



Message du Président

Chers collègues et amis,

Quand j'écris ce message, je procède à l'analyse des données sur les crues, les pluies, la fonte des neiges et l'hydrographie d'un important bassin versant agricole proche de ma maison à Montréal. La rivière Richelieu qui prend sa source dans les monts verts de Vermont et d'Adirondack de New York, alimente le lac de Champlain, passe par la province de Québec et entre dans la rivière de St. Lawrence à 50 km de Montréal. Depuis début avril, le bassin versant est sans cesse affecté par des crues intensives. Ce phénomène a causé des dégâts en détruisant plus de 3000 maisons, et une superficie de plusieurs milliers d'hectares de terre cultivée est submergée, par ses crues. La période de 23 à 27 mai est le temps optimum pour la semence étant donné que la période de croissance est très courte, il est évident qu'il ne sera pas possible aux fermiers de faire la semence, ou qu'ils le feront tardivement. Ainsi, le rendement sera considérablement réduit, les cultures ne pouvant pas atteindre à temps la phase de maturité. Ainsi, le rendement sera considérablement réduit, les cultures ne pouvant pas atteindre à temps la phase de maturité. Quand j'ai visité cette région touchée par les crues, j'étais très soucieux de voir comment les terres les plus productives du monde et l'agriculture étaient anéanties à ce moment

Cette situation alarmante de crues cause aussi un effet dévastateur sur des centaines de fermiers de Manitoba du Canada, et peut être sur plusieurs milliers de fermiers du bassin de Mississippi aux États Unis. Aucune mesure financière de remédiation ne peut compenser les dégâts, la misère et les pertes causées aux habitants émus par cette situation.

En tant que Président de la CIID, je sais très bien que nombre de pays membres sont très affectés tous les ans par les phénomènes tels que les moussons, les tempêtes et les



hurricanes. Il s'agit ici d'une référence non seulement aux pays tels que l'Inde, le Pakistan, l'Indonésie et le sud-est asiatique, mais aussi à l'Australie (année dernière) et à la Colombie (à présent). Je suis même plus conscient que, dans nombre de ces pays, la situation est alarmante – pertes en vie, chômage, évacuation des familles, dégâts en permanence – et que le cercle vicieux de souffrance, de misère et de pauvreté continue de frapper.

Evidemment, il n'existe aucun moyen de financement des mesures structurelles et non structurelles pour la protection des villages, des villes et des bassins versants. Nous ne pouvons envisager ces mesures même si nous le voulons. Je me rappelle ici des pertes énormes (en vie humaine) et des dégâts causés par le tsunami qui a frappé récemment le Japon. Nos collègues du Comité National Japonais expriment son appréciation pour le soutien accordé et la sympathie exprimée par la famille CIID à travers le monde.

Les crues ont détruit les civilisations humaines depuis des milliers d'années.

Ce phénomène, ainsi que la famine qui s'ensuivit, laisse une trace ineffaçable sur les civilisations. Nos préoccupations doivent donc porter sur le fait que – malgré notre avance en matière hydrographique et technologique – les problèmes – les crues et leurs impacts sur les vies et les propriétés, l'approvisionnement alimentaire aux niveaux local, national et international – restent non résolus.

Il est temps que l'opportunité se présente à la fraternité CIID de partager les expériences, les leçons apprises et les meilleurs pratiques, et d'agir conjointement pour s'acquitter de notre responsabilité pour une meilleure gestion des crues dans nos pays respectifs. Je serais heureux de recevoir vos commentaires sur ce sujet, et d'étudier la possibilité de tenir une session spéciale soit au Congrès de Téhéran soit lors d'une réunion du CEI.

En conclusion, je remercie les Comités Nationaux Indiens, Français et Hollandais de m'avoir donné bon accueil aux récentes réunions locales et régionales. En effet, il m'a fait grand honneur de participer aux délibérations et de rencontrer un grand nombre d'experts. La CIID est donc puissante en raison de ces événements, de la large participation et de la richesse des dialogues.

J'espère que vous prenez les dispositions nécessaires pour participer au CEI et au Congrès, octobre 15-23. Notre hôte, Comité National Iranien, travaille vigoureusement pour assurer que le Congrès aboutisse à plein succès. Je vous prie d'y participer et de soutenir le Comité National. Dans l'attente de vous voir tous à Téhéran,

Le Président CIID

Chandra A. Madramootoo

Établie en 1950, la Commission Internationale des Irrigations et du Drainage (CIID) est une Organisation Internationale Non-Gouvernementale Scientifique, Technique, volontaire et bénévole, ayant son siège social à New Delhi, Inde. Lettre CIID (trimestrielle), Texte original en langue anglaise déjà paru.

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ICID Prepares for the 6th World Water Forum

The 6th World Water Forum (WWF6) will be held during March 2012 in Marseille, France. ICID is partnering with FAO especially in preparation of Thematic Priority 2.2 on Contribute to Food Security by Optimal Use of Water, as well as 2.1 on Balance Multiple Uses through IWRM. President Hon. Bart Schultz, Chairman Task Force to Guide ICID Inputs to World Water Forum 6 and the Coordinator Thematic Priority 2.2 provides an overview of the Forum process and an update on ICID preparations.

General forum focus of the WWF6 is on "Time for Solutions." The forum is organized along with 3 Strategic Directions, 12 Priorities for Action, and 3 Conditions for Success. The 3 Strategic Directions viz., (i) Ensure everyone's wellbeing, (ii) contribute to economic development, and (iii) Keep the planet blue, are in line with the 3 pillars of sustainable development. The 12 Priorities for Action are grouped under 3 Strategic Directions. For each Priority for Action a specific Goal has been formulated providing additional guidance for the implementation of targets and solutions. Solutions are the concrete actions required to achieve the targets. This goal and its related targets is intended to become an important contribution to the global water agenda and in particular to the Rio+20 Summit to be organized by the UN.

The focus of WWF6 is on targets and solutions. In order to achieve this in the past there have been various meetings and discussions leading to draft documents that will be further elaborated and improved in the coming period up to WWF6. There is a thematic process, a regional process and a political process. A schematic representation of the process involved in the development of 'solutions' for WWF6 is shown in the figure.

During mid April, the International Forum Committee published its decisions on the Targets, the Core Groups and the Target and Solution Groups. All details can be found on the Forum website: www.worldwaterforum6.org.

For Thematic Priority 2.2 the coordinator of the Core Group is FAO - Pasquale Steduto - and co-coordinator ICID – Bart Schultz. For thematic Priority 2.1, AFEID - Francois Brelle - is the coordinator. Within Thematic Priority 2.2 there will be eight Targets as follows:

(i) By 2020, sustainably increase by **xx percent** - as compared to 2005 - 2007 baseline - land and water productivity (yield per ha and per m³) of rainfed agriculture (for specific crop categories);

- (ii) By 2020, sustainably increase by **X percent** - as compared to 2005 - 2007 baseline - water productivity per unit land and per year (yield per m³ per ha and per year) of irrigated agriculture (for specific crop categories);
- (iii) Increase productivity and lower costs of irrigated agriculture (yield per ha, per m³ of water and per \$\$ of production cost) in such a way that by year 20yy there is food security at affordable prices for all;
- (iv) By year 20yy, increase by **x percent** - as compared to 2005 - 2007 baseline - the safe use of non-conventional waters, either (treated) wastewater or other low-quality water, in agriculture;
- (v) By year 20yy increase by **xx percent** the capacity of water storages in support of irrigated agriculture (either supplementary, deficit, or full irrigation) - within the framework of an environmentally sufficient and socially sound management;

(viii) By 2015, define water-related components of a strategy that will improve food supply chain efficiency by **50 percent** and promote sustainable diets, including steps for its implementation by 2025.

For each of the Targets, a Target and Solutions Group has been formed. ICID is the coordinator of the Target and Solutions Groups III – Jacques Plantey and Bart Schultz, and for the Group V - Pres. Chandra Madramootoo. A Background Note has been made that was recently updated, based on the latest decisions. There are draft descriptions of the Targets and a Metaplan showing the provisional composition of the Core Group and the different Target and Solution Groups. The revised Background Note and the Metaplan can be viewed at http://www.icid.org/wwf6/wwf6_bg_note.pdf.

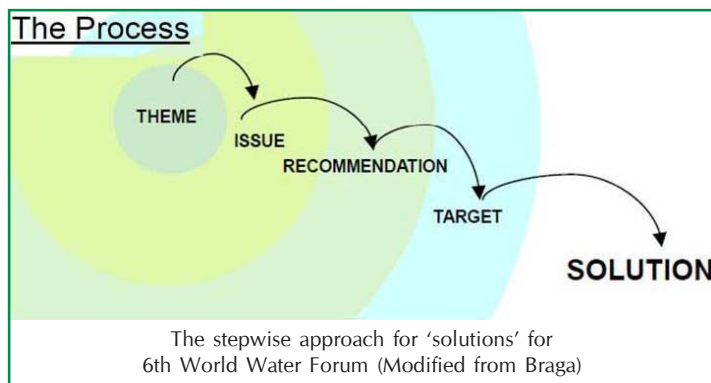
During the coming period, the Target and Solution Groups are expected to make action plans and to compile an overview of interesting solutions. In addition, based on the Background Note and the other documents, a report on the Thematic Priority as well as a programme for the sessions will be prepared. The sessions will be based on the Targets. All relevant documents will be posted on the ICID website as well.

Within ICID, the Task Force WWF6 is coordinating the different activities in close cooperation with Central Office. During the meetings in Yogyakarta, Indonesia, Orleans,

France and Groningen, the Netherlands special sessions have been held on WWF6. During the Congress in Tehran there will also be a Special Session on WWF6.

We hope that in this way we can present a strong case on the optimal use of water for food security. Any additional input from all will be most welcome.

For further queries please contact: Prof. dr. Bart Schultz at: schultz1@kpnmail.nl and / or Dr. S.A. Kulkarni at: icid@icid.org.



- (vi) By 20yy, develop and adopt two "regional" (e.g. West Africa; Europe / Euro-Med) visions for food security and water, and 200 local sustainable agriculture plans;
- (vii) By 20yy, develop national strategic action programmes for key 'hotspot' aquifers exploited by intensive agricultural use (**percent** aquifer depletion, **percent** pollution), including a local definition of maximum admissible drawdown (MAD) and local definition of maximum admissible pollution levels (MAP) for agricultural uses; and

Barrage Tehri - histoire du succès indien

Depuis cinq dernières décennies, le Gouvernement indien a fait de grand investissement dans le développement des ressources en eau par les projets à but multiple des vallées fluviales. Le Barrage Tehri est l'un de ces projets de stockage moderne de l'eau. Le VPH Larry D. Stephens, Vice Président Exécutif, du Comité National des Etats-Unis des Irrigations et du Drainage (USCID) et Directeur Exécutif de l'USSD, a visité le Barrage Tehri durant sa visite au Bureau Central CIID New Delhi en janvier dernier. M. Stephens partage ses impressions sur cette merveille du génie civil.

En 2009, le Barrage Tehri a reçu le prix de la CIGB en tant que "Barrage International en enrochements". Avec une structure en terre et enrochements de hauteur 260,5 m, le Barrage est situé sur la Rivière Bhagirathi au nord-est de New Delhi sur les Monts Himalaya en Inde. La construction fut commencée en 1978 et achevée en 2006, le coût de construction étant environ \$EU 1 milliard. Ce projet a été conjointement entrepris par le Gouvernement indien et le Gouvernement de l'Etat d'Uttar Pradesh. La Commission Centrale des Eaux (New Delhi) était les Consultants dans la Conception de ce Projet.

Le réservoir créé par le barrage Tehri possède une capacité de réserve vidangeable de plus de 2,6 milliards de mètres cubes (et une capacité totale de retenue de 3,54 milliards de mètres cubes). Ce projet à but multiple satisfait en permanence le niveau maximum d'énergie l'hydroélectrique (1000 MW) et fournit l'eau à l'irrigation dans un environnement de mousson, tout en assurant l'approvisionnement en eau potable à plusieurs zones rurales et urbaines, y compris la Capitale Nationale de New Delhi; la gestion des crues du bassin versant amont du Barrage Tehri est un avantage secondaire en plus d'autres avantages tels que les flux environnementaux adéquats etc. En plus de la stabilisation de 604 000 hectares de terre irriguée existante, une superficie d'environ 270 000 hectares sera couverte par l'irrigation supplémentaire; Il sera possible de fournir 270 millions de gallons d'eau potable par jour pour satisfaire les besoins ruraux ainsi qu'urbains.

La centrale électrique du Barrage Tehri possède actuellement une capacité de 1,000 MW. Elle obtiendra une capacité supplémentaire de 1,000 MW à l'Etape II quand l'Usine de Stockage Pompée, ayant quatre unités de 250 MW chacun, sera installée dans l'avenir. Avec l'achèvement récent du Barrage de Koteshwar à l'aval, le Complexe Tehri d'Hydro-électricité contribuera au réseau un supplément de 400



Tehri Right Bank Shaft Spillway (Morning Glory) in operation evacuating floods above the Full Reservoir Level

Photo: Tehri Hydropower Development Corporation

MW. En janvier dernier, j'ai visité le Barrage Tehri, la Centrale électrique et le Barrage aval de Koteshwar, accompagné du Secrétaire Général M. Gopalakrishnan. A ce temps là, il était l'ingénieur de conception à la Commission Centrale des Eaux (Inde) étant directement impliqué dans les aspects du Barrage Tehri. Il a servi d'un guide excellent qui a reflété de nombreux aspects du barrage, y compris particulièrement de nouveaux concepts tels que les galeries au centre d'un haut « barrage en terre », les évacuateurs en puits de diamètre de 12 mètres, ayant une profondeur d'environ 200 mètres pour gérer les flux d'environ 1900 cumecs dans chacun d'entre eux, et augmenter ainsi la capacité du canal à forte pente typique avec une chute de plus de 220 mètres qui gère environ 5500 cumecs à MWL. Nous avons visité la Centrale électrique du Barrage Tehri qui a été construite du côté de la colline sur la culée

gauche du barrage car il n'y avait pas assez d'espace dans le canyon au-dessous du barrage pour construire la centrale électrique. J'ai été hautement impressionné en particulier par la maintenance du Barrage Tehri et de la centrale électrique.

Nous avons aussi visité le Barrage de Koteshwar en cours de construction. Nous avons observé la fermeture des vannes de tunnel de dérivation, ce qui a fourni l'unique occasion de voir le front du barrage amont (le travail récemment achevé); les ingénieurs du projet nous ont informés que le réservoir serait plein dans trois jours. La réunion avec M. R.S.T. Sai, Président et Directeur Général du « Tehri Hydro Development Corporation Ltd. » était le point essentiel de cette visite. Il était très fier du projet et de l'honneur rendu par la CIGB. Au bureau de M. Sai, une grande importance est accordée au Prix.

Ma visite en Inde comportait une réunion très positive avec le Comité indien des Grands Barrages. Nous avons discuté l'offre de l'USSD de tenir la Réunion Annuelle de la CIGB 2013 et l'offre de l'INCOLD de tenir la Réunion en 2014. J'ai passé en revue des activités préparatoires de l'USSD et ai montré la vidéo que nous avons présentée lors de la réunion CIGB 2010 à Hanoï. Les fonctionnaires de l'INCOLD ont soutenu la proposition de l'USSD d'accueillir la réunion CIGB en 2013; ils ont aussi proposé un Mémoire d'Accord entre l'INCOLD et l'USSD pour l'échange technique entre ces deux Comités nationaux.

Contactez le VPH Larry Stephens à : stephens@uscid.org.

Stephens Receives India Power Award



USSD Executive Director **Larry D. Stephens** was named a recipient of a 2010 India Power Award. The Awards are presented by the Council of Power Utilities and recognize significant contributions in the fields of power and energy. Stephens was named in the International Category, and was recognized for his contributions to energy development in underdeveloped and developing countries. The award was presented by ICOLD Honorary President C.V.J. Varma, in the ICID office, New Delhi, on January 19.

The 2010 Awards mark the third year for the India Power Award Program, which was established on the occasion of the 25th anniversary of the Council's official journal, *India Power*.

Challenges Facing Groundwater Management

24th European Regional Conference of ICID was held during March at Orléans, France. The theme of the conference was 'Groundwater Management' and gathered 300 participants from 20 countries. More than 100 papers were presented and discussed in two plenary sessions and six parallel topics. Sami Bouarfa, President of the Technical Committee of AFEID provides summary and key highlights of the event

Of the 300 million ha of irrigated land in the world, some 113 million ha presently depend on groundwater accounting some 25% of the total irrigation water withdrawals. The overall groundwater extraction has gone up from 100 million km³ in 1950 to about 1000 km³ in 2000. Of which 70-75% extraction goes for agriculture. It is estimated that groundwater-based systems generate \$210–230 billion of revenue and are economically and socially more efficient than surface water systems. The low costs of installing and operating tubewells along with the resulting *groundwater revolution* have been the main reasons for this rapid growth. Groundwater irrigation covers the major irrigated area in France; half of the irrigated areas in South-Asia and is crucial in North-Africa. But, unlike surface water, groundwater is not easily measurable and manageable. In most cases it is used by a large number of independent users, including farmers, who have direct access to water. The same goes for diffuse pollutions. The complexity of aquifers functioning on large time and space scales hampers collective action as well as the perception of the impacts on the environment.

Despite these challenges, ICID so far has not focused enough on issues related to groundwater. The Conference hosted by AFEID is therefore of significance. The Beauce region is an important region for grain production in France. Here farmers have tested an innovative volumetric management system to manage the groundwater. A return from experience by stakeholders and users of the Beauce groundwater was presented and discussed.

President Madramootoo in his keynote address spoke on global trends in the usage of the groundwater reserves and resulting pressures from overexploitation. Dr Margat, a world-renowned hydrogeologist presented key data on the usage of the groundwater for irrigation, noting its rapid development during the past 50 years and the difficulties in managing a collective resource for which thousands of individuals have liberal access. Pr Ghislain de Marsily, an eminent hydrologist and member of the French Academy of Science, presented a case study on aquifer management in the French region of

Marais-Poitevin which calls into question the necessity for extensive knowledge of water resources for its management. Dr. Marcel Kuper, on behalf of Dr. T Shah, senior fellow at IWMI described how communities in India have responded to aquifer development and overexploitation, noting two distinct responses based on the abundance and accessibility of water resources. Pr B Barraqué, political scientist and economist with the French Centre *International de Recherches sur l'Environnement et le Développement*, described the evolution of water management in Europe, as the status of groundwater resources move from a thing that is privately owned to a common resource under Public Trust.

Key Issues

- Irrigation withdrawals are causing the imbalance of groundwater in the Mediterranean region. The groundwater quality has deteriorated due to very high nitrate concentrations (sometimes higher than 400 mg/l).
- While conjunctive use of groundwater in irrigated schemes is desirable, it can also be the source of new inequities between those who can invest in a borehole and other farmers. It would therefore be important to know if a collective appropriation of groundwater and its management is appropriate through allowance policy, collective drillings.
- There are a few cases of successful groundwater management implementation and also a few cases of uncontrolled "tragedies of the commons."
- The Water Framework Directive 2000/60/CE (WFD) requires Member States to protect, enhance and restore waters with the ultimate objective of achieving "good status" for both surface and groundwater bodies. While "good



Delegates at the field visit organized by the agricultural chambers of the Beauce region

quantitative status" is clearly defined in the WFD, this is not the case for the complex "good chemical status." So the lessons learned in the last 10 years were presented.

- Economic approaches of groundwater management discussed were (i) dynamics of, economic activities and groundwater resources, (ii) assessing and comparing the economic cost and/or benefits of different groundwater management options, and (iii) designing and testing groundwater regulation instruments such as prices, (abstraction/pollution) charges or taxes and markets of water rights.
- Groundwater pollution is not only the responsibility of agriculture with a highly variable ratio between agricultural/non-agricultural pollution sources, but also other users. It is thus necessary to involve all the parties to find solutions at the local scale. The types of action (preventive like local arrangements between water suppliers and groups of farmers or curative like water treatment or alternative resource) should be analysed in context to technical and economic criteria.

The proceedings/presentations of the conference are accessible through the website: http://www.groundwater-2011.net/program_and_proceedings. Sami Bouarfa can be contacted at <sami.bouarfa@cemagref.fr>.

What Does Efficient Irrigation Really Mean?

The South African National Committee hosted the 2010 SANCID Symposium in Upington in the Northern Cape. The theme for the symposium was "Efficient water use for food production." A total of 26 papers were presented on sub-themes of irrigation scheduling, soil nutrient management, irrigation strategies, water management at catchment scale, irrigation efficiency, water productivity and modelling water use. Dr Richard Stirzaker, Principal Research Scientist, CSIRO, Canberra was the keynote speaker and gave a very interesting presentation on the perception of efficient irrigation. He conveyed the following message to the delegates:

Depending on how you look at things, the task of feeding the world in 2050 can seem hopeless. Population increases at 200,000 individuals per day, water supplies are diminishing, land is degrading, food is diverted to biofuels and diets are changing to consume more water per person. Can we really double food production when the macro indicators are all going in the wrong direction?

But if you look at the business of turning water into food step by step from the small scale upwards, things might not look quite so bleak. Let's start with 100 liters of water in the dam, which we want to turn into food on a farm. When the water is delivered to the farm through open unlined channels, 20% of the water can easily be lost through evaporation and channel leakage before reaching the farm gate. On reaching the farm, the water may be stored in a small dam before being moved around the farm in earthen canals. Evaporation from the dam and leakage from the farm canals means only 70% of the remaining water reaches the edge of the field.

Then we apply this water to the crop by flooding the field. Sometimes water runs off the far end of the field and it is common for more water to infiltrate into the top end of the field and drain below the roots. We may only get 60% of the available water into the root zone, of which 50% evaporates from the soil surface. Do the calculations - $(0.8\% \times 0.7\% \times 0.6\% \times 0.5\%)$ and we see only 17 liters of our original 100 liters are transpired by the plant.

There are several points here where we can intervene. Let's suppose we can get 95% of the water to the farm gate and pipe the remaining 95 liters of water around the farm to each field, again at 95% efficiency. Five more liters are lost somewhere on the farm and the remaining 90 liters reaches the sprinklers in the field. We manage to get 85% of the 90 liters stored in the root zone, leaving 77 liters available for the crop to use of which 65% of the water was transpired and 35% evaporated. The amount of water used by the plant is now 65% of 77 liters, or 50 liters $(0.95\% \times 0.95\% \times 0.85\% \times 0.65\%)$



Photo: Editor

of the 100 liters that left the dam. Moving from a poor system to a better one can give us three times the amount of useful water – from 17 to 50 liters. There is a caveat here because not all the inefficiencies result in a net loss of water. Water draining below the root zone of crops reaches the ground water and may find its way back to the river, or be pumped up and reused by another irrigator.

A well grown crop can produce 1 kg of grain from a thousand liters of water, whereas a poorly grown crop would be unlikely to be one third as productive. We have seen above that we can increase the water transpired three times (from 17 to 50 liters) and with the right kind of investment in farmer training and support we could increase the crop productivity of water threefold as well. Putting the engineering and the biological sides together gives us 3x3 or a nine fold improvement. This is not to say that the ninefold increase is easily attainable – just that it is within reach and is in fact being achieved in bits and pieces all over the world. The question is 'why do we not learn much faster?'

In order to achieve higher water use efficiency, new technologies must be coupled with the development of new

institutions that are capable of managing water effectively. It is necessary to use adaptive management to deal with the complexity by involving professionals from many disciplines and through the process of 'learning by doing.' Which in turn shall be based on simple monitoring programs that include observation, evaluation, and revision of decisions and projections to sustain continuous improvement of water use efficiency in agricultural systems.

When we look again at the big picture, the need for new institutions and a trans-disciplinary approach to managing water at appropriate scales is clear. But at the other end of the spectrum, many small by gains can be made through systematic application of adaptive learning, based on the use of simple tools. Some examples of this in practice can be seen at <http://www.thescientistsgarden.com> and at <http://www.youtube.com/watch?v=Cyj6BzdUllI>. To double food production by 2050, we will have to double our efforts at both ends of the water management spectrum.

Dr Richard Stirzaker is the winner of ICID WatSave Technology Award 2003 and he may be contacted: <Richard.Stirzaker@csiro.au>. Thanks are due to VPH Felix Reinders, Chairman, SANCID, South Africa for facilitating publication of this article.

[SOUND PRINCIPLE NO. 53]

Believe in infinite possibility.

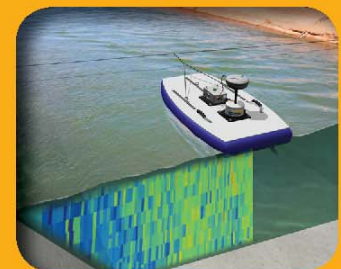


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Integrated Watershed Development for Sustainable Development of Rainfed Areas

For the greater part of the world, water stress is primarily a blue water issue, and large opportunities exist in the management of rainfed areas, i.e., the green water resources in the landscape. Dr. Suhas P. Wani, Principal Scientist (Watersheds) and Project Coordinator (IWMPs), Resilient Dryland Systems, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), India explains as how an integrated watershed development approach can increase the crop yields 2 - 4 times in rainfed areas.

Globally, 80% (1.25 billion ha) of arable land is rainfed with varying importance with the region (95% in sub-Saharan Africa, and 60% in South Asia) and produces most food for poor communities. These areas are the hot-spots of poverty, malnutrition, severe water scarcity, prone to severe land degradation, and have poor infrastructure.

Agriculture is the world's second largest consumer of the water after the forestry, and is also a cause of depleting soil quality. Growing need to produce more food, feed as well as biofuel for energy means increasing pressure on scarce water and land resources. Simultaneously, the per capita availability of land and freshwater has been declining since 1950 due to increased human population. These inter-linked and multiple challenges can't be solved with business as usual approach, without enhancing the efficiency of water, land and other natural resource use, without crossing the safe operating space for the humankind.

The current global population that has blue water stress is estimated to be 3.17 billion and expected to reach 6.5 billion in 2050. If both green and blue water are considered, the population currently experiencing absolute water stress is only a fraction of projected (0.27 billion), and will only marginally exceed today's blue water stressed in 2050. Large parts of China, India, and sub-Saharan Africa are conventionally water scarce, but still have sufficient green and blue water to meet the water demand for food production.

Large yield gaps with farmers' yields being about 2 to 4 times lower than the achievable yields for major rainfed crops are observed in Asia, Africa and CWANA (Central and West Asia and North Africa) regions. There is an urgent need to develop a new paradigm for upgrading rainfed agriculture and the business as usual approach can no longer achieve the goal of food security. Vast scope exists to unlock the potential of rainfed agriculture through sustainable management of natural resources through integrated watershed management (IWM) approach. The IWM approach provides a framework for



Women empowerment in a watershed, Andhra Pradesh, India

Photo: Suhas Wani

unlocking the potential of rainfed agriculture to improve livelihoods through knowledge-based and participatory method for sustainable intensification with increased efficiency of natural resource use.

The ICRISAT-led consortium developed an innovative farmers' participatory IWM consortium model that espouses the integrated genetic and natural resource management (IGNRM) approach where

Important components of the ICRISAT's New Model

- Collective action by farmers and their participation from the beginning through cooperative and collegiate mode in place of contractual mode. Participatory research and development (PR&D) approach.
- Principle of "users pay", no free rides in the program.
- Demand-driven approach, and no supply driven technologies.
- Integrated water resource management and holistic approach for improving livelihoods.
- A consortium of institutions for technical backstopping.
- Knowledge-based entry point to build rapport with community and enhanced participation.
- Tangible economic benefits to individuals through on-farm interventions enhancing the efficiency of conserved soil and water resources and targeted income generating activities for women and vulnerable groups.
- For equitable benefits to small farmers, low-cost and environment-friendly soil and water conservation measures throughout the topo-sequence.

activities are implemented at the landscape level. The entire process revolves around the four E's (empowerment, equity, efficiency and environment), which are addressed by adopting specific strategies prescribed by the four C's (consortium, convergence, collective action and capacity building).

The IWM consortium model has produced multiple benefits such as increasing crop production by 2 to 4 folds, doubling of the family incomes, increasing groundwater availability, reducing runoff to less than half and soil loss by 1/7th, conserving belowground and above-ground biodiversity, building social and institutional capital in the benchmark watersheds in India, Thailand, Vietnam, China and Philippines. The Integrated Watershed Management approach in Kothapally is revolutionizing agricultural productivity and incomes. The crops yields have increased by two to four folds as compared to the best land crop yields and have bridged the yield gap substantially.

The scaling-up of the IWM is taken up by the Government of India and other countries in Asia. Through South-South collaboration, the IWM approach is being evaluated in southern and eastern Africa through ASARECA (Association for Strengthening Agricultural research in Eastern and Central Africa).

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Iranian National Committee of ICID (IRNCID) Invites all to Tehran Congress in October 2011

In a few months from now the Iranian National Committee on Irrigation and Drainage (IRNCID) will host the ICID's 21st Congress on Irrigation and Drainage, 62nd International Executive Council at the magnificent city of Tehran. The theme of the Congress is "Water productivity



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towards food security." The 8th International Micro Irrigation Congress on the theme "Innovation in technology and management of micro irrigation for enhanced crop and water productivity"; Special session on modernization of water management schemes; Symposium on climate change impacts on soil and water resources, History seminar and many other International meetings like FAO session on modernization of Irrigation, special session on modernization and water management experiences in Australia, technical exhibition of irrigation and drainage related equipments/products. ICID Office in New Delhi has received large number of technical papers for the Congress. We hope delegates will be benefited by the variety of International events, technical exhibition and post conference tours.

IRNCID is fully prepared to make this event the most successful and memorable. A special

strategic high level council with the Chairmanship of Minister of Energy, an Executive Board has been setup to steer the technical, organizational, financial, promotional activities of the event. IRNCID fully ensures the comfortable stay and safety, of all the honorable delegates during the entire period of the event.

Organization of technical and sightseeing tours to see historical monuments, beautiful coasts of Caspian Sea in the North, Historical and Modern Water Structures of Khuzestan

in the South, as well as, tours to historical cities of ISFAHAN and SHIRAZ for the honorable guests. Accompanying persons shall also enjoy themselves in their free time by participating in the attractive Tehran tours.

The Executive Board has facilitated issuing visas with the cooperation of Ministry of Foreign Affairs (MFA). The participants are requested to fill the registration form and visa application form by accessing the Congress website. We encourage delegates to initiate visa related formalities at the earliest. The Executive Board has made agreements with many reputed hotels with reasonable prices



The Congresses and various meetings will be held in the magnificent, modern and fully equipped venue in Tehran. The venue has glorious halls, modern audio – visual equipments, and simultaneous translation facility. The entire organization of the event is handled by a high level internationally experienced organizer.

and hope that participants' will find it satisfactory. Information of such hotels can be found on the Congress Website.

IRNCID is eagerly looking forward to receiving delegates from all across the world and to enjoy the Iranian hospitality in a friendly atmosphere, as well as, to experience technical, social and cultural heritage of Iran. For further information, please refer to the Congress Website <<http://www.icid2011.org>>, or write to E-mail: <irncid@gmail.com>.

3rd African Regional Conference, Bamako, Mali 29th November to 5th December 2011

The 3rd ICID African Regional Conference will be held during 29th November to 5th December 2011 at Bamako, Mali. The theme of the Conference is 'Food security in Africa and climate change: Improve Irrigation and drainage contribution'. The main objectives of the Conference are - (i) To share documented experiences and knowledge on climate change and how to scale up experiences; (ii) To suggest strategies for improving water

productivity; and (iii) To advise policy makers on how irrigation could contribute to food security in Africa. Following are the sub-themes: **Theme 1:** Effects of climate change on the development of irrigation and drainage in Africa, **Theme 2:** Policies and strategies to improve the contribution of irrigation and drainage to food security in Africa under climate change context, and **Theme 3:** Water use productivity in agriculture and the

challenges of climate change. The last date for receipt of the abstracts (500 words) is **15 June 2011**; and for submission of full length papers is **15 August 2011**. For more information please contact: Conference Secretariat, E-mail: secretariat3.craf@amid-mali.org or gueyekeita@yahoo.fr, Tel: +22320287521 / +22320227192; website: <http://www.amidmali.org>.

Dû au surcroît de travail à l'Unité Française du Bureau Central de la CIID, nous regrettons de ne pouvoir fournir à nos lecteurs le texte intégral des Nouvelles CIID.

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