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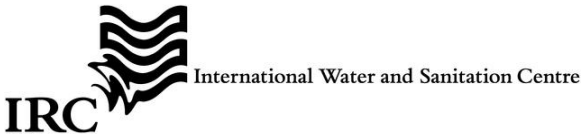
Strengthening Capacities for Planning of Sanitation and Wastewater Use

Experiences from two cities in Bangladesh and Sri Lanka

Occasional Paper Series 44

Stef Smits, Carmen Da Silva Wells and Alexandra Evans

Occasional Paper Series



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Disclaimer

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Strengthening Capacities for Planning of Sanitation and Wastewater Use

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Acronyms and Abbreviations

AI	Agriculture Instructor
BELA	Bangladesh Environmental Lawyers Association
BSCIC	Bangladesh Small and Cottage Industry Association
BUET	Bangladesh University of Engineering and Technology
COSI	COSI Foundation for Technical Cooperation
DAE	Department of Agriculture Extension
DPHE	Department for Public Health Engineering
FO	Farmers' Organization
GIS	Geographic Information Systems
GND	Grama Niladhari Division
IRC	IRC International Water and Sanitation Center
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
LA	Learning Alliance
LGED	Local Government Engineering Department
MC	Municipal Council
NASCIB	National Association of Small and Cottage Industry in Bangladesh
NGO Forum	NGO Forum for Drinking Water Supply and Sanitation
NWSDB	National Water Supply and Drainage Board (Sri Lanka)
PAP	Participatory Action Plan
RCC	Rajshahi City Corporation
RDA	Rajshahi Development Authority
RUET	Rajshahi University of Engineering and Technology
SEI	Stockholm Environment Institute
WASPA	Wastewater Agriculture and Sanitation for Poverty Alleviation

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Executive summary

It is well-known that many peri-urban communities use wastewater (often untreated) in agriculture. Although wastewater-dependant agriculture provides livelihoods to farmers, there are associated health and environmental risks. The roots of this situation lie in the poor sanitation in cities where part of the population doesn't have access to basic sanitation services at all, where domestic wastewater is not properly collected or is discharged into open water bodies without any treatment, and where industrial discharges and dumping of solid waste often add to the pollution problem.

The basic premise of the Wastewater Agriculture and Sanitation for Poverty Alleviation (WASPA) in Asia project is that by integrated planning both the lack of sanitation services and the health and environmental risks associated with wastewater use in agriculture can be addressed simultaneously. The idea is to improve conditions along the entire sanitation chain (from household latrines to collection, treatment and reuse of wastewater), while maintaining the characteristics of wastewater valued by farmers, such as nutrient content.

This concept was tested in two towns: Rajshahi in Bangladesh and Kurunegala in Sri Lanka. The project worked through Learning Alliances, composed of local stakeholders, including farmers, residents, small industries and local authorities. With these Learning Alliances, the current situation was analysed, and integrated plans for improvement were formulated and executed in a collaborative manner with a range of stakeholders. This document provides an overview of the experiences of the project and provides a critical reflection on the WASPA concept and its applicability.

The project found that the sanitation situation in both cities was less severe than originally hypothesised. Lack of access to basic sanitation only contributed in a minor way to wastewater flows. Instead, other sources of pollution were identified, such as discharges from small industries and leakage from poorly maintained or inadequate septic tanks. At the same time, the impacts of wastewater agriculture on crop yields and health risks were less than expected.

The situation also proved to be more complex than originally thought, necessitating that a broader range of stakeholders be involved in the identification and implementation of solutions. The multi-stakeholder approach of Learning Alliances and participatory planning cycle provided a useful framework for addressing this complex problem. It allowed examination of the entire sanitation chain and identification of potential strategies for improvements along the entire chain. In addition, it provided a way of gradually building up relations between stakeholders in a context characterised by institutional fragmentation,

conflict and poor accountability. Over time, relations improved and more integrated planning emerged.

A potential drawback to the approach is that stakeholders tend to identify isolated and conventional actions to address the situation, and thus need strong faciliation and increased knowledge to arrive at appropriate solutions. Also, transaction costs of the approach are high, in terms of getting the teams in place, starting up the multi-stakeholder process, and getting stakeholders to carry out a joint planning exercise and subsequently implement their plans. However, the project demonstrated that integrated, joint planning is important for addressing complex problems that span sectoral, administrative and social divides and that, ultimately, the high transaction costs are justified.

1. Introduction and objectives of the paper

Wastewater and sanitation management challenges in South Asia

Many cities and towns in South Asia are struggling to provide sanitation services. Sanitation services include not only access to basic sanitation facilities such as latrines but also the management and treatment of wastewater generated. Inadequate wastewater service provision results in discharge of untreated wastewater into storm water drains and open water bodies; leakage of wastewater from poorly constructed or full septic tanks; and open defecation along water courses. These practices pose a significant risk to the health of people living around these water bodies, who become exposed to pathogens. In addition, poor sanitation contributes to degradation of the urban environment, causes bad smells, and reduces the value of nearby land. In addition, polluted watercourses often become de facto dumping-sites for garbage.

At the same time, these polluted watercourses often serve as sources of valuable irrigation water for farmers in the peri-urban fringe. In various cities in Asia wastewater agriculture contributes to around 50% of urban vegetable production (IWMI 2003). A recent study by the International Water Management Institute (IWMI) across Asia, Africa, Latin America and the Middle East found that in 80% of the 53 cities studied wastewater is being used in urban agriculture (Raschid-Sally and Jayakody 2008). In some cases, farmers directly use wastewater – seeing it as a reliable source of irrigation water. In others, they use formerly clean irrigation sources that have been contaminated by urban wastewater.

Wastewater can act as fertilizer because of its high phosphorus, nitrogen and organic matter content, but it may also contain elements that are harmful to plant or human health. Wastewater irrigation therefore poses potential health risks to farmers and consumers of their produce, especially from pathogens (WHO 2006). Hazardous substances, such as chemicals and heavy metals pose health risks as well as risks to the environment and crop productivity (Pescod 1992).

Wastewater management requires that the potential benefits of wastewater use in agriculture (e.g., food production and improved livelihoods) be balanced with potential environmental health risks. To achieve this balance, different types of interventions and regulations can be considered along the entire chain: from the place where wastewater originates in households and commercial units and industries, to its collection and transport, to its potential treatment, and its use in agriculture. Some of the interventions, particularly centralised wastewater treatment, are very expensive, while others are relatively low-cost measures, such as the promotion of specific hygiene measures among

wastewater farmers. Often, a combination of measures will be needed within a plan that covers the short-, medium- and long-term (WHO 2006; Martijn and Redwood, 2005).

Different stakeholders have diverging interests in improving sanitation: households in town want safe sanitation facilities at their homestead, and may not be too worried what will happen to wastewater downstream; farmers' want an affordable and reliable source of nutrient-rich water; and authorities are usually concerned with enforcing compliance with national water quality and pollution parameters, and reducing public health risks. Finding solutions that minimise health risks while maximising benefits from nutrients in wastewater requires making trade-offs and depends to a large extent on the capacities to plan for reuse and to manage wastewater.

Because the sanitation and wastewater situation is complex and affects a broad range of stakeholders, an integrated approach is needed – one that takes into account the range of potential measures and interventions along the wastewater chain and the interests of the stakeholders in these interventions. Currently, planning for sanitation and wastewater in many rapidly growing cities is at best haphazard; new neighbourhoods often develop 'spontaneously' without planning for services provision by authorities; environmental regulations are often poorly enforced; there is little knowledge about farming practices and stakeholder interests' in wastewater management; and local authorities and other stakeholders may have little capacity to carry out integrated planning. Any efforts to develop an integrated planning approach need to start from the current reality of urban development and planning, and strengthen capacity while taking a stepwise approach to technical solutions.

The WASPA Asia project

It is against this background that the Wastewater Agriculture and Sanitation for Poverty Alleviation in Asia (WASPA Asia) project was undertaken. This three-year project (2005-2008), funded by the European Union under its Asia Pro-Eco-II programme, aimed to strengthen approaches for integrated planning of sanitation and wastewater, thereby improving the livelihoods of wastewater farmers and minimizing health and environmental risks. WASPA Asia's main objective is: "*to contribute to the improvement of livelihoods of urban communities in Bangladesh and Sri Lanka, through integrated sanitation, wastewater management and agricultural use, for improved agricultural output, reduced environmental pollution and lessened food chain contamination".*
WASPA Asia was carried out by a consortium[1] of five partners with different areas of expertise related to sanitation, wastewater, agriculture and institutional change, as well as

[1] The consortium consists of the International Water Management Institute (IWMI), Sri Lanka; the IRC International Water and Sanitation Centre, the Netherlands; COSI Foundation for Technical Cooperation

skills in research, documentation and facilitation of learning processes. Geographically, the work was focused on the towns of Kurunegala in Sri Lanka and Rajshahi in Bangladesh. Both face sanitation and wastewater management challenges similar to those of many other urban centres in South Asia. In both, many of the poorest members of the population do not have access to adequate sanitation, and where they do, collection and disposal of waste is insufficient. As a result, there are significant wastewater flows out of the towns, which are used by farmers for crop production. Such irrigated agriculture is central to farmers' livelihoods, but the use of wastewater brings health and environmental risks. Efforts to improve sanitation have been ad hoc and isolated at best, and the implications for wastewater management have received little attention.

In response to this situation, the central focus of WASPA Asia has been on strengthening the capacity of local stakeholders, including community members, local authorities, farmer groups, NGOs and researchers to participate in integrated planning of sanitation and wastewater management interventions. Learning Alliances were established in each city to act as platforms where these stakeholders could come together for joint learning and discussion of wastewater-related issues. The project followed a process of participatory action planning with these Alliances to identify and analyse the current situation and develop a vision and strategy for addressing wastewater-related issues.

The objective of this paper is to provide a critical reflection, based on the project's findings in the two towns, on how the problems of inadequate sanitation services and health risks associated with wastewater use in agriculture could be addressed simultaneously through integrated planning of sanitation services delivery and wastewater management. Although ultimately this approach will affect people's health and livelihoods, these impacts are not explicitly evaluated in this document. Rather, the focus is on analysis of the approach in terms of impact on stakeholder capacity for such integrated planning.

Methodology

The following methodology was utilized for the review:

- Review of relevant project documents: assessment reports, process documentation and change stories, Learning Alliance meeting minutes, and other relevant literature.
- Reflection workshops in both of the countries, including joint interrogation of the assumptions behind WASPA. The workshops were also used to formulate lessons learnt and conclusions. The analysis was structured along the main components of the WASPA project.

(COSI), Sri Lanka; NGO Forum for Drinking Water Supply and Sanitation (NGO Forum), Bangladesh; and the Stockholm Environment Institute (SEI), Sweden.

- Interviews with key stakeholders from the Learning Alliances and reflection with Alliance members. After the interviews had been processed and the reflection with the project team had taken place, a reflection with the full Learning Alliance was carried out in which the strengths and weaknesses of the project approach were discussed. In addition, the issues of sustainability of the Learning Alliance and Participatory Action Plans after the project end-date and ways to institutionalize both were considered.

Some of the authors' roles as facilitators and researchers within the project make impartiality difficult; however, following the best practice principles of process documentation (Schouten et al. 2007) the authors have sought to be self-critical and reflective. In addition, the lead authors of this paper were less involved in the action-research itself and have therefore been able to facilitate the analysis with greater critical distance.

As a result of the role of the authors as facilitators and researchers, some interviewees and participants in the Learning Alliance meetings may not have been fully open in their critiques. By triangulating information with earlier interviews and observations from the field team, and reviewing project documents, the authors have tried to obtain the most realistic analysis of the change process so far.

Structure of the report

The report starts with a description of the methodology followed in the WASPA Asia Project, including the overall project approach and some key concepts applied. It then describes the context of the two study areas, including an overview of the physical situation related to sanitation and wastewater management, as well as of the key institutions. The results section lays out the project findings in the form of a reflection on the key hypotheses and premises of the conceptual framework. The paper ends with conclusions and recommendations relating to the WASPA project premises and methodology.

2. Project approach

This chapter begins with an overview of the overall project approach. After that, each of the elements in this approach is discussed in more detail. The chapter ends with a detailed overview of the financial and human resources involved in the project.

Overall project approach

The WASPA project can best be described as an action-research project, in which the consortium tried to introduce, change and strengthen approaches for integrated planning for sanitation and wastewater, so as to contribute on a more structural level to an improved sanitary situation and to human health and livelihoods more generally. The consortium also documented and analysed lessons learnt on the project approach and methodologies so that these can serve other towns facing similar situations.

Central to WASPA are the linkages between sanitation, wastewater and its use, as can be seen in the project approach, summarised in Figure 1. It is these linkages that the project aimed to improve. These are addressed within a process of participatory action planning: the linkages are assessed; a vision for the future is defined; and strategies and plans are developed and implemented to achieve the vision. This process is supported by the Learning Alliance process of stakeholder involvement, which is structured around the planning cycle. A fourth cycle around this, is the documentation of the process. Activities related to the facilitation and management of the processes are not shown in the diagram.

Linkages between sanitation, wastewater and wastewater use

Urban water situations can be highly complex; understanding the physical complexities and linkages is crucial in order to identify where the major areas of pollution and risks are. A first step was thus to characterise this network of physical complexities and identify linkages in the two towns studied. This involved, among other tasks:

- Mapping water courses using GIS and physical observations;
- Pollution mapping to identify the points where effluent flows into the water courses, and characterising semi-quantitatively the pollutants involved; and
- Periodically measuring water quality along the canal.

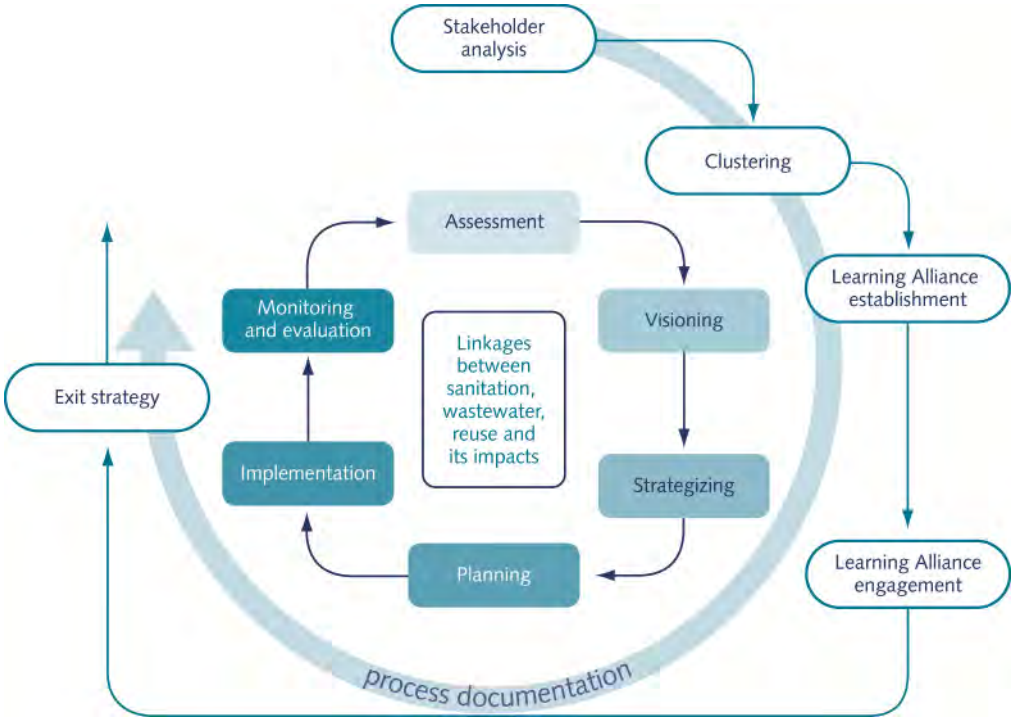

Figure 1: Relation between the main project elements.

There are both potential positive and negative impacts and risks for different stakeholders living alongside and using these watercourses – impacts and risks that they may not necessarily perceive. For example, initially, there was little knowledge about the sources, flows and risks of wastewater. Focus group discussions and meetings with farmers revealed that they were not aware of possible health risks associated with handling wastewater. Discussions with officials and polluters revealed they were not fully aware that wastewater was being used for farming.

A number of the potential impacts of poor sanitation and wastewater exposure and use were assessed, using the following methods:

- Mapping of the communities along watercourses enabled the team to identify which communities would be most exposed to risks related to wastewater.
- A sanitation and hygiene assessment reviewed access to and use of sanitation facilities and hygiene practices in those communities identified in the mapping exercise. It focused on communities identified as risk-prone and included low-income communities and farming communities. This assessment provided an insight into communities' real exposure to wastewater and risks related to lack of sanitation and poor hygiene practices. It also provided an idea of the perceptions of the stakeholders on the linkages between wastewater, sanitation, hygiene and health.

- Assessing impacts of wastewater use on agricultural production, including crop growth, yield, certain soil characteristics, and nutrient requirements and current use through surveys, observation and soil and crop sample testing.

These findings were summarised and analysed in a series of project reports, which were reviewed with relevant stakeholders. They are available on the project website. The findings provided a baseline against which to monitor the impact of the project and also served as starting point for the development of Participatory Action Plans (PAPs).

Participatory action planning

Addressing complex issues such as those around sanitation and wastewater requires a structured approach to problem analysis, identification of possible strategies to address the problems, implementation of some of these strategies and monitoring impacts. The project drew on the approach of consensus building through participatory action planning, which proceeds through situation analysis, stakeholder analysis, participatory planning, clustering stakeholders, consensus building, review and dissemination (Barr 2001; Bunting, 2005). The participatory planning cycle was a central element in the project strategy. WASPA Asia followed a six step planning cycle, as outlined in Figure 2, drawing on a range of other experiences in using and applying these kinds of planning approaches for addressing water resources management problems (EC 1998; Moriarty et al. 2005, 2007). In WASPA, the cycle that was adapted and elaborated to deal with integrated planning for sanitation and wastewater use in urban environments is presented in Figure 2. The participatory planning cycle helps to focus stakeholder dialogues and participatory decision-making and ensures that decisions are based on shared and evidence-based analysis of problems (see also Moriarty et al 2007 for further description of participatory action planning).

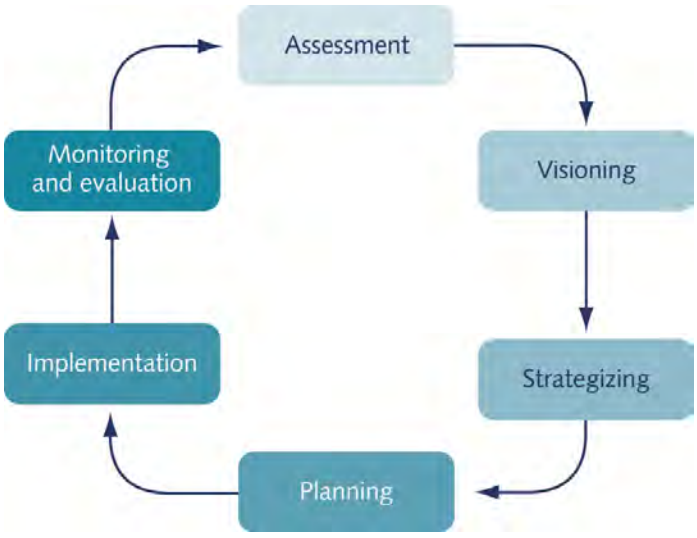

Figure 2: The planning cycle as followed in WASPA Asia.

Each of the steps has specific objectives and methods:

- **Assessment phase -** *to come to a shared understanding among the stakeholders of the current situation in terms of sanitation, wastewater management and use of wastewater in agriculture, and the linkages between them.*
  Key informant interviews, focus group discussions, secondary data collection, participatory transect walks and sampling and analysis of water and soil provided the data for the various assessments. The assessments were presented and discussed in the first Learning Alliance meetings. Analysis of linkages and causal relations was completed in a participatory way using a problem tree approach[2], so as to help visualise problems and discuss possible solutions, roles and responsibilities. The assessment phase took a year to complete.

- **Visioning phase –** *to promote stakeholder dialogue and formulate a jointly agreed, achievable future (vision) for which stakeholders can plan.*
  Based on the assessments, the key issues related to sanitation, wastewater management and use were prioritised, differentiating between issues that could be solved relatively easily by one or two stakeholders, and more complex issues that would require a longer planning horizon and involvement of a larger number of stakeholders. Stakeholders discussed visions of their ideal future and identified possible activities to achieve those visions. While the visions could go beyond the scope and funding of the project, the project could only support a limited number of activities, so the overall vision for the desired future state was checked in terms of its feasibility.

- **Strategizing phase -** *to jointly develop strategies that would be needed to reach the vision.*
  Long- and short-term strategies were developed, and an analysis was made of the coherence of the entire set of strategies.

- **Planning phase –** *to turn the strategies into detailed plans, indicating methods to be used, costs, responsibilities, schedule of activities and agreed targets*.
  For each planned activity, a core group of relevant stakeholders worked together to guide the implementation and monitoring of the plans. For example in Kurunegala, one plan related specifically to reducing oil and grease from service stations and hotels. Stakeholders agreed it was not always necessary to meet with the full Learning

[2] A problem tree is a visual problem analysis tool that can be used to specify and investigate the causes and effects of a problem in a structured way, to highlight relationships between them and to promote stakeholder dialogue. See Toolkits for development: http://www.toolkitsportdevelopment.org or WASPA Guidance Note 3 (Smits and Verhagen 2007) for a detailed description of the method.

Alliance; instead meetings were held with the service stations, Municipal Council (MC) and National Water Supply and Drainage Board (NWSDB) and progress was reported to the full Learning Alliance.

- **Implementation phase -** *to implement the plans according to the specifications provided in the plan*.

- **Monitoring and evaluation phase –** *to assess how the implementation of plans progresses and define necessary adjustments to achieve the expected result*
  The project teams, together with stakeholders (in project meetings and workshops), monitored progress in stakeholder involvement and joint formulation and implementation of plans. The project teams evaluated implementation through several workshops, supplemented by interviews and process documentation, to see whether the plans helped to reach the defined objectives.

In reality, at various points in the cycle, the project had to deviate from the originally identified cycle, steps, methods and tools, and iterations took place between steps. These deviations are discussed in the results section.

Learning Alliances

The main approach to stakeholder involvement chosen in the project was that of Learning Alliances. These can be defined as a series of interconnected multi-stakeholder platforms at different institutional levels (for example national, district and community), aimed at strengthening the process of identification, development and scaling up of innovations (Smits et al., 2007). The premise behind the Learning Alliance concept is that addressing complex problems requires a multi-stakeholder approach to come to shared solutions. Through linked platforms at different levels within society, these solutions are not only applied locally, but also help to develop capacity for participatory and integrated problem solving elsewhere. In the WASPA Asia project, only platforms at local level were established. Originally, the idea was to establish platforms with relevant stakeholders at national level as well. However, due to resource constraints, this has not materialised. Instead, more ad hoc interactions with national stakeholders were sought to share lessons from the WASPA project at national level.

The Learning Alliance approach in WASPA sought to:

- Establish a common understanding on the sanitation and wastewater situation;
- Foster dialogue between local government, NGOs and community representatives, and farmers, and empower particularly the latter two;
- Facilitate integrated planning;
- Find innovative local solutions through joint learning;
- Provide a way to channel knowledge and research into action;
- Ensure buy-in from all stakeholders for sustainability of the proposed solutions and activities;
- Scale up solutions to other locations by building ownership among some of the Learning Alliance members to take the approach forward.

The Learning Alliance process can broadly be divided into a number of steps:

- **Stakeholder analysis** - to identify those with a stake in sanitation and wastewater use, and their perception of the problem. A guidance note was prepared to guide this analysis (Verhagen and Smits, 2006). An institutional analysis of different responsibilities and roles in relation to sanitation, urban planning, wastewater management, agriculture and industry complemented the stakeholder analysis and problem mapping. After the stakeholders had been identified, the project teams conducted a series of meetings with those considered to be of greatest relevance to the project. The interviews were a means of generating rapport with the project team, introducing the project and its objectives, as well as initiating background data collection. The information gathered in the interviews fed into a set of studies on institutional roles and responsibilities, agriculture, wastewater production and sanitation. These studies were used to inform the project team and provide a foundation for relevant discussion with stakeholders.

- **Stakeholder Clustering** – The project initially identified “clusters” of stakeholders (for example those involved directly in production or use of wastewater or those needed for decision-making) who could be involved in some of the planning cycle activities, before moving into a formal Learning Alliance, which included a wider group of stakeholders. One-on-one interviews, focus group discussions, and field visits helped to raise awareness of the project and stakeholders’ interest in being involved in further project activities.

- **Learning Alliance establishment** - aimed to bring people from the different stakeholder groups together in a local (i.e. the town and surrounding areas) level platform, for engagement in the remainder of the planning cycle. To support the country teams in establishing the Learning Alliances, guidance notes were prepared on the key concepts of Learning Alliances and the phases in the participatory

planning process and (Smits and Verhagen 2006 and Smits and Verhagen 2007, Smits and da Silva Wells, 2006).

- **Learning Alliance continued engagement** – the project teams kept stakeholders engaged and actively involved in the project through formal and informal meetings for joint research and analysis, planning, implementation, monitoring and evaluation. Sub-groups of the full Learning Alliance were set up to carry out certain activities within the planning cycle. The visioning activities helped to further engage the stakeholders and strengthen the Learning Alliance. The activities under this step included: moderating discussions within clusters and the platform, organising and documenting meetings and other events, and ensuring coherence in the methodology followed. In addition, substantial facilitation was required to ensure that farmer representatives were heard in discussions and could participate actively.

- **Exit strategy** - from the outset it remained an open issue whether the Learning Alliance would continue after the end of the project, and if so in what form. The Alliance is not an end in itself but a mechanism for integrated participatory planning and uptake of activities and innovation. Towards the end of the project, discussions were held on the future of the Alliance, the possibilities for continued activities in integrated planning and follow-up to the plans that were developed.

- **Documentation and analysis** – this step focused on the process of establishing the Learning Alliance and engaging stakeholders, and the changes in attitudes of stakeholders and their ability to address issues relating to WASPA. The changes in ability documented helped to determine the effectiveness of WASPA in achieving its goal of strengthening stakeholder capacity.

Process monitoring and documentation

As the project aimed to achieve changes in the way in which stakeholders plan sanitation and wastewater management, it was important to capture whether and how these changes were taking place, and what hindered or enabled change. In order to achieve this, a monitoring and documentation approach was used, which is detailed by Smits and da Silva Wells (2006) and builds on work done in other projects (Schouten 2007, Schouten *et al.* 2007, Chavez-Tafur *et al. 2007*, GTZ 2006).

1. **Identification of key change processes to be monitored and indicators -** In line with WASPA's objective to strengthen the capacity of stakeholders, the key change process was identified as *the change in capacity of stakeholders to deal with WASPA-related problems in a sustainable manner*. The process monitoring focused on this change, and qualitative indicators related to knowledge, skills and attitude were formulated. However, the team struggled in using all the indicators for reporting. The

original idea to document the process against all indicators was therefore dropped, and only indicators that related to knowledge and empowerment of stakeholders were used (Table 1).

Table 1: Indicators for the change process.

Change process	Indicators
Capacity of stakeholders to deal with WASPA related issues	For 'Knowledge' • Ability of stakeholders to explain the linkages between main WASPA components (sanitation, wastewater, agriculture); • Ability of stakeholders to explain the interests and roles of themselves and of the other key stakeholders. For 'Empowerment' • Ability of stakeholders to explain their own understanding and interests around elements of WASPA to other stakeholders.

2. **Data collection** - The information needed to capture change processes is often implicit in stakeholders' actions and contributions to the process. It may be made explicit in direct answers to questions, but more often, changes in people's knowledge and empowerment only become apparent indirectly, through observations they make, questions they ask, solutions they propose, their behaviour in meetings and site visits, and actions they undertake. Process monitoring requires that these be captured in a structured way through: records of meetings and workshops, quotes, semi-structured interviews and joint site visits; informal discussions; and other interactions with stakeholders and observations (Schouten, 2007). Box 1 gives an overview of quotes from field diaries that demonstrate awareness of linkages between sanitation, wastewater and hygiene on the part of stakeholders.

Box 1: Quotes reflecting ability of Wilgoda women to explain the linkages between sanitation, wastewater and hygiene from field diaries

- They are very happy to have the toilets and water points renovated, even the women who had their own toilets because now open defecation is reduced.
- Disposing of grey water is a problem in the squatter houses as there is no drainage system.
- A plan was once developed by the women's groups with a few male members of the CBO to maintain toilets and the nearby concreted premises.
- They are aware of the benefits of being clean and hygienic. Bala, a community leader, said, "*The people are much cleaner. We have better sanitation behavior now–not everyone yet, but most people"*.
- Children have less frequent purging and stomach aches now.
- Still concerned about tenure and lack of services.

They believe that change is not easy with drunks in the area and with the male domination. "Our husbands are restricting us being too much with the CBO".

Source: WASPA Process monitoring interviews

3. **Analysis** - The team discussed progress against the indicators for the different stakeholder clusters at set times in the project and analysed factors that helped or blocked change.

4. **Documentation** - To provide insights into changes that are largely qualitative in nature, the two country teams produced illustrative "change stories" to try to trace and explore the process behind the most relevant changes in stakeholders' awareness, their behaviour and how they perform their roles. These narratives also included changes in awareness of project staff themselves, as illustrated by the change story in Box 2.

Box 2: How the delimitation of the project area changed.

When the WASPA project started in 2005, the team in Rajshahi was not familiar with the area. Together with the partner NGOs we tried to get the information relating to the flow of wastewater. Time was spent contacting and meeting different government officers until it was found that Rajshahi Development Authority (RDA) had drainage maps of the area. The RDA provided the GIS maps but they appeared to be outdated. We toured the area on motorbikes to observe how the drains flowed, and took photographs, GPS readings, and asked local people. Once the team had gathered this information and it was possible to define the pilot project area. Initially two slums and two agricultural areas were considered but after the mapping it became clear that one slum did not drain into the agricultural area and the other was demolished. As for the agricultural areas, it was found that they were connected to different drains and that it would make sense to take areas on one drain.

Source: Ara, 2008

5. **Learning** – The project produced a series of process documentation briefs to capture changes in attitudes and abilities among stakeholders and to enhance understanding of what hinders or encourages change. These briefs were discussed with the LA members, to allow them reflecting back their own capacity development.

Financial and human resources

Multi-stakeholder platforms can be considered resource-intensive since there is need for considerable human and financial resources to facilitate the process, and transaction costs can be high. Box 3 gives an idea of the effort expended on gaining commitment from stakeholders and keeping them engaged. However, to our knowledge, there are no clearly defined benchmarks for the resources required. This section describes the resources that have been invested in the process in both cities, as reference for the results that have been obtained.

Box 3: Efforts to get and keep stakeholders engaged.

In order to gain support and keep the process moving, the country teams invested a lot of time and effort in interactions with stakeholders. Besides formal Learning Alliance meetings, one-on-one meetings with stakeholders took place throughout the project and were supported by numerous telephone calls and formal and informal visits.

In Bangladesh the team estimates that they have had over 25 meetings with Rajshahi City Corporation (RCC), with the frequency of meetings increasing before a particular event such as an LA meeting or the implementation of a planned activity. They have also met with Rajshahi Development Authority (RDA) around 50 times, the Ward Commissioners (WC) 14 times and BELA 13 times. The Chief Conservancy Officer took a special interest in the WASPA project, and thus facilitated a good working relationship with the project team, supported information exchange and generally helped ease contact between the project and RCC. Apart from the government meetings, there were the Learning Alliance meetings. Members agreed to the following formal meetings schedule: core groups of mandated stakeholders meet every two weeks, the city level Learning Alliance every two months and the wider Learning Alliance (including those with an interest but not a direct stake, e.g., universities) every six months

In Kurunegala, COSI or IWMI staff paid 1-3 visits per month to various stakeholders. These continuous visits had an influence on agencies such as the Municipal Council (MC) by keeping the key messages of WASPA on their routine development agenda. Meetings were also arranged between working groups involved in implementation of specific action plans and as preparation for trainings and presentations.

The total staff budget for the entire process, over three years, was Euro 491,000 (Table 2). This included five partner organizations of which two were in constant contact with the stakeholders in the project cities. In both cities, there were one or two junior staff engaged full-time for data collection, planning, implementation and facilitation. They received regular support and guidance from senior staff, especially in facilitation of meetings and activities with senior level city officials. The facilitating team received methodological support and guidance from the international project partners, who developed a series of guidance notes and other materials, both on the research activities as well as on the Learning Alliance facilitation, documentation and planning activities.

It was not possible to derive an accurate division of budget spending between types of activities, such as research, training and facilitation, since a record was not kept throughout the project. In addition, some of the activities are so intertwined that it is difficult to differentiate. Partners estimated that they spent the following percentages of their budget on facilitating the Learning Alliance processes and developing the PAPs: partner 1, 30% of their budget, partner 2, 60%, partner 3, 60%, partner 4, 90% and partner 5, 0%. According to the estimates, these components make up an estimated 50-60% of the total project expenditure. Since no benchmark data exist, it is not possible to see how this compares to similar projects and whether this can be deemed cost effective. The process monitoring and analysis that follows goes some way towards this.

Table 2: Staff Time Expenditure and Activities.

Partner	Cost (Euro)	Activities
Partner 1	258,134	Overall project management, guidance, research, inputs into developing and implementing the action plans, monitoring, reporting, dissemination
Partner 2	157,707	Data collection, reporting, Learning Alliance development, action plan development and implementation, process monitoring
Partner 3	154,854	Data collection, reporting, Learning Alliance development, action plan development and implementation, process monitoring
Partner 4	69,420	Guidance on Learning Alliances, participatory action planning and process monitoring
Partner 5	14,632	Training workshops
Total	471,744	

3. Context: An introduction to the two towns

This section describes the context: the location and setting of the two towns; the situation related to sanitation, wastewater and its use in agriculture; and the institutional context, as encountered at the start at the project.

Kurunegala

Kurunegala city is the capital of the North Western Province of Sri Lanka and of Kurunegala District. It is comprises 12 local government divisions (*Grama Niladhari Divisions,* GNDs) but also has a Municipal Council. The population of the city was some 28,000 people at the last census (DCS, 2001). Another 4 GNDs, with a total population of 4,700, are relevant to this project, as these are the areas where wastewater farming takes place, outside the area of jurisdiction of the Municipal Council (Nishshanka et al., 2006). Two specific locations were selected for the project: Wilgoda, a low-income community living alongside the canals, and Aswedduma where wastewater farmers live.

Two canals, which have now become urban storm water drains, flow through Kurunegala town: the Wan Ela and Beu Ela. The Beu Ela was originally an irrigation canal and still receives water from Wennaru Wewa (a small man-made reservoir), whereas the Wan Ela receives irrigation run-off from upstream agricultural land. The Wan Ela flows alongside Kurunegala Lake and may receive overflow if the water levels are high. The canals flow for some 6 km through residential, commercial and cultivated areas, collecting drainage water and solid waste as they go. They join within the city limits and flow on to the Maguru Oya (River), just outside the western boundary of the Municipality, which is used further downstream as a source of drinking water. There is an *anicut* (weir) at Wilgoda, which is operated to provide irrigation water to 93 ha of rice (paddy) fields to the east of the city (Jayakody et al., 2007a; Nishshanka et al., 2006).

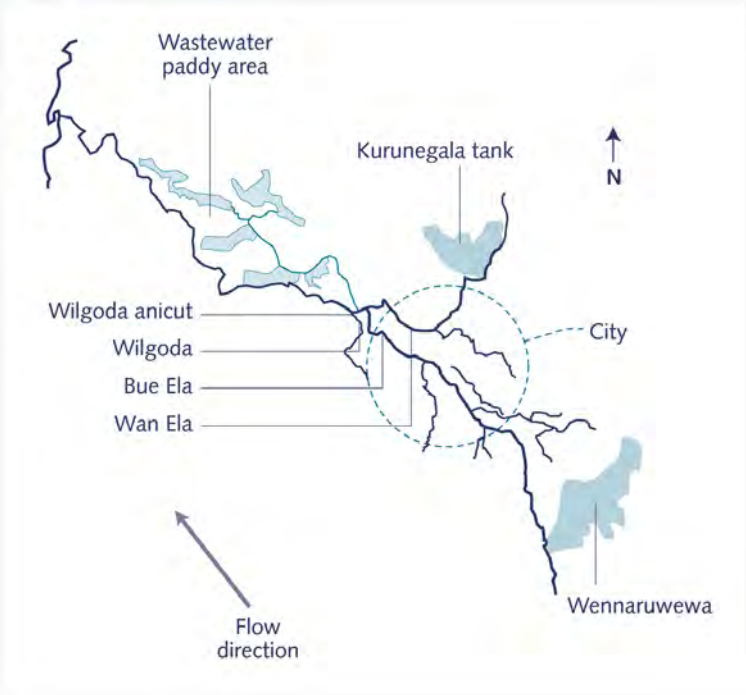

Figure 3: Schematic diagram of the study area.

In terms of water supply, around 54% of the households in the GNDs relevant to this study has protected wells and 40% is connected to a piped water supply system. Nearly all households in Kurunegala Municipality have on-site sanitation (Table 3), as there is no sewerage system, but according to the Chief Public Health Inspector (PHI), around 8% do not have latrines in adequate condition. A detailed survey in Wilgoda revealed that people are practising open defecation or using polythene bags for defecation and then disposing of them in the canal.

Table 3: Percentage of households with access to sanitation facilities in Kurunegala.

Type of sanitary facility	Kurunegala Municipal Council area	Kurunegala Divisional secretary
Water-sealed toilet	42	69
Pour-flush toilet	52	11
Pit latrine	2	11
No toilet	0	8
Other	3	1

Source: Nishshanka et al., 2006, based on DCS, 2001

Although most toilets have pits or septic tanks much of the waste seeps into the canals. It is estimated that the wastewater generated by Kurunegala city is 4620 m^3/day, of which 68% is generated by households and 29% by industries (Ranaweera, 2005). Dissayanake et al. (2007) mapped the industries and commercial units in the city that could potentially drain into the canals, reviewed the types of activities undertaken and identified the likely

pollutants. The study found that one of the main sources of pollution was the Kurunegala Teaching Hospital, which discharges some 750 m^3 of wastewater per day, which flows largely untreated into the drain since the treatment plant is not functioning. Other sources were private clinics, vehicle service stations, schools and colleges, hotels and restaurants.

Within the project area there are a total of 188 farmers of whom 145 use the water from these canals to cultivate 56.5 ha. The majority of households (63%) have small landholdings (0.19-0.31 ha). The main crop grown is rice, in the dry and wet season, which is usually consumed by the family, although any excess may be sold.

Water quality analysis in the canals suggests that the main parameters of concern for human health are pathogens from faecal contamination. Very low if any concentrations of heavy metals were recorded; concentrations fell within the Sri Lankan standards for irrigation and agriculture and the WHO guidelines for wastewater use in agriculture (Dissayanake et al., 2007).

The wastewater is mainly used for growing rice and the health risks are therefore predominantly to agricultural workers and their families. Consumers are less likely to be at risk because rice is always cooked. There could also be health risks to the households that use contaminated ground water for washing, cooking and other purposes. The main strategies pursued by the project where the introduction of simple treatment methodologies and management strategies to bring down the levels of coliform and reduce solid waste in the canals.

The project identified a range of government institutions with some relation to the issues (see Varma et al., 2007). The resulting analysis showed a highly complex and fragmented framework of roles and responsibilities across levels of government (from national down to divisional). The main institutions are described below.

- The Municipal Council (MC) is the authority responsible for Kurunegala City. It is responsible for town planning and public services provision, among other things, and can set by-laws. The MC has a number of extension staff, including PHIs, who are responsible for health and hygiene education; an engineer; and an environmental officer.
- The Pradeshiya Sabha (PS) has a similar role to the MC in rural areas. The farming areas covered in the study fall under such a PS. Like the MC, the PS has operational staff responsible for issues such as health.
- The National Water Supply and Drainage Board (NWSDB) is a national level body with operations throughout the country. In Kurunegala it is developing plans for a

project to construct sewerage and treat the waste from half the city, including the hospital (NWSDB, 2005; Dissanayake et al., 2007a).

- The Department of Agriculture and the Department of Agrarian Services are responsible for agricultural extension.
- The Irrigation Department is responsible for operation and maintenance of irrigation works.

Based on the analysis the main stakeholder clusters identified were:

- Wastewater farmers in Aswedduma - the main users of the wastewater.
- Inhabitants of the Wilgoda area - low access to sanitation and located adjacent to the canal.
- "Small polluting units" - such as the hospital and small commercial units.
- Government entities - providing sanitation services, and in charge of regulation and pollution control.

Within these major stakeholder clusters, further sub-divisions were made. For example, within Wilgoda, the project worked separately with men and women. Among government agencies, a wide range was identified, and different activities were undertaken with higher level decision-makers and with extension officers. The full list of Learning Alliance members includes: Municipal Council (including Commissioner, Public Health Engineers and Environmental Officer); District Secretary Division; Teaching Hospital; Pradeshiya Sabha; Greater Kurunegala Sewerage Treatment Project (part of NWSDB); Provincial Council; District Health Service; Wilgoda community based organization (CBO); farmers via the farmers organization; Department of Agriculture; Department of Agrarian Services.

Rajshahi

Rajshahi *Zila* (District), which is located in the north west of Bangladesh bordering India, covers an area of 2407 km^2, of which 62 km^2 is river (BBS 1993). It comprises seven *pourashava* (municipalities), including Rajshahi City Corporation (RCC), which was formed in 1987. The RCC area covers approximately 48 km^2.

Rajshahi city is located on the alluvial planes of the Padma River and contains several water bodies, covering 5% of the total land area. A network of ten main drains runs from the south, near the Padma, through the city, collecting surface run-off and urban effluents. The drains terminate either in *beels* (shallow lakes) or in the Baranai River, some 15 km away. As Rajshahi does not possess any sewerage system, illegal connections from houses, small industries, markets and commercial units mean that the drains essentially act as sewers. The two drains that flow through the project area are called: Circuit House Drain and Dargapara Drain (Clemett et al., 2006).

At present 46% of the population is connected to the piped water supply system. The rest of the population mainly depends on hand pumps and wells for drinking and cooking, and ponds and the river for other domestic purposes. The initial water quality testing showed that the water in the drains and seasonal ponds does not satisfy WHO guidelines for primary contact (Guideline for Safe Recreational Water Environments) and Bangladesh standards for recreational waters (WHO 2006; GoB 1997; Annex VIII).

The main potential health risk to farmers using wastewater in agriculture is from microbial and parasitological contamination from human excreta. This is also of concern for people residing near the drains and the seasonal pond as they have use the water for bathing, washing household items and even rinsing meat and vegetables. The baseline survey showed no other parameters that pose a major risk to health from wastewater irrigation, although the need for further testing for metals was advised (Dissanayake *et al,.* 2007b).

An assessment of interventions to reduce the quantity of domestic waste entering the drainage channels showed that improving on-farm practices and post-harvest activities (such as washing vegetables) could reduce the risk for farmers and their families and consumers of wastewater irrigated produce.

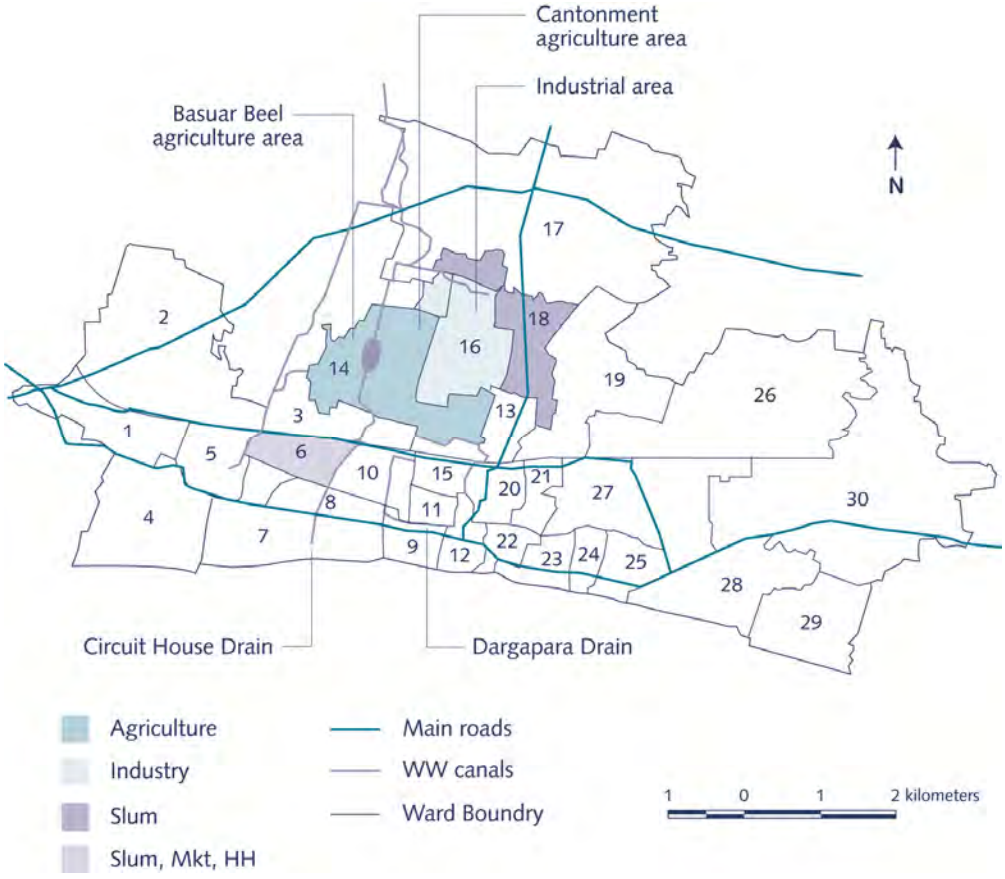

Fig. 4. Rajshahi study area

About 50% of households in the city area had sanitation facilities in 2004, amounting to 22,954 households (RCC, 2004; BBS, 2005). Ten percent of households do not have any sanitation facilities and defecate in the open (RDA vol-I 2004). There are 104 industries in Rajshahi city, including many silk production units. They do not have any treatment facilities.

Table 4: Types and categories of industries present in Rajshahi.

Industry Type	Industry Category[1]	Number of industries[2]		
		Ward 15	Ward 16	Ward 18
Textile/Silk/Shari	Red	0	36	0
Food Industry	Orange A/B (depending on investment)	1	13	0
Plastics Industry	Orange A/B	0	8	0
Medicine Industry	Red	0	3	0
Rice Flour Mill	Orange B	0	12	3
Chemical Industry	Red	0	3	0
Factory	-	4	12	7
Cold Storage	Orange B	0	2	0
Total		5	89	10

Source: [1]GoB 1997; [2]transect walk; in Dissanayake, 2007b

Note: the categories are based on the Bangladesh Government, Environment Conservation Rules, 1997, in which industries are categorized as Red, Orange A, Orange B and Green based on their size and ability to pollute with Red being the most polluting.

The RCC area produces approximately 200 metric tons of solid waste per day, of which around 25% is not collected by the RCC and is therefore littered around the city and also collects in the drains. The RCC is not responsible for collecting waste directly from households and in some areas the communities have organized themselves to collect the waste and dispose of it at the local collection points.

Wastewater irrigation in Bangladesh has remained largely unnoticed or ignored both by the authorities and non-governmental agencies. Bangladesh's water quality guidelines cover the disposal of industrial waste into open water bodies and agricultural land (Environmental Conservation Act, 1995 and Rules 1997), but they are rarely enforced and authorities are more concerned with drinking water quality than with surface water for irrigation. WASPA focused on a group of approximately 247 farmers in the Terokhadia area to the north of Rajshahi city. These farmers pump wastewater from the drains to cultivate a total area of 100ha.

Rice yields in Rajshahi are 1.05 tons per acre compared to a national average of 0.95 tons per acre. Other crops produced include vegetables (spinach, cabbage and cauliflower), maize, wheat, potatoes, sugarcane and jute. The agricultural produce is traded in 12

bazaars and transported to Dhaka and other regions, which means the produce is not only consumed in the environs of Rajshahi (Jayakody *et al*., 2007b).

The institutional context in Bangladesh is complicated with overlapping jurisdictions, ministries and responsibilities. The RCC and the Rajshahi Development Authority (RDA) are critical stakeholders as they play a key role in planning and development in the project area. The two authorities operate under different government ministries: Local Government and the Ministry of Housing and Public Works, respectively. The RDA is responsible for planning and designing the drainage infrastructure and approving all plans for buildings. The RCC, which is akin to a municipal council, is responsible for implementing drainage infrastructure plans and enforcing compliance with discharge requirements. In reality, both organizations lack the funding and manpower to adequately fulfil their obligations. There is presently little coordination between other institutions in relation to wastewater management, drainage management and pollution reduction.

The industrial area falls under the authority of Bangladesh Small and Cottage Industries Corporation (BSCIC), which is the government body responsible for encouraging entrepreneurship in small and cottage industries. As a result, the RCC does not take responsibility for facilities in the BSCIC area in Rajshahi. In addition, there is the National Association of Small and Cottage industry in Bangladesh (NASCIB), which is the central body for the silk industries and provides technical support, guidelines and indications within the sector.

The following clusters of stakeholders were involved through the Learning Alliance and planning cycle:

- Wastewater farmers;
- BSCIC, NASCIB, the teaching hospital and private clinics;
- Residents in Wards 16 and 14 through the Ward Commissioners;
- RCC, RDA and the Department of Agriculture Extension (DAE);
- NGOs, including the Bangladesh Environmental Lawyers Association (BELA); and
- Rajshahi University of Engineering and Technology (RUET).

4. Findings

Linkages between sanitation, wastewater and use

Wastewater, pollution and treatment

In both Kurunegala and Rajshahi, the wastewater entering the canals is mainly storm-water, combined with septic tank overflow and effluent from commercial units. In general this wastewater is from washing and processing, not from toilets. There is a difference in composition of wastewater between the two locations: in Sri Lanka the main source of pollution is domestic solid and liquid waste; in Bangladesh there are higher levels of industrial and chemical waste.

From these findings, we can conclude that the main cause of wastewater problems is not the absence of toilets. Rather, it stems from toilets with septic tanks that leak, overflow or are deliberately flushed into the drainage channels. The households that lack sanitation facilities also contribute to the problem through open defecation, 'flying toilets' (using polythene bags for defecation and then disposing of them in the canal), and in some cases leaking communal septic tanks. However, the relative size of the contribution of waste originating from inadequate sanitation is much less than originally expected; an expectation that was influenced by the visibility of this source of contamination, especially in Rajshahi where latrines hang over drains and water bodies. That said, locally, the lack of sanitation does contribute to pollution, bad smells and environmental health risks.

Addressing the pollution in neighbourhoods lacking sanitation was an important area of project activities, despite the relatively small contribution to total contamination, because the project aimed to address livelihoods and health risks along the entire continuum from wastewater generation to use.

Solid waste pollution is mainly caused by inadequate facilities and lack of sufficient or timely collection services. The project team also observed that while community members complained about the issue, they were initially either unable or unwilling to do anything about it themselves. This complacency was compounded by the lack of enforcement by government officials.

The project found that much of the solid waste finds its way into watercourses and there is very limited or no provision for its removal. As a result, the waste clogs farmers' pumps in Rajshahi and it contributes to flooding near the anicut in Kurunegala. Not only do people living close to the drains find the solid waste unpleasant, but they also suffer injuries when syringes, glass and other sharp objects find their way onto farmers' fields.

Despite plans and proposals in both cities, there are presently no central wastewater treatment plants. There is little knowledge among authorities about decentralised or lower cost treatment options.

Agricultural use of wastewater

In Kurunegala the city's waste pollutes what was originally an irrigation canal; in Rajshahi urban wastewater pollutes the relatively clean storm water drainage that farmers used to receive. While the quality of these water sources has decreased, their temporal reliability has increased, thanks to the regular inflows of wastewater. Thus farmers are able to irrigate more often and throughout the year (Jayakody et al., 2007a) and are able to grow crops with high water demand, such as sugar cane. At the same time, farmers at both sites have no alternative to the increasingly polluted water.

The impact of wastewater on yields is not clear as it depends on a number of factors, such as crop type and species and fertilizer application rates. Jayakody et al. (2007a and b) generally found that yields in wastewater-irrigated fields did not differ significantly from yields in fields irrigated with clean water in both cities. However, in Kurunegala the fields closest to the canal and *anicut* were found to have lower yields of rice. One of the hypotheses is that these fields receive a relatively higher concentration of nutrients, leading to higher vegetative growth, and lesser grain development. This could be improved if fertilizer applications were better managed. Also, changing crop choice, for example switching from rice to a leafy vegetable, may be feasible. However, this requires further field research.

Fertilizer use was found to be highly variable across farmers – both the ones using wastewater and clean water – in both cities. Agricultural extension support at the inception of the project was not provided to wastewater farmers. As a result of WASPA, agricultural support agencies have started to take up the issue and assist in providing guidance to wastewater farmers (WASPA change stories Ara 2008 and Udkumbure 2008).

Health and hygiene

In both cities, flood irrigation is practiced and farmers work barefoot in the fields, which poses a potential health risk. In Rajshahi, farmers also handle wastewater pumps with bare hands and enter the drains to locate the pumps. Yet, farmers had limited awareness of the health risks of using wastewater. The trainings provided by WASPA targeted this lack of awareness.

Communities that use contaminated groundwater for washing, cooking and other purposes also face health risks. In addition, site observations revealed that people use the water

from the canals and natural ponds for a range of purposes, including bathing; dishwashing; washing of meat, fish, hides and vegetables; and for soaking jute.

The project did not directly look into the possible impacts on consumer health; however, in Kurunegala, since the primary wastewater irrigated crop is paddy rice, which has a husk and is always eaten cooked, the health risks from consumption are minimal (WHO, 2006). For the vegetable crops grown in Rajshahi, the health risks to consumers may be more substantial.

Discussion

The findings in both towns reflect experiences from many other towns and cities, with respect to the lack of sanitation, wastewater, its use in agriculture, and the impacts on farmers and neighbouring communities. However, the extent and severity of the issue in both cities is less than originally expected.

The wastewater use in both locations can be characterized as indirect wastewater use, according to the typology proposed by Van der Hoek (2004). Farmers are using water sources that were initially relatively clean and safe, but have become increasingly polluted over time. This means that nutrients and potentially harmful chemicals are more diluted than in cases where farmers are using wastewater directly. Subsequently, impacts on yields and crops are not as large as expected. Other factors, such as fertilizer application practices and plot size have more of an impact on yield than wastewater irrigation per se.

Also, health risks are less acute than expected, particularly in Rajshahi. Stakeholders see the situation more as a nuisance (because of odour and visual signs of garbage dumping) than as a direct health risk.

Whereas the extent of the problem is arguably less severe than expected, at the same time, it is more complex. The original hypothesis was that through investments in access to sanitation, flows of wastewater could be reduced, or at least captured and managed to reduce risks from reuse. However, the findings from the cases show that the problem does not lie so much in the lack of sanitation, as in the need to address wastewater coming from a large number of relatively small sources. To give an example, those that do not have any sanitation, such as many people in Wilgoda, only contribute a small amount to the wastewater stream; instead it is those who do have access to toilets who contribute larger volumes of wastewater that need to be managed if the wastewater is to be productively used. The characteristics of wastewater sources and thus the composition of the wastewater itself also varied, since the project areas include both domestic units and small industries. The management of these sources of pollution can be expected to present a high degree of complexity.

This is not to deny that investments in basic sanitation are needed; they are, to address local unsanitary conditions. But, such investments only will not have a major impact on the downstream wastewater management and use options.

Governance situation

Prior to the project, the local authorities in both towns had done very little work to address the sanitation and wastewater problems. Only in Kurunegala were plans being made to develop a sewer and centralised treatment system. There are various reasons why wastewater management was never addressed in the past.

First, there is limited awareness and information at different levels on the flow of wastewater and its end use. Without such information, it is difficult for authorities to plan measures to adequately address the situation. Data gaps exist either because the data are not collected or because they are not routinely analyzed and publicly reported. For example, the project team was unable to acquire up-to-date and reliable information about the number of septic tanks in either city or the number of connections to the drains or the flows in them. Also, what data is available must be used with caution since discrepancies exist between the information gathered from different sources and between definitions used by different authorities (Ara *et al.,* 2007).

Secondly, field officers and extension staff had little awareness and knowledge of wastewater management. As there was no formal recognition at national level of wastewater use and management, field officers have not been able to address the issue by, for example, giving advice to wastewater farmers.

Finally, affected groups themselves, such as farmers, did not see wastewater as a key problem, nor did they have much awareness of possible risks and benefits of wastewater use.

It has also proved difficult to address the issues because of lack of explicit recognition of wastewater management in institutional mandates. In addition, there is a high degree of institutional fragmentation, primarily because, by its very nature, wastewater management overlaps with solid waste management and sanitation. For example, RCC is at present responsible for drainage from the city but not for wastewater disposal. It is responsible for the surface water quality inside its area, but not for water quality in the river, which lies outside the city boundaries, but which is the primary disposal site for drainage water. Furthermore, where clear mandates do exist, monitoring and enforcement of rules and regulations are weak. This is compounded by the fact that wastewater producers and users are not always within the same administrative boundaries and do not therefore fall

under the responsibility of the same authorities. For example wastewater from the city, which should be regulated by the MC or RCC, enters rivers and water bodies that become the responsibility of District-level authorities including the Department of Environment in Bangladesh and the Central Environmental Authority (CEA) in Sri Lanka. Unless some sort of coordination can be arranged between jurisdictions or unless polluters are forced to take responsibility, the problem of wastewater will be difficult to tackle.

A wider perspective on wastewater and water resource management points to the issue of absence of a clear basin or catchment authority. Pollution in urban sub-catchments has a high impact on the surrounding environment and requires an integrated water resources management (IWRM) approach. In Sri Lanka, the environmental authorities are in charge of pollution control and regulation and would come closest to having the necessary authority to manage water resources in a more integrated manner. However, respondents complained that the relevant authorities have little presence on the ground for effective control and enforcement of rules. Furthermore, urban areas are often left outside the scope of activities: the Bangladesh Water Development Board, for example, does not include urban areas in water resources planning for agriculture. In short, there is fragmentation and lack of clarity in institutional mandates at the lowest levels of government, while the higher levels of water governance do not explicitly deal with pollution from urban areas. As a result, authorities had not taken steps to address the issues surrounding wastewater management.

Affected communities also failed to mobilise and take action. This lack of action has its roots in poor relations between communities and the authorities as well as conflicts within and between communities. Despite the existence of a farmers' organization in Kurunegala, communities have not been able to hold relevant authorities to account or get support from the agricultural extension services. Wilgoda community previously had such a bad relationship with the municipality, that endeavours to work on sanitation services ended in conflicts, and the opinion of the citizens was that the MC did not prioritize sanitation. Often institutional mandates and ensuing responsibility or accountability are not clear to citizens. For the domestic polluters themselves, there are few incentives to address the issue. Services like emptying of septic tanks is not timely, and households end up emptying their tanks into drains.

Evidently there is no clear institutional home for this complex issue, nor a specific stakeholder group that can immediately take responsibility. The institutional 'home' would have to be a multi-stakeholder platform. However, starting up such a platform requires an initiator or facilitator, often from outside the group of direct stakeholders.

5. WASPA interventions and their impacts

In chapter 2, the planned intervention steps were described but in reality, the project was not able to follow such a linear approach - iterations and adjustments were needed along the way. In this section the steps that were actually taken are described, their results, and a reflection on the experiences of applying these steps.

Team formation

As mentioned in the introduction, the consortium consisted of organisations with different areas of content expertise (sanitation, wastewater agriculture and governance) and skills (research, documentation and facilitating learning processes). Whereas every partner had expertise in a part of the WASPA concept and project methodology, they needed to develop a common understanding of the entire frame for the project. In addition, specific methods related to facilitating Learning Alliances and following Participatory Action Planning cycles were new to some of the staff of the country teams and had only been implemented in a limited number of settings by the other project partners. Therefore, time was required to ensure that everyone in the team was comfortable and conversant with the methodologies and would be able to implement them in the given settings. It also meant that the team had to be adaptive and could not always follow the structure initially proposed. A series of guidance notes was developed to ensure consistency in the methodology applied across the two countries. In addition, team training workshops, on-demand backstopping and co-facilitation of events were carried out.

Stakeholder analysis

The first step in the planning process was a stakeholder analysis. In this, the main stakeholders related to wastewater were identified. Bilateral meetings, focus group discussions and interviews were held with the stakeholders to identify their interests and stake in the wastewater issue. Further understanding was developed regarding relations between stakeholders, and on this basis, the clusters and the Learning Alliance were formed.

The stakeholder analysis proved a crucial step for the project approach. The project teams worked with those initially identified, but also continued raising awareness with a broader group, which included interested parties such as universities. Once the project evolved and stakeholders' potential roles and inputs became clearer, the awareness-raising phase was revisited to involve other stakeholders. Some actors remained outside the scope of the project as their activities and interests differed from that of WASPA. The national level stakeholders were involved gradually, but a full Learning Alliance at national level was not developed, because most efforts went into the Learning Alliances at city level.

Assessments

The assessments formed the next step for further planning. They focused on gaining more detailed insight into the status of wastewater and sanitation, wastewater use in agriculture and the relevant institutional arrangements. The assessments used techniques such as interviews, review of secondary data, mapping and participatory transect walks, focus group discussions, and water quality testing. The data were summarised in a series of reports. The assessments yielded various outcomes:

- A better understanding among stakeholders and the project team of the complexity of the situation, as well as of the degree of severity of the issue. To a large extent the assessments confirmed some of the intuitive knowledge of stakeholders and the project team, but they also uncovered some myths. In Rajshahi, the common perception was that industrial waste from the BSCIC area posed the biggest health risks, but water quality tests did not corroborate this perception and showed that pathogens from domestic wastewater were more likely to pose a human health risk (Evans and Varma 2009).
- Stakeholders started to see the entire wastewater chain. Initially, most stakeholders only had an understanding of the part of the problem directly related to their interest. For example, farmers initially only knew that they received water which over time had become polluted with wastewater, but didn't know the detailed origins or characteristics of this water. Through the assessments they obtained a better understanding of where their water came from. Techniques such as problem trees, transect walks and photo presentations proved very useful in revealing the complexity of this chain. Problem trees, because they show causal relations, proved particularly helpful in identifying clusters of problems. In addition, the problem tree approach helped separate myths from facts. Initially all the problems identified were included in the tree. As more assessment data became available, certain perceptions could be confirmed, whereas others were revealed to be myths and were removed from the problem tree. Unclear relationships needing further research were indicated by question marks. Figure 5 contains the problem tree for Kurunegala that was eventually used for the vision building exercise.

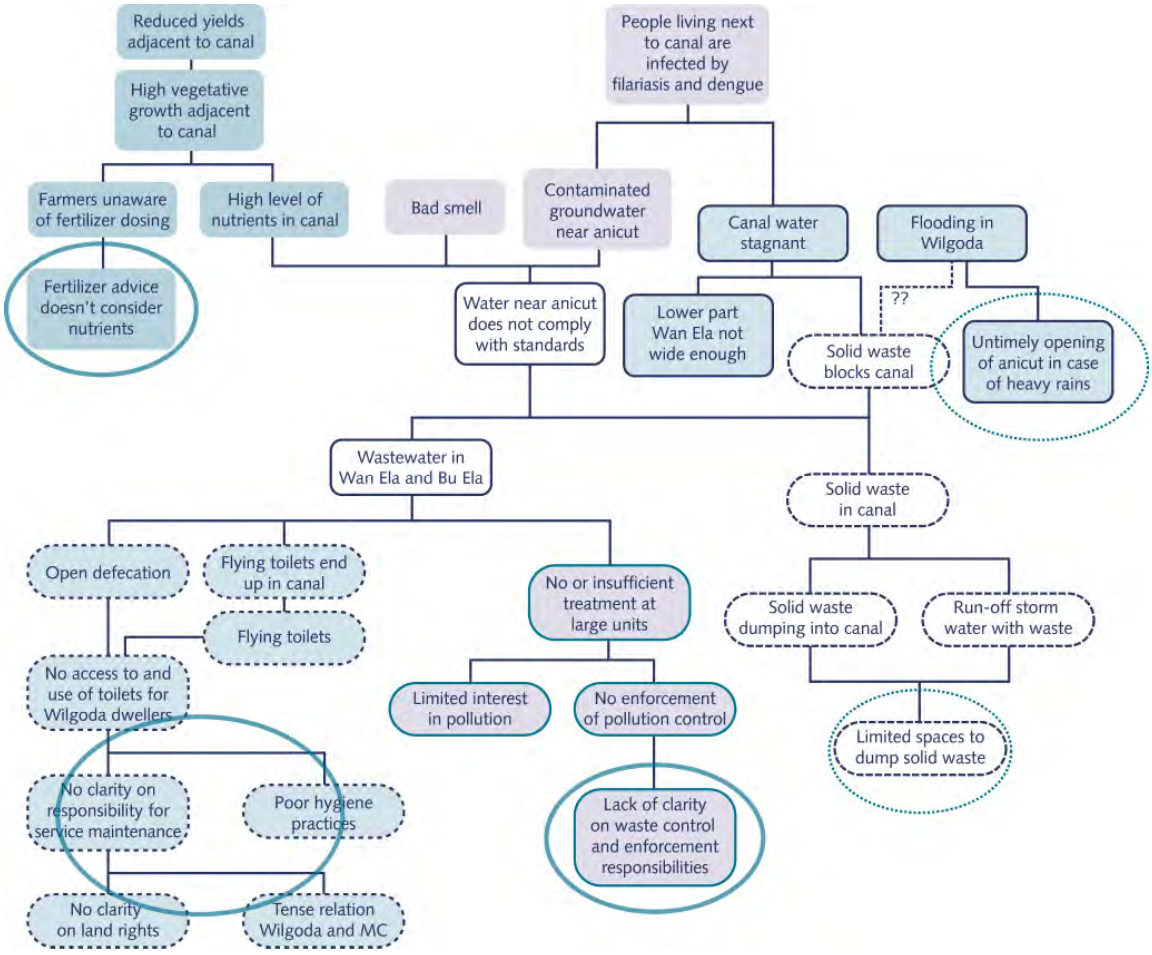

Fig. 5. Problem tree for Kurunegala.
Circles indicate root causes identified through the process, with the dotted ones indicating perceptions rather than confirmed facts. Question marks indicate unconfirmed relationships.

- Stakeholders also gained a better understanding of the roles, responsibilities and interests in the wastewater chain. As shown in chapter 3, the institutional framework is complex with a high degree of fragmentation. These factors led to confusion, particularly among city dwellers and farmers, about which entity to approach in case of problems. The assessments and their feedback provided an opportunity for stakeholders to voice their problems to the appropriate authorities.
- A better rapport developed between stakeholders and the project team, and between different stakeholder groups. As stakeholders were involved in the various activities, their understanding of the linkages along the wastewater chain grew, and they became more open to working jointly on the issue.

The assessments took a lot of time: around one year to collect, analyse and document the information. They were not done with the full stakeholder group, but with each sub-group individually, since the Learning Alliance hadn't been formed yet. The project team felt it

was important to have these consolidated assessments before bringing all the stakeholders together. This phase of the planning cycle interested stakeholders the least. They wanted to move forward rapidly with planning and implementing interventions. The project found that stakeholders lose interest if the assessment phase continues for too long without action. Evans and Varma (2009) therefore suggest using intuitive knowledge on visible problems to expedite appropriate interventions that are readily agreed upon, but carrying out a thorough assessment of problems where the root causes are not unequivocally visible.

Obtaining reliable data was difficult. Relationships with several of the stakeholders had to be established before the project team could gain access to the limited data. These relationships were developed through frequent personal visits and phone calls, as well as joint activities such as field visits. However, the time and effort required also prolonged the assessment process.

Vision building and strategy development

While the assessments served to establish rapport and to collect the necessary information for planning, more pro-active involvement of stakeholders began with the development of Participatory Action Planning by the Learning Alliance. Vision building was a first step in this process.

Representatives from all stakeholders groups conducted a joint problem analysis, using the assessment results as a starting point. In Kurunegala, problems were analysed on a geographical basis: the upper urban catchment where wastewater originates; the middle stream where low-income communities, often with poor access to sanitation, live along the drains; and the lower reaches where wastewater is used in agriculture. Visual tools, particularly a community map, supported the process.

In Rajshahi, the problems were structured around the groups causing or receiving the pollution: domestic wastewater producers; industries and clinics as sources of industrial and hazardous waste; and farmers as users of wastewater. This structure reflected the less linear flow of waste and the higher attention given to industrial waste.

After the problem analysis, a vision was developed for each problem area: for each geographical area in Kurunegala and each stakeholder group in Rajshahi. The vision reflected the situation the stakeholders wished to see in the medium term (5 years). The visions for the geographical areas were then brought together for the entire town, and checked for internal consistency. The final step in this stage was to develop strategies – the actions needed – to achieve each of the visions (Tables 5 and 6).

Table 5: Visions and strategies for Kurunegala.

Vision	Strategies
To have drainage facilities for rainwater and liquid waste that are free of solid waste; and appropriate disposal	Engage with the Greater Kurunegala Sewerage Treatment Project (GKSTP), which is developing sewerage and treatment
	Work with selected commercial units on cleaner production and facilities to treat wastewater
	Strengthen the procedures and regulatory system for waste control
	Raise awareness among the general public on waste issues and waste management
To have adequate sanitation, hygiene, water supply and waste collection services in Wilgoda	Upgrade water supply facilities in Wilgoda
	Improve sanitation facilities in Wilgoda
	Improve hygiene and sanitation behaviour in Wilgoda through community awareness, and strengthening the CBO
To have better yield and improved health for wastewater farmers; and access to irrigation water of acceptable quality	Prevent solid waste from reaching fields
	Provide recommendations for fertilizer applications, according to irrigation water quality, in collaboration with relevant authorities
	Educate farming community on health risk reduction
	Strengthen farmer's organizations

Table 6: Visions and strategies for Rajshahi

Vision	Strategies
To have improved wastewater management systems in RCC area	Conduct demonstration projects, e.g., garbage trap; feasibility studies for appropriate treatment and small-bore sewerage
	Support community activities, e.g., reducing solid waste entering canal
To have improved water quality in drains through industrial wastewater management	Facilitate industries to take greater responsibility for wastewater management – investigation and implementation of cleaner production options
	Support authorities to review, improve and enforce wastewater management from industries
To have wastewater of improved quality for agricultural use as well as improved yields and reduced health risks	Identify suitable treatment options for the wastewater flowing into the agricultural area and explore possibilities for implementation by RCC
	Training farmers how to improve yields and reduce health risks when irrigating with wastewater
	Provide messages for communities in agricultural area regarding hygiene practices especially in relation to wastewater use and consumption of wastewater crops

This collective work helped all involved to better understand the full wastewater chain and linkages within it; and it helped to reduce tension among stakeholders, because it was not just about solving problems, but rather developing a collective vision of the future. The open process, which was conducted in a meeting where different stakeholder groups could stand up and speak and were treated with respect, also helped avoid conflict. Last but not

least, the collective exercise created transparency about decisions taken and the reasons behind them.

Visioning was an important step in the process of consensus building. However it remained difficult to balance realistic visions and dreams, and move from 'problem-solution' thinking to longer-term conceptualization of a desired future. Some of the initially proposed visions were not realistic, and some strategies did not provide the level of detail required to support action. After the workshop, the visions had to go through several more iterations in which the project team polished and re-formulated some of the visions and strategies and related these back to the stakeholders.

One could argue that some problems do not need larger visions or strategies to address them. For example, solid waste in the canal could easily be addressed by a simple garbage trap. But despite such simple, obvious solutions, stakeholders hadn't taken action. Clarity on the bigger picture, including of some of the smaller issues that can seemingly be dealt with easily, was needed to move stakeholders to action. In addition, the exercise brought about clarity on roles and responsibilities, to encourage stakeholders to take the actions corresponding to them.

Planning

It was decided that different strategies, and activities to achieve them, could be taken forward more efficiently by smaller groups from the project team and some of the stakeholders, instead of working with the entire Learning Alliance on all strategies (Table 7).

Table 7: Examples of activities identified and implemented in both cities.

Kurunegala	Rajshahi
• Placement of a garbage trap • Research on fertilizer dosing for wastewater farmers • Record-keeping training for the farmers organisation and awareness raising among the farmers on the role and function of the farmers organisation • Upgrading of communal latrines • Hygiene promotion to wastewater farmers and Wilgoda community (with a special focus on women's' groups and children) • Hygiene training for wastewater farmers • Training on home composting for Wilgoda community • Developing cleaner production guidelines for hotels, industries	• Placement of a garbage trap • Study on cleaner production for small industries • Awareness raising on cleaner production for small industries • Street drama with hygiene messages • Developing information products (calendar) with hygiene messages • Hygiene promotion and training for wastewater farmers • Agriculture training for wastewater farmers • Feasibility study for small-bore sewerage • Feasibility study on enhancing natural treatment in Bashuir Beel

Looking at the list of actions, most can be considered tried and tested solutions. Evans and Varma (2009) provide a reflection on the type of activities that were eventually identified and implemented, and concluded the following:

- Software activities such as “training” or “awareness-raising” are readily identified, even if they are not the most appropriate solution. These activities are needed, but on their own they only have a limited scope in what they can achieve. They may be identified because people are more familiar with them, or by lack of an immediate answer to complex problems, which require a more detailed searching for an answer.
- Stakeholders readily identify conventional solutions. In both cities, there was a high interest in centralised wastewater treatment plants, even though no financing was or would be available for that. Although this is not a unique situation, government officials (and often funders) have high expectations of these kinds of conventional solutions, even in the absence of adequate funding.

Probably, it is too much to expect hugely innovative or alternative activities to come out of such a participatory planning process, especially in the beginning of the project. It was observed however that there was more interest among local decision makers in innovative solutions towards the end of the project.

WASPA attempted to encourage innovative thinking by linking knowledge centres with other key stakeholders. For example, the Bangladesh University of Engineering and Technology (BUET) was contracted to do a study on small-bore sewerage. BUET actively involved RCC representatives in analysing the problems and reviewing different options. This collaboration has resulted in increased interest in a solution that the RCC had initially considered a low-cost and thus inferior option for their city.

The main innovations of the project lie not in the individual interventions identified, but in the approach to the development of solutions:

- Assembling known solutions in a locally relevant manner. Although the interventions themselves are not particularly innovative, the participatory planning process allows “assembling” of all these interventions in a local context. It is the combination of all interventions that would lead to the expected benefits, rather than one single solution.
- Creating ownership and joint commitment to the proposed solutions. It has been widely discussed that participatory processes are crucial to obtain stakeholder ownership of proposed solutions (see for example ADB 1995; World Bank, 2004). In such a process with multiple stakeholders, an additional mutual commitment is created. Because the strategies have been discussed in the complete group, there is clarity as to who is responsible for implementing them and there is a higher degree of accountability to a

wider group to actually carry them out. However, the LA is not a formal decision-making body, so accountability of stakeholders is mainly achieved through social pressure.

Implementation

Within the small groups, responsibility for the implementation of planned actions was assigned. Where possible the institution that normally has the mandate for the issue in question was given responsibility for implementation. In some cases which agency should logically take the lead was clear, for example, management of industrial pollution falls to BSCIC and NASCIB in Bangladesh. The case of solid waste management proved to be more complicated. Both the MC and RCC have a role in collection, but citizens must deliver the solid waste to collection points. Negotiations were needed to define clearer responsibilities in interventions.

A complicating factor was that because WASPA was driving the overall process, stakeholders also expected WASPA to take the lead in implementation. For example Evans and Varma (2009) report how certain stakeholders from agriculture departments suggested that “the project” should test water and soil to improve fertilizer recommendations for farmers. They specifically referred to the project as an external entity, not something that they were part of, even while they themselves had the mandate for such testing. This confusion over roles and responsibilities became especially critical when it came to interventions involving infrastructural works. It took time to agree with the relevant authorities that they should take the lead, since none of the project partners had the necessary mandate or experience, and could only support these interventions through tasks within their expertise, such as training, capacity building, research and funds.

A disadvantage of working through the existing structures is that many government authorities must follow bureaucratic procedures to carry out any works. These led to hurdles and delays in implementation.

Monitoring

As the stakeholder clusters began to dedicate themselves to the detailed planning and implementation of the strategies, the function of the full Learning Alliance changed. It became a platform where the clusters reported their progress and where emerging issues were discussed. After the planning workshop, another two full Learning Alliance meetings were held in each of the cities. In addition, bilateral meetings were held between the project partners and relevant authorities. In this way, the Learning Alliance became a kind of monitoring platform for reporting. However, only towards the end of 2008, did it start working on a more formal monitoring system of the implementation of the PAP.

Discussion

This section discusses the effectiveness of The Learning Alliance approach and participatory action planning cycle in addressing the wastewater-related issues. It looks at the benefits and drawbacks of the approach as well as the way in which the process was run.

Benefits and drawbacks

Stakeholder interviews and project review workshops showed that both city stakeholders and the project team members regarded the Learning Alliance and participatory planning as beneficial. A key benefit was found to be that dialogue and analysis of the current situation helped participants to see the entire wastewater chain. This understanding formed the basis for identifying potential solutions in a more integrated framework, which in turn provided a basis for a more constructive and ongoing dialogue between stakeholder groups. Whereas conflicts had existed previously, the discussion, planning and joint action facilitated through the Learning Alliance helped stakeholders to see each other's points of view and interests. Conflicts were moderated and an atmosphere of collaboration was created. The visioning process also allowed stakeholders to move from the problems to constructing a future. The fostering of stronger relationships within and between clusters of stakeholders through this process is therefore probably one of the most important results of the approach.

Most of the actions identified were not technical innovations and some reflected conventional and even inappropriate solutions. Did the solutions identified justify such a heavy participatory planning approach? Or could one arrive at similar solutions through a more top-down approach? The answer is that although the solutions identified were not highly innovative, the participatory approach did have several important benefits: it created a higher degree of ownership over the solutions and some mutual accountability between stakeholders for implementing the approach. In addition, it allowed the various actions to be assembled into an integrated framework. Perhaps, it would be too much to expect highly innovative solutions to come out of such processes. The project team members therefore played a key role in suggesting and promoting alternative options.

The original hypothesis was that building capacity among the stakeholders would enable them to take the approach forward after project completion, in terms of continuing to implement the Participatory Action Plans, and even using the planning cycle or a multi stakeholder platform in other parts of the city. It is too early to say whether this has been achieved. Stakeholders have clearly expressed interest in continuing some form of multi-stakeholder platform and even in extending the approach. For example, officials from the MC in Kurunegala would like to apply the participatory planning cycle to other areas, such as transport. However, it is not clear whether they have the capacity to facilitate such a

process. WASPA required a great deal of facilitation by the project team. The MC officials recognize that facilitation skills would need to be built within the MC in order to take the platform or methodology forward. On the other hand, because of strengthened relations between community groups and authorities, there may also be a stronger demand from the community side to continue with these processes, and the community would have some strengthened capacity to partake in a continued effort. An example of this is BELA, the Bangladesh Association of Environmental Lawyers, an NGO that is keen to become the Learning Alliance facilitator in Rajshahi in 2009. They are seeking funds for an integrated water and environmental management project, for which they saw the existing Learning Alliance as an extremely useful platform.

One should look in a similar way at the ultimate impacts on governance of wastewater. The project did not aim to, and hence did not succeed in, addressing some of the underlying governance problems. For example, the institutional fragmentation that existed before the project still prevails. Rather, the project worked within the existing governance framework, and raised awareness of the issues and interlinkages. Through the Learning Alliance, a start was made at strengthening the way in which decision-making processes are run – by strengthening relations between stakeholders, empowering groups previously excluded and providing a more integrated framework within which decisions are made. Also, governance limitations were analysed. For example, the Rajshahi Law University supported the review of policies and legislation in the field and held workshops with the stakeholders on these legal dispositions.

The way the participatory planning process was run in the two towns reflected the pre-existing governance situation. In both cases, the authorities were open, at least to some degree, to engaging with community groups. However, there was initially more genuine commitment to the process in Kurunegala than in Rajshahi. Hence, initially more progress and a more constructive dialogue was fostered there. In Rajshahi, this developed at a later stage, especially once a smaller core group with more mutual trust and commitment was established. Providing clarity on the institutional framework and governance arrangements to all involved also proved to be crucial, so that it was clear who was responsible – at least formally – for which aspects of sanitation and wastewater management.

Facilitating and structuring the process

The project teams in both cities reflected on the way that the processes were run and facilitated. First of all, it was recognised that the role of the facilitator was critical. Participatory planning requires a rigorous methodological approach, and a facilitator is needed to ensure this. In addition, prior to the project, many stakeholders did not see the entire problem, and there were conflicts between groups. In order to be effective, the facilitator must be acceptable to all stakeholders and be seen not to have a vested interest.

Seniority is also a factor given the hierarchical structure in both countries. Senior officials prefer to be approached by similarly placed counterparts, who also had the right contacts.

In WASPA, it took time to develop the facilitating role within the project team. The project teams had to first become better acquainted with the Learning Alliance methodology and participatory planning process. In addition, it took time and perseverance to achieve the necessary level of acceptance by the stakeholders. It took hundreds of courtesy meetings and telephone calls between the facilitator and the RCC over the course of the three-year project to build the personal friendships and trust that ultimately helped to ensure the RCC presence at meetings as well as their active engagement.

Once the process gets going, a balance must be found between meaningful participation and speed. Separating issues that can be addressed on the basis of intuitive knowledge and those that require the full participatory cycle can help facilitate quick wins and thus hold stakeholders' interest. Experience from WASPA reveals that such a balance can be achieved in different stages:

- The identification of stakeholders is the initial step in developing a Learning Alliance and is critical for both the effective start-up and assessment phase. However, the initial stakeholder analysis does not need to provide the "definitive" list of relevant actors. In WASPA it proved important to define a core of the most crucial stakeholders. Others became more or less involved around specific issues at later stages of the cycle.
- Assessments are crucial to deepen understanding of particularly complex issues, but such assessments are of least interest to stakeholders. In WASPA the assessments took such a long time that stakeholders lost interest. In hindsight, it would have been better to consider a two-staged approach consisting of a rapid assessment to map the issues, which can then be fed back to stakeholders, and then identification and deeper analysis of those issues that require more detailed work, for example, where there are no clear cause-effect relations, or where the relative importance of sources of pollution needs to be assessed.
- Visioning and strategizing is the key moment of integration, where all stakeholders need to be brought together.
- Detailed planning and implementation requires consensus and can thus be a difficult and lengthy process. Forming smaller clusters around specific action plans helped to move things forward more rapidly. Once the Learning Alliance has agreed on a broad line of action in the development of the strategy, it can leave work on specific issues to the clusters. However, it proved important for the clusters to feedback to the entire Learning Alliance on decisions made to maintain mutual ownership and legitimacy of the process.

Throughout the process, building and maintaining relationships is important but difficult. A common challenge is to ensure that relationships with individuals in the relevant authorities translate into institutional support. A significant constraint to the project teams in both locations was transfer of government staff and officials to other areas or positions. Ongoing political instability in Bangladesh complicated the process. On the other hand, having contacts who are supportive and influential (champions like the Chief Conservancy Officer in Rajshahi and involvement of the Mayor in Kurunegala) helped the project to progress.

It is evident that a multi-stakeholder approach must be given sufficient time to develop. After a relatively long period of conducting assessments and building relations with the stakeholders, the more visible project activities gradually increased in pace in the second half of 2008 (2.5 years into the project). This may have been because time was running out but it also reflected the fact that stakeholders were becoming more comfortable with the Learning Alliance and with the project team, and they perceived the project to be providing some benefits. Experience in other multi-stakeholder processes confirms that getting stakeholders to invest their time requires building trust and also delivering results that make their involvement worthwhile (Warner, 2006, Moriarty *et al.,* 2007).

6. Conclusions and recommendations

The WASPA Project started from the premise that lack of access to sanitation in low-income communities leads to the generation of wastewater flows, which are subsequently used in agriculture; and that interventions to improve access levels would need to go hand in hand with activities to change the management of wastewater, so that its benefits to users would be retained, while risks were reduced. In order to develop such integrated interventions, a multi-stakeholder planning approach would be needed. The project experience reveals that the original premise needs some adjustment, but that the implications regarding the need for integrated planning that involves a range of stakeholders holds true.

The project found that in the intervention areas in both towns, the lack of access to sanitation in low-income communities only contributes in a minor way to the generation of wastewater flows. Unauthorised sanitation connections, direct draining of greywater, leakage from septic tanks and illegally dumped garbage, and effluents from small industries are the most important sources of pollution.

The impacts of wastewater use in agriculture in terms of crop yields and health risks for farmers were lower than expected. Concentration of nutrients, pathogens or other contaminants is not as severe as originally thought, but reduction of the levels of coliform and solid waste in the canals is recommended. The use of wastewater was found to have only a limited impact on yields, alongside many other factors, which require further research. There are some health risks relating to handling wastewater with high faecal and parasitological contamination, particularly at the Bangladesh site. Stakeholders themselves see wastewater more as a nuisance than as a threat to their health.

At the same time, the situations were characterised by a higher degree of complexity than originally envisaged. Actions are needed to address the nuisance and risks, but geared towards a large number of relatively small sources of pollution. Investments in providing basic access to sanitation are needed to reduce local contamination and sanitary risks in low-income communities. Finally, activities are needed to raise awareness and strengthen knowledge among farmers on how to deal with the wastewater they receive.

Various reasons were found why the issue so far had received little attention in both cities. First of all, there was little awareness among the communities and authorities involved of the situation. It was not seen as the key problem they faced, and little data and information was available. Secondly, wastewater management has so far fallen between the cracks of institutional fragmentation. Different authorities play a role along the chain of contamination, without clear final responsibilities. Even where these exist, enforcement is

poor. This situation is compounded by the fact that poor accountability relations existed between the authorities and those communities affected. A further complicating factor is the mismatch in boundaries: in both cities affected farmers fall under different jurisdictional areas from the municipalities from where the pollution occurs. They therefore struggled to hold those authorities to account.

In view of the above, the relevance of the proposed multi-stakeholder approach of Learning Alliances became even more obvious. The high complexity of the situation indicated that a wider group of actors has a stake in the situation and hence need to be involved in identifying potential solutions. Besides, there was not a clear institutional home or stakeholder group that would have the logical *lead* role in tackling the issue. Last, but not least, a multi-stakeholder approach could allow further underlying governance limitations to be addressed by stimulating dialogue and joint planning and by increasing accountability and transparency.

Through the Learning Alliance approach, stakeholders started to see and understand the full complexity of the sanitation and wastewater situation. They went as far as identifying a vision and implementing actions to move towards their vision. However, most of the solutions identified were “conventional” in nature, and some were inappropriate, such as expensive treatment options. Only towards the end of the project did participants propose more innovative solutions tailored to their particular context.

The Learning Alliance process strengthened the capacity of stakeholders and relations between them to form a more constructive and integrated dialogue and thus to continue addressing the situation. Underlying governance arrangements, such as the institutional fragmentation, did not change as part of the process, but the informal mechanisms through which problems and solutions are identified were strengthened.

Further insights were gained into how to structure and facilitate such processes, for instance, a clear and structured methodological approach is necessary, and the vision-based planning cycle proved useful in this respect. This cycle, in turn, helped the stakeholders to understand each other’s position and to think about downstream impacts. This experience confirmed that these processes require a lot of time and resources, and above all experienced teams with both knowledge of the local context and the legitimate standing among actors to facilitate the process.

The transaction costs of the approach followed are high, in terms of getting the teams in place, initiating the multi-stakeholder process, getting stakeholders to carry out a joint planning exercise and subsequently implement it. However, these transaction costs are

justified in order to prevent wastewater management problems from being ignored or addressed only in a haphazard way.

Recommendations

Based on the lessons learnt in the two cities, recommendations for addressing issues of sanitation and wastewater use in other cities have been formulated.

- **Understand the sanitation chain and the complexity within it.** The cases have shown that the causal relations between (lack of) access to different types of sanitation services, wastewater, crop yield and health risks were different to what was expected. In other cities, these linkages may again be different. Any attempt to address (parts of) the chain needs to start from understanding the entire chain. Emphasis needs to be given to the most important sources of pollution, and the most severe impacts these cause. A Learning Alliance type process can help to address the whole chain and engage the various stakeholders.
- **Promote integrated planning approaches, while also prioritizing quick wins.** The cases have shown the need to intervene at various points along the wastewater and sanitation chain. However, in the past, many efforts have gone into isolated interventions, e.g., treatment at the end-of-the-pipe, or provision of access only. An integrated planning approach provides a framework for identifying and linking those types of interventions, and should be promoted. At the same time, certain issues can be addressed on the basis of intuitive knowledge, and do not require a full planning cycle. In this way, quick wins can be obtained, and stakeholders' interest maintained.
- **Work within the existing governance context**. Many of the root causes for the poor sanitary situation lie in weak governance. This should not form an impediment to working on wastewater issues, but any efforts to develop an integrated planning approach need to start from the current reality of urban development and planning, and strengthen capacity in a pragmatic way from within this reality.
- **Provide facilitation support**. To have constructive dialogue, planning and implementation, facilitation is needed. It is not likely that many small towns will have the skills and resources for integrated planning, let alone the capacity to facilitate this kind of participatory process on their own. Support from external or local stakeholders with experience in participatory planning is likely to be needed, along with sufficient human and financial resources to invest in the process. Involvement of local universities or resource centres can be beneficial both in improving knowledge and increasing sustainability. The stakeholder facilitating the PAP process must be seen not to have a vested interest and must be acceptable to the stakeholders involved.

- **Gradually build an inclusive membership of the Learning Alliances, but maintain stakeholder clusters.** The Learning Alliance requires an inclusive membership; however, not all stakeholders will be equally empowered at the beginning of the process. Therefore it may be good to first work with clusters of stakeholders who are on a more or less equal footing, and gradually build a full Alliance. At the same time, in order to maintain speed, work with a core group of motivated stakeholders, but make continuous efforts to involve a broader group where appropriate and relevant. Jointly identifying areas for further assessment could also help involve stakeholders at an early phase. Ensuring that a wide range of stakeholders is involved in the formulation of problems, visions and strategies is an important requirement for an inclusive process and for ownership of the actions.
- **Promote out-of-the-box options**. Through the planning process stakeholders should identify solutions that they consider most relevant. However, there is a risk that they stick to the options they know best, and reinforce current unsustainable water management practices. Bringing in outsiders who can promote, but not impose, out-of-the-box options and help identify innovations that are feasible in the specific context at hand is a useful approach, and facilitators should not be afraid to do so.
- **Linking to higher levels of scale.** Pollution has effects that cross administrative and institutional boundaries. Many aspects of environmental sustainability cannot be dealt with within urban areas alone. Therefore, governance arrangements that encourage co-operation between local governments and provide for policy formulation and action on a city-regional scale are needed. Efforts should be made to link citywide planning processes to governance reforms at higher levels of scale.

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About IRC

IRC facilitates the sharing, promotion and use of knowledge so that governments, professionals and organisations can better support poor men, women and children in developing countries to obtain water and sanitation services they will use and maintain. It does this by improving the information and knowledge base of the sector and by strengthening sector resource centres in the South.

As a gateway to quality information, the IRC maintains a Documentation Unit and a web site with a weekly news service, and produces publications in English, French, Spanish and Portuguese both in print and electronically. It also offers training and experience-based learning activities, advisory and evaluation services, applied research and learning projects in Asia, Africa and Latin America; and conducts advocacy activities for the sector as a whole. Topics include community management, gender and equity, institutional development, integrated water resources management, school sanitation, and hygiene promotion.

IRC staff work as facilitators in helping people make their own decisions; are equal partners with sector professionals from the South; stimulate dialogue among all parties to create trust and promote change; and create a learning environment to develop better alternatives.

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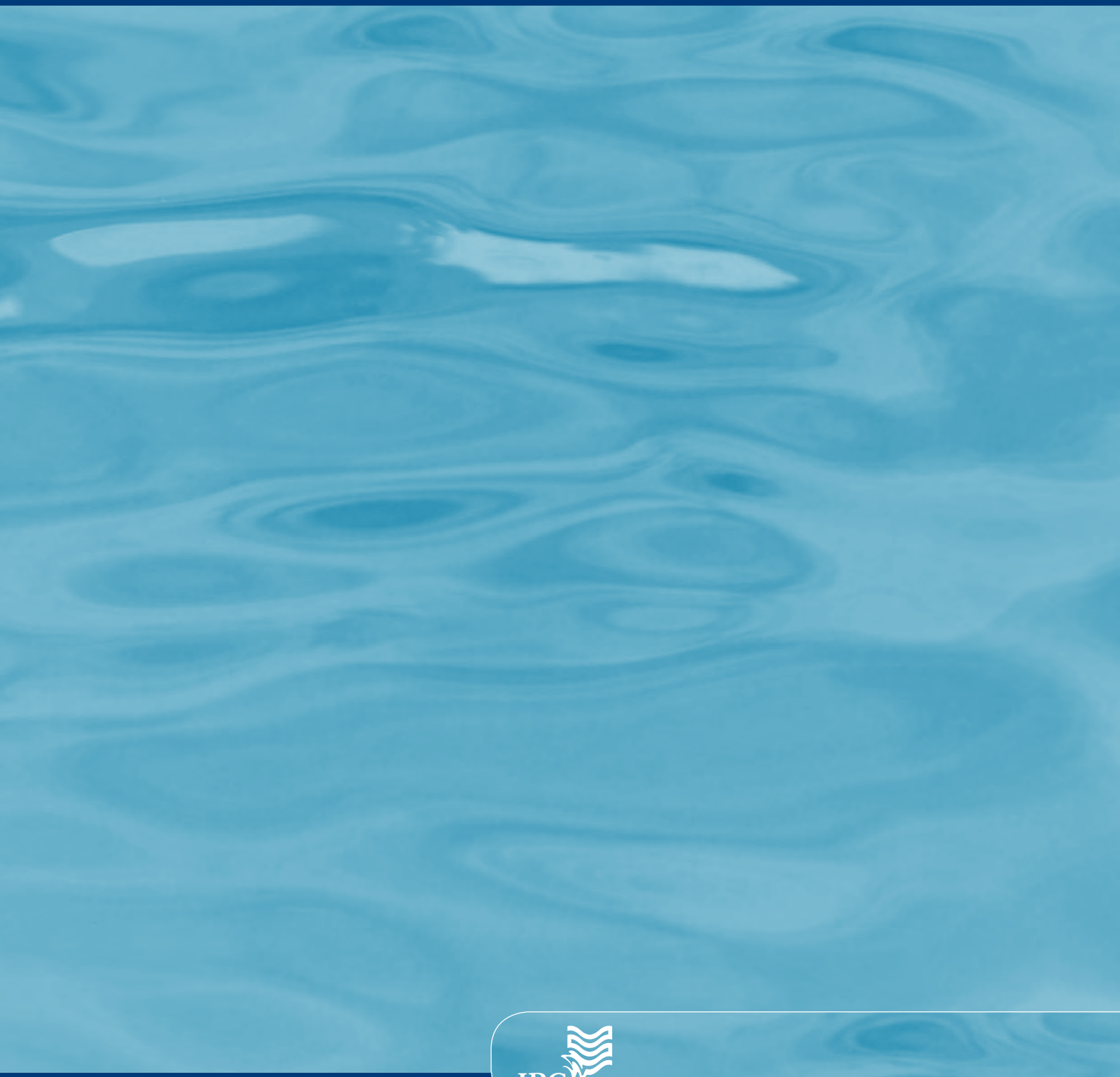

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