Mapping exercise of activities of UN-Water members and partners in the area of water quality

Final Report

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1. Summary

The mapping exercise on water quality is a contribution to the overarching goals of UN-Water. It was initiated by the UN-Water Thematic Priority Area (TPA) on Water Quality, led by UNEP. In addition to UNEP's leadership, the work has been coordinated and supervised by the UN-Water Decade Programme on Capacity Development (UNW-DPC). It benefits from expertise and insights gathered during previous mapping exercises, e.g. by the mapping of activities related to transboundary waters management. Preliminary findings were presented in Stockholm mid-August 2011 to the TPA leadership and briefly during the UN-Water meeting in Stockholm. Further input and feedback from TPA members on their activities was received. TPA members and UN-Water members were encouraged to check their entries to the data sheet and to continuously provide updates to the TPA. Some input and feedback was received. Keeping members activity lists up-to-date requires limited but continuous efforts.

The overarching objectives of the mapping exercise are to provide an overview of who is doing what in the area of water quality as well as an analysis of this overall "picture". Altogether, 181 single entries, i.e. activities in the realm of water quality, have been collected and analysed. Based on this state of knowledge, this mapping activity highlights areas well/less well covered by the activities. It also highlights the fact that the activities are quite different in nature, ranging from single papers on specific topics to comprehensive programmes such as GEMS/Water Quality Monitoring Programme by UNEP. No attempt was made during the mapping process to identify a "size" an activity has to have in order to become part of the list. The focus was rather on collecting activities comprehensively. This is an issue the TPA may want to look into itself.

The mapping exercise produced broadly speaking two main results. First, a data set of activities of TPA members in the area of water quality has been created; it provides important information and transparency concerning the work done in this field. This data set benefits from the established "UN-Water Activity Information System" (UNW-AIS) set-up and managed by UNW-DPC. Information on a given activity includes (usually) a short

description of the activity, organizations involved, information on target audience, geographical scale, thematic foci, the "type" of activities, and, if available, information on the planning of a given activity. Second, based on the information collected, an analysis is presented by this report resulting in recommendations for the further work of the TPA.

One overarching finding of this mapping is the "twin character" of work related to water quality. On one hand, activities in this field contribute to specific issue areas such as ensuring the supply of safe water or ensuring the safe reuse of wastewater for agricultural purposes. In many instances, talking about water quality without referring to its specific uses is only of limited relevance. One activity of a TPA member, IWRA, is spot-on in this respect: *Which quality for which uses*; which is also a contribution to a sub-target of the upcoming 6th World Water Forum, Marseille 2012.

On the other hand, water quality has a cross-cutting nature. There is hardly any case of a water related activity, which does not have quality aspects as a secondary or underlying concern. However, starting with lively discussions during a TPA seminar during the World Water Day 2011 celebration, Cape Town, followed by consultations in Stockholm at the World Water Week 2011, the mapping exercise has applied a narrower concept of "water quality". As a result, it is considered insufficient to contribute "only" to sustainable management of water resources to be labelled a water quality activity. This is part of the wider (integrated) water resource management activities and not (directly) to the more specific work on water quality.

This challenging set-up for the TPA in general and the mapping exercise in particular requires setting some "boundaries", i.e. what is and what is not in the realm of water quality. In order to construct the "matrix" for this, the realm of water quality as presented in major reports and assessment processes was used for this mapping exercise. As a second step, it is discussed briefly vis-à-vis the ToRs given for this TPA. These ToRs may be readjusted in the future, for the time being, however, they provide an important frame for the activities analysed here.

As the findings of this exercise indicate, the set-up of the TPA given by its ToRs and implemented by the activities of its members and partners responds, in principle, well to this challenge. However, not every issue area is equally well covered. For instance, standards and

guidelines are particularly well covering issues related to water supply and sanitation. This area is also, very often, backed by activities moving these standards and guidelines from words on paper to action on the ground. In contrast, a comparable set of comprehensive activities is missing for water quality for ecosystems and hence activities initiated by the TPA on this present a case addressing a gap existing so far.

2. Main messages

1) Any mapping has to build on solid input from TPA members. Input received had to be complemented by extensive web-based research by the consultant. Depending on the level of detail the TPA wants to have, for example concerning information about the status of the activity like start, end, or budgetary information, the TPA may request further information from its members. The annexed data sheet (excel file) presents what has been collected during the mapping exercise. Adding further information and keeping it up-to-date presents a continuous task that would need the full backup from the TPA and its leadership.

2) The analysis shows that a broad spectrum of water quality related topics – clustered into different thematic foci such as water supply and sanitation, agriculture, or environment – is covered by on-going activities. Water quality related work vis-à-vis drinking water supply and safe use of water is the dominating realm of activities. Possibly even more important, it can also be seen that this thematic focus consists of a coherent set of activities that are able to make a significant contribution. These activities include for instance work on guidelines, capacity building activities to meet these guidelines, monitoring activities as well as water treatment options at the household level.

3) This thematic focus of current activities on water supply and sanitation is, however, not the thematic focus of the TPA in its current shape. The current thematic focus of the TPA on ecosystems vis-à-vis water quality is addressing a field rather less well covered. To put it differently, this focus sets a new priority and work initiated by the

TPA on standards and guidelines for water quality for ecosystems addresses a relevant gap.

4) As the picture was getting more complete during this mapping exercise, one could see quite clearly the division of labour in place. The mandates of organization such as WHO and UNICEF, FAO, or UNEP also represent sub-clusters of work on water quality. However, as just reported, according to information available, not all thematic issue area have initiated comprehensive sets of activities as those working on water supply and sanitation, for example under the "Water Safety Plans" framework. Hence, there is great potential for more cooperation on water quality and hardly any duplication of effort exists (leaving aside the various activities on arsenic pollution with a special focus on Bangladesh, which may duplicate each other partially).

5) The cross-cutting nature of water quality needs special attention. The focus of the TPA on cross-cutting functions in its ToRs (and not, apart from ecosystems, on specific themes) is a good response to this set-up. As work on water quality is dependent on the specific water uses such as drinking water, agriculture or water needs for ecosystems, policy interventions need to be tailor-made. Supporting these specific thematic foci with more generic functions can be seen as the value-added of the TPA. In this respect, the TPA reflects the role of UN-Water at the more detailed level: it tries to enable water quality related work of thematically focused UN agencies such as WHO, UNICEF or FAO by providing coordinating, synthesizing or facilitating functions as well as closing gaps, for example concerning availability of water quality related data.

6) The areas of work captured by the ToRs for this TPA can contribute to strengthening this field as they focus on "policy interventions". Based on the state of information available, however, these policy interventions are not equally well covered by ongoing activities. Interestingly, promoting legislation and policy advice and to some extent awareness-raising seems to be less well covered than other priority areas of the TPA. A further debate on the scope of the TPA may be useful, based on the results of the mapping exercise. It could be discussed whether (and why) fields such

as financing or technology (transfer) should be/should not be a key concern for this TPA.

7) In addition to the "scope" of the TPA, the membership issue may also be discussed. UN-Water members such as UNIDO address important issue areas of water quality and hence were included in this mapping exercise although not being a member of this TPA yet. GEF-funded projects in the realm of international waters have very often an intrinsic water quality component and may need to be considered more comprehensively as well. They have been included only sporadically so far. Finally, only UNECE has been responsive as a Regional Commission for this mapping exercise as it has significant activities in the realm of water quality.

8) Pollution stemming from industrial and other forms of human developments as well as technological options for wastewater treatment is not well addressed, yet. There may be a remaining data gap. This does not apply to a multitude of efforts, largely by FAO, on wastewater treatment and re-use for agricultural purposes.

3. Background, objectives and outcomes of the mapping

UN-Water is an inter-agency mechanism to strengthen co-ordination and coherence among UN agencies dealing with water-related issues. Its work includes and benefits from the contributions of UN-Water partners as well. This mapping exercise on water quality is a contribution to this overarching goal of UN-Water and was initiated by the UN-Water Thematic Priority Area (TPA) on Water Quality, led by UNEP. The overarching objectives of the mapping exercise are to provide an overview of who is doing what in the area of water quality and to provide recommendations for the TPA. About 180 single entries, i.e. activities in the realm of water quality, have been collected and analysed.

This mapping exercise can build on previous activities, on a mapping of activities in the realm of transboundary waters management and one on water and climate change performed by UNW-DPC. In addition, a general mapping of UN-Water members' mandates and key activity areas was done as well, which provided a first overview of who is doing what within UN-Water and which is now complemented by such detailed mapping exercises in specific issue areas. Hence, as these mapping exercises unfold, an increasingly comprehensive picture of

the work of UN-Water and its members can be drawn and used for the further development of its work, for example for the work of its TPAs.

In addition to the UNEP leadership for this TPA, the work for this mapping exercise has been coordinated and supervised by the UN-Water Decade Programme on Capacity Development (UNW-DPC). It is part of the ToR for this mapping exercise to include UNW-DPC's knowledge about process and results of the previous mappings mentioned above. In addition, substantial input was gathered during the meetings in Stockholm, August 2011, and previously in Cape Town, March 2011.

The mapping exercise produces two main results. First, a data set on activities in the area of water quality has been created that provides important information and transparency concerning the work done in this field. Second, based on this database, an analysis is presented in this report resulting in recommendations for the further work of the TPA.

4. Defining information collected, or setting boundaries of what is/is not part of water quality related activities

Scope: Already at the seminar on the mapping exercise held during the World Water Day Conference, Cape Town 2011, one major point of discussion was the *cross-cutting nature* of water quality. As said above, this cross-cutting has "stimulated" thinking about the nature of the subject matter. While the focus of some activities is straightforward on water quality related activities such as work on water pollution, wastewater handling or work related to water quality in aquatic ecosystems, activities touching upon water quality as a secondary focus were analysed well, as appropriate, in order to obtain a more comprehensive picture. The work of the UNEP Finance Initiative may be a case in point here, as it focuses fully on water supply and use, however, in doing so, it considers quality concerns as well. Other examples are UNEP's training manual on pollution control within the IWRM approach or the role of water quality within the water safety plans framework as presented by WHO. As the general "guiding principle" for the final selection of activities, activities were only included if they explicitly focus water quality and hence can be differentiated from broader water resource management activities.

While many activities are meant to be relevant both for ***surface and for groundwater***, information accessible cannot really prove or disprove it. In fact, only a very few activities address water quality or pollution prevention for groundwater explicitly. Overall, the focus of this mapping is on ***freshwater***. However, due to the interface of marine and/or coastal environments with land-based water activities, this boundary is somewhat blurry. Work addressing "recreational water quality" or coastal ecosystems in general are examples for this.

The ***organizational focus*** is mainly on those agencies participating in the TPA, including some of UN-Water partners who are part of this TPA as well. In addition, some attempts have been made to indicate important players in this field who are not yet members of the TPA, like UNIDO or UNECE. The mapping does not entail a comprehensive list of GEF projects, yet. Activities of the World Bank present currently rather a snap-shot than a comprehensive list of projects. A successful inclusion of these organizations in this mapping depends, so far, largely on information freely available on the web.

Since "mandates and key activity areas of UN-Water agencies" were already subject of another mapping exercise, only ***concrete activities*** were included. No separate analysis has been done whether agencies mandates and strategic priority areas are matched by concrete activities. However, the current data set consists of ***different kinds of activities***. They range from fully-fledged programmes with a set of individual activities such as GEMS/Water or the comprehensive set of activities in the realm of water supply and sanitation under the framework of Water Safety Plans, to individual projects, over publications to a few individual workshops. Overall, it can be concluded that the activities mapped here are rather of "normative" than "operational" character. I.e. concrete projects implementing work on the ground are just one sub-group.

Another important feature which needs further work is the ***time scale***. Information provided and collected relates to activities which are still running, but also to some activities already completed. In order to get a comprehensive picture, a few activities became part of this mapping which were included a rather long time ago. Whether this could/should include activities in planning (which would make the data set a useful tool to work with), whether it should be restricted to those only recently completed, and whether or not this list should be updated/further improve continuously needs further consolidation by the TPA.

A particularly useful step of this mapping exercise was to be aware of information from ***previous mapping exercises***. Particularly the mapping of transboundary waters seems to be illustrative in this respect, because a major focus in this realm concerns water quality as well. In doing so, insights can be drawn for the realm of water quality and its TPA but also for the UN-Water mapping exercise series in general.

5. Schedule and Process

The schedule was fixed by the ToR for this mapping exercise, bearing in mind that the formal start was postponed a bit. The presentation of activities collected and based on this a draft report was finally combined with UN-Water meetings taking place back-to-back with the Stockholm World Water Week mid-August. Hence, the submission of the final report and the final data sheets was postponed, too.

The consultant was involved in previous mappings such as mandates and key activity areas as well as partially involved in transboundary waters management. He reviewed previous mappings, attended the seminar at the World Water Day in Cape Town and the meetings in Stockholm, consulted with UNEP on expectations for the mapping exercise, and conducted extensive web-based searches. An inception report was submitted and discussed during a tele-con, followed by a first full draft report for the Stockholm meetings, which was updated once more in November. Based on the discussions in Stockholm and the feedback and input received, this final report was prepared. At the same time, the data sheets are handed over to the UNW-AIS. They are set-up in a way that future input can be included easily.

6. Mapping approach – collection and data model

Two elements of the mapping methodology should be highlighted: the collection of information from information sources and the data model used for the characterisation of the information.

6.1 Collection of information

In addition to input received by members, an intensive web-based search has been conducted. This has been further complemented by bilateral interviews as well. Based both on findings from the internet and individual input, a first (pre-) filled data spread-sheet was produced and has then been continuously updated since (annexed here).

For the analysis and for a more comprehensive picture, results of the mappings of transboundary waters management and water and climate change were "scanned" and filtered for activities relevant for water quality. Even though activities reported before were not included directly into this mapping exercise on water quality, as TPA members submitted new sets of activities, they provide another important source of background information as well. (About 170 reported single activities for transboundary waters management were received and more than 100 reported for water and climate change.) Especially work done by UNECE in the context of the transboundary TPA is important for the thematic focus of this mapping exercise as well. These activities address, for example, gaps of work done by TPA members such as (transboundary) water pollution stemming from industrial accidents.

Web search, supplemented by analyses of major reports and assessment processes as well as information from other mapping exercises → **Information Collection** ← Consultations and feedback

6.2 Characterisation of activities vis-à-vis the data model

This mapping exercise benefits from the established UN-Water "activity information system" set-up and managed by UNW-DPC. The AIS is aiming at providing a "one-stop-shop" for UN-Water activities and hence provides the tested frame for the data model for this mapping exercise. As this data model is used for large parts of the analysis of this mapping, it is presented briefly. However, some differences between the data model and the issue area of water quality occurred during the mapping exercise that will be discussed briefly below. A detailed presentation of the UNW-AIS was given by UNW-DPC in Stockholm 2011.

The *title* of the activity and a short *summary* are essential reference points of the data model. As a next step, a set of pre-selected "rubrics" with a sub-set of key words has been

identified. The activities were then mapped based on project documents and input by TPA members. This approach has been used (here and in other mappings) to enable accessibility of the information collected, to run sorting functions (e.g. how many activities address legal aspects) and for analysis.

The data model has the following main categories in addition to 1) title and 2) summary:

3) Organizing bodies, subcategorizing them into lead organizations and, where applicable, partners, including country level organizations
4) Target Groups of an activity
5) Geographical Scale (this can be twofold: a) scale information such as global, regional, national and b) as a kind of "typology" such as a given basin, river, lake, aquifer etc.)
6) Scope (surface and groundwater)
7) Thematic focus (several)
8) Type of activity (several)
9) Project Planning/Status (this category needs further discussion on what is most useful for the work of the TPA)
10) Information sources

Two categories should be highlighted, as they were of key concern of the mapping process.

a) The "thematic focus" captures two kinds of information. First, the thematic areas addressed by a given activity, like drinking water quality and safe water uses, wastewater treatment and reuse, or ecosystem protection. Second, overarching thematic categories or principles of an activity can be identified as well such as a focus on legal, policy, institutional reform, stakeholder and public participation, or on building resilience.

b) Under "type of activity", the given sub-categories specify in which way a given thematic focus is implemented, for example is the activity part of a dialogue process, an awareness raising campaign, contributing to capacity development, or about data collection and management.

These two categories, a) and b), should not be seen as overly rigid and need to be applied in respect of the specific needs of the water quality mapping exercise. On one hand, it has been proven that the general distinction between themes (i.e. *what* is addressed) and types (i.e. *how* it is addressed) is useful. Since a certain thematic focus, e.g. wastewater reuse, can be approached in many different ways, for example as an issue of research and/or by formulating guidelines and providing policy advice, the combination of both categories will shed light on the current status of activities in the realm of water quality. Coherence or possible overlaps (or non-overlaps) as well as gaps within this area can then be analysed.

On the other hand, the sub-categories of the data model are the result of previous mappings that were used for "sorting" their input. As said above, water quality should be seen vis-à-vis its specific uses. As a result, the overall mandates of the executing agencies such as water quality and agricultural practices (FAO), water quality and water supply and sanitation (e.g. WHO, UNICEF), water quality and ecosystems (UNEP) and so forth correlate well with the main thematic sub-categories for this mapping exercise.

7. Mapping against what? Major reports and assessment processes, the UN-Water documents, the ToRs for the TPA on water quality

7.1 Water quality – a snapshot of the state-of-affairs

The definition of the "boundary" of a water quality activity as done in 3. (see above) in combination with the data model as presented in 6. (see above) can be further discussed on the basis of major reports and assessment processes such the World Water Development Report, the Millennium Ecosystem Assessment, the Global Environment Outlook, or the handbook on water quality by UNICEF. Taken together, these *reports* provide a "conceptional matrix" of challenges and fields of activities relevant for water quality and hence for the work of the TPA. Complemented by an *UN-Water Policy Brief on Water Quality* presented below (see 7.2) and the priorities identified by the *ToRs for the TPA* (see 7.3), main clusters for grouping water quality activities can be identified. These are finally presented below (see 8) in Figures 2 and 3.

Many different factors, i.e., biological, physical, chemical, and societal factors, affect water quality. Particularly *organic loadings* stemming from human activities such as sewage have been identified as the major source of pollution globally. Consequently, water-related diseases such as cholera claim millions of lives annually. Albeit being widely recognized, these causes of poor water quality are very difficult to tackle at the required scale. In addition, individual vulnerability towards decreased water quality is not only an issue of being exposed to polluted waters, it is first and foremost a social issue of (not) having access to clean and safe water, which is for given reasons the overarching concern of global water governance as implemented by UN-Water and its members.

Salinization from irrigation practices and water diversions for agriculture, heavy metals, oil pollution as well as pharmaceuticals (a further emerging challenge rooted in the increased use of pharmaceutical products for humans and livestock), thermal pollution from industrial energy production or other cooling related activities add further pressures to water quality. More often than not, these challenges are not addressed effectively yet; for instance, wastewater treatment is globally insufficiently implemented. Some progress has been made, however, this is often restricted to some (high-income) countries and hence the handling of wastewater is still not satisfactory. Even if concrete activities for technology transfer as well as broader governance responses such as capacity building and raising awareness exist, they still have to be up-scaled (massively). Studies have demonstrated that investing in water – both in the supply and treatment of waters used – can be highly beneficial as they can prevent, for example, diseases or lower the pressure on scarce water resources. For example, as represented by various activities of FAO, if applied carefully, treated wastewater can be reused. Such reuse may happen for agricultural purposes, generating multiple benefits and/or contributing to a “circular economy of water” that is “closing the loops”. As the world approaches up to 10 billion people by mid of this century, wasting resources such as water is hardly an “option” anymore.

In addition to (largely anthropogenic) drivers resulting in water pollution, river engineering, large infrastructure projects or deterioration of wetlands and other aquatic ecosystems have contributed to a decreased capacity of the world’s aquatic systems to cope with pollution induced stress. Hence, pressures from social systems translate into a disruption of natural water systems and hence a disruption of maintaining good water quality.

Compared with preindustrial condition, aquatic ecosystems have become so-called "coupled socio-ecological systems" because they have to cope with a massive loading of nutrients, for example, which puts their intrinsic self-purification capacity under pressure. Eutrophication and oxygen stress in waterways are main consequences of these stressors. A problem which needs special attention is the pollution of groundwater resources, as they are "hidden" and very costly of not impossible to clean.

Thus, which clusters for a mapping of water quality activities can be identified *based on major reports and assessments as well as literature research*?

1) Activities related to the **provision of safe water**, both as a service itself such as drinking water and as safe water for the broader hygiene challenge such as washing, bathing etc.
2) Activities related to **agricultural practices** as they relate to addressing major sources of water pollution (as well as re-use options)
3) Activities related to other **inorganic pollutants** as they occur, for example, within industrial production processes (including mining, which is often associated with major pollutants) but also within natural processes such as the arsenic challenge, mainly within Bangladesh (this "case" is addressed by many activities and presents an "icon" of water quality problems which has helped putting this challenge on the agenda)
4) Activities as they relate to **treatment of polluted water and re-using water** from different sources of polluted water for different after-usage purposes
5) Activities related to the **protection of the natural environment**, which is both affected by a decline in water quality (e.g. by Eutrophication as a result of a high-nutrient load, mainly phosphorus and nitrogen) but also providing important ecosystem services such as their capacity of self-purification.

7.2 The UN-Water Policy Brief on Water Quality

The 2011 released *UN-Water Policy Brief* on water quality presents four comparable "fundamental strategies" to combat water quality problems, which can be seen as a second set of overarching clusters for mapping water quality activities.

1) **Prevention** of Water Pollution, related to industries, agriculture and human settlements.
2) **Treatment** of Polluted Water, related to different kinds of pollution and possible after-usages.
3) **Safe use of wastewater**, in relation to very different after-usages, from irrigation to industrial production to ecological sanitation.
4) **Restoration and protection of ecosystems**, in order to maintain and benefit from their functions, including water purification.

These 4 strategies are complementary to the 5 clusters of activities introduced above. It is worthwhile to note that the policy brief pays *less* attention than literature and official documents to provision of clean and safe uses of water as such; and *more* attention to specific quality challenges such as avoiding pollution and providing treatment options for polluted waters so to ensure the availability of clean and safe water also in the long-run. I.e. the policy brief is narrowing down the water quality challenge or sets stricter "boundaries" for this realm.

The policy brief complements these 4 "fundamental strategies" with "policy interventions", which mirrors the distinction in thematic foci on one hand and types of activities/cross-cutting functions on the other hand as introduced in chapter 6.2 above. While the first address the "what", the latter have their focus on the "how". Five points of intervention are identified:

a) Better understanding of the challenges through **monitoring, data collection and analysis,** as well as **scenario building**. This part is addressed to a greater extent by the policy brief than others; it includes work on standards and guidelines and also refers to the WHO-led process of Water Safety Plans as it applies a "systems perspective", i.e. treating water as a holistic challenge from source to tap;
b) **Communication, education, and advocacy**; in order to achieve both systemic and behavioural changes, for example through capacity development;
c) **Financial and economic approaches**; which includes both concepts (e.g. polluter pays), assessments (of the "full costs"), pricing and financing;
d) **Legal and institutional arrangements**; including guidelines, standards, policies and planning as well as cooperation;

e) **Technology and infrastructure**; including support for technologies and infrastructures conducive for sustainable water management as well as for changes in production and efficiency concerns.

It can be an issue for debate whether the policy brief has addressed the five points of intervention equally well or whether they get more and more vague from a) to e). As a matter of fact – and this is a finding of this report as well – activities captured so far by this mapping exercise confirm such an observation. Points a), b) and d) – if d) does *not* stand for what is usually referred to as "institution building" – are particularly well addressed by current activities of TPA members and partners, much better than c) and e).

7.3 The Terms of Reference of the TPA in the light of this mapping exercise

In the context of such a conceptional matrix, the current scope of work of the TPA on Water quality can be discussed, too. The work of the TPA addresses currently:

1) the development of international water quality **standards and guidelines for ecosystems** taking into account the use of water;
2) improve global water quality **monitoring and data collection**;
3) promote **legislation, policies, and regulations** on water quality;
4) support **research, education and capacity building** on water quality; and
5) **raise awareness** globally about water quality.

This mapping takes stock and presents an analysis of how these areas are currently covered and implemented. It also enables a comparison of the current ToR for the TPA and the somewhat wider context of the challenge, which can be drawn from insights from main documents and activities currently implemented. Again, the scope identified by the ToR for the TPA is of a more focused nature, which can be seen and appreciated as an attempt to narrow down the very broad topic of water quality. Hence, it can and should be interpreted as an issue of prioritization. It may, however, also hint at existing gaps vis-à-vis the broad water quality challenge. As a matter of fact, the ToRs for the TPA do not address financing and technology and infrastructure even though it is discussed by the UN-Water Policy Brief

and implemented by some activities. The activities collected and the analysis of this report should help having an informed discussion about this within the TPA.

8. Mapping results

Figure 1 presents the state of information collected. Even if this graph does not say much in concrete terms, it provides an impression of who is involved and who is particularly active (based on the information reported or accessible; incomplete information on the work of the World Bank so far, which is not a member of the TPA). Some UN-Water members who are not part of the TPA but active in water quality related fields are included in figure 1 as examples (e.g. UNECE, UNIDO). This indicates that more may be happening than mapped so far.

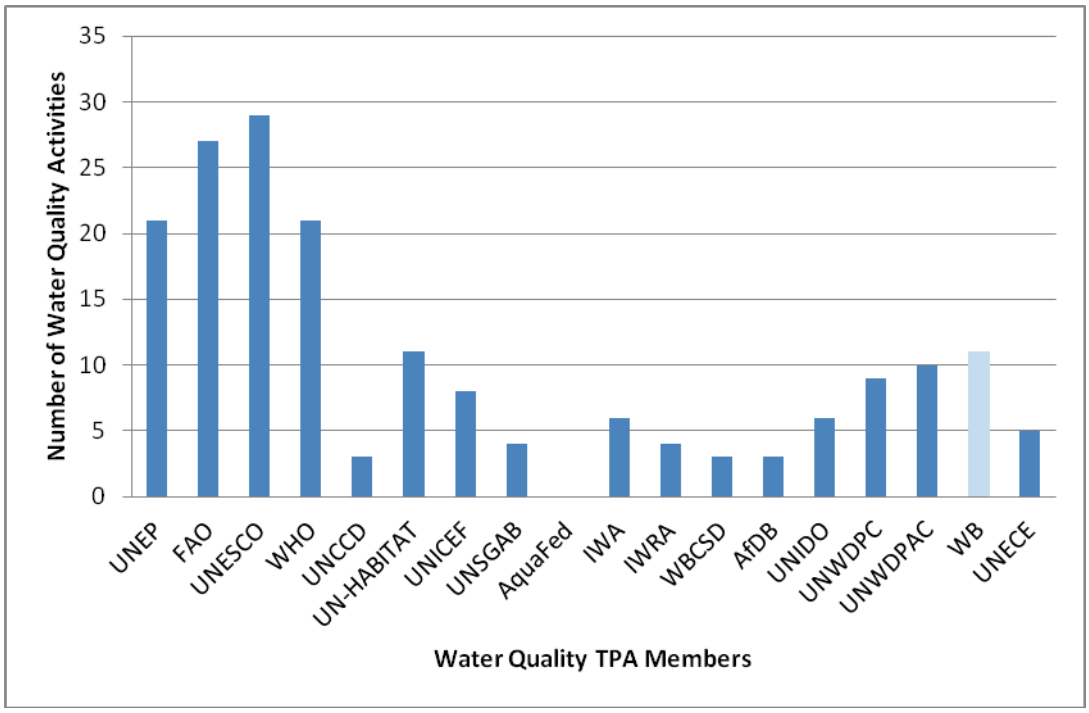

Figure 1: Who is involved

In figure 2, the main thematic focus areas of ongoing activities are presented. As the figure shows, drinking water quality and safe water use is the main focus. It is complemented by activities contributing to public health issues, which can be seen *in this context* as a more

specific sub-cluster. Thus, this is presented separately (and not subsumed under the topic "drinking water"). *Several* distinguishable activities such as water related assessments are part of the domain called "state of water".

As said throughout this report, it is important to specify water quality for *specific uses* instead of highlighting the water quality part of any water related activity. Otherwise, literally any activity could be qualified as a water quality related activity. In this respect, the mapping has clearly shown that the overarching mandates of the agencies represent by and large the thematic foci of water quality related activities as well. Hence, duplication of efforts is not an issue of concern. For instance, work done by WHO or UNICEF focuses on water quality in relation to water supply and sanitation (and health more general). Work of FAO is clearly linked to the thematic focus of agriculture and food security. Activities of UNEP address water quality mostly with a focus on environmental concerns, and so on.

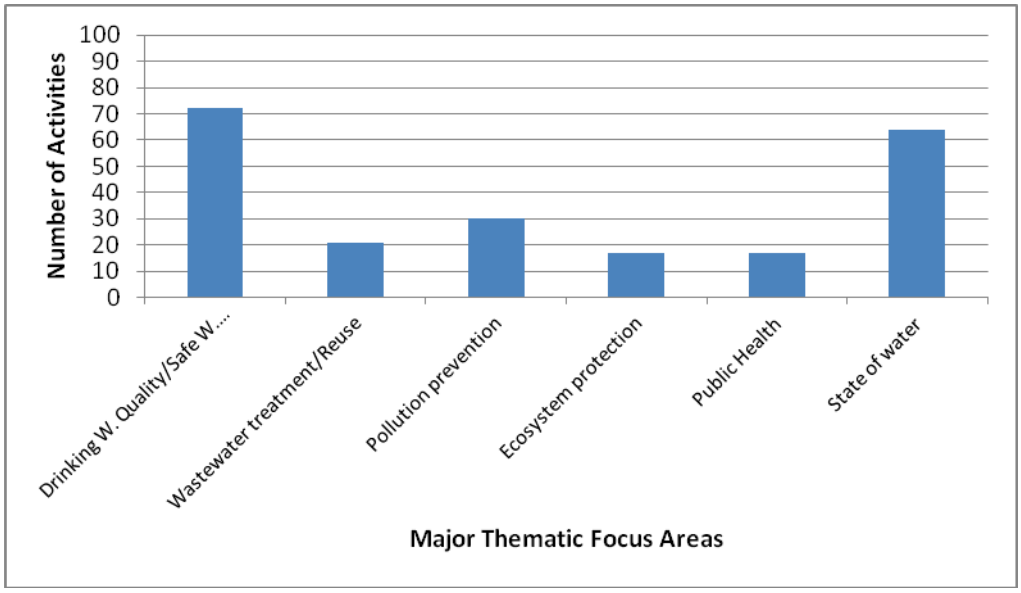

Figure 2: What is being done

Looking at these results, one may conclude that the thematic focus areas of water quality such as wastewater collection and reuse, pollution prevention and ecosystem protection and restoration are not appropriately covered yet. Furthermore, these activities have to be seen in relation to specific water usages such as agricultural issues. It is agricultural water uses

that cover most entries about wastewater management and wastewater reuse (8 concrete activities), leaving only a few activities that address wastewater issues of other sources of pollution such as those stemming from mining or industrial activities (3 concrete activities), complemented by some activities (8 altogether) addressing this challenge in a more general manner. Hence, this can be identified as an area not particularly well addressed by activities mapped.

This situation, i.e. that the overall water quality challenge is not yet comprehensively addressed is further exacerbated by the fact that the activities often contribute in similar ways to a given challenge (i.e. *how* an activity is implemented). For example, many activities conduct a study or provide capacity building and training rather than initiating policy reforms (see figure 3). Hence, due to the "normative nature" of many agencies and their mandates, there is a concentration on some topics and on some types of activities. However, information available does not support the conclusion that we can see a duplication of efforts, quite the contrary. The current state of activities leaves ample room for more activities addressing water quality challenges, for example for specific projects supporting the implementation of wastewater treatment technologies or reforms in the institutional structures. At the same time, this mapping has shown, for example, that the development of water quality standards and guidelines related to ecosystems addresses a remaining gap, so far. As a subsequent step, support for legislation and policy formulation may be identified as policy interventions in order to move from identifying the problem to providing solutions for it.

Hence, while Figure 2 addresses the "what", Figure 3 captures the "how". This figure is called "TPA ToRs", as the ToRs mainly address the "how" as said above. However, due to a difference between the ToRs and ongoing activities, this is not a perfect fit (and it does not have to be like this). For example, work related to standards and guidelines covered by this graph goes well beyond ecosystems. Another "type of an activity" has been added in this graph, namely "networking activities", as it is implemented by some members such as GEMS/Water regarding water quality monitoring or by WHO activities related to (small communities) water supply. Nevertheless, this graph presents a good representation of how the different priority areas/ToRs of the TPA are currently covered and may provide a basis for further discussions of the ToRs of the TPA. It is worthwhile to highlight that "hard"

measures such as “legislation, policies, and regulations” are not very well covered by the activities reported or identified so far.

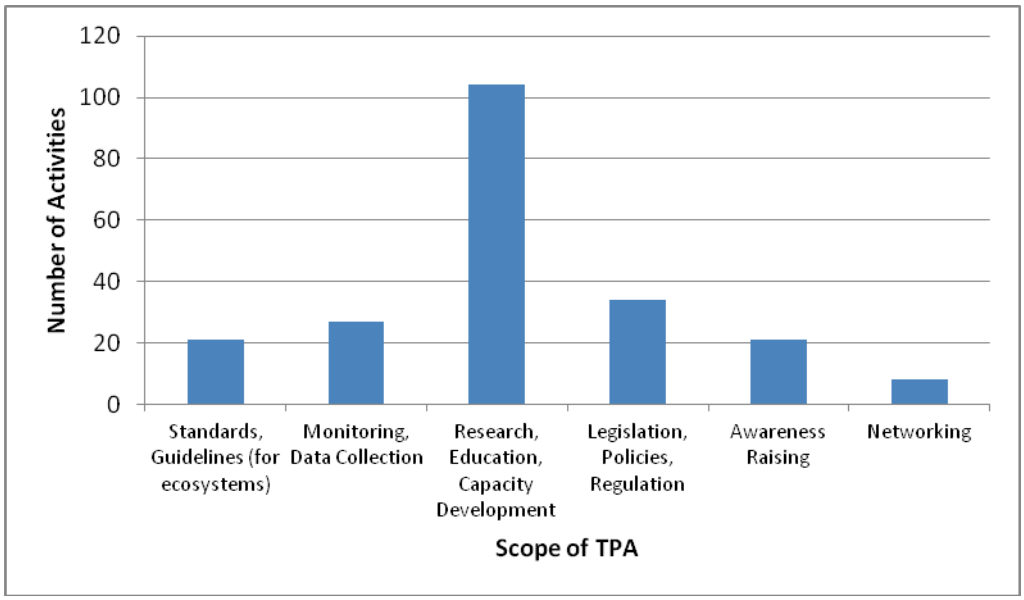

Figure 3: How is it being done

Another way of specifying the “types” of activity is presented in figure 4. Programmes such as GEMS/Water or comprehensive activities as the WHO led process for promoting water safety plans can and should be distinguished from small-scale activities. If information on activity budgets can be received – which was not yet the case – this would provide further information on the “size” of the activity. (As a matter of fact, the mapping of activities for climate change adaptation did not include small activities such as individual workshops or publications.)

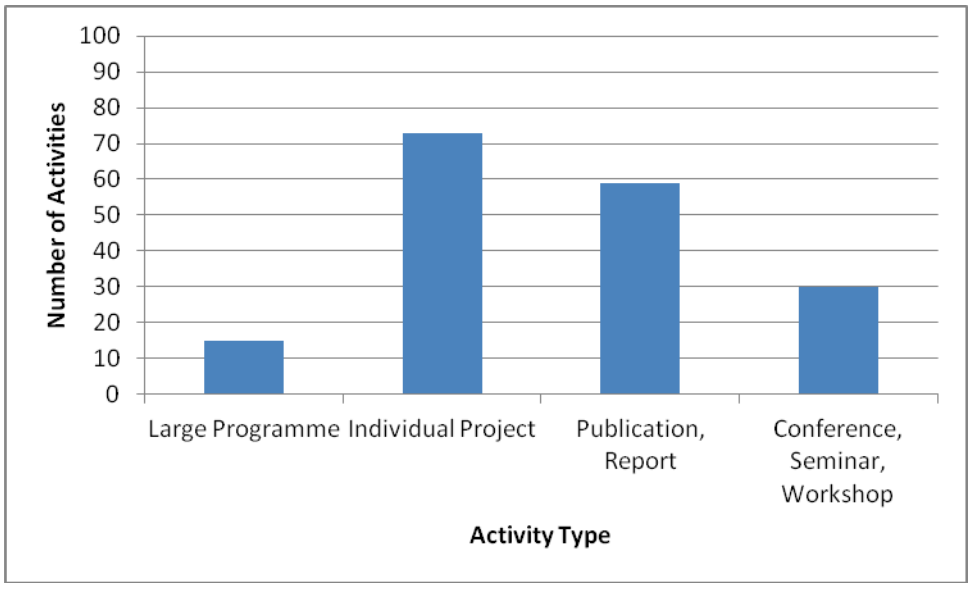

Figure 4: Type or "size" of activity

Finally, the dominance of the "global scale" is largely based on the fact that quite some activities are not "projects" in a classical sense but other activities such as publications addressing water quality challenges in a more general, i.e. global manner. To issue a "supplement" consisting of 54 country case studies in conjunction with the 3rd World Water Development Report is one way (in the realm of assessments) how the multi-scale character of water quality challenges could be addressed.

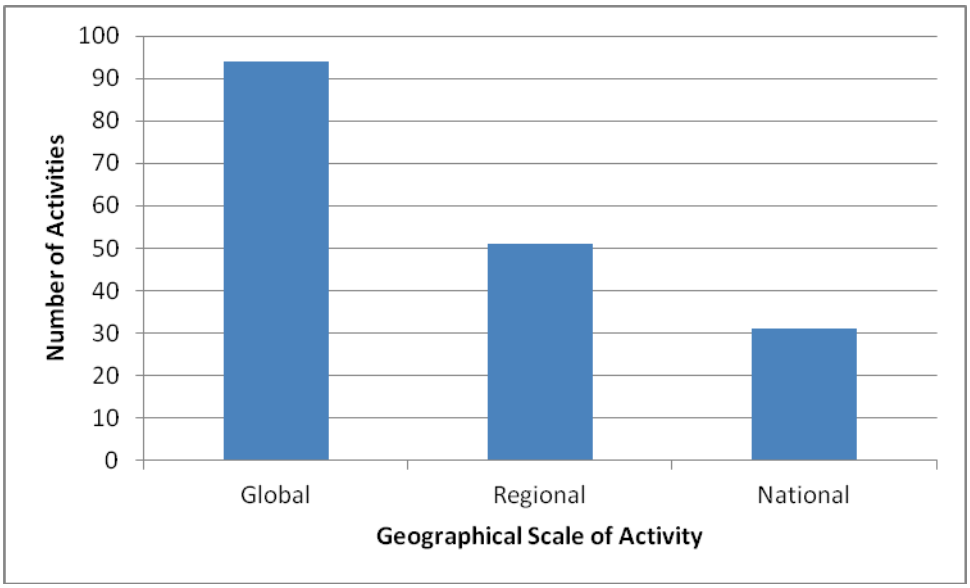

Figure 5: Geographical scale

9. Findings, conclusions, and recommendations

1) The concrete purpose of a given water use is a key determinant of the activities. Water quality for drinking water is different from water quality for bathing-water or agricultural usages or ecosystems. Although this seems to be a trivial fact, it has been of great importance for this mapping. For example, drinking water is by definition linked to activities related to water quality. Other issue areas such as agricultural production have a tight link to water quality concerns as well, however, often in terms of "pressures" on water resources. Yet other activities are directly linked with the subject matter by providing technologies or governance frameworks for addressing water pollution or the treatment of wastewater. Finally, the functions of ecosystems for water purification or in relation to the "state of water" more generally are also linked to these issues. Hence, sometimes water quality is the *primary focus* of these activities, in other occasions, however, water quality is a *secondary concern*, for when poor water quality directly affects human development and nature and hence has to be taken into account. Activities collected address both types, primary and secondary, adding up to a comprehensive picture of the challenge at hand.

2) Different types of activities or *policy interventions* are the second equally important pillar for the mapping exercise (in addition to thematic foci). UNESCO, who pursues water related activities in a rather *cross-cutting* manner, presents a comprehensive set of activities. In the context of this mapping exercise this highlights first and foremost that the nature of activities of this agency can support *thematically focused* work in this area. Using this as a case in point, work of the TPA should also keep its focus on policy interventions in order to facilitate work that is implemented through concrete topics by its individual members. Since UN-Water as a whole is set-up as an inter-agency mechanism, the TPA operates exactly along the same lines.

3) That said, it seems to be justified to focus on the topic "ecosystems" within this TPA as this has addressed a remaining gap. Identifying and initiating the closing of gaps could be a promising way forward for the work of the TPA and may be replicated for

other issue areas. Other than that, the TPA's focus on policy interventions relevant for all thematic focus areas of all agencies can indeed add value to on-going activities and does not run the risk of duplicating efforts of TPA members. Hence, it can be concluded that the ToR of the TPA are "correctly" defined. The TPA should further continue to ensure tight links to different forms of water use (household related water supply, agricultural uses, industrial uses, and ecosystems) as they also define the specificities of sources of pollution, treatment options, as well as possible after-usages. With WHO and UNICEF and UN-HABITAT, FAO, UNEP and, not yet part of the TPA and therefore only briefly referred to, UNIDO, focal agencies are in place who run related activities covering the different thematic aspects of water quality.

4) One of the findings of the mapping exercise is that "soft" interventions are more often covered than "hard" ones (see Figure 3). At the same time, policy interventions such as technology or financing are addressed by a few activities but are not yet part of the ToRs for this TPA. The promotion of institutional and policy reforms is identified as a priority area for this TPA but not well addresses either. In times of Rio+20 (as discussed, for example, by UNECSO or UNW-DPAC activities that make the case for water in the context of "Green Economy") and the run-up to the year 2015, which will present a major milestone for global water governance, it cannot be said easily anymore whether so-called "soft" or "hard" interventions can still be used synonymously for "effective" and "ineffective" water governance. That said, one way of "addressing" the gap of "hard" policy interventions is to think about those not yet involved in the TPA. It is a bit surprising that hardly any GEF-related activities were reported by UNEP (or others), even if the overarching focus of the GEF International Waters project portfolio is on sustainability. Hence, some discussion should take place within the TPA on this question.

5) Many of the collected activities are water quality related publications or reports, ranging from specific issues such as urban water quality to rather large efforts such as compiling a handbook on water quality. Less activities have the form of concrete projects such as water quality related projects addressing concrete challenges through concrete activities within a given water basin. Some of the activities represent (relatively) large programmes such as GEMS/Water, implemented by a

variety of individual activities. This may be an issue for debate within the TPA and the inclusion of the World Bank may be a concrete way forward.

6) Some comprehensive policy developments such as the process to develop and promote water quality guidelines for different uses or Water safety plans are part of the ongoing activities. The thematic focus on drinking water quality and safe use of water is the one addressed in the most comprehensive manner. It builds on an overarching framework (for example the water safety plans) and it has put forward over the years strict standards and guidelines, a sound data base and fact finding processes, increasingly sophisticated monitoring processes and it is implemented by different partners and for different sub-categories. It adds training modules, networking activities, for example for (small-scale) operators and regulators, and is very often supported by concrete projects on the ground. The TPA may want to discuss whether such "systemic approaches" are/can be replicated for other thematic priority areas.

7) Concrete issue areas such as addressing the challenges of arsenic pollution of drinking water sources in Asia present the kind of challenges that need a coordinated response and, in some cases, immediate action. The existence of the TPA could help to coordinate such activities in the future. Being aware of who is doing/is planning to do what seems to be a necessary condition in this respect. The emerging issue of pharmaceuticals may be a field for further work, as the TPA could be a "network of networks" consisting of partners knowledgeable both about pharmaceutical and the water quality parts of the challenge. In this case, which is just used as an example here, the TPA should be aware which member is observing this situation that may or may not evolve into a major problem (horizon scanning) and it should be aware and coordinate action of its members accordingly.

8) The increased pressure on water and land sources in order to ensure food security, to give another example, is one of the top priorities these days. This field of work may provide a "litmus test" for the responsive capacity of this TPA, demonstrating that ensuring water quality is not a limiting but an enabling factor for long-term food security. Also here, through work done by FAO, in collaboration with other TPA

partners, concrete activities are in place which may (have to) benefit more strongly from work of the TPA in the future.

9) Finally, the current priority of member states and UN-Water "Sanitation: the drive to 2015" presents another concrete large-scale challenge that will either contribute to solving water quality problems or, if not addressed effectively, will further increase the pressure on water resources. In order to do so, the TPA could first and foremost present what has been done so far in this respect, identify partners and their profiles for further action and remaining gaps which will have to be closed by concrete work of its members.

10) These given examples (in points 7, 8 and 9) provide a sense of what can and should be done with the results of this mapping exercise: to use this information base to address water quality challenges more effectively.

Annex: data set, basic document for the UNW-AIS (separate excel file)