



High Level Conference on:

Water for Agriculture and Energy in Africa: The Challenges of Climate Change

Sirte, Libyan Arab Jamahiriya

15-17 December 2008

Following the decision taken on the occasion of the 12th Ordinary Session of the Executive Council and the 10th Ordinary Session of the African Union Conference held in Addis Ababa from 27 January to 2 February 2008, the Food and Agriculture Organization of the United Nations (FAO), as a chair of the inter-agency mechanism (UN-Water), together with the Government of the Libyan Arab Jamahiriya and partner organizations, will organize a High Level Conference on "Water for Agriculture and Energy in Africa: The Challenges of Climate Change". The Conference will be held in Sirte, Libyan Arab Jamahiriya from 15 to 17 December 2008.

Introduction & Background

The African continent is facing an escalating food crisis. The recent surge in staple commodity prices will hit many developing countries hard, and this is particularly the case for Africa which will have to find financial resources to pay for a commercial food import bill that on average amounts to US\$17 billion annually alone. Over 60 percent of this bill is accounted for by food staples. Moreover, terms of agricultural trade are worsening: agricultural net trade has been declining steadily passing from approximately US\$3.3 billion surplus in the 1970s to a dramatic deficit of US\$4.4 billion in 2004. If only coarse grains are considered, the amount imported increased eightfold between 1970 and 2004, and was boosted by a further 70 percent during the period 2005-2008.

At the continental level it is apparent that Africa has not been able to intensify agricultural production and generate intra-continental trade to feed growing cities or buffer the volatility of rainfed production. While Asia benefited from the effect of the Green Revolution that involved the large scale development of irrigation, the use of seeds, fertilizers and pesticides, and the extensive and heavily subsidized rural electrification to pump groundwater, the African continent did not face any similar trend in agricultural growth. In order to apply this model to Africa a careful examination of a very different context is required where land, water, labour and marketing opportunities are markedly different. While North Africa has had some success in achieving agricultural growth, it has generally reached the limits of its available land and water resources and further growth will have to come from efficiency gains. By comparison, sub-Saharan Africa has seen very low or even stagnant levels of yield growth in its rainfed sub-sector, and slow development of its irrigation sub-sector.

The food crisis trap that threatens the African continent is not only the effect of the lack of investment in the agricultural sector, but also a product of its vulnerability to climate. Farming in Africa is largely done under rainfed conditions and Africa's reliance on agriculture and its very low levels of irrigation make it singularly vulnerable to the vagaries of its highly variable climate. Africa has also, over recent decades, experienced growing environmental degradation such as

deforestation, desertification, declining soil productivity, loss of biodiversity and depletion of freshwater. The United Nations Intergovernmental Panel on Climate Change (IPCC) predicted that climate change could cause crop yields in some African countries to fall by 50 percent by 2020, seriously threatening the continent's fragile food security.

Combined with the rapid increase in the price of the main agricultural commodities Africa is facing a parallel increase in the price of energy. The upward trend of energy costs and concerns regarding the effects of climate change has reinvigorated the interest in alternative energy, including bio-energy and, more specifically, bio-fuels. This interest further complicates the demands on water. Energy is fundamental for the achievement of each of the eight MDGs. About 1.6 billion people have no access to electricity and two billion people still rely on traditional fuels – wood, dung and agricultural residues – as their sole source of energy. Africa, however, has enormous potential for energy production, particularly hydro-power, which will have to be exploited in the face of a growing economy that is placing increasing stress on water resources, and is generating further energy needs.

Substantial progress has been made in the recent past in terms of national, regional and international commitments. In 2002, NEPAD's Comprehensive African Agriculture Development Programme (CAADP) offered a framework for investment in agriculture in Africa, with special emphasis on water control. In Maputo, in 2003, the Heads of State and Governments of the African Union committed themselves to allocating at least 10 percent of their national budgetary resources for agriculture and rural development. In 2004, the Sirte Declaration focused on ways to implement integrated and sustainable development of agriculture and water in Africa. In 2005, the Report of the Commission for Africa titled Our common interest highlighted the need for investment in water and energy infrastructure. Unfortunately, progress remains too slow, and Africa is lagging behind in terms of energy and agricultural productivity, with serious implications for development and trade balance.

Challenges to be addressed

a) Agriculture-Energy Nexus in Africa

Rapid agricultural growth is urgently needed at present to face the severe crisis currently escalating in the continent. Food prices have doubled over the last three years and the cereal bill for low-income food-deficit countries (LIFDCs) in Africa is projected to increase by 74 percent in 2008 and to triple by 2030 under current trends putting heavy pressure on fragile national economies. Continuous increases in oil prices put a direct burden on the energy bill of African countries and call for alternative solutions to energy supply. A worrisome implication of the increasing link between energy and food prices is also the fluctuations of high energy prices that are increasingly translated into high food price fluctuations.

Water and energy are two highly interconnected sectors but at present these linkages are not fully taken into account in policy-making. In the context of a fast growing population and economic development, leading to increasing demands and competition for water, it is time to adopt an integrated approach to the management of water to serve both energy and agricultural needs. Experience has shown that the simultaneous analysis of all water use sectors at the policy level can enable significant increases in productivity and positively impact development and growth. This also requires the integrated management of land, water and biological resources and ecosystems at a range of scales from the individual land users and communities to sub-catchments and river basin levels.

The way energy is produced, distributed and consumed affects the local, regional and global environment. Agriculture is a key sector where the spillovers of energy production and consumption are pronounced. Accelerating access to electricity for the rural poor offers new opportunities for agriculture, including access to cheap sources of energy for water pumping. If access can be improved, and energy needs for agriculture anticipated and met, then a potential barrier to agricultural growth can be avoided. Rapid growth in agricultural production could then stimulate rural and overall economic development. The objective of food security could come closer to reality, and exports of agriculturally-based products could improve the regional trade balance.

One answer to the problem of rising energy costs has been the rush to grow biofuels as an alternative source of energy. This has caused a modification of the cropping patterns in the direction of monocultures not orientated to food production and has contributed to the overall increase in food prices. The biofuel growth was spurred on by what can only be described as massive subsidies and supporting regulations that provide the incentives for farmers to shift from food production to fuel production. However, subsidies for biofuels exacerbate the negative impact on poor households, as they implicitly act as a tax on basic food.

Africa has a vast largely untapped potential of renewable energy sources. In particular, Africa's large hydropower potential appears an attractive option for meeting energy needs. Acceleration of hydropower development is already apparent both in the Nile and Congo basins and it will continue to increase as will, possibly, the establishment of regional power grids and energy markets. In many cases, hydropower dams are promoted as being suitable for multiple functions, such as supplying water for irrigation and drinking water.

b) Investment in Water for Agriculture and Energy

Growth is a priority for Africa and all the natural resources are available to make it happen. It will require a massive invest-

ment in infrastructure to break down the internal barriers that hold Africa back and to increase the trading capacity of African farmers as well as market access for their products. Growth will be boosted by more investment in agriculture, particularly water and energy infrastructure – ranging from rural roads and small-scale irrigation to large multi-purposes projects. The public and private sectors need to work together to create an environment which unleashes the entrepreneurship of the peoples of Africa, generates employment and encourages individuals and firms, both domestic and foreign, to invest.

Investment in water for agriculture can directly contribute to agricultural growth and poverty alleviation by permitting intensification and diversification, and hence increased farm outputs and incomes; increasing agricultural wage employment; and reducing local food prices and hence improving real net incomes. Investment in agriculture has, however, experienced a continuous decline since the 1970s when huge investments worldwide especially in new irrigation systems led to high annual growth rates in the world's irrigated areas, with a timid recovery in recent years. Yet, returns to irrigation remain comparable to other investments in agriculture and non-agricultural products: an evaluation of 192 World Bank funded irrigation projects implemented between 1950 and 1993 showed that 67 percent received an overall satisfactory rating and an average internal rate of return of 15 percent at evaluation. The fact that the return on capital invested in irrigation and agriculture rarely matches that in industry and urban services fails to capture the multiplier and social benefits from rural investment.

The consequences of low and declining investment are manifest in the comparative state of Africa's agricultural infrastructure. The world area under irrigation amounts to about 20 percent of the arable land area, while in Africa, only 7 percent of the arable area is irrigated (3 percent in sub-Saharan Africa). Moreover, there is correlation between Africa's under-capitalization and its lack of competitiveness on global markets. This insufficient attention to agricultural infrastructure and the rural economy in general is manifest in falling investment in water control, mechanization, fertilizer, seed and other inputs which has had serious consequences for Africa where, in most countries, the agricultural output per capita keeps falling. Part of the solution will be investments in agricultural water and the commercialisation of production, but equally important is providing the appropriate policy environment and support to effect transition from inherently vulnerable subsistence agriculture to more commercially oriented farming. Also required is the creation of a sound environment whereby investment can take place. In this context, the issue of access and tenure rights (applied to water as well as to land tenure) is a must. A key purpose of both land tenure rights and water rights is to confer a degree of legal security

on the user so as to create favourable conditions for investment in the resource or activities that involve its use.

c) Climate Change and Agriculture in Africa

Africa has contributed the least to climate change but is likely to suffer the most. Increased climate variability already affects its water resources, land, forests, and biodiversity; and these impacts are likely to worsen over time. According to the most recent report of the Intergovernmental Panel on Climate Change (IPCC), the cost of adaptation in Africa could be as high as 5–10 percent of the continent's GDP. The impact on cereal production, for example, will be particularly strong in Africa: while due to climate change, cereal production in developed countries will increase by more than 8 percent, sub-Saharan Africa will see a loss in cereal production as well as a considerable increase in the variability of cereal outputs. These trends, if not tackled, will inevitably impact the food import bill of many African countries. Such an increase in cereal trade, coupled with the economic and environmental costs of food transportation over long distances on poor infrastructural networks, will cause further increase in food prices, worsening the current food crisis.

In many African countries natural resources are threatened as people strive to get the most out of land already in production or push into virgin territory. The damage is increasingly evident, and Africa now faces the additional challenges of climate change that will impact on the land, water and biodiversity resources and ecosystems:

- Increased water stress: Even small reductions in rainfall over large areas could cause large declines in river water and it is estimated that by the next decade, between 75 and 250 million people could be exposed to significant water stress due to climate change.
- More severe land degradation: Severely degraded lands in the agriculturally less favourable semi arid areas will increase by 10 percent, preventing the continued use of rainfed cropping and reducing potential and productivity of livestock. This will dramatically affect a large proportion of the 180 million people who live and rely on agriculture in such areas for their livelihoods. Moreover, the projections for climate change show that by 2050 the African continent will face a decrease in the amount of rainfall, rainy events will tend to be stormy and the soil will face direct impacts of raining intensity and wind, leading to a rapid increase in soil erosion and desertification.
- Reduced food security: Recent estimates show that each 1°C rise in average temperature will reduce dryland farm profits in Africa by nearly 10 percent. The length of growing seasons, the area suitable for agriculture and the yield, are expected to decrease, thus endangering

progress in achieving food security.

- Growing competition for natural resources: Several currently populated areas are expected to become less desirable or uninhabitable due to climate change, opening the way to accelerated migration. Drought and other climate-related shocks will lead to greater water interdependence and competition for both water resources and farmland.
- Negative impacts on the energy sector: Many African countries rely highly on biomass and hydropower, energy sources that are greatly affected by climate change. Changes in precipitation, can be felt through loss or variability in hydroelectric potential, variations in runoff (which can lead to siltation, with subsequent impact on hydroelectric power generation), and impacts on biomass (and hence fuelwood and charcoal) production.

d) Inter/Intra-basin Cooperation in Water and Energy Transfer

Climate variability coupled with growing water demand in all sectors of use and deteriorating water quality present daunting challenges to African river basins. A comprehensive, strategic approach to the water sector is required, based on integrated water resource management. This implies regional cooperation over transboundary water resources; improved water governance to manage competing needs; and increased and more effective management of investment in water infrastructure. These requirements were all addressed in the G8 Water Action Plan agreed at Evian in 2003.

The Nile Basin Initiative (NBI) is a good example of cooperation in the development of water resources in a river basin which is also catalysing wider regional integration. It aims to reduce poverty through the equitable use of the Nile's water. Another good example concerning water transfer from shared basins is the case of the river Zambezi which demonstrates that the shipping of freshwater to augment supply to the coastal areas is an economically competitive option alongside the desalination of seawater. A major advantage of such shipping of freshwater would be the reduced environmental impact of the operation, compared to abstraction from a river, or the energy requirements and waste products associated with desalination of seawater. The Nile basin and Lake Victoria basin collaborative processes which initially focused on water resources have learned from their initial phases, the need for integrated management of land and water resources in view of the direct and indirect impacts of land use and management practices on water resources.

In parallel, African countries also need to consider the possibility to enhance large-scale conversion, transfer and utilization of renewable energy, which offers a suitable strate-

gy to counter environmental problems caused by combustion of fossil fuels. International cooperation would be essential and would involve the interests of countries having substantial renewable energy resources, countries on the transmission corridor and potential energy purchasing nations that would be prepared to utilize renewable energy.

River basin organisations in Africa require long-term donor support, with a special focus on basin-wide institutional capacity building and intersectoral processes. Priority should be given to supporting measures, including the development of regional conventions and strategic action programmes which facilitate the development of shared goals and approaches by cooperating countries. Through such funding, economic integration is supported, with potentially important returns in terms of growth and political stability.

e) Closing the water technology gap

The agricultural water technologies in Africa are lagging behind: Africa's proportion of land irrigated has hardly changed over the last 20 years while that of South Asia has been rising. Irrigation can be increased without significantly affecting other users of water, through the use of micro-irrigation systems, local level water harvesting, soil moisture conservation as well as other technological measures such as improving post-harvest infrastructure. For technology improvement and dissemination in the continent, a dual process is required: (1) to promote the adoption and adaptation of existing technologies; and (2) to foster the process of technological innovation, involving both the government and the private sector, to adopt and adapt technologies appropriate to local realities.

Conditions for adoption of water technologies will vary according to local settings and agricultural conditions. In arid and semi-arid areas, like in Northern and Southern Africa, water scarcity calls for a widespread dissemination of localised irrigation to boost productivity and increase water use efficiency. In sub-Saharan Africa, simple, affordable and easily manageable irrigation technologies can go a long way in enhancing farmers' productivity. Appropriate micro-irrigation systems and other technologies are already in use in East and Southern Africa, and extending them to a wider area and network of producers could boost productivity in irrigated areas.

Of fundamental importance in adoption of water technology are the aspects of capacity building. African countries need to enhance the sharing of agricultural innovations and knowledge amongst them and benefit as well from South-South and North-South cooperation. In particular, there is scope for intense collaboration between Africa and Asia. Recent innovative South-South research partnerships, such as those behind the New Rice for Africa, point to the benefits of such collaboration. The potential of such partnerships is not currently being fully exploited in terms of water technolo-

gies. Moreover, the international community must assume the pressing role to support Africa's efforts to increase investment and innovation in agriculture by increasing funding in research and extension services in Africa. An effort to share technologies across Africa needs to be reinforced and made a regular feature of development processes.

Another vital area for technology development and experience sharing is land resources management for the more effective capture and infiltration of rainwater, retention of soil moisture, recharge of groundwater and safe management and harvesting of runoff water. Land and water management must go hand in hand with water conservation.

It is also recognized that progress in developing more integrated strategy on water for agriculture and energy will depend not only on technology development and sharing experiences between more and less technologically advanced countries but also on building capacities for improved water and ecosystems management of the range of stakeholders at all levels and communities that use and manage the land and water resources, the various concerned technical sectors and policy makers, the private sector and the water and energy consumers.

Purpose of the Conference: Why Sirte 2008?

The Conference aims at unlocking the potential of water for development in Africa. In particular, it aims at:

- assessing the challenges faced by the agricultural sector, in view of the impending/glooming food crisis in Africa taking into account the strong linkages with energy and climate change;
- carefully examining how investment in the rural space can reverse trends to obtain well balanced sub-sectors that offset production risks, close food production gaps and ensure food security;
- analysing bottlenecks and constraints to accelerated water development in support of the continent's food and energy needs; and
- proposing ways to promote and secure investment in water to maintain food and energy security in the region.

The Conference will adopt a dynamic visionary framework that will primarily consider the actions/outputs stated in the declaration of the Sirte 2004 Conference¹ as its entry point. The commitments agreed upon in 2004 have not been fully delivered or translated into concrete action while new pressing challenges have emerged and need to be robustly tackled.

In particular, there is a need to address the linkages between water and energy at an accelerated pace focusing on the reciprocal impacts of the use of these resources on climate change and vice versa.

The Conference will also be a follow-up to the FAO High Level Conference on “World Food Security: the Challenges of Climate Change” (FAO, Rome, June 2008). In its final declaration, the High Level Conference highlighted the necessity to contribute to international and regional initiatives on soaring food prices; to put in place revised policies and measures to help farmers increase production; to step up investment in science and technology for food and agriculture; and to foster exchange of experiences on agricultural and biofuel technologies. It also urged the international community to help developing countries and countries in transition to expand agriculture and food production, and to increase investment in agriculture from both public and private sectors.

The Conference will focus on two different time horizons: one based on the CAADP² projections for agricultural development investment needs by 2015, under current African population growth trends; and interventions that target food consumption demands in four distinct situations in terms of water control requirements, namely: small-scale (village) irrigation, rehabilitation of existing irrigation schemes (large and small); modernization of large schemes and inter-basin water transfer. The second time horizon will look at a longer-term perspective (2050) with an African population reaching 2 billion people and where climate change will have a greater impact and influence. In this case, hydropower projects involving Africa largest trans-national river basins are expected to become key engines for development. Due consideration will be given to the place of rainfed agriculture systems in Africa and their potentials and constraints facing the climate change scenarios.

Conference approach

The Conference will provide an opportunity to review the current situation and the prospects in terms of water resources management and food and energy security in the context of climate change. Three main issues will guide participants in their discussions and be introduced by eminent speakers. They are:

1. Challenges ahead: in which context will African development take place over the next decades? What are the

challenges for the continent in terms of food, water and energy?

2. Development options: rainfed vs irrigated agriculture; smallholder vs commercial irrigation, what type of investment will have the most impact? and be most cost effective?
3. Making it happen: what prevents progress in water development for agriculture and energy to take place in Africa today, besides the considerable efforts and commitments that were made in the recent past?

The Conference will be organized around five main themes for which thematic papers will be prepared:

- a. Agriculture-Energy Nexus in Africa.
- b. Investment in Water for Agriculture and Energy.
- c. Climate Change and Agriculture in Africa.
- d. Inter/Intra-basin Cooperation in Water and Energy Transfer.
- e. Closing the water technology gap.

It is proposed to convene a set of panels that will examine a number of questions related to the main themes. Panels should include representation from governments, scientific community, international and regional organizations and the private sector. A set of case studies will be prepared to illustrate the different issues and questions and analyse how they are being addressed in specific contexts. Voluntary national reports will illustrate the situation of food and energy security and water management in the countries and inform about existing plans and programmes in the field of water development.

Parallel sessions and side events including roundtables, discussions on specific topics, meetings on partnership initiatives, ad-hoc working group sessions, as well as a technology exhibition, will also be organised.

Expected outcomes and follow-up of the Conference

The expected outcomes of the Conference will be the following:

- a. A stocktaking of the major issues regarding water for Agriculture and Energy and the impacts of climate change.
- b. A re-commitment by Heads of State and Governments of Africa and development partners to engage in a long

¹ Sirte Declaration: The Challenges of Implementing Integrated and Sustainable Development of Agriculture and Water in Africa, Sirte, Libyan Arab Jamahiriya, 27 February 2004.

² CAADP: NEPAD's Comprehensive African Agriculture Development Programme, available at <http://www.fao.org/docrep/005/Y6831E/Y6831E00.htm>

term investment programme for water development in support of agriculture and energy.

- c. A declaration and plan of action at short, medium and long term on water for agriculture and energy.
- d. Partnership Agreements for food and energy security in Africa.

The clear action-oriented vision of the Conference requires the setting up of a comprehensive implementation strategy that will lead to the adoption of concrete mechanisms that guarantee an adequate follow-up of action plans agreed upon. This will include the following:

- Wide dissemination of Conference results.
- Partnership Agreements, North-South and South-South Cooperation.
- Establishment of implementation and monitoring mechanisms.

