (Water4All, Biodiversa+, LIFE etc) and guiding it towards applying to those open calls before the end of the Action.

It is helpful for the TAP Steering Committee Chair to closely collaborate with the SC, provide continuous guidance and feedback. We recommend taking the workload into the account when planning the efforts.

It is not recommended to split the honorary fee to the SC into 2 installments. In case of the AQTP, the installments were coming in late. One was paid out late in the second half of the Action and the second one is planned to be paid out after the Action ends. We believe that such caution is unnecessary and discouraging for the SC. All TAP Action outputs are due before the end of the Action and we believe that the fee should be also.