

BESSE newsletter 6

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SEPTEMBER 2012

Final Seminar in Brussels

The European Economic and Social Committee in Brussels hosted the Final BESSE Policy Seminar in September 2012.

The seminar was attended by fifty invited sanitation, local government and policy experts from Europe.

The programme had two distinct foci, being and information session to set the scene about BESSE, and knowledge brokerage in the field. BESSE partners shared their experiences and what they experienced in the pilot projects, through their research and ultimately how knowledge is brokered to affect change.

This first session was enriched by speakers from different policy environments, such as the Council of European Municipalities and Regions; DG Environment—European Innovation Partnership on Water Efficiency; and DG Research and Innovation of the European Commission. Snippets from the valuable input by the guest speakers appear later on in this newsletter.

The second part of the Seminar focused on the lessons learnt from a policy perspective. Speakers consisted of BESSE project's research partner, the LSC and guest speakers from Municipal Waste Europe, TNO and from the DG Research and Innovation of the European Commission.



Newsletter 6

Brokering Environmentally Sustainable Sanitation for Europe

BESSE Concludes its 3-year Knowledge Brokerage Programme

The BESSE project ended at the end of October 2012. While this is our last newsletter, our website will stay alive for some time.

BESSE was a project that was as much about the ten consortium partners researching, testing, learning and debating the different perspectives held on what they understand to be knowledge brokerage, as policy experts pushing for a more general applicability of local practices and academics querying what exactly sustainability could mean in a sanitation context. BESSE has truly been an extensive knowledge brokerage project from beginning to end!

extensive Resource File (downloadable from the BESSE website); and a Policy Brief that summarises the policy outputs (also downloadable from the website).

The book summarises the main findings pertaining to knowledge brokerage in the EU-FP7 project BESSE (Brokering Environmentally Sustainable Sanitation for Europe), while the Resource File was conceived as a publication that provides background material for the book and that gather the main documents produced in the framework of BESSE.



WBL Wastewater Treatment Plant in the Limburg Province, The Netherlands

To conclude the BESSE project, two major products had to be delivered, being publications that outline the lessons learnt during the project and policy implications for environmentally sustainable sanitation for Europe; and a set of policy guidelines which would guide the discussions at a final seminar.

A number of final documents were produced: firstly, a book entitled '*Knowledge Brokerage for Environmentally Sustainable Sanitation*', edited by project partners Wiebe E Bijker (Maastricht University, The Netherlands) and Giovanni Caiati and Luciano d'Andrea (Laboratory of Citizenship Sciences, Italy); an

About Knowledge Brokerage

Knowledge brokerage is the activity and the process to facilitate knowledge and technology to move from one place to another, in order to help individuals and organisations learn, innovate and improve.

BESSE's testing ground to experiment with knowledge brokerage was environmentally sustainable sanitation (ESS) and the question it set out to answer was 'how to facilitate innovation in the sanitation sector to make it more sustainable'.

BESSE concludes its 3-year knowledge brokerage programme ... cont.

Although focused on sanitation and sanitation-specific problems related to knowledge transfer, most of the project outputs had a broader relevance since they touched on issues which emerged when environmental policies are concerned. Moreover, BESSE's experience may also have relevance with respect to how knowledge dynamics - linking research, industry, policy making and society - are changing in Europe. This is particularly relevant for the European research policies that, through the shift from the 7th Framework Programme to Horizon 2020, is now seeking to intensify such relationships in order to boost research and innovation.

Three wastewater treatment organisations in Bulgaria, Italy and The Netherlands provided the empirical research sites for BESSE. These companies (and the public authorities that are responsible for their management) collaborated with research and public policy institutions to experiment with and reflect on innovative processes and the possible role of knowledge brokerage therein.

A key lesson about knowledge brokerage that emerged from this collaboration, was to recognise knowledge brokerage when it happens, and then to value it and to enhance it. This learning process was unique in as much as the BESSE project itself was a knowledge brokerage project. And, not surprisingly, this learning was about what precisely is meant by 'environmentally sustainable sanitation', what 'knowledge brokerage' meant for all of us, and about the very aims and set-up of the BESSE project itself.

Publication: Knowledge Brokerage for Environmentally Sustainable Sanitation

This book reports on the European Commission-funded project: Brokering Environmentally Sustainable Sanitation for Europe (BESSE) G.A. 226744

BESSE was funded in the EU-FP7 programme Enhancing connectivity between research and policy-making in sustainable development' (ENV.2008.4.2.3.2).

The BESSE project was carried out by a consortium comprising ten partners between June 2009 and October 2012.

The book comprise of six chapters summarising the project. Extracts from the book, specifically focusing on policy issues start on page 8. The contents are:



1. **Introduction**
2. **The BESSE project as a learning process**
 - Environmentally sustainable sanitation: principles and orientations
 - Environmentally sustainable sanitation: what is at stake?
 - Knowledge brokerage: a preliminary conceptualisation
 - BESSE: its process and structure
3. **BESSE Empirical Studies of Knowledge Brokerage in Environmentally Sustainable**
 - Sanitation
 - Analysis of the state of the art
 - Pilot projects
4. **Knowledge Brokerage and Innovation: towards a new understanding**
 - A difficult path
 - Four forms of resistance to innovation
 - The innovation cycle
 - The multifaceted role of knowledge brokerage for a more sustainable sanitation
 - From professional brokerage to strategic brokerage
5. **Lessons learnt**
 - Understanding knowledge brokerage
 - Setting up knowledge brokerage
 - Applying knowledge brokerage
6. **Policy guidelines**
 - Policy framework
 - Overall Recommendations
 - Recommendations for research institutions
 - Recommendations for utilities and technology companies
 - Recommendations for civil society organisations
 - Recommendations for policymakers
 - The future mission of knowledge brokerage in sanitation

<http://www.besse-project.info/viewer/file.aspx?FileInfoID=72>

The Final Seminar: Inputs from Specialists

Setting the Scene to Discuss Sanitation Policy for Europe

Martin Siecker

European Economic and Social Committee

The European Economic and Social Committee is delighted to host this event, as the issue of water management features high on our political agenda, linked to the themes of sustainability, growth, solidarity and development. We have been closely involved in the policy dialogue leading to the European Innovation Partnership on Water, and we will actively participate in the discussions in the framework of the forthcoming Blueprint on Safeguarding Europe's Water Resources.

Unlike almost any other resource, water has no alternative for life on our planet.

In



Martin Siecker, EESC

the face of climate change and increasing pressures on water resources, we need to look critically at our current water management systems, in order to meet the competing needs of domestic use, agriculture, fisheries, industry, transport and natural ecosystems.

The EESC notes with concern that numerous people in Europe continue to have no free access to running water and sanitation. These people often belong to the most marginalized groups of society. The EESC links the challenges associated with water management to the fight against poverty and the goal of eradicating it. It is important for member states to stay vigilant and improve important aspects in water services such as ownership, pricing, reinvestment and maintenance of works and infrastructure.

In addition, we are aware that existing sanitation networks are facing significant challenges related to their water resource use, environmental impacts, health risks and financial costs. We need

a comprehensive review of our approach to urban wastewater in order to develop new, sustainable solutions. This is why I am especially pleased to open this seminar addressing the critical subject of sanitation: a sector which has seen too little research and innovation in recent decades.

As the EU body representing organisations of employers, employees, farmers, consumers, and other civil society stakeholders, the EESC advocates continuous networking and knowledge transfer among all actors in the water sector. In the field of environmentally sustainable sanitation in particular, we are convinced that such a dialogue will help to:

- ◇ raise awareness about the challenges related to current sanitation systems;
- ◇ bring sustainable sanitation high on the policy agenda;
- ◇ define the needs of stakeholders and better target research and innovation efforts;
- ◇ promote potential or applied ESS solutions, and make their benefits visible; and
- ◇ build a culture of continuous cooperation and trust among the key players in the field.

Let me congratulate the BESSE project team for their comprehensive analysis and policy recommendations on addressing the institutional, technological, social and cultural challenges to innovation in the field!

The CEMR Perspective

Marie Bullet

Adviser, Environment, Energy, Transport and Climate Policy, Council of European Municipalities and Regions

The CEMR (the umbrella organisation of the BESSE partner AICCRES) seeks to influence the EU's wide-ranging environment law-making agenda, and works with the Commission to develop new policies and initiatives.

Ms Bullet stressed the issue that the CEMR is increasingly becoming involved in climate change and specifically water and sanitation. The organisation had created a focus group addressing water

from a global perspective. Water and sanitation is an important issue as the Millennium Development Goals have not been reached for sanitation in Europe. At European Union level we follow the blueprint for water, but for urban wastewater the water treatment directive is followed. It is evident that countries are struggling to implement the directives. Thus, the onus rests on municipalities to provide good water and sanitation on the one hand. However, on the other hand there is an economic crisis and the issues of finances and investments need to be considered as local and regional investments have declined throughout Europe and globally and these issues will again be under pressure in the next budget rounds.

It is against this background that innovation becomes critical and where better bridges need to be built between researchers and policy makers. It has never been as important for these different sectors to work together and emerge with innovations that will enhance service delivery while at the same time consider the financial constraints.

For CEMR the four issues to keep in mind are: the key role that local and regional government plays; the ever-increasing financial constraints within which they work and are still expected to deliver services; the greater imperative on innovation and to consider that the sanitation MDG target has not been reached and the need to address this is immense.



Marie Bullet, Council of European Municipalities and Regions

Final Seminar: Keeping Reality in Mind...

Panagiotis Balabanis

Deputy Head of Unit of Sustainable Environment, DG Research & Innovation, European Commission



Panagiotis Balabanis, Deputy Head of Unit Environmental Technologies, DG Research & Innovation, EC

The BESSE project is important and the results show that we have changed the way in which we implement our policies.

It is important that we integrate research and policy making and emphasise the creation of a new dynamic.

It is good to bring together different stakeholders to find solutions and it normally works during the project life. But, what will happen when the project ends? What will the people of this consortium do in terms of the lessons learnt? It is difficult to follow through on the project lessons learnt, and very often this does not happen after a project has ended. Another problem is that it is not clear what is possible in terms of the lessons from projects. The questions that need answers are: who will implement the recommendations? How do we make this happen? Is it the people who work in municipalities? What is very important is that in the BESSE project, we

have addressed this gap. However, it is important that the discussions during this seminar extract how to bring about the change.

The European Union has numerous funding streams that often address the same issues. However, there are structural funds that can be used. It is a fact, though, that there is a disconnect between the different funding opportunities. The question then is, is it possible to combine the funds? Regulations do not permit that as it is clear that when you receive structural funds, you cannot get other funds. What the EU is trying to say is to get assurance for a whole cycle in order to have continuation. BESSE was successful in getting funding as there was money available.

The results of BESSE are timely as the research is fully committed to facilitate synergies and to address some of the recommendations. Another issue of importance is whether the recommendations are applicable to developing countries and to what extent. How do we transfer these results to developing countries, for instance Africa?

Lastly, one thing that may be interesting to take forward is the issue of innovation – a very important element. As per its definition, innovation means a change in traditional sanitation practices and approaches. However, it is also important to keep in mind that we have to ensure that the results of this project are defined and linked to reality. Do we know how it relates to markets and jobs, etc.? How do we transfer these results to developing countries, for instance, Africa?



Speakers Panel: Wiebe Bijker (BESSE Coordinator, Maastricht University), Panagiotis Balabanis (EC), Andrew Cotton (Seminar Chairperson, WEDC)

European Innovation Partnership on Water Efficiency

Robert Schroeder

DG Environment, European Commission, European Innovation Partnership on Water Efficiency

There are many parallels between what the BESSE project set out to do and what the European Innovation partnership on Water Efficiency has as a mandate. There are thus many opportunities to cooperate.

The directorate focuses on two primary objectives, being to facilitate and support development of innovative solutions to water challenges, and to create market opportunities for innovations. During the present time of economic stress, combining market opportunities with research projects with the aim of stimulating economic growth is a very good idea.

The basis for the innovation partnership is to ensure that the innovation value chain is streamlined and effective. One sees this at the different elements of the innovation value chain where the elements are fragmented, for example research, technology development, market application and export all focus on different aspects. What we do see is that there are still problems how to connect these elements and to function well together. We need to ask ourselves, what are the bottlenecks and barriers? It could be legislative and regulations, dealing with standards. It could be financing, or procurement practices. How can we improve this for innovation? What EIP strives towards is not to create another initiative, but rather foster better coordination between projects and to bring together the project elements to streamline this cooperation. It could be under an umbrella body that make use of the project outputs and initiatives and coordinate better.

The BESSE project can be very useful for this: when we start implementing our own work we can learn from BESSE how to deal with the bottlenecks so that we can ensure that the value chain will perform more efficiently.

There are a number of principles: to support innovation partnerships and the one way to do this is to look at multi-disciplinary approach. If one talks about innovation, it is not a fragmented concept where one component on its own is referred to, for instance research and development. Included in the holistic construct is also, for instance financial

engineering, ensuring that smaller companies can bring their products to the market. At the same time, public awareness is critical as public health is a key issue. People want to know that their public health is protected. ICT is another component should be included. Finally, if we work on innovation, it is critical to involve all different stakeholders, being



Robert Schroeder, DG Environment, European Innovation Partnership on Water Efficiency, European Commission

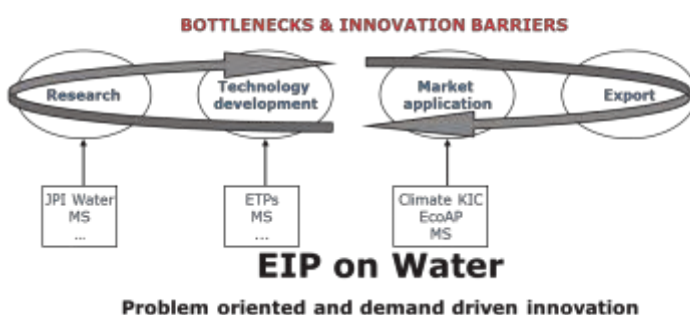
the citizens and their local governments as they are often on the demand side of innovation. One thus has to ensure that the innovation is of value to this target audience.

The third principle that the EIP embraces is to ensure that the demand and supply sides of the innovative value chain are better connected. These are fundamental components and the BESSE project has very clearly indicated how knowledge brokerage can be applied to bring together the logical elements of innovation and research and technology. It is, however in putting them into practice, where the challenge lies. Insights from projects such as BESSE are very useful as it offers us the opportunity to address these issues and to prevent the same mistakes being made again.

The outputs that the EIP want to have are:

- ◇ By 2013 the development of networks around priority areas of action will be established;
- ◇ By 2013 the EIP will make financial support available for demonstration projects linked to the priorities;
- ◇ By the middle of next year there will be a web-based market place operational (connect demand and supply sides of innovation), where demand and supply can find each other over borders. They often function on a regional or national level;
- ◇ In two years' time, the EIP hopes to have identified the barriers to innovation and propose ways to break down barriers. This will include elements such as legislation, standards, etc.;
- ◇ By 2020 there should be tested solutions for at least ten major water challenges that can be marketed;
- ◇ Dissemination will be a key element as not often successful innovations are promoted and
- ◇ New mechanisms will be stimulated through a partnership approach.

EU added value



If you're not failing every now and again, it's a sign you're not doing anything very innovative.
(Woody Allen)

Final Seminar: Keeping Reality in Mind...

Wanda Gaj

DG Research and Innovation, European Commission



Wanda Gaj, Unit Environmental Technologies, DG Research & Innovation, European Commission

Each project and each project partner needs to remind themselves in our different work to concretely take responsibility.

Wanda Gaj was the project officer responsible for the BESSE project for the duration of three years.

Her message:

Some of the Brokerage projects are now coming to the end, and I am moving from one final conference to another, seeing that at the very

beginning we all noticed that we had a natural tendency to stay within our comfort zones. There is a comfort zone for researchers; there is a comfort zone for policy makers; and there is a comfort zone for citizens. We all like to be in the comfort zone.

I was very pleased to hear this morning that the BESSE project started from some fundamental disagreement, or several fundamental disagreements, and then discovered that knowledge is dynamic and it changes while moving because what I understand is that knowledge brokerage is very much about pushing us or the others (but mostly us) outside of our comfort zones. And this is a kind of job that is not always rewarding. In fact, most of the time is not rewarding. It's a job that is somehow putting us and the others in a uncomfortable position. And this raises the question: Why are we all doing this?

What we want to do with knowledge brokerage is put a coma instead of a full stop: something that opens and does not close or draw conclusions on some issues.

Vanya Veras

Secretary General, Municipal Waste Europe

This presentation touched on the practical aspects dealing with waste manage, specifically solid waste management, which is waste generated at municipal level. The links between sanitation and solid waste management are many: waste management is a public responsibility as it concerns the health and welfare of citizens. Normally, citizens expect the municipality to deal with these public responsibilities and they do not concern themselves with it as it is not their problem. However, as soon as citizens are faced with the

question or a new project or the building of a new plant, then they start to get involved. They then express themselves that why change things that don't need changing, why are things changing on my doorstep? They then suffer from NIMBY (not in my back yard). It is this aspect of BESSE - where knowledge is brokered and where technology and innovation information is brought to citizens or municipality and vice versa - that is critical for the municipal waste management.

The BESSE project explored the mechanisms of bringing this message home. It is thus important that the information that the BESSE project created should not be lost. It should be passed on to other projects, for example, to the waste management environment.

On the one hand we have innovation and on the other we have the need of the municipality. Municipalities need new, efficient, and cost effective technologies but they firstly generally lack the investment funds and secondly, they lack the knowledge to understand how they will use the technology. In this case, it is important that a knowledge broker acts as a mediator in order to assist them. For the funding component of this the EU funding programmes are important.

In terms of technologies, many municipal regions in Europe need wastewater treatment plants as they have none. This situation prevails in many of the new member states or the old member states in the south of Europe. The knowledge gap there is huge and in many instances, they simply don't have the knowledge. Coming to them with a solution that can provide them with a quick, long-term and affordable solution is a way to achieve sustainability in terms of environment as well as for the economy. It is often cheaper in many ways as it includes the long-term spin-offs, for instance health benefits and reduced health treatment costs. As far as government is concerned one then approaches economic sustainability as well as environmental sustainability.

In terms of public procurement, there is a knowledge transfer gap on European level. Public procurement any feedback that is needed from environmental domain needs to be fed into parliament now. Next year there will be new directors and they are trying to put the squeeze on the flexibility of municipalities to make their own choices.

What is the next step? A follow-up BESSE project to test the new technology and at the same time as testing the project, making a business case for the ease of implementation, is needed. There are various ways in which to do this.



Vanya Veras, Secretary General, Municipal Waste Europe

Final Seminar: Keeping Reality in Mind...

Adriaan Slob

TNO, The Netherlands

PSI-connect project is an FP7 project funded by the EC. While this project has many parallels with BESSE, it also has a few differences. For instance, the starting points were differed: PSI-connect finished in April 2012, so the Lessons Learnt has already been extracted. From this project the partners learnt through a hands-on approach how to do things.

What was PSI-connect all about?

It had two components, the first one being the water policy part. In the European Union Water Framework Directive, the issue of policy changes in different types of policy processes in EU countries needed to be appraised and PSI-connect looked at how to connect best science and knowledge to these policy processes.

The second component was climate change and more specifically the flood directive for climate change. In some countries these two concepts are integrated and sometimes they are not integrated. How then, do we get the issues to the policy makers and the to the policy process? PSI-connect acted as the knowledge broker in this instance to bring these processes together.

PSI-connect connected at different levels and to different types of policy processes and the project acted in real-life settings. It meant that when the lessons were extracted from the project, the project partners first had to look at themselves. This process taught all the partners and there was a specific work package to track their progress. The impact and processes were then evaluated and the responses analysed.

The first view of knowledge brokerage – when the project was being built - was that the concept is not very technical and it is about knowledge. If one talks about knowledge, one talks about the people who carry the knowledge. It is a

social process and in brokering knowledge, and in translating knowledge one has to go into communication and relationships. Meetings are important to build up the relationships and communication channels are also types of meetings. One of the things the project observed was that people really make the difference. With some people it was easy to connect and with others it is very hard to get a knowledge brokerage action going. And sometimes it did not work at all.

If one talks about making the connection between policy scientists and stakeholders, it can be very broad and not easy. Languages – and in this instance language does not refer to mother tongue language – as tools of people's interests needed to be developed in order to get to a point where a new language could be used and so that people could understand one another. Here timing was very important as it took time to build trust, which means that a lot of patience is required to eventually reach joint a understanding(s).

There are numerous processes that one can apply to come to a better understanding, which is also a joint understanding. The processes work to help share knowledge and generate new insights. It can also help to jointly come to new knowledge. The application of new knowledge is a change issue and this is another component of PSI-connect that is parallel to BESSE.

If one looks look at the application part of the processes, new knowledge is easily taken up when it fits into a routing or fits into the rules of the organisation. However, if it is new and different, and does not fit into the organisational picture it can be very difficult to change people's minds and one needs to see this from a change perspective. Knowledge brokerage can be a lot of things and do a lot: it can be exchanging knowledge or communicating with different groups and it can be making new knowledge together.

It is to make this new knowledge work that is the difficult question.



Speakers Panel: Marie Bullet (CEMR), Wiebe Bijker (BESSE Coordinator, Maastricht University), Panagiotis Balabanis (EC), Andrew Cotton (Seminar Chairperson, WEDC) and Adriaan Slob, (Psigonet, TNO)

KNOWLEDGE BROKERAGE FOR ENVIRONMENTALLY SUSTAINABLE SANITATION

The book *Knowledge brokerage for environmentally sustainable sanitation* was edited by Wiebe E. Bijker, Giovanni Caiati and Luciano d'Andrea

The BESSE project started from the diagnosis that there is a gap between the practice of sanitation and the available knowledge and technologies. Most sanitation plants in Europe are still using old technologies and obsolete management systems. These plants do not even begin to meet the sustainability criteria that are becoming increasingly pressing, such as reducing energy costs and limiting environmental impact. At the same time, universities and other knowledge centres have sophisticated technologies in stock that would greatly contribute to a more environmentally sustainable sanitation. How do we bridge this gap?

We bridge this gap by, inter alia, dealing with the policy framework currently in place and showing the relationship between what the sanitation environment currently entails and the policy changes that need to be made in order to facilitate movement in the sanitation sector to meet current (modern) needs.

As the project has shown, the context for innovation is unfavourable in the field of sanitation. The dominant orientation is towards 'conservative innovation', for instance, a slow innovation process that stays within the path of traditional 19th-century sanitation. The sustainability paradigm, which is slowly entering energy production and urban solid waste management, is still hardly making way into sanitation.

Perhaps the most significant fact emerging from BESSE is that, to sort out this impasse, major sanitation actors have to develop their own strategic knowledge brokerage, understood as a coordinated set of actions and programmes (in short, a policy) aimed at using knowledge brokerage to speed up the transfer and exchange of scientific, political, environmental, organisational or technological knowledge within the sector. This requires the creation or strengthening of all dialogue structures, facilitating boundary work, whatever form they may take (innovation networks, roundtables, local observatory, participatory structures, etc.), as well as making knowledge transfer a permanent habit of sanitation actors and, therefore, a characteristic of their culture and a part of their operational standards.

A second fact highlighted by BESSE is that the lack of innovation in sanitation cannot be solved by only improving the interactions between research and industry, but mostly by 'injecting' knowledge brokerage in all phases of the innovation process. Strategic knowledge brokerage should therefore involve not only research institutions and utilities, but also the other major sanitation players, beginning with civil society organisations (especially environmental movements) and policymakers.

A third fact emerging from BESSE is that, at all stages of the innovation process, several practitioners (perhaps in smaller numbers than other sectors) are systematically performing functions of knowledge brokerage, as professionals or civic activists, although they are often not recognised - and then

find it hard to recognise themselves as knowledge brokers. They can be found, for example, in the university liaison offices and science parks, science communication agencies, enterprise incubators, industrial districts, water utility networks, scientific and professional associations, water companies' units, entities promoting media campaigns or engaged in social lobbying (for example, through rating or review activities) on environmental issues. Operationally they can be referred to 'KB practitioners'.

Despite the presence of large overlaps between the strategic knowledge brokerage played by sanitation actors and the practical knowledge brokerage performed daily by KB practitioners, in the guidelines it may be useful to consider them as two distinct objects. They are viewed here as the two souls of knowledge brokerage as a whole; two souls to be integrated in order to achieve tangible results. Without a strategic perspective, in fact, KB practitioners may lose sight of the underlying objective to be pursued, namely to accelerate innovation in sanitation and direct it towards more sustainable technologies and procedures. On the other hand, strategic knowledge brokerage may encounter serious difficulties in turning ideas to facts without developing them in a practical dimension.

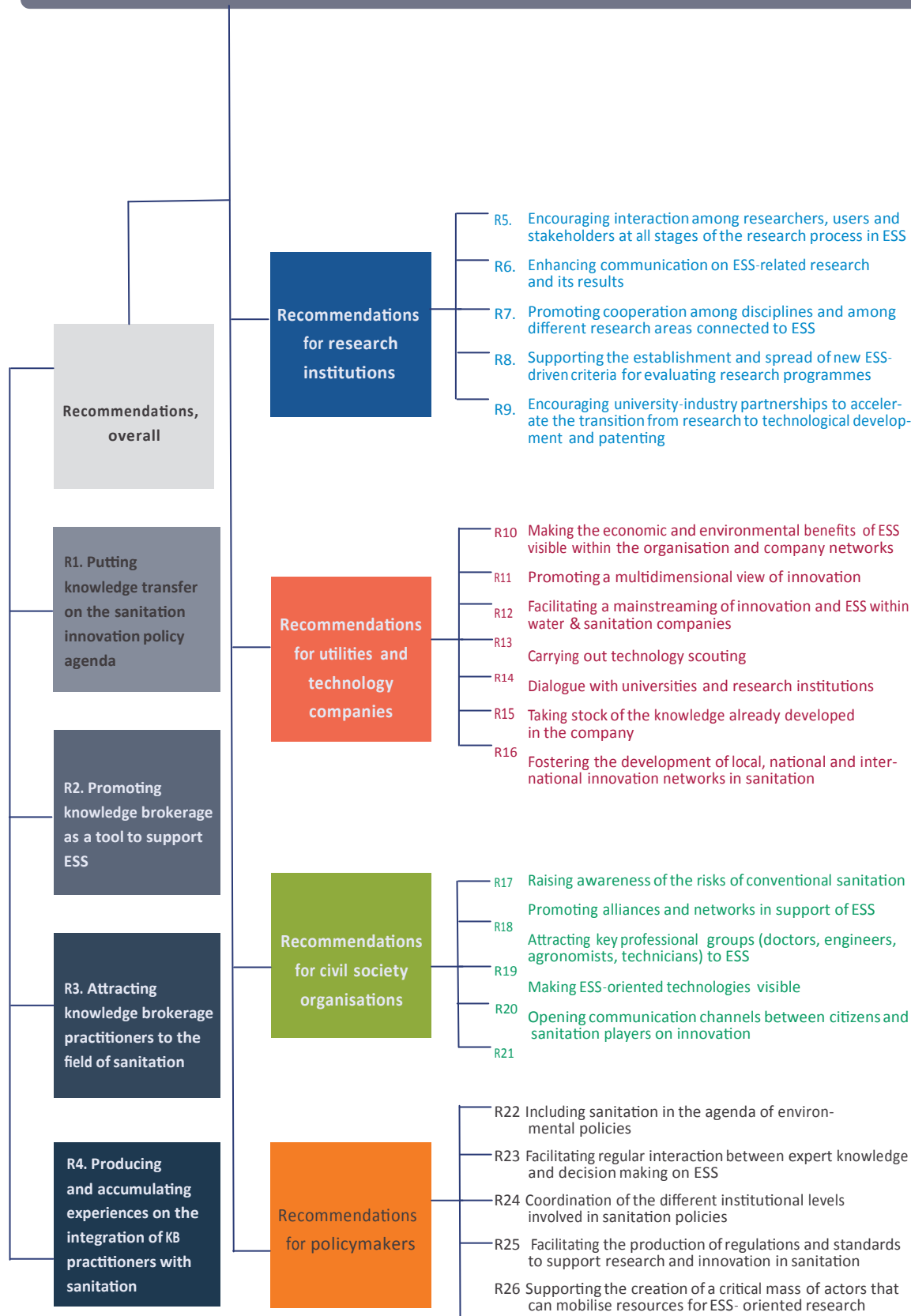
These guidelines focus attention on strategic knowledge brokerage. However, they will also present what emerged from BESSE to support practical knowledge brokerage in sanitation, keeping in mind that there is a broad tradition of practices and resources that KB practitioners - be they professionals or activists - can refer to.

The policy guidelines are therefore organised into five sections. The first includes recommendations for the overall development of knowledge brokerage in sanitation, while the other four present recommendations respectively addressed to research institutions, utilities, civil society organisations (especially environmental movements) and decision makers. Of course, all recommendations are also addressed to the European Commission and the other European institutions. In the new perspective of Horizon 2020, these are destined to increasingly play a role in removing existing obstacles (related to, for instance, communication, professional cultures, policy strategies, interests and value), and in stimulating cooperation between key societal actors involved in research and innovation.

The recommendations are drawn from BESSE and, in particular, the map of the obstacles and facilitating factors for innovation in sanitation, the pilot projects, the inventory of innovative practices and the lessons learnt. At the end of each section there are some methodological suggestions aimed at KB practitioners, as they emerged from BESSE.

On the page 9 is a roadmap of the policy guidelines.

POLICY GUIDELINES OVERVIEW



POLICY GUIDELINES: RECOMMENDATIONS

A first set of recommendations is designed to support the use of knowledge brokerage as a common practice in the field of sanitation.

R1. Putting knowledge transfer on the sanitation innovation policy agenda

THE ISSUE. Most key players in sanitation are barely aware of the extent to which the delays in innovation stem from problems of identification, transfer and use of knowledge. A first step to be taken is, therefore, that of putting the issue of knowledge transfer on the agenda of such key players. Without improving knowledge transfer process overall, the aim of spreading more sustainable technologies in Europe remains impossible.

ACTIONS. Seminars on transferring knowledge to business associations, research institutions and civil society organisations, collection and study of best practices; development of information tools on knowledge transfer; development of dissemination tools.

R2. Promoting knowledge brokerage as a tool to support ESS

THE ISSUE. Knowledge brokerage is not widespread in sanitation. Bringing out the relevance of knowledge transfer to encourage more sustainable sanitation does not automatically mean promoting the spread of knowledge brokerage. Key players in sanitation should therefore understand that knowledge transfer cannot be achieved in the absence of a parallel spread of brokerage-related expertise, skills and professionals. Promoting knowledge brokerage should be a responsibility which primarily involves institutional actors, but also the national, European and International networks of local governments², sanitation professionals³, research institutions in the environmental field⁴, institutes engaged

in environmental communication⁵ and environmental organisations.

ACTIONS. Communication initiatives; awareness-raising campaigns; internet portals; scientific and political dialogue initiatives; development or reinforcement of networks involving knowledge brokers operating on environmental issues; dissemination of publications of a technical nature (toolkits, guidelines, handbooks) on knowledge brokerage.

R3. Attracting knowledge brokerage practitioners to the field of sanitation

THE ISSUE. Knowledge brokerage is a professional field, which is still growing. There is an increasing awareness, among KB experts themselves, about the importance of applying knowledge brokerage, not only in areas where it is now most widely used (for example, that of medicine) and not merely for transferring knowledge from research to industry. There is therefore a favourable context to propose sanitation and, more generally, water cycle management as a privileged locus of professional commitment for knowledge brokers. This, however, requires a special effort, especially by the key players of national and international water and sanitation policies, to promote initiatives specifically geared to attract KB practitioners.

ACTIONS. Communication actions aimed at knowledge brokers' networks and institutes; involvement of experts in knowledge brokerage in activities (seminars, conferences, publications) focused on water and sanitation.

R4. Producing and accumulating experiences on the integration of KB practitioners with sanitation players

THE ISSUE. To hasten the application of knowledge brokerage in sanitation, it is essential to promote a rapid accumulation of experiences based on the integration of KB practitioners and sanitation players. The goal is to show that integration can and must become a usual practice in sanitation.

ACTIONS. Dissemination of experiences already carried out; promotion of new integration initiatives (also in the form of pilot and demonstration projects); implementation of benchmarking initiatives aimed at transferring integration practice from other sectors; promoting research programmes of an experimental nature aimed at testing for structural change hinging on the integration of KB practitioners in research institutions, utilities and civil society organisations.

Recommendations for research institutions

A second set of recommendations addresses research institutions, public and private. For them, the knowledge brokerage priority is to increase the relevance of research results to application contexts in order to have more substantial and rapid impacts on the innovation processes in sanitation.



Source: Sulabh International: Museum of Toilets

POLICY GUIDELINES: RECOMMENDATIONS ... cont.

R5. Encouraging interaction among researchers, users and stakeholders at all stages of the research process in ESS

THE ISSUE. One of the main features of what is called 'post-academic research' is research that takes into account the potential contexts of use of the knowledge produced. Knowledge brokerage can greatly contribute to this process, encouraging close interactions between researchers, direct users of research results (technology development companies, utilities, etc.) and stakeholders (such as civil society organisations) in all phases of the research process. Such interactions can also increase the quality of knowledge demand and supply, and further develop viable ESS-related strategies.

ACTIONS. Development of intermediate structures between research and business (science parks, university liaison office, etc.) specialised in sanitation; agreements between utilities, technology developers, environmental organisations and research institutions for the creation of joint research teams, dialogue initiatives among universities, technology companies, utilities and civil society organisations on research programmes in sanitation; organisation of science days, conferences and seminars on sanitation issues.

R6. Enhancing communication on ESS-related research and its results

THE ISSUE. Sanitation research is still facing major obstacles in benefiting from global trends in research, often remaining limited to the national dimension. This is partly because the technology market in this sector is still hardly globalised and highly dependent on national and local actors. Knowledge brokerage can provide an important support to bridge this gap by strengthening the access to and the circulation of high quality information on ESS-related research. This action is primarily directed at major sanitation actors, but also at the public at large. In this way, knowledge brokerage should also foster greater public attention on economic, environmental and social research programmes and encourage greater transparency in the activities of research institutions.

ACTIONS. Creation of databases, internet platforms, internet-based repositories and inventories on research programmes and technological options; development and circulation of documents summarising the scientific knowledge produced or in production, also through internet-based tools (news aggregators, websites, blogs); exhibition and fairs; dissemination activities through community outreach programmes; scientific communication activities (television, magazines, websites, events, etc.) on sanitation.

R7. Promoting cooperation among disciplines and among different research areas connected to ESS

THE ISSUE. The production of new knowledge in the field of sanitation is severely hampered by poor communication between scientific disciplines. In fact, sanitation is, by its

nature, an interdisciplinary research field. However, a significant proportion of research in this area follows an academic approach that tends to reinforce disciplinary boundaries, which in turn foster institutional and communication barriers. A specific role of knowledge brokerage is then to remove, or at least lower, such barriers by creating bridges between the different stocks of knowledge, fostering interdisciplinary communication and promoting the emergence of common research protocols.

ACTIONS. Organisation of interdisciplinary research seminars; promotion and wider use of interdisciplinary journals, publications and websites focused on sanitation; identification and establishment of regular communication channels among research teams working in different disciplines or in complementary research areas; cooperation agreements between scientific societies; organisation of courses, lectures and seminars focused on ESS involving different disciplines or research areas.

R8. Supporting the establishment and spread of new ESS-driven criteria for evaluating research programmes

THE ISSUE. In the field of sanitation (and in other sectors



POLICY GUIDELINES: RECOMMENDATIONS ... cont.

too) research programmes are rarely evaluated according to their potential for innovation, their technological applications and their impact on environmental sustainability. Knowledge brokerage activities may be particularly useful to stimulate the inclusion of such criteria in research evaluation procedures; for example by facilitating the connection between funding agencies, research institutions and users of scientific knowledge (such as technology developers and water companies).

ACTIONS. Dialogue and consultation initiatives involving funding agencies, researchers and other stakeholders in the setting of funding programmes; inclusion of representatives of utilities and non-academic experts in the evaluation teams; gathering and dissemination of innovation-oriented evaluation practices; internet-based discussion spaces (forums, webzines, on-line conference and events) devoted to the issue.

R9. Encouraging university-industry partnerships to accelerate the transition from research to technological development and patenting

THE ISSUE. One factor that may inhibit innovation in sanitation is the restrained attitude to patenting and the limited exploitation of the patents produced. This is due to various factors, many of which have been previously illustrated (inertia of utilities in innovation, poor development of the

sanitation technology market, high costs of innovation, conservative culture of utilities, and absence of a systemic approach to sanitation policies). Knowledge brokerage can help to get out of this impasse, facilitating the identification of knowledge that can lead to the production of new patents or the technological exploitation of existing ones, favouring a closer link between research teams, technology developers, funding agencies and utilities.

ACTIONS. Creation of specialised databases including unexploited patents in the field of sanitation; development of relations between research teams to encourage potentially patentable research; promotion of cooperation agreements and joint platforms involving research institutions; technology developers and utilities aimed at carrying out long-term experimental activities and developing patents; support the organisation of demonstration activities and demo-sites to obtain funding for the patenting of new technologies.

Recommendations for utilities and technology companies

With regards to water & sanitation utilities and technology companies (including plant construction companies and engineering consultancy firms), the primary role of knowledge brokerage may be to support them in activating cultural, organisational and communication changes so as to increase orientations to ESS.

R10. Making the economic and environmental benefits of ESS visible within the organisation and company networks

THE ISSUE. Water & sanitation utilities have a low propensity to innovation, both because they operate on large infrastructures requiring big investments to be innovated and because they tend to keep their internal structures and technologies, also to ensure continuity of service. The 'ideological basis' for this is in a broader culture of conservation, which gives little value to new knowledge and leads to avoiding risks linked to innovation. To combat the conservative and risk-aversion approach usually shared by the water companies, knowledge brokerage can provide a contribution by making economic and environmental benefits of ESS technologies visible as well as by showing their compatibility with the service needs and finally their reliability and adaptability with a wide range of local contexts.

ACTIONS. Organisation of visits to technological sites; participation in demonstrations and showcases; undertaking of case studies on the application of ESS technologies; the dissemination of information on ESS in in-house communication facilities (newsletters, corporate intranet, internal communication circuits, etc.).

R11. Promoting a multidimensional view of innovation

THE ISSUE. Utilities and technology companies tend to underestimate the social dimension of sanitation, not to recognise the social, organisational and economic aspects of technology transfer and to give little importance, as pivotal as-



Pilot project: Castel St'Angelo, Italy

POLICY GUIDELINES: RECOMMENDATIONS ... cont.

pects of innovation, to maintenance and management. Many utilities manage innovation activities in outsourcing, considering them peripheral to their strategic objectives. Consequently, the planning of innovation activities tends to be of low quality and short-term oriented. Knowledge brokerage can help them develop a multidimensional representation of innovation, support them to develop innovation plans embodying all the dimensions of innovation (including social, environmental and organisational aspects) as well as to exert more control over all stages of technology transfer (testing, installation, maintenance, etc.).

ACTIONS. Negotiation activities on the organisation's vision, mission and strategies; promotion of workshops, presentations, seminars and internal workshops; promotion of advanced assessment tools on existing technological options which take into account environmental and social sustainability criteria.

R12. Facilitating a mainstreaming of innovation and ESS within water & sanitation companies

THE ISSUE. Few sanitation utilities are organised for the effective management of innovation processes. In general, they show a lack of interest in reviewing their procedures; they usually adopt a top-down approach, often bureaucratic in nature; finally, the amount and quality of communication among their internal units are low. Even when they are willing to innovate, they often show limited ability to do so. Knowledge brokerage may act by promoting a mainstreaming of innovation within the company, bringing the issue of sustainable sanitation to all areas of the organisation, so as to enhance overall capacity to innovate.

ACTIONS. The development of quality management and monitoring tools; internal communication initiatives on

innovation; creation of committees, specialised staffs and networks on innovation and ESS cross-cutting the organisation's structure; staff training; promotion of internal opinion pools, internal surveys and consultations on the organisation's innovation policies.

R13. Carrying out technology scouting

THE ISSUE. Information on technologies and knowledge in the field of sanitation is scattered and fragmentary. This prevents an efficient evaluation of technological options and their adaptability to local conditions, from the environmental, technical, social and regulatory points of view. Knowledge brokerage can facilitate the realisation of technology scouting activities that help water companies identify solutions that best fit their technological, organisational and environmental needs.

ACTIONS. Collection of best practices; participation in fairs and exhibitions; promoting participatory platforms on technological scouting; demonstration activities; databases on ESS technologies.

R14. Dialogue with universities and research institutions

THE ISSUE. One of the critical points - perhaps the most important - hindering innovation in sanitation is the reluctance of utilities to dialogue with research institutions. This is a problem, which, as we have seen (see Recommendation 5), appears to be the mirror image of a similar reluctance shown by researchers to interact with companies. Knowledge brokerage, in this context, is expected to perform one of its typical functions, i.e. to establish communication channels enabling people who use scientific knowledge and technology to interact with those who produce it so as to facilitate the transfer of knowledge. The



Pilot project: Pernik, Bulgaria

POLICY GUIDELINES: RECOMMENDATIONS ... cont.

brokering of knowledge also helps manage all the obstacles and implications of that transfer regarding, for example, the mentality of the utility engineers and technicians, organisational routines, time organisation and communication within the company units concerned.

ACTIONS. Inclusion of academic researchers in laboratories and technical units managed by the company; cooperation with external research teams to identify and address the company's innovation needs, even in the medium and long term; promotion of informal relationships between utility experts and external researchers; development of cooperation programmes between utility networks, scientific institutes and/or individual research institutions.

R15. Taking stock of the knowledge already developed in the company

THE ISSUE. Operating in a context dominated by a conservative approach, utilities and technology industries have mostly little control over the dynamics of knowledge within the organisation. Rarely do they apply knowledge management tools, so that often managers are not even aware of the knowledge that the organisation already has developed. One of the tasks of knowledge brokerage is therefore to seek out and take stock of the knowledge, skills and experience developed in the company so as to preserve them and to exploit them for innovation.

ACTIONS. Scouting activities within the organisation through: interviews with 'gatekeepers' of the various units; creation of centralised repositories or collections of documents, materials and projects; networking activities involving the staff; rapid access (e.g. through intranet) of ready-made information on internal knowledge and know-how; adoption of reporting standards facilitating the access of technical information.

R16. Fostering the development of local, national and international innovation networks in sanitation

THE ISSUE. The many factors hindering innovation in sanitation (see chapter, 4) make it difficult, for a single company, to shift from the traditional sanitation paradigm to the ESS paradigm. Such a shift can hardly be triggered if each water company works in isolation, without activating forms of cooperation, coordination and exchange with other sanitation players. Knowledge brokerage can facilitate this transition, supporting the development of local, national and international sanitation networks and widening the participation of existing ones. This type of policy provides ESS with a context of legitimacy and can trigger wider processes of knowledge transfer with a focus on innovation.

ACTIONS. Activities for exchanging experiences among water companies; twinning initiatives; promotion and support of virtual networks, support for water company associations and networks, development and dissemination of documents and handouts on ESS for water utilities and technology companies.

Recommendations for civil society organisations

Another set of recommendations target civil society organisations. The overall role knowledge brokerage can play here is that of catalyst and amplifier of social and environmental needs and demands, helping such organisations promote social obligation in support of more sustainable sanitation approaches.

R17. Raising awareness of the risks of conventional sanitation

THE ISSUE. It is a widespread belief that traditional sanitation systems have definitively solved the problem of liquid waste management, without damage or risk to the environ-



Pilot project: Pernik, Bulgaria

POLICY GUIDELINES: RECOMMENDATIONS ... cont.

ment or people. In the public view, sanitation is not connected with health and environmental issues. There is also a lot of cultural resistance to making the management of human excreta a subject of public debate. In this framework, knowledge brokerage may provide key support in raising the awareness of civil society organisations and the public at large about the deep links between wastewater management and other major environmental issues (water supply, sustainable agriculture, land protection, energy saving, etc.) as well as showing the risks of conventional sanitation.

ACTIONS. Educational and demonstration activities in the schools; public information campaigns; development and distribution of information packages (reports, videos, etc.) on sustainable sanitation; organisation of opinion polls aimed at collecting data on people's attitudes on sanitation-related issues; development of Internet sites on topics related to water cycle management; awareness raising activities on ESS targeting journalists and media practitioners.

R18. Promoting alliances and networks in support of ESS

THE ISSUE. Collective disengagement from sanitation issues prevents the formation of 'social pressure' to urge policy-makers to promote more sustainable forms of wastewater management. Knowledge brokerage can oppose this process by bringing together individuals and organisations with a greater propensity for this issue, promoting alliances and local or national networks involving different sectors of civil society, professional networks, scientific societies, local authorities or public utilities. When appropriate, these alliances and networks may have a technical- scientific nature or they may pursue the more general aim of raising awareness in citizens and public opinion of sustainability in sanitation.

ACTIONS. Promotion of inter net portals as a way of creating informal networks on sustainable sanitation; organisation of local, national and international meetings; promotion of networks for the spread of specific ESS inspired technologies; activation of web forums; organisation of events or thematic panels on sanitation.

R19. Attracting key professional groups (doctors, engineers, agronomists, technicians) to ESS

THE ISSUE. In a context already very unfavourable for promoting social mobilisation over sanitation, the presence of strong opposition from some key professional groups (medical doctors, agronomists, hydraulic engineers, sanitation technicians themselves) to some basic criteria of sustainable sanitation (for example, wastewater recycling or the decentralisation of sanitation systems) is also to be recorded. In the absence of a public debate on sanitation issues, this opposition has no difficulty in hindering the spread of technologies promoting sustainable sanitation approaches. In that case, knowledge brokerage

can help spread evidence-based knowledge on ESS among such professional groups in an attempt to change their cultural orientations and views on sustainable sanitation.

ACTIONS. Specific training sessions tailored to the information needs of specific professional groups; visits to sites where ESS technologies have been successfully applied; exchange meetings between different professional groups involved in sanitation systems and policies; dialogue initiatives on sanitation within professional associations, societies and networks; dissemination of information on ESS through magazines, newsletters and other communication channels used by professional networks; promotion of professional training courses and learning initiatives to enrich professional curricula with expertise and skills related to sustainable sanitation.

R20. Making ESS-oriented technologies visible

THE ISSUE. The majority of people, as well as many sanitation practitioners and stakeholders, are unaware that sanitation problems can be addressed through approaches radically different from conventional ones. Besides that, there is also much scepticism among many sanitation actors about the effectiveness of ESS-oriented technologies. To promote ESS, therefore, it is of strategic importance to show that ESS-oriented technologies exist and are effective. Knowledge brokerage may have an important role in this domain, facilitating the implementation of programmes and initiatives addressing sanitation practitioners, local stakeholders, local authorities and the population at large to show how such technologies work and how and under which conditions they can be applied.

ACTIONS. Visits to sites and plants where ESS technologies have been applied; organisation of exhibits on innovative technologies in the field of sanitation; media campaigns; audio and video products on ESS-oriented technologies.

R21. Opening communication channels between citizens and sanitation players on innovation

THE ISSUE. In some areas (for example, water supply, ener-



POLICY GUIDELINES: RECOMMENDATIONS ... cont.

gy, health, solid waste management), procedures and mechanisms for dialogue between citizens and service providers have been gradually established, even though often they did not succeed in preventing conflicts and tensions. Despite this, dialogue can achieve higher levels of quality, participation and transparency in the management of public services. In the field of sanitation this process has not yet occurred, if not in episodic forms. Knowledge brokerage can greatly help bridge this gap, fostering the establishment of new communication channels between citizens and sanitation service providers to promote a real debate on future choices and investments in innovation.

ACTIONS. The promotion of participatory budgets and environmental budgets for utilities; participatory evaluation activities of sanitation services involving citizens and citizens' organisations; dissemination of scientific and technical information; inter net-based two-way communication activities; organisation of public hearings on wastewater management at local level; technological forecasting exercises focusing on water cycle management.

Recommendations for policymakers

The last set of recommendations concern policymakers. The social function held by knowledge brokerage may be to facilitate lobbying activities addressed to those political, economic and cultural institutions that play a role in decision-making processes related to sanitation and sanitation research, in order to increase their engagement in support of more sustainable approaches to sanitation.

R22. Including sanitation in the agenda of environmental policies

THE ISSUE. Sanitation in general and, by extension, research in this area, is not a political priority. Most of the funds on environmental sustainability are channelled to other issues such as energy, solid waste management or biodiversity protection. This fact stems, in part, from the lack of interest of policymakers and often water company managers in seeing and understanding the environmental and economic risks associated with conventional sanitation and in recognising the added value produced by sanitation approaches based on sustainability and recycling of excreta and urine. A role that knowledge brokerage can play in order to counter the inertia of institutional actors is that of fostering the inclusion of sanitation issues in the agenda of environmental policies, thus promoting change in the political culture.

ACTIONS. Involvement of decision makers in public seminars and initiatives on sanitation; production and dissemination of publications, toolkits, guidelines and sourcebooks on sustainable sanitation in relation to other environmental issues specifically conceived to be read by policymakers; production of policy briefs and policy papers on ESS; awareness raising programmes addressing local authorities; collection and dissemination among policymakers of information and statistical data on risks related to traditional sanitation systems and on benefits deriving from ESS-oriented technologies.



Pilot project: Limburg, The Netherlands

POLICY GUIDELINES: RECOMMENDATIONS ... cont.

R23. Facilitating regular interaction between expert knowledge and decision making on ESS

THE ISSUE. In addition to the problem of a lack of awareness on sanitation needs, often policymakers and their staff suffer from a lack of technical and scientific support, due to poor interaction with experts and researchers. This reduces their ability to understand what is at stake with the shift from traditional to more sustainable sanitation technologies as well as the elements of complexity inherent in sustainable sanitation, be they related to environmental dynamics (water cycle, nitrogen cycle, etc.) or the social and organisational aspects. An important contribution knowledge brokerage may provide is facilitating regular interaction between policy making and expert knowledge on ESS to enhance the quality of the decision-making processes in this field.

ACTIONS. Involvement of experts on ESS in the places where environmental policies are planned (parliamentary committees, task forces for the development of public environmental policies, etc.); organisation of seminars for decision makers and their staff; promoting flagship initiatives and best practices in interaction between policymakers and experts; establishing virtual information desks tailored to policymakers' information needs about environmental issues.

R24. Coordination of the different institutional levels involved in sanitation policies

THE ISSUE. Several problems related to innovation in sanitation stem from the fact that such a sector is managed by many public and private actors operating at different levels with varying degrees of responsibility. Interaction between these actors tends to be, for various reasons, not very efficient. Moreover, they often have diverging interests and points of view and are rarely able to establish forms of collaboration effective enough to adequately support research and innovation. The role of knowledge brokerage should be particularly useful in promoting an alignment and coordination among such actors to foster convergence on ESS-oriented policies.

ACTIONS. Promotion of formal and informal contacts among the players involved; activation of institutional arrangements allowing rapid contacts and simplified coordination procedures; institutional networking activities; promotion of consultation meetings and joint initiatives; development of monitoring activities on the implementation of public policies on water & sanitation and dissemination of the results to the ministries and administrations concerned.

R25. Facilitating the production of regulations and standards to support research and innovation in sanitation

THE ISSUE. The sanitation sector is characterised by regulations and standards that are largely insufficient for the development of innovation processes. In general, and apart from some EU member states, regulations often penalise the adoption of new technological solutions and impose

standards that are too rigid. Moreover, regulations and standards often change over time and lend themselves to different interpretations. These characteristics hinder scientific and technological research, discourage investors from funding new research programmes and, more generally, create pessimism about being able to develop innovative solutions.

In this framework, knowledge brokerage help by facilitating the dissemination of knowledge on existing rules and regulations to highlight the barriers and bottlenecks to innovation they produce, even unintentionally, and to accelerate the development of regulations encouraging innovation and the production of new patents in the field of sanitation.

ACTIONS. Research and collection of data on regulations on sanitation for dissemination (through publications, online databases, electronic publications, etc.); consultation and opinion pools among sanitation players on regulations and standards in order to identify barriers to innovation and to collect proposals for change; collection of best practices in standard setting; promotion of the development and application of innovation-oriented policy evaluation criteria.

R26. Supporting the creation of a critical mass of actors that can mobilise resources for ESS-oriented research

THE ISSUE. Some countries and agencies are developing practices specifically designed to complement traditional forms of research funding with additional mechanisms to give research more stability and continuity. These mechanisms are aimed, inter alia, to compensate for the low profitability of innovation in the sanitation market; support enterprises and research institutions in dealing with the typically lengthy procedures necessary to develop and test new technologies; encourage the involvement of a plurality of stakeholders (such as utilities, technology manufacturers and national governments) in research funding. Knowledge brokerage can play a key role in facilitating the establishment of a critical mass of actors that can potentially mobilise resources for research on ESS by transferring knowledge about new funding mechanisms and new practices, optimising the use of research funds.

ACTIONS. Creation of information platforms facilitating the establishment of agreements on water and sanitation research and the coordination of different funding agencies and programmes; transferring knowledge on possible institutional arrangements encouraging the creation of public-private research funds; establishment or enhancement of networks involving research funding agencies and institutions (venture capital, credit institutions, etc.); information campaigns to raise funds for research on ESS; support for establishing incubators and high-tech spin-offs focused on ESS-oriented technologies; awareness raising activities addressed to water companies to encourage engagement as research funders or promoters.

POLICY GUIDELINES: RECOMMENDATIONS ... cont.

The future mission of knowledge brokerage in sanitation

The recommendations presented above highlight the perspective adopted in this report to understand the future mission of knowledge brokerage in sanitation. Overall, two main policy drivers emerge from BESSE. On the one side, key sanitation actors are invited to take knowledge brokerage seriously, so seriously that they should place it strategically at the very centre of their policies. On the other side, because of the same mechanisms of knowledge brokerage, other stakeholders should be taken seriously too. This means accurately identifying needs, attitudes and orientations of the involved actors before devising knowledge brokerage strategies and selecting the most appropriate approaches and tools.

During the implementation of BESSE, knowledge transfer proved to be a key factor for the spread of ESS-oriented policies, even though there are other factors that come into play, such as the levels of investments for the construction of more sustainable sanitation infrastructures and the availability of funds to support innovative research programmes in this field.

However, to fully perform its task, knowledge brokerage must have a much clearer and more visible role than it has today. The extent to which it can facilitate innovation is linked to its capacity to be a catalyst of social energies, actors, resources and ideas, fostering the achievement of concrete and widespread results in as short a time as possible. This is particularly true in the case of sanitation, where innovation processes are hindered by different factors. However, it is also relevant for many other sectors, be they related to environment or not, where interactions and cooperation among the key players are similarly difficult.

Precisely for this reason, knowledge brokerage has to become a practice that is commonly applied in all phases of innovation and shared by all actors involved in the innovation process. Moreover, knowledge brokerage must be able to adapt to different environmental conditions, specific organisations, and varying local and national contexts. It must never lose sight of the need to be concrete and to pursue concrete results. Changes in the societal perception of sanitation would also be part of such concrete results.

These guidelines, concerning the idea of strategic knowledge brokerage, refer to a coordinated set of knowledge brokerage actions that have a strategic value for the promotion of sustainable sanitation in which key sanitation players, starting with those most sensitive to the issue of sustainability, should increasingly invest in the future. These guidelines thus concur with the European Commission's efforts to mobilise environmental knowledge for policy, industry and society.

Besides this, a second message emerged from BESSE. In order for this perspective to materialise, it is also necessary to improve the quality and visibility of what has been previously referred to as practical knowledge brokerage. Reference is made here to knowledge brokerage as a daily practice, usually deemed to be marginal and of little weight, while it requires highly qualified professional skills and know-how, regardless of whether it is performed on a paid or voluntary base.

It is not always easy to distinguish strategic knowledge brokerage from practical knowledge brokerage. However, distinguishing between them is useful, at least to understand how important it is to increase the use and quality of knowledge brokerage in its practical dimension in order to devise effective strategic knowledge brokerage plans.

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