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***STAKEHOLDER MEETING***

**The Case for a CGIAR Challenge Program  
on  
Water and Agriculture**

**Agenda Item:** 6b – Program Initiatives, Water and Agriculture

**This item is for:** Information  Discussion  Decision

**Proposed Action:** None

**Background:** Improving water productivity and improved water resource management are major issues in agriculture. A program initiative on water and agriculture has been formulated by IWMI and its partners. Being suggested as a potential theme for challenge program, the initiative will be presented and discussed in Parallel Session I.

**Comments:**

# The Case for a CGIAR Challenge Program on Water and Agriculture

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This note outlines the case for a CGIAR Challenge Program on Water and Agriculture. It shows the potential for linking such a challenge program with ongoing initiatives: 1) the Dialogue on Water, Food and Environment; and 2) the Comprehensive Assessment of Water Management in Agriculture. The degree to which such a challenge program meets the criteria formulated by the CGIAR Task Force on Challenge Programs is also outlined.

## Water as a critical challenge for society

The 2<sup>nd</sup> World Water Forum in March 2000 in The Hague was a powerful expression of the increased importance of water on the political agenda. Over 120 ministers, over 5000 stakeholder representatives and water professionals, and over 600 journalists put water on the map as a “major issue”. Agriculture is a key player in the use of water for human purposes – more than 80% of all water resources withdrawn from rivers and aquifers in developing countries is used to grow food and fiber. Rainfed agriculture uses at least as much water (soil moisture). The productivity of the use of this water – both rainfed and irrigated – is critically important. It is important to determine how much more water resources need to be developed, and how many dams need to be constructed, to provide food security and rural livelihoods, as well as water for drinking and industry – while maintaining or restoring environmental security.

*“On the one hand, the fundamental fear of food shortages encourages ever greater use of water resources for agriculture. On the other, there is a need to divert water from irrigated food production to other users and to protect the resource and the ecosystem. Many believe this conflict is one of the most critical problems to be tackled in the early 21<sup>st</sup> century” (Global Water Partnership, Framework For Action, 2000, p58).”*

## The challenge for the CGIAR

To solve a major part of “the world water crisis”, the challenge is to grow more food with less water - decreasing water use in agriculture to meet environmental goals and other human needs, yet growing enough food, and improving livelihoods of the poor. This challenge requires substantial increases in productivity of water in agriculture. In 25 years, 60 percent increases of water productivity on irrigated lands, and 30 percent on rainfed lands will certainly go a long way to solving the crisis (see Table 1). Water productivity needs to be understood in the widest possible sense – including crop yields, fisheries, ecosystem services and direct social benefits such as to health.

*“We need a Blue Revolution in agriculture that focuses on increasing productivity per unit of water – “more crop per drop” (Mr Kofi Annan, Secretary General of the United Nations, Report to the Millennium Conference, October, 2000).*

Many of the 16 Future Harvest centers supported by the CGIAR have already made major contributions to improving water productivity (through higher yielding varieties) and improved water resources management. But, as TAC concluded, there is a “*relative under-investment in water management research at a time when lack of access to fresh water is rapidly becoming a key constraint to global food production*”(2001 Financing Plan - TAC Observations).

**Table 1. Water productivity and cereal yield growth rates for a scenario meeting goals of food and environmental security (Source: IWMI, 2001)**

<b>Growth Rates</b>	<b>Irrigated</b>	<b>Rainfed</b>
Recent Annual Growth in Cereal Yield	1.0%	0.5%
<b><i>Business as Usual Scenario*</i></b>		
Annual Growth in Cereal Yield	1.0%	0.5%
Annual Growth in Water Productivity	0.6%	0.5%
Total Growth in Water Productivity (25 years)	20 %	15 %
<b><i>Food and Environmental Security Scenario*</i></b>		
Annual Growth in Cereal Yield	1.3%	1.0%
Annual Growth in Water Productivity	1.8%	1.2%
Total Growth in Water Productivity (25 years)	60 %	30 %

\* *The Business-As-Usual Scenario forecasts an increase in water resources withdrawn for agriculture by 12-17% from 2000 to 2025. The Food-and-Environmental-Security Scenario would reduce the total withdrawal for agriculture by 10% for the period 2000-2025.*

The challenge for the CGIAR is to catalyze effective and efficient improvements of water productivity in a way that is pro-poor, gender-equitable and environmentally sustainable. To this end there are very considerable resources in the system, related to crop breeding for drought tolerance, to participatory natural resources management, to fisheries, forestry and water resources management at field, basin and national level. These resources are not, however, mobilized in a coherent, integrated manner that maximizes the synergies among these approaches – and “water” is under-invested in the system as a research area.

#### **Breeding for drought tolerance**

*A recent review of the status of breeding for tolerance of abiotic stresses by John Bennet of IRRI, written on the request of TAC is quite optimistic. The recent advances in genomics, the development of advanced analytical tools at molecular level by the public sector in ARIs, provide a basis for understanding the mechanisms of stress tolerance. It concludes that investments by the CGIAR in the new tools for gene discovery will produce breakthroughs in our understanding of abiotic stress tolerance that will benefit all mandated crops. **It also concludes that the combined resources for of the CGIAR for this work are immense but under-utilised.** While drought is the most important, it is also the most intractable of abiotic stresses. Bennet concludes that there is considerable scope for improvements, however. Developing plants that are high-yielding even when grown under recurrent mild water deficit would benefit both irrigated and rainfed crops.*

#### **The Dialogue on Water, Food and Environment**

Ten key stakeholders in the water, agriculture and environment areas have joined hands to form a strategic alliance – known as the Dialogue on Water, Food and the Environment – to help bridge the chasm between agriculture and environmental communities over the way water should be managed and developed. These organizations range from UN agencies (FAO, UNEP, WHO) to associations of farmers (IFAP), irrigation engineers (ICID), environmental organizations (IUCN, WWF), water umbrella organizations (GWP, WWC) and water research (IWMI, representing the CGIAR). The Dialogue is organized around three main (groups of) activities:

1. cross-sectoral dialogues at national and basin levels, organized by (the national committees/members/associations/offices of) e.g., ICID, IUCN, IFAP, GWP, and WWF;
2. a “knowledge-base” of credible and authoritative information – acceptable to both agricultural and environmental communities – largely based on linking and adding to knowledge available in CGIAR, FAO, etc.; and
3. local-action activities that aim to provide an information exchange and best-practice identification, platform, linking thousands of local, NGO and bilateral projects and activities into the formal knowledge base(s).

The Dialogue on Water, Food and Environment was successfully launched in August 2001 at the Stockholm Water Symposium. IWMI is representing the CGIAR in the consortium implementing the Dialogue. The Stockholm event and press release created extensive press coverage for the Dialogue. There were a number of workshops in which six Future Harvest Centers participated (CIAT, CIFOR, ICLARM, ICRISAT, IFPRI, IWMI). Donors who have made or committed contributions include Netherlands, UK, Germany, Japan and GEF. Denmark, Sweden, Norway and USAID are seriously considering participation. World Bank, Asian Development Bank and the African Development Bank have also indicated that they will join as participating organizations in the Dialogue. Contributions and commitments have been received to date for over US\$2 million out of a US\$3.7 million 3-year secretariat and core funds budget. The total program has a US\$50 million target budget over 6-year. Considerable elements of this program of activities have been funded, or are in the process of being funded. A Secretariat has been established, hosted by IWMI, a director (Hans Wolter, formerly director land and water at FAO) and several other staff have been recruited. Proposals for projects under this program are being developed. The next event is a second design workshop, December 1-2, in Bonn, linked to the International Freshwater Conference and hosted by the German government. The Dialogue on Water, Food and Environment has been recognized as one of the core themes for the 3<sup>rd</sup> World Water Forum, scheduled for March 2003 in Kyoto.

**Recommendation 1:** *For CGIAR to request the consortium of partners in the Dialogue on Water, Food and Environment to be an external partner of CGIAR for: (1) development of a research agenda for a CGIAR challenge program on Water and Agriculture; and (2) review of the outputs and impacts of the CGIAR challenge program.*

### **Comprehensive Assessment of Water Management in Agriculture**

The core objective of the proposed research program on water management in agriculture would be to assess the potential to grow more food with less water in ways that alleviate poverty and sustain or improve human and environmental health.

The Comprehensive Assessment for Water Management in Agriculture (the re-formed CGIAR system-wide initiative on water management, SWIM2), or CA, is being developed in parallel with the Dialogue. The CA is a major component of the Dialogue's Knowledge Base. Inputs for its design are therefore coming from the Dialogue partners, e.g. at the Knowledge Base design workshop held in Stockholm on August 13-14, with 64 participants, including the 6 Future Harvest Centers named above. An first version of a proposal was prepared early in 2001 and has been available on the IWMI website. The Lead Researcher, David Molden has prepared a second draft, to take into account comments received. The CA program is now prepared as a 5-year 25 million US\$ program (including a number of important ongoing projects related to water management in the CG system). The program has a US\$25 million budget for a 5-year period. Contributions of ongoing CGIAR research are estimated to be around US\$10 million. The Netherlands is probably approving a grant request for an additional US\$7.5 million of non-CGIAR funds before the end of the year. Additional contributions are sought for another US\$7.5 million. The next events are a scientific workshop on Water Productivity, November 12-14, followed by a CA design workshop on November 14-16, in Colombo, Sri Lanka, that will bring together many if not most water researchers from across the CG system, ARI and NARS partners (up to 80 participants – including over 50 scientists that are expected to participate actively in the program). At least ten Future Harvest centers, 5-6 ARI partners and at least 15 NARS partners are expected to participate in the Comprehensive Assessment.

**Recommendation 2:** For CGIAR to request the partners in the Comprehensive Assessment of Water Management in Agriculture to prepare a proposal for a CGIAR challenge program on water and Agriculture. The Comprehensive Assessment will provide scoping and analysis of potential research areas in the challenge program. The Comprehensive Assessment can be a first stage of a challenge program, be absorbed into it, or remain separate.

### **Fast-tracking Water and Agriculture as a challenge program**

The development of ideas for a CGIAR Water and Agriculture challenge program are currently at a stage where they could be fast-tracked for Full-Proposal development, as discussed below. The criteria are taken from the Interim Executive Council document “*Recommendations on CGIAR Reform for Approval by the AGM: An Integrated Proposal*” (version of late September).

**Phase 1 Criteria:** The CP

- addresses an issue of overwhelming significance. Issues addressed can be global, regional or sub-regional in importance;
- fits within the CGIAR mission and goals; and,
- is likely to generate significant outputs and impact.

Reducing water required for agriculture while achieving food security for all and relieving water shortages for cities and industry without further damaging environment, is clearly an issue of overwhelming significance. It fits squarely within the CGIAR mission and goals and is likely to generate significant outputs, as argued above and in separate documents (e.g. presentations of Molden and Rijsberman for MTM01).

**Phase II Criteria:** The CP:

- is time bound and clearly defined in terms of research outputs as well as the potential impacts on CG clients;
- has clearly defined mechanisms for the delivery and dissemination of research outputs;
- is based on science that is both excellent and relevant, often requiring logical integration of multiple disciplines to address issues of great complexity;
- employs a mode of operation that enhances efficiency and effectiveness of the CGIAR System, with demonstrable contribution to CGIAR goals;
- involves both CGIAR centers and their partners and is based on the core competence and comparative advantage of collaborating partners;
- adds value to existing research and produces synergies between existing core competencies of the Centers’ and the partners;
- is co-operative and collaborative in nature; with no overwhelming dominance by a single institution;
- gives evidence of stakeholder involvement in problem identification and link to bottom-up priority setting mechanisms;
- requires significant levels of up-front funding to achieve its objectives;
- there is clear evidence that donors are willing to commit significant up-front funding;
- involves active participation of NARS from the South and contributes to capacity building of NARIs from the South.

While not discussing each and every criterion here at length, key arguments in favor of the Water and Agriculture area are the following.

1. The emerging program has been defined with a very high degree of interaction with many stakeholders, from both outside and inside the CGIAR. This started with a stakeholder

meeting with over 130 participants in December 2000 in Colombo and a Knowledge Base workshop with over 60 participants (including 6 CG centers) in August 2000. Ideas development occurs in close interaction with an organized alliance of key stakeholders through the Dialogue on Water, Food and Environment.

2. The program is closely linked to bottom-up priority setting, both through the current regional GFAR exercises as well as the many bottom-up priority setting exercises in the water sector (through the World Water Vision process and ongoing groups of the Global Water Partnership).
3. The emerging program is highly multi-disciplinary, and brings together key areas of competence of the CGIAR: crop-breeding, water management at field level, water management at basin level, INRM approaches to land and water resources management, and environmental sciences.
4. The program is cooperative and collaborative in nature, without the dominance of a single organization. Whereas the (preparatory) Comprehensive Assessment still has relatively large participation of IWMI and IFPRI (in the analysis and modeling stage) – the bulk of the research expenditures during the challenge program will shift to crop breeding and field level research at both Future Harvest centers and NARS partners.
5. The program requires significant additional funding to bring together and cross-fertilize areas of competence of different centers, and speed up development of ideas that are currently developed at individual centers. The program does no longer require a project preparation grant. These funds have de-facto been provided from outside the CGIOAR through World Bank / The Netherlands, Germany and Japan (about US\$0.5 million in 2000/2001).
6. The linking parts (Dialogue and Comprehensive Assessment) have currently received commitments for about US\$10 million in fresh, non-CGIAR funding. There is interest from the Netherlands, once the challenge program approach and fast-tracking have been decided upon, to make available considerable additional funding to the CGIAR for a Water and Agriculture, if the CGIAR at least matches those funds.

**Recommendation 3:** *For CGIAR to fast-track a challenge program on Water and Agriculture, by asking for a Full Proposal to be prepared. The planned design workshop for the Comprehensive assessment can make a major contribution to developing such a proposal. A Full Proposal should be available for review in February 2002. If review and decision-making can take place before July 2002, a challenge program on water and Agriculture could become operational during the second half of 2002.*