DBSA
Development Bank of Southern Africa

Global Water Partnership

PROCEEDINGS

Regional Approaches to Food and Water Security in the Face of Climate Challenges

May 2011 Workshop

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The Development Bank of Southern Africa (DBSA) is one of several development finance institutions in South and Southern Africa. Its purpose is to accelerate sustainable socio-economic development by funding physical, social and economic infrastructure. DBSA's goal is to improve the quality of life of the people of the region. The Bank plays a multiple role of Financier, Advisor, Partner, Implementer and Integrator to mobilise finance and expertise for development projects.

The Global Water Partnership's vision is for a water secure world. Its mission is to support the sustainable development and management of water resources at all levels. The network has 80 Country Water Partnerships, 13 Regional Water Partnerships and over 2,550 Partner organisations in 161 countries around the world

These proceedings were prepared by Mike Muller (member of South Africa's National Planning Commission, GWP's Technical Committee and DBSA infrastructure advisor) who convened and facilitated the workshop.

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Introduction: Food and water security in the face of climate challenges

The global focus on the threats posed by climate change has drawn attention to the fact that water will be the medium through which many of its impacts will be felt. In addition to the direct impacts of damaging floods and interruptions to water supply due to drought, a particular concern in many regions is the threat to food security, driven by changing rainfall patterns and increased aridity.

While climate change is a long term threat, many African countries already confront immediate challenges in managing present climate variability, the droughts and floods that regularly cause social distress and undermine economic performance. This highlights the need to develop strategies that will address immediate challenges while building resilience to adapt to long term trends.

Although many local and national responses have been identified, there is also a potential in the inter-connected regions of southern and eastern Africa to develop regional approaches that would build creatively on the different circumstances of the countries concerned to strengthen food and water security in the face of climate challenges across the region. This was the focus of a workshop held in May 2011.

The workshop brought together policy and decision-makers with researchers and practitioners to address these issues with the aim of:

- Improving the understanding of the regional and inter-sectoral dimensions of food and water security;
- Identifying opportunities for regional and inter-sectoral strategies to better address the challenges faced by individual countries and sectors in contributing to food and water security;
- Highlighting areas in which further research and collaboration is required and building partnerships to take such work further; and
- Identifying immediate opportunities for development projects and programmes that would meet the common goals of the countries and their development partners.

Since the structure of the regions' energy economies is linked to agriculture, water and climate in a variety of ways, relevant energy issues were also considered.

The workshop was hosted in Midrand, South Africa, by the Development Bank of Southern Africa (DBSA) in partnership with the Global Water Partnership (GWP), International Water Management Institute (IWMI) and South Africa's National Planning Commission (NPC) with the support of SADC, the EAC (East African Community) and the African Development Bank.

Framing the questions

Participants were welcomed by **Ravi Naidoo, Group Executive: Development Planning at DBSA,** who said that, while, as a bank, the DBSA must be prudent in its lending, it has a mandate to support development in Africa, both through lending and through facilitating developmental activities. The DBSA already supports significant regional infrastructure projects and is always seeking new projects where its funds and knowledge can make a difference.

As a development institution DBSA is guided by the concept of sustainable development, focusing on the triad of people, their livelihoods and inclusion in the wider community; the economy, since without a strong economy there will not be resources raise the quality of life of the people; and ecology, since the natural resource base that underpins all social and economic activities must be sustained if communities are to have a future.

The workshop was thus closely aligned with DBSA's core focus. Taken together with the challenges of climate variability and change, it was appropriate to consider how the emerging global climate programmes can help Africa to address the challenge of food security in the context of the natural resource challenge of water security. DBSA was thus committed to work to build new partnerships together, across borders and across sectors.

Letitia Obeng, Chairperson of the Global Water Partnership, explained that GWP was established to promote new approaches to the management of water which recognised that business as usual was not going to achieve the results sought, whether in terms of peoples' social conditions, the economies in which they worked or the protection of the environment. Management of water is not simply a matter of balancing supply and demand. Tradeoffs between different interest groups and goals can only be resolved if there is discussion across sectoral and national boundaries, between groups who represent communities and private interests, organised labour and environmental concerns as well as the different components of government.

The increase in income and population growth across Africa is deepening demand for food and, with limited water and agriculture resources, this constraint is exacerbated by climate change. For these reasons, GWP is working through its regions to consider how working to achieve water security can address the social and economic challenges of food security in the face of climate challenges.

In South Asia, the focus was to get people and countries who share river systems to work together to manage them more effectively for common benefit. But since different regions have different problems, it was appropriate to come to Africa join to consider the linkages between food and water security in Southern and Eastern Africa and strategies to address them in the context of climate challenges. GWP's aim is to promote new partnerships that go across the traditional divides. This workshop will have been a success if we see water people talking about agriculture and trade, power people talking rural farm livelihoods and environmental people talking about how climate finance can support water security.

Dr.Pius Chilonda of the International Water Management Institute, (IWMI) noted that with the global population growth projected to reach 9 billion by 2050, addressing the world's food is a major challenge. Agricultural growth is critical to achieving the Millennium Development Goals, starting with the first MDG which seeks to address poverty and hunger. For this, there is an obvious need to invest in irrigation systems at all scales. In addition, there is a need for technologies which will assist the smallholder producers who are critical to reducing poverty quickly in developing countries since this will also improve livelihoods and the ability of people to feed themselves.

Minister Trevor Manuel, Chairman of South Africa's National Planning Commission, said in his keynote address[1], that "in pursuing economic development, we need to understand our endowments; it is necessary to plan or work from what we have and not what we hope we had."

"In other parts of the Southern and East African regions, countries have demonstrated the ability to transcend these challenges in designing their developmental paths. In many cases, development plans incorporate land and water resources, as well as large numbers of relatively unskilled, poor people and decided that agricultural development will remain a focus for development, even as other sectors grow.

"But as we imagine different futures for our different countries, we should also have the courage to imagine ourselves working together as a single region.

"If we do that, we find that the balance of our endowments looks a little different. If we combine our access to capital as a region, with the diversity of human resources that we have, the independence dividend that is now maturing in the region, with our extensive natural resources (including water, whose utilisation rate would fall to 5% or less if we include DRC: The Democratic Republic of the Congo), a completely different set of opportunities would arise. And while we would still have large numbers of relatively unskilled people, they would have far wider opportunities than if we simply worked as individual countries."

Minister Manuel highlighted opportunities for regional cooperation to improve food and water security ranging from a regional energy complex based on sugar production to hydropower development and that could support irrigation and more specialised agricultural production. He also highlighted the opportunities that may arise from the establishment of funds to support climate adaptation but cautioned that funds would need to be raised before they could be distributed.

Manuel also warned against underestimating the challenges of regional cooperation:

"Within a single country, it is often difficult to get different sectors to work together cooperatively. And the challenges of working across boundaries are even greater. The co-operation we recognise as important, and in the interest of which we have all signed a myriad of treaties and protocols, remains elusive. The preamble to so many texts is premised on the need to increase intra-regional trade and develop cross-border infrastructure to that end; we explain in some detail the objectives of trade facilitation towards a freer movement of people and goods – but our delivery on these noble objectives remains sub-optimal."

Business also had to change its approach and begin to think regionally:

"The opportunities on our continent are significant and increasingly recognised by investors across the globe. It must be that the best way to optimise the value of the multiple opportunities we have is by ensuring that we build strong and resilient regional economies. We need to grow consumers and producers; we need the scale that the region offers to invest in infrastructure – roads, port, rail and ICT; we need to act smartly on the planning and utilisation of key natural resources such as sunshine and water. We also must co-operate in the development of our human capital – investment in education and skills will drive our ability to innovate and become competitive.

"... what is critical is to engage with our colleagues, across communities, between business and government and civil society, across sectors of activity and across national boundaries; we need to

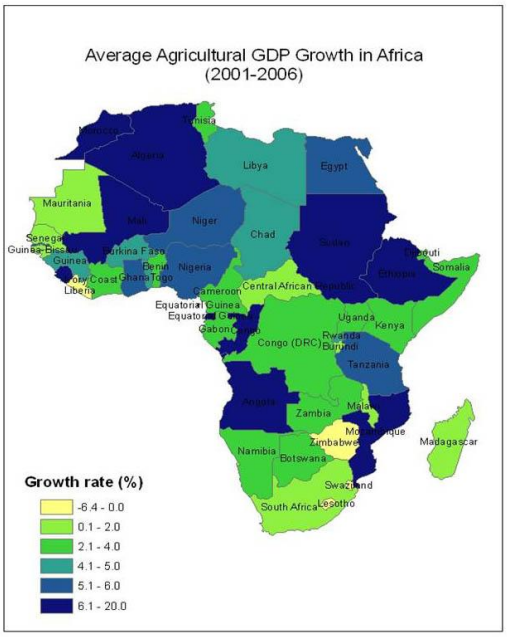
[1] The full text of Minister Manuel's address and the other presentations is available at http://www.npconline.co.za/pebble.asp?relid=590

engage and build a common vision of where we are trying to go and how we are going to get there. In the process, we also have to build trust, trust that we are committed to working together for mutual benefit, not simply trying to profit by exploiting our neighbours for our personal gain. Bringing people together, to talk about these issues, to develop common approaches to achieving a common vision is at least as important a part of planning as the nuts and bolts of project identification and analysis, resource allocation and implementation."

Where do we stand today?

Eastern and Southern Africa in a global and continental context

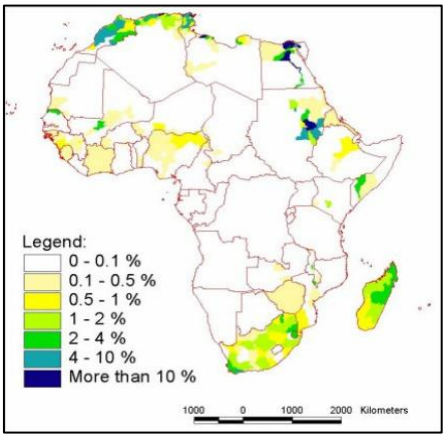
Dr Uma Lele is a member of the GWP's Technical Advisory Committee who as a senior World Bank staff member and subsequently, has been deeply involved with the Consultative Group on International Agricultural Research CGIAR, the leading global agricultural research initiative. Her keynote address situated the Southern and Eastern African challenge in a global context. She highlighted the similarity between the resources of the region's savannah and that of the hugely productive Brazilian *cerrado* zone and noted that while Africa had tremendous unexploited potential which was attracting widespread investor interest, it continued to be a net food importer.



In general, Africa's agricultural productivity was low and was improving very slowly. One challenge was the tension between alternative models for Africa's agricultural development between larger farms, and a business model which involves smallholder producers.

Since agriculture was the dominant water user in both sub-regions, agricultural and water development would have to go hand in hand although agricultural expansion should not be seen simply in terms of large scale irrigation projects – rainfed agriculture offered substantial opportunities. While the proportion of development aid to agriculture had declined in the two decades up to 2007, there were signs that this was reversing and that agricultural research and investment were growing although much more need to be done. Lele concluded by identifying some pointers for improving water management to support agricultural development.

Professor Elijah Phiri, from the University of Zambia and leader of Pillar 1 of NEPAD's (The New Partnership for Africa's Development) Comprehensive Africa Agricultural Development Programme, dealing with Sustainable Land and Water Management (CAADP Pillar 1) and Programme Coordinator for the Sub-regional Center of Excellence on Land and Water Management of SADC, the Southern Africa Development Community. He focused on the current state of agriculture in Southern Africa and on the approach being taken by the CAADP programme but began by providing a brief overview of food security, agricultural production and irrigation in sub-Saharan Africa.



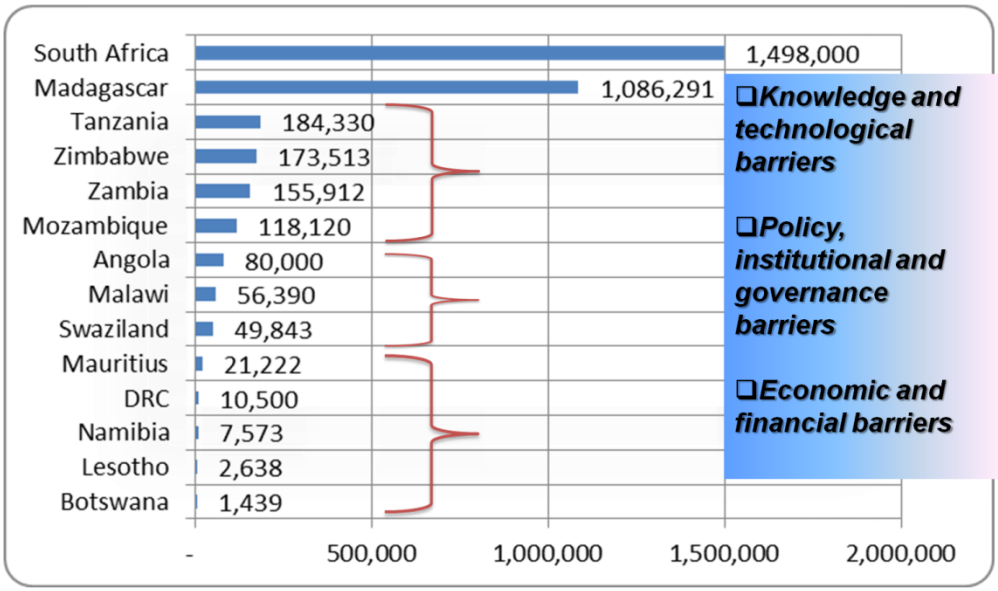
Extent of irrigation development in Africa (% cultivated land under irrigation)

He provided a stark reminder of the development context of sub-Saharan Africa and the Southern African region. In sub-Saharan Africa, one third of the population lives in chronic hunger, 45% earning less than a dollar a day. In Southern Africa, 67% of the population depends on agriculture for their livelihoods and the sector accounts for 80% of employment as well as generating a substantial proportion of the region's foreign exchange earnings.

While Africa is well endowed with water and land, the resources are unevenly distributed and, as a result, under utilitised in some areas and unsustainably overused in others. Productivity is generally very low, soil fertility is declining and land degradation is a serious problem. At a SADC level, there is vast untapped potential of water availability for agriculture and food production; water resources so far mobilized for agricultural use are generally small with respect to the total annual renewable resource.

In sub-Saharan Africa over the last 40 years, only 4 million ha of new irrigation have been developed, of which by far is the smallest expansion of any region (China added 25 million hectares and India added 32 million hectares FAO, 2003a). Water withdrawals for agriculture are small: estimated at less than 7%of the total renewable water resource.

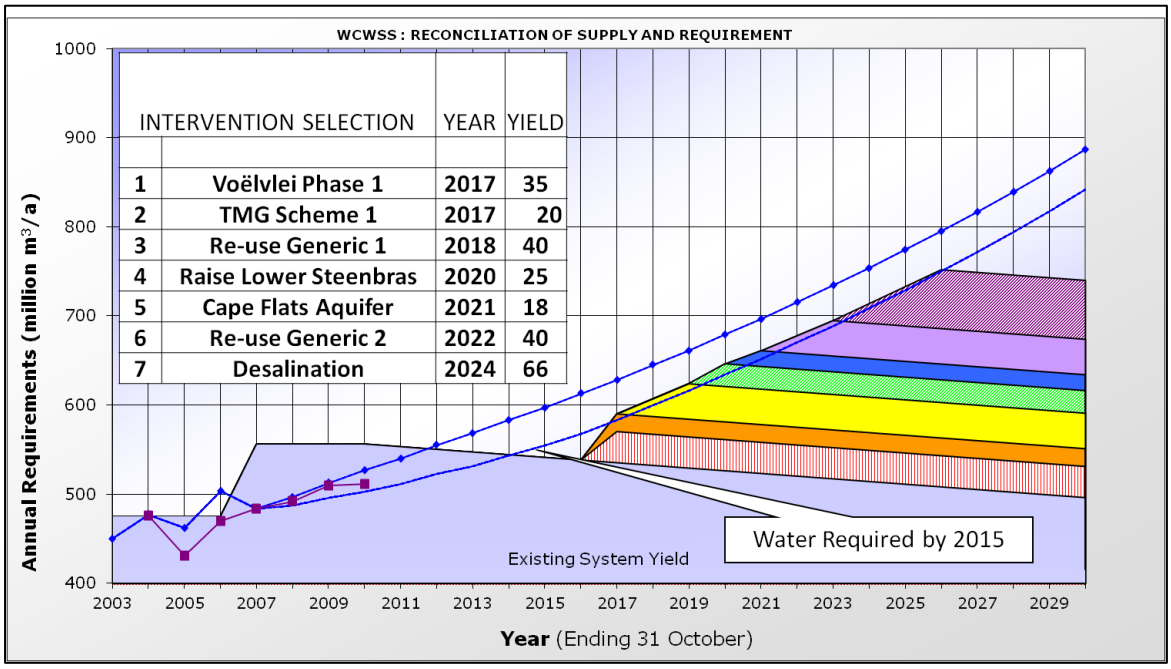
Area under Irrigation (ha) in SADC Region



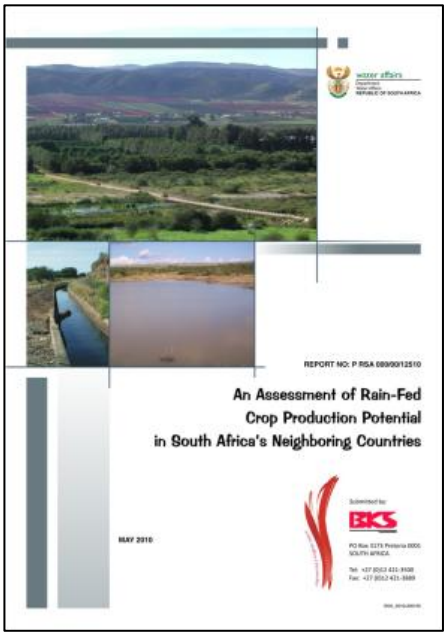
Food security from a water resource perspective

Johan van Rooyen, Director National Water Resource Planning at South Africa's Department of Water Affairs, explained why South African water managers are interested in the agricultural potential of the region. He outlined the planning process that guides resource management and development. Increasing demands rather than climate change were South Africa's major challenge in the medium term. While South Africa could meet its water needs until 2030 and beyond, through new developments and more reuse, the cost of doing so would rise sharply. Since agriculture was the lowest value user of water, there would be pressure on agricultural users to release water for other sectors either by trading, efficiency investments or both.

Scenario 3: Climate Change and Cape Town copes with climate change water demand management 50% successful



At the same time, the water planners were aware of the huge potential in the rest of the region for the production of many staple crops in terms of land, water and people. Greater agricultural cooperation and specialisation could release water for other uses in South Africa while creating opportunities for greater production in the region and maintaining South Africa's food security. Since water-sharing was already working in the region, food sharing should also be considered, he suggested.



Using the example of Cape Town, Van Rooyen explained that climate change was not the major factor limiting water supply. If funds were availableto invest in new schemes and water demand management was efficiently implemented, supply could be assured beyond 2030.

Regional agricultural water management challenges

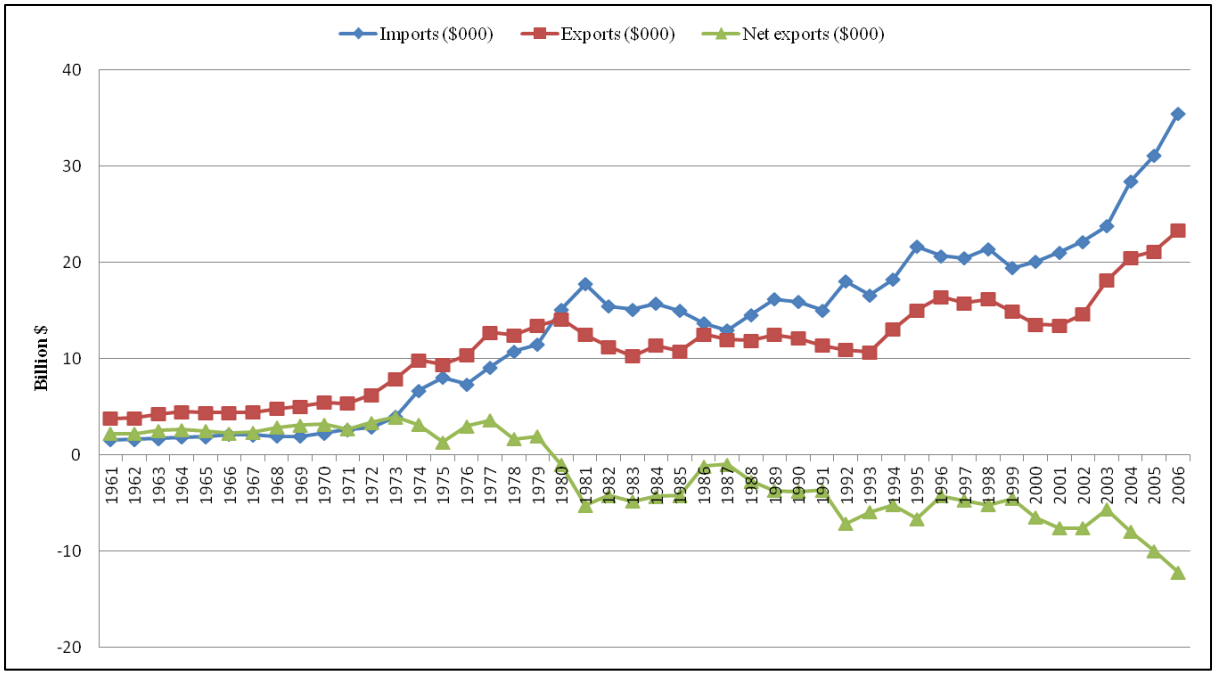
Dr Tadele Gebreselassie is based at IWMI (International Water Management Institute) where he coordinates IMAWESA (Improved Management of Agricultural Water in Eastern and Southern Africa), a regional knowledge management network funded by IFAD (International Fund for Agricultural Development). He previously worked as Regional Project Manager at the Nile Basin Initiative, focusing on the efficient water use for agricultural production and presented a perspective from both regions.

Gebreselassie pointed out that ESA (Eastern and Southern Africa) suffers from economic rather than physical scarcity of water (inadequate infrastructure and lack of investments and supportive policies). In both regions, total water withdrawals are less than 5% of what is available. With the exception of South Africa there are very limited storage facilities for water. While there is extensive land available, only a third of this is cultivated. Yields are very low, associated amongst other things with extremely low levels of fertiliser usage. Land use is constrained by the lack of reliable water and, in some cases, degradation. Only 2.6 million hectares are under irrigation, out of a potential of 16.6 million, most of this in South Africa and Madagascar. There is a lack of investment and institutional capability to address this backlog.

What opportunities do agricultural specialisation and trade offer?

Prof Nick Vink, an agricultural economist at South Africa's Stellenbosch University, who has had extensive involvement with Government Commissions on agriculture and food at national and regional level, addressed the core topic of agricultural specialisation and trade. He outlined agricultural trade trends between South Africa and Africa and highlighted how Africa's agricultural trade deficit had grown since the 1960s while South Africa continued to be a large net exporter to Africa, in particular to Southern Africa. Africa accounted for a third of SA's agricultural exports but less than 6% of agricultural imports and this was growing very slowly. Maize accounted for over 20% of exports although processed foods were (marginally) the fastest growing segment.

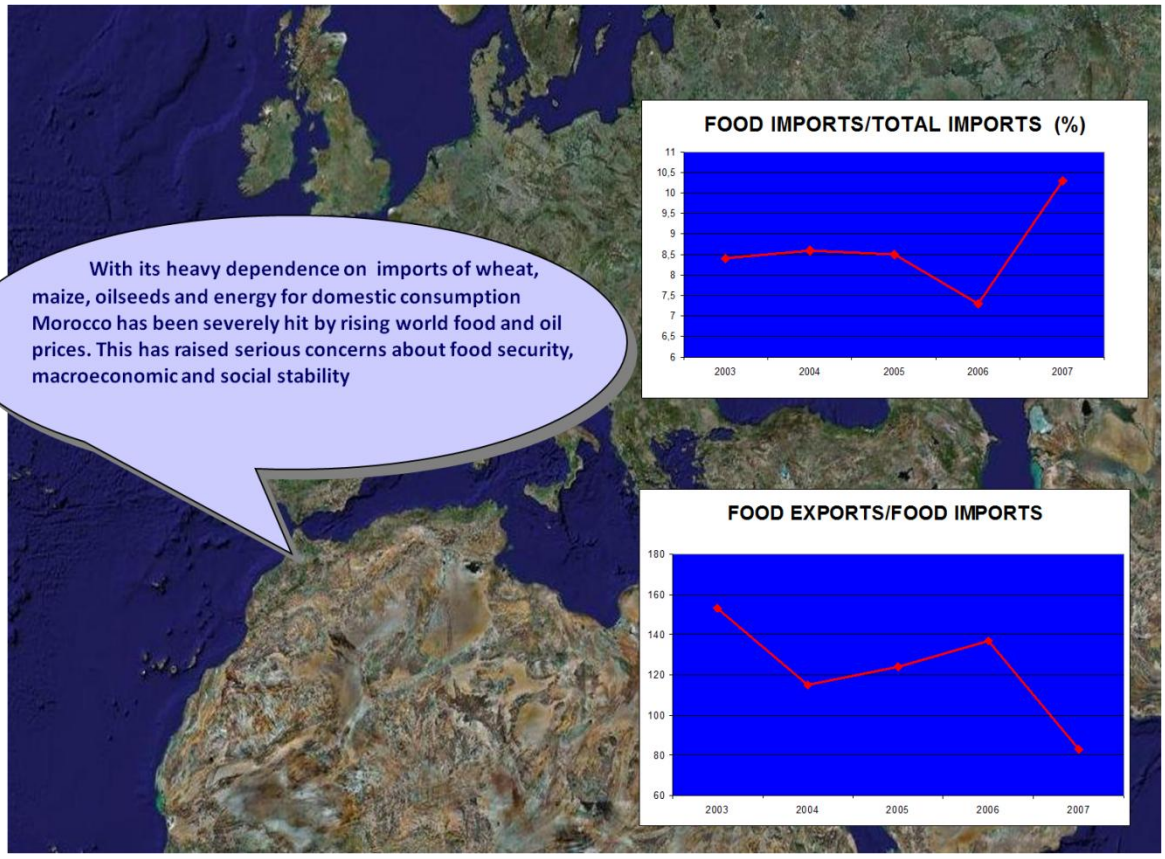
Net agricultural exports from Africa, 1961-2007



This suggested that there was little immediate opportunity for substantial growth of the South African market for African produce or for the region to become a supplier of staple grains. However, when African agriculture was looked at from a wider perspective, it was clear that there were many positive developments in the region that were not always recognised by commentators. African farmers were finding markets beyond the continent and developing profitable niches. It was important, given globalisation, not to compare small scale farmers to large scale farmers and treat them as a dichotomy. In some contexts, small farmers were best able to take advantage of opportunities while in others, large scale commercial farming was the only model that was likely to be competitive.

The experience of other countries

Dr Mohamed Ait Kadi, who is Chair of GWP's Technical Committee and President of the General Council of Agricultural Development of Morocco, described the food and water security challenges that faced his country and the importance of trade in resolving them. Morocco is a highly water stressed country with erratic rainfall and frequent droughts and few opportunities to increase water supply. Present water use patterns and withdrawals are not sustainable and water security is becoming a major limiting factor for socio-economic development. Water resources management is therefore shifting to a more difficult task of ensuring economically, socially and environmentally efficient water allocation within the existing water resources constraints. Already, the country is making the transition from rural to urban (approaching 50% urban) with agriculture a shrinking share of the economy (23% in 1998 to16% in 2005).



Changes in water management arrangements, including water pricing and trading to move water to more productive uses have been part of this. One consequence is that Morocco is producing and exporting more "water efficient" crops and importing water-intensive grains and oilseeds. However, Morocco has to compete in a global market with developed countries and food security has become a challenge. With its heavy dependence on imports of wheat, maize, oilseeds and energy for domestic consumption, Morocco has been severely hit by rising world food and oil prices. This has raised serious concerns about food security, macroeconomic and social stability.

This has led to concern about the trade policy implications of current trends, in terms of which Morocco will become less self sufficient and will have to rely on the world market for food imports. It has been shown that different trade regimes can have deleterious consequences for the efficient allocation of water. On the other hand, trade reforms can alter the picture and encourage more efficient use of resources such as water. So, while water reforms must continue, with more integrated development and allocation of water resources , as part of a rational climate change adaptation strategy, this will not be enough to ensure food security.

Ait-Kadi pointed out that the agricultural trading system is neither truly global nor truly free. Developing countries still face difficulties in accessing the markets of developed countries, which continue to provide trade distorting subsidies to their farmers and impose tariff barriers to developing country exports. In Morocco's case, the achievement of food

and water security will require a trading system that draws on the expertise of every nation and returns to every nation a more diverse and above all secure supply of food.

People and livelihoods – critical consideration in food security

In the discussions that followed these presentations, it was recognised that food security was not primarily about agriculture and food production but rather about development that generated employment and livelihoods. In her introductory remarks, **Professor Milla Mclachlan** from Stellenbosch University explained that in South Africa, food security was determined within a food a system that started with primary production but also included processing and manufacturing, transport storage and distribution, food retail and purchase as well as food preparation, consumption and disposal. While food security was often discussed only in terms of production, a substantial proportion of all food, estimated to be between 30% and 50%, is lost or wasted as it passes through the food system.

However, for most of the other countries of southern and eastern Africa, with their predominantly rural populations, it is the structure of and support for agriculture that is critical. Even in these countries, however, there is also a challenge to generate more employment in urban areas as well as increasing the productivity of agriculture. While it is widely believed that staple foods such as grains are more efficiently produced on large mechanised farms, there is evidence from the region that relatively small-scale farmers are able to contribute significantly to meeting national requirements.

There was general consensus, however, that food security depended on the ability of national economies to generate adequate livelihoods for their people rather than simply to produce food. Beyond that, as the Moroccan case showed, trade arrangements are critical for countries that choose to achieve food security at national level by relying on global markets. Water was only one part of the challenge although, particularly in countries with low productivity, better water management could play a transformative role.

What are the opportunities and challenges?

Against this background, participants considered the future challenges – and opportunities. Since climate change was dominating much development discussion, it was appropriate that its potential impacts should be considered first.

Climate variability and change – a South African perspective

Climate variability is already a major challenge for agriculture in Eastern and Southern Africa and climate change will aggravate the situation. **Prof Roland Schulze**, Senior Research Fellow at the School of Bioresources Engineering & Environmental Hydrology, University of KwaZulu-Natal, is one of South Africa's leading water resources modellers, focusing in particular on land and water interactions at catchment scale. He was thus ideally suited to address issues of water & food security under projected climate change in a South African context which provided some perspective on the challenges that were likely to face the wider sub-regions where "downscaling" of climate models to make detailed predictions at sub-catchment level has not been undertaken.

Schulze outlined the expected impacts of climate change in terms of temperature, rainfall, evaporation and river flows, emphasising that the effects were complex and that, aside from temperature and evaporation effects, predictions were uncertain and should be viewed as scenarios rather than probable outcomes. He highlighted the need to consider impacts at the level of local sub-catchments and emphasised that changes in variability of rainfall and streamflow were likely to be as important as absolute changes in the amount.

While increased flows were expected in some major rivers (the Orange in the west and the Sabie in the east), the amount of water required for irrigation was expected to increase in many parts of South Africa. Increased variability was going to make farming more difficult, particularly for small farmers without extension support and access to adaptive options. This has implications for approaches to achieving food security and to more general social policy since collapsed livelihoods will undermine security and political stability.

Opportunities for sustainable livelihoods in corporate supply chains and beyond

While the natural environment provided some of the context for understanding the challenges of food and water security, it is clear that land and water are not the major constraints and that the economic environment is critical for the opportunities it creates – or withholds. A number of participants addressed different dimensions of the economy, always with a focus around the peoples' livelihoods, since it was generally accepted that this was a key to household food security.

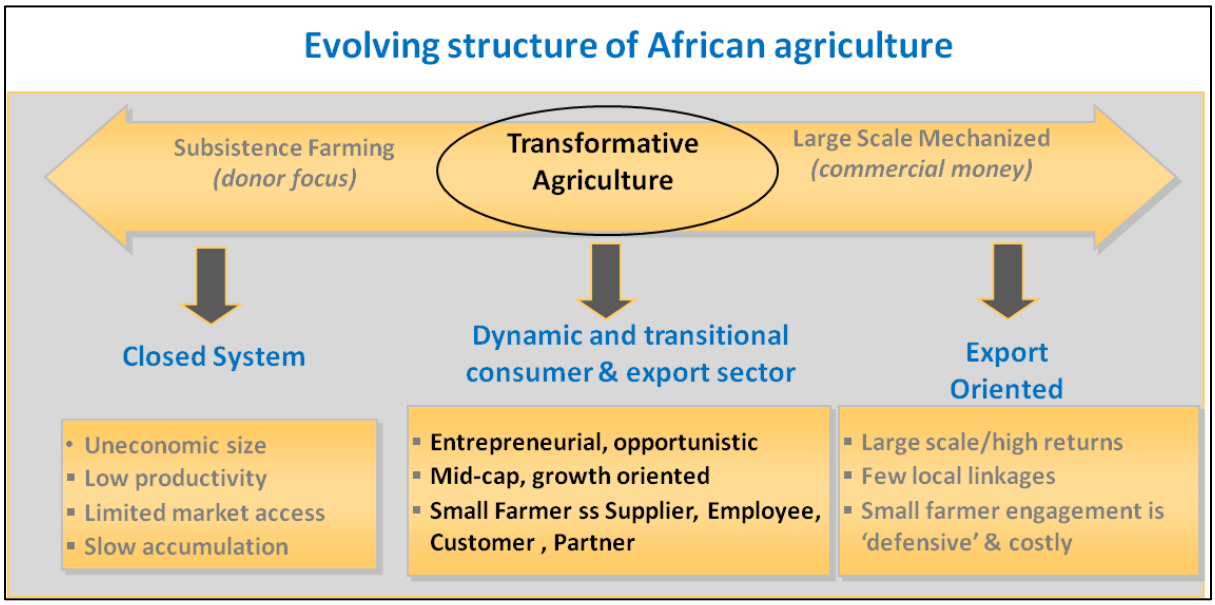
Andre Fourie, Head, Sustainable Development, at SABMiller, presented the perspective of a global company which operates in a large number of countries and has had to consider its impact on the broader community. In evaluating its water impacts, it soon realised that what happened inside its plants was just a fraction of its true impact, which occurred mainly in the production of its agricultural inputs which included crops such as barley and hops as well as sugar and, in some markets, sorghum.

When evaluating its supply chain in developing countries, it also identified opportunities to engage local producers and, through its relationship with them both to improve their production methods (and livelihoods) as well as to ensure that the impact of their activities was sustainable in environmental terms. The relationship that SAB had developed with producers in its supply chain created opportunities to improve water management as well as to provide sustainable livelihoods. It had had very positive results in a number of countries but noted some concerns:

- The limited capacity of partners (for example: small holder farmers) often requires long term support
- By "doing good", companies may also distort the market without intending to do so, for example, by having small scale farmers become dependent on them. This both prolongs the need for active support but also reduces the value gained from the promotion of self-sufficient actors.
- While some of these activities are country based, opportunities for regional and global efficiencies may become more important in the future.

Lynette Chen, CEO of the NEPAD Business Foundation, presented the NBF's (NEPAD Business Foundation) TransFarm Africa programme, which seeks to find more systematic ways to engage small farmers in the supply chains of large organisations in a sustainable and equitable way. Her organisation's focus was on promoting inclusive agricultural opportunities along the region's "development corridors", taking advantage of the access provided by new infrastructure.

TRANSFARM AFRICA
Transformative agriculture emerging as dynamic segment of African agriculture



TFA's approach was to identify and remove key barriers that were inhibiting such development. These could include supporting the development of appropriate contractual arrangements to give small farmers access to markets or addressing the "last mile" infrastructure gaps, which prevented them from taking advantage of opportunities. These could include infrastructure to link farm irrigation systems to bulk water supplies.

Rural sociologist and gender expert **Barbara van Koppen** who is based at IWMI Southern Africa addressed the question: "Is food security a livelihoods or an agriculture issue and how can water and energy management help to achieve it?" She called for a more critical approach and drew attention to the particular characteristics of farming in the SADC (Southern Africa Development Community) region where, for historical reasons, there was a dual economic system and what some considered to be a "premature" agrarian transition from small-scale labour-intensive peasant farming to "modern", large scale capital-intensive operations.

As a result, successful large commercial farms now coexisted with extremely poor peasant farmers. The large farms were frequently characterised as "economically viable' with "rational farm sizes" using modern, mechanized methods producing a surplus which contributed to national food

security. Small farmers on the other hand were often described as subsistence producers who never competed with large-scale farming or had any surplus and always required public support, "an eternal drain on water and treasury" which was just welfare and charity. This suggested that there was a dichotomy between livelihoods and agriculture and the question was whether politics and policy was driving reform or further polarizing SADC's dual agrarian structure.

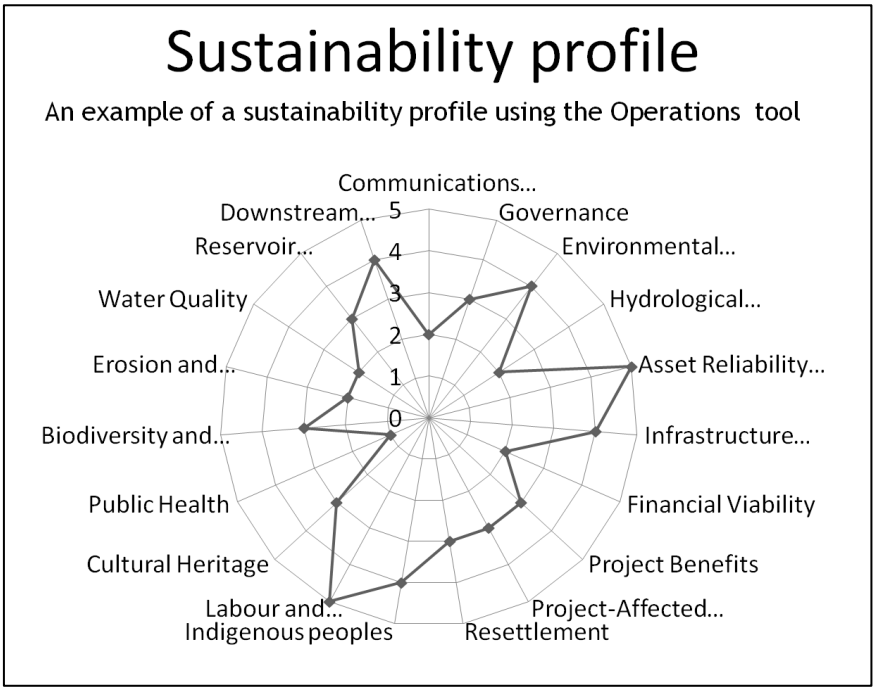
Van Koppen drew attention to the historical subsidisation enjoyed by minorities prior to independence and South Africa's 1994 democracy, which had helped to develop livelihoods for poor white communities while at the same time consolidating settlements on contested land with access to water resources. This also had the effect of crushing highly productive indigenous farmers.

New approaches to tap market opportunities, establish joint ventures and integration into supply chains and markets through outgrower arrangements (subsidising land and water infrastructure to do this) had to be critically reviewed. The question was whether these were agrarian reforms for broad-based food security and justice or simply an accelerated settlers' land and water-grab, helping commercial interests to outcompete smallholders?

Hydropower : Problem or solution?

The uncertainty about policy directions in the agricultural sector could make it difficult for other sectors to support its development. Yet there were many opportunities that could be tapped, if here was policy coherence and inter-sectoral collaboration.

Cameron Ironside is Programme Director of the IHA (International Hydropower Association) and has a particular interest in climate change and renewable energy market. Given the controversy that has surrounded the building of large dams, which has until recently blocked the development of hydropower in donor-dependent African countries, his presentation focused on the development of a Hydropower Sustainability Assessment Protocol.



The Protocol, adopted in 2010, outlines procedures to be followed in the analysis of options, design and implementation of large scale water projects involving hydropower. These had been developed in conjunction with a wide spectrum of interested parties, including representatives of development finance institutions as well as environmental groups and civil society. The Protocol covers a full range

of social, economic, environmental and institutional dimensions as illustrated in the slide on page 14.

Ironside highlighted the importance of multipurpose water resource development in which a "bankable" hydropower component could help to fund public good type objectives such as flood control and water storage and supply for irrigation. In an African context, given the continent's large number of shared rivers, many such projects would necessarily have to be regional in nature, as had already been demonstrated by developments on the Zambezi and Orange-Senqu rivers.

Regional cooperation : benefits and obstacles

While there are clearly opportunities from inter-sectoral cooperation across national boundaries, there are also problems to be confronted before these can be realised. In a paper presented by **Samson Muradzikwa**, Chief Economist in the International Division of the Development Bank of Southern Africa outlined some of the benefits that should be derived from regional cooperation, including:

- Bigger markets which offer more potential for specialisation and economies of scale;
- More suppliers and increased competition that could benefit consumers in individual countries;
- Bigger regionally integrated markets will attract more investment, both internal and foreign;
- Management of transfrontier natural resources (e.g. water, fisheries and hydroelectric) can be more easily improved to better meet both national and cross-border needs.

However, these potential benefits were not being realized in practice, for a range of reasons. The absence of regional funding models meant that, even where cross-border projects have been identified and motivated in a regional context, their financing has usually been done on a national basis. This led to a fragmentation of the projects, with different terms and conditions applied to different segments based on different risk regimes for participating countries.

This reflected the absence of project champions who could mandate and drive regional projects, which, said Muradzikwa, is often a binding constraint. Institutional capacity challenges at the level of the regional economic communities limited their role in the facilitation of regional infrastructure projects and programmes

A wider set of challenges was the lack of cross-border "software": the absence of harmonised policy, regulatory, procedural, technical standards as well as environmental and other safety requirements are significant constraints to regional project development. When this was investigated, it was often found that there were serious contradictions between national and regional priorities and policy. Finally, integration and cooperation was often pursued more aggressively at a political level than with the private sector and civil society which resulted in a lack of support for regional initiatives.

Unlocking potential opportunities?

A feature of many of the presentations was the recognition that food security at both household and national level could be improved by linking communities of small scale farmers to market opportunities at local, national or regional level. At the same time, finance for infrastructure to support water supply for irrigation, essential in many areas to reduce climate risk, could be supported if it was developed as part of a multi-purpose scheme which included hydropower generation or as part of a broader agro-energy initiative. This highlighted the importance of situating the food and water security discussion in the context of climate change, even if this was not the most immediate challenge.

Climate change as an opportunity

The emerging challenges of climate change offer substantial opportunities as **Judy Beaumont**, of the Performance Monitoring and Evaluation Unit in the South African Presidency (and a member of South Africa's climate negotiating team) explained in her presentation on "climate change adaptation and green economies: the links to food, water and energy security". Highlighting the need to understand the dependencies between different sectors, such as water, food, energy, health and infrastructure generally, she suggested that Africa had to use adaptation programmes to generate economic growth, employment; AND make sure that new development is "climate proofed".

Climate proofing agriculture might involve approaches to achieve higher yields, extended use of drought resistant crops, greater soil protection and water conservation, better management of livestock densities etc. In the water sector, it might mean reducing leakage, water demand management as well as better long term planning and seeking new water supply solutions that save energy while energy would see a move to renewable and increased energy efficiency.

Throughout, the aim should be to achieve growth in incomes and employment driven by investment that reduces carbon emissions and pollution, enhances energy and resource efficiency, and prevents loss of ecosystem services. The challenge was to find different ways of doing business, of expanding economic activity, building social resilience AND reducing both consumption of natural resources and environmental impact.

To do this,. it would be necessary to select catalysts with multiple outcomes: using criteria such as employment creation; local industry development; enhancing competitiveness; building on what exists; enhancing natural capital. Beaumont hoped that the funding mechanisms that were under discussion in the climate negotiations would contribute towards these goals.

A regional bio-energy programme

One example of a potentially catalytic approach came from the presentation by **Wolfgang Fechter**, Executive: Biofuels and Business Expansion at Tongaat-Hulett, who outlined how energy focused cooperation in the sugar industry, could contribute to regional livelihoods as well as food and water security. Comparing the resource endowment of Southern Africa with that of Brazil, he said that the cost of cane production in SADC was competitive with Brazil and that it would be possible to create up to 3 million jobs in a Rand 70 billion agricultural and agri-processing industry; produce a substantial proportion of the region's liquid fuel needs as ethanol, equivalent to 20 billion litres of petrol; and generate up to 10 000MW of electricity. This could be done without prejudice to water and land resources but would require a substantial investment programme to build up to 120 new mills and develop between 3 and 6% of the region's cropland.

There was potential synergy in the production of electricity from hydropower and sugarcane sources. In the summer rainfall season, there is no harvesting and high river flows can be used for power production; during the winter dry season when river flows are low, sugar harvesting and cane

processing can generate electricity. In Brazil, electricity from sugar mills is used to balance supplies from hydro-power sources.

The principal barriers to such developments were financial and regulatory. While there were significant opportunities for the entry of new participants into this sector, funding is a challenge, especially in the case of new farms where owners do not have adequate resources. However, the provision of rural infrastructure for new development would also allow more available land to be used to kick-start small to medium scale food production for SADC and export; SADC could aim to become a significant future food producer to supply growing global demand.

But regional coordination was a greater challenge since SADC frameworks for energy, climate change, agriculture, water, infrastructure and development funding would have to be aligned. Fechter indicated that there is a need to enable a freer flow of energy (both electricity and liquid fuels) across SADC as well as to improve the public infrastructure to support new plants. Since South Africa currently accounts for 70% of the fuel market and 80% of the electricity market, South African policy would be key to unlock these opportunities. Specifically, ethanol markets and standards would have to be developed and changes made in automotive sector policy.

Support for agricultural water management

Prof. Elijah Phiri, had outlined what was being done under NEPAD's Comprehensive Africa Agricultural Development Programme (CAADP). Noting that land and water are the primary natural resources necessary for agriculture, food production and rural development in most African countries and SADC in particular, he said that if used in proper association with suitable technologies and related resources, Southern African agricultural production could outpace growing demand despite declining availability of per capita land and water resources.

The focus of Pillar 1 of CAADP, which he coordinates, is to extend the area under sustainable land management and reliable water control. However, it is recognised that to achieve the potential benefits from increased food supply, there will also have to be attention to the rural infrastructure, marketing and finance.

There is significant support for these activities. As **Dr Tadele Gebreselassie** of IWMI explained, the focus for the IMAWESA (Improved Management of Agricultural Water in Eastern and Southern Africa) programme was to improve productivity by increasing land under agricultural water management. This embraced the whole water cycle and included measures to:-

- Improve soil and water conservation;
- Adopt water efficient technologies starting with appropriate choice of crop varieties, modification of cropping calendars, conservation agriculture and improved agronomic practices more generally;
- Water harvesting (off-farm & on farm) to support the development and improvement of irrigation, noting that water storage was an important intervention since 70-85% of rainfall is "lost". Developed countries stored over 70% of their renewable flows, while Africa stored just 4%;
- Application of a variety of irrigation technologies such as small pumps, drip and sprinkler irrigation.

These initiatives would help to make African agriculture more resilient to climate change. But the issues should not be approached on the basis of simplistic distinctions between rainfed versus irrigated; smallholder versus commercial agriculture. Rather, what is needed is a systematic overall management approach to the problems. In that context, Agricultural Water Management is a holistic approach that involves a comprehensive package including trade, inputs, markets, and technologies.

Catalytic funding is already available

Akissa Bahri, head of the African Water Facility (AWF) based at the African Development Bank explained the role of the AWF in the context of the attention and support that is being given to climate change focused activities. The objective of the AWF was to offer a demand-driven African instrument that could support smaller projects (of up to €5 million) that were innovative and catalytic. The AWF (approval process) was streamlined and able to fast track the processing of projects. It targeted a wide variety of African institutions: NGOs and CBOs, municipalities as well as national and regional entities.

From Bahri's perspective, it was important that climate change interventions should be rooted in a clear development paradigm. At present, climate change funds are paying far more attention to mitigation rather than adaptation, which was not appropriate in Africa. The AWF was already addressing some areas related to the climate/water/food theme through its projects, notably transboundary water resource management projects that addressed climate change and water security issues, such as 6 regional Transboundary Water Resources Management projects: Congo, Volta and Kayanga-Geba river basins; Lake Chad; Bugesera area of Burundi/Rwanda; and ECCAS (Economic Community of Central African States) region. The portfolio of sectors covered by the Congo Basin Strategic Action plan is illustrative of the AWF's approach, including as it did hydropower, navigation, navigation, domestic water supply and sanitation and eco-tourism.

DISCUSSION

Rich and wide-ranging discussions followed the presentations. Focusing on three themes:

- Pro-poor approaches in land and water, for livelihoods and food and water security
- Climate challenges & opportunities: can energy and finance dynamise agriculture and water management?
- What interventions are needed in trade and markets?

Participants were encouraged to identify priorities for action in the short term; and areas for collaborative work in the longer term with indications of the constraints that would have to be addressed to make this possible. Key points from the discussions are noted below.

A. Pro-poor approaches in land and water, for livelihoods and food and water security

It proved extremely helpful to consider water security in the context of food security, since this focused attention on the need to consider impacts of water resource policy and programmes at the household level. This in turn highlighted the substantial challenge of engaging with poor communities to develop approaches that were supportive of their needs. Challenges identified included that fact that poor communities often lacked voice and there were often not effective channels for participation or representation. This was aggravated by the tendency of governments to operate in silos which made it difficult to have coordinated impact from collective work at a local level.

The role of the private sector was also questioned. Wolfgang Fechter of Tongaat Hulett was asked whether there were examples of projects where communities benefit from support to smallholder farmers. Fechter replied that there were examples in Mozambique as well as in South Africa. In the latter, however, there is limited land and coordinating redistributed land and making it productive is proving to be a major challenge.

Has Hulett avoided being called “land grabbers”? Fechter felt that Hulett’s investments have generated significant development that has generated a great deal of employment. With respect to the land, various schemes are in place and indigenisation is an important part of the process, there is just a need to find balance with the needs of external investors. Similarly, on the sustainability of making ethanol from sugar cane, bearing in mind water scarcity and that sugar cane is a water intensive crop, it was a matter of doing the right development in the right place. However, it was pointed out that even in the many areas where food and water is plentiful, care is still needed to ensure that commercial development models benefit rather than bypass poor communities. Often poor households and communities held land but could not raise the funds to develop it.

Other contributors recalled the 2002 Food Summit priorities and suggested that what was needed was a framework that enhanced the rights of landholders and secured their interests and benefits. This would benefit external investors by providing them with a clear structure within which to work. The priority in the long term must be to learn from the implementation of collaborative approaches. In many African countries, NGOs try to work together but lack collective goals. There was also often a disjuncture between government programs and donors as well as between government and NGOs. There is substantial scope to improve and align the design and implementation of projects. In this context, aid effectiveness approaches were important; donors must support government and not run programs in parallel; it would be helpful if donors could have long term plans aligned with country’s development plans.

From a water management perspective, two key lessons emerged from the discussion. First, the achievement of water security in Africa is often primarily an economic rather than a technical challenge. As a consequence, water resource managers must engage with existing and potential

water users to understand their needs and identify and promote ways in which investments in water management can contribute to meeting them.

B. Climate challenges & opportunities: can energy and finance dynamise agriculture and water management?

Given the extremely low levels of water utilisation in eastern and southern Africa, there was general agreement that, in most cases, the challenge for agriculture was to make water reliably available where it could best be used. This highlighted the general conclusion that the barriers were economic rather than physical and led to the description of much of sub-Saharan Africa as "economically water scarce". In these circumstances, a key issue was to identify potential sources of funding support; hence the interest in the potential of climate finance.

Judy Beaumont, from her perspective as a climate negotiator, warned that a systematic approach would be needed and that choices and trade-offs would have to be highlighted when discussing the redirection of investment and focus on climate change. Conceptualising the transition, the key question was how developing countries could best manage the transition to a lower carbon, more resource efficient and climate resilient growth path in a manner that also creates job opportunities, promotes economic growth and reduces poverty.

Transition requires prioritisation; categorisation of the type of actions that are possible to optimise positive spin-offs; sequencing; and an understanding of path dependencies, which implied that policy frameworks would have to be in place before programmes were designed and funded. So an important step would be to adopt a conceptual framework of climate change; what was going to happen, where how and when? While the IPCC has produced summarised global climate models, adaptation is a local responsibility and countries make efforts to downscale so that they can make impact assessments.

However, as was emphasised during the proceedings, climate change is just one of many challenges that African countries currently confront. So there were questions about whether it was possible to focus on adaptation alone. Improved water use efficiency might be "climate friendly" if it reduced agriculture's energy requirements but, for countries with limited irrigation, water use efficiency would be built into new programmes, which would not necessarily be eligible for adaptation funds. The strategy should be to make adaptation part of country's development plans and promote benefits of adaptation. But if funds are focused on adaptation and mitigation of climate change, this may not be possible.

Given these challenges of accessing potential climate funding, and uncertainty about when and how it would become available, other possibilities would have to be considered. Given the constraints on public budgets in many countries, multipurpose projects that could be at least partially self-funding were attractive. Water resource development schemes involving hydropower and urban water supply were examples. The potential benefits from integrating agricultural producers into the supply chains of major industries was also of interest since, if this guaranteed future cash flows, it might be possible to mobilise investment finance for water infrastructure.

Here too, challenges remained. Asked what the attitude of NGOs is to the International Hydropower Association Protocol, Cameron Ironside responded that, while there has been some buy-in, there is still resistance; some of the debates are ideological and not practical. A question has now been raised about potential green house gas emissions (methane) associated with hydropower versus. While there was little information about this (the IPCCC had initially said it was not significant), guidelines are being developed to measure emissions from reservoirs. So far it has been found that emissions depend on where the reservoir is situated. Some reservoirs have been noted to be absorbers of emissions. In applying the Protocol, the key must be to remember that people are the cornerstone of development.

In practice, it was pointed out by other speakers, substantial opportunities had already been lost. Implementation of the Inga "super-projects" in the Congo, which could generate all sub-Saharan Africa's electricity needs, was not likely to be politically feasible in the short term. But there were numerous other hydropower projects in Angola, Zambia and Mozambique that could have contributed to meeting South Africa's electricity demand. Because these were not at an adequate level of preparation, South Africa had proceeded with the construction of over 6 000MW of coal-fired power stations and was now considering a similar investment in nuclear power.

A further energy/food/water linkage that was identified is the energy requirements for the production of fertilisers, notably the nitrogenous fertilisers on which global food security already depends. Since the cost of fertiliser is dependent on the cost of energy, the availability of reliable and relatively cheap hydropower could support Africa's agricultural development through fertiliser production.

Given the concerns about corporate engagement in agriculture, the ongoing opposition to hydropower and dams and the uncertainties about climate funding, it was clear that none of these approaches would be a "magic bullet" that would support large scale water development. Countries and communities would still have to compete for very limited public finance. So it was important to highlight an important change that had occurred over recent years: The entry of partners like the Chinese, Indians and Brazilians who were less constrained in what they were prepared to finance and more willing to support local priorities.

C. What interventions are needed in trade and markets?

From a regional perspective, trade had the potential to be an important enabler of development that supported food and water security. However, there were many challenges. Key amongst them was the need to link business driven (bottom up) processes with policy driven (top down) approaches since, at present, there seemed to be very limited learning and communication between the two.

Institutional constraints were also particularly evident where multi-sector inputs are required, for instance achieving cooperation between infrastructure and agriculture as well as trade. Some of the trade and regulatory barriers had already been discussed; aside from formal barriers and the absence of a regional policy and supporting framework on opportunities such as ethanol, there were also incompatible standards for electricity. From a practical perspective, for a bioethanol economy to develop, there would have to be free market flows across SADC and infrastructure improvements to enable new plants to be commissioned.

This was an example of the situation in which significant development could only occur at a regional level because of the economies of scale that were needed in both production and markets. For these developments to proceed there would have to be significant coordination between countries. It was suggested that, paradoxically, the new tripartite arrangements being established under the broader umbrella of COMESA might help to assist with inter-SADC trade.

Finance remained the main challenge. Even with hydropower projects, complementary public finance might be required to address goals such as flood control and storage for irrigation. And, for agricultural projects, funding is a challenge, especially in the case of new farms where farmers do not have adequate resources or title to the land against which to raise funds.

CONCLUSIONS

The workshop succeeded in highlighting some of the complex interactions that will determine whether food and water security is achieved in the many different contexts of southern and eastern Africa. Land is under-utilised and widely available, although it is contested in more densely populated and developed areas. And it was notable that, in the two regions considered, outside of South Africa, Zimbabwe and Kenya, the overall physical availability of water resources was not the major constraint to the achievement of food security at a national scale. As a number of speakers highlighted, water scarcity is primarily economic rather than physical.

Water resource development and management can only support or catalyse efforts to achieve societies' broader development goals. Given that the principal constraint on achieving water security at household, community or national level is economic, the challenge is to identify strategies through which water management can help to address that constraint.

So substantial investment in infrastructure and institutions will be required to use the water that is available. Although much of this will be focused on land development and agriculture rather than on water, it will include investment in infrastructure to ensure that more of the regions' extensive water resources can be made reliably available where they are needed to support an expansion of irrigation as well as to meet other needs.

While climate change is a long term threat, coping with current climate variability is a far greater and more immediate challenge for the regions in which most countries are still struggling to achieve water security. But actions to reduce vulnerability to current climate variability will build resilience to the future impacts of climate change.

A further important conclusion is that food security will not be achieved simply by focusing on food production since, at household level, the question is one of access to and affordability of food. The real challenge is to find development paths that offer people the kinds of livelihoods that enable them to achieve and maintain food security. Given growing concerns about land and water "grabs", agricultural development models should focus on people and their livelihoods rather than simply production and profits. These models will need to use water in the most effective way possible, given the difficulty of providing the infrastructure and institutions required to make water enough reliably available.

Although African governments are prioritising agriculture, it is still difficult to mobilise funding for agricultural development in general and for agricultural water management in particular although there are a number of interesting initiatives underway. In both sub-regions, there are cases where linking energy and other market opportunities with activities focused on food and water would open new possibilities. These include the development of multipurpose water projects, where hydropower components could make a substantial contribution to the costs; bio-energy programmes in which energy sales could underpin investments; as well as connections with global and regional supply chains for agro-industries. In addition, if energy related approaches are linked to climate change mitigation or adaptation, climate funding might in the future be a possible source of support.

When the challenges of food and water security are considered in this light, a number of substantial opportunities can be identified that would best be realised through a regional and inter-sectoral approach. The proceedings highlighted cases where a regional rather than a national approach could achieve greater synergy in the use of land, water and energy resources that would in turn improve livelihoods throughout the region, building resilience to climate variability and change in the process.

However, from the evidence presented, it appears unlikely that rapid progress will be made in integrating food markets to achieve more effective use of the regions' available land and water

resources or to mobilise their energy potentials. There are substantial barriers to be overcome before these opportunities can be unlocked. New approaches are needed to identify, plan and implement regional development programmes. To be successful, these will have to engage private sector and civil society as well as governments. They will have to emphasise sharing benefits from specific developments rather than replicating single strategies across the diverse countries and communities of the region.

Markets, trade and harmonisation of regional regulation will be important enablers but an effective institutional framework is required to identify specific barriers and facilitate action to remove them. This will have to cross both sectoral and national boundaries.

As an immediate follow-up, a commitment was made to take specific recommendations through appropriate channels, specifically to the forthcoming SADC Water Stakeholders meeting and into the South African National Planning Commission's planning processes.

A final important step will be to encourage further public discussion of the practical benefits that could result from a more focused approach to regional development. This will help to create a climate of opinion in which more rapid progress can be made, to the benefit of all the peoples of the regions.

Report from the workshop "Regional approaches to food and water security in the face of climate challenges".

The workshop was hosted in Midrand, South Africa, by the Development Bank of Southern Africa (DBSA) in partnership with the Global Water Partnership (GWP), International Water Management Institute (IWMI) and South Africa's National Planning Commission (NPC) with the support of SADC, the EAC and the African Development Bank.

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