PRESS RELEASE

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Embargoed for: Monday, November 23, 1998 at 4:00 p.m.
Released in Washington, DC and London

Ismail Serageldin, Chairman of the Consultative Group on International Agricultural Research (CGIAR), will offer a demonstration of ***The World Water and Climate Atlas*** *on Thursday, November 19, 1998, 2:00 pm EST at the main World Bank Building in Washington, D.C., 1818 H St. NW, 4th Floor, Room 119. Reservation and photo I.D. required. Please call 703-820-2244 to make a reservation.*

The World Water and Climate Atlas

Powerful New Computer Tool Examines Earth in Detail

One-quarter of the world's population will suffer severe water scarcity within the next 25 years, even during years of average rainfall. This poses the single greatest threat to food security, human health and natural ecosystems of the next century, say scientists at the Consultative Group on International Agricultural Research (CGIAR).

Some 80 percent of all water used each year goes to irrigated agriculture, which produces 30-40 percent of world food crops on just 17 percent of all arable land. The demand for water for irrigated agriculture is increasing sharply: 50-60 percent of all new food output between 1960 and 1980 grew on irrigated land. Consequently, as surface water is fully utilized in the semi-arid regions of Asia, the Middle East and Africa, including some of the major bread baskets of the world, the groundwater table is falling at an alarming rate.

"New ways must be developed to take advantage of this diminishing resource if humanity is to feed itself in the 21st century," says Ismail Serageldin, CGIAR Chairman and World Bank Vice President for Special Programs.

The International Water Management Institute (IWMI), one of 16 CGIAR centers, has developed **The World Water and Climate Atlas**, a computerized tool that allows scientists, agronomists, specialists in agriculture, irrigation and weather, and farmers to zero in on their region of the globe and extract key water and climate data **visually**. The Atlas will display and map the temperature, precipitation and other parameters for single months, crop seasons or annual periods.

In addition, an enormous quantity of additional information on population densities, river basins, vegetative indices, and other factors can also be visually displayed and analyzed. The Atlas, sponsored by the Japanese Government and the U.S. Agency for International Development, is available on the World Wide Web or on CD-ROM. A computer slide show demonstrating the Atlas can be viewed on the IWMI web site: http://www.iwmi.org.

The Atlas project began in 1996 with the goal of providing a computer-based atlas of world climate and related water and natural resources data in a format that could be quickly and easily used in geographic information systems (GIS) studies. "There is an urgent need to focus the attention of both professionals and policy makers on the problems of groundwater depletion and pollution," says Mr. Serageldin.

This new tool has become available just when a newly established **World Commission on Water for the 21st Century** is preparing a long-term vision for addressing water issues.

"Water is a precious resource and learning to manage it better requires us to harness cutting edge technology. This is the promise of the new Atlas," says Mr. Serageldin, who chairs the new World Commission.

The 1998 Atlas has been greatly enhanced from its earlier version.

Examples of what can be done with the Atlas include:

- identifying areas suitable for rainfed agriculture;
- providing inputs for hydrological modeling of river basins;
- extracting climate information to determine crop potential;
- helping conserve water and estimating demand globally, nationally and by river basins.

"This is a major breakthrough. Before the creation of the Atlas, irrigation experts from IWMI and other organizations had to depend on local sources for information on water and weather patterns.

The only way to collect hard data was typically to visit the nearest airfield or climate station and get the data," says David Seckler, Ph.D., Director General of IWMI. "The Atlas gives professionals a more exact tool, based on a much larger data set, for planning irrigation and agricultural development."

How the Atlas Functions

The Atlas is composed of data grids for Asia, along with similar data at lower resolution produced by other organizations, for the world as a whole or for specific regions, such as Africa. These international databases can be supplemented by local data from national meteorological agencies and other sources to improve the detail and accuracy of the estimates.

The Atlas for continental Asia now contains monthly climate data and important agricultural variables such as potential crop water requirements. The Atlas also contains information showing the extent to which rainfall is adequate to meet crop needs (indicating the potential for non-irrigated agriculture), or inadequate (indicating the need for irrigation). For Asia, the data is available at a relatively high spatial resolution of about 4 kilometers.

IWMI has assembled the data and tools in the Atlas in a standardized format that can be quickly and easily integrated and analyzed using the accompanying software package, the *Synthesizer*.

The *Synthesizer* is a vehicle for viewing, managing, integrating and analyzing geographic information from many different sources, whether in the form of spatially distributed data (grids), vectors (digital line graphs), labels or time-series point data. It contains common GIS components along with enhanced tools for working with time-series point data such as those collected at climate stations.

Among some 15 specific tools in the Synthesizer are:

Virtual world zooming -- allows the user to zoom in and move around climate regions as needed with simple mouse movements;
Polygon/point specific data extraction -- allows the user to retrieve selected data from a single cell or group of cells in a specific area or polygon, from a grid or set of grids.
Point data preparation -- a powerful and versatile tool that allows manipulation of time-series point data from climate stations and other data points. For example, the user can calculate the average or total precipitation for a water year instead of a calendar year, or for a month or week. The user could also calculate the extreme minimum temperatures for almost any period of record.

CropWat link -- allows the user to select a group of grids and extract a specific point from those grids into a data file compatible with the Food and Agriculture Organization's CropWat program. The user can then use this file in CropWat for analysis. The same facility for other crop models will be added later.

A major benefit of the IWMI Atlas is the large library of data products converted to a common data format and ready to use in the Synthesizer. All products are easily accessible using the Synthesizer and available on the IWMI web site.

IWMI has also added a *localization* capability in the software that enables researchers to effectively collaborate with local groups to create improved grids on a national or regional basis by including more detailed data than was included in the global data sets on which the regional grids were based.

The value of this feature was illustrated by the climatic data for Sri Lanka, the product of a collaboration between the Sri Lankan Meteorological Agency and IWMI. Other collaborative localization projects will soon be undertaken in Nepal and southern Africa.

Mr. Serageldin points to the island nation of Sri Lanka to demonstrate how precise the new Atlas is. "The precipitation for each local area is clearly defined by different colors," says Mr. Serageldin. "Previous maps showed the southeastern tip of the island as receiving a great amount of rainfall, and therefore a poor candidate for irrigation. In the new computer map, the southeastern tip is clearly a dry area, now marked in orange, showing that irrigation would be needed to support year-round agriculture production in the area."

One early map of Sri Lanka was created from just 13 weather stations, and could show only large, indistinct blocks. The new Atlas is based on reporting from 240 weather stations.

"The Atlas is available on CD-ROM for those without access to the World Wide Web," says IWMI Director General Seckler. "In some cases, the available computer systems would take one year to download the entire Atlas off the web site, and a CD-ROM is a better alternative. Users can specify subsets for particular areas, and IWMI will create and send the disks to them."

"We will need better data for a global system that would be as detailed as South Asia," says Mr. Seckler. "There is a need for continued support to work in this area."

Earth's water problems

Today, 1.3 billion people have no access to clean water and 2 billion have no access to sanitation.

Development experts say that water scarcity, not shortage of land, is likely to be the main future constraint to agricultural production in developing countries. Slightly more than one billion people live in arid regions that will face *absolute* water scarcity by 2025, which means that they will not have sufficient water resources to maintain 1990 levels of per capita food production from irrigated agriculture, even at higher levels of irrigation efficiency, while meeting reasonable water needs for domestic, industrial and environmental purposes.

New technologies and better management can help to avert water shortages in the next century that are expected to affect some of the world's major breadbaskets.

"Since water resource development programs typically require twenty years or more to bring to fruition, it is important to anticipate problems and take appropriate actions well in advance, before they reach a crisis state," says Mr. Serageldin.

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Long Term Vision for Water, Life and the Environment

In 1996, the World Water Council was established in France with the main objective of improving water management on a global scale. The Council is preparing to launch its ***World Water Vision*** *on water use in the next century, and plans to present the first results of its efforts at Second World Water Forum, to be held in The Hague in March 2000.*

"The departure from previous approaches will lie in the emphasis that the Vision places on the integration of water-related issues into the socio-economic planning and consensus building process," says Ismail Serageldin, Chairman *of the* ***World Commission on Water for the 21st Century****. "Conventional socio-economic development strategies often resulted in misallocation and wastage of water, and damage to the environment, stemming from institutional weaknesses, market failures, ineffective pricing policies and misguided investments."*

The Vision will take into account such realities as the majority of rivers and aquifers worldwide are shared by two or more countries, yet no enforceable laws govern the allocation and sharing of international waters. The Vision will also appeal to countries with abundant water resources as well as nations where water is scarce.

"We want to develop a widely shared vision on the actions required to achieve a common set of water-related goals, and commitments to carry out these goals," says Mr. Serageldin. "The Vision must be truly global, including both developed and developing countries, but with special attention to the needs of the poorest developing nations."

The main goals set out by the Vision are:

- *Ensuring food security through aquaculture, and rainfed and irrigated agriculture;*
- *Providing adequate water supply and sanitation services;*
- *Developing water resources for economic uses, including industrial water uses, energy production, navigation and tourism and recreation;*
- *Preserving essential environmental functions with increased emphasis on sustaining the earth's eco-systems.*

MEMBERS OF THE WORLD COMMISSION ON WATER FOR THE 21st CENTURY

Chairman:

Dr. Ismail Serageldin , Vice President, The World Bank, and Chairman, Global Water Partnership

Members:

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- Asit Biswas, Editor and Professor, Centro Interdisciplinario de Investigacion y Estudios sobre medio Ambiente y desarrollo (CIIEMAD), Mexico
- Margaret Catley-Carlson, President, Population Council
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