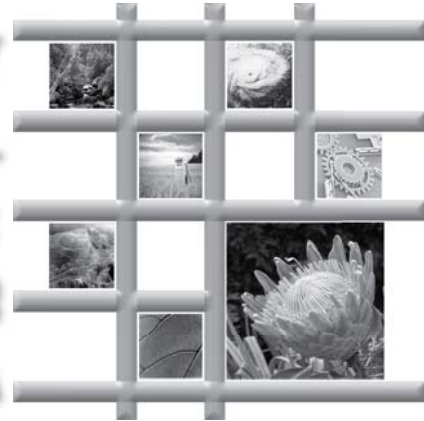


**EVIDENCE-BASED POLICY FOR ENVIRONMENTAL SUSTAINABILITY:
A PATH FORWARD FOR SOUTH AFRICA**

EVIDENCE-BASED POLICY FOR ENVIRONMENTAL SUSTAINABILITY: A PATH FORWARD FOR SOUTH AFRICA



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Acknowledgements:

The editors would like to thank the following people for their valuable inputs and support in designing and/or running the Collaborative Workshop on Evidence-based Policy-making which is discussed in this handbook. Special thanks goes to the following individuals and institutions: Phil Callaghan from the United Kingdom's Department of Food, Environment and Rural Affairs (DEFRA), Rod Lamberts from the Australian National University (ANU), Dorah Nteo and Mapula Tshangela from the Department of Environment and Tourism (DEAT), Imraan Patel and Kogilam Iyer from the Department of Science and Technology (DST), Samira Kenward and Thabisa Mbungwana from the British High Commission, and Marius Claassen, Maronel Steyn, Wilma Strydom and Pat Manders from the Council for Scientific and Industrial Research (CSIR). The following individuals were kind enough to share their expertise at introductory presentations during each of the four case study group discussions: Alan Brent, Phil Hobbs and Ndeke Musee from the CSIR and Katharine Vincent from the University of the Witwatersrand.

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Evidence-based policy for environmental sustainability: a path forward for South Africa

March 2009

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This handbook should be cited as:

Funke, N., Shaxson, L. and Bielak, A.T. 2009. *Evidence-based policy for environmental sustainability: a path forward for South Africa*. Pretoria, South Africa: Council for Scientific and Industrial Research, 35pp.

This document is also available at:

www.csir.co.za

ISBN 978-0-7988-5587-7

This handbook has been made possible with kind support from:



**science
& technology**

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& tourism**

Department:
Environmental Affairs and Tourism
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The participants who attended the Collaborative Workshop on Evidence-based Policy-making that was held at the SAPPI Technology Centre in Pretoria on 19 and 20 November 2008.

Foreword

South African research institutions such as science councils and universities have an important role to play in supporting government through the provision of sound evidence for decision-making and policy development. The Council for Scientific and Industrial Research (CSIR) has a key role to play in this discussion, through its mandate of conducting directed and multi-disciplinary research and technological innovation to foster industrial and scientific development which ultimately contributes to the improvement of the quality of life of the people of South Africa.

South Africa is faced with increasing natural resource pressures, e.g. climate change, water resource management, pollution and waste, energy production, food security, natural resource utilisation and management. However, government also has a responsibility to promote economic development, job creation and poverty alleviation. More and more, policy-makers and scientists alike are faced with growing levels of complexity in decision-making and policy development around the environment – a complex system of social, economic and ecological interactions.

Promoting collaboration at the science-policy interface provides an opportunity to embed science in the policy-making process, while also directing research in a way that will maximise its benefits to society. Evidence-based policy-making is an area receiving growing interest both locally and internationally to provide the robust evidence base needed to develop policies and to improve the relationship between science, policy-makers and citizens.

The evidence-based policy-making workshop held on 19 and 20 November 2008, with support from the United Kingdom's Department of Food, Rural and Environmental Affairs (DEFRA), the South African Department of Environment and Tourism (DEAT), the Department of Science and Technology (DST) and the CSIR, resulted in a platform from which to strengthen science in support of policy in South Africa.

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List of acronyms

- ANU** – Australian National University
- ASSAf** – Academy of Science of South Africa
- CPSI** – Centre for Public Service Innovation
- CSIR** – Council for Scientific and Industrial Research
- DEAT** – Department of Environment and Tourism
- DEFRA** – Department of Food, Environment and Rural Affairs (in the UK)
- DG** – Director General
- DME** – Department of Minerals and Energy
- DoA** – Department of Agriculture
- DoC** – Department of Communications
- DoE** – Department of Education
- DoH** – Department of Health
- DoL** – Department of Labour
- DoT** – Department of Transport
- DPLG** – Department of Provincial and Local Government
- DST** – Department of Science and Technology
- DTI** – Department of Trade and Industry
- DWAF** – Department of Water Affairs and Forestry
- HSRC** – Human Sciences Research Council
- IPCC** – International Panel on Climate Change
- NACI** – National Advisory Council on Innovation
- NGO** – Non-governmental organisation
- NRE** – Natural Resources and the Environment
- NRF** – National Research Foundation
- R&D** – Research and Development
- SADC** – Southern African Development Community
- SANBI** – South African National Biodiversity Institute
- UK** – United Kingdom



EXECUTIVE SUMMARY

Science represents one of several components of the evidence that influences policy-making (such evidence also includes indigenous knowledge systems, values and public opinion). It is important to establish what its role is in this regard, and how, together with other forms of evidence, it can be used to help policy-makers better address, resolve and implement answers to different types of policy issues. The onus thus falls on providers of evidence, such as the CSIR, to collectively inform policy by, for example, working on projects in multi-disciplinary and multi-sectoral teams.

A Collaborative Workshop on Evidence-based Policy-making in South Africa was held at the SAPPI Technology Centre in Pretoria on 19 and 20 November 2008. The workshop was funded by the United Kingdom's (UK's) Department of Food, Rural and Environmental Affairs (DEFRA), as well as South Africa's Department of Environment and Tourism (DEAT) and the Department of Science and Technology (DST). The event was organised by the Council for Scientific and Industrial Research (CSIR) and focused on the question of what existing, emerging and new evidence policy-makers in South Africa require to inform the policy-making process and to solve complex policy issues which have implications for the environment.

While it is clear that there is an iterative feedback loop between evidence and policy, the workshop focused specifically on how policy can best draw on evidence. The following questions were asked during the workshop:

- How can South African policy-makers solicit and source the particular type of relevant and reliable information they require from scientists and other sources in order to deliver policy goals?
- How can scientists subsequently improve how the evidence they produce is taken up into the policy-making process and used by policy-makers?

The workshop

The workshop began with presentations from South African and British participants, which helped situate it within a broader understanding of

evidence-based policy-making initiatives in South Africa and globally. The workshop was designed around four case studies with very different characteristics to begin to draw out lessons for DEAT, DST and the CSIR. The issues around which the case study discussions centred were acid mine drainage, climate change, nanotechnology and biofuels. After the presentations, the participants were separated into groups to start work on each of the case studies.

The second day began with presentations from Canada and Australia, before participants returned to complete their case studies. An afternoon session on the second day brought together the learning points from all four case studies into a set of conclusions.

Conclusions from the workshop

The detailed conclusions from the individual case studies and the overall conclusions from the workshop are given later on in the document but are summarised here. They are:

1. There is no single science-policy interface: instead, the relationship between science and policy can be improved by strengthening links between individuals, teams and whole organisations. As a major player at the South African science-policy interface, the CSIR has a clear role to play in building lasting relationships which deliver the evidence to formulate better policies.
2. However, it is not only the CSIR's responsibility to ensure that the supply of evidence matches the demand from policy. All departments with an interest in policy issues need to clarify their roles and responsibilities across the science-policy interface.
3. Maintaining a clear focus on strategic policy objectives can help reorient research in the right direction, and it can also help work out which institutional relationships are most appropriate for each particular issue. The workshop participants felt that DST could have an important role to play in maintaining this strategic focus, and in bringing the relevant institutions to the table.
4. There is a specific need to develop techniques which help bridge the gaps between policy-makers and Parliamentarians who have a generalist background, and scientists with more specialised knowledge.
5. Several tools were presented at the workshop which had been

tried and tested in the UK, Canada and Australia. These include:

- a. Delivering research reports in a format which is designed to engage policy-makers, not simply to report results;
 - b. Adding value to the results of research by using one piece of evidence several times (newsletters, websites, etc.) and targeting it well to ensure that it reaches its widest potential audience;
 - c. Developing a series of meetings or workshops at which scientists and Parliamentarians can meet to discuss the importance of scientific research.
6. Participants admitted that these efforts to improve evidence-based policy-making will require additional resources. However, participants also felt that realigning incentives for both scientists and policy-makers could have a profound effect on how they interact with each other at the science-policy interface.



BACKGROUND TO THE WORKSHOP

The following section provides a short description of some of the major initiatives related to evidence-based policy-making that are currently taking place in South Africa:

DST's Global Change Grand Challenge

DST adopted the Ten-Year Innovation Plan in 2007, which builds on the foundations laid by the National Research and Development Strategy adopted in 2002. The Ten-Year Innovation Plan will help South Africa become a knowledge-based economy: it is driven by the assumption that producing and disseminating knowledge will lead to economic benefits and contribute to all fields of human endeavour. One of the five grand challenges that underpin the Ten-Year Innovation Plan is the Global Change Grand Challenge, which can be described as “Science and Technology for Global Change with an emphasis on climate change” (DST, 2009).

With reference to evidence-based policy-making, the impact of the Global Change Grand Challenge over the next decade will, among other things, be measured by “the extent to which decision-makers have used improved scientific understanding and technological development to achieve sustainable development goals in South Africa and Africa” (DST, 2009).

This clearly highlights the need to improve the linkages between science and policy in South Africa in order to address the challenges that climate change and, more broadly speaking, global change pose. It is likely that South Africa's and also the Southern African Development Community's (SADC) negotiation positions at international forums will be considerably enhanced if an improved and more coherent science base exists to inform policy. Development planning from national through to local scale will in turn also benefit if the communication channels between scientists and both policy-makers and implementers are made more effective (DST, 2009).

One of ten key actions envisioned by DST as part of the Global Change Grand Challenge is to address the problems of interaction between the scientific and policy-making communities by coming up with an “an integrated and

consolidated plan for reducing the ‘knowledge chasm’ and building the science-policy interface”. This action will be two-fold and will address the science-policy interface (top down) and the science-society interface (bottom-up). While this workshop focused primarily on the science-policy interface and ways to address it; the science-society interface is also of importance (Turton et al., 2007). “Efforts to address the latter would focus on involving, motivating and empowering citizens and institutions to do research, adapt and act” (DST, 2009).

The CSIR and a range of other stakeholders are currently assisting DST in developing the Global Change Grand Challenge Science-Policy-Practice Strategy aimed at achieving the effective use of Global Change science in policy- and decision-making practice. The process is also benefitting from the learning that has come out of this workshop.

DEAT’s concept for a strategy around evidence-based policy-making

DEAT has identified a need for a common framework for collecting evidence to support policy decisions. It aims to develop a system that will make use of undisputed evidence to underpin policy decisions so that these decisions will be able to stand up to intense scrutiny (Tshangela, 2008).

In moving forward DEAT seeks to develop a sector-wide R&D/evidence strategy, which should call for streamlined, forward looking policy and research. In order to facilitate this, there should be careful scoping of research questions and short, medium and long-term research priorities based on policy priorities. Horizon scanning and quarterly analyses form an important component of identifying long-term research priorities. It would be of particular importance for DEAT to develop its knowledge management system to provide policy-makers with instant access to in-house research results and a wide evidence base (Tshangela, 2008).

Another suggestion by DEAT is to establish a forum for technical discussions between DEAT, DST, research councils (e.g. the CSIR and the HSRC), academia, public entities and other partners. Collaboration should take place on several priority issues, including Science and Technology for Global Change, biodiversity, and marine, coastal and Antarctic research (Tshangela, 2008).

The CSIR's ongoing interest in evidence-based policy-making

The concept of evidence-based policy-making, and research into the science-policy interface and knowledge transfer, is a relatively young one in South Africa.

The CSIR has conducted several studies on areas related to evidence-based policy-making over the past two years. Examples of research in these areas include a study on the ability of scientists to influence the political level (Funke and van Wyk, 2007), a study on research and development dissemination and uptake in South Africa, which includes a focus on the uptake of scientific knowledge by policy-makers (Funke et al., 2008), and the development of a proposed model for knowledge brokering at the science-policy interface (Godfrey et al., in press). The development of this model stemmed from a visit by a South African delegation (Ms Linda Godfrey, Ms Carmel Mbizvo – CSIR - and Ms Dorah Nteo and Mr Obed Baloyi – DEAT) to DEFRA in February 2008, to learn more about evidence-based policy-making in the UK and how this could potentially benefit similar initiatives in South Africa.

In addition, the CSIR proactively liaises with Parliament through its Parliamentary Office, has several Memoranda of Understanding in place with national government departments that inform its research and also hosts a biennial conference to demonstrate to its stakeholders the impact its science and technology has on improving the lives of South Africans. In February 2009 a small “knowledge-brokering” workshop was hosted by the CSIR’s Natural Resource and Environment Unit. At this workshop it was decided that a knowledge broker should be appointed for the research unit, who would work together with other units within the CSIR and would be responsible for liaising with the CSIR’s network of stakeholders (including policy-makers) and be familiar with and understand the policy environment. The knowledge broker would work separately from (but in conjunction with) the communications team and would be responsible for science communication, the production of target-specific products, conducting target-specific stakeholder interaction, project knowledge dissemination and offering project planning advice to researchers. He/she would be responsible for a range of products that could include workshops, meetings and briefing sessions to facilitate stakeholder interaction, positioning statements, web-based information for stakeholders, short documents (e.g. two pagers) that are issue or problem-specific, report summaries for decision-makers, topical articles/opinion pieces etc. The workshop was very much informed by the learning from this workshop and by information that had been shared with the CSIR by the Canadian and British facilitators.

Other work on evidence-based policy-making in South Africa

The Collaborative Workshop on Evidence-based Policy-making took place within the context of a number of other initiatives dealing with the science-policy interface that are underway in South Africa.

Firstly, the Policy Analysis Unit at the Human Sciences Research Council (HSRC) deals specifically with “getting research in policy and practice” and facilitates the generation of policy recommendations (for instance in the form of policy briefs) based on research evidence and policy dialogues in several priority policy areas. These areas are: poverty reduction, employment, quality education, HIV and AIDS, and service delivery (HSRC, 2009).

An interesting initiative that explored ways of improving the use of research in policy-making processes was a discussion between policy-makers, academics, researchers and representatives from civil society entitled “HIV and AIDS in Africa - Getting Research/Evidence into Policy and Practice”. The workshop was aimed at “reaching some consensus and understanding on how best to use existing and emerging knowledge for combating the disease and influencing policy processes more generally” (HSRC, 2008).

Several obstacles were identified that stand in the way of the uptake of research into policy. The following conditions were said to be crucial for researchers to keep in mind in ensuring that research evidence is considered during the policy-making process:

- “Evidence needs to provide policy makers with concrete suggestions and options of actions;
- The policy-making process is bound by time limits and therefore the dissemination of evidence needs to coincide with policy cycles; and
- Researchers should be aware of the political flavour of the times. If their research topic is hot on the policy agenda at the time, they stand a better chance of being noticed and the research results utilised” (HSRC, 2008).

Furthermore, researchers need to ensure that their research meets the needs of the policy-makers, and also that effective, continuous engagement and dialogue between themselves and policy-makers takes place. This will facilitate the creation of a shared understanding of the research problem and will also provide an opportunity to discuss the potential merits of proposed solutions (HSRC, 2008).

Secondly, the Academy of Science of South Africa (ASSAf) has an important science advisory function and is mandated to “provide effective advice and facilitate appropriate action in relation to the collective needs, opportunities and challenges of South Africans” (Republic of South Africa, 2002: Section 3a). An example of Assaf’s engagement in the science advisory sphere is a double symposium on “Evidence-based practice” that was hosted at the CSIR Convention Centre in September 2006. At the end of the symposium it was made clear that “ASSAf ...has a major role to play in acting as a professional body drawing judiciously on the large pool of intellectual resources at the universities, at the highest level of expertise and in a multi-disciplinary way, to generate advice on big national issues” (Jansen et al., 2006). It is clear that this potential will have to be harnessed in future in order to support ASSAf’s role in the national science system.

Thirdly, the National Advisory Council on Innovation (NACI) also has an important science advisory function. This council is appointed by the Minister of Science and Technology to advise him/her (and via the Minister to also advise the Ministers Committee and Cabinet) on the role that innovation has and the contribution it makes in both promoting and achieving South Africa’s national objectives. These objectives are to:

- Improve and sustain the quality of life of all South Africans
- Develop human resources for science and technology
- Build the economy
- Strengthen the country’s competitiveness in the international sphere (NACI, 2008)

NACI has a membership that is broadly representative of all sectors. This ensures a spread of knowledge and experience in terms of national and provincial interests, scientific and technological disciplines, innovation needs and opportunities in different socio-economic fields and research and development in all sectors (NACI, 2008).

When looking at these efforts to improve evidence-based policymaking in South Africa, it is clear that there are many interested actors and that a considerable amount of work has been done already. As will be seen later on in this handbook, further work needs to be done to pull together the breadth of experience of evidence-based policymaking across the country and to improve international collaboration around the issue. It was within this context that the CSIR workshop was designed to look specifically at policy issues within the context of environmental management with the aim of building a small community of practice which could take forward some of the recommendations.



THE WORKSHOP

The Collaborative Workshop on Evidence-based Policy-making in South Africa brought together close to 50 people from 12 government departments and research organisations in South Africa. It was designed as part of an ongoing commitment by DST, DEAT and the CSIR to improve the sourcing and use of scientific evidence in policy.

Day 1

The presentations on Day 1 helped to situate the workshop within wider policy-making processes in South Africa, and within the international debate on evidence-based policy-making (presentations available online, see appendix). In the afternoon delegates broke into the four groups to begin the case study work.

The topics - climate change, nanotechnology, biofuels and acid mine drainage - were chosen prior to the workshop to represent the range of characteristics that might be found at the science-policy interface and thus the different issues which relate to sourcing and using evidence in policy. These are the reasons why each issue is of interest:

- Acid mine drainage: the interplay of a complex evidence base with multi-departmental responsibility for different parts of the issue
- Climate change: the role that evidence at different levels (global, regional, national and local) plays in different policy-making processes
- Nanotechnology: the question of sourcing and using evidence that is uncertain and developing rapidly
- Biofuels: the means of ensuring that policy-makers have access to the full range of evidence about this interdisciplinary and interdepartmental topic

The group work was intended to draw out key issues in the evidence-based policy-making debate in order to meet the objectives of the workshop; it was not meant to “solve” the problems in each of the case studies. Because

of the breadth of expertise in each of the groups, the break-away sessions began with experts giving a brief presentation on the topic to set the scene. Thereafter participants mapped out the stakeholder base, together with the help of the facilitator, and identified the strength of the links between evidence providers and evidence users.

Day 2

On the second day, the first session focused on international experience of linking science to policy, drawing from Canadian and Australian experiences. Following a brief recap of the issues which emerged from the previous day's session, participants split into two groups: the climate change group continued their detailed stakeholder mapping exercise, while the other three groups began to draw together some of the threads which had emerged from across the case studies. These learning points are presented later in this document.

The case studies

The case studies began to map out policy-making processes and the sources of evidence for the four different topics so that participants could begin to draw out issues that might characterise the science-policy interfaces for each case study.

The first step was to develop a map of stakeholders, distinguishing between organisations with a role in implementing policy on each issue and organisations providing the evidence (in some cases these were one and the same). To distinguish between the different roles organisations can play at the science-policy interface, the maps were constructed along two axes: the X axis denoting the local-national-international scales, and the Y axis denoting practice-policy-strategy/vision (see figure 1 below). Participants first brainstormed to determine who the stakeholders are that are involved in the debate and then decided where they might appear on the map. The newness of nanotechnology science and policy in South Africa means that only a few institutions are currently involved, so for the nanotechnology case study the question was posed as: who else could be involved in the debate?

Once the maps had been created, participants discussed the strength, weakness or absence of links between the various organisations and what it meant for the relationships between science and policy.

Common issues emerging from the case studies were drawn together in a plenary session. These were then used to inform a debate about practical ways to improve the science-policy interface in South Africa.

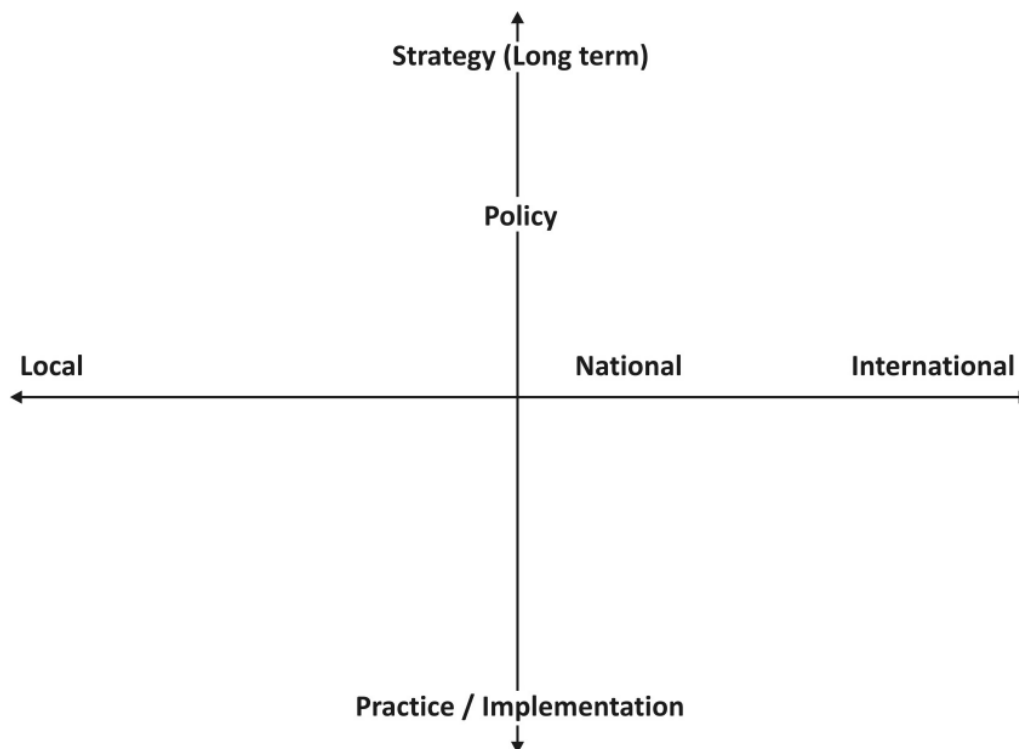


Figure 1: Map template used to distinguish between the different roles that organisations can play at the science-policy interface

Acid mine drainage

There are many policy players involved in the issue of acid mine drainage in South Africa as noted in all parts of the map.

One of the key issues which emerged from the workshop is the confusing picture related to the question of which government departments currently have responsibility for the different aspects of acid mine drainage, and which other government departments perhaps ought to be involved.

There are relatively few evidence providers on the issue of acid mine drainage; the science cluster therefore makes for a less complex ecosystem than the policy cluster. The links between science and policy on this issue are varied. For instance, there are insufficient links between research providers and key line departments or Parliament. Some stronger links exist between universities and provinces, for example (though these are variable), or with the international research community. There is a flow of staff between academia and national government, which helps the flow of knowledge. However, some research is not disseminated, e.g. that commissioned by the Department of

Minerals and Energy (DME) which may be commercially sensitive or may be held by consultants.

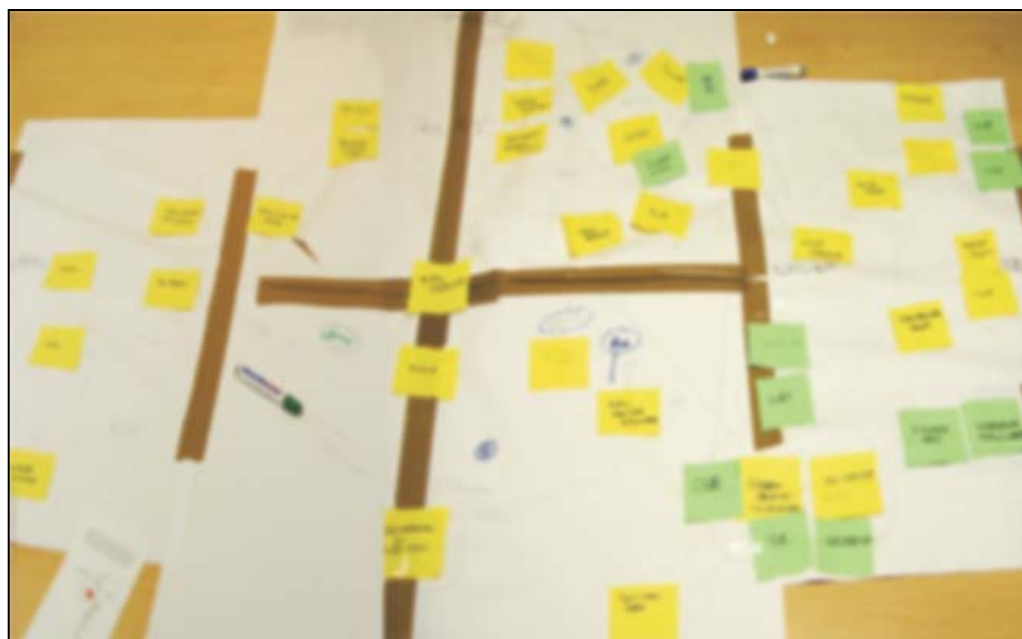


Figure 2: Map for acid-mine drainage case study group discussion¹

The participants came to the conclusion that the acid mine drainage issue is “orphaned” in terms of national ownership of the problem. The issue of context is very relevant to increasing the priority of issues on the political agenda, though it is not clear who can make the “business” case for this issue to become more visible and attract more attention than it currently does. In theory this should be the Department of Health (DoH) since the mine water issue has a direct impact on the health of the country’s citizens. However, problems exist when it comes to the poor and vulnerable raising their concerns around this issue. Illegal immigrants, for instance, who would also be affected health-wise, do not have a legal “voice”.

If mine water were to decant into the Vaal Barrage, acid mine drainage would become a significantly more prominent issue. While it is a well defined issue at the moment, it is also highly complex and multidisciplinary in nature, yet is currently only one of many issues that South African water resource managers face. It therefore needs to be seen as part of a bigger approach to water quality in South Africa and cannot be packaged separately from other issues such as health and poverty.

However, despite this insight, questions did arise about how to engage those

¹ Please note that the maps are presented only as illustrations of how the workshop process was followed. They cannot be seen as a comprehensive representation of the actor and policy/practice landscapes of the various case study issues, given the limited number and range of participants at the workshop.

key players who are currently disengaged from policy-making around acid mine drainage, and how to deal with blockages in the flow of knowledge between science and policy.

Climate change

Figure 3 depicts the many stakeholders and interested and affected parties involved in influencing climate change policy at local, provincial, national, regional and international levels. Also illustrated are the different stakeholders that influence policy at a strategy development level and those that apply the policies.

The workshop concluded that links with a reasonable level of influence and effectiveness exist at a local level. These include interaction amongst the local public, local media, local business and industry, and their relationship with local government. Also, the link between provincial and local government appears to be effective, and national government seems to have a very strong influence on provincial climate change policies. However the interactions concerning climate change policy between local government and provincial and national government can be improved. In addition, the influence that provincial government has on the national level is assessed to be weak.

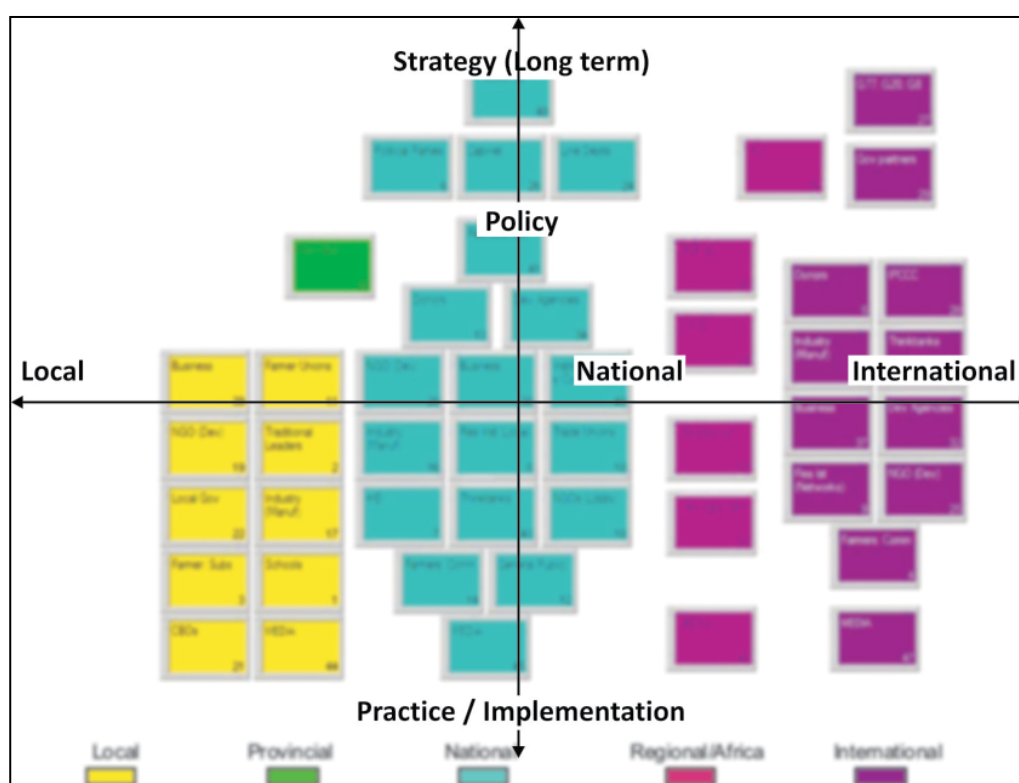


Figure 3: Map for climate change case study group discussion

The influence that national science institutions have on the policies of national level institutions such as the Presidency, Cabinet, government departments, associations, unions, non-governmental organisations (NGOs), the national media, business and the general public is weak. Likewise the influence that these national level institutions have on the response of scientific institutions is weak. The influence that national scientific institutions exert on local level institutions is also considered to be weak. The same situation applies at the metropolitan and provincial government levels.

South African and other African scientific institutions have limited influence on climate change policies at a regional and continental level in spite of the fact that climate change has received global recognition as an environmental threat by both academia and governments. A reasonable degree of influence exists between national scientific institutions and their international counterparts including bodies such as the International Panel on Climate Change (IPCC). However, weak links exist between other research institutions in Africa and the international scientific community.

International governmental bodies such as the G77, G20 and G8 strongly influence the climate change policies of national governments across the continent; however, the contrary does not apply.

Nanotechnology

The main point participants took away from the presentation and discussion on nanotechnology was that everything about it is new: the science is new, the policy is new. The map of stakeholders for South Africa (Figure 4) is therefore purely hypothetical because new links are still emerging, and the workshop participants could only identify those stakeholders who might have an interest or a role in the field.

The links on the right hand side of the map (at the national and international level and relating to strategy and policy) seem to be fairly easy to make, and to keep up. These are the links between departments, national and international researchers and industry.



Figure 4: Map for nanotechnology case study group discussion

It may well be harder and more expensive to reach those organisations on the left hand side of the map, representing the more national level organisations working on practical aspects of nanotechnology policy rather than strategic vision. These organisations would include provincial and local government, NGOs and others, such as local municipal waste management organisations. While they may be hard to reach, participants felt that nonetheless they still need to have a voice in the emerging nanotechnology debate.

As an emerging area, the map incorporates a great deal of uncertainty: uncertainty on the part of the workshop participants about the issue, uncertainty regarding the science of nanotechnology and uncertainty about what policy may be required and how policy might be made. However several issues do arise from the map:

- There are more potential stakeholders than might initially seem the case: at present it might appear that DST is the only stakeholder in the debate: as funder, client and evidence provider. The map shows that nanotechnology has a wider stakeholder base than is immediately obvious;
- It does appear that links between interested departments are still emerging;
- What the map helps us do is identify where links exist, where they could be strengthened, as well as where there ought to be dialogue and where links should be formed;
- The role of the media could be important, but at the moment it is very unclear

The participants discussed what the map meant in the context of an idea which had emerged from DEAT's presentation the previous day: that policy decisions need to be able to withstand intense scrutiny from all sides. They felt that as the map currently stands, policy decisions would withstand scrutiny from those stakeholders in the right quadrant (Figure 4) (e.g. departments, national and international researchers and industry) but not those in the left quadrant (provincial and local government, NGOs and others).

The conclusion for this case study is that if we were to reconstruct the map in four years' time, we would not want to see all the sources of evidence still on the right hand side of the map. Having said that, the question that comes to mind is, "How do you give those on the left hand side of the map a voice in the nanotechnology debate?"

Biofuels

The question of biofuels as a contributing solution to the world's energy crisis has received a lot of media attention in the last few years. One should be mindful of this media hype as the topic is often misrepresented. Clearly there is a potential for biofuels to be used as an alternative source of energy and contribute to rural economic development, but this potential has not been fully understood. When considering biofuels as a viable option, there are some issues that need to be considered. Firstly, one cannot look at biofuels as a single product; it has to be understood and implemented in an integrated way. Secondly, because of the media hype surrounding biofuels, local expectations regarding its potential are very high, which may be in conflict with the actual viability of biofuels as a source of alternative energy.

There seem to be several compelling reasons why the biofuels policy should become more prominent and attain higher levels of support:

- There is a need for climate change mitigation measures and climate change adaptation strategies.
- It is also necessary to address the energy crisis and look at energy security and ways to diversify the current energy supply.
- There is a government focus on poverty alleviation, rural development, economic growth and sustainable development.
- Biofuels may be cheaper than fossil fuels.
- Biofuels might help to address the problem of limited non-renewable resources.
- The South African government is subject to international pressure for biofuel development within Africa.

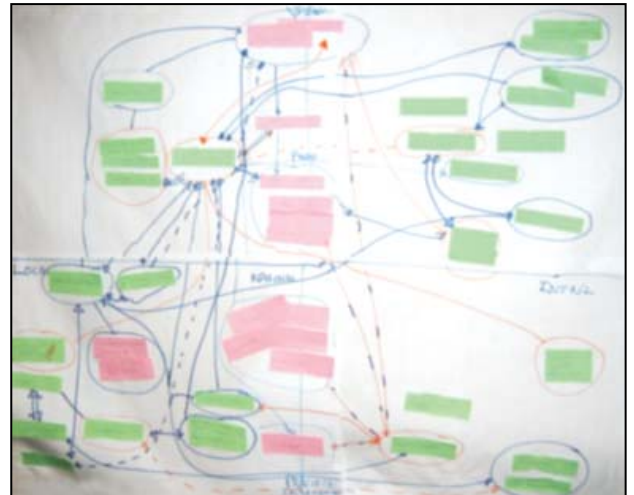


Figure 5: Map for biofuels case study group discussion

However, in the South African context there are also a number of reasons why biofuels remains a contested area:

- Uncertainties exist involving land rights of private land owners if their land is to be used for the production of biofuels.
- South Africa has limited arable land and is water stressed.
- The food security debate (food vs fuel) is a factor that may hinder the popularity of a suggested biofuels policy.
- Biofuel production is technologically intensive and difficult to achieve with limited infrastructure.
- Biofuel production has consequences in terms of creating new waste streams and for the environment (loss of biodiversity).
- Several governance issues arise here, e.g. how to control multiple refineries and how to handle the competition that big oil companies with vested interests present.
- There is limited knowledge surrounding this new and emerging market.
- There is uncertainty with regards to what the most appropriate feedstock with the greatest yield potential is.

When looking at the map of stakeholders and policy processes, there seem to be strong links within the science and policy-making communities respectively. This is especially the case at the national level. Examples of evidence-providers for biofuels include NGOs, higher education institutions, science councils and societal stakeholders, the private sector and business. Their policy-making counterparts include DME, the Department of Agriculture (DoA), DST, the Department of Water Affairs and Forestry (DWAF), DEAT, the Department of Trade and Industry (DTI), the Department of Provincial and Local Government (DPLG), the Treasury, the Department of Communications (DoC), the Department of Labour (DOL), DoH, the Department of Education (DoE), the Department of Transport (DoT) and the Department of Land Affairs.

The reason for these strong linkages within the science and policy communities seems to be their respective mandates for research and policy-making on climate change issues and just the general uncertainty of the social and environmental impacts of the emerging industry. Strong links also exist between the IPCC at the international level and local science councils and government departments such as DST and DEAT. The reason behind this seems to be that DST and DEAT take their cue from the IPCC and solicit research accordingly.

However, a number of weak links exist as well. There is a disparity between the learning that has been gained by the international community concerning

the use of biofuels as a viable energy source and what we have learned in South Africa. The primary reason for this is that the application of biofuels is, geographically speaking, quite context-specific. Therefore, the links between international learning on biofuels and local learning on biofuels is not strong. Also, as a result, the links between the originators of the international vision for biofuels and South African biofuels visioning bodies, namely DME and the Treasury, could be better developed.

In order for the weak linkages between actors to be addressed, the links between DME as lead authority on biofuels in South Africa with other government departments should be strengthened. There should also be a strengthening of the link between science councils (where there is more capacity for research) and central government so that the visioning process is able to benefit from a solid grounding in science.

A number of ways were identified in which the weak links could be strengthened:

- Better relationship management;
- Knowledge brokering to improve the relevance of science knowledge to government, for example between science councils and government; and
- Increased scope for improving the relevance of the science that the science councils are doing

Two other potential links were also identified:

- Integration of the national department should be influenced by cross-cutting issues (secondary in the biofuels industry).
- Indigenous knowledge should be used within science councils and government.

Case studies – specific learning points

The following are key learning points that arose from the case studies, and general learning points from the workshop.

Workshop participants studied all four maps together, to try to bring out issues common to all of them. They noticed similarities in all four case study maps: usually the policy influence is located in the upper quadrants of the map, more towards strategy and vision than towards practice. In all four maps there is also a concentration of issues in one quadrant and a blank area in

another quadrant, which is an issue that is worth exploring further. Whether the links are systematic or ad hoc is a question to consider, as well as whether there are geographical issues.

The media could play a big role in certain case studies. While they did not appear initially in the climate change case study, the team agreed that they should be added to the map. The plenary group also observed that religious groups and leaders fora did not appear in any of the case studies. For example, there is a large social justice community in South Africa: two Cabinet members are designated to meet with such groups on a regular basis.

Participants also noticed that the way the process is presented influences our thinking and perhaps the construction of the maps. For example, there is a perception that “voices need to go up” while the “President comes down.” The latter is easy while the former is an uphill battle. It might be worthwhile to work towards creating a level playing field.

How do we relate such issues to the science-policy interface?

There was much discussion about the role of individual organisations, based on the case studies. In relation to the nanotechnology case study, for example, participants asked:

- Does the National Nano-ethics Committee need to be better connected so it can open up and maintain the debate?
- To whom should it be connected, and how?
- What needs to happen to make the necessary connections?
- How can it be “protected” as an organisation so that it has the necessary authority to continue debating this potentially contentious issue, even when debates become most difficult?
- Can science councils improve their links to a cluster of core ministries?

An important point to emerge from the workshop was the concept of “orphan issues” where there is no clear institutional home and no line department has responsibility for driving policy forwards. Biofuels is potentially an orphan issue; so is acid mine drainage. The question that arises here relates to how such orphan issues can be recognised: should there be systematic mapping or visioning to identify them? (Should “orphanages” be created?) And what

can be done about orphan issues? Participants suggested that perhaps presidential working groups could be formed: such entities would create a forum/opportunity to highlight issues. There was strong consensus that DST could/should create such vehicles. In fact, DST was also identified in the acid mine drainage case study as potentially needing to play a catalytic role together with other key ministries in advancing the issue.

The following are some points that arose during the discussions:

- While there is a need for a change agent or catalyst with sufficient energy behind it to bring these issues to the fore, one needs to consider that change agents often become casualties in the process of effecting change. Therefore, clearly any such agent requires impeccable credentials or to be “bullet proof”.
- With respect to acid mine drainage, science councils have known and published in the peer reviewed literature about the issue for a long time. It is only since South African society has become involved (because of matters such as food security etc.), that the issue has come to the fore.
- In the case of acid mine drainage, risk and uncertainty are important and careful consideration should be given to how this can be communicated to decision-makers. A scenario could be presented to the relevant ministers where acid mine drainage is depicted as a risk for South Africa with heavy political consequences. However, if the issue becomes so serious that drastic measures are required to respond to it (e.g., if acid mine drainage decants into the Vaal barrage, and the government has to bring in the army to deal with the situation), then it is too late and the case is “lost”.
- Again it was felt that DST could play a more significant role in the acid mine drainage issue, one that would be welcomed by various other parties.
- The participants felt that DST could have considerable convening power for these sorts of issues: as a “bullet proof” organisation it could bring together the science being produced by the (relatively small) South African science community and broker it to the broad policy universe. In effect, DST would be acting as a knowledge broker at the macro level. In addition, DST is in a strong position to make recommendations about how to communicate outward from research to policy until individual relationships between scientists and policy-makers are strong enough to be self-sustaining. In fact, DST did put a process in place to draw together relevant knowledge to an issue, although the knowledge brokering work that was done was “under the radar” and thus not all of the workshop participants were aware of DST’s work in this area.



THE SCIENCE-POLICY INTERFACE: GENERAL LEARNING POINTS

The following emerged from discussions over the two days about both the presentations and the case studies.

1. There is a clear need for knowledge brokering activities to take place to improve links between science and policy. This can be done in different ways: by individuals, teams or whole organisations. Three issues were raised:
 - The CSIR executive level may well buy-in to the concept of knowledge brokering, but how can this buy-in be converted to effectively functioning institutional mechanisms?
 - Making time is important: institutions such as the CSIR need to support those individuals who need to make time to do this bridging-type work.
 - Thinking about knowledge brokering in terms of supply and demand is a useful framework for analysing what to do and why.
2. A focus on strategic policy objectives could be a useful way of reorienting research, but more thought needs to be given to how the “demand pull” from line departments can be stimulated. The organisation/actor(s) that should create this “demand-pull” were not yet identified, but it is clear that clarity of roles and responsibilities throughout this knowledge ecosystem is important.
3. Mechanisms need to be developed to bridge the gaps between general-interest policy-makers and specific-interest scientists:
 - Members of Parliament need to know about the utility of the research: they want to know that there is a solution, not necessarily the detail of what that solution is.
 - There is a disconnect between the outputs of science councils and the ability of policy-makers to access that output. This is especially the case when it comes to accessing journals: policy-makers are unable to pay for access to many of them and in addition scientists do not write scientific articles with policy-makers in mind as their audience.

- Everyone involved at the science-policy interface needs to be clear about the target group for high-level communications (policy briefs etc.) and the sort of timing they prefer. This needs to be clear before the briefs are written.
4. The participants referred to several tools for knowledge brokering which had been outlined in the presentations:
- The 2:3:25 report structure to communicate science into policy. After final technical reports from research projects have been peer reviewed for quality, researchers could be asked to produce a shorter (25-page) policy relevant report with a 3-page executive summary, following guidance about how to write concisely for a policy audience. Policy clients and researchers could then work together to condense this further, into a single sheet of paper (two sides of information). This very short summary would be used to encourage engagement by non-specialists, and by policy-makers in related areas.
 - Using indicators, particularly DEFRA's "stretching the web" diagram to present indicators of complex problems and to demonstrate that sustainable development is not a "trade-off" or "balance" between economic, social and environmental impacts. The various indicators of interest are presented as spokes on a wheel: moving outwards towards the end of a spoke shows improvement in the indicator. Drawing lines between the measures for each indicator gives a "web" effect and it is relatively easy to see where improvement is needed. The idea is to "stretch the web" by improving all the indicators at once. More information can be found at <http://www.defra.gov.uk/sustainable/think/stretch/index.htm>
 - Taking a Canadian approach to repackaging information that we are getting anyway, for instance by the creation of newsletters, based on information that is already being channelled within organisations, and targeted to specific audiences (Bielak et al., 2008).
5. The process of getting information out there should be taken more seriously, though this will mean more resources. Several questions come to mind here:
- Can we review the incentive structures for both scientists and policy-makers to include some of the issues discussed here?
 - Can the way in which scientists are currently assessed (based on documents such as peer-reviewed scientific articles and books) be

adapted to encourage their involvement in knowledge-brokering related activities?

- Can the way in which policy-makers are currently assessed (based on the production of strategy documents) be adapted to encourage their involvement in knowledge-brokering related activities?
- How can impact become one of the key result areas according to which employees at science and government institutions are measured? How should “impact” be defined?



NEXT STEPS - KEEPING UP THE MOMENTUM

Many points were raised by the participants, all of whom were keen to remain involved in the ongoing debate about science-policy links and evidence-based policy-making more generally.

Following this workshop

The workshop needs to be situated within the wider debate about evidence-based policy within South Africa. This handbook is being distributed to all the participants at the workshop and will also be made available online on the CSIR website for other interested parties to look at.

Some possible institutional commitments

An organisation such as the CSIR could take the lead in constituting a forum for policy and science to debate together, perhaps on a biannual basis pulling together key issues facing South Africa:

- This could be captured around specific challenges: it is easier to draw a crowd around specific issues such as the science-policy divide for biofuels, than for a more general issue such as science-policy links throughout government. Creating common themes for discussion creates champions and this in itself creates more momentum. Careful thought would need to be given to evaluating this process.
- The Minister for Public Administration convenes the public management conversation, bringing together key people from the NGO community, policy, and science to talk around a specific challenge: Could this approach be ratcheted down a level, say to the Director General (DG) level?
- DST's Global Change Grand Challenge around the science-policy–practice interface is a vehicle for this sort of conversation: much of the learning from this workshop will feed into this process, via a working group and another workshop.

- Can we change the way that scientific conferences are designed to encourage more interaction between scientists and policy-makers?
- Calling a conference “science meets policy around X” rather than “conference on X” helps to frame the conference as an interaction between participants.
- It is important to build into conferences some sessions for interaction, such as panels.
- It is also important to build on conferences to generate papers, which reflect interaction.
- Consideration should also be given to participating in any international fora on science policy linkages or on knowledge brokering.

Making personal commitments

Here is some advice for scientists and policy-makers that came out of the workshop discussions:

- “Subscribe to stuff – you don’t have to read it all!”
- Make a personal commitment to sharing knowledge: send documents to people you think will be interested – it only takes a few seconds to forward a document to someone by email.
- If we have a commitment to share knowledge, this will begin to build an informal community of interest around this workshop. In time it may turn into a more formal community of practice which could accomplish more, but at least we will know who is out there and could be involved.

A potential international conference on knowledge brokering in environmental sustainability policy might be taking place in Canada in mid-2010, which the workshop participants and other interested parties could benefit from.



APPENDICES IN PRINT

a. Agenda

DAY ONE: 19 November 2008	DAY TWO: 20 November 2008
08:00 REGISTRATION & TEA	08:00 TEA
08:30 Welcome	09:00 Genesis of a knowledge brokering unit: lessons from a Canadian experience. <i>Alex Bielak, Environment Canada</i>
09:30 Developing the UK's Sustainable Development Strategy: Lessons Learned <i>Phil Callaghan, DEFRA</i>	09:30 Evidence-based policy-making – the Australian/Pacific Islands experience and lessons learnt <i>Rod Lamberts, Australian National University</i>
10:00 Evidence-based policy-making: what's the question? <i>Louise Shaxson, DELTA</i>	10:00 TEA
10:30 TEA	10:30 Case study group discussions
11:00 Key themes to emerge from a Getting Research Into Policy and Practice Seminar <i>Jonathan Carter, Human Sciences Research Council (HSRC)</i>	12:30 LUNCH
11:30 DST's evidence-based policy-making Initiatives <i>Imraan Patel, Department of Science and Technology, South Africa (DST)</i>	13:30 Continuation of case study group discussions
12:00 DEAT's concept for a strategy on evidence-based policy-making <i>Dorah Ntezo, Department of Environment and Tourism, South Africa</i>	15:00 TEA
12:30 LUNCH	15:30 Feedback and highlights of the last two days
13:30 Case study group discussions	16:30 Closing
15:00 TEA	
15:30 Continuation of case study group discussions	
16:30 Depart for accommodation	
18:00 Start of social event	

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& tourism
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Note: The programme was amended slightly. Due to personal reasons Rod Lamberts from Australian National University was not able to attend. Alex Bielak presented on his behalf.

b. List of participants

This list of participants includes their affiliation and email address (in alphabetical order)

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APPENDICES ONLINE

The presentations that were delivered during the plenary sessions of the workshop are available online at:

<http://globalchange.grandchallengeonline.org> (Click on the Evidence-based Policy link.)



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