Integrated Water Management: Assessing the Capacity Needs of the Victorian Water Industry

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Abstract

The inter- and multi-disciplinary nature of integrated water management (IWM) and the number of stakeholders involved in urban and water planning present significant challenges to the current water industry. For organisations and individuals to embrace and successfully implement IWM, current capacity gaps need to be identified, understood and addressed appropriately. In 2014/15 Clearwater, a leading capacity building organisation, undertook an extensive study to identify IWM capacity needs in the Victorian water industry.

Participants from all of Clearwater's customer segments (local and state government, water authorities, consultants etc.) were involved in a rigorous market research process which included interviews, focus groups and an online survey. The data was analysed using a capacity assessment framework grounded in international best practice. Importantly, the framework goes beyond an assessment of individual capacity (e.g. a person's skills and knowledge), to include intra-organisational capacity (e.g. organisational processes), inter-organisational capacity (skills demonstrated between organisations, e.g. cooperation between stakeholder groups), and institutional rules and incentives (referring to the wider framework which includes governance and legislation for improved uptake of IWM).

The results highlighted amongst others that there is a strong need to clarify individually meaningful and relevant drivers for IWM, so that people understand the real value and benefits of IWM to their organisation. There is also a clear need to encourage stronger collaboration between organisations and stakeholders involved in IWM. In addition, the study showed that, for local governments in particular, there is a need to improve organisational capability/processes and senior level support. Besides technical skills, there was recognition for the importance of 'soft skills' such as systems-thinking, change management and influencing skills. In general, items listed in the 'individual capacity' were considered mainly in small *need of improvement as opposed to other capacity needs, which were rather in* major *need of improvement.*

The wealth of data collected will be used to develop new / align existing capacity building models to best cater to the evolving needs of the water industry and ensure they provide ever relevant service offerings.

1. INTRODUCTION

For the urban water industry, Integrated Water Management (IWM) represents a major shift from the traditional, linear approach, where different parts of the water cycle were managed separately by different organisations or by different 'silos' within organisations. In Australia, this approach has been in place for over 100 years.

In the last two decades, the potential benefits of IWM have begun to emerge and many governments have responded by mandating the adoption of these approaches in water and urban development planning. As a result, government agencies, councils, water authorities etc. are being increasingly

required to take a different approach to how they manage water and urban development. However, the inter- and multi-disciplinary nature of integrated water management (IWM) and the number of stakeholders involved in urban and water planning present significant challenges to the current water industry.

The term capacity building emerged in the realm of international development during the 1990s. Definitions of 'capacity' vary greatly, ranging from the very general to the more specific but all agree that it is much more than training or education. In the Australian water management context, it has been recognised by practitioners and academics that capacity not only depends on having sufficiently developed human resource capacity, but also sufficient capacity in organisational and institutional contexts (Brown and Farrelly, 2009; Brown et al., 2006; Van de Meene et al., 2009).

It is well accepted that inadequate capacity is a major issue preventing successful IWM planning and implementation in Greater Melbourne (Brown et al., 2006; Clearwater et al., 2011; Jennings 2012; Melbourne Water, 2013; Morrison et al., 2010). Organisational capacity gaps will be a significant impediment to the reform agenda if they are not identified, understood and addressed appropriately.

This project therefore set out to engage with a variety of stakeholders to build awareness of IWM, and importantly, identify IWM capacity needs from a range of industry perspectives. In a second stage, the collected data will be used to develop new / align existing capacity building models to best cater to the evolving needs of the water industry and ensure they provide ever relevant service offerings. This paper focuses on Stage 1 of the project, and summarises the extensive capacity needs assessment undertaken by Clearwater during 2014 and 2015.

2. METHOD

The methodology draws on the experience of the well-regarded United Nations Development Programme capacity needs assessment model (2008) and recent research on institutional capacity building by experts in this field. Clearwater has applied their extensive knowledge of the context, key stakeholders and industry capacity needs to tailor the methodology for the Victorian IWM context.

2.1. Data collection

The main data collection process involved direct engagement of a variety of stakeholders through face-to-face interviews, focus groups and an online survey. This data collection process was complimented by a number of existing data sets such as reports and desktop studies, which were used to:

- inform the choice of thematic prompts for interviews and focus groups (see below), and
- verify the data collected by direct engagement and provide insights into the findings.

The project directly engaged 177 participants:

- Stakeholders hailed from a variety of industry sectors and included both representatives from peak bodies as well as industry practitioners.
- While some participants were specifically invited to contribute to this project based on their knowledge of the industry and of the stakeholder group they would represent, others responded to an open invitation to participate in this study.
- As mentioned earlier, participants were engaged through face-to-face interviews (46), focus groups (17) and an online survey (116).
- Whilst all participants in the interviews and focus group represented the state of Victoria, around 20% of survey respondents work interstate or overseas.

A summary of industry participant numbers and engagement processes is provided in Table 1.

Table 1. Needs assessment participants (in no particular order)

	TOTAL	Consultants	Water Authorities	Local Government	Developers	Contractors	State government	Education and Research Institutions	Others *(e.g. community, Not-for-profit, training etc.)*	Victoria
Interviews	**46**	2	9 + 1 CMA	12	12	5	2	2	1	100%
Focus groups	**33**	3	-	4	6	-	2	-	-	100%
Survey	**116**	15	30	30	2	1	13	9	4 (+ 12 unknown)	83%
TOTAL	**177**	20	40	46	20	6	17	11	17	

The interviews and focus groups included a range of questions to identify capacity barriers and needs, and broadly followed the inquiry structure below:

- How does your current role relate to IWM?
- What are some of the main water issues in Victoria?
- What are the barriers (problems) faced by the industry in implementing IWM? Thematic prompts (*identified through the desktop research*):
    - External Policies and Planning
    - Community engagement and education
    - Collaboration between organisations
    - Organisation
    - Industry-wide Skills, Knowledge and Implementation
- Will these barriers change in the future (i.e. in five years' time)?
- What are the causes of the top 5 barriers?

The survey was available online for a total of 3 weeks. A wide range of IWM practitioners were encouraged to take part in it via several promotional channels (direct emails, Clearwater newsletter, other industry newsletters etc.). The aim of the survey was to complement the findings from the interviews and focus groups by getting feedback from a wider range of stakeholders to (a) verify the IWM gaps/needs identified (Table 2), and (b) prioritise them. The survey was also used to gather feedback about the Clearwater program itself, but only the findings relating to barriers and challenges with IWM implementation are reported within this paper.

Table 2. IWM gaps/needs verified in online survey

Across the industry	• Shared vision/understanding of IWM • Meaningful drivers to implement IWM • Strong leadership and direction in IWM • Coordinated and broad-scale community engagement • Ties between water and planning industry • Clear and holistic legislation on IWM • Cost and benefit information of IWM – business case • Clarity over who should bear the cost of IWM • Long-term funding sources • Enforcement of IWM
Within and between organisations	• Ongoing strategic engagement between state government and other stakeholders involved in IWM • Clear roles and responsibilities between organisations involved in IWM • Communication and coordination between organisations involved in IWM • Communication and collaboration within organisations involved in IWM (between the different groups/departments) • Organisational processes facilitating IWM • Buy-in from senior management on IWM • Willingness to take risks • IWM champions (individuals and/or organisations)
At the individual level	• Open and honest sharing between industry practitioners (in particular sharing of lessons learnt) • Coordination of programs who provide IWM information dissemination and/or training • Contractor skills/knowledge (construction, maintenance) • Learning from doing – hands-on training, on-site tours etc. • Technical skills/knowledge • Social sciences skills/knowledge (e.g. engagement, change management, economics, leadership etc.) • Planning provisions and deemed-to-comply solutions • Technical guidance and guidelines on IWM

2.2. Data analysis

Key models and frameworks to assess the capacity in implementing and sustaining IWM - specifically for the Australian context - have been developed by leading researchers and adapted for use by practitioners. These include Brown et al. (2006) and Van de Meene and Brown (2007).

The seminal work by Brown et al. (2006) identifies 26 IWM capacity needs of councils across the attributes of knowledge building, professional development, organisational strengthening, directive reforms, and facilitative reforms. This model is presented in a modified form in Figure 2 and shows that institutional capacity is defined using four nested areas (or spheres), representing the following capacity aspects (Brown et al, 2006):

- **Individual capacity** – the technical and 'people' knowledge, skills and expertise
- **Intra-organisational capacity** – the key processes, cultures and resources within organisations
- **Inter-organisational capacity** – the agreements, relationships and networks that exist between organisations
- **Institutional rules and incentives** – the regulations, policies and incentive schemes.

Figure 1 Capacity areas in implementation of IWM (adapted from Brown et al. (2006))

The above model was evolved by van de Meene and Brown (2007) to include a series of attributes against which to define or measure an organisation's capacity to implement IWM. Both the above model and these capacity attributes were used as a guide to identify the capacity needs of the industry for this project.

In order to facilitate the online data gathering process, this model was presented in a simplified version in the survey (Table 2), with only three main areas of focus: (1) across the industry, (2) within and between organisations, and (3) at the individual level.

3. RESULTS

Figure 3 summarises the IWM capacity issues / needs identified through the market research process. The data traverses a range of issues which, at times, go beyond capacity building needs to include broader IWM issues encountered by the water industry.

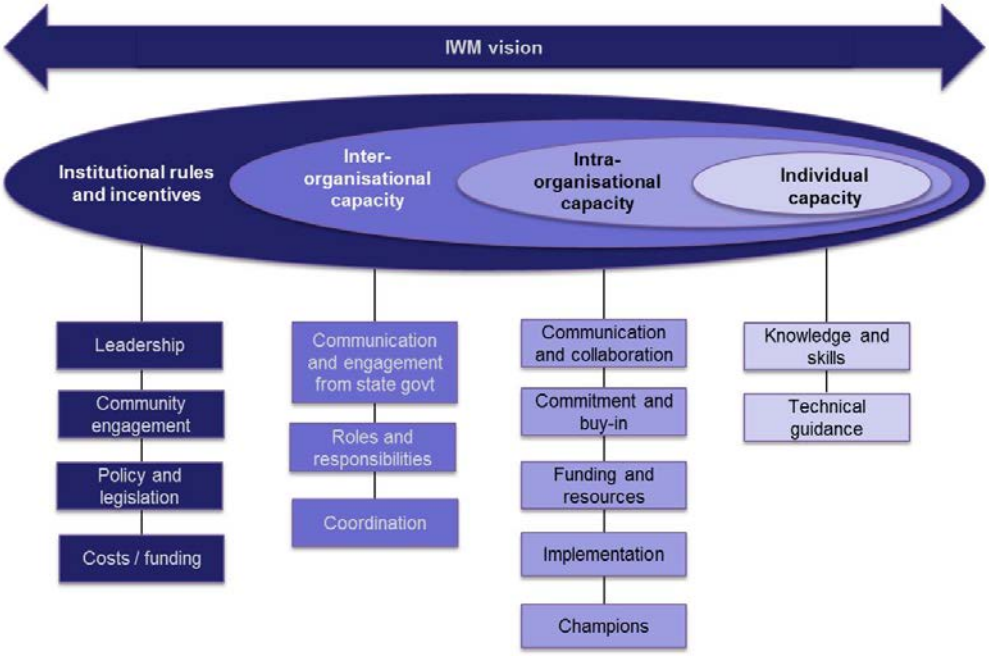

Figure 2 Summary of IWM capacity gaps / needs raised by stakeholders

Whilst interviews and focus groups/workshops allowed the initial identification of themes, they were confirmed by the online survey: between 85 and 95% of respondents (n=116) think there is a (small or major) need for improvement for all the capacity building gaps/needs listed in the survey (Figure 4).

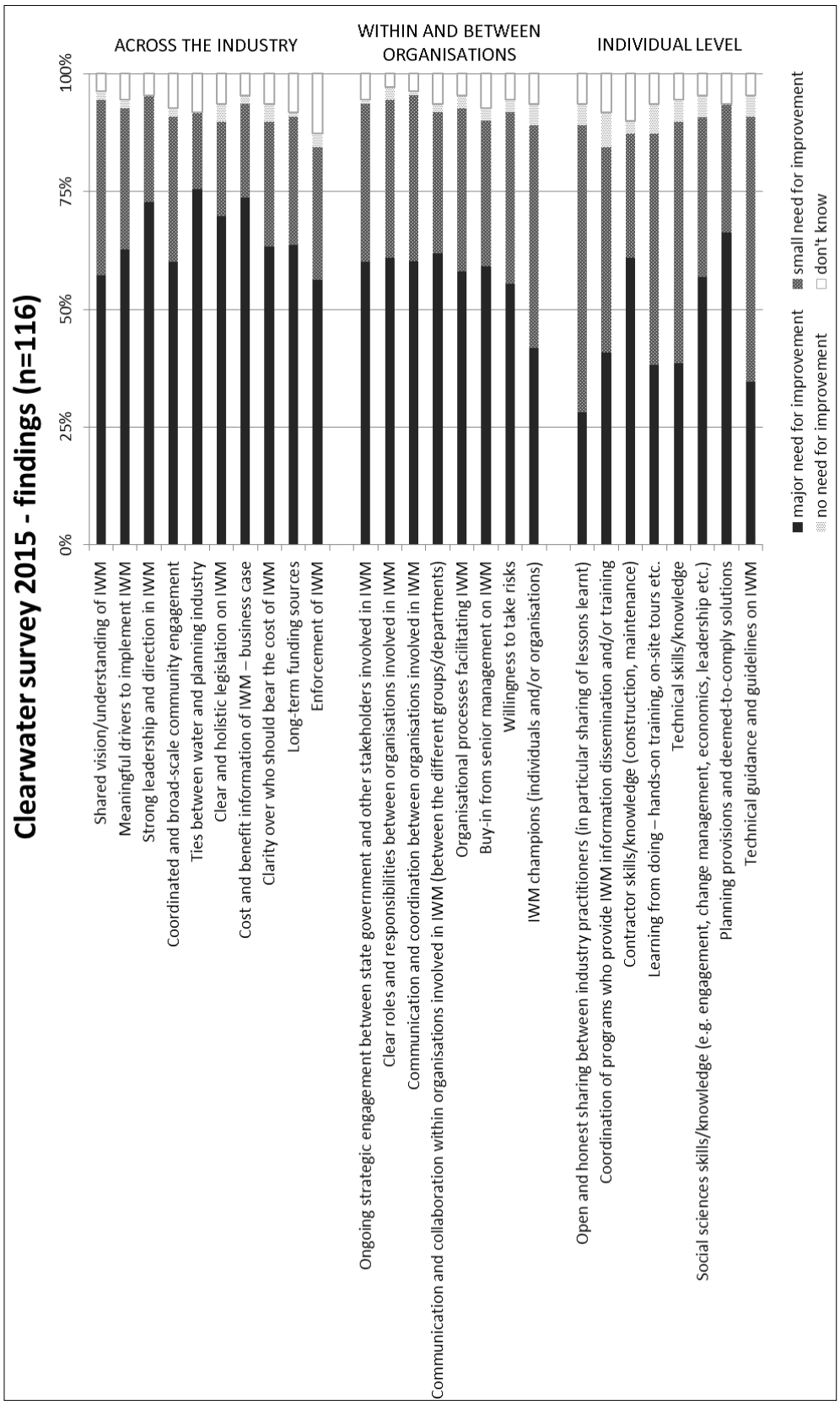

Figure 3 Barriers and challenges to IWM implementation – prioritisation of needs (Clearwater survey 2015)

Figure 4 shows that, in general, survey respondents agreed that items listed in the 'higher' spheres were rather in *major* need of improvement, as opposed to items listed in the 'individual capacity' sphere for example, which are mainly in *small or no* need of improvement.

The needs assessment also uncovered a number of differences in capacity between metropolitan Melbourne and the regions. In general, the capacity in regional areas was lower, however a number of stakeholders commented that regional areas have **much greater opportunities** for IWM due to lower population density and reduced development.

4. DISCUSSION

4.1. IWM vision

The need for a shared vision and understanding of IWM was a recurrent theme throughout the stakeholder feedback. This theme was therefore presented outside of the framework of the four capacity building spheres as a stand-alone entity.

The need for a clear and simple definition of IWM was mentioned by several stakeholders during interviews and focus groups, who also articulated the necessity for the IWM message to be tailored to different stakeholder groups, so it becomes meaningful to them. This was strongly supported by 57% of the survey respondents (Figure 4, *major* need for improvement).

In addition, participants talked about the need to clear up terminology issues. Indeed, Victorian participants reported a confusion and frustration due to the shifting use of terms such as whole-of-water cycle management (coined by the previous government), integrated water (cycle) management, water sensitive urban design (WSUD), water sensitive cities and liveability. Most participants used the terms IWM or WSUD.

There was also a lot of discussion around the need for a 'new' driver, given drought is not as strong a driver as in previous years. Participants expressed a need to (re-) focus both industry and the community's attention on the outcomes that IWM is trying to achieve and to translate these outcomes into a clear driver (63% of survey respondents rated this as a *major* need).

4.2. Sphere 1 – 'Institutional rules and incentives'

The institutional rules and incentives sphere relates to the governance of IWM, to setting external rules, and providing a clear interpretation of strategy to on-ground outcomes. As highlighted above, the majority of survey respondents considered items listed in this sphere as being *major* needs rather than *small*.

Leadership

One of the most prominent capacity building needs, at the institutional rules and incentives level, is the requirement for stronger and clearer leadership in IWM. Almost 75% strongly agreed, classifying strong leadership and direction in IWM as a *major* need (Figure 4). Some participants questioned whether the structure of the water industry is appropriate to implement IWM. Needs such as *"coordination and leadership in key issues"* as well as *"having a single authority with jurisdiction over all water issues"* were seen as *"crucial"*.

Stakeholders identified that in the past, advice from state government departments has been inconsistent and that a clearer understanding of agencies' long-term strategies is needed.

Community engagement

The online survey showed that, out of 116 respondents, 60% considered that there is a *major* need for coordinated and broad-scale community engagement (Figure 4).

Most participants are of the opinion that, at present, the community are typically poorly engaged in IWM. One of the issues raised by local government officers in particular is that they do not have the

requisite experience, advice or guidelines on how to engage the community. In addition to this, there are issues with finding a driver that is meaningful to the community. With the recent rain (as compared to drought), it was seen that "*people's attention has moved on.*"

Policy and legislation

Many stakeholders raised the issue of a lack of clear and consistent legislation and regulation for IWM. This was supported by survey respondents, with 70% classifying policy and legislation as a *major* need (Figure 4). There is a desire for IWM to be legislated in a holistic manner, and the main example of a key piece of legislation which needs to change are the Victorian Planning Provisions - Clause 56.

It was suggested that, to enable these changes and further IWM, there was a need for stronger engagement with the planning profession and a requirement for ongoing commitment from state planning authorities. This was strongly backed by survey respondents, with over 75% considering this a *major* need (Figure 4).

Costs / funding

Some participants stated that, recently, governments have been sending messages about cost reduction and water pricing which are often at odds, or perceived to be at odds, with a transition towards IWM. It was recognised that, when using traditional costing frameworks, IWM will appear more expensive, and a common theme was therefore the confusion of how IWM could be achieved whilst increasing affordability. Several participants believed that IWM projects were only viable using grant funding – a solution they however deemed unsustainable in the long run, due to the short-term nature of these incentives. Most participants therefore expressed a strong need for a longer term strategy to address funding issues. This was strongly supported by survey respondents, with 64% rating 'long time funding sources' a *major* need for improvement (Figure 4).

Participants also voiced their concern over who should bear the significant cost impositions and said that, without a clear direction, it would be very difficult to institutionalise IWM. 63% of survey respondents agreed that there is a *major* need to improve the clarity over who should bear the cost of IWM (Figure 4). Local government in particular are quite reluctant when they see that implementation of IWM could have quite significant cost impositions on them: "*Why should we be responsible for IWM? That's a problem because IWM will really rely on local government supporting the initiative."*

As a result, the above issues prompted strong arguments for the need for reliable cost-benefit data to inform costing models. This was considered a *major* need by 74% of survey respondents (Figure 4).

4.3. Sphere 2 – 'Inter-organisational capacity'

Inter-organisational capacity mainly relates to the relationships between organisations. Whilst the ratio was not quite as important as for the 'institutional rules and incentives' sphere, once again, most survey respondents generally considered items listed in this sphere as being *major* needs rather than *small* ones.

State government communication

There was general agreement amongst the respondents that policy initiatives can be hampered by lack of communication, untimely communication or communication not targeted to the audience. They recognised the need for timely and strategic communication especially between state government and other stakeholder groups (60% of survey respondents strongly agreed, Figure 4). Local government respondents also highlighted their desire for ongoing engagement rather than a more top-down, as-needs approach.

The general need for improved communication from state government ties in closely with the strong need for leadership (Section 3.2).

Coordination

A number of comments from the interview and focus group participants showed that there was a perceived lack of coordination on IWM between organisations – this was corroborated by survey respondents (Figure 4; 61% considered it a *major* need for improvement).

This lack of coordination goes from strategic and state wide issues through to individual projects. Interestingly, the lack of coordination isn't restricted to organisations of different stakeholder groups, but is also present between organisations within the same stakeholder group (e.g. within State and Local government).

Roles and responsibilities

As a result of the shift from more traditional water management to IWM, there is now a wide range of organisations involved in the implementation of IWM. Whilst not every organisation is responsible for all elements of the urban water cycle, this intersecting and overlapping mesh of organisations within the IWM industry has led to confusion over who is responsible for what. The lack of clarity around roles and responsibilities of referral and lead agencies in the water sector was a common theme when stakeholders discussed the issues or barriers in delivering IWM; this was confirmed by survey respondents, with 60% rating it a *major* need for improvement (Figure 4).

4.4. Sphere 3 – 'Intra-organisational capacity'

Intra-organisational capacity is the area / sphere which encompasses the widest array of themes, ranging from policy frameworks, funding and implementation processes, general staff buy-in, all the way to good communication between departments with clearly defined roles and responsibilities. Similarly to the 'inter-organisational' sphere, most survey respondents generally considered items listed in this sphere as being *major* needs rather than *small* ones.

Issues within this section were raised predominantly from participants that work in local government, with some comments from other stakeholder groups. Since local government still focuses mainly on stormwater, most of the data presented in this section is in the context of stormwater, drainage and WSUD projects rather than other parts of the urban water cycle.

Internal communication and collaboration

Communication issues were raised about local government, water authorities and state government agencies in particular. Participants complained about the fact that they often get different answers from different contacts within the same organisation. This issue relates back to the need to define clear roles and responsibilities for organisations (as mentioned in 3.3), and the subsequent intra-organisational capacity need to ensure that this information gets filtered through to every level and department within the organisation.

Beyond the issue of communication, another clear message was that most local councils were encountering issues with establishing the right level of internal collaboration. This was supported by survey respondents, with 62% agreeing that there is a *major* need to improve both communication and collaboration within organisations (Figure 4). This collaboration is very important to achieve delivery of WSUD and IWM projects, as they always involve more than one department. This goes hand in hand with efficient organisational processes, which 58% of survey respondent considered a *major* need for improvement (Figure 4). There were some exceptions visible in the data, which were represented by most inner city councils and councils with strong leaders or champions.

Commitment / Buy-in (Local government)

It was found that councils often have a low level of organisational commitment to IWM, which might be related to low levels of IWM knowledge at an organisational level. In addition, most councils reported a lack of buy-in by executive management and / or councillors to IWM. This was confirmed by survey results, with 59% of respondents classifying this as a *major* need for improvement (Figure 4).

A common explanation was that senior staff are mainly concerned about maintenance and upfront capital costs and have a strong fear of failure in most councils. This also demonstrates that senior management are concerned that by investing in IWM projects they are making a risky decision, as the risk are not clearly defined. Indeed, 55% of survey respondents confirmed that there is a *major* need to improve the willingness to take risks (Figure 4).

Funding and resources

In addition to the issues mentioned at the institutional rules and incentives level (Section 3.2), participants raised 'funding and resources' as a significant concern at an organisational level, in particular for local government and developers.

Several local government stakeholders (particularly in growth or regional areas) indicated that, compared to other infrastructure and community projects, WSUD / IWM is not a key priority for councils, in particular given the decline of water conservation as a driver. Councils therefore often allocate insufficient funds to maintain assets properly. From the developer perspective, the data showed that the implementation of IWM in development projects is governed by most economically efficient outcomes as developers seek to keep cost down.

The need for the economic case for IWM was therefore also raised as an issue at the intra-organisational level.

Beyond the capital cost of implementation, it was recognised that the long-term operation and maintenance costs are a critical barrier to IWM implementation. IWM projects that local council are now considering or taking ownership of are adding to existing tensions between local government departments in the allocation of funds between capital and maintenance. This issue is especially concerning for fringe councils, who have limited budgets to undertake IWM, but are becoming burdened by a range of assets being handed over from developers.

Implementation of policy and guidelines

Several interview and focus group participants mentioned the lack of enforcement as another barrier to IWM implementation, and survey respondents confirmed this, with 56% rating 'IWM enforcement' as a *major* need for improvement (Figure 4). One example was the lack of council enforcement relating to Clause 56 of the Victorian Planning Provisions, which often results in low levels of implementation. Indeed, the data showed that whilst developers are sometimes willing to invest above average to incorporate sustainable elements, hoping for a return on investment, this option stays accessible only to the very big companies. Smaller sized developers are much more constrained by costs alone.

Champions

The ability of champions to enable the implementation of IWM is acknowledged within the industry as a key success factor. The term champion was mostly a reference to organisations, which links this section back to the theme of leadership (Section 3.1.2). In addition however, the data revealed the value and the crucial need to foster and / or maintain individual champions within an organisation. While most councils were in need of local champions, the data shows that some (mostly inner city, but also some regional) councils have had a champion for some time already. This was also shown by the fact that, out of the 89% survey respondents who recognised champions as a need, over half of those characterised it as a *small* need, rather than a *major* need.

4.5. Sphere 4 – 'Individual capacity'

Individual capacity refers to individuals' skills, knowledge and ability to understand policy and strategies and deliver projects that will see on-ground implementation of IWM. Overall, survey participants classified most items within the 'individual capacity' sphere as *small* rather than *major*, which points towards the fact that so far, most capacity building efforts have focussed on this area.

Knowledge and skills

Compared to some of the previously mentioned issues, there was a general consensus that individual skills and knowledge are not a major barrier to the successful implementation of IWM, mainly as a result of ongoing capacity building initiatives undertaken by organisations such as Clearwater. However, skills and knowledge were still raised in various forums and interviews and it was stressed that the level of training and skill development should, at the very least, continue as it has been for the past five or more years.

One issue that was raised by the participants dealt with the extensive range of available training exercises and courses. Ideally, there would be a central point which would coordinate all the

information about training providers and courses to make it more accessible for industry. This was also supported by the survey results (Figure 4).

Some of the gaps mentioned by participants included the lack of training for contractors in particular (with 60% of survey respondents identifying this as a *major* need, Figure 4), and the scarcity of training available to the regions. In addition, there were suggestions to include more hands-on modules with real examples (including demonstration projects), and to consider bringing in more in-depth training sessions such as 'masterclasses'. Moreover and in order to increase the learning potential, it was suggested that there was a need to encourage the sharing of failures as well as successes (Figure 4).

Finally, there was a big emphasis on the fact that the areas for knowledge and skills improvement needed to extend beyond the technical engineering and design skills, to include 'soft skills' such as stakeholder engagement, economics, systems marketing etc. This shows clearly in the survey results, with social sciences skills considered more a *major* need as compared to technical skills (Figure 4).

Technical guidance

A key issue mentioned by participants is the available technical guidance and support to facilitate the implementation of IWM (Figure 4). This includes the need for appropriate and up-to-date tools.

While specific technical skills were not raised as a key capacity issue (rather as a *small* need for improvement, Figure 4), the need for technical guidance and guidelines was a recurring item. This need is of course closely linked to the development of new policies / planning tools mentioned in Section 3.2. Translating a strategy and the big picture into projects that can be scoped, designed and built is important for practitioners. With more projects and on-ground examples for the industry to learn from, the need for guidelines may become a lower order priority.

It was found that the guidelines should cover the whole-of-life of a project (including design, construction, establishment and maintenance). In addition, stakeholders identified the need for deemed-to-comply solutions to assist with the implementation (and enforcement) of projects (66% of survey respondents considered this as a *major* need for improvement, Figure 4). Some stakeholders however were nervous about how prescriptive guidelines can be and would advocate retaining a certain flexibility, such as the existence of alternative approaches to deemed-to-comply solutions. In the context of transitioning from detailed design to construction works, participants also advocated the need for standard technical drawings.

5. CONCLUSION

This project identified a wide range of capacity building needs in the area of IWM. The survey in particular shed light on the fact that items listed in the 'higher' spheres were rather in *major* need of improvement, as opposed to items listed in the 'individual capacity' sphere for example, which are mainly in *small* need of improvement. Indeed, most capacity building programs have traditionally focussed on addressing individual capacity, therefore a greater focus on organisational strengthening activities (targeting intra- and inter-organisational capacity) is needed, along with directive and facilitative reforms to the operating environment of the urban water sector (Brown et al. 2008; Rijke et al. 2012).

The data collected will be used by Clearwater to develop new and align existing capacity building models to best cater to the evolving needs of the water industry and ensure they provide a relevant service.

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