

**International Dryland Development Commission
Ninth International Conference on Dryland Development
Alexandria - 7 to 10 November 2008**

***A few thoughts on dryland development
and combating desertification***

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Mr. / Mrs. Chairperson,
Dear colleagues and friends,
Ladies and Gentlemen,

First of all, I would like to address warm thanks to Adel El-Beltagy and his team for their wonderful hospitality, and a well organized and highly interesting conference. I would also like to extend my warm thanks to Ismail Serageldin for hosting this conference, in this unique place, the Bibliotheca Alexandrina.

My talk will be focused mainly on development in dryland areas and relationships with desertification. Agriculture will remain my main entry point but not the only one; in addition I shall not treat the climate change as such since many of you have already done it, much better than I could do.

I prepared my presentation with a text written especially for this 9th IDDC Conference by Marc Bied-Charreton, President of CSFD, the French Scientific Committee on Desertification which has its headquarters in Agropolis International, at Montpellier, together with several UN documents, as well as two papers on agriculture of the future that I presented to French authorities, and various prospective studies on agricultural development, particularly those carried out in France as part of the Agrimonde project. I also used an article by Louise Fresco 'From Kyoto to sustainability: new challenges for the 21st century', published in 2007, some publications by ICARDA and recent data from FAO, an Organization, for which, as you know, I worked for 11 years.

I will successively discuss issues concerning the future of global agriculture, and present a few considerations on sustainability and global change, before focusing more specifically on desertification and dryland development in the context of global change.

I – Issues concerning the future of global agriculture.

I will just highlight global issues and challenges concerning the future of agriculture, through three entries while keeping in mind drylands and desertification. My coverage of the topic will be brief, since it has been, and continues to be, widely studied throughout the world, and has been well presented by several speakers, yesterday and this morning.

The first entry is the recent renewed emergence of agricultural priorities on the international agenda, associated with the recognized multifunctionality of agriculture for food and fiber production, for sustainable management of all services generated by ecosystems, for economic, social and cultural development, for income, nutrition, quality of life, etc. This renewed priority preceded the recent food crisis, and was substantially bolstered by it.

The negative externalities of agriculture have also been recognized, especially by IAASTD, whether it is environmental degradation, or detrimental effects on human health or issues of poverty and social exclusion.

Finally, the agricultural multifunctionality concept, for which I and other colleagues at FAO fought a tough battle, has finally been recognized as relevant. The working definition proposed by OECD associates multifunctionality with the existence of multiple commodity and non-commodity outputs that are jointly produced by agriculture, some of the non-commodity outputs being externalities or public goods, mostly out of markets, to roughly summarize. This concept is obviously of interest for drylands and desertification. I'll get back to this point later.

The second entry is that the future of agriculture is linked with external factors that make up its environment. This especially concerns global changes in general and climate change that seems to be accelerating; and also the economic shocks (sharp rises/drops in agricultural product prices, financial crises, which are likely preludes to a global economic meltdown); and population changes (population growth, demographic transition, urban/rural population ratio); and social and cultural changes (especially changes in food habits); and present and future energy crises; and ecosystem transformation and losses; and pollution, etc.

This second entry has many impacts in terms of public policies. I will just mention two of them. The first is the need to gain further insight into global changes so as to be able to foresee them – hence the importance of public awareness on ecosystem evolution and the importance of prospective studies, which are being conducted to an increasing extent in the world. The second is the need to reduce the rate of these global changes and their impacts, and especially to adapt to them – this is a major role of agriculture overall, having in mind that agriculture cannot be the only driver.

The third entry, more classical is our collective obligation to feed the planet and eliminate poverty. This has continued to be crucial, but the food crisis has renewed our approach, boosting public awareness on the fact that poor urban and rural consumers have both been hit, and also that agriculture in rich and emerging countries has mainly profited from the rising prices while, contrary to what was generally claimed, agriculture in poor countries has got little or no benefit.

There are still some major questions that require consideration: By 2050, how will it be possible, and who will be able to feed 3 billion urban poor people living mainly in towns and cities of developing countries? It implies that global agricultural production will have to increase by 75% by that time and that prices will have to remain affordable for urbans! And how could persistent poverty, in

particular rural poverty, be alleviated? These questions are also crucial for areas threatened by desertification.

I will close this brief prospective look by pointing out of the many consequences, two of them which seem to be prevalent and directly concern drylands:

First, we must, of course, adapt to global changes and sustainably manage our ecosystems and their services. This is a scientific problem, as well as a national and international public policy and governance issue.

Second we have to evolve towards what Thierry Gaudin, one of our top French prospective analysts, calls a 'knowledge-based biosociety': it is essential to foster knowledge transfer and innovation processes. This is also a scientific imperative.

II - Some considerations about climate change, sustainable development and global change.

Over the last 10 years, the overall question of climate change and its impacts on agriculture and desertification has been a prime focus of often heated public and governmental discussions.

Climate change is a facet of wider environmental and global changes. "Many of these global changes are a direct function of the economic development pathways that mankind has followed so far. And many of the fastest changes take place in developing countries, while at the same time some of the poorer of these countries will be the first to suffer. The relationship between climate, global environmental change and economic development is of great complexity"(Louise Fresco) and needs a better understanding: this is crucial!

Concerning the scientific challenge, she also states that "there is nearly unanimous agreement that human activities cause effects that are of the same order of magnitude and even exceed the natural forces that regulate the Earth system. Climate is only one of the subsystems of the Earth system. As a consequence, climate should not be seen as a subject on its own, nor only in relation to the energy agenda or limited to reducing CO₂ levels. Our efforts to understand, mitigate and adapt to climate change must be an integral part of our move towards a sustainable society". "We can probably find common ground in the thought that sustainability does not exist in an absolute sense and that it is always a matter of tradeoffs between various alternatives with divergent long-term and short-term effects. Hence sustainability is both about being able to react to unexpected fluctuations and to deal adequately with negative effects, where they occur. Sustainable development aims to minimize human effects on the environment, to reduce our dependence on the scarcer natural resources and to close material and energy cycles in production processes."

In short and although this is not mentioned explicitly in the MDGs, the relationship between sustainability and development should be a prime focus of our interest. This view of interactions between sustainability and global

change is highly relevant when applied to the development of drylands and combating desertification. This is the subject of the third part of my talk, which is to follow.

III - Desertification and sustainable development in drylands in the global change setting.

Land degradation currently has an impact on 2 billion people, a third of the Earth's surface, in around 100 countries worldwide. Deforestation and desertification are responsible for the degradation of ecosystems and human well-being, leading to loss of biodiversity, soil fertility and its water-retention capacity. These phenomena also increase soil erosion and reduce its carbon storage capacity, while deteriorating local inhabitants' living conditions and increasing poverty.

This environment and development issue has a local and global scope. Humans are the cause of desertification but also its victim. Future scenarios indicate that degraded land will likely increase with population growth, food and energy needs and the higher drought risk due to global warming. If no remedial measures are taken, living conditions for a third of humankind will worsen to an unbearable extent: food insecurity, health risks, social destabilization, increased poverty, forced outmigrations, etc.

Combating desertification and global warming is far from being a purely technical issue and is now recognized as being heavily dependent on the policy enabling environment, which very strongly influences household wealth. At this stage, you will recall the conclusion of the first part of my talk on the importance of scientific investment to enhance ecosystem management and gain greater insight into innovation processes, as well as the conclusion of the second part on interactions between sustainability and development. These underlie the more realistic public policy measures that I will now discuss.

First, dissemination policies and programmes. They should inform and train farmers on options to combat desertification and their impacts on costs and risks.

They should promote classical land management options for drylands, such as new agroforestry systems, new ways of harvesting and managing water, or combining organic and inorganic sources of soil fertility, etc. They should also focus on collective land resource management practices, at watershed or ecosystem levels, including new ways of exchanging goods and services between stakeholders, like payment for environmental services. Technologies should also impact food security, climate change adaptation and mitigation, biodiversity preservation, and rural poverty alleviation. Practices based on intensive agro-ecology and on sustainable land management (SLM) principles, such as conservation agriculture, are generally used.

Technology development and dissemination policies and programmes should be multi-targeted, context-dependent, and always, I insist always, promoted in full cooperation with the land users.

Second, pricing and market policies. Policies that influence the level and variability of agricultural commodity prices also influence land management investments. Similarly, policies that influence the availability and cost of agricultural inputs also influence land management by altering the production costs and input availability and use.

When markets are functioning well and households have clear and secure land tenure, policies that promote higher or more stable commodity prices and input prices promote investments in land management by increasing the expected returns and reducing the risks of such investments.

With imperfect markets and trade or unclear and insecure tenure, which are very common in drylands, farmers have limited or no incentives to invest in land resource management.

This is particularly important today with the recent soaring food prices: policymakers are often tempted to subsidize seeds and fertilizers in order to rapidly offset the increase in agriculture input prices. Such policies do not mean that the land will be better managed, or that desertification will be tackled more efficiently. They may artificially boost the land productivity and in turn hide the land degradation process and the need to manage the land ecologically. In other words, soaring prices may negatively impact land management, and finally reinforce the desertification process in the medium and long run. This is a major issue and a focus of diverging opinions with respect to public policies among regions and countries today.

Third, land tenure and land planning policies. They have marked impacts on land management. With land tenure insecurity, farmers have less incentives to invest in combating desertification. Policies that undermine tenure security, such as periodic land redistributions as used in some countries, tend to slow down such investments. In many cases, customary tenure systems, which are common in dry rangelands, provide good security for land access and use, whereas titling programmes may undermine the advantages of traditional systems. To tackle land tenure and land use complexities, programmes that integrate land administration policies with land planning and land management policies, as is the case in Ethiopia, involving different categories of public and private stakeholders as well as farmers' organizations, have to be developed in a participative manner.

Fourth, social and sectoral policies and programmes. Investments in infrastructure and education, promotion of non-farm income activities, and food-for-work programmes, can have a substantial impact on land management decisions, given that many measures to combat desertification are labor intensive. You will note that here we find again the multifunctional approach that I discussed at the beginning of the talk.

This approach requires a careful review of various options with the land users and other stakeholders, scientists, the private sector, NGOs and farm organizations: (1) to replace damaging practices that local societies have been obliged to use during stress survival periods, and (2) to promote the adoption of new ways to protect and improve local livelihoods. Mobilization and gender policies that facilitate the empowerment of local

people and communities, reinforcing their control and ensuring that they have safe and fair access to resources, are of prime importance. All land-related policies have to be formulated, implemented and monitored with the full participation and control of the users concerned.

Fifth and last, national and international strategies and investments to combat desertification. Sectoral policies that influence desertification control cannot be applied separately, or only through rural development programmes. Therefore, they must be embedded in national development plans and strategies, especially poverty alleviation strategies, as well as in budgetary and investment frameworks. They should be based on the elimination of institutional, legislative or infrastructure bottlenecks that hamper sustainable land management and should facilitate the management of development projects by stakeholders' decision-making processes.

Clearly, a set of consistent public policies must be implemented, along with high public investment in research, information, infrastructures, water, education, health, markets, etc. It cannot be overstressed that the primary responsibility of the governments of countries crippled by desertification – despite the fact that they are usually poor – is to draw up, to negotiate with stakeholders, to partially fund and to implement global strategies.

Finally, official development assistance (ODA) should have contributed to financing these natural environment restoration investments. However, it was not the case and over the last 20 years, this ODA, especially the share allocated to agriculture and natural environments, has decreased. There has been an upturn in this trend, as I noted at the beginning of this talk, but the situation is still very far from being acceptable. International efforts to get the global community involved in supporting dryland restoration and combating desertification have generated minor results with respect to the needs. We could certainly ask why, but this topic is beyond the scope of my talk today.

Conclusion

It is now time to conclude. We have seen that public policies are crucial for dryland development and combating desertification, in a setting of peace, economic freedom and political stability. Governments need to be tough and courageous to be able to cope with their lack of resources but also with the huge crises affecting our planet, economic and monetary crises, energy crises, climate change...the list is long.

Finally, I would like to put a word in about science. After all, I am here, before you, as President of Agropolis International, representing a community of 2300 scientists working in Montpellier on agronomy, natural resources, food production and biodiversity, but also as President of the French, Montpellier-based Agropolis Foundation, which promotes knowledge development in the fields of integrative biology and innovation. I am also very proud to be a Board Member of ICARDA, a magnificent international center which has already contributed incredibly to fostering dryland agriculture, and whose status as a leader in this domain continues to grow.

As scientists, we recognize our responsibility and are working hard towards fulfilling it. Governments, and the international community, are becoming increasingly aware of the urgency and importance of our current and future work towards sustainability and global change, especially in dryland areas.

Biology has, and will continue to have, a key role in dealing with desertification problems. This science enhances our understanding of functional adaptation mechanisms through different strategies, for instance using breeding techniques to promote adaptation to drought conditions, improving water use efficiency by modifying physiological mechanisms, developing favorable interactions via soil microorganisms (symbiosis), and finally tapping the potential of adaptation genes through comparative genomics and biotechnologies. Innovation is also a primary focus of our research, as a complex process, but also as a crucial condition for biological progress to have impact.

We are all committed to fulfilling this task together and in synergy, we scientists of developed countries with our expertise inherited from our long-standing agricultural tradition, in partnership with international agricultural research and its centers, and in collaboration with the many national research teams in this region that are striving to develop their drylands and combat desertification.

[Thank you very much for your attention. and again many thanks for the wonderful Egyptian hospitality and for the intellectual challenge of this conference.]