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Olli Varis, Konrad Enckell & Marko Keskinen

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Olli Varis*, Konrad Enckell and Marko Keskinen

Department of Civil and Environmental Engineering, Water & Development Research Group, Aalto University, Espoo, Finland

Water constitutes a sector that overlaps with many other sectors and within itself has an array of quite different interests, stakeholders with varying mind-sets and consequently notable governance challenges. Integrated water resources management (IWRM) is the recommended approach to tackle this situation. Integration – both vertical (within the sector) and horizontal (across different established sectors) – is seen as fundamental to balanced governance and policy making. IWRM has a long history, and rich experiences, both positive and negative, have been reported. This article summarizes some of this experience and concludes that both vertical and horizontal challenges are ample. To contextualize and systematize integration, a flow chart is presented for various tasks and phases of water governance, and the challenges of integration are embedded into that framework. Because water is not the only sector that overlaps with other sectors and has integration challenges, the health sector is considered to learn from its approaches. Particularly interesting is the 'health in all policies' approach. This is helpful in further developing IWRM, in particular with respect to horizontal integration, in which IWRM may particularly need development.

Keywords: water governance; integrated water resources management; health sector; health in all policies; policy integration

Introduction

When it comes to governance and sustainable development, the fad of the day is integration. Over several decades, researchers and politicians alike have discussed and disputed integrated policymaking and related approaches, and for good reasons. Decisions made in one sector require coordination with other decisions within the same and other sectors, because they may be deeply coupled. Consequently, integration is seen from two dimensions. The *horizontal* dimension refers to responsibilities within a single organization or sector – between various competing interests, stakeholders, government departments, businesses and so on. The *vertical* dimension is required to harmonize policy interventions that influence and transcend the boundaries of established policy fields and sectors.

Integrated approaches have been at the centre of attention in contexts such as the Millennium Development Goals, the World Summit on Sustainable Development, the Millennium Ecosystem Assessment, the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change (UNEP, 2009). One of the most important aspects, if not a requirement, for achieving sustainable development through governance is integrated policy making (Kemp, Parto, & Gibson, 2005). Yet, as pointed out for example by Mitchell (1990), there are usually few explicit incentives for integration

*Corresponding author. Email: olli.varis@aalto.fi

within the water sector, and vertical and horizontal fragmentation creates an environment that rewards those who concentrate upon and even defend their own areas of interest.

Integrated water resources management (IWRM) is a widely promoted approach within the water sector to integrate and coordinate planning, development, management and policy making. The goal of this article is first to introduce IWRM and the debates around that concept and then to explore its vertical and horizontal dimensions. The vertical dimension is explored by embedding IWRM into a generic water governance context. The horizontal dimension is explored by considering existing developments in an overlapping – and similarly cross-cutting – sector: health. This research focuses on the horizontal dimension, because it is less investigated in the water sector than the vertical one. With this analysis, we hope to systematize the debate around IWRM and to provide an array of novel ideas and viewpoints into it.

IWRM explored

The water sector, besides being a sector in its own right, is at the same time a part of environment, agriculture, energy, health, infrastructure, and several other sectors. Water links and cuts across many natural and management functions in these sectors, and at the same time it overlaps with numerous other sectors. Consequently, both the vertical and horizontal dimensions of integration are critical for management and governance of activities within the water sector.

Nevertheless, water is not the only sector that has these properties. In fact, innumerable other sectors cross-cut and overlap with other sectors and have both vertical and horizontal integration needs. Integrated approaches are very important within these sectors, too, and they have thus developed their specific approaches to systematize and promote integrated management. Examples include the health, natural resources management and coastal zone management sectors and their respective integrative approaches: health in all policies; integrated natural resources management; and integrated coastal zone management (Keskinen, 2010; Stucki, 2011).

Various agencies and scholars have presented definitions of IWRM. One of the most commonly used is from the Global Water Partnership (GWP, 2000), for whom IWRM is:

> a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment.

The World Water Council (2000) define it as a

> philosophy that holds that water must be viewed from a holistic perspective, both in its natural state and in balancing competing demands on it – agricultural, industrial and environmental. Management of water resources and services need to reflect the interaction between these different demands, and so must be coordinated within and across sectors. If the many crosscutting requirements are met, and if there can be horizontal and vertical integration within the management framework for water resources and services, a more equitable, efficient, and sustainable regime will emerge.

Accordingly, waters should be used to provide economic well-being to people, without compromising social equity or environmental sustainability. This should happen in a basin-wide context, with stakeholder participation and under the prevalence of good governance (Keskinen, 2010; Varis & Keskinen, 2006; Varis, Keskinen, & Kummu, 2008; Figure 1). In this way, IWRM can be seen to aim at enhancing good governance and promoting balanced development in relation to social equity, economic growth and environmental sustainability (largely according to the philosophy of sustainable development, which is commonly defined
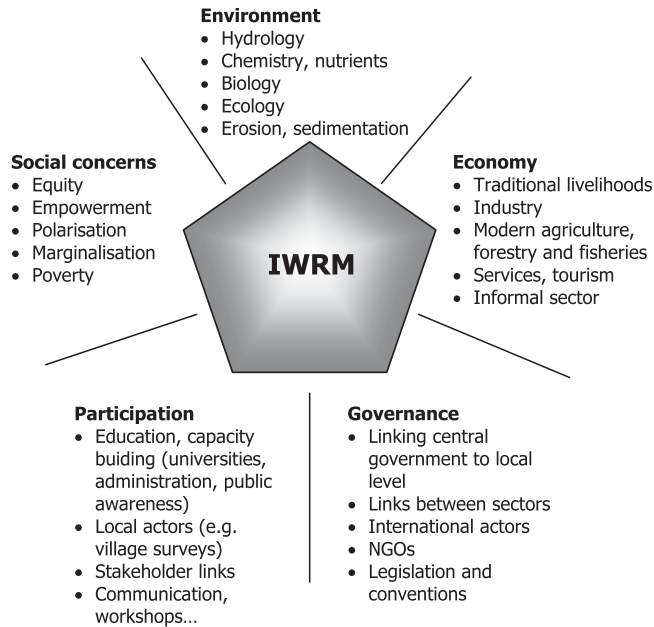
Figure 1. Integrated water resources management should occur under and enhance good governance (Varis et al., 2006).

through the triple bottom line as social, economic and environmental sustainability). While all these objectives are naturally very relevant and important, achieving such a balance is typically challenging due to the inherently political nature of decision and planning processes. The political nature is naturally connected to the feature that the three *E*'s of sustainability and IWRM (economic well-being, social equity and environment) are often antagonistic and thereby imply difficult and partly value-laden trade-offs (see e.g. Molle, 2008).

Historically, we can go back centuries to discover forerunners of the present IWRM paradigm. In a number of countries, water management has been institutionalized in an advanced and integrated way over centuries, although with varying focuses (Keskinen, 2010; Rahaman & Varis, 2005). Following the integrated water management paradigm – which today is known as IWRM – has been the recommended approach to incorporate the multiple competing uses of water resources at key international policy agendas over several decades. This started most notably with the United Nations Water Conference in Mar del Plata, Argentina (1977), and has continued through all important international water policy events (Rahaman & Varis, 2005).

Rich experience exists on IWRM, and profound reviews and critiques are available (e.g. Biswas, 2005; Gallego-Ayala, 2013; Lenton & Muller, 2009; Molle, 2008). Based on our own previous experience and IWRM case studies (e.g. Mehtonen, Keskinen, & Varis, 2008); Varis & Keskinen, 2006; Varis, Kummu, & Keskinen, 2006, 2008; Varis, Rahaman, & Stucki, 2008; Varis & Lahtela, 2002), many of the commonly debated themes can be summarized in the following five items:

- *Means to an end.* Too often, in practice, most of the attention is allocated to an IWRM plan, and less attention is paid to its implementation. The end goal should not be to present an IWRM plan but to improve water governance and management to achieve goals such as welfare or sustainability.

- *Importance of having a specific governance context.* Water governance structures and possible bottlenecks in water governance should be looked at. IWRM would best serve as a generic approach for that purpose.
- *Better performance and inclusion.* Integrated policy making within non-water sectors is still far from completed (UNEP, 2012), and so is the sufficient inclusion of relevant stakeholders in policy making in the water sector. Water-sector actors can learn substantially from paradigms and practices in other related sectors, and see water-sector activities in a more general context.
- *Interplay of water and people*. Water governance is the result of the interplay of the societal governance system and nature. It is frequent that IWRM stresses that the appropriate unit for water management is a river basin. This is only partly valid, given that most governance occurs in quite different scales and units. Water management at the river-basin level is important, but it should be juxtaposed with jurisdictions, economic zones and the activities of other related sectors.
- *Blocks due to over-definition and axiomatic attitude.* IWRM should increasingly be seen at a very generic level, and over-definition, toolboxes, etc., should be avoided. IWRM as defined currently can be seen as a sustainable development corollary in the water sector.

As we can easily see, both vertical (within a sector) and horizontal (across sectors) dimensions are amply represented in these themes. Both these dimensions are discussed below.

Vertical vs. horizontal dimension: IWRM in the water governance context

As mentioned, IWRM is one of the key approaches for enhancing good water governance – rather than a goal on its own. But then, what exactly does water governance mean? Water governance is a subset of overall societal governance, and therefore the general definition of governance should obviously apply to operations in the water sector as well (Pahl-Wostl, Gupta, & Petry, 2008; Tortajada, 2010a, 2010b). Water governance has a large number of definitions (Araral & Wang, 2013; Lautze, de Silva, Giordano, & Sanford, 2011; Movik, 2012). Here we use that coined by UNDP (2004), which is among the most widely used:

> The term water governance encompasses the political, economic and social processes and institutions by which governments, civil society, and the private sector make decisions about how best to use, develop and manage water resources.

Because the concept of water governance is broad and numerous definitions exist, analyses of real-life properties and bottlenecks of good water governance abound. Without a solid review – which would go far beyond the scope of this article – we refer to our experience from a programme of water-sector capacity building in eight countries in the Middle East and North Africa (Morocco, Algeria, Tunisia, Egypt, Jordan, Syria, Palestine and Yemen). During a series of annual capacity-building workshops between 2005 and 2009, a list of key governance failure elements was produced for water governance in those countries (Varis & Tortajada, 2009), including:

- Strong sector *fragmentation*
- Problems with the *institutional set-up* (unclear roles of actors) and *coordination*
- Notable shortcomings in law and policy *enforcement*
- Various centralization- and decentralization-related challenges
- Shortage of *stakeholder involvement* possibilities and their willingness to improve

  the situation
- *Insufficient data and information* (reliability, accessibility and sharing)
- Shortage of *funds*
- General low public awareness
- Difficulty in the shift of focus from water supply provision to *water demand management*
- *Crisis management* rather than long-term management
- Water scarcity and non-sustainable use of water resources (including growing water quality problems)
- Reuse and water saving
- Increasing use of *economic instruments* and involvement of the private sector
- The strong role of water in *culture and religion* is not always properly understood
- Contrast between *traditional and modern water management* practices (danger of abandoning traditional methods per se)
- *Technological* shortcomings

Many of the items listed are quite often present in studies and policy documents dealing with factors behind governance failures within the water sector. Horizontal and vertical challenges are again both amply present. We hope that this list gives an idea of typical water-sector governance challenges, particularly to those who are not familiar with the sector and come for instance from the health sector.

Rather than going into the definitions or experiences of water governance in further detail, we proceed by proposing a flow-chart type of presentation for the general procedure of water governance (Figure 2). As water governance is a subset of the general societal governance system, water is a subset of the earth system. It serves an array of partly situation-specific interests (needs, social interests, requirements, etc.; Movik, 2012). These constitute the basic mind-set for water governance, which is preconditioned by education, cultural considerations, public and political will, skill, awareness and similar considerations. These interests are related to and often rival the interests of other sectors, and are to a high degree context-specific.

The water sector, like other sectors, has its actors and institutions. These often overlap with those of several other sectors. Thus the institutional diversity and challenges of the water sector are typically considerable (Bakker & Morinville, 2013; Tortajada, 2010a, 2010b). This includes interest groups from different economic sectors such as agriculture, energy, industry and many more, and can be divided into formal and informal institutions. The division between public and private actors is often relevant, as is the one between civil society and the government (Susskind, 2013). The different actors and institutions all have their stakes in formulating and implementing policies, plans, programmes, strategies and other actions that are aimed at improving societal or environmental benefits, compliance with values, or other aspects that they want to address with their policies.

Water governance analyses usually highlight the chain from actors to actions. Virtually all of the references cited in this section address this as one of the key bottlenecks of achieving good water governance. We understand and agree with this concern and hope that our presentation of water governance helps in seeing and comprehending, as well as systematizing, the complex vertical links within the water sector by indicating how many types of mind-sets, interests, externalities, contexts, stakeholders and the like are involved in the sector. For instance, an IWRM plan or institutionalization of IWRM should (in our view) be seen in this sort of systematic governance framework, and also with close linkages to the earth system that water is one part of. In particular, it may be difficult to
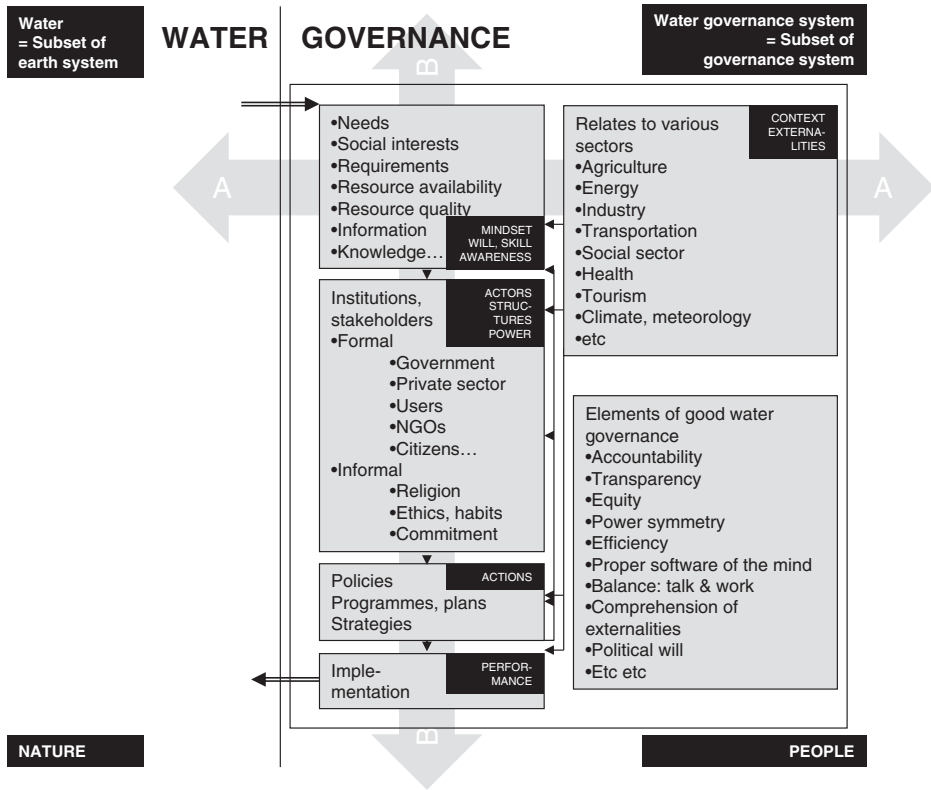
Figure 2.   Schematic visualization of water governance, showing the horizontal (A, across sectors) and vertical (B, within a sector) dimensions.

realize how to tackle challenging issues such as those listed above without reflecting on the reasons behind those challenges from various angles (or boxes) as provided by Figure 2. The good-water-governance angle proposed here is particularly important.

IWRM as a concept – as it is implemented today – may suffer from the bias of being too vertical in nature. This is because it tends not to be very strong in pushing the debate 'out of the water box', to properly see the horizontal links. Instead, other sectors are too easily considered as some kind of externalities. Hence, IWRM may in practice support vertical integration better than horizontal.

Strong in the horizontal dimension: the health sector explored

So, how could IWRM be developed so as to draw the water debate 'out of the water box'? For that purpose, it is quite useful to investigate how the health sector approaches integration, because this sector has been quite successful in horizontal integration in its policy approaches, as is shown later. The health sector was mentioned in the introduction as one of the many sectors that share the imperative of integrated solutions in view of their many links and cross-cutting features with other sectors. This section reviews the similarities and differences between the health and water sectors. We also compare their most influential integrative management approaches, respectively 'health in all policies' (HiAP) and IWRM. The possibility of a modification and transference of the HiAP

approach onto the water sector is discussed. Policy making in the health and water sectors differs between countries, and the following therefore focuses only on the most general features shared by most countries of the world.

The health and water sectors compared

The health and water sectors share many similarities. Health is, for example, similarly interlinked to – and impacted by – almost all conceivable government policies, whether this is recognized or not. Policy fragmentation is also quite common in both sectors, partly due to the broad and cross-cutting nature of the two. The governance and management aspects in both sectors also include different levels and scales, from the local to national all the way to the regional and global levels.

In many parts of the world, health governance – even more than the water sector – has passed from a strictly centralized governance form to a more multilayered and pluralistic one. In several countries, the health sector involves several different, often totally independent systems, operated by both public- and private-sector actors with alternative versions of governance (Kickbusch & Gleicher, 2012). The role of multinational private actors has become highly influential. Yet, the public agencies of both sectors play a significant role as distributors of services even in countries where private-sector involvement is significant. The provision – or at least the regulatory functions – of clean water, sanitation, and food and nutrition are often stated as being within the Ministry of Health's sphere of influence. In practice, these matters are usually taken care of by other sectors (Siddiqi et al., 2009).

Kickbusch and Gleicher (2012) conclude that just as the water sector does, health governance requires a synergistic set of policies. Many of these reside in sectors other than health and outside government and must be supported by structures and mechanisms that facilitate cross-sectoral collaboration. Governance in the health sector entails so-called whole-of-government and whole-of-society approaches to well-being and health. Together with other actors and sectors, these approaches reach beyond government to attain societal goals like prosperity, well-being, equity and sustainability (Kickbusch & Gleicher, 2012).

There are naturally several major differences between the health and water sectors. Most importantly, while health is understood as an end of many policies, water (with the exception of mere water supply services) is more often understood as a means to an end. In other words, water is seen as a means to generate electricity, improve crop production, enhance health, reduce poverty, improve ecosystem health and so forth. Consequently, when the water and health sectors are examined from the perspective of the general public it seems clear that health issues are more easily understandable that water-related ones (Leppo, Ollila, Peña, Wismar, & Cook, 2013). Because of this difference in perceptibility, health issues also tend to get more coverage in media and politics than water issues. There is also one very specific feature that makes the water sector different from the health sector in a fundamental way. A three-dimensional geographic system for managing water is needed, because water is usually managed across administrative regions, across river basins, and across economic zones and corridors. Various infrastructure-related factors contribute to the high importance of corridors, particularly in urbanized and other highly economically active regions.

The integrative approaches: HiAP and IWRM

Let us now investigate how the health sector considers the question of integration within its own sphere of interest through an approach called health in all policies. The thesis of

the HiAP approach is the integration of policy making in the health sector with that of other sectors. The first step is to introduce and highlight the health-related issues of a certain decision or policy in another sector. Decision makers in that field can then take these under consideration and as a result make a decision more favourable from the perspective of public health. While similar integrative approaches have already been promoted under different names for decades, the HiAP approach has gained significance over the past decade. As a result, it is making its breakthrough particularly in the EU, Australia and Canada; policy making in other parts of the world has used HiAP as a model for the future as well (Leppo et al., 2013; WHO, 2010).

According to a commonly used definition (Ollila, Baum, & Peña, 2013):

> Health in All Policies (HiAP) is an approach to public policies across sectors that systematically takes into account the health and health systems implications of decisions, seeks synergies, and avoids harmful health impacts, in order to improve population health and health equity. A HiAP approach is founded on health-related rights and obligations. It emphasizes the consequences of public policies on health determinants, and aims to improve the accountability of policy-makers for health impacts at all levels of policy-making.

According to HiAP proponents, the approach is revolutionary in the sense that it focuses on the issue of integrated policymaking, both horizontally and vertically (Leppo et al., 2013). We also see that the main novelty of HiAP is its focus on the policy level and its emphasis on influencing the policies of the non-health sectors. As such, HiAP provides an overarching framework under which different kinds of methods and instruments promoting health can be fitted (e.g. Kickbusch & Buckett, 2010; Ståhl, Wismar, Ollila, Lahtinen, & Leppo, 2006; WHO, 2010).

At the same time, HiAP has from the very beginning focused strongly on the challenges in its actual implementation. Successful implementation requires profound and therefore difficult changes in policies and, most importantly, mind-sets in the sector and other sectors. HiAP's starting point is therefore that integration and integrative policies are not something that will emerge automatically or easily; they are likely to meet resistance and thus require active promotion and facilitation (e.g. WHO, 2010). As described by Ståhl et al. (2006, pp. 39–40):

> The understanding of the scientific basis and articulation in the background of the concepts used in the context of broad understanding of health is useful as a learning process. However, the real test of any policy or approach is at the level of practice. The policy implications of the broad understanding of health and of population health imply that a major share of policy work needs to be performed outside the particular remits of the health sector.

Building on this notion, the HiAP literature takes a strongly strategic view on the inclusion of health into other sectorial policies, highlighting the importance of strategic thinking, solid information and active networking (e.g. Ståhl et al., 2006; WHO, 2010; Wilkinson & Marmot, 2003). For example, Ståhl et al. (2006) – in one of the key reports laying the foundation for the present-day HiAP approach – recognize two different strategic options. These are a health-sector-driven 'health as the main objective' strategy and a 'mutual gains' strategy, where health issues are considered as part of the policy process of another sector. The same report also notes that policy changes can accelerate in times of crisis, and suggests the utilization of three conditions for policy change:

(1) the problem stream (the problem that puts the issue on the agenda);
(2) the policy stream (the alternatives and solutions produced by experts); and

(3) the politics stream (the politically determined solutions).These are naturally all familiar concepts in theories about political change, but including them as critical components in an integrative approach feels – at least for us as water-sector experts – refreshingly different and relevant.

It is therefore no wonder that HiAP also recognizes the importance of values – such as equity, sustainability and participation – for policy making. This is noted even in the WHO-sponsored Adelaide Statement on Health in All Policies (WHO, 2010, pp. 2–3):

> Building a process for Health in All Policies requires using windows of opportunity to change mindsets and decision-making cultures, and to prompt actions. ... It is not unusual that such a process can create tensions within government as conflicts over values and diverging interests can emerge. Resolution can be achieved through persistent and systematic engagement with political processes and key decision-makers

Such a view is also supported by other HiAP literature. For example Ståhl et al. (2006, p. 145) note that all policy making is about making choices to bring about change: "it is a political process circumscribed by values and principles, whether these are explicitly stated or not."

On a more practical level, one of the fundamental principles of the HiAP approach is that it makes possible prediction of the health consequences of different sectorial policies (Ståhl et al., 2006, p. 189). Among the key tools for such prediction is the health impact assessment (HIA), an approach that aims to support policy makers by predicting the health-related consequences as well as clarifying the different trade-offs that have to be made (Kemm et al., 2011; Ståhl et al., 2006). While the name of the HIA suggests that it works just like any other impact assessment, there are some major differences in its theoretical foundation. While most assessments build on observations, the HIA builds on notions taken from healthy public policy and policy science. As a result, it starts with a series of theories about how the world works and the causal connections between different events (Ståhl et al., 2006). Nevertheless, the HIA aims to present the health consequences of a certain project or policy in a concentrated and comprehensible form to inform decision makers of both benefits and trade-offs (Leppo et al., 2013). From examining the use of the HIA around the world it is clear that the HIA is necessary in the integration of policy making in the health sector and that it is a contributing factor in many beneficial decisions that have been made (Gottlieb, Fielding, & Braveman, 2012; Kemm et al., 2011).

What about a 'water in all policies' approach?

The sections above have illustrated that while the health and water sectors share some major similarities related to their cross-cutting nature, the key integrative approaches of the two sectors – HiAP and IWRM – seem to be theoretically farther apart. The interesting question is whether, despite the obvious sectorial differences, HiAP theories and practice could provide fresh ideas and viewpoints for integrative management and policy making in the water sector.

Overall, the HiAP approach is clearly much more policy-oriented than IWRM. HiAP embarks upon the inclusion of health concerns in all other policies that have or may have health implications, and also seeks to specify a set of determinants and instruments for this purpose. In that sense, HiAP implicitly recognizes much of the analogical governance structure presented in Figure 2.

As such, we believe that an 'in all policies' philosophy – building on the key HiAP components outlined above – could be of much relevance to the water sector. A 'water in

all policies' (WiAP) approach would increase the emphasis on the horizontal, i.e. cross-sectoral, integration that seems to remain a weak point of IWRM. Without a new opening for more strategic and systematic approaches for involvement of other sectors (one of which is already emerging, namely the water–food–energy nexus), IWRM will remain very much the water sector's own approach, with relatively weak linkages to and implementation in other sectors, despite more than a decade of active promotion and application.

WiAP could also bring more strategic thinking to the water sector, emphasizing the need to actively promote and lobby the importance of water issues in other sectors and recognizing impact pathways or streams to make this happen in practice. Also, WiAP could bring the water sector a stronger focus on the ends rather than the means (recognized as one of the bottlenecks of IWRM). In other words, the main issue is to enhance integration and to better include water in other sectors' planning processes. It does not matter under which concept or term – IWRM or something else – this actually happens. Related to this, we believe that an up-front recognition of the political and value-laden nature of all integrative policy processes is something that should be considered much more strongly in the IWRM approach.

Conclusions

Water is an important cross-cutting factor that overlaps with many other sectors. Consequently, integrated management and policy making are instrumental in the promotion of equitable and sustainable development in water-sector operations. While this is not a new observation, it does need perennial emphasis, in view of its importance. As the key integrative process in the water field, IWRM – with its pros and cons – remains both relevant and useful.

This article has discussed the implementation of IWRM, noting that its success requires both vertical and horizontal integration. While the two forms of integration require very different approaches and methods, we believe that there remains plenty of opportunity for development. To facilitate the discussion of integration within the water sector, we have embedded the IWRM approach into a schematic visualization of water governance. IWRM can be, and is, used at many sub-functions of this entity, and we believe that many of the shortcomings of IWRM are due to only partial consideration of an entity that should be seen as a whole. In general, it is obvious that the success of the IWRM rests very much on the general governance framework. If the principles of good governance are not followed, no approach – be it IWRM or some other – is likely to succeed, irrespective of its merits or weaknesses.

When it comes to the horizontal integration of the water and other sectors, we see a particular opportunity for development in pushing the water debate 'out of the water box'. We argue that IWRM is presently not implemented quite successfully in this regard. The 'health in all policies' approach discussed in this article provides one alternative to look at horizontal integration, because HiAP, with its emphasis on policy influence, is specifically designed for this. As a result, we proceeded to suggest that a *'water in all policies'* approach would most likely be beneficial in the water field as well. In particular, we believe that strategic thinking – with recognized policy pathways – to increase the consideration of water in other sectoral policies is currently in short supply in the water sector.

At the same time, we realize that the water sector does not need yet another buzzword or additional management framework. We should focus on the ends, rather than the means, and hence make use of the best practices from other fields. The proposed WiAP approach could be implemented under the existing IWRM and/or other water management processes,

bringing additional ideas into their implementation. At the same time, we also need to consider the specific characteristics of the water sector, including its transboundary nature and related institutional settings. All in all, we believe that this article has shown that the water field should reach out to other sectors in search of theories of integrated approaches, because much remains to be learned from them.

Acknowledgements

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