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## **Award-Winning Science Helps Developing Countries Cope With Natural Disasters, Made Worse by Climate Change**

### **A Sophisticated Knowledge Tool on Coral Reefs and Flood-Proof Rice Variety Earn International Recognition**

BEIJING (December 4, 2007) – The most comprehensive database of the world’s 10,000 coral reefs and groundbreaking research to produce rice that can withstand floods were among the scientific awards announced today by the world’s largest alliance of international agricultural research centers.

The Consultative Group on International Agricultural Research (CGIAR) is bringing international recognition to research that illustrates particularly well how science can help poor farmers and consumers in the face of growing concern about higher prices for basic cereals and the devastating impacts of climate change in developing countries. Six CGIAR Science Awards were conferred on outstanding scientists and research teams at the organization’s Annual General Meeting in Beijing on December 3.

“International agricultural research has shown again and again how science-based innovations can help combat hunger, poverty and environmental degradation in the developing world. Today, we’re recognizing a group of CGIAR scientists who are profoundly committed to this goal and have shown extraordinary persistence and creativity in contributing to it,” said CGIAR Chair Katherine Sierra at the awards ceremony.

**ReefBase**, the most sophisticated and comprehensive information-management system available on the world’s coral reefs was developed by a team of CGIAR marine biologists and information technology experts at the WorldFish Center ([www.worldfish.org](http://www.worldfish.org)), based in Malaysia. ReefBase proved critical after the tsunami of December 26, 2004, hit Southeast Asia in helping scientists and relief workers assess the damage to coral reefs and to the coastal communities whose livelihoods depend on them.

The multidisciplinary minders of ReefBase were named **Outstanding Scientific Support Team** for keeping this valuable resource relevant and up to date with information from 120 different countries, including 25,000 publications, 4,000 photographs and contact details for 3,500 coral reef experts.

WorldFish scientists consider their response to the 2004 and subsequent tsunamis as a kind of “dress rehearsal” for disasters that lie ahead, as climate change unfolds. Researchers expect that ReefBase will prove more useful than ever for helping researchers, conservationists and development specialists monitor the impacts on coral reefs and make sound decisions about their management for the benefit of poor coastal communities.

Another key asset in developing countries’ struggle to cope with natural disasters is the Sub1A gene, which confers flooding tolerance on rice, as documented in the CGIAR’s **Outstanding Scientific Article**. Published in *Nature* during August 2006, the article, with ten co-authors, including four from the Philippines-based International Rice Research Institute ([www.irri.org](http://www.irri.org)), describes how the gene was introduced into a popular rice variety (Swarna), grown on about 6 million hectares in India and Bangladesh. When completely submerged under water for 12 to 18 days, the tolerant version of the variety (Swarna-Sub1) yields two to three times more grain than its non-tolerant original. The Sub1A genetic sequence has also proved useful in searching rice germplasm collections for further flood-tolerance genes.

An especially rich source of genes for rice improvement consists of 22 wild species belonging to the rice genus *Oryza*. Practically nobody knows this resource better than IRRI’s Darshan S. Brar, recipient of the CGIAR’s **Outstanding Scientist Award**. Brar has spent the better part of his career as a plant breeder finding ways to transfer useful genes from these wild species – for disease and insect resistance as well as tolerance to drought and acidic soils – into cultivated rice through an approach referred to as “wide crossing.” To overcome troublesome reproductive barriers between species and thus uncover hidden genetic variability, Brar and his team have resorted to a variety of tools – including tissue culture and molecular markers – for creating cross-species breeding lines. Serving as “bridges” for the introduction of valuable traits from wild to domesticated rice, seven of these lines have been released to farmers as commercial varieties, including one (AS966) that is now sown to 100,000 hectares on moderately acid soils in Vietnam.

All of the research recognized with CGIAR Science Awards features partnerships with diverse institutions, which Sierra referred to as “a key prerequisite for technological innovation, especially in the face of complex challenges.”

But one group was singled out for its especially inclusive and novel approach to collaboration. This was the Latin American and Caribbean Consortium to Support Cassava Research and Development (CLAYUCA, its Spanish acronym), winner of the **Outstanding Partnership Award**. Set up by the Colombia-based International Center for Tropical Agriculture (CIAT) in 1999, CLAYUCA ([www.clayuca.org](http://www.clayuca.org)) is an alliance of 33 public and private organizations in 13 countries. They jointly plan and finance research for the development of cassava (*yuca* in Spanish), a starchy root crop that provides food and increasingly serves as a source of animal feed and industrial raw material in tropical America. The consortium has greatly expanded members’ access to technologies for improving cassava production and processing. Among its current initiatives is the development of an alternative, decentralized approach for producing ethanol from cassava, with the active participation of small farmers. Value-added products derived from the residues are used in animal feed and fertilizers.

Another way in which agricultural researchers add value to staple crops is through improvement in the quality of grain and other products. In China, for example, better processing quality for noodle production is highly important to the country's wheat milling industry and translates into benefits for both farmers and consumers. In recognition of critical contributions to the development of three high-quality wheat cultivars, the Joint Wheat Quality Team of the Shandong Academy of Agricultural Science (AAS) and Chinese Academy of Agricultural Science (CAAS) received the CGIAR's new **Regional Award for Outstanding Agricultural Technology, Asia-Pacific Region**. The pedigrees of two of these varieties include lines provided by the International Maize and Wheat Improvement Center (CIMMYT). The cumulative economic returns from the three new wheat varieties for Chinese farmers – estimated at US\$411 million – include \$101 million in premiums for higher processing quality.

The newest variety – Jimai 20 – was sown on 1.3 million hectares in Shandong and three other provinces in 2006. In addition, it is the only Chinese cultivar showing resistance to a new African strain of the wheat stem rust pathogen and could therefore serve as a parent in CIMMYT's international campaign to develop resistant varieties. The new rust strain, which was recently found in Yemen and is expected to spread across Asia, poses a dire threat to the region's wheat production.

A key aspect of food quality on which many CGIAR scientists now focus is nutritional balance. Specifically, they are engaged in a major effort to increase staple crops' content of micronutrients, such as zinc and iron, thus complementing other approaches to combat widespread micronutrient malnutrition, especially in Africa. Rapid progress in this work depends in part on the availability of cheap but reliable methods for quickly diagnosing key nutritional traits, thus permitting efficient, large-scale screening of grain samples. For her extraordinary achievements in this area, microbiologist **Natalia Palacios** of CIMMYT ([www.cimmyt.org](http://www.cimmyt.org)), based in Mexico, was named **Promising Young Scientist**. One of her innovations made it possible to handle more than twice as many samples per day as before, doubling the number of maize varieties undergoing improvement for content of pro-vitamin A. Palacios has also shown exceptional dedication to strengthening the capacity of national grain quality laboratories in Africa and Latin America.

The Consultative Group on International Agricultural Research (CGIAR), established in 1971, is a strategic partnership of countries, international and regional organizations and private foundations supporting the work of 15 international agricultural research Centers. In collaboration with national agricultural research systems, civil society and the private sector, the CGIAR fosters sustainable agricultural growth through high-quality science aimed at benefiting the poor through stronger food security, better human nutrition and health, higher incomes and improved management of natural resources. [www.cgiar.org](http://www.cgiar.org)