Opening Statement by CGIAR Chairman Ismail Serageldin

INTRODUCTION

Your Excellency Deputy Prime Minister Wally, Your Excellencies, Distinguished Guests, Colleagues, and Friends.

On behalf of the Consultative Group on International Agricultural Research—the CGIAR—and on my own behalf, I extend to all of you the warmest possible welcome.

I thank everyone in Egypt's National Organizing Committee, at ICARDA, and at the CGIAR Secretariat, who have worked so hard to arrange this meeting. They can be assured that, in the wonderful setting they have provided for us, we will be committed to ensuring that the best of science we espouse will pass the ruthless tests of relevance with flying colors. Will our science change the world for the better? Can it help the farmers and the green plants they tend? Will it reduce poverty? Will it nurture and protect Mother Earth on whom we all depend?

These issues, I know, are of absorbing interest to His Excellency Deputy Prime Minister Youssuf Wally. I am especially grateful to him for taking time away from his national duties to be with us today. I thank you, Sir, for your perceptive remarks about our work and, needless to say, for your kind comments about me.

THE SETTING: A CHANGING WORLD

Consider the paradox of our times. We live in a world of plenty, of dazzling scientific advances, and of technological breakthroughs. Adventures in cyberspace are at hand. Yet our times are marred by conflict, violence, debilitating economic uncertainties, and tragic poverty.

Globalization grows, fueled by the integration of the world economies, a revolution in computers, telecommunications, and the non-stop activities of capital markets that transact over $1.2 trillion a day—enough to buy and sell the whole GNP of the United States in a week!

Equally global, are the increasing inequities between societies and within societies. The top 20 percent of the world's population consumes 83 percent of the world's income, while the remaining 80 percent live on 17 percent. A generation ago, that top 20 percent was 30 times as rich as the bottom 20 percent. Today they are 60 times as rich. Poverty is a global phenomenon; there are rich people in poor countries and poor people in rich countries. However, poverty remains enormously more pervasive and acute in the South.

In the forty-seven "least developed" countries of the world, 10 percent of the world's population subsists on less than 0.5 percent of the world's income. Some 40,000 people die from hunger related causes every day. Over a billion people are compelled to live on less than $1 a day.

Our environment and ecosystems are under siege. The marine fisheries of the world are grossly over exploited. The soils are rapidly eroding in many parts of the world. Water is becoming scarcer as underground aquifers are drawn down faster than their natural recharge rate, and pollution reduces the usability of the available freshwater. Deforestation is still continuing at the rate of some 25 million hectares per year. The global challenges of desertification, climate change, and potential loss of biodiversity demand redoubled efforts.

To this stock of problems, we are adding a flow of new challenges due to population growth that is averaging 90 million persons a year. Ninety-five percent of this growth will be in the poorest countries.

The stakes ahead are enormous, and agricultural research stands at the heart of it. Yes, agricultural research, for agriculture is not only the means of producing food for the billions of humans on the planet, it is the key interface between humans and the natural environment. In the developing countries, where 80 percent of the population lives, agriculture accounts for about 70 percent of land used and 80 percent of water. If agriculture is not intensified in an environmentally appropriate fashion, then the sheer expansion of the population and its requirements will lead to the destruction of the forests from slash and burn farming of poor smallholders who eke out a meager living. The hillsides will be further colonized, and the soil further degraded and eroded. More water will be lost, and more will go hungry as they become environmental refugees. This will be our legacy if we do not transform agriculture.

Transforming agriculture, however, is just a small part of the overall equation. It must be done in a manner that benefits, even relies on, the smallholder farmers of the developing world. That will reduce rural poverty, reduce vulnerability, and improve food security. Cheap food will also be critical as the single most direct and effective program for assisting the urban poor who have to purchase their food.

The transformation of agriculture is not going to happen without a sustained and continuing investment in agricultural research at the international and the national levels. That is why the Consultative Group on International Agricultural Research and national institutes in developing countries must receive even greater support.

THE CGIAR

The CGIAR is a South-North enterprise of fifty-four members, that supports a network of sixteen international agricultural research centers. The mission of the CGIAR is to contribute through its research to promoting sustainable agriculture for food security in developing countries. The CGIAR works in close collaboration with all segments of an emerging global agricultural research system. Partnership committees of NGOs and the private sector help to strengthen such collaboration.

Surprisingly, this remarkably effective CGIAR has no legal persona, no charter, no constitution, no statutes, no regulations, no membership laws, and even no voting. That is part of the uniqueness of the CGIAR. It functions, is imitated, and is profoundly effective, only because of the dedication of its members, partners, and constituent institutions.

As befits a non-existent organization; contributions for supporting research are voluntary. This arrangement has enabled the CGIAR to raise over $4 billion in support for research since 1972. This amount represents an investment in the future, an investment with outstanding returns. Consider these facts:

- Since the early 1970's, global food production has increased by more than 80 percent, with over half that increase in developing countries.

- Productivity gains have led to decreased food costs over time and contributed in many parts of the world to food security.

- Caloric consumption per person in developing countries increased by 26 percent, with consequent improvements in nutrition and health, and increased life expectancy.

- The land saved—that is, not brought under cultivation—internationally by the intensive use of new technologies pioneered by the CGIAR is some 300 million hectares, equivalent to the total arable land of the United States, Canada, and Brazil combined.

- Land savings have protected biodiversity, the precious heritage of the human family.

- Integrated pest management and natural means of pest control developed through research have vastly reduced the use of chemical inputs and saved crops. Cassava production made possible by biological control of the green mite is worth about $60 million a year.

- Rates of return on investment in CGIAR research have been consistently high; for example, from a "high" of 191 percent on maize improvements in South America to a "low" of 50 percent on wheat in all developing countries.

These are formidable achievements, but more, much more, remains to be done.

CLOUDS ON THE HORIZON: SCIENTIFIC APARTHEID IN THE TWENTY-FIRST CENTURY?

The scientific climate of the new century is likely to be very different than the one in which the CGIAR thrived and was able to achieve so much working with the national agricultural research systems of developing countries.

Beyond the income inequalities discussed before, there are other inequalities that are even more troubling. The world of the knowledge based societies and global linkages is one that will favor the nimble, the educated, and the powerful.

There is a vast and growing gap in the production and availability of scientists and engineers between the North and the South—3,800 per million population in the United States versus less than 200 per million population in the South, as of 1990. This is purely on the quantitative side, and does not speak of the quality of the training or the resources at the disposal of the scientists. In the United States alone, there are 200,000 academic researchers funded to the tune of some $60 billion annually.

These disparities are just part of the problem. Ill-equipped as they are, the scientists in the South are confronted by an amazing information explosion, matched by an explosion in computing and communications. Today in the United States, there are more computers than cars. There is more e-mail than regular mail, and the volume of traffic on the Internet is doubling every 10 months.

Ironically, just as the informatics revolution makes more information more accessible to more people than ever before, the very nature of the scientific enterprise is changing. More and more, the new breakthroughs in science and technology in domains such as informatics and biology are driven by the private sector, especially in the United States. With enormous energy, imagination, and drive, these entrepreneurs of knowledge are creating new realities that will doubtless bring enormous benefits to many. However, the manner in which the research is carried out, including the need for intellectual property rights to recoup their investments, will make it impossible to practice the open exchange of information and germplasm that have been the hallmark of the past. Collaboration between scientists will increasingly be governed by carefully drafted legal agreements, no matter how easily connected they are.

In addition, the whole range of traditional knowledge and its wisdom, as well as the experience of many, will be marginalized in this new, dichotomizing world of the science of the

twenty-first century. The poor, public goods, and the environment may be the victims of this emerging scientific apartheid, where over 80 percent of humanity in the South could be almost permanently locked out of the major developments of the scientific enterprise. We cannot allow that to happen.

We need a new paradigm of research, where the synergies in agricultural research will unite all the actors, national and international, private and public, in rich and poor countries, and the formal and informal institutions of the civil society. All have their contributions to make. The newly created Global Forum for Agricultural Research is an important first step in that direction.

THE CHALLENGE FOR THE CGIAR

The promise and the problems come together in the concerns of the CGIAR, in particular in the area of biotechnology. Today, I want to talk of biotechnology:

- not because it is necessarily the most important, although some would think so;
- not necessarily because it is the most dangerous, although some would think so; and
- not necessarily because it holds the most promise, although some would think so.

Rather because it is having a huge impact on how the entire enterprise of science in the domains of primary interest to the CGIAR and its clients will be done in the future.

BIOTECHNOLOGY: THE PROMISE AND THE PERILS

February 22, 1997 was the day on which the international community as a whole was compelled to come to terms with the spectacular progress of biotechnology. Dolly the sheep was introduced to the world. It immediately focused attention on a branch of science that is little known and less understood by the public at large.

The promise and perils of biotechnology developed a mystique of its own, and the world was soon buffeted by conflicting stories of the possible benefits of scientifically created super abundance and of possible disasters, raising fears from Frankenstein's monster to Jurassic Park. More thoughtful concerns were expressed about the possible health or environmental effects of Genetically Modified Organisms, in addition to the ethical concerns of tinkering with nature.

We need to be more dispassionate. Let us disentangle the issues. ***A priori***, biotechnology could help pursue the mission of the CGIAR in introducing environmentally friendly disease and pest resistance. It could help develop hardier plants with resistance or tolerance to drought, salt, and herbicides. Plant characteristics could be genetically altered to, for example, adjust maturation speed, increase transportability, reduce postharvest losses, and affect water content and stem size—all aspects of great relevance to poor farmers in low potential environments.

Biotechnology is also relevant to the CGIAR, because it is seen to be scale neutral. Unlike mechanization, for example, it has no intrinsic bias against the smallholder farmer. However, the complexity of managing refuge areas in Bacillus thuringiensis (Bt***)*** transgenic crop plantings shows that it is not as easy to transfer as might appear at first blush. In the case of livestock,

so essential for the smallholder farmer, biotechnology provides the most important defense against disease; for example, vaccines for East Coast fever in east Africa.

The biotechnology revolution is here. It is relevant to the CGIAR's mission. For the CGIAR it raises important questions relating to ethics, biosafety, and intellectual property rights.

THE ETHICAL ISSUES

For many, including myself, not everything that is technically feasible is ethically desirable. For some, transgenic tinkering with nature raises fundamental issues, which must be respected. Conversely, this must be weighed against the possible benefits that biotechnology, with adequate safeguards, can bring to the poor and the environment. Ethically we cannot accept the notion that deprivation should forever be imprinted on the genes of the poor and destitute—that misery is their inevitable destiny. Both sets of issues need to be boldly confronted. These issues were scrutinized at a recent workshop held in Brazil under the auspices of the CGIAR Genetic Resources Policy Committee. This is a major step forward in terms of disentangling the issues.

THE ISSUES OF SAFETY

The correct balance has to be established when weighing the benefits against the risks of biotechnology. The fear exists of transgenic plants turning into weeds, or providing paths for new genes to move into wild plants that become weeds, or creating new viral strains from virus-containing transgenic crops, in addition to the concerns of possible health or environmental impacts of these transgenic organisms in food crops. Such concerns are real. They must be examined dispassionately, and I propose to hold in October of this year a conference, cosponsored by a number of distinguished scientific organizations, to assess the scientific evidence on biosafety of biotechnology applications in agriculture. That will be another step in disentangling the issues.

INTELLECTUAL PROPERTY RIGHTS

On IPR, let us review what is happening. A huge transformation in biotechnology is taking place, with an enormous increase in market capitalization in the last year. In the United States, market capitalization of biotechnology firms increased by over $30 billion to reach over $83 billion. In the United Kingdom, it jumped from ECU 261 million to ECU 1.2 billion. This is being accompanied by a consolidation of the big private sector companies, dominated largely by the big pharmaceutical companies, and with a large number of smaller "niche" specialty biotechnology firms. In the United States these biotechnology firms now employ over 120,000 employees and spend about $8 billion annually on research.

Patents are essential for these private sector firms to mobilize the funds to make the huge investments they are making. They will recoup their investment only if they are able to market it. Efforts are underway to further extend the life of patents, and the Moorhead-Schroeder bill in the US Congress is seeking to extend the life of a patent more than 20 years.

What is covered by a patent is also in the process of being defined. The so-called Markman hearings, at which judges hear witnesses and decide the exact coverage of the patent before going to adjudicate whether infringement has occurred, are helping to develop case law on the coverage of patents. In addition, a number of lawsuits among the primary actors in biotechnology are helping to define the boundaries or the rules of the game.

The situation, even in the United States, is far from clear. The definitions are fluid and changing. The situation in Europe is different, with a strong public sentiment against biotechnology, as reflected in a recent non-binding vote in the European parliament of 407 against 4 opposing advances in certain areas of biotechnology. To add to the confusion, many countries in the South do not permit the patenting of plants and animals.

The situation on the ground is very complex; for instance, the number of companies holding two or more patents relating to the Bt gene is over forty holding 410 patents and counting. Egypt has recently filed for a patent of its own concerning Bt gene resistance. Another indication of patenting complexities is that six collaborating companies are also engaged in lawsuits over patent rights infringements. Nobody said this was going to be easy.

Those who argue for the patenting of such research point to the experience with computers and informatics—a massive explosion of new products and technologies, ever lower prices, and wider reach to serve everyone. Those who challenge the use of patenting of both process and product point to the patterns observed in other industries, such as the pharmaceutical industry, where breakthroughs are few and far between and the costs can be considerable to both the producers and the consumers. Which is it likely to be?

Remember the stakes—800 million are hungry, 2 billion are malnourished, there will be 3 billion more people on the planet in a generation, 95 percent in the poorest countries. It is irresponsible to simply hope that developments will be more like informatics rather than pharmaceuticals.

POSSIBLE CGIAR ACTIONS

So what do we do? The CGIAR must play a role in ensuring:

- that access to the potential benefits are guaranteed for the poor and the environment; and

- that the risks of biotechnology are not minimized, and adequate biosafety provisions are made for the developing countries that would want to benefit from this additional tool.

This means intensifying certain things we have been doing. It means adding to our critical mass of scientific efforts in the area of biotechnology, but not at the expense of the heartland issues of people-centered policies, inclusion of the farm community, natural resources management, and biodiversity. Let us always remember, too, that biotechnology is a tool, to be used in conjunction with other tools, not an end in itself.

There are several dimensions of biotechnology to be considered with different levels of risk and opportunity. They can be categorized in different ways such as the following:

- low risk enabling biotechnologies which are now used routinely to make breeding programs more efficient, to assess and analyze diversity, to diagnose diseases more efficiently, etc.;

- low risk, good opportunity transformation technologies such as: transferring genes between plants of the same species—maize to maize, potatoes to potatoes; or transferring genes between one plant species and a very closely related species—wheat and rye;

- slightly higher risk, good opportunity transformation technologies which do not involve weediness or a virus component that might lead to the development of the feared "super-virus"; these are cases where disease resistance is transferred from one species to another;

- higher risk, high opportunity transformation in cases where no other solution can be offered by breeding or agroecological approaches, where a biotech solution would have enormous benefit to the environment, and where smallholders are suffering great realized or potential losses—such as banana black sigatoka resistance; and

- very high risk, high opportunity transformation—the "magic bullet" that could work wonders, but runs a risk of environmental damage or disastrous crop seasons.

Experience teaches us that it is better to focus additional efforts on some well defined problems. A cluster of such problems, of great relevance to developing countries and the environmental community, that fit into the specific mandate of the CGIAR, and that could be amenable to some biotechnology solutions would include:

- genetic resources conservation and maintenance;

- animal and plant health;

- plant and animal breeding aids (marker aided selection gene identification, location, cloning DNA sequencing);

- pest resistance (diseases and insects);

- stress related (abiotic); and

- cultural (nitrogen fixation and apomixis).

The mapping of these six clusters into the five levels, and then focusing on those levels where biosafety issues are minimal, could be the start of an acceptable focus for a special effort by the CGIAR in the area of biotechnology. This is, of course, in addition to the current work already going on in many of the centers.

THE PREREQUISITES FOR ACTION

Can we now move toward a consensus on how to act? This requires the willingness of the international community to recognize the need for an increased public involvement with biotechnology without diminishing its support for the current agenda of the CGIAR.

Note that in the United States, the country most dedicated to the idea of intellectual property rights and the primacy of the private sector, real federal spending on science, as defined by the National Academy of Science, has declined in all sectors except for biology, where it has gone up.

It requires exploration of partnerships modes through which the work of the private sector will be channeled into programs that fully involve NARS. It calls for both the pros and the cons of biotechnology development to be continuously kept in review.

All this will call for a special effort within as well as outside of the CGIAR. The transfer of technology has proven difficult. The OECD studies in this area have rightly reminded us that the institutional and enabling framework in the country is an essential part of an effective National System of Innovation. In an area where there have been few successes, the CGIAR stands out as one of the greatest and most lasting success stories: 70 percent of the germplasm for CGIAR mandate crops now used in developing counties has benefited from CGIAR material. We must think of the CGIAR as a basic platform for the networking of scientists across the North and the South.

ENVOI

We have spoken of partnerships, of the complementary roles played by the public and the private, the national and the international, the formal and the informal, the farmer and the scientist, the NGOs and the NARS, and the synergies that we have to capture for the benefit of creating a better world, rid of hunger and misery, dedicated to the dignity of people, especially the poor and the future generations from whom we have borrowed this planet.

How are we gong to translate this vision into reality? That is our challenge. Events press on us. We cannot do business as usual. We must embrace change, not for the mere sake of change, but because the future belongs to those who go out and meet it. We must meet it, and bend it to our will. We must be more than just responsive, we must be proactive.

In the past thirty minutes, while I was speaking:

- $25 billion was traded;
- 6,000 people were added to the world's population;
- 900 people died of hunger related causes; and
- 1,500 hectares of forest were lost.

The time for action is now.

Thank you.