



D1.2. Community Engagement Strategy

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Abstract		
<p>The overarching objective of the GOTHAM project is to develop and validate a user-driven tool that enables effective groundwater governance to ultimately preserve the quantity and quality of this strategic resource in the Mediterranean basin. The GOTHAM Tool (GTool) uses an integrated methodological approach that targets optimal allocation of water resources from an environmental, social, and economic perspective, including stakeholder knowledge, priorities and behaviour. One of the main strengths of the tool is that it provides a common framework for collaboration and engagement of the different water users (mainly, agricultural communities but also municipal and industrial users), as well as other relevant stakeholders such as water</p>		

producers/operators and regulator(s). Stakeholders can engage and co-create the tool thanks to an innovative methodology based on the communities of practices concept.

This deliverable builds upon the stakeholder mapping and analysis of each use case. It provides a community engagement strategy, based on the Community of Practices concept, revised, and adapted for the need of GOTHAM. It is conceived as a roadmap to guide partner's work on the field, during project's implementation.

Keywords

Community engagement, Communities of Practice, Innovation management, water basin, water quantity, water quality, Mediterranean basin, ground water

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Project summary

The overarching objective of the GOTHAM project is to develop and validate a user-driven tool that enables effective groundwater governance to ultimately preserve the quantity and quality of this strategic resource in the Mediterranean basin. The GOTHAM Tool (GTool) uses an integrated methodological approach that targets an optimal allocation of water resources from an environmental, social, and economic perspective, including stakeholder knowledge, priorities and behaviour.

One of the main strengths of the tool is that it provides a common framework for collaboration and engagement of the different water users (mainly, agricultural communities but also municipal and industrial users), as well as other relevant stakeholders such as water producers/operators and regulator(s). The GTool will enable all the stated users and stakeholders to exchange information in order to reach the optimal water governance at each point for present and future scenarios.

The concept of the proposed GTool targets effective groundwater governance for the improvement of management and the preservation of this essential and strategic resource. Effective groundwater management remains an important and complex challenge in the Mediterranean and elsewhere and it is essential to ensure long-term sustainable use of this resource.

In this regard, GOTHAM integrates multicriteria decision-making methods for stakeholder group decision making, social-learning and the use of the socio-hydrological water balance framework as a theoretical foundation for water allocation to evaluate the dynamic balance between the societal and ecological systems in the catchments. GOTHAM project presents a bottom-up decision-making approach inspired by this methodological framework.

GOTHAM project presents a scalable and user-specific tool(GTool) for decentralising water resources management, using big data analysis. The proposed user-based tool leverages six analytical modules:

- The **water balance and water quality dynamics module** make use of advanced investigation of the main aquifer formations and real-time monitoring (on-site and distant), including a preliminary analysis of the background hydrogeological and hydro-meteorological information to create a baseline.
- The **water availability and demand forecasting module** predicts different water scenarios and assesses their impact on groundwater quality and quantity status using remote-sensing measurements to model agriculture water demand and assess water availability.
- The **Managed Aquifer Recharge (MAR) and aquifer remediation module** mobilises multicriteria analysis (QGIS environment), including hydrogeological, economic, and chemical (water quality) indicators as well as regulatory restrictions to evaluate the feasibility of MAR schemes.
- The **agro-economic module** simulates the effect of different economic instruments such as water tariff structures, water markets contexts and incentives for water-saving (water demand management) and assessing the economic use value and trade-offs between users in alternative resource allocation scenarios.
- The **user's engagement module** enables to fix water priorities (water boundary conditions) by water users taking into consideration water resources to meet water demands.
- The **optimised water allocation module** calculates the optimal mix of water sources satisfying their requirements

GTool uses data visualisation techniques to deliver the results into customisable dashboards tailored for the needs of each stakeholders.

Broad outreach activities will take place in Europe, Lebanon, and Jordan, therefore contributing to GOTHAM impact maximization.

The further development and exploitation (beyond the project) of the GTool will be done by CETaqua, both on B2B and B2C approaches.

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Executive Summary

The overarching objective of the GOTHAM project is to develop and validate a user-driven tool that enables effective groundwater governance to ultimately preserve the quantity and quality of this strategic resource in the Mediterranean basin. The GOTHAM Tool (GTool) uses an integrated methodological approach that targets optimal allocation of water resources from an environmental, social, and economic perspective, including stakeholder knowledge, priorities and behaviour. One of the main strengths of the tool is that it provides a common framework for collaboration and engagement of the different water users (mainly, agricultural communities but also municipal and industrial users), as well as other relevant stakeholders such as water producers/operators and regulator(s). Stakeholders can engage and co-create the tool thanks to an innovative methodology based on the communities of practices concept.

This deliverable builds upon the stakeholder mapping and analysis of each use case. It provides a community engagement strategy, based on the Community of Practices concept, revised, and adapted for the need of GOTHAM. It is conceived as a roadmap to guide partner's work on the field, during project's implementation.

It is built in three parts:

- **Understanding the communities of practice:** this part provides explanation of the concept and how it is adapted in GOTHAM. It also introduces a methodological shift in the making of CoP that will be tested in GOTHAM.
- **The Roadmap to the creation of the CoP:** this part provides guidelines on how to set up and manage the CoP
- **The declination of the roadmap in each use case:** this part explains how the use case owners have engaged stakeholders so far and what means are available to sustain engagement during the project and beyond.

1.Introduction

At the heart of the GOTHAM project is the concept of Community of Practice (CoP). The project aims at gathering stakeholders and helping them to create consensus on how to use water fairly and efficiently thanks to the GTool. These Communities of Practices will be used to engage different types of stakeholders in each project use case. The GOTHAM communities of practice will become working groups, mobilised in co-creating the GTool through workshops. Co-creating the GTool will guarantee that the tools' features match the interest of all stakeholders. It will also ensure the acceptance of the tool. The project aims at creating Communities of Practices that will last beyond the lifetime of the project.

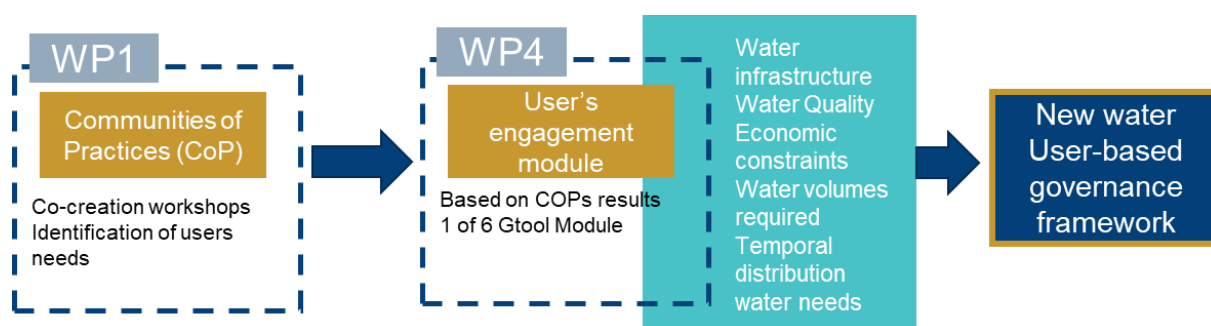


Figure 1 Role of CoP in GOTHAM project

One of the goals of GOTHAM is to develop a user-driven Groundwater Governance Framework (GGF) that could be applied in all the Mediterranean countries. The identified stakeholders will be actively involved in the tool and have economic and/or other incentives to participate in groundwater governance and follow the optimal water allocation recommendations.

A community of collaboration and trust founded on ongoing interactions between the stakeholders will emerge and address the overlapping priorities of water usage. It will be centred on social learning, creating shared interests and co-creating the solution which will result in a long-term collaboration in resource management. The use-case owners will organise CoPs in their regions where stakeholders will share their opinions and propose solutions related to the use-case.

The purpose of the deliverable is to set-up guidelines for the CoPs and to support the use-case owners. The use-case owner first identifies the stakeholders and with the co-creation workshops later gathers them to practise and finally the owner will animate and sustain the CoPs. It also provides a methodology that can be replicated for further innovation.

This methodology is based upon the Principles of Community Engagement: These principles state that to facilitate engagement, one needs to

- to identify and consider the final goals,
- to develop partnerships and inculcate faith,
- to consider the duty and right of all the individuals,
- to build awareness and bring change,
- to consider the heritage and traditions of the community along with knowledge of its history,
- to mobilise the talents and capabilities,
- to include the local organisations and
- to have a long term dedication for the community engagement.

Three separate CoPs for the three use-cases have been set up inside the project at the locations of Spain, Lebanon, and Jordan, and these CoPs will follow the nine principles specified. The CoPs are designed to make it easier to take part in group talks, have one-on-one sessions, learn about new ideas, or take lessons from experts assisting the CoP, and these CoPs are based on the concept of *Aliveness*, which is used to resolve a range of existing and potential groundwater problems in the Mediterranean basin. The important factors being considered in the CoP are that everyone within the community has a feeling of belonging to the community where they have freedom of speech within a friendly environment to encourage dialogue and sharing of best practices. The CoPs are task-oriented and in GOTHAM the CoPs will not dissolve after the completion of the tasks. The three CoPs of the three use-cases can interact and share their knowledge from their basin and a moderator will act as a liaison for all the stakeholders. The organisation of the CoP will also provide aide with various issues when required and the community charter also with this document will hold all the information of the CoP such as goals, timelines and activities.

With the use of blockchain, enabling transparency to the GTool and the workshops organised including all the stakeholders will help the members of the community to understand and forecast water levels and quality and base their cultivation decisions upon that. This GTool will also be co-created along with the communities in question. Three such workshops are planned along the co-creation process and these will be conducted in the locations of the three use-cases, where the first workshop aims at gathering the mapped stakeholders to create the GTool features, the second concerns with the front-end design for improved usability of the tool and finally the third at the end of the project to gather the users' feedback.

Each of the CoP gathers various stakeholders leading to moderation tasks such as the mode of the meetings, requirement gathering related to the meetings, etc, for which a moderator of each of the CoPs would be responsible. The tasks of the moderators are to make sure that the meetings are friendly and that there is equality and to provide a framework, agenda of the meetings. The moderator is also responsible to handle the differences and making notes of the points raised in the meeting.. With the communication and dissemination results, the formal actions, precise project results will be shared with all stakeholders in their regional languages in their preferred mode of communication.

The monitoring of the CoPs is based on the stated goals, the long-term goals and the short-term goals/wins which are favoured by stakeholders and used to generate their interest. These are also used to generate interest inside and outside the community. Systematic anecdotal evidence would be used to capture elements of the stories of the CoP members as suggested by Wenger and Snyder (2000), there will also be a slot for participants to bring their ideas. All the meetings will have thorough documentation.

The CoPs are set up in the locations of Spain, Jordan and Lebanon and extensive interviews were carried out in these locations with all the different types of stakeholders which are water producers, end-users, water suppliers, regulators and organisations (NGOs).

This deliverable provides a guideline for the set up and management of GOTHAM communities of practices. To create the CoPs, several activities will be undertaken. First, use case owners of GOTHAM need to identify the potential members of the Communities of practice. Then, the co-creation workshops planned all along the project, will gather those people around a "practice". Finally, use case owners will continue animation of work to ensure the sustainability of the Community of Practice.

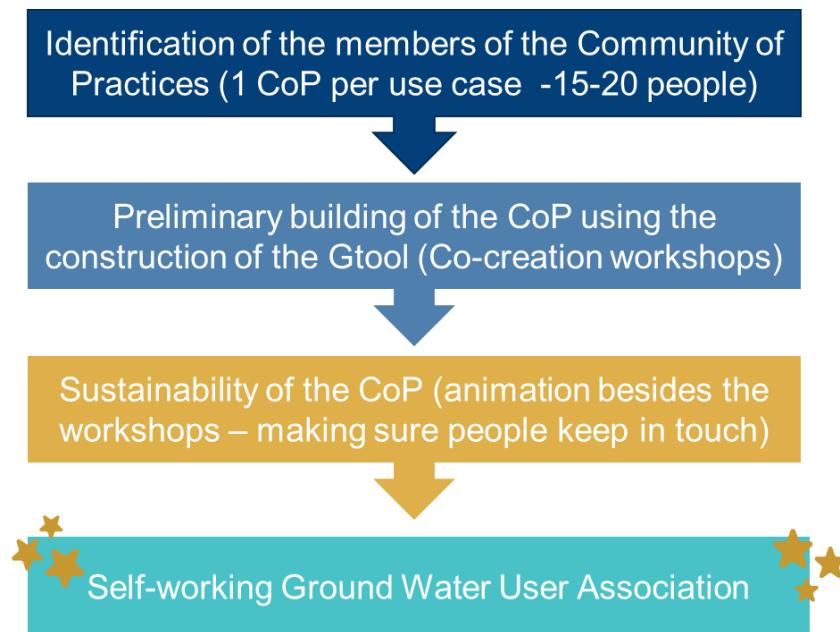


Figure 2 GOTHAM Activities for the implementation of Communities of Practices

This deliverable will provide “how-to” support with the fieldwork of use case owners. It will provide a generic part on community engagement common to all case studies, and a part dedicated to considering the specificities of each use case, to adapt engagement practices.

Also, this deliverable aims at providing a replicable methodology for other collaborative innovation projects. It, therefore, builds on previous projects’ user community engagement in the field of innovation and will assess each of these use cases to bring a critical factor of success which in turn could serve other projects.

The deliverable is divided in three subparts:

- Understanding Communities of Practices
- Roadmap to the creation of CoP in the GOTHAM use cases
- Declination of the roadmap in each use case

2. Understanding Communities of Practices

2.1. Communities of practices in theory

Communities of practices are defined as groups of participants who “*share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis*” (Wenger et al., 2002). CoPs provide useful practice-based framework for collaborative social learning and promoting engagement with local communities.

To cultivate a CoP, the combination of three elements must be done in parallel:

- The domain,
- The community
- The practice (Wenger, 2011)



Figure 3 Necessary characteristics of Communities of Practices

In social sciences, CoP exists. They can be identified but not created. Methodologies exist to make their organisation more efficient: by acknowledging them in the first place and providing them with space and means to work (Wenger, 2011). GOTHAM wants to bring a paradigm shift in creating a CoP, for a specific project and making it sustainable.

In GOTHAM, stakeholders share a domain of interest (management of the water resource) and practice (the creation of the GTool). However, a trustful community based on on-going interactions between members is yet to be created: in fact, users are likely to have conflicting interests over the use of water.

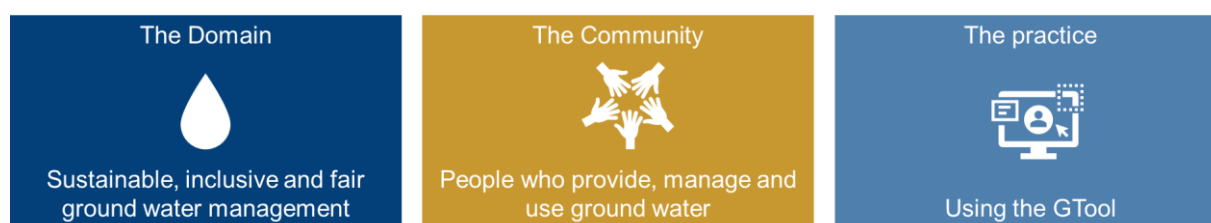


Figure 4 Characteristics of GOTHAM CoP

The community of practices' framework, centred on social learning, will thus help to better understand each other's needs, to create shared interests and co-create the solution aiming at better water management, the GTool. Also, by knowing and interacting with each other, members of the CoPs will set the basis for long-term fruitful collaboration in the field of resource management, sharing knowledge on how to better manage resources and ensuring a long-term positive impact of the project.

To achieve this objective, GOTHAM use case owners will organise Communities of practices in each of the use cases. The communities will be based on the various water users and aim at creating a safe space where different people can share opinions and propose solutions for the shared management of their groundwater.

2.2. Community engagement in the field of innovation

2.2.1. Importance of community engagement

Community engagement is a critical factor of success for social innovation, especially in rural areas.

The challenge in the field of water resource allocation is that conflicts are deeply rooted and require to change in depth the governance framework. This is particularly important in rural areas, where modifying individual behaviours requires engaging several actors (Govigli et al. 2020). Govigli et al, conducted a study on seven use cases in one H2020 project in rural areas around the Mediterranean basin to demonstrate the importance of community engagement in the project to conduct social innovation. Social Innovation is defined by Polman et al. (2017), as, *"the reconfiguration of social*

practices in response to societal challenges, which seeks to enhance outcomes on societal well-being and necessarily includes the engagement of civil society actors”. Their findings suggest that supporting early governance actions in rural areas has helped deliver good result in fostering social innovation. Their study shows that early engagement alone is not enough. Efficient community engagement requires recursive engagement, with a strong presence on the field.

Community engagement in turn provides the project with many benefits for its success. A well-engaged community enables to 1/ ensure public support to the project, 2/ improve the final output, and 3/ improve public policy.

2.2.2. Principles of community engagement

There are 9 core principles for any community engagement that needs to be considered and managed before any Community of Practice is supposed to take place (“Principles of Community Engagement: Second Edition”).

This project will consider and follow the practices that are in line with this published journal. The considerations that are to be followed are as follows:

1. The final goals and the stakeholders/communities should be well-identified and stated.

For communities and stakeholders to participate in the engagement the benefits and incentives of the engagement and benefits for the community should be well defined. These incentives also help in tackling if there are hurdles when initiating the engagement. The motivations for the participation are going to be different and not coherent for all the participants. The goal for community engagement in GOTHAM is very clear: create a tool that will enable a fair and sustainable share of groundwater resources. The incentive is to benefit from a tool that will support effective water governance.

2. Being informed about the history of the community financial environment, social behaviours, systems of policy and control, beliefs and traditions, demographic patterns, culture, and knowledge and lessons learned from the past experiences of other organisations which tried initiating similar general CoPs

Learning as much about the communities as possible from as many outlets as achievable is significant. Learning about the whole environment helps in planning and designing the engagement while respecting the communities, their traditions and culture and helps in approaching the community to initiate the engagement. Understanding the perceptions of engagement within the specified community will help to identify the assets to consider and hurdles to avoid. GOTHAM project deals with three different communities in three different countries. To respect this second principle, in-depth analyses of the communities have been taken. Results are presented in D1.1 Stakeholder Mapping.

3. Go to the community, develop partnerships, build faith, engage with the formal and informal leadership, and pursue the engagement of community groups and stakeholders to implement the community organising process

Meeting with the key community leaders and their surroundings helps to build trusts and partnerships, this can be done with the help of local involvement, going through local bodies/NGOs, and conducting interviews to study more about the community. The highest priority must be the rights,

interests and well-being of people and societies. In GOTHAM, each use case is managed by one project partner: CETAQUA steers the use case in Spain around Campo de Dalias, ICU manages the use case in Lebanon around Iaat, and NARC is responsible for the use case in Jordan, the Azraq Basin. To develop partnership and trusts, frequent site visits (when possible due to the COVID-19 Pandemic) as well as introductory interviews enabled the use case owners to get to know the GOTHAM beneficiaries. In some cases, the use case owners used intermediaries which knew well the local community, to create a link and enforce the trust. This being said, building trust is a long-term process and will be built along with the implementation of the GOTHAM project.

4. Consider and agree that the duty and right of all individuals in a society is mutual self-determination. No external party or organisation should suppose that it has the power to behave in its self-interest in any community.

An external party is always going to be external when it enters a community, obtaining inclusion does not mean that the party is a part of the community. An organisation is said to be of the community when it is formed by the members of the community and is limited only to those individuals. People in a community are more likely to become involved if they understand the problems being discussed, consider them to be significant, and believe they have an impact and can contribute to them. If individuals find few obstacles to involvement, perceive the advantages of participating to outweigh their drawbacks, and agree that the environment and organisation atmosphere are transparent and welcoming, then the participation would be easier to evoke. GOTHAM pursues its interest: building a tool that enables to improve the management of groundwater resources. Yet, the core of the tool is to respect each stakeholder's interest. As a result, it is fully in line with respecting the right of communities to self-determination.

5. To build awareness, bring change and maintain growth, working with the community is of the utmost importance.

The parties and the communities participating in an engagement need to recognise co-learning opportunities and know that they have something to learn and contribute to that engagement. It is necessary to commit to the promotion of improved groundwater management while having something to achieve at the same time. Each group also has considerable responsibility for the outcome and initiative in such a partnership. The communities involved in GOTHAM will be involved in the co-creation of the GTool, during the three years of the project's implementation. This hands-on work will enable us to respect this fifth principle.

6. The heritage and traditions of the community with respect to the engagement must be understood and valued by all the facets of community engagement. In organising, designing, and developing approaches to engage a community, knowledge of a community's diverse cultures and other factors impacting diversity must be paramount.

The different aspects and diverse factors that need to be considered may be related to economy, education, jobs, or health status, as well as to the culture, language, ethnicity, nationality, age, gender, mobility, literacy, or personal interests. What also needs to be considered and paid attention to is the variety of roles played by numerous persons and organisations in the functioning of such a community. When organising fieldwork, GOTHAM works with local experts, who already have a good knowledge of the heritage and traditions of the community. These experts actively participate in the design and implementation of the Community Engagement Strategy. This ensures that heritage and traditions are always respected.

7. Community engagement can be strengthened only by recognising and mobilising the talents and capabilities of the community and by improving the willingness and capability of the community to take actions.

Community assets include individuals and local organisations, values, expertise, and perspectives as well as the networks of partnerships that connect them. Although it is suggested that the existing resources should be leveraged for an engagement when a new resource is developed along with the community the engagement is further strengthened. GOTHAM leverages community knowledge and needs to co-develop the features of its water allocation tool. This tool, in exchange, is proposed to the community, to support them in better managing groundwater resources.

8. Organisations who want to include a group and people wanting change must be willing to loosen control to act and must be versatile enough to address and accept the changing needs.

The objective of a CoP and community engagement is that the project and the steps taken should be community driven. Such an engagement will bring changes to the current relationships between the community and the stakeholders, the organisation should be ready to accept the positive and negative risks that will be brought by such changes and they should be flexible enough to adjust themselves according to those risks. Co-creation is the heart of the GOTHAM methodology. This is precisely because the project's team needs local knowledge to infuse its functioning. By definition, GOTHAM accepts to loosen control.

9. Community engagements and partnerships require long-term dedication and support by all the participating members.

Community engagement and CoPs commonly require long-term dedication and participation and need nurturing over such a term. Not unexpectedly, it takes time to create trust and help communities establish the ability and infrastructure for meaningful action. Members of the communities or the local players may require additional resources, technical knowledge and skills from the organisations initiating such an engagement, at such times, the organisation should be ready to provide assistance and training to their full capacity. GOTHAM is a three-years project: for the time the project runs, a dedicated team will engage use case communities regularly. When the project will be over, most beneficiaries will use the GTool, which aims to work as cement for this newly created community.

3. Roadmap to the creation of CoP in GOTHAM

3.1. Setting up the CoP

With Gotham three different CoPs would-be set-up based on the three use-cases :



Campo De Dalias in Spain

Known as the “Plastic Sea”, this peninsula hosts intensive agriculture in Spain, under greenhouses. Intensive pumping of groundwater has led to changes in the behaviour of aquifers and their deterioration and the overall quality of water. Moreover, the excessive agriculture on this site has led to heavy pollution of the water due to their use of salts, nitrates, fertilizers, and phytosanitary substances.



Iaat Baalbeck-Hermel in Lebanon

The excessive underground water pumping has engendered a decline in the water table level. As a consequence, the springs dry out which results in disappearances of the natural sites. Moreover, there are issues related to pollution: leaks of polluted water in the southern water basin coming from wastewater treatment plants and an increased pollution ratio in underground water.



Azraq Basin-Zarqa in Jordan

In this area, there is a mismanagement of the groundwater due to the lack of control of the government regarding water use and due to the illegal drilling of water by private users. This results in a deterioration of water quality and quantity.

For a CoP to be established, the nine principles stated in the last chapter will be followed and respected. According to Wenger (2011) “*knowledge is a critical asset and needs to be managed strategically.*” There are many factors that lead to or initiate the knowledge exchange and the formation of a CoP but according to Wenger (2002) many factors can lead to inspire a community but nothing works more than the sense of *aliveness*. But as aliveness is an abstract idea one cannot simply plan and implement it within an individual or a community. Nevertheless, this sense can be carefully planned to be evoked. A well-designed CoP makes it easy to engage in group conversations, hold one-on-one meetings, learn about new ideas or watch and learn from professionals helping the CoP.

The CoPs of GOTHAM leverages on this sense of *Aliveness* where the members will come together to share knowledge and co-create the GTool. These CoPs will follow a methodology to deal with the current problems that they are facing with respect to the groundwater in the Mediterranean basin due to the increase in population numbers and increased water demand caused by various factors.

3.1.1. Planning the constitution of a community

The CoPs with respect to planning the community, the most important factor to be considered is that everyone feels included and has a sense of ownership within the community and that all the members can see benefits when participating. The members of the community should have freedom of speech which will be ensured and there shall be a friendly and well-respected atmosphere within the community. The CoP aims to encourage dialogue and activate the sharing of best practices. Contradictory views should be welcome when they are reflective and polite towards the other members of the CoP. The CoPs and their meeting should be functionally and professionally focused to the topics of mutual discussion, but a relevant topic that would help the communities for further growth irrespective of the relevance to the main goal should also be welcome.

The CoPs in general are supposed to be task-oriented which means that when the task in-hand is complete the CoPs dissolve, but with GOTHAM the CoPs will continue to function further even after the task is accomplished for continuous improvement. The CoPs are expected to follow the time commitments of the various members and organisation of the community. The members of the CoP should participate actively during the meeting and the workshops conducted for the CoP.

The three CoPs of the three case studies in the GOTHAM project can interact and should start their learning and problems sharing among themselves and the other CoPs to facilitate better knowledge transfer. Each CoP should select a moderator who will act as a liaison between all the members and facilitate the management of the CoP (Gonçalves, 2020). The moderator is the use case owner (CETAQUA in Spain, ICU in Lebanon and NARC in Jordan).

The organisation of the CoP will provide help related to required applications, tools, support, and training when required. The community charter will hold all the information regarding the CoP such as the goals, the timeline, and activities etc. The CoPs and its members and organisations are supposed to loosely-coupled where they can act independently but also tightly aligned towards the main goals and vision.

3.1.2. Proposing an operating framework (co-creation workshops)

The CoPs will constitute all the different members and stakeholders who hold interest, are impacted by, and/or can influence the outcomes of the GOTHAM project. The GTool will be transparent, thanks to the use of blockchain, and will be designed along with the community. This will be managed with the help of workshops organised, which The operating framework will include all the relevant stakeholders such as water supply managers and regulators, environmental and conservational NGOs, farming groups and community groups. This will help the members of the community to understand the current water levels, the quality, and accordingly which crops to cultivate in that specific season which will reap them the most benefit.

Another objective of the co-creation workshops is to design the GTool along with the community by understanding their needs and reflecting on what else could be improved within the GTool.

Currently, three such co-creations workshops are planned

1. Co-creation workshop 1 – Features of the GTool.

2. Co-creation workshop 2 – Front end design.
3. Co-creation workshop 3 – Finalisation of the platform based on users' feedback.

As the titles of the workshop suggest the first workshop targets to know about the needs of the users and design the GTool and its features accordingly. For this, interviews were carried out over the three case-studies where end users, water producers, water utilities and organisation (local NGOs) were asked a series of questions and the dialogue transcript was created for further reference.

The three regions where these workshops are being conducted and are Campo de Dalías in Spain, Iaat, Baalbeck-Hermel in Lebanon and Azraq Basin-Zarqa in Jordan. As mentioned earlier these regions were selected due to the unique topographical challenges that these regions aim to overcome.

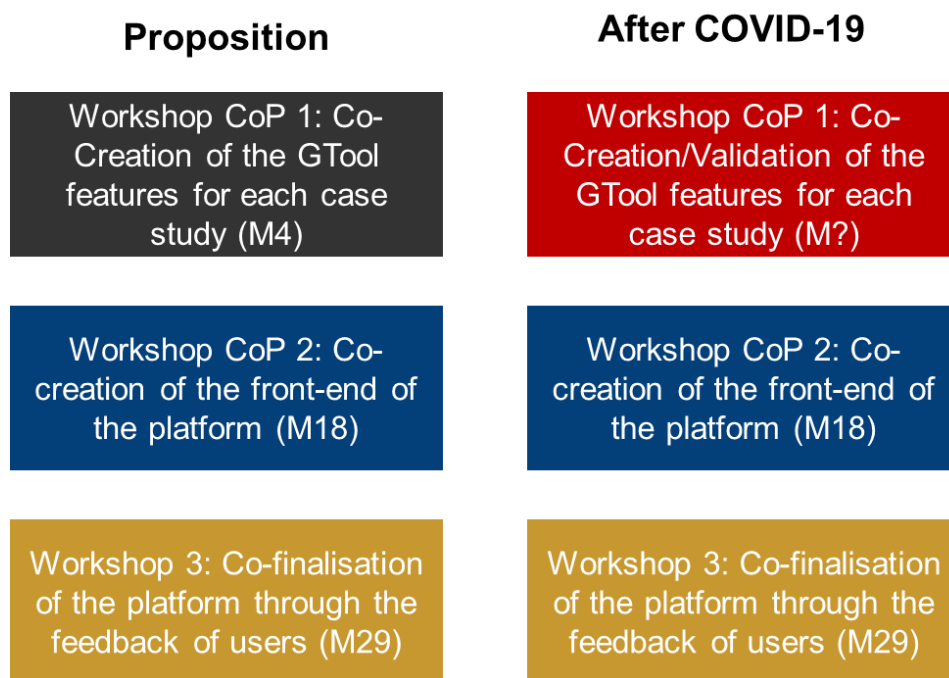


Figure 5 Organisation of the workshops

The first workshops aim at gathering the stakeholders mapped during the first phase to create the GTool features. Early 2020, it was decided internally to the consortium that the workshop should be held live and was hence delayed because of COVID-19. As the sanitary crisis is still continuing in 2021, online workshops will finally be organised to limit additional project delays.

The second workshop will occur at the middle of the project and will concern the front-end design of the GTool.

The third workshop will take place at the end of the project and will serve to gather users' feedback.

These workshops are instrumental in Community Engagement Strategy, as they constitute the practice that gathers all stakeholders. By making them work together, we want to create a sense of belonging.

3.2. Managing the CoPs

3.2.1. Moderating the CoP

3.2.1.1. Moderation during workshops

Each Community of Practice in GOTHAM gathers people from various institutions and background. This means, that there are numerous tasks which are to be undertaken while moderating the CoPs. The CoP meeting may be physical or remote or both with half the members opting to be in the field while half of them opting to connect remotely through digital means, and this also means that the necessary hardware and equipment needs to be arranged for these meetings. There will be an organiser/moderator who will be responsible for the above-mentioned details for each of their CoP.

These meetings should be friendly in such a way that everyone is given the stage to speak and everyone has a sense of equality and belonging when speaking and sharing their views. The facilitator of the meeting must provide a framework and create an agenda for the meeting to value the time of all the stakeholder who are participating. The views and opinions conveyed in such meetings are divergent and of various standards which gives the need for an honest discussion to understanding the nature of the issues. The moderator is supposed to handle such differences, as difference in opinions and views also brings enhanced learning, which is the main motif of any CoP. In difference of views and debates within a CoP meeting, the moderator must be the one noting all the different points of views and asking the members about what they think would lead to success.

According to “Food and Agricultural Organisation of United Nations” Questions play an integral role in promoting successful engagement, making it easier for members to exchange insights and knowledge and draw on the result. To design questions for face to face and digitally mediated procedures, both art and science are available. There are four types of questions:

- **Opening Questions** are consistent with introductory materials which are designed to create a welcoming environment, easily introduce participants into the context and conversations and help them centre their attention and facilitate participation.
- **Informational Questions** initiate the sharing on perspectives and knowledge around the subject at hand between participants. These questions are intended to cast a wide net to shape the conversation in a direction that will lead, based on evidence and experience, towards the goals of the group.
- **Deepening, reflective and interpretive questions** help to build the case for a meaningful synthesis, participants can reflect on what has been shared, think more critically and look for trends, consider biases and test assumptions, and identify areas of agreement and possible tensions or disagreement.
- **Concluding questions** are the collective conclusions of the results of the discussion and next steps are those that shape them.

3.2.1.2. Moderation outside workshops

The CoPs need to be moderated between workshops, to maintain participants attention and interest in the project. For this moderation, use case owners are instrumental. They will be responsible for interacting regularly with stakeholders. Interactions can be either formal or informal.

Formal actions will be organised through the communication and dissemination of the project's results. Precise project's results will be communicated to all stakeholders, in their local language, using tailored channels. In Spain, stakeholders are comfortable with emails, whereas, in Lebanon and Jordan, participants asked for Facebook accounts. Other means of communications could be considered for the CoPs such as Teams conversations or WhatsApp groups.

Informal actions could be taken by the use of case owners as part of their daily project management, such as phone calls or field visits.

3.2.2. Monitoring Outcomes

With different stakeholder and members with different views and diverse background and very different motivations to integrate into a CoP, the hardship occurs when understanding and monitoring the success of the engagement and if the CoP can achieve its goals. This monitoring is based on the stated goals which are mostly long and short-term goals. Usually, outcomes decide the long-term value, while the short-term value is given to the participants by "small wins" that can be obtained in a short period. These little victories favour the members of the CoP by adding excitement and making them see the immediate importance that the presence of the CoP provides.

Such short-term victories can generate interest within and outside the community, luring in more members who were first hesitant to join the CoP. The gap between the meetings of a CoP can range from days to months, so it is important to have constant contact with the members of the CoP.

Wenger and Snyder (2000) define a way of measuring the CoP's results as systematic anecdotal evidence. Since there is no realistic way to quantitatively measure the results of a community, systematic anecdotal evidence captures elements of the stories of the CoP members that link community activities and their outcomes with results. Anecdotal evidence should be gathered systematically: regularly, covering the whole range of members and their activities. Any quantitative measures, such as *"increasing efficiency by x per cent"* or *"improving operations leading to an increase in customer satisfaction of y per cent"* should be added. As part of the CoP reports or minutes, it is recommended that the CoP meeting agendas include a slot for participants to share their stories and capture these. Importantly, both successes and failures should be captured by the anecdotal evidence gathered, as the latter provides a basis for discussing and improving the actions that CoP members take.

There should be a thorough documentation of the meetings, conducted where the minutes, the steps taken, and the results should be well stored and make available to everyone. In GOTHAM, blockchain is used for this purpose so that the information stored cannot be hampered with and is available to everyone.

Regarding the overall monitoring of the project, one KPI relates to the creation of CoP.

KPI_1.1: Number of actors engaged for each case study: 7

- ✓ 2 irrigation communities,
- ✓ 1 public authority/local policy maker,
- ✓ 1 water utility,
- ✓ 1 agri-food industry,

- ✓ 1 consumer association,
- ✓ 1 scientific organisation

4. Declination of the roadmap in each use case

4.1. Spain

In the case study of Spain, stakeholders were identified based on the entities that manage water resources in the area. Campo de Dalías is an area that is not directly managed by Cetaqua or any of its associated entities but is mostly managed by Aqualia, water supplier in Almería.

The main problem in accessing this information is that it is part of the competence and collaboration between these parties is more complicated. Therefore, interviews have been conducted with the most senior people in order to get a complete view. The stakeholder interviews began in December 2020 and were concluded in February 2021.

Approximately 15 interviews were planned, across all types of stakeholders. The majority of the interviews that were not carried out belong to Aqualia, the water distribution company in Almería, which is a direct competitor of Hidralia, to which Cetaqua belongs.

The following entities have been interviewed.

- **JCUAPA:** Junta Central de Usuarios del Acuífero del Poniente de Almería (Central Association of end-users of the Western Aquifer) has a total of 166 users: 7 municipalities, 38 Irrigation Communities, 3 companies and 118 individual users. The best way to find out the opinion of the majority of water end-users is to interview the entity that unites them and gives voice to each of them. It has a vision of its own as it is created by the end-users themselves and is managed by them.
- **Hidralia:** Hidralia manages a drinking water network of 2,547 km, which distributes more than 57.95 Hm³ per year to 12 cities, with nearly 545,000 inhabitants, employing 315 professionals. It is the entity that best knows the management of water resources in the area because it is dedicated to the entire area of the autonomous community. The range is all the territory of Andalusia.
- **Consortium:** Consortium for the Management of the Integrated Water Cycle of the “Poniente de Almería” (focused on non-conventional water resources – public regulator). In particular, the person interviewed has a dual role that makes his vision even more complete. On the one hand, he represents the consortium for the Management of the Integrated Water Cycle in the area, which means that he knows perfectly well how water is managed. On the other hand, he is a member of the local council, so, as he himself points out, he knows how political problems can paralyse management.
- **Andalusian Government:** Regional Ministry of Agriculture, Fishing, Farming and Sustainable Development was represented by its Director General for Planning and Water Resources. It is particularly important to have the opinion of this stakeholder as it is the highest regulatory body in Andalusia, second only to the Spanish government.

- **University of Almería:** Chair of Water in Agriculture, Irrigation and Agrifood. Water resources research projects are carried out, as well as analysis of future trends. Its research is done both internally with the university itself and in collaboration with other research centres.
- **IFAPA La Mojonera:** Agricultural and fisheries research and education institute. The Centre's research, training and technology transfer activities are directed towards the intensive greenhouse horticulture sector.

All interviews were conducted through digital platforms due to the current situation. This did not pose a problem for conducting the interviews, except for the inconvenience of not being able to access the facilities of each of the people.

Another inconvenience derived from COVID-19 is not being able to carry out more interviews with end-users as they did not trust the digital platforms to answer some questions. This is one of the reasons why they have been unwilling to do interviews. Even so, all interviewees were interested in becoming more actively involved in improving groundwater management.

The contact with stakeholders has been carried out through e-mails and by sending the communication carried out by the project, such as newsletters.

It is a fluid and collaborative communication. The problems derived from the inability to meet physically have been solved by using the camera and facilitating the creation of meetings adapted to the needs of each person.

The project will have a clear continuity since all the people who have participated have been very accessible in order to maintain contact and improve the management of water resources, which is the main purpose of this part.

4.2. Lebanon

In this case study, the project team made progress on the mapping of the stakeholders. In cooperation with the Iaat Municipality, a list of 25 stakeholders was planned, this list included 9 water producers, 9 end users, 4 water suppliers, 1 regulator and 2 organisations (NGOs). The selection of stakeholders was done in close collaboration with Iaat Municipality. During meetings held between project team and the Municipality, criteria have been set in order to ensure the selection of stakeholders active in community activities, open to dialogue and discussion and represent a lever for CoP activities and not hinder.

The main criteria was:

- ✓ Involvement effectively in ground water sector;
- ✓ Willingness to collaborate with water management projects;
- ✓ Active in community affairs and social responsibility;
- ✓ Varied educational levels;
- ✓ Involve youth and ladies.

A list of 25 preselected stakeholders were prepared including the address, phone number, role and stakeholder's group. 24 interviews were done finally with stakeholders (See list below), with minor modifications due to the unavailability of some people.

The stakeholder interviews begun at the beginning of November 2020 and were concluded in early February 2021. To ensure easy understanding and ensuring that everyone has an equal chance, the questionnaire was translated into Arabic.

Unfortunately, the slowness in the implementation of these interviews was caused by the COVID-19 pandemic in addition to the lockdown of the country during the last two weeks of November 2020.

Interviews and the questionnaire sheets were translated into Arabic for better understanding and increased participation from all users.

During the meetings, the following question was asked to all stakeholders interviewed “Are you open to the idea of cooperating with stakeholders of the same water basin to better share and manage resources?”. All those interviewed expressed their willingness to join the CoP.

In the next phase of the project (expected to start on 1st of April, 2021), when the MoA’s tasks are transferred to ICU, two people will join our team, a project assistant and a field coordinator. These two figures, in addition to the project manager, will ensure remotely and closely, in case of field coordinator, constant communication with the stakeholders. It will be taken into consideration that the stakeholder who will communicate closely with the stakeholders must be highly experienced in dealing with rural community, have experience in agriculture and water management and be well acquainted with the tradition and practices of the Iaat-Baalbeck area.

Among the means that can be taken to ensure this constant communication are periodic phone calls, creating Whats-app group, carrying out field visits whenever the need arises and the outbreak of the epidemic permits.

In the event that a large number of stakeholders are using Facebook, the benefits of creating a page for Arabic speakers can be evaluated with the project management and in coordination with the partners.

Any decision to hold a meetings or workshops during the COVID-19 pandemic, no matter how large or small, should rely on a risk-based approach. These gathering must be absolutely necessary for the proper implantation of the project activities and reaching the expected results. Indeed, the first option would be through remote communication. If this is not possible, especially that rural communities are not familiar to use applications like Zoom, Team. This what appeared during the interviews with stakeholders mapping. All precautions that should be taken to protect the participants during gatherings.

To ensure the sustainability of a CoP, the ICE team will pay attention to the following critical factors of success.

1. Taking into account the human factor, precisely making sure members are satisfied with the CoP’s activities and the direct/indirect benefits from it
2. Members have a voice in decision making and feel important, adopting a more interactive approach;
3. Building mutual trust between members.

Since October 2020, Lebanon has been experiencing a most difficult and complex crisis since its establishment, what led to the collapse of the economy. This situation brings challenges:

1. The collapse of country’s economy, which will create many difficulties to the productive sectors especially agriculture sector;

2. The deterioration of the security situation as a result of an external war, tightening the imposed embargo, or internal conflicts;
3. Failure in the control of the Covid 19 pandemic and the conditions evolve so that it is not possible to gather the members and launch the CoP activities;
4. As a result, the deterioration of social conditions so that everyone's concern became securing livelihoods and thus neglecting community and social activities.

In the event of getting out of this dark tunnel, any future economic solutions would include the empowerment of productive sectors, especially the Agriculture. Many challenges will be faced, one of the most important and exigent will be the availability of water for irrigation. The water management issues will have a major priority after the crisis phase, especially the water use rationalization, preservation and protection of water resources and the search for alternative, which constitutes an opportunity for the GTool.

4.3. Jordan

In Jordan more than 45 stakeholders were interviewed which included the water producers, water suppliers, end-users, regulators, and relevant organizations.

Interviews and the questionnaire sheets were translated to Arabic for better understanding and increased participation for all users.

The selection of stakeholders was done in close collaboration with the water regulator officer of Azraq from the Ministry of Water and Irrigation and a technical support office (TSO) with a high background experience in Azraq farming community. The community of Azraq was visited by the GOTHAM team with the presence of the MWI officials and the TSO. Based on that important meeting, the different categories of the stakeholders were discussed, agreed upon and different names were selected and listed with their phone numbers to be visited. With respect to the house-hold users, a women association from the local community and based also on close connections, was contacted to facilitate the meetings with the women (house-hold user).

Before carrying out the interviews, all questionnaires regarding each stakeholder category were translated to Arabic to facilitate and ease the interviews. Following the preparatory of all details with the supporting team, the GOTHAM team was able to reach 45 different stakeholders whom were met face to face taking into consideration all the protective measures in this pandemic situation. At the beginning of each meeting, a short summary of the project was carried out to the stakeholder to be familiar with the project objectives and the concept of the GTool. All stakeholders were open to the interview, willing to sign the **Interview Consent Form and take many photos**.

As translated from the English version, the definition of CoP was explained to the people as simple as possible. Based on their understanding, they were willing to meet regularly to share concerns or problems related to their water and tomorrow's solution. 70% of the participants preferred to hold these meetings from 4-6 times annually while, 20% preferred to have it once a month, and 10% preferred to have it twice a year. They also addressed the issue of having physical meetings to discuss various topics related to water resources in Azraq city and to exchange experience between the different stakeholders.

As discussed before, the GOTHAM team has a technical support officer (TSO) working with the team and very professional in dealing with Azraq community. The TSO along with the team are doing their best to communicate closely with the stakeholders and continuously managing relations with the Azraq community. Next step, we are planning to carry out some visits to Azraq through this TSO and a well-known farmer. This is to sustain the link between the project and the different stakeholders with respect to project activities. Also, we will suggest having some means of contact like a Whatsapp group, phone calls with the TSO for any information and a Facebook page if suggested or requested. This can be discussed and agreed upon in coordination with the Lead applicant and the project partners.

Based on our experience with Azraq community, we know that it is very difficult to have virtual meetings or workshops with the stakeholders. The other alternative will be to take official permissions to meet face to face in a big place to gather less than 20 people. This is will be carried out taking into consideration all safety precautions according to the defence rules. Another option will be to conduct several meetings (workshops) for a small group from each stakeholder category. If this is also not allowed, we will arrange continuous visits by the TSO and part of the team who live near Azraq to meet with stakeholders on very small scale and the rest of the team can join virtually.

This question was directed to some stakeholders in Azraq regarding this issue as the team realized that there is no ground water user association (GWUA). The history of this GWUA was not good and it was canceled since a very long time due to financial burden. Based on water resources management in Jordan and in Azraq area, it is very difficult to re-establish the GWUA. In fact the stakeholders expressed the absence of coordination or dialogue between them and the Ministry of Water and Irrigation (MWI) regarding rationalizing the use of water resources or water community management. The suggestion was to create a Non-Profit Association for the stakeholders focusing on farmers.

5. Conclusion & next steps

The Community Engagement Strategy of GOTHAM is used to establish communities of practices in each use case. These communities of practice will support cooperation between actors of the same basin, around the co-creation and use of the GTool. The communities of practice are used a methodology to enable the creation of Ground Water User Associations (GWUA) in each case.

The methodological innovation of GOTHAM consists in supporting the creation of CoPs amongst stakeholders with conflicting interest, against the current state of the art. In social science, CoPs are the results of observations, they can be triggered but not created. In GOTHAM, the co-creation of the Gtool is used as a way to experiment the making of CoPs.

The Community Engagement Strategy is the methodological guide proposed to reach this objective and support the overarching objective of GOTHAM: the development of a user-driven Groundwater Governance Framework (GGF) that could be applied in all Mediterranean countries.

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