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**MINISTERIAL CONFERENCE ON WATER FOR AGRICULTURE
AND ENERGY IN AFRICA: THE CHALLENGES OF CLIMATE
CHANGE**

**Sirte, Libyan Arab Jamahiriya,
15-17 December 2008**

**REGIONAL VIEWS FOR INVESTMENT IN WATER FOR
AGRICULTURE AND ENERGY IN AFRICA**

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I. INTRODUCTION

1. The High-Level Conference on Water for Agriculture and Energy in Africa: the Challenges of Climate Change is an opportunity to discuss water development projects within the framework of the Comprehensive Africa Agriculture Development Programme (CAADP) and to mobilize the required financial resources. It specifically focuses on concrete programmes and the assessment of their financing costs, both in terms of feasibility studies and implementation of works. The Conference preparation included the production of National Investment Briefs for all the African countries, in which estimated investment needs for agriculture and energy are given. The preparatory work for this Conference allowed to produce new estimates for investment needs at national, regional and continental levels. Concrete projects and programmes for water for agriculture and energy at different stages of implementation (recently implemented, on-going and pipeline) have been compiled for each African State and aggregated at continent level. The compiled project portfolios have been reviewed and validated by governments' representatives on the occasion of the five Regional Workshops held prior to the Conference, in which national and regional representatives from the water, agriculture and energy sectors participated.

2. The objective of these workshops was primarily to help the compilation and validation of project portfolios and their review, as well as the estimation of investment envelopes for water in the agricultural and energy sectors at country and regional levels. More specifically, the workshops aimed at:

- defining the investment needs with regard to water for agriculture and energy at country level;
- defining priorities on investment in water control;
- sharing knowledge on national strategies for water, energy and agriculture and investment plans; and
- promoting regional integration, particularly concerning large hydropower projects and integrated water resources management in transboundary river basins, and the harmonization of actions on a regional scale.

A. CHALLENGES

3. An overview of the challenges that Africa as a whole faces, is presented and should serve as a framework for action.

These challenges are summarized below.

- An increasing population projected to reach 2 billions in 2050.
- Extreme poverty which, although especially persistent in the rural areas, is shifting towards the urban areas where rural-urban migration increases the need for affordable food for poor people that no longer produce it themselves.
- Undernourishment is pervasive in the continent with malnutrition particularly diffuse among infants and children. 24 percent of the population suffer from chronic hunger.
- A large majority of the countries in the continent have their economies based on agriculture with, on average, more than 50 percent as value added to their GDP (AQUASTAT, 2008). Despite having essentially agriculture-based economies, the agricultural trade balances are often negative.
- Climate change poses a significant threat to the continent with more droughts and floods and changes in ecosystems taking place. Building capacities in climate change prediction, promoting mitigation and adaptation technologies is already seen as a must for enhanced agricultural development.
- Poor governance and poor management of available water and land resources, which cause productivity to fall below full potential. Irrigation potential is largely untapped.

Rainfed agriculture still prevails and is now being affected at various degrees by climate change.

- The Continent suffers from limited access to electricity: Seventy-seven percent of households in sub-Saharan Africa are without access to electricity, and most rural households still rely on traditional fuels – wood, dung and agricultural residues – that are strongly affected by the climate variability.
- Despite the enormous hydropower potential of about 1 750 TWh, and the opportunity to ensure energy security through hydropower generation, only 5 percent of the potential is currently tapped.

B. WATER RESOURCES FOR AGRICULTURE AND ENERGY IN THE CONTEXT OF CLIMATE CHANGE

4. The Regional distribution of the African countries adopted for the purpose of the Regional Workshops and for the Conference can be synthetically schematized as follows (Table and Annex 1).

Table 1: Regional Distribution

CENTRAL AFRICA	WEST AFRICA	EAST AFRICA	NORTH AFRICA	SOUTHERN AFRICA
Cameroon	Benin	Burundi	Algeria	Angola
Central African Republic	Burkina Faso	Djibouti	Libyan Arab Jamahiriya	Botswana
Chad	Cape Verde	Egypt	Morocco	Comoros
Congo	Gambia	Eritrea	Tunisia	Lesotho
Equatorial Guinea	Ghana	Ethiopia		Madagascar
Gabon	Guinea	Kenya		Malawi
Democratic Republic of Congo	Guinea Bissau	Rwanda		Mauritius
Sao Tome and Principe	Côte d'Ivoire	Somalia		Mozambique
	Liberia	Sudan		Namibia
	Mali	Uganda		Seychelles
	Mauritania			South Africa
	Niger			Swaziland
	Nigeria			United Republic of Tanzania
	Senegal			Zambia
	Sierra Leone			Zimbabwe
	Togo			

Poverty is common and sometimes extreme in Africa (a summary of the results is provided in Table 2). Thirty-four of the 49 Least Developed Countries (LDCs) are Africans and 315 million people, or 36 percent of the total population, survive on less than USD1/day. The sum of national GDPs of all African countries in 2007 amounted to approximately USD 1 200 000 million, or barely 10 percent of the GDP of the United States of America in the same year. It corresponds on average to a per capita GDP of USD 4 800. in North Africa, USD 4000 in Central Africa, USD 2 600 in Southern Africa, USD 700 in West Africa and USD 600 in East Africa. The differences amongst countries are marked, with the per capita GDP ranging from USD 190 in Liberia to USD 8 564 in Seychelles. The Human Development Index (range = 0-1) varies from 0.336 in Sierra Leone to 0.843 in Seychelles (ranked as 50th out of a total of 177 countries globally), while the 22 countries with the lowest HDI are African (UNDP, 2007).

5. In 2007, the added value of the primary sector (agriculture) contributed on average 24 percent to the GDP in Africa, ranging from 18 percent in Southern Africa to 30 percent in East Africa. Some countries, show a very high reliance on agriculture with a contribution to the GDP of the sector higher than 65 percent, e.g. Somalia and Liberia. More than half of the economically active people are engaged in the farming sector, with the only exception of North Africa (21

percent). At the country level, where 90 percent of the total labour force is engaged in the primary sector, Burundi and Rwanda are the two countries with the most limited cultivable area per inhabitant on the continent (less than 0.2 ha/person). Conversely, Namibia and Gabon, with the largest cultivable area per person (12.4 and 11.2 ha/person respectively), have less than 40 percent of their economically active people working in the primary sector. With 5 percent of the economically active people engaged in agriculture and cultivating about 23 hectares per active agricultural worker, the Libyan Arab Jamahiriya is the country with the lowest percentage of economically active people in this sector.

Table 2: Regional Indicators

Variable	Unit	North Africa	Central Africa	Southern Africa	West Africa	East Africa
Total area	1 000 ha	475 144	536 598	751 945	614 321	626 560
Population - current	1 000 inhab	80 287	93 702	186 409	263 631	280 777
Population - predicted (2050)	1 000 000 inhab	160	689	1 000	228	374
Rural population as % of total population	%	32.51	52.13	63.62	58.90	67.30
Gross Domestic Product (GDP) *	million US\$	301 913	66 764	416 323	249 417	243 087
Value added in agriculture	% of GDP	18.21	21.34	17.92	32.88	29.44
Number of undernourished persons **	million inhab	3.20	49.20	53.40	37.20	69.30
Poverty headcount (share of population) - rural **	%	19.23	58.45	64.05	55.52	50.17
Poverty headcount (share of population) - urban **	%	7.60	42.55	43.73	32.71	29.67
Water resources: total renewable (actual)	(10 ⁹ m ³ /yr)	46	2 858	1 032	1 315	385
Total dam capacity	(10 ⁹ m ³)	25	16	316	256	185
Irrigation potential	1 000 ha	2 774	10 346	13 172	9 159	11 343
Area equipped for irrigation: total	1 000 ha	2 918	83	3 436	1 069	5 940
Agricultural water managed area: total	1 000 ha	2 918	211	3 944	2 148	6 173
Agricultural water managed area: as % of cultivated area	%	13.18	3.83	8.57	6.68	25.64

Source: AQUASTAT, 2008

* *World Bank, 2007*

***FAOSTAT, Food Security Statistics, 2006*

6. Annual precipitation in Africa is estimated at about 20 360 km³, which constitutes an average for the continent of 678 mm. Disparities between countries and regions are very important. The driest country is Egypt with 51 mm/year on average, followed closely by the Libyan Arab Jamahiriya (56 mm/year) and Algeria (89 mm/year), with Morocco (346 mm/year) and Tunisia (207 mm/year) as the most advantaged countries in the Northern Region. This is the driest region on the continent with an average of 96 mm/year.

7. Renewable water resources for the whole of Africa amount to about 3 930 km³, or less than 9 percent of global renewable resources. The Central Region is the best endowed, with 48 percent of Africa's resources for only 18 percent of its area. On the other hand, the Northern Region is the most disadvantaged with less than 1 percent of the renewable water resources. The Democratic Republic of the Congo has 900 km³ of internal renewable water resources, 23 percent of the total for Africa, while the Libyan Arab Jamahiriya has only 0.01 percent of these resources.

8. The irrigation potential of the continent is estimated at more than 42.5 million hectares, considering irrigation potential by basin and renewable water resources. One-third of this potential is concentrated in two very humid countries, namely Angola and the Democratic Republic of Congo with a potential of 3.7 and 7 million hectares respectively. Most of the regions in Africa are highly dependent on rainfed conditions, as shown below.

- Central Africa is the region that shows the highest dependency on rainfed agriculture and, with the exception of São Tomé, Chad and, to a lesser degree, Cameroon, the regional irrigation potential is largely underexploited. Only 212 000 hectares, or just over 2

percent of the 10 000 000 hectares of potentially irrigable land are under water management.

- Central Africa About 50 percent of the 11.3 million hectares of irrigable land in the East African region is equipped; however it ranges between the 77 percent of Egypt to only 2 percent in Rwanda and Eritrea. It can be noticed that only two countries, namely Egypt and Djibouti, completely rely on irrigated agriculture, while in other countries such as Uganda, Ethiopia and Kenya, water control is still not significantly developed.
- Instead North Africa appears to be an exception to the previously indicated trend with very large areas of land, in terms irrigation potential, under water management régimes, ranging from just over 75 percent in Tunisia to around 90percent in Morocco In the case of the Libyan Arab Jamahiriya, because of the country's exploitation of its fossil fuel deposits, the controlled areas far exceed the irrigation potential based on renewable freshwater resources, and the potential exploitation rate is around 1 175 percent.
- West Africa suffers from chronic water shortages because of uneven rainfall distribution, low levels of water mobilization (less than 2 percent) and poor water management. Only 10 percent of the potentially irrigable lands are equipped for irrigation, with the agricultural water managed area ranging from 28.8 percent of the cultivated area in Sierra Leone to less than one percent in Benin, Ghana and Togo.
- Less than 7.5 percent of the Southern African region's vast irrigation potential has been so far equipped. Only in a few countries (Madagascar, Mauritius and Swaziland) more than 20 percent of the cultivated area is equipped for irrigation, while in countries with a great potential such as Zambia or Mozambique less than 5 percent of the cultivated land is equipped.

9. The technically feasible hydropower potential of Africa is around 1 750 TWh which is about 12 percent of the global capacity. Only 5 percent of this technically feasible potential is exploited. The demand for electricity in Africa grows at an average annual rate of 3.1 percent, while the rapid exploitation of this enormous potential is hampered by dispersed population and ever-increasing demand for electricity.

10. The different endowments in terms of water of the five African regions reflect on the different development of hydropower. Out of the current 20.3 GW developed hydropower capacity, about 23 percent is located in North Africa, 25 percent in West Africa and the remaining 52 percent is distributed amongst the remaining regions. The largest regional discrepancies, though, emerge when the potential hydropower generation is considered, as presented synthetically in Table 3; the highest hydropower potential can be encountered in Central Africa, particularly concerning the development of large scale hydropower concentrated around the Congo basin. West Africa, instead, shows the highest potential for small hydropower development and the lowest percentage of the potential exploited (only 2 percent). Southern Africa, on the contrary, exhibits the highest installed capacity: 21 percent of its vast potential has already been tapped. North Africa generally does not rely on hydropower, apart from the case of Morocco and Egypt, and its hydropower potential is almost exhausted.

Table 3: Hydropower potential and installed capacity

	Large Hydropower (MW)		Small Hydropower (MW)	
	Installed	Potential	Installed	Potential
North Africa	1 541.67	-	26.45	52.65
West Africa	638.82	3 740	11.64	1 178.08
Central Africa	4 819.95	218 605	18.59	241.17
East Africa	418.24	4 380	7.92	418.24
Southern Africa	1 062.13	5 056	25.51	-

11. Climate change is already recognized as an important factor impacting on the agricultural and energy sectors in Africa. Increased climate variability already affects its water resources, land, forests and biodiversity, and these impacts are likely to worsen over time. According to 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. Agricultural production and food security in many African countries are likely to be severely compromised by climate change and climate variability, and projections indicate reduced yields of up to 50 percent in some countries by as early as 2020, with small-scale farmers being the most affected.

12. Some countries have already experienced an increase in frequency, extent, and magnitude of droughts and floods. Also, coastal areas and island states will increasingly be affected by sea level rise while, in a wide range of countries, erosion of natural resources due to climate change will increasingly put a burden on traditional agriculture and pastoral livelihoods. Furthermore, in all the Sahara Belt climate change is expected to further reduce food production, due to the declining rainfall and increased variability, with a drop of crop yields of up to 70 percent in the most vulnerable areas. Climate change has also an impact on hydropower generation: soil erosion, in fact, has directly affected the total storage volume of many of the reservoirs in Africa, as exemplified by the case of the Koka dam in Ethiopia, resulting in a reduced power generation capacity and in a reduction of the benefits obtained from irrigated agriculture.

C. INVESTMENT PROGRAMMATIC FRAMEWORK AND ENVELOPE

13. The Regional Workshops have stressed the need to move from a project-based approach to a programmatic and integrated overview for the water and energy sectors. The important contribution that irrigation can make to food security has to be recognized, especially given that rainfed agriculture, which currently accounts for the bulk of agricultural production, is highly vulnerable to climate change. If lower yielding and extensive rainfed production can reliably meet demand in food staples, then stabilizing rainfed production, particularly smallscale, should be the most economic means of achieving food security. But if the volatility of rainfed production becomes intolerable, irrigation of staples whether promoted through economic incentives or structural planning or a combination of both becomes necessary. This makes it urgently necessary to encourage complementary irrigated agriculture (off-season production, etc.) by both small-scale and large-scale irrigation, which more than ever now are closely geared to local and regional demands and conditions.

14. With the foregoing in mind, the programmatic framework for investment can be synthetically presented as follows:

- Actions undertaken can be based on the individual National Investment Briefs but must be seen within the context of a shared regional vision, and eventually an overall African one.
- The objectives of the investment plan should aim to address poverty alleviation through food security and health upgrading, agricultural development pillared in hydraulic and energy infrastructure, the promotion and scaling up of renewable and alternative energies, and the protection of ecosystems and the environment.
- While priorities necessarily vary from country to country, conjunctive use of water resources must be a key consideration in all efforts. Likewise, all water projects should address the viability of power generation components, and reflect a river basin perspective. Thus, an integrated water resources management approach shall be an embedded component of the investment plan.
- A capacity development component should be inherent to every element of the investment plan. Indeed, the needs are broad: i) enhancing institutional and managerial capacity for the absorption of investment funds at both country and regional level; ii)

upgrading capacity to deal with climate issues, such as variability and impact of change, mitigation and adaptation for both rainfed and irrigated conditions, predictions and early warning systems, etc.; and iii) support for adoption and implementation of Climate Change Adaptation Action Plans at national and regional levels; already under various degrees of preparation.

- As shown in the preparatory work of the Conference, the cumulative amount of investments for ongoing and pipeline projects in water for agriculture and energy on the continent reaches about US\$64.6 billion. The investment framework specifies the size of irrigation infrastructure (small-scale irrigation, rehabilitation of irrigation, large hydraulic projects) and distinguishes between projects and programmes in the short (<4 years), medium (between 4 and 8 years) and long term (> 8 years). The highest proportion of the cost is noticeably allocated to large-scale projects including large-scale irrigation schemes development and hydropower projects. Similarly, 56 percent of the total investment envelope is expected to be exhausted in the medium term, showing a clear need to enhance the planning for investments in the long term to ensure sustained and permanent growth in the agriculture and energy sector to meet the food and energy security goals.

INVESTMENT ENVELOPE (million US\$)				
Size of project \ Time Frame	Small scale water control	Rehabilitation of irrigation	Large scale	Total
Short-term	2 385	778	7 818	10 981
Medium-term	7 041	3 509	28 207	38 758
Long-term	1 491	1 329	12 042	14 862
Total	10 917	5 616	48 067	64 600

- As demonstrated by the results of the preparatory work for the Conference, Western Africa, with the great hydropower potential to be exploited, accounts for 32 percent of the continental investment envelope. Southern Africa, East Africa and North Africa have a share of 26, 24, and 15 percent respectively, while the residual 3 percent is for Central Africa, indicating that more effort should be made in the region to undertake project formulation and feasibility studies in the water sector, particularly considering the enormous hydropower potential not yet exploited.

REGIONAL DISTRIBUTION OF THE INVESTMENT ENVELOPE					
Time Frame	North Africa	East Africa	West Africa	Central Africa	Southern Africa
Short-term	16%	10%	35%	11%	28%
Medium-term	12%	29%	29%	2%	28%
Long-term	23%	19%	37%	1%	20%
Total	15%	24%	32%	3%	26%

D. INSTITUTIONAL ENVIRONMENT

15. It is necessary to harmonize sectoral policies (water, agriculture, energy and economic development, among others). The approach entails very close sub-regional cooperation and countries will therefore need to align and integrate their agriculture and energy policies accordingly. Thus, this makes it appropriate for the countries to embark on high-level institutionalized regional cooperation.

16. Regional cooperation and integration will play a vital part in the joint management of water resources, the development of agricultural product markets and energy. This would make it possible to create free-trade areas and introduce the mechanism needed to encourage trade and the

exchange of experiences. In practical terms, supplementary human and financial resources must be marshaled more than ever, and conflict prevention and management mechanisms must be put in place. Likewise, regional standards for irrigation must also be developed and promoted.

17. The countries possess different and complementary areas of expertise, and exchanging them would be mutually beneficial. Establishing regional centers specializing in research and training, and collectively mobilizing financing will make it possible to make up for the knowledge deficits at the lowest cost. Scientific and technical cooperation, and the harmonization of rules and procedures, will also be promoted to encourage trade. Unfortunately, national institutions are often weak and are unable to produce robust field-based projects. Therefore, an investment-friendly framework must be created for the construction of economically profitable and socially and environmentally justifiable infrastructure, and the quality of investment feasibility studies must be improved.

18. The Regional Workshops have recognized that an Integrated Water Resources Management (IWRM) approach needs to be put into practice, both with regard to inter-sectoral management and the management of the large transboundary basins. For this, the African countries proposed establishing a subregional structure to coordinate the various IWRM plans. Promoting multipurpose works and a framework for concerted action and coordination between water users should also make it possible to control the competition between energy and irrigation needs.

19. Therefore, in summary, a successful institutional environment for the implementation of the investment plan will require in addition to its promotion, the facilitation to ensure that a number of conditions are met: i) to have a favourable institutional framework with a strong emphasis on governance; ii) to seek and secure effective involvement of regional bodies to balance the issue of sovereignty and ensure equitable access to resources (water and energy); iii) to ensure wide market access, both agriculture and energy-related; iv) to include a strategy for better land care (soil and water conservation, watershed and river basin management, including agro-pastoral and forestry considerations); and v) to strengthen the capabilities for intervention, with emerging and proven water technologies playing a lead role.

20. Finally, countries recognize that in general there is a lack of information which prevents them from making informed decisions. Therefore, countries stress that the obligation to collect data in order to have reliable databases at national level and implement monitoring and evaluation should be governed by law.

E. IMPLEMENTATION STRATEGIES AND FINANCING MECHANISMS

21. Investment programmes must be designed taking into account the food, energy security and climate change adjustments; but they also need to include economic development, health care, education and environmental objectives in general. Factors such as population density, the vulnerability of the population to climate variations, the types of agricultural producers and the options available for both public and private intervention in the matter of energy and agriculture need consideration.

22. Any attempt to accelerate investment for food and energy security must remain coherent with the principles of the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action, and therefore to build on available funding mechanisms. Examples exist of vertical funds to address specific issues at regional level. The question as to whether such vertical funds should be promoted or existing financing mechanisms should be scaled up to accommodate the additional financing is worth considering.

23. A priority for all countries in Africa is to effectively allocate their own resources as part of the investment envelopes in order to signal the seriousness of their commitment to donors and partners; such action should be a key element of any investment implementation strategy. In addition, sub-regional pool funds to support agriculture and energy components need to be

designed and incorporated as part of a broad investment plan financing mechanism. More innovative approaches, such as taking advantage of carbon trade and funding opportunities or specific renewable energies-related incentive funds, among others, need to be seized to support hydropower in Africa.

24. The five Regional Workshops have also stressed the following:
- Approaching the implementation of the overall African Investment Plan based on the respective Regional Plans through the development of a shared vision that has both regional and continental bodies playing, overseeing and coordinating roles that create synergy, trust and provide confidence towards fair and balanced interventions.
 - The emphasis on the Investment Implementation Plan must reach into the realm of food security and poverty alleviation while underpinning the need to protect the environment. The Plan must be directed towards the optimization of water resources utilization for which human and institutional capacity building is essential.
 - The need for massive Regional Capacity Development efforts, aggregating eventually at the continent level, what should be seen as an integral component of the Investment Plan and that cuts across disciplines and projects.
 - In general, each country will be strongly committed to develop and emphasize water technology options and packages that provide, *in primis*, a clear added value to their own conditions, but always adopting a synergic approach to implement optimal solutions on a national, regional and continental scale.
 - Concrete opportunities should be provided for an increasing role of the private sector in itself or through private-public partnerships for both water for agriculture and energy.
 - A clear and transparent monitoring and evaluation mechanism at regional level, as well as national data collection mechanisms and databases, is required to convey a sense of fairness in prioritizing activities and to provide guidance of when and where further interventions should be forthcoming.
25. With regard to energy security, work must begin on framing appropriate policies and strategies, stressing: i) the diversification of energy sources; ii) the development of renewable energy sources with particular focus on the exploitation of the currently untapped small and large hydropower potential; iii) the interconnection of networks as a factor for regional integration; and iv) the role of micro-power plants to facilitate rural electrification and for the decongestion of the large networks.

II. CONCLUSIONS

26. African governments, financing institutions and other development partners would need to undertake firm commitments to initiate and guarantee the financing of projects to improve food security and energy security (accompaniment measures).

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.

27. So far, based on available information, only five countries have achieved the Maputo budget allocation target. Estimates indicate that about a dozen countries have reached or exceeded half of the Maputo budget target. The African regions have the necessary experience and

expertise, and encouragement and incentives must be provided to share it (South-South Cooperation). The same applies to cooperation between the African Regional Economic Communities. The recommendations made at the earlier international fora have not yet been implemented. The causes of this situation must be analyzed in order to ensure that the present Conference reaches concrete and operational plans of action..

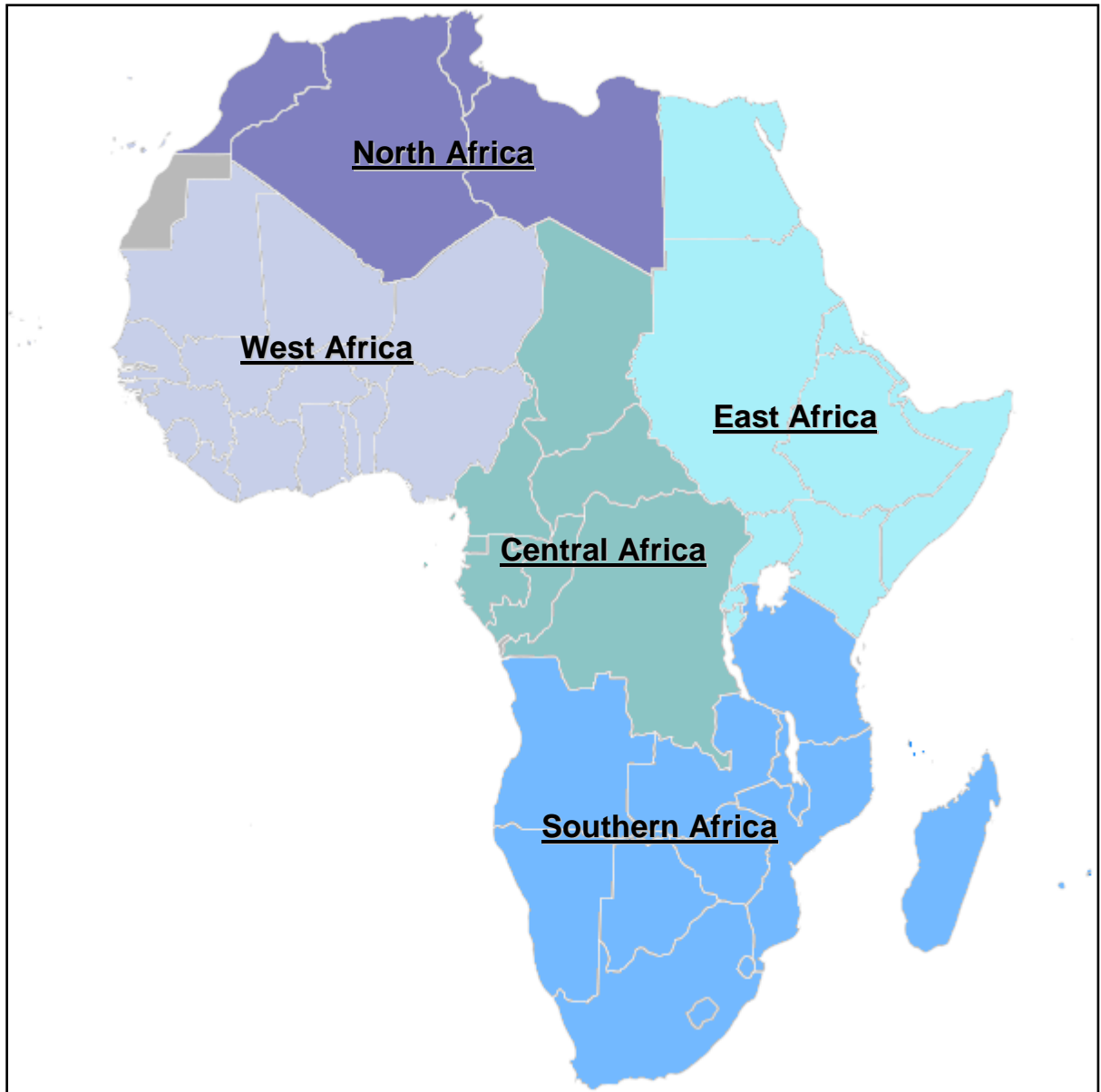
28. Successful implementation of the proposed African water sector investment plans clearly requires a major new round of commitment not only from the various development partners; but also the private sector as investors, operators and users of water sector infrastructure. Moreover, the success of the national and regional investment plans will be ensured only by focusing more on funding structural investments in water management for the highly interconnected sectors of agriculture and energy, without neglecting the importance of emergency measures which necessarily act in synergy with long-term investments. Governments should clearly set out their priorities and take them into due account when framing their investment programmes. Each government needs to promote and develop suitable policy and strategy documents for developing the water for agriculture and energy sector that are in line with the respective investment envelopes. The policies defined to implement the national investment programme should be incorporated into wider and holistic regional initiatives, particularly in the context of regional power pools and river basin organizations.

29. External investment, both public and private, should be promoted in countries with plentiful water and land resources still awaiting exploitation, particularly those which cannot afford to finance water mobilization infrastructure. A measure of this kind would help to increase food production, and would benefit both sides – investors and proprietors alike. The development partners should support countries in post-conflict situations to help finance their priority projects.

30. There is a strong need for expanded irrigation while enhancing water control in rainfed agriculture which represents the bulk of farming activities in the continent; but care should be taken to embed climate change adaptation measures from the outset. Governments should develop climate change adjustment action plans. Similarly, in areas where the opportunity costs of water can be expected to increase, care must be taken to ensure that farmers and extension services are able to adapt to aptly valued farming systems. It should also be noted that irrigation expansion will in most cases, require storage. This suggests opportunities for multi-purpose dams at various scales, from community up to basin level. This in turn calls for greater inter-sectoral planning and cooperation than may have been the case to date.

31. There is a clear need to raise existing levels of expenditures on agriculture and food security, which are far below NEPAD-CAADP initial projections, while massively increasing investments in hydropower and introducing a new focus on general water resources management, especially where there are transboundary issues. Mechanisms (political, fiscal and economic) must be put in place to create a framework to encourage private investment in agriculture and hydroelectricity and to forge private-public partnerships in this area.

ANNEX 1: REGIONAL DISTRIBUTION



ANNEX 2: AFRICA AND THE WORLD

Variable	Unit	Africa	World	Africa as % of the world
Total area	1 000 ha	3 004 084	13 442 788	22
Cultivated area	1 000 ha	210 697	1 540 708	14
in percentage of total area	%	7	11	
per inhabitant	ha	0.24	0.24	
per economic active person engaged in agriculture	ha	1.03	1.16	
Total population 2004	inhabitants	868 094 000	6 377 646 000	14
Population growth 2003-2004	%/year	2.2	1.2	
Population density	inhabitants/km ²	29	47	
Rural population as percentage of total population	%	61	51	
Economically active population engaged in agriculture	%	56	21	
Precipitation	mm/year	678	818	18
Renewable water resources	km ³ /year	3 931	43 744	9
per inhabitant	m ³ /year	4 521	6 859	
Irrigation	ha	13 444 875	277 285 000	5
in percentage of cultivated area	%	6	18	

Source: Irrigation in Africa in figures – AQUASTAT Survey 2005

ANNEX 3: INVESTMENT ENVELOPES

NORTH AFRICA				
Time Frame \ Size of project	Small scale water control	Rehabilitation of irrigation	Large scale	Total
Short-term	555	163	1,059	1,777
Medium-term	1,803	820	2,216	4,839
Long-term	481	200	2,711	3,392
Total	2,839	1,183	5,985	10,007

EAST AFRICA				
Time Frame \ Size of project	Small scale water control	Rehabilitation of irrigation	Large scale	Total
Short-term	299	153	599	1,051
Medium-term	1,117	596	9,605	11,318
Long-term	94	105	2,680	2,878
Total	1,510	854	12,883	15,247

WEST AFRICA				
Time Frame \ Size of project	Small scale water control	Rehabilitation of irrigation	Large scale	Total
Short-term	710	134	3,025	3,869
Medium-term	1,794	684	8,648	11,126
Long-term	458	333	4,718	5,509
Total	2,962	1,150	16,391	20,504

CENTRAL AFRICA				
Time Frame \ Size of project	Small scale water control	Rehabilitation of irrigation	Large scale	Total
Short-term	159	83	991	1,234
Medium-term	167	63	526	756
Long-term	9	1	162	171
Total	335	148	1,679	2,161

SOUTHERN AFRICA				
Time Frame \ Size of project	Small scale water control	Rehabilitation of irrigation	Large scale	Total
Short-term	661.95	244.29	2144.47	3050.70
Medium-term	2160.57	1345.93	7212.63	10719.13
Long-term	449.36	691.23	1771.11	2911.69
Total	3271.88	2281.45	11128.21	16681.53