

AGUASAN and WASH: A Forty-Year Comparative Study

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I. Introduction

1. Historical Context of The Water, Sanitation, and Hygiene (WASH) Sector

The Water, Sanitation, and Hygiene (WASH) sector has changed significantly over the past decades, and Switzerland has been part of this evolution in international cooperation since the 1960s. Back then, the Swiss Agency for Development and Cooperation (SDC) focused mainly on technical solutions, responding to crises with measures like drilling wells during the 1965 drought in India (Brutschin, Hartmann, & Lutz, 2003). Globally, large, centralized water supply projects dominated the 1960s and 1970s. While these projects expanded access, they also brought social and environmental costs, including displacement and long-term maintenance challenges. By the late 1970s, it became clear that infrastructure alone was not enough. The UN's International Drinking Water Supply and Sanitation Decade (1981-1990) encouraged a shift toward participatory approaches, appropriate technology, and sustainable operation and maintenance.

In the 1990s, discussions in the sector began emphasizing integrated approaches such as Integrated Water Resources Management (IWRM). Switzerland supported these shifts through participation in global platforms like the Global Water Partnership (Brutschin, Hartmann, & Lutz, 2003). It was during this period of transition, in 1984, that AGUASAN was founded. Although the term “Community of Practice” was not yet in use, AGUASAN quickly became a space for practitioners to exchange experiences, reflect on challenges, and collectively explore solutions. Learning and long-term cooperation were central from the start.

While AGUASAN is based in Switzerland, its discussions reflect experiences from many countries where SDC operates. Members have worked in contexts with some of the most persistent WASH challenges, particularly in Sub-Saharan Africa and South Asia, where 2.2 billion people lack safely managed drinking water and 3.5 billion lack safely managed sanitation (WHO/UNICEF JMP, 2023). By connecting Swiss institutional experience with international realities, AGUASAN creates a space for meaningful knowledge exchange across different contexts.

Today, WASH remains a central development issue, formalized under Sustainable Development Goal 6, which emphasizes universal access, water quality, wastewater treatment, and ecosystem protection. Emerging pressures like climate change, rapid urbanization, conflicts, and population displacement make the sector more complex than ever. AGUASAN's role is increasingly important, providing a space where practitioners can share lessons, rethink approaches, and collaboratively respond to new challenges.

This study situates AGUASAN within broader global WASH developments, linking historical documentation, practitioner reflections, and thematic analysis. By combining these perspectives, it provides a unique view of how knowledge is co-created, shared, and adapted over time.

2. Research Question

The research question: *How have the key questions and topics discussed in AGUASAN evolved over the past 40 years, and what trends can be identified?*

This research question is relevant for several reasons:

- AGUASAN is one of the oldest practitioner networks in the WASH sector. Its discussions provide a detailed record of how thinking has changed over time, from infrastructure-focused approaches to more systemic and governance-oriented discussions.
- The SDC (2003) states that learning and long-term cooperation are key to Switzerland's development approach. Understanding how AGUASAN has contributed to knowledge sharing over 40 years helps to show what long-term Communities of Practice can bring to the sector.
- Comparing AGUASAN's internal topics with global trends, such as those reported by WHO/UNICEF JMP, UN Water or SDC's own strategies, helps to see how practitioner networks respond to global agendas and sometimes anticipate them.

Studying AGUASAN therefore provides insights not only into the history of the community but also into how WASH knowledge develops, shared and adapted over time.

3. Scope and Significance

This research is centered on AGUASAN, a long-established Community of Practice in Switzerland, emphasizing its WASH sector contributions over a span of four decades. Its main stakeholders are the current and former members of AGUASAN, practitioners, and water and sanitation stakeholders. While Switzerland is the hub, the impact of AGUASAN goes beyond the borders through its involvement in development projects, knowledge-sharing networks, and collaborations.

This research is also significant because it examines how WASH priorities, themes, and knowledge-sharing practices have evolved within a specialized practitioner network. Understanding these shifts provides insight into how AGUASAN has helped shape sectoral discourse, fostered professional learning, and influenced policy and practice at both national and international levels. By tracing thematic evolution, the study highlights how technical solutions, governance, sustainability, and social dynamics have been addressed over time. Additionally, the research places AGUASAN's work in the wider WASH environment. It looks at how quarterly meetings, workshops, and collaborative projects have enabled peer-to-peer learning and the co-production of knowledge. Such activities help the community become resilient to new challenges like climate change, the link between the humanitarian and development sectors, and rights-based approaches. By putting equal focus on historical documents and practitioners' views, the study gives a different perspective of knowledge flow and how it shapes sectoral priorities, something that cannot be achieved by the usual literature reviews.

II. Literature Review

1. Current State of the Research

1.1 The Global Shift in Academic WASH Discourse

Internationally, Clean Water and Sanitation is one of the major highlights of the 2030 Agenda. Included in the Sustainable Development Goal 6 (SDG), the goal seeks to ensure availability and sustainable management of water and sanitation for all. To be specific, the domain of Water and Sanitation encompasses 8 main dimensions:

- Safe and affordable drinking water
- End open defecation and provide access to sanitation and hygiene
- Improve water quality, wastewater treatment and safe reuse
- Increase water-use efficiency and ensure freshwater supplies
- Implement integrated water resources management
- Protect and restore water-related ecosystem
- Expand water and sanitation support to developing countries
- Support local engagement in water and sanitation management

The conversation surrounding Water, Sanitation and Hygiene (WASH) has evolved significantly over the last few decades, shaped by shifts in global governance, policy-making, and participatory learning. One of the most observable developments in recent WASH research is the expansion beyond technical solutions toward a more systemic, governance-oriented, and participatory approach. Taken together, the existing literature points to three recurring themes: systems thinking is increasingly guiding planning and intervention; governance, sustainability, and accountability are recognized as central to success; and knowledge is being co-produced among practitioners rather than simply delivered top-down. Yet a significant gap remains: the informal, iterative learning processes where ideas are debated, tested, and refined, and where WASH priorities actually emerge, remain largely invisible.

In their article "System Approaches to Water, Sanitation and Hygiene: A Systematic Literature Review," Valcourt et al. (2020) reveal that WASH research has evolved beyond merely concentrating on infrastructure. By looking at peer-reviewed articles, organizational reports, and grey literature, their study shows that the financial and technical aspects are the most frequently discussed in published literature, followed by institutional, social, and environmental issues. Grey and organizational sources mostly refer to the daily operational aspects, such as tariffs, funding, and management, whereas academic publications focus more on markets, incentives, and broader structural questions. The difference here indicates the author's and the purpose's influence on the WASH writing focus. The review relies on both formal and informal sources but does not take into account the changes in WASH knowledge and priorities over time as well as the geographic diversity of the sector explicitly. Additionally, informal learning, peer exchanges, and the everyday conversations that shape practice remain largely invisible.

Huang and Zhou (2021) in "*Trends in Global Research on Sanitation: A 30-Year Perspective from 1990 to 2019*" offer a supportive view. Using bibliometric analysis, the research traces global research trends

over three decades and across 171 countries. The research findings show the growing importance of sustainability, governance, and systems integration in WASH research, providing a clear macro-level view of how knowledge and collaborations evolve. However, despite the broad scope of research, the analysis is limited to formally published outputs and doesn't capture grey literature or reports. Furthermore, similar to the paper by Valcourt et al, informal discussions or tacit knowledge that often guide real-world practice. Comparison of Huang's and Zhou's paper with Valcourt's et al. highlights the recurring theme in the literature: publications document intellectual debates while program-based studies capture the practical realities of implementation.

A further dimension of the sector's evolution is the formalization of water and sanitation as human rights. Fantini (2019) traces how the human right to water became both a legal and political contest, moving from implicit recognition in international human rights instruments to its formal codification in the 2010 United Nations General Assembly resolution. The rights-based approach introduced a fundamentally different logic into WASH discourse: rather than framing access as a development outcome to be delivered, it frames access as an entitlement to be claimed, shifting accountability from donors and implementers toward states as duty-bearers. As Fantini observes, this shift generated productive tensions within the sector between rights-based and market-based approaches to service delivery.

The most recent transformation in global WASH discourse involves the intersection of climate change, humanitarian response, and long-term development of what has come to be termed the Humanitarian-Development-Peace (HDP) Nexus. Mena et al. (2022) argue that climate change and disaster risk reduction are most effectively addressed not as separate policy streams but as dimensions integrated into existing humanitarian and development frameworks. Their analysis highlights that the persistent institutional separation between humanitarian and development actors is one of the central obstacles to sustainable WASH service delivery in fragile and conflict-affected settings, as they each operate on different timelines, with different funding logics and accountability structures.

De Wit et al. (2024) synthesize these developments into the most comprehensive historical account of the WASH sector to date. Tracing seven decades of sector development, their study identifies four successive phases: *technicalization*, *universalization*, *responsibilization*, and *metricization*. The paper explains how priorities and narratives change in response to global agendas, policies, and societal expectations, showing that modern WASH work is as much about accountability, equity, and evidence as technical knowledge. This four-phase framework provides the primary analytical base against which AGUASAN's thematic evolution is compared in this study's discussion.

To explain the reasons why the lack of informal conversations included in thematic research on WASH should be addressed, Bury (2008) in *"A Global Community of Practice: Creating Resource Centres that Build Capacity in Local WASH Service Provision"* shows how Communities of Practice (CoPs) enable peer-to-peer learning, shared reflection, and the transformation of collective experience into practical solutions. The study highlights the role of interaction and collaboration in shaping sector knowledge. This complements system-level, bibliometric, and historical analysis, which identify trends and priorities but often miss how ideas emerge, adapt, and spread in practice.

1.2 CoP Dimension

Communities of Practice (CoP) was proposed to characterize a new process of learning. The initial concept of CoP originated in Wenger's partnership with Jean Lave in their 1991 publication *Situated*

Learning: Legitimate Peripheral Participation. In this work, Lave and Wenger used an anthropological perspective to argue that learning is not just receiving or absorbing information. Rather, learning is regarded as "increasing participation in communities of practice" (Lave and Wenger 1991, 49). In *Communities of Practice: Learning, Meaning, and Identity* that focuses on workplace learning, Wenger expanded the scope of CoP articulation, illustrating how social resources shape learning trajectories and members' professional identity (Wenger 1998). Following this publication, Wenger developed the concept of CoP further by presenting it as an approach to knowing and learning cycle that is applicable to various contexts, including business, organizational design, government, education and civic life.

In short, CoP was defined in the book *Cultivating Communities of Practice* (Wenger, Dermott and Snyder, 2002) as groups of people who share a concern, a set of problems or a passion about a topic, and thereby deepening their knowledge and expertise in this area by interacting in an ongoing basis.

Respectively, three key components constitute the modality of learning in CoP, including:

- The domain of knowledge, which defines the area of shared inquiry the set of issues discussed in the community;
- The community, the members of a community, the social fabric, their motivation, and interactions;
- The practice, the set of frameworks, ideas, tools, information, styles, language, stories and documents that the community members share.

While the operation of CoPs goes beyond individual gains within the community, the community itself could evolve and produce collective results through continuous internal interaction and exchange. The collective results are defined by:

- Outcome: Results of a programme or project relative to its objectives that are generated by its respective partners' outputs.
- Output: The tangible products (goods, services) of a programme or project.
- Impact: Positive and negative, primary and secondary long-term changes or effects produced by a programme or project, directly or indirectly, intended or unintended.

These theoretical contributions paved the way for the widespread adoption of CoP across diverse domains, leading to a series of more practice-oriented analyses that emerged in the 21st century.

A central debate of CoPs concerns the tension between autonomy and institutional embeddedness. Nicolini demonstrates that CoPs are simultaneously constituted through shared practice and shaped by broader organizational and institutional contexts (Nicolini 2022). In this sense, *Communities of practice as Hybrids: Delving into the Hybridization Work of Community Leaders* conceptualizes CoPs as hybrid organizational forms governed by both social interaction logics and instrumental organizational strategies (Sandrine 2024). This perspective was advanced by Contu and Willmott, who argue that CoPs are embedded in power relations and cannot be understood as neutral spaces (Contu and Willmott 2003). Particularly, learning described as legitimate peripheral participation by the CoP theory is a complex notion implicated in social structures involving power. Power dynamics determine access to resources, entry into the community, and what knowledge is deemed "legitimate". (Contu and Willmott 2003). In the case of AGUASAN, this leads to the question whether knowledge production is shaped by structural asymmetries, particularly the influence of dominant actors such as the Swiss Agency for Development and Cooperation (SDC).

Furthermore, recent literature connects CoPs to debates on knowledge politics and epistemic inequality. Santos in *Epistemologies of the South Justice Against Epistemicide* argues that global knowledge systems systematically marginalize non-Western epistemologies (Santos 2015). Extending this argument, Haverkamp shows that transnational knowledge networks selectively legitimize certain forms of knowledge, through which inequality is reproduced (Haverkamp 2024). AGUASAN, therefore, as a CoP that not only functions in Switzerland, but rather increasingly extending its operation in fields of the Global South, functions as essential knowledge exchange channels that can decide on equality and equity through its epistemic election and legitimation process.

Finally, scholars highlight the role of CoPs in boundary work and cross-epistemic coordination. The concept of boundary objects was developed by Star and Griesemer and has been widely applied to explain how different knowledge communities collaborate (Star and Griesemer 1989). Particularly regarding the relationship among different communities in same or similar domains, different communities are not merely competing or mutually exclusive but can be anchored together through boundary objects and standardized methods, driving the production of new knowledge while maintaining their respective autonomy. In this context, Bueger argues that norms and knowledge emerge through interaction, contestation and translation across multiple CoPs. To be specific, participants in a CoP engage in debates over standardized procedures and meta-norms to achieve a “scaling up” from localized practices to generalized knowledge structures. Ultimately, this jointly produced knowledge is stabilized through material inscription in artifacts such as manuals and maps, ensuring the circulation and recognition of practical knowledge. (Bueger et al. 2024) This is particularly relevant in the WASH sector, which spans multiple disciplines. AGUASAN can thus be conceptualized as a boundary space that facilitates translation and integration across diverse epistemic communities.

Taken together, integrating CoP theory with global governance and knowledge politics literature allows for a more precise understanding of AGUASAN's role in shaping norm formation and discursive evolution in the WASH sector, and positions it within broader processes of transnational knowledge governance.

1.3 AGUASAN as a Community of Practice

In Switzerland, water and sanitation have always been viewed as a fundamental public service, with extensive institutional frameworks and a long history of regional authority management. The Swiss Agency for Development and Cooperation, or SDC for short, has been significantly influential in promoting international cooperation, specifically in the water and sanitation sector, combining technical knowledge with training and support for policies. Within this scene, AGUASAN was founded as a Community of Practice, where practitioners, researchers, and decision-makers gather to create an environment for peer-to-peer knowledge sharing. AGUASAN's activities, including quarterly one-day meetings, annual week-long workshops, and thematic discussions as well as positionings, reflect a broader understanding of WASH, linking technical solutions to governance, social dynamics, and sustainable development goals.

By putting Switzerland's experience with water and sanitation issues in the grand scene of global WASH challenges, AGUASAN provides a unique setting to explore how practitioner networks shape knowledge, share lessons, and influence sector priorities. The community emphasizes not only technical innovation but also learning through dialogue and collective reflection. Over time, this

approach has allowed members to address emerging issues such as climate change, humanitarian-development linkages, and rights-based approaches, illustrating how WASH practice evolves in response to shifting global and local demands.

2. Research Gaps

Firstly, on a broader conceptual level, the intersection of water, sanitation (WASH), and the organizational model of Communities of Practice (CoPs) is a very understudied area. Although various initiatives have embraced CoP methods, following the footsteps of AGUASAN, such as Global WOPs Community CoPs, CoP4WASH in Central Asia, and the Community of Practice on Sanitation and Hygiene, there is a lack of systematic academic scrutiny of these instances. Most of the existing discussions are descriptive and practice-driven, hardly touching on organizational dynamics or learning processes, rather they focus on activities or outputs. Since CoP is a concept that is inherently adaptable and changes differently in different sectors, there is a need to understand in depth how the WASH sector, with its institutional, technical, and socio-cultural aspects, is translated into CoP principles.

Secondly, in connection with AGUASAN, it is extremely difficult to find a detailed study that follows the evolution of the network's thematic agenda over 40 years. While there are materials such as annual workshop reports, summaries of quarterly meetings, strategic documents from SDC and other sponsors, overall observation is fragmented. At present, there is no systematic framework that charts how AGUASAN's main themes have changed over time, how different themes connect to each other, or how particular topics have deepened or changed. Therefore, the change internal to AGUASAN regarding knowledge production, priorities, and organizational identity is not fully acknowledged and classified analytically.

Thirdly, there is a lack of comparative studies that link AGUASAN's evolution of focus with worldwide shifts in development thinking, environmental governance, and the international WASH agenda. Therefore, there is a need to study how global policy trends, donor priorities, technological innovations, or geopolitical changes have affected AGUASAN's evolution and, in turn, how AGUASAN has been a source or a forerunner of global debates. The absence of this comparative viewpoint hides what is steering AGUASAN's path and somewhat limits the understanding of its role as a mirror and an actor of international WASH discourse.

III. Methodology

1. Identify Sources

The analysis draws on primary sources produced by or directly associated with AGUASAN across four categories. First, the 39 annual workshop reports published between 1984 and 2025 constitute the core dataset. Particular attention was given to their topics, sub-topics, summaries, and key questions addressed in order to identify AGUASAN's evolving areas of focus. Second, quarterly meeting agendas and minutes from the same period served as essential supplementary sources, extending the corpus beyond the annual workshop series to capture the community's operational discussions, technology updates, and international engagement. Third, AGUASAN publications, including *AGUASAN: Learning from a Remarkable Community of Practice* (Egger, 2004) and *Voices about AGUASAN* (2016), were reviewed to capture first-hand reflections on the community's evolution. In addition, primary sources from AGUASAN's major initiating and sponsoring organizations were consulted, including SDC strategy documents and the SDC Global Programme Water (GPW) frameworks for 2017-2020 and 2021-2024. These materials, alongside secondary literature on global WASH trends, were used as comparative benchmarks rather than primary analytical objects. The final combined corpus consists of 705 entries spanning 1984-2025, comprising 198 workshop entries and 507 quarterly meeting entries. Each entry corresponds to one thematic discussion unit which could be either a singular agenda item, like an individual presentation, or a group of case studies presented during the same workshop or meeting when several presentations discussed the same overarching issue.

Secondly, primary sources from AGUASAN's major initiators and sponsoring organizations will be analyzed. As AGUASAN was co-initiated by the Swiss Agency for Development and Cooperation (SDC), Helvetas Swiss Intercooperation, the Skat Foundation, and the Water and Sanitation in Developing Countries (SANDEC) program, documents such guidelines documents published by these organizations offer important insights. These materials help elucidate the principles underpinning NGO development in Switzerland, the rationale for establishing AGUASAN within the water and sanitation sector, and the extent to which AGUASAN's work aligns with Switzerland's development priorities and broader international agendas.

Thirdly, primary sources issued by the Swiss government in the water and sanitation sector will be collected. Key documents include the *Report on Effectiveness: Swiss Development Cooperation in the Water Sector* and *Sanitation & Hygiene Promotion - Operational Guidelines*. These sources enable an analysis of how Swiss approaches, institutional structures, and technical strategies in water and sanitation have evolved over time, providing a comparative framework against which AGUASAN's position and trajectory within the Swiss system can be assessed.

Fourthly, primary sources published by the United Nations and other international organizations will be examined. Water and sanitation have long constituted a priority area for organizations such as UNICEF, the World Health Organization (WHO), the United Nations Development Programme (UNDP), and the United Nations Environment Programme (UNEP). Flagship reports, such as the WHO/UNICEF Joint Monitoring Programme's assessments of WASH affordability, *UN World Water Development Report*,

World Water Forum Reports and Documents published by Stockholm World Water Week—provide indispensable references for identifying global trends in the water sector. These international trajectories will be used as comparative benchmarks to analyze AGUASAN's drivers of change and thematic evolution.

2. Research Methodology

2.1 Framework-Based Analysis

This study adopts a framework-based analytical approach to examine AGUASAN as a CoP. The analytical framework is primarily derived from the conceptual foundations of CoP theory as developed by Etienne Wenger and his collaborators. Building on this theoretical foundation, the study first extracts key analytical dimensions from the CoP literature, including: (1) the domain, referring to the shared area of interest and the boundaries of relevant knowledge; (2) the community, understood as the network of actors engaged in sustained interaction and mutual learning; (3) the practice, encompassing the repertoire of shared resources, tools, and routines developed over time; and (4) the impact, referring to the extent to which the CoP contributes to knowledge production, norm formation, and policy influence. These dimensions provide a structured lens through which the internal dynamics and external relevance of AGUASAN can be systematically assessed.

Empirically, the framework is operationalized through a combination of document analysis and qualitative interview data. The analysis takes as a starting point the 2004 report published by the Swiss Agency for Development and Cooperation (SDC) marking 20 years of AGUASAN, which offers a retrospective account of the platform's development between 1984 and 2004. This document serves as a baseline representation of how AGUASAN has been institutionally framed and historically narrated.

In addition, the study critically extends and refines its analytical categories by incorporating empirical insights from semi-structured interviews with AGUASAN members. These interviews provide access to practitioners' lived experiences, perceptions of community dynamics, and reflections on knowledge exchange and influence, thereby allowing the study to capture dimensions of the CoP that may not be fully visible in formal documentation.

Through this iterative process, the research uses AGUASAN as an empirical case to test, refine, and contextualize CoP theory. In doing so, the framework-based analysis serves a dual purpose: it enables a theoretically grounded interpretation of AGUASAN's evolution, while also assessing the extent to which core CoP dimensions are realized in practice within a transnational WASH platform.

2.2 Thematic Analysis

The thematic analysis was conducted using an inductive coding strategy. The process consisted of two stages.

First, in the familiarization phase, all 705 entries were read in full to identify recurring concepts, key questions, tools discussed, and thematic patterns, from which categories naturally emerged from the data rather than being imposed from an external framework. Tools such as Notebook LM and AI-assisted summarization were employed to support this initial pass, enabling the extraction of recurring

topics, sub-topics, and thematic signals across a large corpus. Critically, all patterns and categories identified through AI-assisted tools were manually validated and iteratively refined by the research team before any analytical conclusions were drawn, in order to mitigate the risk of systematic misinterpretation.

Second, a manual coding scheme was constructed based on what emerged from this reading process. Each entry was assigned two codes: one describing the problem being addressed (9 categories, P1-P9) and one describing the approach deployed (8 categories, A1-A8). These categories came directly from the recurring vocabulary, key questions, and concerns found across the 705 entries. A decision log was maintained for ambiguous cases, and a second pass of the full corpus was conducted to ensure consistency. The resulting coding scheme is described in full in Annex 2.

Following the initial coding, a matrix coding analysis was conducted to examine co-occurrences between problem and approach categories across the full corpus. Era-based frequency analysis was also performed, dividing the corpus into five historical periods: 1984-1989, 1990-1999, 2000-2009, 2010-2019, and 2020-2025. These operations allowed patterns of thematic evolution to be identified both longitudinally and structurally.

The documents analyzed consist of publicly circulated AGUASAN workshop reports and meeting summaries. No personally sensitive or confidential content was processed through AI tools. All AI-assisted analysis was conducted on this publicly available material, and interview transcripts were anonymized prior to any processing and stored on password-protected institutional drives accessible only to the research team.

2.3 Comparative Analysis

The comparative analysis builds on the two parallel analytical streams: the thematic analysis of AGUASAN's corpus with 705 entries and a systematically developed external comparator: Waterlines Parallel Corpus. Waterlines is an International Journal of Water, Sanitation and Waste (Practical Action Publishing, 1984-2024) was selected as the primary external comparator due to its being the only peer-reviewed WASH practitioner journal that has been published continuously during the entire study period and its thematic focus and researcher-practitioner nature aligns well with AGUASAN's. The complete article listing was derived from JSTOR and the Practical Action Publishing archive resulting in 1251 unique articles. Of those, 907 were considered relevant WASH content; 344 were excluded from consideration due to lack of relevance (irrigation, solid waste, editorials). Each article of relevance was then designated both a single P category and a single A category utilizing the identical coding method utilized when developing the AGUASAN catalog. When deciding upon which theme would be used for the article coding process the following rule was followed: when a theme was the dominant theme of the article then that was the theme that was chosen based on the title.

A more integrative assessment explores how AGUASAN's thematic evolution aligned with or diverged from these external dynamics. The analysis highlights AGUASAN's contributions to both national and international water and sanitation discourse, while also identifying potential blind spots, asymmetries, and areas where AGUASAN either exceeded or lagged behind broader sectoral developments.

2.4 Interviews

Potential interviewees are grouped into three primary categories: members from SDC, members from AGUASAN CoP and workshop participants of AGUASAN. Interviewees can be different in terms of their experiences with AGUASAN and years of joining AGUASAN, which offers diverse perspectives to the analysis. The expected number of interviewees is ten.

For ethical issues, all the interview questions will be sent in advance to interviewee to keep them informed of the purpose, lasting time and contents of the interview before it takes place. At the beginning of each interview, two details will be further confirmed: prior informed consent will be obtained for interview recording for internal use; Interviewees will be asked whether they wish to remain anonymous (name, position).

Interview questions are designed to serve two purposes. Firstly, questions will focus on interviewee's experiences with the CoP within the water and sanitation sector, including their mutual influence, feedback and suggestions for the community. The second part will focus on interviewees' perception of the evolution of priorities in broader WASH trends in comparison over 40 years. There will also be a brief introduction of the data analysis output and ask for feedback, questions and comments.

3. Expected Outputs

- Thematic mapping of AGUASAN's Work Focus (1984-2024): A comprehensive thematic categorization of AGUASAN's workshops, agendas, and publications, highlighting the evolution of its major work domains; visual representations showing shifts and patterns in AGUASAN's focus over four decades.
- Analysis of knowledge flows with AGUASAN as a CoP: insights into how AGUASAN functioned as a CoP, including mechanisms of knowledge sharing, member engagement, and innovation diffusion, informed by workshop documentation and member interviews.
- Comparative Analysis of AGUASAN and Swiss and international WASH trend: comparative diagrams and analytical narratives illustrating alignments, divergences, and potential influences between AGUASAN, national policies in Switzerland and international WASH trends.

4. Limitations

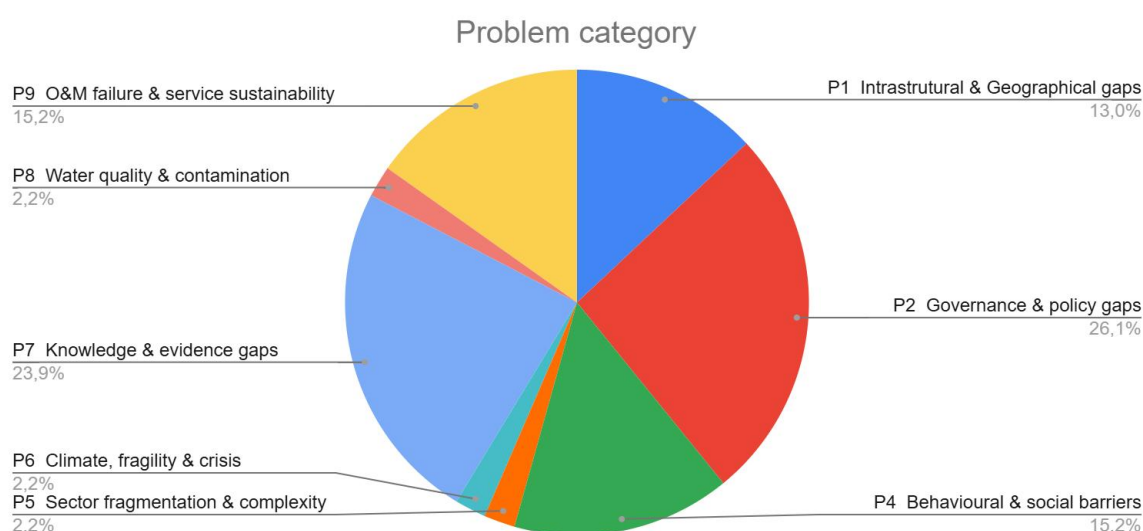
- AI-assisted preliminary coding: while data analysis tools are used to assist inductive coding, these tools cannot fully replace human interpretive judgment. Subtle contextual or sector-specific nuances in the reports may be overlooked, requiring careful manual validation.
- Scope of comparative analysis: the comparative component between AGUASAN and a broader scale will be made based on the selected Swiss government documents and international organization publications. The selection of documents to analyze the trend of WASH could be partial that ignore certain potentially influential actors.
- Source bias and completeness: The primary sources largely consist of AGUASAN workshop reports, meeting minutes, and publications, which may reflect the perspectives of key organizers and official narratives while underrepresenting dissenting or informal viewpoints. Language barriers to some historical documents may hinder the accuracy and comprehensiveness of the thematic analysis.

IV. Findings

1. Thematic Evolution of AGUASAN's WASH Discussions, 1984-2025

The combined catalogue of 705 entries: 198 workshop topics and 507 quarterly meeting topics: constitutes the most comprehensive longitudinal record of AGUASAN's intellectual engagement assembled to date. The data were coded using a two-layered classification system of 8 methodological approaches and 9 problem areas. Organized according to five time periods, the findings show that over four decades AGUASAN has transformed from being a group of practitioners with a developing thematic concern into a community of practice that has developed significant thematic changes over time, while maintaining a consistent thematic emphasis on certain aspects of the field since its inception.

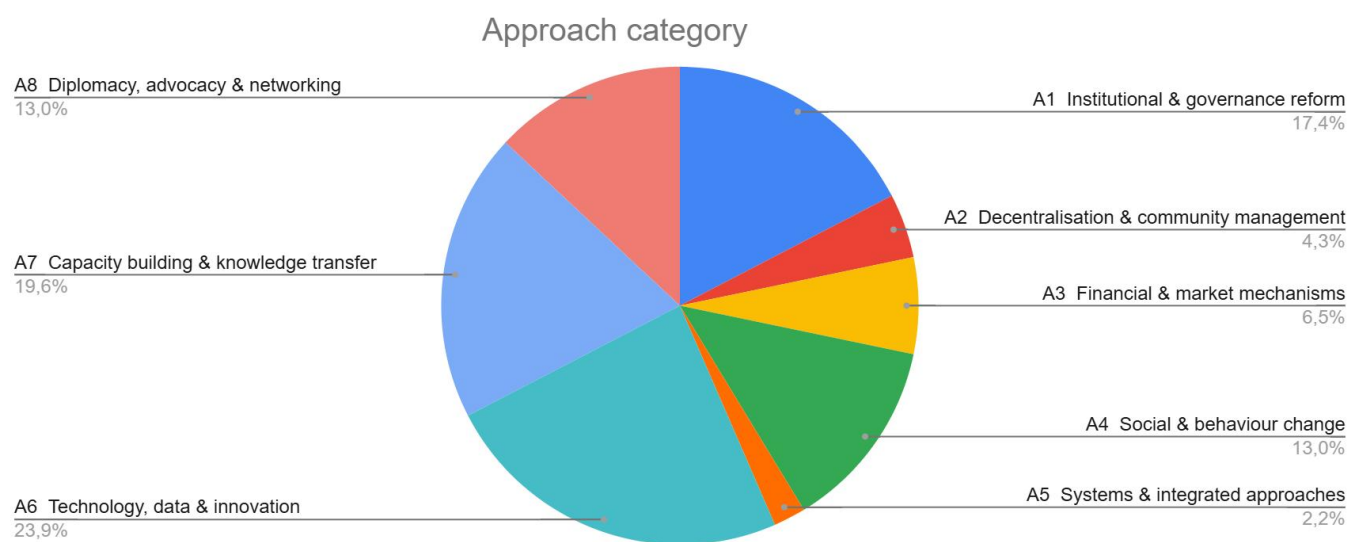
Governance/policy gaps (problem area P2) represent the greatest percentage (21.1%, $n = 149$) among all 705 items, followed closely by knowledge/evidence gaps (problem area P7) which also have been identified as major problems in each era with a frequency of 19.3% ($n = 136$). Thus it appears that AGUASAN members have consistently viewed institutional and epistemic weaknesses as the two greatest barriers to WASH improvement. No other problem area was identified with similar consistency or with respect to both temporal and thematic considerations.



[Figure 4.1.1 Problem categories share in AGUASAN's topics]

Comparison with the Waterlines parallel corpus (907 articles, 1984–2023) shows that Waterlines is instead dominated by P1 Geographical and Infrastructure Gaps across all five eras, confirming that AGUASAN was constituted as a diagnostic and governance-oriented network from the outset, rather than a field delivery community.

Regarding methods, technological/innovation/data (method A6) was used more frequently than any other methodological approach throughout the entire study (28.9%, $n = 204$), and was the sole methodological area to increase in frequency across each subsequent time period. From representing 23.9% of all items in the first time period (1984-1989), it represented 35.3% of all items in the fifth time period (2020-2025). While this represents growth in usage of digital tools within the last few years, it also demonstrates the continued primacy of hardware/technical solutions: e.g., from hand pumps/SODIS in the initial years to sensors/AI/digital twin models in current times, as the principal conceptual/practical discourse of AGUASAN's practitioner community.



[Figure 4.1.2 Approach categories share in AGUASAN's topics]

Era 1 (1984-1989): Social Foundations Before the Sector's Social Turn

The founding era is the smallest in the catalogue at 46 entries, but analytically the richest for what it reveals about AGUASAN's founding orientation. Governance and policy gaps (P2) lead at 26.1%, followed immediately by knowledge and evidence gaps (P7) at 23.9%, and then: strikingly: O&M failure and service sustainability (P9) at 15.2% and behavioral and social barriers (P4) also at 15.2%.

The attention to P4 at founding is significant in comparative context. The 1984-1989 period corresponds to the final years of the International Drinking Water Supply and Sanitation Decade (IDWSSD, 1981-1990), which was still primarily infrastructure-oriented at the global level. AGUASAN's engagement with social, cultural, and participatory dimensions from its very first workshop positions it ahead of the sector's formal turn to demand-driven and participation-based approaches, which accelerated globally only after the Dublin and Rio conferences of 1992. The 1986 workshop on

community participation and the 1987 workshop linking health, water, and hygiene behavior predate the formal institutionalization of these ideas in international WASH policy by several years.

Equally notable is the early presence of O&M failure (P9): 7 of 46 entries in the founding era address the breakdown of systems that already exist. The 1985 meeting minutes show sustained discussion of Operation and Maintenance training modules, and the 1988 workshop devoted entirely to maintenance systems confirms that AGUASAN understood operational sustainability as a distinct problem from the outset, decades before the sector's more recent emphasis on professionalized O&M.

A further finding specific to this era is the role of capacity building (A7) as the leading approach alongside technology, accounting for 19.6% of entries. Capacity building essentially disappears from the quarterly meeting record in 1990-1999 before returning steadily from 2000 onward, a pattern that likely reflects the transition from meeting minute records (which documented training module development) to formal quarterly meetings with a different agenda structure.

Era 2 (1990-1999): The Governance-Finance Duality

The 1990s represent a period of fundamental reorientation in global WASH thinking, and AGUASAN's catalogue reflects this clearly. The era's 56 entries show a three-way competition between governance and policy gaps (21.4%), financial and economic barriers (19.6%), and knowledge and evidence gaps (17.9%): a configuration not seen in any other era and indicative of a community working simultaneously across multiple conceptual frontiers.

The position of P3 (Financial & economic barriers) as a top-two concern mirrors the 1992 Dublin Principles, which introduced the concept of water as an economic good and opened the door to market-based approaches in WASH. AGUASAN's 1993 workshop on willingness to pay, cost recovery, and economic sustainability preceded the formalisation of SDC's sector policy in 1994. The 1998 and 1999 workshops: on the market-oriented model for public service provision and on private sector involvement respectively: show the community systematically working through the implications of this shift, including the conceptual move from treating users as beneficiaries to treating them as clients.

On the approach side, systems and integrated approaches (A5) appear as a co-dominant approach at 23.2%: higher than in any subsequent era: alongside technology at 25.0%. The 1990 workshop on sustainability across five simultaneous dimensions (ecological, social, institutional, technical, and economic) is the clearest expression of this systems orientation and represents the earliest instance in the catalogue of what would later be formalised as AGUASAN's recurring systems thinking commitment.

Era 3 (2000-2009): The Governance Peak and the Emergence of Fragility

The 2000-2009 period is by far the largest in the catalogue at 257 entries, reflecting the expansion of quarterly meeting records from 2000 onward. Governance and policy gaps (P2) reach their highest share of any era at 25.7% (n=66), consistent with the MDG-era emphasis on institutional reform, sector coordination, and regulatory development. The dominance of A1 (Institutional & governance reform) and A2 (Decentralization & community management) as approach co-dominants in the workshop sub-series: culminating in the 2007 and 2008 workshops on decentralization models and rural management

typologies: reflects AGUASAN's deepest engagement with the question of how to organize sector governance.

Two new patterns emerge in this era that would define the next decade. First, climate, fragility and crisis (P6) appears as a meaningful concern for the first time, moving from 5.4% in the 1990s to 4.3% overall in this era but concentrated specifically in the 2009 workshop, which addressed the WatSan continuum concept and featured case studies from Afghanistan, Chad, and Haiti. The 2009 workshop marks the moment when fragile and conflict-affected states entered the AGUASAN workshop agenda explicitly: a shift that deepens considerably in subsequent eras.

Second, this era sees the first substantial rise of diplomacy, advocacy and networking (A8) as an approach category, reaching 25.3% of era entries: a dramatic increase from 1.8% in the 1990s. This reflects the expansion of quarterly meeting discussions to include updates from international forums, World Water Week, global policy processes, and SDC's international representation. The emergence of A8 is almost entirely a meeting-data phenomenon: it represents a layer of AGUASAN activity: influencing the global sector from outside through advocacy and coalition-building: that was structurally invisible in workshop-only analysis.

Era 4 (2010-2019): Intellectual Diversification and the Nexus Turn

The 2010-2019 era is analytically the most heterogeneous in the catalogue. With 244 entries, it is nearly as large as the previous era, but no single problem category accounts for more than 17.6% of entries. Knowledge and evidence gaps (P7) leads narrowly at 17.6%, followed by governance and policy gaps (P2) at 15.2% and climate, fragility and crisis (P6) at 13.1%: the first era in which P6 enters the top three. Water quality and contamination (P8) also rises to 12.7%, entirely driven by meeting topics covering arsenic and fluoride mitigation, cholera responses, and water quality monitoring.

The 2013 and 2014 workshops are particularly significant for their nexus orientation. The 2013 workshop on WASH in health facilities brought fragmentation between the WASH and health sectors explicitly onto the agenda, while the 2014 workshop on the water-energy-food-ecosystems nexus marked the fullest expression of AGUASAN's systems thinking trajectory, using the concept of 'system thinking' explicitly to describe a necessary shift away from 'actor thinking'. Although AGUASAN had been drawing on systems thinking concepts since 1984, through Vester's interconnected systems model and later Capra's paradigm in 2001, the phrase itself only appeared as explicit language in workshop documents in 2014, when it was used as a directive to shift from actor thinking to a holistic view.

The 2016 workshop on SDG 6 implementation and the 2019 workshop on bridging human rights approaches with business cases illustrate the era's defining tension: AGUASAN was simultaneously trying to operationalize the SDG framework and reconcile fundamentally different theories of change: rights-based versus market-based: about how WASH services should be delivered.

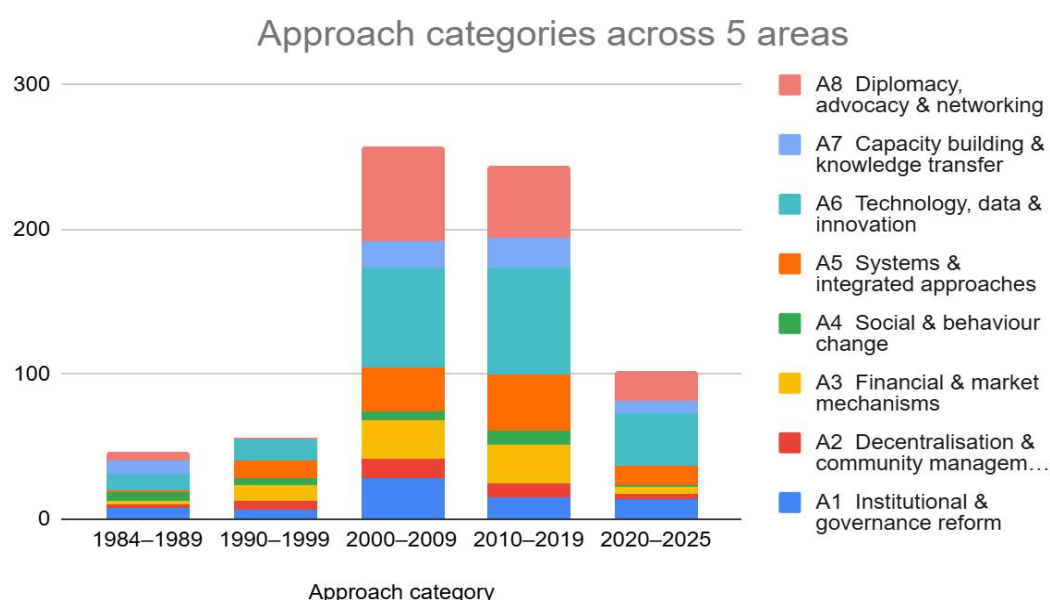
Era 5 (2020-2025): The Climate and Crisis Turn

The most recent era, with 102 entries, shows the sharpest thematic concentration in the catalogue. Climate, fragility and crisis (P6) rises to 16.7%: its highest share in any era: and accounts for the

dominant focus of the annual workshops in 2022, 2024, and 2025. O&M failure and service sustainability (P9) returns to 15.7%, matching its share in the founding era, driven by the 2023 workshop on digitalization in rural water services .

The pairing of P6's rise with P4's collapse to 2.9%: its lowest level in any era: is analytically striking. Behavioral and social approaches, which defined AGUASAN's founding identity, have essentially disappeared from the workshop agenda. Whether this reflects a genuine shift in the community's understanding of the sector's priorities, or a structural effect of the 2020-2021 COVID gap in the workshop series, cannot be determined from the catalogue data alone and is a question for the interview findings.

Technology and data (A6) reaches its highest share in this era at 35.3%, driven by the 2023 workshop exclusively devoted to digitalization: AI, citizen science, digital twins, and data governance as responses to water service challenges. This represents a qualitative shift from earlier eras in which technology was primarily hardware-focused: the 2020s see a transition to data infrastructure and digital governance as the dominant technological concerns.



[Figure 4.1.3 Approach categories share across 5 eras]

2. Problem-Approach Pairings: The Intellectual Reflexes of AGUASAN

The problem-approach pairing matrix reveals that AGUASAN's intellectual responses to sector challenges are not random but follow recognizable and in several cases near-deterministic patterns. Across the full 705-entry dataset, five pairings account for the majority of analytically significant co-occurrences and reflect what might be described as the community's dominant theories of change.

The tightest pairing in the matrix is between water quality and contamination (P8) and technology, data and innovation (A6): 85.2% of all 61 water quality entries pair with a technological approach (n=52). This near-exclusive reliance on technical solutions for contamination problems: filters, chlorination devices, remote sensing, water quality monitoring platforms: reflects a strong consensus in the community that water quality is fundamentally a technical rather than a governance or behavioral challenge. Notably, not a single water quality entry pairs with institutional reform, decentralization, or behavior change approaches.

The second tightest pairing is between financial and economic barriers (P3) and financial and market mechanisms (A3) at 71.4% (n=45). This is the clearest reflexive pattern in the data: when AGUASAN identifies a financial problem, it almost invariably reaches for a financial solution. The 15.9% of financial barrier entries that pair with diplomacy and advocacy (A8) represent the exception: primarily entries where financial challenges are framed as requiring international advocacy rather than local financial engineering.

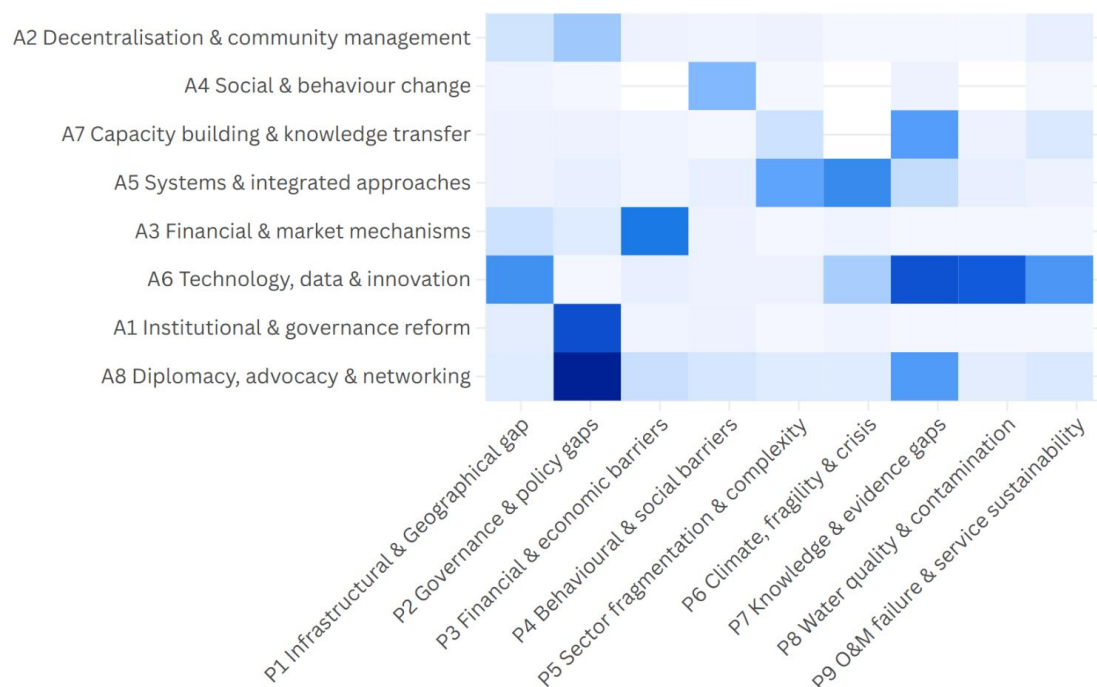
Sector fragmentation and complexity (P5) pairs with systems and integrated approaches (A5) at 64.0% (n=32), and climate, fragility and crisis (P6) also pairs primarily with A5 at 62.5% (n=40). These two pairings together represent what might be called AGUASAN's 'integrationist reflex': when the community perceives problems as complex or multi-dimensional, it responds with frameworks that emphasize coordination, nexus thinking, and multi-stakeholder platforms. The practical content of these responses varies significantly: from IWRM in the 1990s, to nexus frameworks in the 2010s, to humanitarian-development coordination in the 2020s: but the structural preference for integrated approaches over targeted interventions is consistent.

Governance and policy gaps (P2) present a unique pattern in that they are addressed through two almost equally prominent but philosophically distinct approaches: institutional reform (A1) at 36.9% (n=55) and diplomacy, advocacy and networking (A8) at 43.6% (n=65). This split reflects two genuinely different theories of change within the community: one that works through reforming institutions from within, and another that works through external pressure, international advocacy, and coalition-building. The slight dominance of A8 over A1 for governance problems is a finding specific to the combined dataset and was invisible in workshop-only analysis, since A8 is overwhelmingly a meeting-data phenomenon.

Knowledge and evidence gaps (P7) present the most distributed pairing pattern in the matrix. Technological solutions (A6) account for 39.7% of responses (n=54), but capacity building (A7) accounts for 25.0% (n=34) and diplomacy and advocacy (A8) for 25.7% (n=35). This three-way distribution is analytically distinct from all other problem categories and suggests genuine uncertainty or plurality within the community about how knowledge gaps should be addressed: through better tools, through training practitioners, or through pushing evidence into international policy processes.

Value 0  65

Variable



[Figure 4.2.1 Problem x Approach categories matrix across 40 years]

3. Tracing a Concept: Systems Thinking in AGUASAN, 1984-2024

One of the most analytically productive findings of close reading across the full catalogue is the traceable intellectual genealogy of systems thinking within AGUASAN: a concept that can be shown to have been present from the community's founding, decades before it entered formal use in WASH documents.

The evolution of systems thinking terminology in AGUASAN workshop sources proceeds as follows:

- 1984 — Interconnected systems: The founding workshop explicitly referenced Frederic Vester's 1978 book *Our World: An Interconnected System*, positioning systemic interdependence as a foundational lens for the new community.
- 1992 — Systematic approach: The eighth workshop on the water and sanitation knowledge system used "systematic approach" as a keyword to describe the transition from simple hierarchical models to complex interaction models among sector stakeholders.
- 2001 — Systems approach reference: The seventeenth workshop provided participants with Fritjof Capra's essay *A Systems Approach to the Emerging Paradigm* as background reading, explicitly framing the paradigm shift being discussed in systems science terms.

- 2014 — Explicit "system thinking": The thirtieth workshop used the phrase "system thinking" explicitly as a directive: describing the necessary shift from "actor thinking" to a holistic view of the water-energy-food nexus.
- 2018 — "Think systemic": The thirty-fourth workshop's recommendations to researchers and NGOs included the directive to "think systemic" and act based on need rather than donor requirements.
- 2024 — "Systems-based approaches": By the thirty-eighth workshop, the terminology had matured into "systems-based approaches" and "systems strengthening" as operational language for addressing WASH challenges in fragile contexts.

This six-point trajectory illustrates a pattern observed more broadly in AGUASAN's catalogue: concepts enter the community first as implicit orientations or borrowed frameworks, then as analytical tools, then as explicit directives, and finally as operational language. The systems thinking arc spans forty years and three distinct phases of the global WASH literature. Valcourt et al. (2020) place the emergence of systems approaches in the formal WASH research literature from the mid-2000s onward; AGUASAN's engagement with the conceptual foundations predates this by more than two decades. This is the most clearly documented instance of the community functioning as a site of intellectual anticipation: exploring ideas in practitioner discourse before they enter the formal research literature.

The significance of this finding extends beyond systems thinking as a specific concept. It suggests that AGUASAN's workshop series has consistently functioned as a space for conceptual experimentation, where ideas drawn from adjacent fields: systems science, economics, negotiation theory, rights-based frameworks: are introduced, tested against field experience through case studies, and gradually absorbed into the practical repertoire of the WASH community. The quarterly meetings, by contrast, show a more reactive profile: tracking emerging crises, new technologies, and international policy developments: that complements rather than replicates the workshop's conceptual function.

Together, these two functions: conceptual experimentation and operational tracking: constitute the distinctive contribution of AGUASAN as a community of practice to the WASH sector over forty years. The findings sections that follow examine both in greater depth through the lens of member perspectives gathered in the interview rounds of December 2025 and January 2026.

4. Cross-Era Comparative Summary: AGUASAN and Waterlines

4.1 Waterlines Topics from 1984-2024

Across all 907 articles, physical infrastructural and geographical gaps (P1) account for the largest share at 23.8% (n=198 articles), followed by O&M failure and service sustainability (P9) at 16.9% (n=153), and water quality and contamination (P8) at 13.9% (n=126). Behavioural and social barriers (P4) account for 13.8% (n=125), governance and policy gaps (P2) for 9.5% (n=86), and knowledge and evidence gaps (P7) for 9.8% (n=89). Climate, fragility and crisis (P6) accounts for 8.9% (n=81) across all eras. Financial barriers (P3) and sector fragmentation (P5) represent the smallest shares at 5.1% (n=46) and 2.5% (n=23) respectively.

Era 1 (1984-1989, n = 125)

The P1 Geographical & Infrastructural Gap category was ranked first with a percentage of 24.8 % (N = 31) and in second place the P9 O&M category had a percentage of 19.2 % (N = 24) and third place was taken by P8 Water Quality with 18.4 % (N = 23). The fourth position is taken by the P4 Behavioural category which has a share of 13.6 % (N = 17) and fifth place is held by the P6 Climate category with a share of 7.2 % (N = 9). In sixth position is the P2 Governance category that takes a share of 6.4 % (N = 8) and seventh place is taken by the P7 Knowledge category that has a share of 5.6 % (N = 7).

Era 2 (1990-1999, n = 272)

P1 Geographical & Infrastructural Gap also holds the top rank with a percentage of 21.7 % (N = 59) as well as second place being taken by P9 O&M with a percentage of 15.4 % (N = 42) and third place being taken by P8 Water Quality with a percentage of 12.9 % (N = 35). Fourth place is taken by the P4 Behavioural category with a share of 11.0 % (N = 30) and fifth place is taken by the P7 Knowledge category with a share of 12.5 % (N = 34). Sixth position is taken by the P6 Climate category which has a share of 7.0 % (N = 19) and seventh position is taken by the P2 Governance category which has a share of 11.8 % (N = 32).

Era 3 (2000-2009, N = 241)

In this era the P1 Geographical & Infrastructural Gap again has the highest ranking with a share of 27.0 % (N = 65), while the second place is occupied by P8 Water Quality with a share of 13.7 % (N = 33) and the third position is occupied by P2 Governance with a share of 13.3 % (N = 32). Fourth position is occupied by the P7 Knowledge category with a share of 12.0 % (N = 29), fifth position is occupied by the P4 Behavioural category with a share of 10.4 % (N = 25) and sixth position is occupied by the P6 Climate category with a share of 8.3 % (N = 20).

Era 4 (2010-2019, N = 209)

This era has seen an increase in the importance of the categories. So far, it can be said that the P4 Behavioural category has increased its importance compared to previous eras and now occupies the first position with a share of 28.2 % (N = 59). Second position is occupied by P1 Geographical & Infrastructural Gap with a share of 17.2 % (N = 36) and third position is occupied by P8 Water Quality with a share of 13.9 % (N = 29). Fourth position is occupied by the P6 Climate category with a share of 12.9 % (N = 27) and fifth position is occupied by the P2 Governance category which now has a very low percentage of only 4.3 % (N = 9). Last but not least we have to mention the P7 Knowledge category with a very low percentage of only 6.2 % (N = 13).

Era 5 (2020-2025, N = 59)

As expected from the developments during the previous eras, the P4 Behavioural category remains on top with a share of no less than 30.5 % (N = 18), while the second position is again occupied by the P1 Geographical & Infrastructural Gap category with a share of no less than 11.9 % (N = 7). Third position is occupied by the P6 Climate category with a share of no less than 11.9 % (N = 7), fourth position is occupied by the P8 Water Quality category with a share of no less than 10.2 % (N = 6), fifth position is occupied by the P9 O&M category with a share of no less than 6.8 % (N = 4) and last but not least we

have to mention the P2 Governance category which now takes the sixth position with a share of no less than 8.5 % (N = 5).

4.2 Comparative Findings between AGUASAN's Discussion Topics and Waterlines' Research Topics

- Era 1 (1984-1989): Divergence from the start regarding structure. AGUASAN was created around governance and knowledge. Waterlines research started primarily around physical infrastructure gaps and operations and maintenance.
- Era 2 (1990-1999): Lead on financial issues in part. AGUASAN places P3 Financial Barriers at second, representing an advancement in line with the economic paradigm of Dublin. Waterlines continues to prioritize physical infrastructure and O&M. In terms of governance and knowledge, both corpora demonstrate some level of engagement, although neither demonstrates significant leadership over each other.
- Era 3 (2000-2009): AGUASAN and Waterlines converge on governance. The P2 Governance rises in both corpora similarly to the institutional reform agenda of the Millennium Development Goals. Although there is evidence of similar external influences shaping both corpora during this time period, specifically the MDGs, AGUASAN does not appear to have been anticipating or leading the trend. Additionally, Waterlines demonstrates modest engagement with P6 Climate (8.3%) in advance of many assumptions regarding when such engagement would occur. Conversely, AGUASAN's climate-related topics appear to be clustered in the last year of this era (2009), whereas those of Waterlines are dispersed throughout the decade.
- Era 4 (2010-2019): AGUASAN's climate focus lead emerges. P6 becomes a top three priority for AGUASAN, while the category ranking fourth for Waterlines. During the same time frame, P4 Behavioural increases substantially (to 28.2%) for Waterlines, compared to P4 Behavioural remaining relatively flat (at 6.1%) for AGUASAN.
- Era 5 (2020-2025): Maximum convergence on climate; maximum divergence on behavior. Both corpora now rank P6 third. However, while P4 Behavior reached an all-time high of 30.5% for Waterlines, AGUASAN's P4 Behavior decreased to an all-time low of 2.9%. This is the most dramatic era-level divergence seen across the entire 40-year comparison between AGUASAN and Waterlines, and therefore establishes a clear reference point for examining structural gaps.



[Figure 4.4.1 AGUASAN vs. Waterlines — Problem Share by Era (%)]

V. Discussion

1. AGUASAN in Relation to Global WASH Trends

Comparing AGUASAN to the world-wide WASH sector requires an adequate analytical frame. As such, De Wit et al.'s (2024) four-phase progression: *technologicalization*, *universalization*, *responsibilization*, and *metricization*, provides an external yardstick against which the results of the catalogue can be measured. Alongside this phase structure, AGUASAN's 40-year history does not tell just one story. There are aspects of WASH history where AGUASAN was ahead of the curve, aspects where the community followed along with developments globally, and there are areas where the community demonstrated notable lack of awareness or understanding. The honest report will include all three.

1.1 Where AGUASAN Led

There are strong indications of anticipation concerning social, participative and behavioral aspects of water and sanitation in the catalog. The 1986 Community Participation Workshop for Water Projects and the 1987 Workshop relating Health, Water and Hygiene Behavior to each other preceded Dublin Principle 2 (which established participatory management as a globally recognized standard for governance) by six years. In the mid-80s at the global level, the sector was largely still functioning in the technicalization phase, focused primarily on providing the physical elements necessary for delivering services. AGUASAN had already made participation and behavior essential parts of its work. In addition, the same logic can be observed regarding sustainability. The 1990 workshop organized along five concurrent dimensions (ecological, social, institutional, technical, and economic) occurred two years prior to the first multi-dimensional concept of sustainable development as presented at the Rio Earth Summit. The systems thinking arc described in Section 5.4 follows the same logic over an extended time frame: from the 1984 workshop referencing Vester's connected systems model, through the 2001 reference to Capra's Systems Approach, through the 2014 workshop explicitly requiring "system thinking," to "Systems Based Approaches" being used as operational terminology in 2024. The community was developing with system-level, integrative conceptualizations of WASH issues well before they became commonplace terminology in the sector.

Regarding the humanitarian-development dimension there is also the same pattern. The 2009 Workshop, organized using the WatSan Continuum Concept, and including case studies from Afghanistan, Chad, and Haiti, addressed challenges associated with coordinating humanitarian response and long-term development programming seven years prior to the first formal introduction of the HDP Nexus at the World Humanitarian Summit (2016), and ten years prior to when the OECD/DAC formalized it as a recommendation in 2019. While the term "Nexus" was absent in the 2009 Catalogue Entries, the issue of bridging humanitarian and development responses was the explicit organizing principle of the entire Workshop. A participant stated during his interview that the nexus approach is "not completely novel" and appears "cyclical over time" (Lukas, Q11), a characterization consistent with the catalog data demonstrating how intersectoral framing have been present since at least the 1987 health-WASH nexus workshop.

Lastly, AGUASAN's exploration of Willingness To Pay (WTP) and Cost Recovery Logic in 1993, represented as a dedicated Workshop Sub-Sessions, happened one year prior to SDC codifying its Water & Sanitation Sector Policy in 1994 (SDC, 1994). As such, while AGUASAN explored many of the implications of these economic perspectives at roughly the same time as its main funder began translating them into policy, they were acting in parallel as opposed to AGUASAN leading the way.

1.2 Where AGUASAN Mirrored the Sector

Some of AGUASAN's Thematic Shifting Was Not Anticipatory. Many of AGUASAN's thematic shifting is indicative of tracking or responding to changes in global agendas as opposed to anticipating them.

The governance peak (2000-2009) is most illustrative. The percentage of Governance And Policy Gaps (P2) reaches its high point in this period at 25.7%, corresponding with the MDG-era focus on institutional reform, sector coordination and regulatory development. The 2007 Workshop On Community Driven Service Delivery Models and the 2008 Workshop On Rural Management Model Typologies demonstrate AGUASAN's strongest engagement with governance-related themes. According to de Wit et al. (2024), this corresponds to what they refer to as the Responsibilization Phase of Sector Development. AGUASAN followed this trend, but did not establish it.

The 2015 Disaster Risk Reduction (DRR) Workshop, which focuses on applying DRR principles in WASH, took place in conjunction with the adoption of the Sendai Framework in 2015, thus indicating alignment as opposed to anticipation. The SDG 6 Workshop of 2016, occurring one year after the SDGs were adopted in 2015, demonstrates similar patterns: rapidly translating global policy developments into practitioner reflection without generating those developments from scratch.

1.3 Where AGUASAN Lagged

1.3.1 Gender, Women's Roles, and Menstrual Hygiene Management

The Human Right to Water issue does not create a lag in awareness of the issue, but it creates a more complicated situation than a simple lag. AGUASAN had been aware of the Human Right to Water issue since 2006 when it was included into their catalog with an SDC Fact Sheet on the Human Right to Water that was reviewed at a quarterly meeting. It was mentioned again at quarterly meetings in 2008 and 2010, prior to the United Nations General Assembly Resolution in 2010 that formally recognized the Human Right to Water. The first complete Workshop Treatment of the HRWS Framework occurred in 2011, one year after the resolution. The picture here is one of involvement of the operational meetings before moving to formal elevation to the Annual Workshop Agenda, which could be interpreted as a deliberate reaction to support practitioners in effectively addressing the implementation of the human rights

However, there is clearly a structural blind spot regarding Gender. Although Women were placed at the center of water management based upon Dublin Principle 3 since 1992, there are only six mentions of gender-specific WASH throughout the entire forty years of the catalog, all of which occurred at Quarterly Meetings in 2012, 2013, and 2016, none of these references were ever treated as primary annual workshop themes. In a quote from the interview of Anette regarding the long-standing members of AGUASAN she said that menstrual hygiene management is "a very important topic now, largely absent previously." According to Egger (2004), AGUASAN started out as a group of engineers and the

first female engineer joined the organization in 1991. What the catalog information reflects is how the original membership composition created a lasting influence on which topics the community focused upon within their most intense knowledge-producing processes over many decades.

1.3.2 Menstrual Health Management in the Context of WASH

The lack of menstrual health management (MHM) in the AGUASAN catalog of projects has also been the most glaring omission. Since 1998, Waterlines published 34 papers globally on MHM, almost exclusively in Eras 4 (24 papers) and 5 (10 papers). In addition, there was a special edition in 2015. Beginning in 2012, MHM appeared in JMP monitoring frameworks, SDG-6 indicators, Major Donor Program Guidelines, and Technical Standards for WASH. The literature today links MHM directly to girls' school attendance and drop-out, women's dignity and safety, and realization of their human right to water and sanitation. In the same time frame, AGUASAN created only two catalogue references to MHM over its 40-year history, two quick conversations in 2012 and 2018 quarterly meeting, referencing gender and sanitation but only tangentially touched upon MHM.

In terms of the interview findings related to this issue, they are quite clear. As mentioned by Annette Fay, Menstrual hygiene management is a very important topic now, largely absent previously.

1.3.3 The Urban Poor & Informal Settlements

AGUASAN has been working on WASH in a rural and poor context since the beginning of the CoP. It has also worked on WASH within urban settings, small town or regional service areas and at the city level throughout all time periods. Where AGUASAN is not present appears to be very specifically in relation to informal settlements (squatters) that include an urban poor as a main target population. In fact there are only three examples of informal settlements included as catalogue entries for the past 40 years, one entry specifically position the urban poor at the center of the conversation, and none were identified as annual workshop topics. On the other hand, Waterlines have continuously incorporated informal settlement sanitation, urban poor water supply access, and informal settlement upgrading into their work since its inception. This is important as informal settlements continue to grow rapidly as the largest global WASH challenges, and it is in these same regions (Sub-Saharan Africa and South Asia), where SDC also concentrates most of its bilateral development cooperation.

2. Knowledge Flows of AGUASAN as a CoP

2.1 Domain and CoP Mapping

Targeted by AGUASAN CoP, WASH (Water, Sanitation and Hygiene) is a highly complex and mobile domain of international development. The WASH sector is characterized by its institutional embedding in Sustainable Development Goal 6, and its inherently interdisciplinary nature spanning engineering, public health, peace keeping and social behavioral change. By this token, no single knowledge system is sufficient to address challenges in the domain, which highlights the necessity of CoPs as integrative and flexible structures connecting diverse actors and forms of expertise.

Particularly, in the context of international development, CoP holds the potential to transform the one-side or top-down transmission to a dynamic and ongoing knowledge integration process. Through the

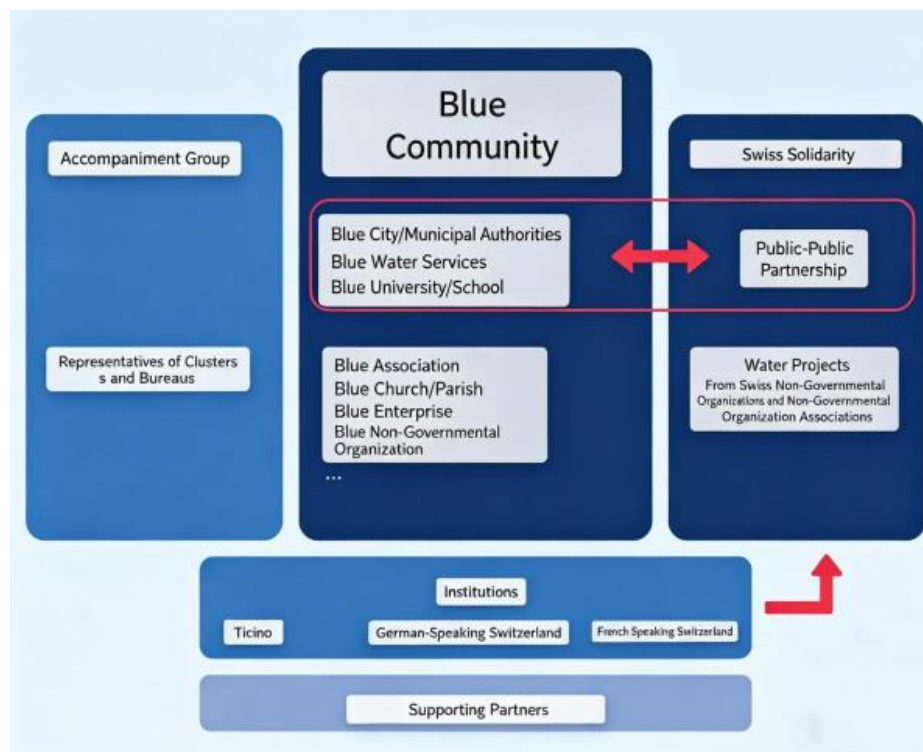
mechanism of legitimate peripheral participation, participants interact to co-construct a shared repertoire of tools and narratives that cohesively contribute to the domain. To be specific, CoPs can adjust rigid power structure, through which CoPs provide a venue for negotiation, allowing originally marginalized groups to transform from peripheral participants into core interlocutors. Simultaneously, quantified outputs in the development field (such as final reports and diagrams) undergo a process of reification within the community, becoming part of institutionalized knowledge. Through these dual dynamics, CoP members constantly seek a balance between social order and social change. Therefore, mere assistance in international development is advanced on a social learning system based on mutual engagement and identity, ensuring adaptations to ever-changing political, economic, and environmental contexts.

2.1.1 Other CoPs in Swiss WASH Landscape

Blue Community Switzerland

Originating from the global Blue Community initiative launched in Canada in 2009, the Swiss chapter emerged in 2013 and has since developed into a multi-stakeholder network comprising municipalities, universities, civil society organizations, churches, and water-related institutions. (See Figure 5.1.1) Blue Community Switzerland is defined by a normative commitment to water as a human right and to the public governance of water services. The CoP is operationalized through four institutionalized principles: the recognition of water and sanitation as human rights, the protection of water services as public goods, the promotion of tap water over bottled water, and the support for international solidarity and cooperation.

The primary function of Blue Community Switzerland lies in norm diffusion rather than knowledge production. With a particular focus on international partnerships and project promotion, the CoP is committed to promoting international WASH cooperation, often in collaboration with platforms such as Solidarité'eau Suisse, thereby extending local public water management practices into global development contexts. Projects with focal points on drinking water, sanitation facilities, residential hygiene covers areas of Africa, Asia, Central America and South America. By translating abstract principles of water justice into actionable commitments and facilitating their replication across diverse institutional settings, the network enables the transformation of shared values into sustained practices. At the same time, its emphasis on public-public partnerships and international solidarity situates the CoP within broader global WASH governance processes. (Blue Community 2026)



[Figure 5.1.1 Blue Community's Networking]

Swiss Water Partnership (SWP)

Swiss Water Partnership (SWP) as a multi-stakeholder platform established in 2012, reflects key constituents of a CoP. Operating within the Swiss water governance knowledge network, SWP assembles institutional participation in its community, bringing together approximately 70 Swiss organizations from academia, civil society, the public sector, and notably the private sector. Through essential practices such as presenting at global water events and promoting policy dialogues, it holds the overarching aim of promoting Swiss expertise in addressing global water challenges.

SWP functions more as a policy-oriented platform within global water governance, with a core function centered on articulating and projecting “the Swiss voice in global spaces for water security.” Importantly, the platform was initiated under the leadership of the Swiss Agency for Development and Cooperation (SDC). As stated in its official action plans, one of the principal outputs of SWP is to “facilitate and organize the members’ voice at global events,” including major international fora such as the World Water Forum and World Water Week, as well as to contribute to policy debates, position development and international partnerships. (Swiss Water Partnership 2024). It is recognized that SWP operates primarily at the level of global governance rather than operational water service delivery. (Interview Record).

In addition, SWP’s reflects a broader, organization-based and cross-sectoral approach that extends beyond the scope of WASH. Although WASH remains one of its thematic areas, the partnership explicitly engages with a wider set of issues including water governance, water security, innovation and international development cooperation. SWP features a broader multi-stakeholder composition of

research institutions, public authorities, NGOs, and private companies, indicating the dialogue and synergy of diverse organizational capacities. (Interview Record). Instead of a specific subsector in WASH, its primary organizing principle lies not in the coordination of diverse organizational capacities across the water domain.

Furthermore, SWP underscores the inclusion of the private sector in the CoP. One of the stated objectives of SWP is to “link Swiss expertise and solutions to market demand” and to facilitate access to international water projects through matchmaking and partnership-building (Swiss Water Partnership 2026). Membership of the CoP is open to companies, involving consulting firms and engineering companies that operate globally in the water sector. In this regard, SWP functions as an intermediary platform that connects private companies that are active abroad, thereby enabling the expertise export as Swiss water solutions.

2.1.2 AGUASAN as a CoP

AGUASAN was established in 1984, emerging from informal meetings among four pioneering Swiss organisations: IRCWD (now SANDEC), SDC, Helvetas, and SKAT. Notably, this founding predates the formal theoretical articulation of the Community of Practice concept itself—a fact that situates AGUASAN as an organic, practitioner-driven initiative rather than one constructed in response to academic frameworks.

On one hand, to define the relationships among AGUASAN and other CoPs in Switzerland, it is arguable that they emerge as practitioners with the shared nature in Swiss WASH landscape. In this sense, there can be checks and balances in terms of strategy-making and operation.

On the other hand, the structural nature as a CoP is not equivalent to a functional homogeneity. As put forward in Wenger’s CoP model, “boundary interaction” is another learning process to understand the knowledge flows across different CoPs in the same domain. Boundaries are not merely lines of separation, whereas within these interactive spaces, different CoPs bring distinct knowledge systems to the same issue, creating innovations and holistic learning. Boundary interaction is a generative process, in which CoPs do not simply exchange information, but actively reinterpret and reconstruct knowledge that leads to the emergence of new practices. (Wenger 1991). Underpinned by this theory, the relationships between AGUASAN and other CoPs are understood as highly complementary and integrative in the entire WASH mapping.

The complementary relationship is reflected in AGUASAN’s practical network with Blue Community Switzerland and Swiss Water Partnership, the other two major CoPs in the Swiss WASH landscape. AGUASAN is recognized by Blue Community Switzerland to provide technical support and expertise for its international assistance programs. Similarly, SKAT, one of the initiators behind AGUASAN, participates in Swiss Water Partnership as an active member and knowledge broker, contributing to strategic development of the CoP.

Respectively, two key dimensions have distinguished AGUASAN from other Swiss WASH CoPs and to make it a pivotal actor in CoP networks.

Firstly, AGUASAN is equipped with technical and professional perspectives that are considered essential to WASH-related programs. AGUASAN derived from the World Bank’s Technical Advisory

Group's aspiration on promoting adapted technologies in WASH domain, which marked the technical cradle that the CoP was given birth to (AGUASAN Final Report 2004). In real operation, AGUASAN's quarterly meetings and workshops serve as launching platforms for technical incubation. It was described as the place where researchers can launch ideas or technologies that are new, and receive from their peers in a review setting. In addition, the CoP creates a new channel for technical knowledge transmission, referred to as providing "frequent exchange", "trust atmosphere" and "personal talks over lunch"(Interview Record). The technical insight is particularly valuable to other CoPs without such highlight or network. For example, AGUASAN specifically provide expert opinions on project proposals submitted to Solidarit'eau Suisse for financing. As described by the Blue Community Switzerland, AGUASAN's technical second opinions ensure the highest quality standards of Solidarit'eau's projects (Blue Community 2026).

Secondly, AGUASAN is one of the oldest existing sector specific CoP on the Swiss development scene, whose longstanding position compared to other CoPs' later initiation provides a benchmark in WASH domain. Since 1984, far before the concept of CoP was proposed, AGUASAN began to act as a vibrant and most pertinent exchange platform in shaping Swiss response to the global water crisis. A look back on AGUASAN's initiation reveals the already existence of knowledge and experience exchange as defined by the CoP, which serves as an often-cited example for a series of upcoming CoPs by around 2010 (AGUASAN Final Report 2004). AGUASAN's ongoing operation of 42 years combines temporal length with collective memory, whilst the CoP itself serves as a shared carrier to trace Swiss WASH domain across centuries. Meanwhile, in the continuity of forty years, AGUASAN has witnessed while serving as pioneer on the earliest WASH topics of the time, such as groundwater, local water cycle management and antibiotic resistance (Interview Record). Therefore, AGUASAN's experiences from its long-standing presence provides authoritative and representative insights to other Swiss CoPs overall.

Looking ahead, despite Swiss CoPs' complementarity and AGUASAN's uniqueness in operation, concerns have it that AGUASAN's synergy with other CoPs and WASH-related platforms are to be furthered. Firstly, it is contended that there's a lack of holistic and formal outputs of AGUASAN's standing point amongst networks in the broader WASH sector, including but not limited to SuSanA, RWSN and Women in WASH (Interview Record). Secondly, it is generally acknowledged that there are overlaps in the target audience among AGUASAN and other Swiss CoPs, yet synergies among those networks can be further developed. For example, the Swiss Water Partnership connects commercial entities, Blue Community advocates public values, while AGUASAN integrates academic and practical knowledge, through which more effective coordination mechanisms are to be established to replace only paper commitments (Interview Record). The network overlap itself is not problematic, the crucial issue lies in how to transform overlap into cooperative momentum rather than competitive tension.

2.2 Community-Building

2.2.1 Integration of Membership

As an informal group of specialists working in the water and sanitation sector, AGUASAN's membership is characterised by a high degree of diversity, including governmental agencies (notably SDC and its country offices), international and local non-governmental organisations (NGOs), and academic institutions. Through this multi-actor network, AGUASAN brings together policymakers, practitioners and researchers, thereby facilitating linkages and enabling shared learning.

AGUASAN started off with an informal character and a small size to ensure that all members would have enough time for discussion during a one-day and face-to-face meeting. With membership criteria evolving from the following framework at the preliminary stage (AGUASAN Final Report 2004):

- Broad and practical experience in the water, sanitation and waste disposal sector in the third world countries (including Eastern Europe);
 - Field of activity predominantly related to development countries /development issues
- Practical experience in at least two continents;
- Good methodological and professional knowledge related to development and cooperation issues;
 - The member pledges to participate regularly at the AGUASAN meetings over an extended time period. If participation is ensured by alternate members of an institution, then they are responsible for bringing each other up-to-date to ensure continuity;

Notably, the community size has been intentionally kept to be 15-20 without a massive enlargement to keep the community on track even with informal engagements. Cheerfully in response to that concern, AGUASAN has remained an integrative and united community over 40 years and was kept on the aspirational track.

Firstly, internal spirit and members' recognition has kept the community tightened. Below are some of the feedback from members in AGUASAN CoP (Interview Record).

It is a welcoming Community of Practice, never making you feel guilty that you've missed something.

I think Aguasan is an open, flexible and evolving Community of Practice.

AGUASAN is a very persistent community, and there's a very familiar and trusted atmosphere there.

A lot of the impact within AGUASAN has been made, particularly for the co-created and mutual learning.

AGUASAN is a long ascending Community of Practice, and it's based on individual interest, serving to improve knowledge and networking in your work.

Secondly, a well-documented database has kept the community continuity.

AGUASAN's documentation and communication system is regarded by members as a critical mechanism for maintaining knowledge continuity and lowering barriers to participation. By archiving materials from annual workshops and meetings on its official website, AGUASAN has constructed a

retrospectively accessible knowledge base, enabling members to autonomously retrieve historical information according to their own schedules rather than relying passively on real-time participation. The e-documentation ensures systematic information transmission through a consistent format: for new members and members who failed to join the community events, they can still access discussion contents via distributed minutes, thereby avoiding information gaps or fear of missing out resulting from single absences.

2.2.2 SDC

Swiss Agency for Development and Cooperation SDC) is one of the four initiators of AGUASAN as well as the major sponsor to the CoP. In the first few years, the membership of AGUASAN consisted mainly of the representatives of SDC, Helvetas, SKAT and SANDEC who had also founded the community.

By far, SDC is the most powerful organisation of Swiss development cooperation represented in AGUASAN in terms of political power and financial resources. Most organisations represented in AGUASAN get considerable core funding or have mandates from SDC. In particular, SKAT holding a backstopping mandate from SDC acts as the internal driver of AGUASAN. On the one hand, SKAT has a backstopping mandate from SDC for water supply and sanitation and funds its participation in the AGUASAN meetings and the work for the community like writing of minutes or preparation of meetings from the resources of this mandate. On the other hand, SKAT has also a higher responsibility for the group, providing the AGUASAN workshop reports and other (AGUASAN Final Report 2004).

Nevertheless, over the 40-year span, particularly entering the 2020s, SDC has been experiencing a series of structural reorganization and funding reallocation, which might provide the CoP with new direction of adjustments to align with the broad change of policies.

Firstly, structural reorganization within AGUASAN has highlighted the humanitarian-development nexus for overall Swiss CoPs in the international development arena.

In 2022, SDC embarked on an institutional reform process called Fit for Purpose (F4P). The main objectives of this reorganisation are to better integrate humanitarian and development work, to strengthen thematic expertise, and to bring decision making on programmes down to the operational level as much as possible (OECD Development Profile 2025). The key changes include the merger of humanitarian and development teams into common geographic divisions, and the creation of a thematic co-operation division. The thematic division aims at influencing normative frameworks and international policies as part of global programmes, as well as supporting country offices. Finally, more decision-making responsibility was given to the external network of embassies and country offices to ensure context-specific solutions, and full-time equivalent posts were transferred from SDC headquarters to the external network.

By merging humanitarian aid and development cooperation teams into unified geographic divisions, SDC has reduced the path dependency associated with functionally segmented structures and instead strengthened a context-oriented approach to intervention. This shift enhances the coherence of responses in fragile and conflict-affected settings. In addition, the establishment of a thematic co-operation division elevates thematic expertise to a central governance resource, transforming knowledge production from practice-based insights into institutionalised capacities that can be

leveraged to influence international norms and policy frameworks. Moreover, the decentralisation of decision-making authority to country offices, accompanied by corresponding staff reallocation, promotes a more decentralised governance structure in which programme decisions are more closely aligned with local contexts. Overall, structural reorganization not only reinforces SDC's role in shaping global development agendas but also strengthens the headquarters' capacity to support cross-regional learning and policy coherence.

Secondly, the funding cut in international development has severely impacted Swiss entities in related fields, putting a financial strain on AGUASAN.

A new cycle of financial decline began in 2024. According to OECD, Switzerland provided USD 4.6 billion (preliminary data) of ODA in 2024 (USD 4.4 billion in constant terms), representing 0.51% of GNI.¹ This was a decrease of 14.9% in real terms in volume and in the share of GNI from 2023. Switzerland's total ODA has been on an upward trend since 2020. Since 2021, Switzerland has been meeting its domestic objective of a 0.5% ODA/GNI ratio, which is lower than its international commitment to achieve a 0.7% ODA/GNI ratio by 2030. However, the budget envelope for 2025-28 will reduce the ODA/GNI ratio to 0.41%, or 0.36% excluding in-donor refugee costs. As Switzerland did not extend any loans during 2023 and all other instruments used were fully concessional, this conveys a grant element of 100%. Based on federal budget planning and decisions by the Federal Council and Parliament, the core contributions to Swiss NGOs have been reduced by around 10.5% compared to the 2023-24 period (OECD Development Profile 2025).

2.2.3 Private Sector

At the beginning of AGUASAN's initiation, it was noted by the CoP that private consultants and companies should not be regular members of the community. The major reason lies in the concern that the private sector would mainly lurk for mandates of SDC and the potential competition could hamper discussions and knowledge sharing. Meanwhile, it was also clarified that it's not the intention of AGUASAN to exclude the private sector completely from the community and the group has maintained a regular exchange through invited guests (AGUASAN Final Report 2004).

By comparison, in the recent decade, the private sector has assumed an increasingly visible role in the WASH sector and broader development arenas, particularly due to its financial capacity and operational flexibility. This shift has also been reflected in the strategic orientation of the Swiss Agency for Development and Cooperation, which has strengthened its engagement with private actors and identified Private Sector Engagement (PSE) as a priority within its international cooperation framework. For instance, in this context, the SDC "Promoting Water Stewardship 2030" launched in 2018 has encouraged companies to not only to pursue commercial interests, but also to assume long-term responsibility for their environmental and social impacts. The private sector is encouraged to cooperate with governments, local communities and international organizations in water governance processes, with the aim of ensuring that water use remains socially equitable, environmentally sustainable and economically beneficial. (SDC Water Network)

Within this broader policy adjustment, the boundary set between the CoP and private sectors' inclusion has been arousing increasingly heated discussions over the necessity and possibility to further involve the private sector in the community. In this context, the involvement of the private sector discussed in

AGUASAN mainly refers to the private sector receiving mandates from SDC and could support programme delivery alongside NGOs and public actors to enhance communal diversities and dynamics.

2.2.4 Discussions on Community-Building

Considering the constantly changing circumstances over the forty years and stakeholders general adjustments to adapt to emerging contexts in the new era, discussion as it over possible channels for AGUASAN as a CoP to move a step further. Below illustrates some insights and suggestions proposed by members of AGUASAN, trying to present some likelihoods of change and debates on the table (interview Record).

Inclusion of more younger generations in the CoP:

The broader WASH trend and water governance has suffered from a declination of meaningful youth engagement, particularly in long-term institutional processes. Particularly, young people are often portrayed as “agents of change” in global sustainability discourse, yet their participation frequently remains symbolic disconnected from local governance practices and decision-making structures. While AGUASAN as a CoP, with its flexibility and inclusiveness for being able to continuously invite new dynamics through its multiple practices, serves as a feasible starting point to include younger generations and adopt youth voice in the WASH domain.

Still, it is noticeable that the network of AGUASAN has long been led by technical experts as the core group to support the community. While many AGUASAN members are approaching the retirement age, the question of how the next generation of professionals access tacit knowledge has become critical. There is an urgency of developing intergenerational change, and to develop a replicable way of effectively including young professionals in water governance. To further include younger generations in the community, it was highlighted that youth participation requires not merely technical access but emotional connections to local realities and professional identity.

To this end, there can be a way out to include youths in regular practices, such as establishing student presentation slots as AGUASAN quarterly meetings (eg. at least one student presentation per quarter as the bare minimum participation guarantee). Furthermore, it was also put forward that the community form linkages with external youth networks to utilize existing youth participatory vitality and open up more opportunities for systemic engagements. In this sense, Youth Water Solutions is an often-cited example that supports young entrepreneurs and innovators in developing local solutions to water and sanitation challenges through training, mentoring, and incubation programmes. (Interview Records)

Adaptation to innovative trends of knowledge transmission

Promotion and creative knowledge transmission has become an emerging topic of NGOs and CoPs. Development actors have been shifting from traditional service deliveries to innovative generation across institutional boundaries.

As a professional community in Swiss water and sanitation for over four decades, it was contended that AGUASAN has paid more attention to preserving traditional ways of knowledge transmission than highlighting innovative communication prevailing in the new electronic era. Respondents diagnosed this structural deficiency as constraining its network expansion and generational renewal. For instance,

AGUASAN's network was recognized to undergo a difficult transition from the "paper age" to the "email age" and onward to the "post-email world," yet the structurally evolving media landscape was yet given enough response. The traditional data documentation including workshop reports and quarterly meeting minutes displays a continuity and constitutes an indispensable way of traditional preservation, but risks restricted knowledge transmission to the new generation given the increasing virtual dependency and information fragmentation in the media age.

At the solution level, it will be helpful to establish diversified digital platforms such as LinkedIn professional communities to make information dissemination more easily invite new members, synchronizing AGUASAN's existing information to these platforms to achieve communicative broadening. Moreover, deliveries of weekly or monthly newsletters through email will enable members in the community to catch up with the latest updates and reach out to the most heated discussions in WASH.

Systematic training for new members

Given the dynamics of involvement and diverse membership constitution as a CoP, AGUASAN largely relies on a general learning-by-doing mode for members' integration into the community. At the welcoming session of AGUASAN, there has been a brief welcome package sent to new members, including an introduction to CoP structures and the current member list for a quick update.

Still, a lack of systematic new member training and onboarding mechanisms were identified insufficient. While this openness may reflect the flexible and non-hierarchical nature of a community of practice, it was observed that it simultaneously creates significant uncertainty for newcomers, who are required to "figure things out" without clear guidance. It was further emphasized that, within the competitive landscape of Swiss WASH networks, the absence of a clearly articulated value proposition makes it difficult for new members to understand the distinct role and relevance of AGUASAN in comparison to alternative platforms. In addition, in face of the potential generational updates of the community, the access mechanism of AGUASAN could transcend a simple information delivery to become an institutionalized vehicle of knowledge transmission within the community: by clarifying the community's historical trajectory, core thematic concerns, participation norms and interaction patterns, it provides newcomers with accelerated access to collective cognitive frameworks and shortens the transition period from legitimate peripheral participation to full membership. (Interview Records)

In this context, it was suggested that more institutionalized entry mechanisms could play a crucial role in facilitating integration and enhancing sustained engagement, including but not limited to structured onboarding sessions for new members, more detailed digital knowledge repositories, or potential mentorship or buddy systems pairing newcomers with experienced practitioners.

Emphasis on the technical bar for members.

Technical expertise is regarded as one of the core strengths of AGUASAN within the networks of CoPs in WASH and has been an attraction for key practitioners in the domain to expand and sustain collaborations with AGUASAN. That has raised a crucial debate on how to formally define the technical threshold for membership, as well as how to crystallise the depth and quality of technical knowledge exchange within the community.

On the one hand, AGUASAN especially in the recent decades has shifted from a prominent technical focus to broader governance-related topics such as governance decentralization approach, social and behavioural change, water diplomacy and humanitarian-development nexus. Arguably, the gradually turning to a series of soft governance approaches aligns AGUASAN more closely with the overall WASH envision of Switzerland, positioning it as an early mover and forerunner in advancing governance discourse. Further, given the growing interdisciplinary and transdisciplinary nature of WASH, it is essential for technical expertise to gain a more comprehensive understanding of other related dimensions for the sectoral development.

On the other hand, clearer expectations regarding technical competence, or ensuring a balanced integration of technical and governance perspectives, could strengthen AGUASAN's overall effectiveness as a knowledge platform. It was contended that a stricter definition of the technical focus and a higher requirement for a technical background of membership can bring AGUASAN back to its core competency that supported its leading position over the four decades. Particularly in an increasingly competitive landscape among emerging entities and platforms in WASH, taking a slight step back to AGUASAN's original aspiration may be a way out to reduce external reliance with hard knowledge in an age of instability.

2.3 Practice and Impact

2.3.1 Workshops and Quarterly Meeting Routine

By far, yearly workshops and quarterly meetings held four times a year are the primary two practices of AGUASAN to transfer WASH knowledge in the learning cycle and gather members to discuss the latest move of the CoP.

In terms of the workshops, it is recognized as the yearly “moment fort” for the community (AGUASAN Final Report 2004). The workshops are an excellent occasion for AGUASAN to explore new issues and trends by listening to contributions and by discussing case studies through group work. The workshops produced several innovative ideas and thematic inputs that considerably influenced the work of AGUASAN, its constituents and its partners. Through interactive formats including case presentations, group discussions, and collaborative analysis, the workshop facilitates interdisciplinary knowledge exchange and experiential learning. Distinct from conventional conferences, AGUASAN workshops emphasize co-learning and the co-production of knowledge, with outputs often feeding back into policy and practice in the form of reports or recommendations. As such, the workshop serves not only as a platform for knowledge dissemination but also as a key intermediary space linking policy, practice, and research. Last but not least, the workshops refresh the spirit and cohesion of the community, and AGUASAN is revitalised for further work.

Over forty years, an evolution of the workshops' organization was seen through the participants' constitutions and the change of places to hold the workshops. To be specific, early workshops emphasized "global perspective" rather than regional focus, selecting cases through the principle of geographical balance, with participant structure deliberately maintained as "one-third SDC, one-third SDC partners, one-third external" diverse composition; This model has adjusted in recent years, such as the 2022 workshop's first location outside Switzerland (Jordan), marking the profound impact of localization on the spatial logic of thematic formulation. This decision was made during the COVID-19 pandemic, as the originally scheduled 2020 workshop was postponed due to the outbreak, prompting

organizers to relocate the event to the Middle East. Relocating workshops to project regions presents distinct advantages: participants can engage more closely with local realities, and field visits render discussion topics more tangible and accessible (Interview Record).

In addition to the annual workshop, AGUASAN organises quarterly meetings as a key mechanism for sustaining continuous interaction and knowledge circulation within the community. These meetings are typically smaller in scale and more informal in format, primarily involving core members and focusing on ongoing projects, policy developments, or emerging issues. Their primary function lies in facilitating ongoing knowledge exchange and maintaining relational ties among participants, thereby reinforcing trust and collaboration within the community of practice. Compared to the annual workshop, quarterly meetings are more flexible and responsive, enabling timely engagement with new challenges and supporting iterative learning and adaptive decision-making over shorter timeframes (AGUASAN Final Report 2004).

2.3.2 Multi-Faceted Impacts

Assessing the impact of a CoP presents inherent methodological challenges, as its outcomes are often diffuse, relational, and embedded in processes of learning, interaction, and knowledge co-production rather than easily measurable outputs. In the case of AGUASAN, many of its contributions cannot be readily quantified through conventional indicators, as they manifest in forms such as shifts in professional perspectives, the strengthening of networks, and the circulation of tacit knowledge. Nevertheless, the following analysis identifies several dimensions in which AGUASAN's influence becomes more directly observable, including its effects on individual professional development, its role within SDC, and its broader contributions to advance SDGs in the WASH sector. In addition, AGUASAN produces a range of tangible outputs that provide a more visible and traceable form of impact.

Individual Gain

AGUASAN generates multi-dimensional impacts at the individual level, particularly in terms of knowledge transmission, professional development, and network formation.

AGUASAN mobilizes knowledge across multi-sectors and different WASH arenas over the world. The CoP provides participants with access to catch up with current debates and latest policy orientations within the Swiss WASH sector, enabling them to quickly develop an understanding of context-specific knowledge structures and operational logics. This is especially valuable for professionals transitioning across regions or countries to facilitate a form of geographically embedded knowledge. Moreover, through participation in thematic workshops and knowledge co-production processes, individuals do not merely acquire knowledge but actively contribute to collective knowledge generation, thereby deepening their understanding of sectoral transformations, particularly in a context of ongoing change in the WASH field.

AGUASAN plays a significant role in fostering meaningful professional networks in the WASH landscapes. It enables participants to establish connections with key actors, particularly building up upward connections with SDC, thereby opening up opportunities for career advancement. Engagement in specific thematic activities and analytical tools facilitates direct interaction with influential institutions and decision-makers, which in some cases contributes to critical career transitions. In addition,

AGUASAN functions as a high-quality professional network through which participants can identify relevant contacts for specific topics and access a broad range of resources across the WASH sector. Importantly, the platform promotes a bidirectional model of knowledge exchange, where professionals not only receive information but also share experiences, seek feedback, and engage in collective reflection. This interactive learning environment enhances both individual capacity development and deeper integration into the professional community.

Contributions to WASH in Switzerland

For SDC, AGUASAN as a pivotal practitioner in WASH serves as a vital actor to echo SDC's wills and policies, while providing essential knowledge and new angles to complement SDC's strategy-making. Over the years, AGUASAN and SDC have formed a closed alliance with mutual influence on each other's work. In this sense, AGUASAN's impact on SDC is a non-negligible dimension to analyze

AGUASAN represents an excellent opportunity to solicit informal feedback from a comprehensive selection of skilled practitioners and researchers on a range of new ideas. Since SDC is an active bilateral donor in the international arena of development with a particular interest in water supply and sanitation issues and only limited internal capacity, AGUASAN's influence is potentially far reaching. The community acts as a multiplier, making it possible for SDC to enhance its impact in the water and sanitation sector with only very limited internal capacity. In addition, the group supported SDC with coordination in the sector. AGUASAN's ongoing partnership with SDC is embodied in SDC's water sector policy, as the group made considerable contributions to the drafting of this important document (AGUASAN Final Report 2004).

AGUASAN strengthens SDC's connections with field actors to support its localization strategy. By inviting practitioners from Central Asia, Africa, and Latin America to participate in face-to-face meetings in Switzerland, AGUASAN enables SDC to devolve decision-making to local actors and achieve domestically-led development. This practice of engaging local people in the advocacies and promotion of change aligns closely with SDC's international cooperation objectives of strengthening locally-based systems that are more financially stable and resilient, connecting headquarter insights to field experiences (Interview Record).

AGUASAN has made concrete conceptual contributions to SDC's strategic framework. The historical strength of SDC's water division lay in its tight articulation with international cooperation guidelines, particularly the early-formed "Water and Peace" policy discourse. As a platform for generating and diffusing this discourse, AGUASAN systematically implanted the normative framework of water as a tool for cooperation and conflict mediation into SDC's institutional reform process through its quarterly meetings and annual workshops (Interview Record). AGUASAN's discussions were not limited to WASH technical issues, but consistently expanded into politically sensitive areas such as water diplomacy, peacebuilding, and transboundary water cooperation, thereby furnishing knowledge foundations and network preparedness for SDC's subsequent formal launch of the "Blue Peace" initiative (Interview Record).

Contributions to WASH over the World

SDG 6, with its six sub-topics, now serves as the basic standard for international practitioners in WASH to take actions. In particular, founded in 1984, AGUASAN was initiated far before 2015 when the

decisions on SDG were made. Apart from implementing SDG 6's key advocacies, it is notable that AGUASAN immensely contributed to the form of SDG 6 as a separate section included in the 17 goals.

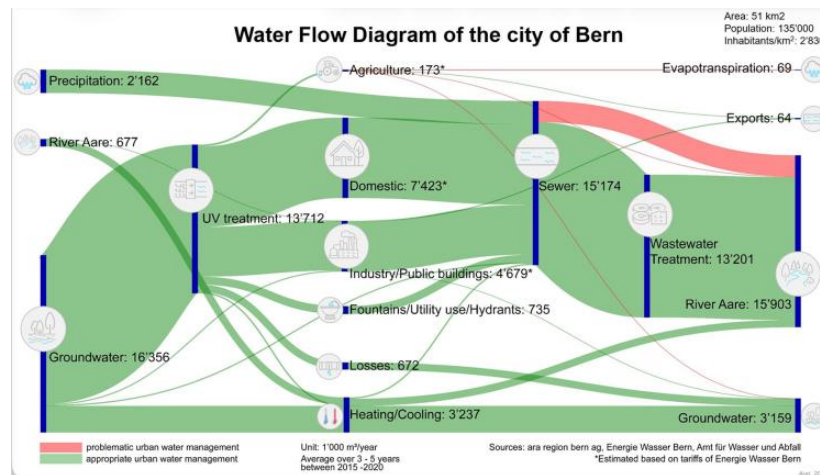
Though with no formal documentation, AGUASAN's core contributions to SDC manifested in systematic policy mobilization surrounding the formulation of the SDG6 between 2012 and 2015. At the initial stage of SDG negotiations, there was no intention to have a specific SDG on water and sanitation, with water and sanitation issues merely subsumed under broader health or environmental goal frameworks. However, AGUASAN's network effectively integrated academic institutions such as Eawag, SDC policy departments and non-governmental organizations to successfully construct a cross-sectoral policy advocacy coalition. Specifically, this network mobilized up to the Federal Councillor level, persuading Swiss diplomatic apparatus to adopt the policy position of establishing "a dedicated SDG 6," and ultimately propelled the global negotiation outcome that institutionalized a separate goal system on clean water and sanitation (SDG 6.1-6.2) and integrated water resources management (SDG 6.3-6.6). This achievement demonstrates the agency of AGUASAN as policy entrepreneurs in international agenda-setting (Interview Record) .

2.3.3 Tangible Outputs

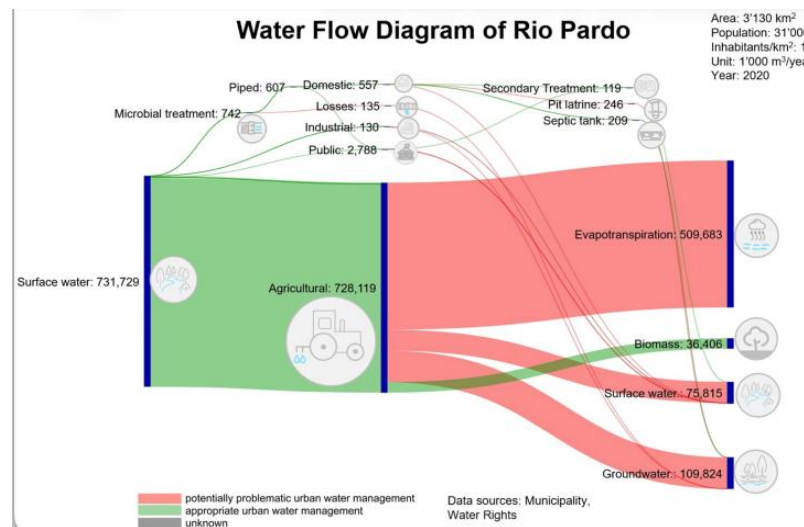
The Water Flow Diagram represents AGUASAN's concrete innovation at the operational tool level, which originated from collective discussion at an AGUASAN quarterly meeting. Participants drew upon the existing Shit Flow Diagram concept (a tool for tracking fecal material flows in urban environments to identify critical nodes for public health intervention) to discover that the water sector lacked a corresponding analytical tool, thereby catalyzing the development conception of the Water Flow Diagram.

The tool's development followed AGUASAN's typical network-driven innovation model: the concept originated from collective CoP discussion, with Eawag (Swiss Federal Institute of Aquatic Science and Technology) assuming technical leadership, SDC providing financial support, and ultimate scale-up achieved through NGO networks. Currently, the Water Flow Diagram has been put into practical use in Brazil (for urban water management), several Swiss cities, the Philippines, and Dhaka, Bangladesh, with application scopes encompassing determining critical nodes for public health intervention and investment priority assessment.

The Water Flow Diagram (See Figure 5.2.1 and Figure 5.2.2) includes a methodology to do integrated water balancing, to identify challenges and opportunities related and to visualize the result in one representation. It connects information related to WASH, Integrated Water Resources Management (IWRM), the Human Right to Water and Sanitation (HRWS) and assists in the creation of a joint vision to prioritise action (Lukas 2024). The aim is to empower municipalities and their stakeholders to work towards more integration and to reduce inequity and increase resilience and contribute to all indicators of SDG6.



[Figure 5.2.1 Water Flow Diagram in Bern]

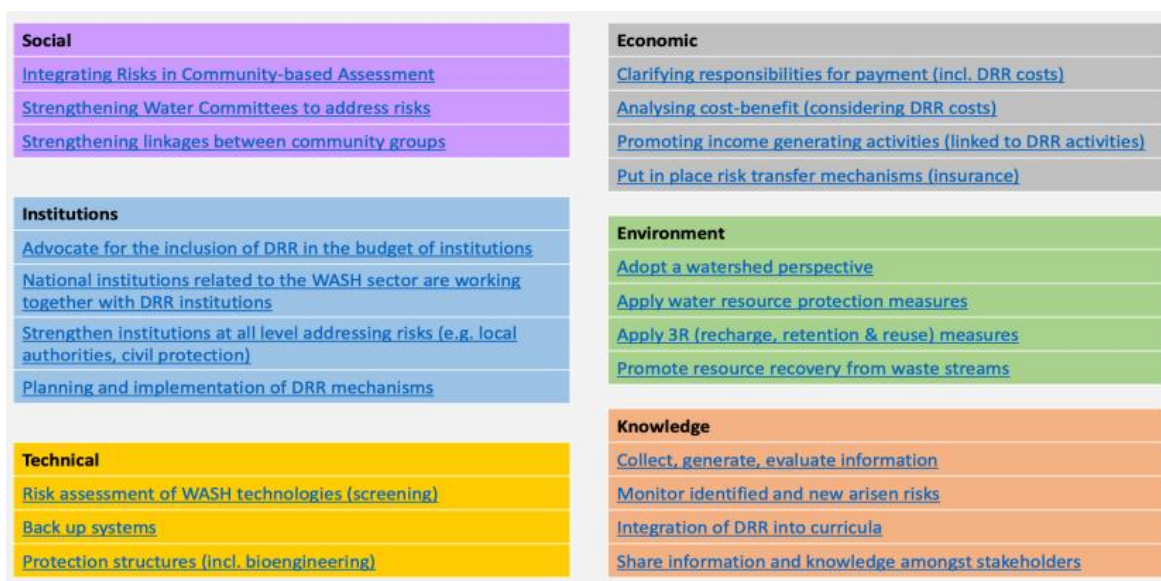


[Figure 5.2.2 Water Flow Diagram in Rio Pardo]

Blue Diamond

The Blue Diamond (See Figure 5.2.3) is a framework that can assist with analysing the most relevant dimensions to be considered for a transition towards circular water and sanitation models. It uses the basic value of water as a human right and water as a common good to inform action across the six interdependent strategic areas: social, economic and environmental as well as the technological, institutional and knowledge/ culture, forming a hexagonal analytical framework that emphasizes "the interconnection of dimensions, requiring a multidimensional approach (AGUASAN Workshop Report 2015).

The Blue Diamond originated in AGUASAN's early developmental phase, whose systematic articulation and sustained dissemination were closely tied to the collective knowledge production mechanisms of AGUASAN. This conceptual architecture's pivotal role in the advocacy process for SDG 6 between 2012 and 2015: through systematic discussions at quarterly meetings and annual workshops, AGUASAN members precisely mapped the Blue Diamond's six-dimensional framework onto the six target areas of SDG 6, thereby providing conceptual legitimacy and structural templates for establishing a dedicated water and sanitation SDG. In addition, the integrated water resources management thinking embedded in the Blue Diamond has been deeply incorporated into SDC's international cooperation guidelines, particularly in the conceptualization of the Water and Peace and Blue Peace movements, where the model furnished analytical foundations for transcending conventional WASH boundaries and integrating diplomatic and ecological dimensions (Interview Record).



[Figure 5.2.3 Six Dimensions of Blue Diamond]

VI. Conclusion

1. AGUASAN Discussions and the Global WASH Research

The purpose of this research was to identify the changes within AGUASAN's themes over 40 years and to discover if there were any patterns in their progressions. The response has been divided into three components.

Firstly, what changed? The two problems of governance and knowledge gaps were co-dominant in each time frame without exception, and together accounted for approximately 40% of the entire topic share. This illustrates a community since inception designed to assess why water sanitation and hygiene systems failed rather than documenting successful approaches to building WASH systems. In addition to this stable core, several patterns have emerged, including the continuous increase of technology as the number one approach to address issues during all five time frames, the increasing significance of climate change/fragility culminating in the prominent theme in the workshops of Era 5, an increasingly articulated concept of sector fragmentation as a coordination issue specific to AGUASAN's multi-actor perspective, a 40 year history of systems thinking pre-dating the concept's introduction in the formal WASH literature by nearly two decades, and consistent exploration of private sector/market based solutions since 1993.

Secondly, what do the patterns reveal? When comparing AGUASAN's thematic evolution against Waterlines' thematic corpus and major world events (Dublin 1992, Rio 1992, the MDGs, UN Right to Water, SDG 6, the HDP Nexus), we see a community which anticipated some developments, followed others, and was absent in a third group. The anticipatory actions were related to governance, systems thinking and humanitarian-development integration. The tracking instances were associated with the governance peak of the MDG era and the rapid uptake of SDGs. These results reflect AGUASAN's institutional makeup: proximity to SDC created an early opportunity to track emerging policies, while distance from practitioners created barriers. Interviewee comments support this observation: "WASH concerns come in waves instead of evolving linearly" (Jessica MacArthur, Q11). Therefore, both actual knowledge expansion and the limits of institutional memory contributed to these findings.

Thirdly, what was absent? Three structural absences were found: gender/women as a primary analytical lens, menstrual health and management, and urban informal settlement WASH access. Waterlines engaged with all three across various time frames. However, AGUASAN produced little to no content on these topics for the remainder of the study period. The gender/MHM absences are especially relevant due to the clear language of international norms governing these areas. Dublin Principle 3 placed women at the center of water resource management in 1992; however, AGUASAN did not significantly engage with gender-related issues until after 25 years had elapsed post-Dublin. Annette Fay commented on her experience with AGUASAN regarding MHM: "Menstrual Hygiene Management is an extremely important area today... largely absent before." Egger documented that AGUASAN began as an organization consisting of engineers with the first female engineer joining in 1991. The catalog data demonstrate how the founding membership influenced the community's boundaries of epistemology across subsequent years, further complicated by decreasing levels of NGO

participation noted by Lukas Bouman (Q6).

In conclusion, AGUASAN's 40-year thematic record indicates a real dichotomy: intellectual leadership in governance, systems thinking and coordination on one hand, and structural omission in gender, MHM and urban equity on the other. This is not a contradiction but an understandable consequence of how the community was established. The same initial focus that produced the depth of analysis also resulted in the blind spots.

2. Knowledge Flows of AGUASAN as a CoP

AGUASAN's forty-year evolution demonstrates that a CoP is not a static organizational form, but a dynamic process with negotiation among multiple dimensions and collective engagement. Rather than following a linear trajectory, AGUASAN has continuously repositioned itself in response to institutional environments and thematic priorities in the WASH domain. Its history therefore reflects a sustained balancing process between continuity and transformation.

Firstly, the relationship between conceptual anticipation and practical contribution reveals the mutually constitutive interaction between theory and practice within AGUASAN. Since the initiation of the CoP framework, concepts such as shared learning, knowledge exchange and collective identity have provided an important analytical lens for AGUASAN's operation. At the same time, AGUASAN has also constantly contributed to the CoP through its practical experiences such as workshops and quarterly meetings, enriching the positioning of CoPs in the development sector.

Secondly, AGUASAN's development reflects an ongoing tension between adjusted organization and persistent internal spirit. Its structures and organizations have continuously evolved in response to changing WASH priorities. Nevertheless, beneath these organizational adjustments lies a persistent collective spirit that has remained remarkably stable throughout four decades: a shared commitment among members to improving WASH conditions and addressing the suffering and inequalities associated with inadequate access to water and sanitation.

Thirdly, the evolution of AGUASAN also illustrates the interaction between institutional embeddedness and internal autonomy. As a donor-supported and policy-oriented CoP, AGUASAN has inevitably been embedded within broader institutional structures, particularly those linked to the SDC landscape. However, institutionalization should not necessarily be understood as a limitation. Despite external dependencies, AGUASAN has retained significant autonomy in shaping its thematic agenda, facilitating critical dialogue, and navigating emerging complexities within the WASH domain. Its longevity partly derives from this capacity to balance institutional alignment with intellectual flexibility.

Fourthly, the thematic analysis on AGUASAN's evolution reveals a pattern of problem continuity alongside emerging terminologies. It can be seen that many challenges discussed over the past four decades have persisted across time. What has changed are the narratives and vocabularies that frame the problems. New terminologies such as sustainability, resilience, climate adaptation, or nexus approaches have continuously redefined the language of water and sanitation, while the increasing overlap of social, environmental, and political risks has further complicated both the understanding of problems and the search for solutions.

Finally, AGUASAN's history reflects a reciprocal relationship between norm adaptation and paradigm shaping. On the one hand, the community has continuously adapted to evolving international and national development priorities and policy discourses. On the other hand, AGUASAN has also contributed to shaping broader paradigms within the WASH sector through its distinctive knowledge-sharing practices, thematic innovations, and practitioner-oriented perspectives. In this sense, its influence has extended beyond internal community learning to inform elements of Swiss development policy and wider international discussions surrounding SDG 6 and sustainable water governance.

Taken together, AGUASAN's forty-year history demonstrates that the development of a CoP is neither linear nor purely institutional, but rather a sustained negotiation among multiple dimensions of continuity, adaptation, autonomy, and collective learning.

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Annexes

Annex 1 — Interview Guide

Structure	Semi-structured interview
Duration	Approximately 40 minutes
Mode	Online
Interviewers	Fan Yujun (IHEID), Phuong Linh Nguyen (IHEID)

Ethical Considerations

- Prior informed consent will be obtained for recording.
- Interviewees will be asked whether they wish to remain anonymous (name, position).

General Rationale

The interview guide is designed to complement the thematic analysis of AGUASAN's 40-year development by providing qualitative insights into how key WASH themes have evolved over time. At the same time, the interview is structured to explore how AGUASAN has been constructed and operates as a Community of Practice (CoP), contributing to the conceptual and empirical analysis of CoP in the field of international development.

Interview Questions

Background & Experience with AGUASAN:

1. How long have you been involved in AGUASAN? What motivated you to do so?
2. What roles have you been playing in the AGUASAN Community of Practice? How do you feel your own experience or expertise has contributed to AGUASAN's discussions? Conversely, in what ways has participation in AGUASAN influenced your work outside the Community of Practice?
3. Could you introduce the organization that you have been working for, and its cooperation with AGUASAN in the WASH sector?

AGUASAN's Priority, Operation & Impact:

4. Through your work experience in the WASH sector, have you heard of or participated in other WASH-related Communities of Practice? If so, what do you think makes AGUASAN valuable for its members compared to other WASH platforms or networks?
5. Since you joined AGUASAN CoP, what were the main priorities of AGUASAN and WASH sector? How did these priorities change over time?
6. What do you think are some of the current themes frequently discussed in AGUASAN and Switzerland? To what extent do AGUASAN workshop themes reflect the key challenges currently faced by WASH practitioners?

7. Have you observed concrete changes, outcomes, or shifts in thinking that emerged from AGUASAN discussions? Are there particular WASH discussions or moments in AGUASAN that stand out as especially influential for you?

Project Suggestions:

8. Do these themes reflect the main problem areas addressed in AGUASAN workshops? Are there important themes that might be missing or themes that seem too broad or overlapping?
9. And from your perspective, how useful could a thematic catalogue like this be for AGUASAN members or workshop organizers?
10. Do you have any suggestions for our secondary analysis focusing on specific themes or approaches from the catalogue?

Future Envision:

11. What key challenges do you perceive for AGUASAN's future work and the WASH sector?

Annex 2 — Coding Key

Problem-Based Categories:

Category Name	Definition	What it includes
P1 Geographical & Infrastructural gaps	Inability of populations to access basic water, sanitation, or hygiene services geographic gaps, unserved communities, and last-mile delivery failures.	Unserved rural/urban communities; coverage deficits; refugee and displaced-population WASH; peri-urban service gaps; geographic isolation; last-mile delivery failures.
P2 Governance & policy gaps	Failures in regulatory frameworks, institutional mandates, sector coordination, and policy alignment that prevent effective WASH service delivery.	Sector policy reform; regulatory weakness; unclear actor mandates; inter-agency coordination failures; policy misalignment; water integrity; anti-corruption; transparency in service management.
P3 Financial & economic barriers	Economic obstacles to sustainable WASH service delivery including cost recovery failures, funding gaps, and barriers to investment at all scales.	Willingness to pay; cost recovery; tariff design; life-cycle costs; blended finance; carbon credits; base-of-pyramid market barriers; subsidy design; ODA dependency; private sector financial engagement.
P4 Behavioural & social barriers	Social norms, cultural factors, gender inequity, and human behaviour patterns that obstruct adoption of improved WASH services or practices.	Hygiene norms and open defecation; cultural taboos; demand creation challenges; gender barriers; menstrual hygiene; rights-based access; inclusion of marginalised groups; disability and age.
P5 Sector fragmentation & complexity	Systemic failures arising from siloed approaches and multi-sector interdependencies that prevent integrated WASH solutions.	Water-energy-food-ecosystems nexus; WASH-health-education links; poor cross-sector coordination; fragmented programming; HDP nexus complexity; WASH in schools and health facilities.
P6 Climate, fragility & crisis	Environmental stressors, climate change impacts, disaster risk, conflict, and humanitarian-development nexus challenges affecting WASH service delivery.	Climate change adaptation; disaster risk reduction; fragile and conflict-affected states; HDP nexus; humanitarian WASH; post-disaster rehabilitation; refugee contexts; environmental water scarcity.
P7 Knowledge & evidence gaps	Insufficient data, monitoring systems, analytical frameworks, or knowledge flows to guide	M&E systems; data governance; research gaps; monitoring systems; evidence-based management; knowledge flows; tool development; citizen science; digital data

	effective WASH policy and practice.	systems; AI-assisted monitoring.
P8 Water quality & contamination	Contamination of water sources by pathogens, natural chemicals, or pollutants that render water unsafe for human use.	Arsenic and fluoride contamination; bacterial and viral pathogens; cholera outbreaks; chemical pollution from mining or agriculture; water quality monitoring at source and point of use.
P9 O&M failure & service sustainability	Systems that exist but break down, are poorly maintained, or fail to sustain service delivery over time operationally distinct from initial access gaps.	Handpump breakdown; pipe network deterioration; maintenance gaps; asset replacement; preventive O&M; system rehabilitation; service continuity after construction; handpump mechanic associations.

Approach-Based Categories:

Category Name	Definition	What it includes
A1 Institutional & governance reform	Approaches that address WASH challenges by reforming laws, policies, regulatory frameworks, and institutional mandates at sector or national level.	Sector policy reform; regulatory strengthening; actor mandate clarification; enabling environment reform; legal framework development; sector restructuring; national water law revision.
A2 Decentralisation & community management	Approaches that devolve authority and responsibility for WASH to local governments, communities, or organised user groups.	Community-managed water schemes; village water committees; local government capacity building; subsidiarity models; user associations; borehole users associations; participatory management.
A3 Financial & market mechanisms	Approaches using economic instruments, market incentives, or private sector engagement to improve WASH sustainability and scale.	Cost recovery and tariff design; PPPs; demand-driven programming; subsidy frameworks; life-cycle costing; blended finance; carbon credits; base-of-pyramid market development; private operator models.
A4 Social & behaviour change	Approaches working through social norms, communication, community mobilisation, or rights-based frameworks to shift behaviours and generate demand.	Social and behaviour change communication (SBCC); hygiene promotion; demand creation; gender mainstreaming; menstrual hygiene programming; rights-based approaches; CLTS; social marketing; handwashing campaigns.
A5 Systems &	Approaches addressing	IWRM; nexus frameworks; resilience planning;

integrated approaches	WASH through cross-sector integration, systems thinking, multi-stakeholder platforms, or resilience frameworks.	multi-stakeholder coordination; integrated urban and rural planning; DRR mainstreaming; systems strengthening; HDP nexus responses; watershed approaches.
A6 Technology, data & innovation	Approaches deploying technical solutions, digital tools, data systems, or innovative hardware technologies to address WASH challenges.	Engineering solutions; low-cost hardware; digital platforms; GIS and remote sensing; M&E tools; AI applications; citizen science; data governance systems; digital twins.
A7 Capacity building & knowledge transfer	Approaches that develop human capital and institutional skills through structured training, education, curricula, and knowledge management.	Professional training programmes; CAS-WASH certifications; MOOCs; academic curricula; field seminars; practitioner networks; knowledge management platforms; mentoring; engineering education.
A8 Diplomacy, advocacy & networking	Approaches that influence the broader WASH agenda through international representation, strategic advocacy, coalition building, and global forum participation.	Water diplomacy; Blue Peace; transboundary water cooperation; World Water Week representation; global forum participation; advocacy campaigns; coalition building; Swiss international water representation.

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