

**MONITORING OF THE CGIAR PROJECTS
CO-FUNDED BY THE EUROPEAN COMMISSION IN 2005
IN A.C.P., ASIA, LATIN AMERICA AND THE MEDITERRANEAN REGIONS**

Through the “Food Security and Food Aid” Budget line

**IWMI
Project N° 3: Groundwater Management**

Eric Mollard and Pierre Todoroff

Final Report

Montpellier and Guadeloupe, July 16, 2007

Dear Madam, Dear Sir:

Please find attached the **final report** for the monitoring of IWMI's Groundwater Management Projects carried out from February 5th to April 22th, 2007 by Dr. Eric Mollard, who is an environmental sociologist trained in agronomy at the French Research Institute for Development (IRD) and Dr. Pierre Todoroff, who is an agronomist at CIRAD in Guadeloupe.

For the monitoring team, it has been a pleasure to work with CE officials and IWMI researchers in Sri Lanka, India, South Africa and Ghana. We are grateful for the opportunity to get so valuable knowledge about a so critical issue, and we hope you will find the report useful.

This final report includes IWMI's feedback given after the draft report, as well as the precisions required at the debriefing meeting held in Bruxelles on July 2, 2007.

Faithfully yours,

Eric Mollard
IRD

Pierre Todoroff
CIRAD

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ACRONYMS

CA	Comprehensive Assessment of Water Management in Agriculture
CGIAR	Consultative Group on International Agricultural Research
CIRAD	French Agricultural Research Centre for International Development
CSIR	Council for Scientific and Industrial Research
DG for Development	Directorate General for Development (EC)
DSC	Development Support Centre (India)
DWAF	Department of Water Affairs and Forestry (South Africa)
EC	European Commission
FAO	Food and Agricultural Organization
GIS	Geographical information System
GLOWA project	Global Change in the hydrological cycle. Bonn University
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFPRI	International Food Policy Research Institute
IRD	French Research Institute for Development
ITP	IWMI-TATA Program
IWMI	International Water Management Institute
MTP	Medium Term Plan
NARS	National Agricultural Research Systems
NGOs	Non Government Organizations
OPEC	Organization of the Petroleum Exporting Countries
WRC	Water Research Commission (South Africa)

Photos: Boubacar Barry and Pierre Todoroff

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EXECUTIVE SUMMARY

1. THE CG CENTRE: International Water Management Institute - IWMI

127, Sunil Mawatha, Pelawatte, Battaramulla, Sri Lanka.

Telephone: +94-11 2787404, 2784080

Fax: +94-11 2786854

The International Water Management Institute is a nonprofit scientific research organization focusing on the sustainable use of water and land resources in agriculture and on the water needs of developing countries. IWMI works with partners in the South to develop tools and methods to help these countries eradicate poverty through more effective management of their water and land resources.

2. PROJECT

Project n°3: Groundwater Management

Groundwater irrigation has made a massive contribution to food production and wealth creation in the rural areas of Mexico, India, China, and the USA as well as Central and West Asia and North Africa over the last 30-40 years. Groundwater use in agriculture is also causing drops in groundwater levels of 30-40 meters, and as much as 150 meters, in a single generation of pumping. Effective policies and enforcement mechanisms are needed to prevent aquifers running dry and wells becoming obsolete (as is already happening in significant parts of Gujarat, India, for example). Building on IWMI's research experience in Mexico, India, China and Africa, this project aims to develop effective groundwater management policies and increase the capacity of governments at national, state and local levels to manage groundwater sustainably.

3. CONCLUSIONS AND RECOMMENDATIONS

Important preliminary note: EC only gave seed money (no money at all in 2006) for IWMI Groundwater Management Programs. However, as mentioned in the ToR, the objectives of the monitoring program are general ones: "Its main purpose is to review the progress made by the selected projects according to their milestones (...) and to evaluate accordingly the possible need of reorienting the EC funding". As reorienting seed money is not the main issue of the monitoring program, we analyze some projects on IWMI-led groundwater management to assess the relevance to develop EC's funding for Groundwater Management in Africa, as we have been said at the briefing meeting in Bruxelles. In the following tables, Output 1 concerns Groundwater Resource Survey in Africa and Output 2 concerns Groundwater Institutional Management in India, India being a possible research framework for Africa's future needs on regulating devices.

3.1 Project Design and Implementation¹

¹ **References:** project description included in the EC/CGIAR-World Bank contract 2003, EC-CGIAR strategy document

Performance ²		HS	S	LS	HUS	Comments
RELEVANCE						
	Output 1 Groundwater Resource Survey in Africa		X			The inventory of hydrological resources is in a starting phase. To be completed by social and institutional research.
	Output 2 Groundwater Institutional Management in India	X				High relevance of the IWMI-Tata development and research programs (see further)
EFFICIENCY						
	Output 1 Groundwater Resource Survey in Africa		X			Objectives remain unclear. To be precised quickly. The objective of the research could be methodological more than development-oriented.
	Output 2 Groundwater Institutional Management in India	X				High effectiveness of the IWMI-Tata development and research programs (see further)
EFFECTIVENESS						
	Output 1 Groundwater Resource Survey in Africa	X				The project is in its starting phase. However, the objectives are achievable.
	Output 2 Groundwater Institutional Management in India	X				High effectiveness of the basic research associated to advocacy activities.
IMPACT & SUSTAINABILITY						
	Output 1 Groundwater Resource Survey in Africa					Starting phase, but development seems unrealistic (if the objective is development) without economic and social research. No end-user beneficiaries apart from researchers and further projects in Africa.
	Output 2 Groundwater Institutional Management in India		X			Plot-based development (drip irrigation as a solution to flood irrigation) needs additional basic research.

² HS: Highly Satisfactory, S: Satisfactory, LS: Less than Satisfactory, HUS Highly Unsatisfactory

TECHNICAL MATTERS					
Quality of the science	X				Highly competent researchers. Strong international publications record. But caution is advised to avoid confusion with development activities.
Quality of the project management	X				
INSTITUTIONAL MATTERS					
Co-ordination with the Centre's other activities		X			Groundwater is not any longer a structural theme in IWMI, resulting in poor relation with themes and between disciplines.
Co-ordination with other CGIAR Centres		X			A lot of cross subsidies and publications, but a lack of leadership between disciplines (every discipline does what they want) to materialize the idea of "water crisis is a governance issue".
Co-ordination with NARS	X				Many specialized relationships with Nars.
Diffusion of the findings / results / outcomes (including training activities)	X				High quality diffusion of results.
Involvement of stakeholders					
• in the project design / reorientation	X				
• in the research activities	X				
• in the results dissemination	X				
• in the project evaluation	X				
OTHER RELEVANT ISSUES TO BE MENTIONED					

3.2 Recommendations

3.2.1 Recommendations linked to project design and implementation

- Interdisciplinary approaches have to be improved with a clear log frame to precise the role of everybody and the gaps to be bridged. Systematically involve sociology-economy-hydrology and precise the needs and the weight for each.
- Develop cross-cutting researches and involve « seniors », whether researcher or citizen, to promote a more global, classified vision of groundwater issues. Political sciences seem to be developed and even to take the lead.

3.2.2 Recommendations linked to Institutional Matters

- Solve the contradictions between development and specialized, basic research, which is one of the main limitations to take into account the reality of groundwater management and development.
- Scientific literature is uneven and sometimes seems to result from the needs of diffusion imposed by IWMI and/or donors.
- The place of water in development has to be defined to promote clear linkages between IWMI and other CGIAR's centres.

3.3 Overall recommendation on future support by the European Commission

	Yes / no	Comment
Suspension	Yes	It seems that there is no immediate interest for users (agriculture, cities, environment, and industry) to develop research on groundwater management in Africa. Very recent data in Burkina-Faso suggest a possible beginning of groundwater overdraft (to be confirmed). According to the results of the Glowa Project, recommendation could be changed. In South Africa, groundwater survey is carried out by the government but there are no clues of any imminent groundwater depletion.
Continuation	Yes	Unlike sub-Saharan Africa, critical groundwater depletion in North Africa, Asia and Latin-America urgently requires basic research on institutional regulation, economic development and irrigation agronomy, and in some cases, a better understanding and assessment of groundwater resources to assess the effort to be done in order to stabilize aquifers. Such basic research would be useful for Africa in the future.

1. Introduction

The European Commission (EC) has been involved in funding the CGIAR since its beginning and has provided the most important share of its overall funding. Every year the EC monitors a set of EC-involved projects. This report is concerned by the projects on “Sustainable Groundwater Management Policies”, especially the research achieved in 2005.

The International Water Management Institute (IWMI) is one of the 15 CGIAR Centres. It focuses on the sustainable use of water and land resources in agriculture and on the water needs of developing countries. IWMI's Groundwater project was a specific project up to the 2004-2008 strategic plan. A reform led to reorganizing IWMI's activities into 4 themes: Basin Water Management, Land Water and Livelihood, Agriculture Water and Cities, Water Management and Environment. The Groundwater project has been mainly dispatched into themes 1 and 2, making it difficult to extract the appropriate information among IWMI's projects portfolio

In 2005 IWMI submitted a research proposal to EC entitled “Sustainable Groundwater Management Policies” and divided in 3 regions: Asia, Central Asia (including China) and Africa. The total cost of the project was evaluated to 1.23 M€ The EC funded 0.22M€including 0.044 M€for Africa. The EC considers this grant as seed money and would like to know if the seed has grown. In addition, the EC would like to know the interests to substantially fund research on groundwater in Africa.

For administrative reasons, the EC and the World Bank were unable to finalise any agreement to fund the projects in 2006.

Thus our monitoring is rather different from one that would be focused on a clearly defined research project. The question was not only to monitor different projects but also to assess the interest to carry out research on groundwater in Africa. In addition we dealt with a set of researches where EC funds have been scattered thinly on. After discussions at IWMI headquarters to get a significant outlook of IWMI's competences and knowledge in groundwater, we decided to visit South Africa and Ghana, as well as India where IWMI has a strong experience.

2. Hydrological Research in sub-Saharan Africa

A detailed study on hydrological groundwater resources in 9 African countries has been conducted by IWMI under the coordination of Dr Boubacar Barry. This research is the African part of IWMI's project on Sustainable Groundwater Management Policies. It aims at assessing groundwater use in sub-Saharan Africa in complement with the Comprehensive Assessment of Water Management in Agriculture (CA –“an innovative multi-institute process aimed at identifying existing knowledge and stimulating thought on ways to manage water resources to continue meeting the needs of both humans and ecosystems”). We mainly relied on Dr Barry's work to back up the evaluation and draw up our conclusions on IWMI's researches on groundwater in sub-Saharan Africa.

Relevance

The « Agricultural Groundwater Availability and Use in sub-Saharan Africa» project aims at assessing groundwater resources and explaining low level in use in African agriculture in comparison with most developing countries such as in Asia and Central America. The question is relevant and adequately corresponds to priority 1 (increased productivity) and 2 (integrated management of natural resources) of the CGIAR strategy. It addresses the « enhancing individual assets » and « sustainable natural resources » priorities of the DG for Development. The study identified the problem and the underlying research questions with objectivity.

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Actually a large number of development projects focused on Africa to promote small abstraction infrastructures (bore holes, tube wells and technology alike). However the expected boom has not occurred unlike the first green revolutions that took place in Asia and Latin America in the 1950s and 1960s. There is a general belief that groundwater is not optimally used without succeeding in quantifying uses. The study offers a wide scale assessment (hydrogeological resources, use, economical contribution) as a prerequisite to any intensification policy.

The methodology is mainly bibliographic and takes advantage of existing works (national water resources services, FAO, hydrological surveys, etc.). Due to the extensive surveyed area, collected information remains partial. In addition, the lack of recent sources and many old works make the updating difficult.

The GLOWA Volta project completes this approach with a fine experimental research on the White Volta basin. The GLOWA Volta Project is an interdisciplinary project supporting sustainable water resource management in the Volta Basin. Its main objective is the development of a Decision Support System (DSS), which would help public decisions in Ghana, Burkina Faso and close countries to optimize water allocation within the basin.

Efficiency

The project "Agricultural Groundwater Availability and Use in sub-Saharan Africa » sketches out a large-scale picture of groundwater resources and use in sub-Saharan Africa. At the local level, knowledge somewhat suffered from imbalance between the ambition and the available human resources. Results are thus heterogeneous between countries, especially when national administrations initiated lately an inventory, as in South Africa.

This work needs to be pursued as recommended by IWMI to provide a systematic picture of sub-Saharan Africa's groundwater economy. Current results partially address the objectives defined in the log frame of the project: "Identification of potential and limitations of groundwater use in sub-Saharan Africa". As a matter of fact, issues on quantification and use limitations require a detailed economic, institutional and political analysis. More than in specific development programs, our recommendation deals a broader analysis to decode political speeches and identify national lobbies in a position to be the brakes or the drivers of innovation.

Coordination within IWMI seems very satisfactory with a good casting between the field researchers, the regional coordinator and the general coordinator in charge of the synthesis and the valorization of the work. The milestones planned for 2005 were reached:

- multi-country assessment of groundwater use in Africa and peer-reviewed journal articles (M. Giordano, 2005 (a), M. Giordano, 2005 (b), Giordano et al. , 2005).
- "The Agricultural Groundwater Revolution" under press.

As for the budget, it was not easy to identify the various financial sources. In particular the share of EC funding for groundwater studies in Africa, calculated to 0.053M€ in IWMI's accounting (see appendix 6), is posted on a project called "ITP Synthesis-Africa". After discussion with the Head of the Regional Office and researchers, this amount consists of a financial participation in a seminar on groundwater management policies in India with some results benefiting to Africa. This seminar is associated with book editing (under press). In addition the publicity on the financial support to the groundwater project only mentions the OPEC and the government of The Netherlands. It is understandable that such limited money implies mixing subsidies. However if we stick to available information, it would be appropriate that all the various donors appear with the diffusion of the project results.

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From a global point of view we consider the efficiency of the project as satisfactory.

Effectiveness

It is much too early to evaluate the effectiveness of such a preparatory project still in progress. As a matter of fact all the objectives are not reached yet, in particular the policy recommendations, which constitute the most important output to reach the intended beneficiaries (policy makers, scientific community, NGOs, political leaders, etc...). In addition it needs to be completed by more systematic studies for each country. But so far, all has been done through journal articles and scientific books. IWMI is exemplary in the diffusion of the results. We may be very optimistic and believe that this project will fully benefit researchers, more directly than "poor farmers" and pave the way to forthcoming studies on groundwater.

As we also underline it in the case of India (see below), IWMI can carry out any reorganizations to fulfil the requirements of donors (like that was made in 2004). There is no doubt that the managerial skills in IWMI seriously take into account indicators and the required flexibility to reorient a project portfolio to fully satisfy donors.

Hydrological resource inventory is in some countries carried out in synergy with national research centres. In Ghana, the CSIR-WRI collects information from various water database and tends to become the central information management service. The project also benefited from synergies with the Glowa Project. In South Africa closer connections could improve the project.

Impact and Sustainability

The same reasons than previously exposed prevent any evaluation of the impact of this project on end-users. This project is a preliminary study to define the strategic lines for groundwater development in agriculture.

We are convinced that development needs fundamental research free from development fashions and doctrines. IWMI management anticipated in implementing project impact assessments and reorganizing project designing and evaluation process. IWMI made of "impact assessment" a core value to raise quality standard. In addition, it created a Knowledge Centre responsible for organisational culture based on the Impact, the Performance and the Service. The impact criteria claimed by the donors is highly fulfilled.

Conclusions and recommendations on groundwater in sub-Saharan Africa

IWMI can boast about flexibility to meet donors' expectations. In addition the great number of publications makes IWMI a reference in communication and valorisation of fundamental and applied research. Like the IWMI-Tata consortium, IWMI is successful in specialized research and development activities. However, this strategy has serious shortcomings for two reasons: the relationship between research and development remains unclear and IWMI has no means to lead fundamental research required by development if it is not supported by donors. As a result the project portfolio results more on donors' budget lines and mirrors the difficulty of undertaking fundamental research for development.

Recommendation 1: To secure room in IWMI for a minimal independence towards donors, NGOS and end-users to guarantee scientific research lines for development, objectivity and quality.

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In Africa the "Sustainable Groundwater Policies Management" project is highly relevant according to the objective of intensifying agricultural production in Africa. Results will be particularly rich. Its technical focus contrasts with the sociological one in India (see below). In both cases projects lose in efficiency: missing hydrological measurements in India, lack of socio-political analysis in Africa.

Recommendation 2: To improve balanced, interdisciplinary approach between sociology – economy - hydrology.

Recommendation 3: To include more senior researchers with a more integral approach and experience.

Recommendation 4: To strengthen partnership with NARS, and Universities (condition also required to fulfil recommendation 1)

Research is often undertaken with different partnerships according countries. Effectiveness appeared somewhat heterogeneous, but rather positive when NARS are closely associated with the project (ex: WRI in Ghana).

Recommendation 5: Identify complementarities with other CGIAR centres and effectively associate them with the project.

Although mentioned in the proposal, we hardly note any complementarities and partnerships on the field with other CGIAR centres (ex: IFPRI). If IWMI has the required competences to carry out this type of research, synergies would be beneficial, in particular with regard to economic drivers in agriculture intensification.

3. Institutional Research in India

In India, the association between IWMI and Tata Foundation gave body to the IWMI-Tata consortium, which, as seen further, is exemplary for international NGOs and donors. This consortium has a substantial financing, offices and qualified personnel. For reasons of legal statute and rapprochement with Icrisat, its seat and part of its research and development activities will be transferred soon from Gujarat towards Hyderabad. It is not a question here to evaluate the whole consortium, whose history and outcomes are remarkable, but rather to identify some strong points and weak points of a device that aims at curbing groundwater overexploitation. We will draw from them some lines for researches to be carried out in Africa and, incidentally, we will discuss the evaluation indicators and the ambiguous role played by international organizations and donors on research for development.

The mission of evaluation made it possible to see the two facets of the IWMI-Tata projects: on the one hand, its implication in village communities and, on the other hand, a fundamental research associated with advocacy towards state and federal political authorities. This double engagement seems, a priori, highly advantageous for a mutual fecundation of research and development. In fact, this integration does not resist the analysis and these two aspects seem little articulated with, on one hand, a traditionally-based professionalized development and, on the other hand, an original research. Our evaluation distinguishes these two aspects.

Relevance

All in all, the association of research and development (development being itself associated with research-action) is, from the point of view of the criteria of formal evaluation, highly relevant because

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it implies de facto the “intended beneficiaries”, “focus on small-scale farmers' needs” and “is likely to contribute to food security”. However, any device of professionalized development is seldom original and the originality is to be found in the section of fundamental research, originality which doubles when it is associated with advocacy operations.

Consequently, the criteria fixed by the basic financial backers (and the European Commission does not make an exception) are easily satisfied because of this good professionalization of the consortium and NGO partnership, as well as a good access to fundings. Moreover, the financing criterion suffices to understand that any criteria of evaluation are inevitably fulfilled. As an example, the NGO Development Support Center, which is partner of IWMI-Tata in Gujarat (with the ambiguous name because it seems a governmental agency), gets funding from 10 prestigious international organizations (including Aga Khan Foundation and the European Union) and for minor supports from 8 organizations, of which an Indian bank and the Pentagon Foundation³. Correlatively, these donors incur low risk due to the contribution of other international organizations. This phenomenon of institutional conformism (so-called “alliances”) is thus synonymous with operational conformism.

The partnerships became a routine for the professionals of development, just like co-operation with stakeholders. As for the methods, they are tried and tested, and fully relevant compared to the criteria defined by financial backers. In these conditions, the association with IWMI and other international organizations simply means that all these actors in development are subjected to the same rules and the same indicators, which require high communication, professionalization and perhaps cynicism without impacts on the field being proven. Coincidentally nobody has demonstrated that donor-defined criteria are the conditions of an effective development. In other words, there is no indicator that the professionals of development leave to chance, including financial realism: all the criteria are perfectly filled. Obviously, criteria design would require a debate.

Efficiency

“Are things done right with available resources?” On the one hand, the traditional approach on the field satisfies the criteria enacted by donors, as seen above. On the other hand, the double originality of fundamental research and political advocacy undertaken by Dr. Shah is even more efficient because, with little resource, the experience of researchers and their social linkages with political institutions is highly efficient for development.

The whole structure of the consortium allows us to state its excellent quality for every aspect: scientific, technical, social, environmental, ethical, financial and political. For each aspect, it is easy to prove it due to the professionalization. A priori, nothing indicates that there is a defective day to day management because of the multitude of controls and donors. As for flexibility, NGOs and IWMI perfectly play requests from international organizations, including restructuring (the disappearance of the groundwater theme at IWMI not only proves a high managerial flexibility, but also probably mirrors the absence of funding, in spite of the severe crisis of groundwater in the world). In fact, it seems that the survival of international organizations, where financial competition is the rule, requires an adaptive behavior at the expense of a more fundamental research and the real stakes of development and environment.

As for the criteria of “value for money”, communication, “internal CGIAR monitoring”, again, the association research and development is able to answer all the conditions, making the IWMI-Tata

³ “The Pentagon Federal Credit Union Foundation assists military personnel and their families who face financial issues due to predatory lending and extends compassion and a helping hand to those wounded in the war on terrorism.” In: <http://www.pentagonfoundation.org/>

consortium a model to secure an organization depending on development funding. However, the question of “whether the chosen indicators of efficiency are suitable” raises the problem of the long-term evaluation, which we analyze in the Impact chapter. One can right now point out a set of difficulties inherent to any monitoring; some of which have been identified for long by political sciences and by anthropologists studying development, even in the case of an external evaluation which would be, moreover, impartial. Let’s mention the problem of surfing from one international development doctrine to another (integrated management, best practices, good governance, capacity-building, multiple use of water, gender issues, etc.), which enables any NGO to assume its self-criticism and to go beyond recognized mistakes; the problem of operations difficult to evaluate like capacity-building or community organization; the problem of incommensurable values, which allow any organization to pass from a domain to another (economic, social or environmental); or the problem of the role of an organization in changes, which in any case occur in any agriculture, without one being able to distinguish the effective part played by the organization (environment sociology even underscores the negative role of international organizations and their doctrines on needed changes to protect environment). During the project, evaluation is even more difficult because self-criticism entails flexibility, the new doctrines being supposed to solve the momentary difficulties of technology transfer for example. Lastly, capacity-building can be seen as a failure because evaluation is impossible even though it postulates the execrable idea of the incapacity by local communities to produce their knowledge and their organization. It is true that users ask for training (before realizing that they are useless) for varied reasons that development anthropology hardly starts to explain.

Effectiveness

Has the project achieved the intended goals and the anticipated outcomes? Again a traditionally-designed and well structured program of development provides the desired results. Any statistics of training and village organization show “the obligation of means”, which is different from the obligation of results (impossible to assess as seen above). There is besides a symbiosis between NGOs and users because everyone finds his interest: new societal projects for the first ones fit the need for recognition and financing of the second ones, and nobody complains on such a different vision neither asks for an impartial, critical and contradictory evaluation, not even donors. Perhaps should we give up such an ethnocentred “offer of development” to an approach of “demand for development”?

“Have the behavioral patterns changed?” Of course, any agriculture in the world is changing, including remote regions like Dogons in Mali or Yanomani in Amazon. But identifying the consequences of the part played by applied research to development is an impossible mission. However, a minimal historical approach (never carried out) would lead to some relativism. As for the themes required by donors, in particular women and poverty, they are largely taken into account by the professionalized development. Is there an “added value”? It is very difficult to prove and depends more on faith and optimism of everybody.

On the other hand, the effectiveness of fundamental research and advocacy is even higher because nobody would have decided, in the objectives of such a project, on the possibilities of leading a successful advocacy or renewing perceptions on the regulation of groundwater uses, as it is the case of the work of Dr. Shah and his colleagues.

Impact and Sustainability

Analyzing outcomes within the framework of available resources and expected objectives has been already discussed, in particular the difficulty to evaluate professionalized development and basic research. In addition, the ToR document mentions the difficulty in a short mission to perform this task. For fundamental research in social sciences, evaluation would need years to identify the history of new ideas and the trajectory of the current paradigm, either by confirming it or changing it. As in other

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social sector, any new knowledge is not validated by the community less for methodological than psychological reasons. The history of sciences also shows the no-linearity between knowledge and application. Since the invention of electricity, this period has been certainly shortened, but innovation remains under the influence of poorly known social reactions, which call into question the concept of research for development. Lastly, thirty years of experiments in development (in fact, much more because development and failures have begun at least in Egypt in the wake of the Napoleonic invasion) are sufficient to show the limits of this kind of development, the problem being the continual flow of funding for which every organization has to compete. Spending not very useful but inexhaustible financings has crafted a whole international structure called development, in which nothing better than research-action and capacity-building have been found, both surviving precisely because of the difficulties to assess their impacts. Thus the misunderstanding will continue with funding, including from the Pentagon Foundation.

On the other hand, recent works in environmental sociology suggest that the political approach is able more to durably influence the social and environmental changes, as it is the case of advocacy. Precisely, the IWMI-Tata consortium has had noticeable results near elected officials in state and federal Parliaments. Nowadays, groundwater is not only included in the political agenda, but also concrete actions have been implemented, like power rationing.

Performance rating

The IWMI-Tata consortium is a model to satisfy the imposed criteria, but also to give some independence to basic research and advocacy. If the performance is exceptionally satisfactory, some recommendations are conceivable.

Recommendations

The success of the IWMI-Tata model, in our opinion, depends on the juxtaposition of fundamental research and development. The absence of precise links between both is not a problem because all the indicators are green lights. It is thus not this aspect of the consortium that is most original. In fact, a traditional field-based development provides legitimacy to the consortium, who can speak on behalf of farmers and the poor in local Parliaments, much more than one researcher could do it. The presence of talented researchers and experts in field realities increases the visibility and the legitimacy of the consortium. It is then in a position to perform independent, fundamental research and to carry out advocacy, which are much more effective than direct development. But it is worth repeating that field work is necessary even though direct impacts are poor (but difficult to evaluate) because it gives legitimacy to advocacy and enables granting to independent research.

In addition, research to give an answer to the fundamental question about the regulation of groundwater uses is making Indian model, in particular the IWMI-Tata consortium, a model of world interest. Pragmatism, whose one of the aspects is advocacy, calls into question the current idea of the rules of state, where government-managed water concessions would remain the supreme value to control users. In this case, the pragmatic idea in India is not to regard any more the law as essential but rather to favor other practical ways, such as power rationing. The model was set up and ongoing studies try to assess the impacts of this new way. In particular, researchers need to know if the outcomes are promising or if some opening to citizens and users, as in the Mexican participative model of aquifer management, would not be necessary to moderate this authoritarianism and foster the legitimacy of public actions in the country.

If the IWMI-Tata model works fine to fulfill donors' requirements as well as to make possible an original fundamental research, it can be improved. In particular, the link between fundamental research and development operations would deserve to be developed.

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After fascinating field visits in northern Gujarat with fine experts of local realities, and after a final discussion with Dr. Shah, the gap between fundamental research, mainly focused on regulation modes, and development clearly appears. To partly fill the gap, one could imagine a regional approach of agricultural economics, which would characterize supported agricultures, analyze their dynamics and identify the main factors of change. Such an approach in geography and economic history would specify the drivers of agricultural diversification, which surprisingly resembles what Thailand has experimented since the Eighties. In particular, it would be possible to define the relationship between the regional frontier of diversification and the micro-irrigation. Indeed, young plantations (mango tree, papaya tree, etc.) are equipped with drip irrigation perhaps to save water but perhaps to extend plantations and save labor. The frontier characteristic casts no doubt with diversification being the economic driver. But what is the fate of old diversified zones? How far do wealth gained in old territories and wealth expected from new territories enables farmers to carry out expensive land leveling of several hectares in sloped landscapes, well digging, mud carriage from a close storage dam, and consequently higher groundwater abstraction? One would then avoid confusion between micro-irrigation and groundwater saving as mentioned in the mouth of many actors of local development.

Water saving is another main issue to be solved. It exceeds Gujarat's limits because it seems nobody has a clear idea on if micro-irrigation results in real water savings. Off record, specialists deny any saving. Indeed, flood irrigation in bunded subplots, as practiced on Gujarat sandy soils, does not necessarily waste water because the greatest part infiltrates and supplies down the aquifer, which is an effective storage for a later use. At most, micro-irrigation would result in energy saving during extraction. If such were the case, all the micro-irrigation-based programs with training and subsidies to save water would be inoperative. However, this uncertainty is recurring everywhere (in other countries, furrow irrigation is modernized with sprinkler and drip irrigation too) and it seems that heavy research is missing to answer this main, expensive issue, which would fall to IWMI.

Finally and maybe beyond the present capacity of IWMI although water policy is the main issue par excellence, a sociological and environmental policy analysis would allow researchers to understand the interplay of actors, including donors, local governments and NGOs, and identify drivers, locking and difficulties in setting up legitimated public actions. More generally, this analysis would cast light on the factors (and even the necessity –in such a case, many programmes fighting populism would be useless) of political populism, the prerequisites of social participation and the dysfunctions of the rules of state. One would understand alliances between actors and assess their capacities to fulfill or circumvent any evaluation criteria. Lobby analysis would detect the possibility to curb powers down. The analysis within the framework of the incipient environmental democracy would result in testing “democratic” solutions to secure and legitimate basic institutions. For example training or capacity-building would be directed less on end-users than on NGOs, donors and every decision makers. Securing the independence of research institutions, firstly international ones, promoting critical evaluations, evaluating the capacity of social leaders (in agriculture for example) to negotiate on behalf of their constituency would be undoubtedly effective solutions to stabilize a disappearing resource.

To conclude, the results of innumerable field surveys would deserve to fall to IWMI, which should have the institutional and financial means to deal the main issues about water and for which we do not have the beginning of an answer. Fundamental research is one of the key issues, which supposes independence compared to donors and international public opinion.

4. General Conclusions and Recommendations

Our conclusion is built around two theses, which remain provisional as they arise from the discussions with specialists of IWMI (in technical and social sciences) in the visited countries (India, South Africa

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and Ghana). The first thesis rests on the need to articulate research between overexploited-groundwater countries and countries which hardly initiated the use of groundwater (mainly sub-Saharan Africa, i.e. except Mediterranean countries). Indeed, the world of groundwater is bipolar with, on one side, countries in a critical situation of present or next overexploitation, like India, northern China, southern Mediterranean countries, or Mexico, and, on the other side, the sub-Saharan countries. In spite of this contrasted world, research must be integrated.

Actually more and more countries experiments critical groundwater depletions exceeding sometimes three meters per year. Water is each year more expensive to extract and its quality is degraded with dissolved salts and heavy metals. In certain cases, aquifers are about to become exhausted, but before, conflicts increases (with urban and industrial users, who have means to pump deeper) so much so that violence is trivialized in this sector (as in Mexico in 2004). In addition, the exclusion of the poorest, unable to maintain the rate of costly and risky drilling, can only lead to increasing poverty. Unfortunately this “law of the jungle” type of regulation can’t stabilize the resource because rich farmers will use extra groundwater to drill new wells. Actually, the richest producers extend irrigated surfaces, often in complete defiance of the law. Whereas the poorest has no other solution than depending on an investor to whom he buys water or to gather to continue the depth race (as in India); in the worst case they return to rainfed agriculture and emigrate. Finally, the aquifer dynamics threatens to be responsible for a substantial fall of the food production in the twenty or thirty coming years when it is exhausted.

Such a situation initially draws its origin from the subsidies in the Sixties and nowadays is maintained through low electricity tariffs - sometimes free in India. However, behind economic appearances there are the serious problems of politics. Indeed, although conscientious national administrations set up early bans to drill, governments never applied them for reasons such as electoral populism, fight against poverty and reduction in food imports. Today, two main regulation models are tested, one on the basis of users’ participation (as in Mexico) and the other one, more pragmatic, on the basis of rationing in electricity as in India. For the time being, it is difficult to make an assessment, but yet both models produced individual and collective reactions. Regulation by rights or regularly updated concessions seems ineffective and we are expecting the extinction of an essential resource for the future of humanity.

As far as countries are concerned, the challenge is to control these uncoordinated uses, promote effective water savings and try to recharge aquifers with surface or rain water. In sub-Saharan Africa, the issue is to promote a sustainable and enlightened groundwater development, not only by avoiding the other countries’ errors, but also having clear answers as the base for the strategy to pursue. Let’s mention for example the so-called micro-irrigation water savings, or the aquifers recharge techniques, two fundamental questions which, along with social regulation type research, can only find answers in critical situation countries, with the help of a fundamental research in a position to answer the major development questions. As a result, research on groundwater management cannot distinguish Africa from other countries, even if Africa is faced with specific questions.

Our second suggestion rightly relates to the importance of groundwater for the potential users in Africa. For an unquestionable conclusion, it would be necessary to answer the two following questions: on the one hand, the development weakness in Africa has not received satisfactory answers to date: lack of market, unwillingness to innovation and enterprise, anthropological and political nature of the societies? And, on the other hand the possibly less expensive option, of surface water irrigation, which could lead to privilege it first. These fundamental questions seem to completely lie beyond the national and international water research institutes which, by nature, prioritized sector-based, engineering works.

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Our recommendations, under the restrictive conditions stated above, are the following:

1. The few studies in progress on groundwater in Africa (resources, uses and suitable technologies) are to be preserved under a “technological watch research” (“veille technologique”). They make it possible to maintain and improve the capacity of expertise and knowledge in Africa, which will be able to provide more direct applications when needed. In this respect IWMI is the only institute able to carry out this type of watch research. Indeed concerned governments cannot make a priority of a resource that no clues make that groundwater would experiment a spontaneous appropriation in the next years. The richest States, like South Africa, are systematizing resource evaluation, but without aiming at research. From the current disinterest of the potential users for this type of resource (with the localized exception of urban vegetable farming for example) it thus arises that there is no rush to develop research programmes in sub-Saharan Africa in the field of resources localization as well as in regulation management or technologies to be tested. On the other hand, fundamental studies on the African capacity (cultural, social, and political) to develop markets and possibly surface water uses should be welcome. They would require a wide-ranging comparative analysis and multidisciplinary fundamental research, in which IWMI could only be an associate member in an international consortium.
2. On the other hand, the aquifer reserves crisis claims for a decisive effort of fundamental research at the international level. Knowledge will be used later for Africa, more effectively than all other studies directly led in Africa, while serving an essential objective for the future of the world food production and the fight against poverty. IWMI should plan to include in its short term- and donor-driven strategy (donors certainly well intentioned but not always inspired) a fundamental research. It is indeed curious that one continues to design water savings thanks to micro-irrigation whereas specialists, off record, doubt its interest according this goal. Are there experimental comparisons of multi-scale water balance for different irrigation techniques, including furrow and flood irrigation? We do not know, but many specialists don't. IWMI must give clear results because Nars cannot do it. It deals with heavy research (on water savings, sociopolitical regulations and aquifer recharge) that can question national lobbies, such as micro-irrigation companies. Concerning sociopolitical regulations, comparative negotiations including developed countries (as the Beauce and the Middle West aquifers) would be fruitful (some insights exist). Most probably, original research would result in thoroughly examining the bases of the rules of states and the new concepts of environmental democracy. Water is a very good indicator for environmental sociology, but it would need a clear interest at IWMI to develop such social, fundamental issues. Finally such political research complement would go beyond some obsolete ideas considering the user as an ignorant species to be educated and trained by a multitude of capacity-building programmes as much ineffective as offensive.

In this line of thinking, the European Commission would need to think about research for development, for example for groundwater issues. Would assessment need not some constructive, critical approach instead of any consensual ones? Are researchers and “developmentalists” the sole

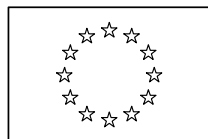
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stakeholders of a research for development? Is every discipline equally involved in solutions for development? Beyond the unequal power of the disciplines (technology and development issues being much more powerful than many social sciences, and economy being much more powerful than political sciences), how can we rank the disciplines according development uses? In groundwater, hydrogeology is probably not the main immediate need; socioeconomics would be more relevant but crop changes, as it is often stated for water saving, depend more on a set of issues; maybe political and agronomy issues would be ranked first, but of course, a debate on disciplines as on donor-imposed indicators would provide a starting point in such an important discussion for the livelihood of many users and the food production in the world.

As a conclusion, the monitoring team (with a background in agronomy and political sciences) feels that there is no immediate interest for users (agriculture, cities, environment, and industry) to develop research on groundwater management in Africa. Very recent data in Burkina-Faso suggest a possible beginning of groundwater overdraft (to be confirmed) and IWMI (annex 7) knows some localized areas experimenting depletion. According to further surveys at national levels (such as the Glowa Project), this recommendation could be changed. In South Africa, groundwater survey is carried out by the government but there are no clues of any imminent groundwater depletion. Only a watch research in order to build a local capacity is recommended in hydrology and use surveys. A much more global analysis on the economics of irrigated farming, in relation with the social drivers of development, would be useful. Then, political sciences on how to promote and regulate groundwater uses in Africa is highly desirable in connection with similar research led in other continents. Finally the agronomy of water saving technology and devices is required, but has to be led in India and other countries experimenting high depletion rates.

The monitoring team would also like to highlight the lack of relevance of many indicators usually assessed in such a monitoring exercise, as well as the role of the donors and their conditions on funding, which make impossible to promote an independent research for development, as shown in groundwater issues analyzed in this report .

Annex 1 – ToR



EUROPEAN COMMISSION

EuropeAid Cooperation Office

Horizontal operations and Innovation

Food security**TERMS OF REFERENCE****FOR MONITORING OF THE CGIAR⁴ PROJECTS****Final****CO-FUNDED BY THE EUROPEAN COMMISSION IN 2005****IN A.C.P., ASIA, LATIN AMERICA AND THE MEDITERRANEAN REGIONS****Through the “Food Security and Food Aid” Budget line****1) BACKGROUND**

Investments in agricultural research are needed in order to develop the most appropriate agricultural technologies, management strategies and policies for sustainable development. Environmentally and socially responsible increases in agricultural productivity and diversification of agriculturally based livelihood options will enable developing countries to take advantage of new opportunities offered by national, regional and world markets. The **CGIAR** established in the early Seventies, aims at contributing to food security and poverty eradication in developing countries through strategic research, research partnerships, capacity building and policy advice.

Europe has been involved in the CGIAR since its beginning in 1971 and it represents now the most important share of the overall funding (about 45% of the annual CGIAR budget of roughly 400 M€). The EC, as one of the largest EU contributor (about 22 M€ in 2004), has a vital interest to participate in the strategy formulation and agenda setting of the CGIAR, including current discussions for policy and institutional reform. In order to provide a solid basis for continued support, the elements of a strategy for EU's investments in the CGIAR have been formulated ([Annex 1](#)).

EC resources are allocated to a defined number of CGIAR projects that are generally co-funded by several donors. Budgets and work-plans are proposed by Centres, reviewed by the CGIAR Science Council, and examined / endorsed by the CGIAR Members for funding each year for the following year. Pledges are then made at the end of the calendar year at the latest with advance payments due at the beginning of the following year.

⁴ Consultative Group on International Agricultural Research

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Annual donor commitments are made against a budget on a project basis, in principle without any breakdown for each individual donor. At the end of each budget period, Centres provide detailed financial reports for each donor. The annual allocations of EC funds to specific projects may vary from one year to another, as a consequence of changing priorities in the wake of the CGIAR restructuring and reform process. However, a lot of attention is given to ensure continuity in the EC support provided to selected projects. The methodology for selecting the projects to be supported by the EC annually and the resource allocation mechanism is described in [Annex 2](#).

The detailed list of programmes / projects targeted by EC funding through the “Food Security and Food Aid” budget line in 2004 is given in [Annex 3](#). A "sample" will be subject to the present monitoring exercise.

2) OBJECTIVES

The monitoring exercise is clearly foreseen in the Financing Proposal endorsed by the EU Member States in May 2002. Its main purpose is to review the progress made by the selected projects according to their milestones (as described in the medium-term plan of the respective Centres) and to evaluate accordingly the possible need of reorienting the EC funding to these projects in the coming years.

More specifically, the experts will assess mainly, as defined below, the relevance, efficiency and effectiveness of each of the EC supported projects selected for monitoring and particularly with regard to the EC support strategy for the CGIAR and to the needs of targeted partners. The expertise has to be regarded as a monitoring exercise rather than a full project evaluation per-se. The consultants need to take a broader look than a single year time frame. In addition, since not all outputs from a particular project are necessary dependent on EC funding, it might be necessary to examine components of projects that were not directly linked to EC-funding.

For that purpose, it will be necessary to examine, among others, the following issues:

At the level of the projects:

- ⇒ Is the project designed with the participation of intended beneficiaries and in response to their specific and defined needs?
- ⇒ Does the project effectively focus on small-scale farmers' needs?
- ⇒ Is it likely to contribute to food security and rural poverty alleviation (MDG-1), other relevant MDGs (for example MDG-7) and sustainable development?
- ⇒ Will the project contribute to improving knowledge and techniques, as well as ensuring their adaptation and adoption by the NARS and target groups?
- ⇒ Are dimensions such as social, economic, local and personal producer strategies for food security and the environment taken into account?
- ⇒ Are the project objectives relevant to current ARD state of the art and does the project not replicate known research?
- ⇒ Is the team best placed to conduct research on the proposed issues?
- ⇒ Do the individual scientists or teams involved have the necessary capabilities to carry out the project?
- ⇒ Are adequate scientific, technical and social partnerships implemented?
- ⇒ Does the project promote inter-institutional co-operation with other stakeholders?
- ⇒ Can the equipment and methods to be employed in the project lead to the expected results?

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- ⇒ Are the work programme, budget, human resources and timetable, as well as management procedures, adequate to achieve the expected results of the project?
- ⇒ Are proper monitoring and evaluation systems incorporated, including farmers' perspectives?
- ⇒ In which way does the research project contribute to an (intended or ongoing) innovation process that is carried forward by private sector firms, by collective organisations in agriculture and by development agencies?
- ⇒ The monitoring exercise requires an examination of project outputs in terms of reports and technical papers. Therefore the monitoring teams should also examine the quality of such reports, along with the usefulness of the project logical framework and how well it has been used as a planning tool.

At the level of the Centres

- ⇒ How does the Centre support the project and ensure the quality control of their activities?
- ⇒ Is the support process enforced by the Centre's headquarters and/or local offices to the project, efficient and adapted to its needs?
- ⇒ How does the project contribute to the overall objectives of the Centres and to the CGIAR as a whole? How does it fit the general policy of the Centre and of the CGIAR?

During the missions in countries, a visit to some EC rural development projects or projects (co-) funded by Member States or FAO and to the local NARS will be included in order to assess the synergies among the results of the research carried out by the Centres and their adoption by the beneficiaries.

3) SELECTED PROJECTS

A sample of projects among those co-funded in 2005 by the EC through the “Food Security and Food Aid” budget line has been selected for monitoring:

- **CIAT:**
Project N° IP – 3: Improving Cassava for the Developing World
- **ILRI:**
Project N° 3: Improving Market Opportunities
- **IWMI:**
Project N° 3: Ground Water Management
- **CIP:**
Project N° 2: Genetic Resources Conservation and Characterization
- **IFPRI:**
Project N° GRP 1: Policies for Biotechnology and Genetic Resource Management
- **CIMMYT:**
Project N° 1 a: Maize and wheat genetic diversity for humanity, ex situ genetic resources
Project N° 1 b: Maize and wheat genetic diversity for humanity, in situ genetic resources
Project N° 1 d: Maize and wheat genetic diversity for humanity, breeding technologies

Annex 4 provides the main features of these projects.

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4) **METHODOLOGICAL ASPECTS**

a) **Main reference documents** to be made available by the Centres:

- ⇒ CGIAR Centres Medium Term Plans 2002-2004 / 2006-2008
- ⇒ CGIAR Centres external reviews and relevant Cross-Centre and Programme Reviews
- ⇒ CGIAR Centres reports (technical, financial, audit reports, etc.) relating to the projects.

b) **Monitoring criteria to be utilised for each selected project**

i) **Relevance:** the relevance of a project relates primarily to its design and concerns the extent to which its stated objectives correctly address the identified problems and real needs at two points in time: when the project was designed and at the time of monitoring.

- ⇒ Identification of real (as distinct from perceived) problems or needs and of the correct beneficiaries, and how well the project's initial design addressed them,
- ⇒ Complementarity and coherence with related activities undertaken elsewhere,
- ⇒ The quality of the entries in the assumptions, risks and conditions column of the of Log Frame at the appropriate levels,
- ⇒ overall design strengths and weaknesses including :
 - quality of the Log Frame ,
 - clarity and internal consistency of the stated overall objectives, purpose and results,
 - whether the objectively-verifiable indicators of achievement (OVIs) were well-chosen and widely agreed,
 - realism in choice and quantity of inputs,
 - overall degree of flexibility and adaptability to facilitate rapid responses to changes in circumstances.

ii) **Efficiency:** The efficiency criterion concerns how well the various activities transformed the available resources into the intended results (sometimes referred to as outputs), in terms of quantity, quality and timeliness. A key question it asks is "were things done right?" and thereby also addresses value-for-money, that is whether similar results could have been achieved more by other means at lower cost in the same time. The analysis of the efficiency will therefore focus on:

- ⇒ The quality of the research from various points of view :
 - scientific,
 - technical,
 - social,
 - environmental,
 - ethical,
 - financial, including possible IPR issues,
 - policy, etc
- ⇒ The quality of day-to-day management, for example in :
 - management of the budget (including whether resources allocated were utilised as planned in the project descriptions, e.g. geographical areas) ;
 - management of personnel, information, property, etc
 - whether management of risk was adequate, i.e. whether flexibility was demonstrated
 - in response to changes in circumstances ;

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- relations/co-ordination with local and national authorities, institutions, beneficiaries, other donors ;
 - respect for deadlines ;
- ⇒ costs and value-for-money : how far the costs of the project were justified by the benefits - whether or not expressed in monetary terms - that they generated , in comparison with similar projects or known alternative approaches, taking account of contextual differences ;
- ⇒ Contributions from donors: were they provided as planned, were communications good?
- ⇒ quality of internal CGIAR Centre monitoring : its existence (or not), accuracy and flexibility, and the use made of it,
- ⇒ whether the chosen indicators of efficiency were suitable and, if not, whether management amended them ;
- ⇒ did any unplanned results arise from the activities ?
- iii) **Effectiveness:** the effectiveness criterion concerns how far the project's results were used or their potential benefits were realised - in other words, whether they achieved the project purpose. The key question is what difference the project made in practice, as measured by how far the intended beneficiaries really benefited from the products or services it made available. The analysis of the effectiveness will therefore focus on :
- ⇒ whether the planned benefits have been delivered and received, as perceived mainly by the key beneficiaries,
- ⇒ the appropriateness of the indicators of benefit used in the above assessment to measure achievement of the project purpose; this should include a judgement on how promptly and effectively the Centre management reacted to any changes that occurred following the initial design by amending indicators found no longer to be appropriate ;
- ⇒ whether behavioural patterns have changed in the beneficiary organisations or groups at various levels; and how far the changed characteristics have produced the planned improvements (e.g. in productivity or ability to generate actions which lead to economic and social development) ;
- ⇒ whether any shortcomings at this level were due to a failure to take account of cross-cutting or overarching issues such as gender, environment and poverty during implementation ;
- ⇒ whether the research outputs represent added value to existing / new (sub-) regional / national initiatives and are supported by related policies / measures at these levels.
- iv) **Impact and sustainability:** these two important issues relate to the longer-term effect of the project on beneficiaries. Though difficult to fully appraise through a short-term mission, some indication should be stated on these issues.
- v) **Performance rating:** monitoring teams should include in their assessments an overall performance rating for each of the above three monitoring criteria, on the basis of the following scale :
- ⇒ highly satisfactory : fully according to plan or better ;
- ⇒ satisfactory : on balance according to plan, positive aspects outweighing negative aspects ;
- ⇒ less than satisfactory : not sufficiently according to plan, taking account of the evolving context; a few positive aspects, but outweighed by negative aspects;
- ⇒ highly unsatisfactory : seriously deficient, very few or no positive aspects).

Each rating should be stated as part of the conclusions for each of the three criteria.

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5) **REPORTING**

- c) **Reports, presentations required for each selected project** : briefing at the EC, draft report, debriefing / presentations to the EC, final report
- d) **Language** : English
- e) **Date of delivery** : draft report within 15 days after the mission, final report within 10 days after reception of the comments from the EC (due 30 days after reception of the draft report)
- f) **Number of copies required** : 5 copies of the draft reports and 10 copies of the final reports
- g) **The main text** of a monitoring report should not exceed 20 pages, plus Annexes, plus an Executive Summary of no more than 2 pages with fully cross-referenced findings and recommendations.
- h) **The main sections** of the monitoring report for each selected project will be as follows :

1- Executive Summary: a tightly drafted, to the point and free-standing Executive Summary is an essential component. It should be short, no more than two pages. It should focus mainly on the key purpose or issues of the monitoring, outline the main analytical points, and clearly indicate the main conclusions, lessons learned and specific recommendations. Cross-references should be made to the corresponding page or paragraph numbers in the main text that follows. See format in [annex 5](#)

2- Main text: the main text should start with an introduction describing, first, the project to be monitored and, second, the monitoring objectives. The body or core of the report should follow the three monitoring criteria mentioned above, describing the facts and interpreting or analysing them in accordance with the key questions pertinent to each criterion.

3- Conclusions and recommendations: these should be the subject of a separate final chapter. Wherever possible, for each key conclusion there should be a corresponding recommendation. The key points of the conclusions will vary in nature but will often cover aspects of the key monitoring criteria (including performance ratings - see above), that is :

- ⇒ *Relevance* : whether the design of the project was originally, and still is, sound as regards targeting the real needs and problems of the right beneficiaries;
- ⇒ *Efficiency* : whether the same results could have been achieved at lower costs; or whether there might have been different, more appropriate ways of achieving the same results;
- ⇒ *Effectiveness* : whether the planned benefits were in fact received, whether the beneficiaries' behavioural patterns changed, whether neglect of cross-cutting issues affected the achievement of the project purpose;

Recommendations should be as realistic, operational and pragmatic as possible; that is, they should take careful account of the circumstances currently prevailing in the context of the project, and of the resources available to implement them. They could concern policy, organisational and operational aspects.

4- Annexes: the report should include the following annexes:

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- ⇒ The Terms of Reference of the monitoring
- ⇒ The names of the evaluators and their companies (CVs should be shown, but summarised and limited to one page per person)
- ⇒ Map of project area implementation,
- ⇒ Calendar of visit and list of persons/organisations consulted
- ⇒ Literature and documentation consulted
- ⇒ Other technical annexes (e.g. statistical analyses)
- ⇒ 1-page DAC summary, following the format incorporated in the contract and annexed to this document (see [Annex 6](#) attached).

The draft report will be proposed for comments to the relevant Centre by each team of monitors before the debriefing in Brussels. The possible comments will be included in the draft report if appropriate under the responsibility of the monitors. The responses of the Centres should be attached to the reports as an annex.

The final reports will be published and posted as appropriate on the Web.

If necessary, an additional confidential report may be submitted to the EC for its consideration.

6) EXPERTISE REQUIRED AND CONTRACTOR'S REQUIREMENTS

6.1. for all Centres

The contractor will have to provide, for each selected project, two high level experts:

- One specialised on the scientific area of the project
- One specialised on the assessment of economic and social impact of agricultural research projects

In addition, one of the two experts should have knowledge on environmental issues.

Criteria for selecting experts are:

- Strong experience in monitoring and evaluation of ARD projects
- Strong background in the socio-economic approaches for assessing the impacts of ARD projects
- Significant background in management of scientific projects
- Significant experience in environmental issues.
- Good knowledge of the CGIAR system, without any current commitment in Centres management (e.g. Board member) or projects

For each project to be monitored, a short-term mission is foreseen, combining:

- a visit to the CGIAR Centre in charge of its implementation and
- a field visit to a characteristic component of the project on the following basis (location to be proposed by the Contractor):
 - Outside the country of location of the Centre's headquarters,
 - Preferably in one of the priority countries of intervention of the "Food Security / Food aid" budget line, or
 - Possibly in a country where significant EC funded rural development projects, or projects (co-) funded by Member States or FAO, related to the CGIAR visited project theme, are implemented.

In each country, a visit to the EC Delegations, to the local NARS and when relevant to the above mentioned development projects will be included during the missions.

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6.2. other considerations

The contractor will submit up to four Curriculum Vitae for each required expert, ranked by order of preference, for a final choice by the European Commission.

Experts will have debriefing meetings at the European Commission in Brussels, before and after their mission.

The contractor is invited to send to the European Commission a technical and a financial offer. The total amount for the monitoring of the selected projects should not exceed €300,000.

The contractor will have to complete the work, i.e. to send the final reports to the EC, within a six-month period after signature of the contract.

Annex 1:	European Commission and the CGIAR: Strategy pointers
Annex 2:	Implementing the Commission's strategy for the CGIAR
Annex 3:	Listing of EU supported CGIAR projects through the “Food Security” Budget line in 2005
Annex 4:	Main features of projects selected for monitoring
Annex 5:	Executive Summary format
Annex 6:	DAC Summary format.

Annex 2 – Names of evaluators and their companies (CVs limited to one page)

Eric Mollard

Institut de Recherche pour le Développement (IRD)
Centre de Montpellier Parc Scientifique 2
911, avenue Agropolis
BP 64501
F-34394 Montpellier cedex 5
France

Office: (33 or 0) 467 63 69 64

Fax: (33 or 0) 467 63 87 78

Eric.Mollard@ird.fr

IRD web site: <http://www.mpl.ird.fr>

Personal web site: http://irdal.ird.fr/article.php3?id_article=1229

Born: November 27th 1957 (49 year old)

French

Current Position

Researcher at the French Research Institute for Development (IRD): 1980-2006

Current research in Environmental Sociology in the IRD Research Unit: Environmental Dynamics.

Experience

2002-2006: Project leader of the International Research Team on “Efficiency of Social Participation in Water Management in Mexico”.

1994-1997: Project leader of the Thai-French Research Team: “Development-Oriented Research on Irrigated Systems in Thailand”.

1987-1991: Researcher in the Mexican-French Team on “The Peripheral Agricultures in Mexico: rain-fed food and cash crop farming, migration and poverty”

1983-1985: Researcher in the Cassava European Program in Ivory Coast on: Functions, Practices and Yields of a Food Crop in Lower Ivory Coast.

1981-1982: Expert in Agricultural Planning at the Ministry of Agriculture in Quito, Ecuador

Education

Ph.D. at the National Agronomy Institute Paris-Grignon with specialization in Agronomy and Development, 1992 (Chair: Prof. Michel Sébillotte)

Visiting scholar at the Department « Agricultural Systems and Development » in the National Institute for Agronomic Research (INRA-Toulouse), 1981

M.Sc. National Superior School of Agronomy and Food Sciences in Nancy (France), Agronomist, 1980

Pierre TODOROFF

Researcher and project manager in crop growth modeling, GIS, Remote sensing
 Centre de Coopération Internationale en Recherche Agronomique pour le Développement – CIRAD
 Station de Roujol, 97170 Petit-Bourg, Guadeloupe, FWI – France
 Tel: +590 590 94 88 98 Email: pierre.todoroff@cirad.fr

Born: 7th September, 1969

Expertise *☞ agronomy and applied mathematics*

- Physics, electromagnetism applied to soil metrology (Time domain reflectometry for soil water content measurements)
- applied mathematics for modeling (optimization of non linear systems, inverse modeling), spatial statistics, scientific computing
- Metrology applied to soil science
- Water management
- Ecophysiology (crop growth modeling)
- Geographic information systems and remote sensing

☞ Project cycle management

Education Ph.D. in Physics and Agronomy, University of Reunion Island (1998)
 Ing.. in Agronomy, Ecole Nationale Supérieure Agronomique de Montpellier (1993)

Experience

Since 2000 Researcher and manager of the Sugarcane Crop Modeling Unit of the Guadeloupe (FWI) CIRAD Centre.

- Adaptation and validation of a sugarcane crop model.
- Development of agricultural applications (yield forecast, irrigation scheduling ...).
- Setting-up and management of an agro-meteorological database and a weather stations network
- Web mapping access to decision support tools based on crop modeling, geographic information systems and remote sensing data
- Project management in relation with local agricultural policy (tuning of the projects with users and political representatives to meet the local needs)

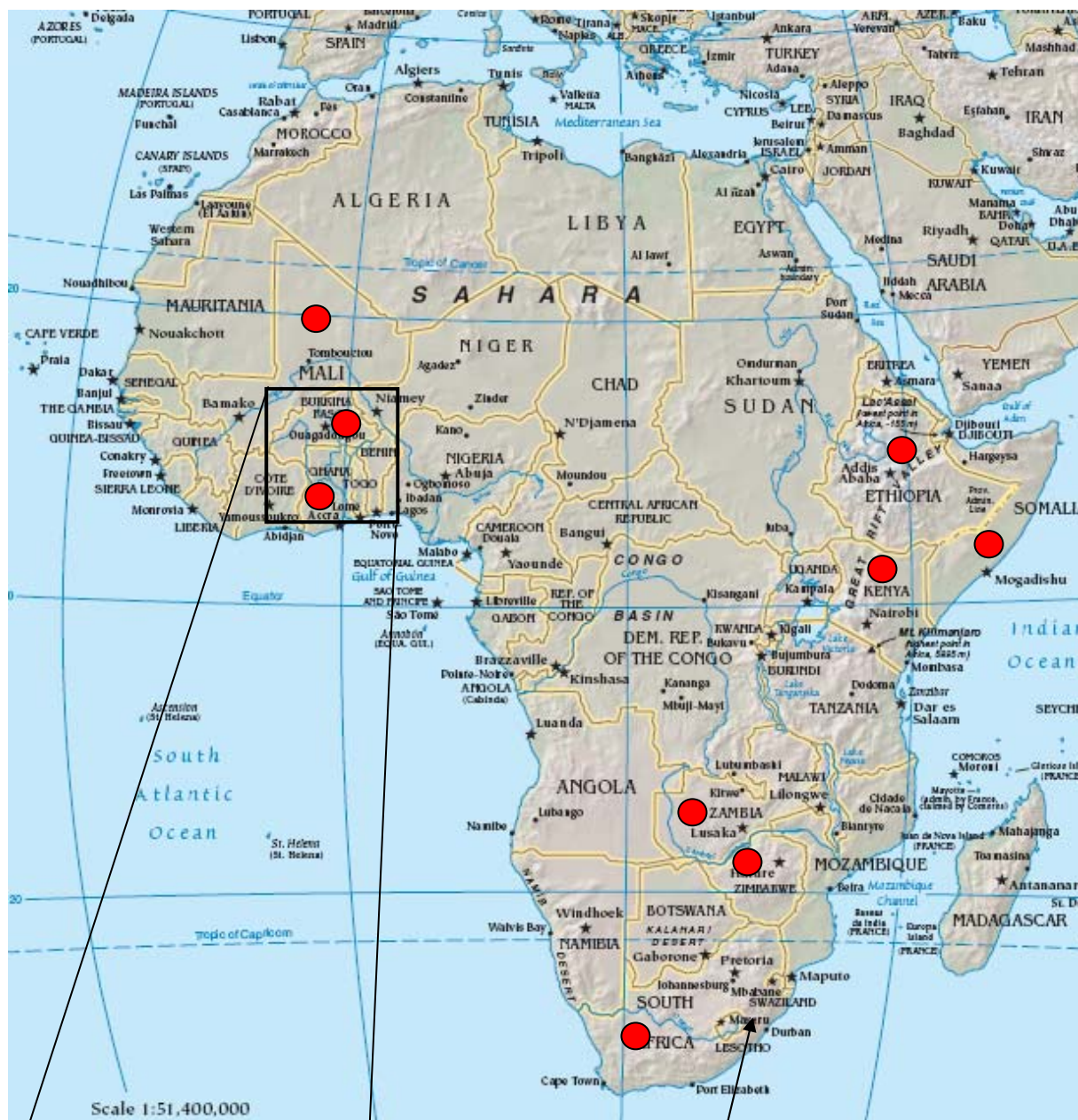
1995-1999 Doctoral and post-doctorate scientist, Reunion Island and France.
 Microwave propagation and soil water content profile modeling using time domain reflectometry (TDR).

1994-1995 Researcher and manager of the soil restoration and water saving unit of the ISRA (Institut Sénégalais de Recherches Agricoles), Senegal.
 Hydrodynamic characterization of crusted sahelian soils.

Other

- Expert: sugarcane harvest commission (Guadeloupe) - yields forecasts every year ; expert for the drought evaluation commission (Guadeloupe) in 2001 and 2003 : evaluation of agricultural production losses, support for the government to fix the compensation amounts.
- Reviewer for “Measurement Science and Technology” Journal (Institute of Physics Publishing-UK) since 2002 as expert in microwave time domain measurements (3 articles in the special issue on microwave moisture measurements, 2006).

Annex 3 – Maps of projects area implementations



● Country studied in the Agricultural Groundwater Availability and Use in Sub Saharan Africa review

Smallholder System Innovations in Integrated Watershed Management (SSI project)

Map of the Volta Basin - GLOWA Project

Annex 4 – Calendar of visits and organizations/persons met

1. Calendar of visits

IWMI Headquarters, Colombo, Sri Lanka

Date	Agenda	Topic
04 Feb 2007, Sun	Travel to Colombo	
5 Feb 2007, Mon Morning	Meredith Giordano – Research Director Frank Rijsberman – Director General Hugh Turrall - Theme Leader Basin Water Management Mark Giordano – Head, Institution & Policies	Introductory briefing Introductory briefing Overview of Theme 1 Groundwater Research Groundwater Synthesis Book and Africa Groundwater Survey
Afternoon	Tushaar Shah – Principal Researcher, Groundwater Management Chris Panabokke – Consultant	Evolution of groundwater research at IWMI and recent synthesis work Groundwater research in Sri Lanka
6 Feb 2007, Mon Morning	Karen Villholth – Senior Researcher Deborah Bossio - Theme Leader Land, Water and Livelihoods & Research Director	CPWF Groundwater Governance project and Post-Tsunami Groundwater work Overview of Theme 2 Groundwater Research
Afternoon	Luna Bharati, Researcher - Hydrology and Water Resources Sanjini de Silva – Acting Head, IKG & Nadia Manning – Communications Coordinator/Researcher	IWMI Groundwater research in West Africa KS in Research Project and linkages with Bright Spots work in Central Asia
7 Feb 2007, Mon Morning	Frank Rijsberman – Director General Meredith Giordano – Research Director Deborah Bossio - Theme Leader Land, Water and Livelihoods & Research Director	Synthesis Bright Spot project
Afternoon	Experts team at the hotel	Synthesis
8 Feb 2007, Mon	Travel back to Paris	

IWMI, Anand Field Office, IWMI-Tata Program, India

Date	Agenda	Topic
10 April 2007, Tue	Travel to Ahmadabad	
11 April 2007, Wed	Travel to Palanpur	
12 April 2007, Thu	Field visit	Individual Farmer, owner of Tubewells
Morning		
Afternoon	Field visit	Water Users Association
13 April 2007, Fri	Field visit	Canal Irrigation
Morning		
Afternoon	Travel Back to Anand	Discussion with Dr. Shah
14 April 2007, Sat	Travel to South Africa	

IWMI, Sub Regional Office, Pretoria, South Africa

Date	Agenda	Topic
15 April 2007, Sun	Travel to Bergville	
16 April 2007, Mon	Field visit	SSI Project
Morning		
Afternoon	Travel back to Pretoria	
17 April 2007, Tue	Hilmy Sally - Head of IWMI South Africa DWAF	Introductory meeting Hydrological resources
Morning		
Afternoon	Jean-Marie Fritsch	IRD research
	Sylvie Morardet - Sen. Res. Economist	Wetlands
	Christian Cheron - Sen. Researcher	Water multiple uses
	Barbara Van Koppen	Water social issues
18 April 2007, Wed	WRC - Water Research Commission	Water research incentives
Morning		
Afternoon	Hilmy Sally - Head of IWMI South Africa Travel to Accra	De-briefing

IWMI, Regional Office for Africa, Accra, Ghana

Date	Agenda	Topic
19 April 2007, Thu	Boubacar Barry - Senior Researcher S. Dapaah-Siakwan - Water Research Institute	The GLOWA Project
Morning		
Afternoon	Field visit	Peri-urban agriculture
20 April 2007, Fri	George Danso - economist	Overview of water economical issues in agriculture
Morning	Anne Chaponnière	poverty alleviation with ground water
Afternoon	Boubacar Barry - Senior Researcher	Review of Water Resources and uses in Sub-Saharan Africa
21 April 2007, Sat	Experts team at the hotel	Synthesis
Morning		
Afternoon	Travel back to Paris	

2. Persons consulted

Thanks to all the management team, especially Frank Rijsberman and Meredith Giordano for their collaboration and helpful hand for the mission arrangements
Special thanks to Drs Tushaar Shah, Mutsa Masiyandima and Boubacar Barry, who spent so much time and shared their knowledge during the field visits.

Location	Name	Position
IWMI HQ, Colombo	Frank Rijsberman	Director General
IWMI HQ, Colombo	Meredith Giordano	Research Director
IWMI HQ, Colombo	Mark Giordano	Head, Institution & Policies
IWMI HQ, Colombo	Tushaar Shah	Principal Researcher, Groundwater Management
IWMI HQ, Colombo	Chris Panabokke	Consultant
IWMI HQ, Colombo	Karen Villholth	Senior Researcher
IWMI HQ, Colombo	Deborah Bossio	Theme Leader Land, Water and Livelihoods & Research Director
IWMI HQ, Colombo	Luna Bharati	Researcher - Hydrology and Water Resources
IWMI HQ, Colombo	Sanjini de Silva	Acting Head, IKG
IWMI HQ, Colombo	Nadia Manning	Communications Coordinator/Researcher
IWMI Anand	Tushaar Shah	Principal Researcher, Groundwater Management
IWMI Anand	Dinesh Kumar	ITP Program Leader
IWMI Anand	Amit Kumar Patel	Program Associate
IWMI Anand	Nitin Bassi	Consultant
IWMI Anand	P Reghu	Executive Assistant
IWMI Pretoria	Hilmy Sally	Head
IWMI Pretoria	Mutsa Masiyandima	Researcher, Hydrologist
IWMI Pretoria	Sylvie Morardet	Senior Researcher, Economist
IWMI Pretoria	Barbara Van Koppen	Principal Researcher on Water, Poverty, Gender
IWMI Pretoria	Thulani Magagula	Research Officer, Hydrologist, GIS, RS
IWMI Pretoria	Christian Cheron	Senior Researcher
IRD Pretoria	Jean-Marie Fritsch	IRD representative
DWAF- Dept. of Water Affairs and Forestry (Pretoria)	Eddy Van Wyk	Ground Water Specialist
DWAF- Dept. of Water Affairs and Forestry (Pretoria)	Zaccharia Mswuma	Director of Hydrological Services
WRC - Water Research Commission (Pretoria)	Shafick Adams	Research Manager
IWMI Accra	Akiça Bahri	Director Africa
IWMI Accra	Boubacar Barry	Agricultural Researcher
IWMI Accra	George Danso	Economist

Annex 5 – Literature and documentation consulted

IWMI literature

IWMI, Medium Term Plan 2006-2008

IWMI Annual Report 2004-2005

IWMI Strategic Plan 2004-2008

Burke J. and al. 2004. Centre Commissioned External Review of the IWMI-Tata Water Policy Research Program. Working Paper 94 IWMI-Future Harvest

Easter W. and al. 2006. Report of the third external program and management review of IWMI. CGIAR-Science Council.

IWMI Response to the Third External Program and Management Review (EPMR) of the IWMI, 9pp. IWMI, 2005 European Union Technical Report, 22 pp.

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Bhatt Y., Bossio D. and al. 2006. Smallholder System Innovations (SSI) in Integrated Watershed Management. SSI Working Paper 109. IWMI-Future Harvest; 59 p.

Eran Feitelson. Impediments to the management of shared aquifers: A political economy perspective. Hydrogeology Journal Volume 14, Number 3 / March, 2006. Social and Economic Aspects of Groundwater Governance

Alberto Garrido, Pedro Martínez-Santos and M. Ramón Llamas. Groundwater irrigation and its implications for water policy in semiarid countries: the Spanish experience. Hydrogeology Journal Volume 14, Number 3 / March, 2006. Social and Economic Aspects of Groundwater Governance

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Annex 6 – Use of EC funds by IWMI

Region	Project	Expenses US\$	Africa US\$	Asia US\$	Central Asia US\$
Africa	IWMI-TATA Program (ITP) Synthesis & Irrigation Reform Study - Africa	53 117	53 117		
Asia	ITP Synthesis & Irrigation Reform Study - Asia	40 000		40 000	
Asia	IWMI Tata Water Policy Program	51 747		51 747	
Central Asia	Research Support Costs	26 605			26 605
Central Asia	Bright Spots	39 833			39 833
Central Asia	Water Productivity in C. Asia (Syr Darya)	11 725			11 725
Central Asia	Livelihoods Water Mgt. Ferghana Valley	20 143			20 143
Central Asia	CAC Rehabilitation of Saline Soils (Knowledge Sharing in FV)	20 000			20 000
	Sub-Total Ground Water Research (EU funded)	263 170	53 117	91 747	118 306

Allocation of EC funds to Groundwater Management sub-projects: Africa, Asia and Central Asia

Annex 7 DAC Summary

THE STANDARD DAC FORMAT FOR EVALUATION REPORT SUMMARIES ¹

Evaluation title (+ evaluation reference)

Monitoring of the CGIAR projects co-funded by the European Commission in 2005 in ACP., Asia, Latin America and the Mediterranean regions through the “Food Security and Food Aid” Budget line.

Project n° 3: Ground Water Management - IWMI

Subject of the evaluation

Assessment of the relevance, efficiency, and effectiveness of IWMI Projects on Ground Water Management with regard to the EC support strategy to the CGIAR and to the needs of NARS partners.

Evaluation description

Purpose

The main purpose of the monitoring exercise is to review the progress made by the different projects carried out by IWMI since 2004. Actually the EC funds in 2005 on these projects may be considered as seed money. The second purpose of this monitoring is to evaluate accordingly the opportunities for the EC to orient its financial support to IWMI for ground water management research in Sub-Saharan Africa

Methodology

This project was monitored by a 2-person EC-independent team through discussions with research and development projects leaders and with scientists during visits to IWMI centres (Headquarters and Global Research Division - Colombo-Sri Lanka, IWMI Regional Office for Africa - Accra-Ghana, Sub Regional Office for Southern Africa - Pretoria-South Africa, and Field Office for the IWMI TATA Water Policy Program - Anand-India), discussions with NARS scientists and water users, and literature analysis.

Main findings

Our conclusion is built around two thesis, which remain provisional as they arise from the discussions with specialists of IWMI (in technical and social sciences) in the visited countries (India, South Africa and Ghana). The first thesis rests on the need to articulate research between overexploited-groundwater countries and countries which hardly initiated the use of groundwater (mainly sub-Saharan Africa, i.e. except Mediterranean countries). Indeed, the world of groundwater is bipolar with, on one side, countries in a critical situation of present or next overexploitation, like India, northern China, southern Mediterranean countries, or Mexico, and, on the other side, the sub-Saharan countries. In spite of this contrasted world, research must be integrated.

Actually more and more countries experiments critical groundwater depletions exceeding sometimes three meters per year. Water is each year more expensive to extract and its quality is degraded with dissolved salts and heavy metals. In certain cases, aquifers are about to become exhausted, but before, conflicts increases (with urban and industrial users, who have means to pump deeper) so much so that violence is trivialized in this sector (as in Mexico in 2004). In addition, the exclusion of the poorest, unable to maintain the rate of costly and risky drilling, can only lead to increasing poverty. Unfortunately this “law of the jungle” type of regulation can’t stabilize the resource because rich farmers will use extra groundwater to drill new wells. Actually, the richest producers extend irrigated surfaces, often in complete defiance of the law. Whereas the poorest has no other solution than depending on an investor to whom he buys water or to gather to continue the depth race (as in India); in the worst case they return to rain fed agriculture and emigrate. Finally, the aquifer dynamics threatens to be responsible for a substantial fall of the food production in the twenty or thirty coming years when it is exhausted.

Such a situation initially draws its origin from the subsidies in the Sixties and nowadays is maintained through low electricity tariffs - sometimes free in India. However, behind economic appearances there are the serious problems of politics. Indeed, although conscientious national administrations set up early bans to drill, governments never applied them for reasons such as electoral populism, fight against poverty and reduction in food imports. Today, two main regulation models are tested, one on the basis of users’ participation (as in Mexico) and the other one, more pragmatic, on the basis of rationing in electricity as in India. For the time being,

it is difficult to make an assessment, but yet both models produced individual and collective reactions. Regulation by rights or regularly updated concessions seems ineffective and we are expecting the extinction of an essential resource for the future of humanity.

As far as countries are concerned, the challenge is to control these uncoordinated uses, promote effective water savings and try to recharge aquifers with surface or rain water. In sub-Saharan Africa, the issue is to promote a sustainable and enlightened groundwater development, not only by avoiding the other countries' errors, but also having clear answers as the base for the strategy to pursue. Let's mention for example the so-called micro-irrigation water savings, or the aquifers recharge techniques, two fundamental questions which, along with social regulation type research, can only find answers in critical situation countries, with the help of a fundamental research in a position to answer the major development questions. As a result, research on groundwater management could not distinguishing Africa from other countries, even if Africa is faced with specific questions.

Our second suggestion rightly relates to the importance of groundwater for the potential users in Africa. For an unquestionable conclusion, it would be necessary to answer the two following questions: on the one hand, the development weakness in Africa has not received satisfactory answers to date: lack of market, unwillingness to innovation and enterprise, anthropological and political nature of the societies? And, on the other hand the possibly less expensive option, of surface water irrigation, which could lead to privilege it first. These fundamental questions seem to completely lie beyond the national and international water research institutes which, by nature, prioritized sector-based, engineering works.

Recommendations

Our recommendations, under the restrictive conditions stated higher, are the following:

1. The few studies in progress on groundwater (resources, uses and suitable technologies) are to be preserved under a "technological watch research" ("veille technologique"). They make it possible to maintain and improve the capacity of expertise and knowledge in Africa, which will be able to provide more direct applications when needed. In this respect IWMI is the only institute able to carry out this type of watch research. Indeed concerned governments cannot make a priority of a resource that no clues make that groundwater would experiment a spontaneous appropriation in the next years. The richest States, like South Africa, are systematizing resource evaluation, but without aiming at research. From the current disinterest of the potential users for this type of resource (with the localized exception of urban vegetable farming for example) it thus arises that there is no rush to develop research programmes in sub-Saharan Africa in the field of resources localization as well as in regulation management or technologies to be tested. On the other hand, fundamental studies on the African capacity (cultural, social, and political) to develop markets and possibly surface water uses should be welcome. They would require a wide-ranging comparative analysis and multidisciplinary fundamental research, in which IWMI could only be an associate member in an international consortium.

On the other hand, the aquifer reserves crisis claims for a decisive effort of fundamental research at the international level. Knowledge will be used later for Africa, more effectively than all other studies directly led in Africa, while serving an essential objective for the future of the world food production and the fight against poverty. IWMI should plan to include in its short term- and donor-driven strategy (donors certainly well intentioned but not always inspired) a fundamental research. It is indeed curious that one continues to design water savings thanks to micro-irrigation whereas specialists, off record, doubt its interest according to this goal. Are there experimental comparisons of multi-scale water balance for different irrigation techniques, including furrow and flood irrigation? We do not know, but many specialists don't. IWMI must give clear results because Nars cannot do it. It deals with heavy research (on water savings, sociopolitical regulations and aquifer recharge) that can question national lobbies, such as micro-irrigation companies. Concerning sociopolitical regulations, comparative negotiations including developed countries (as the Beauce and the Middle West aquifers) would be fruitful (some insights exist). Most probably, original research would result in thoroughly examining the bases of the rules of states and the new concepts of environmental democracy. Water is a very good indicator for environmental sociology, but it would need a clear interest at IWMI to develop such social, fundamental issues. Finally such political research

complement would go beyond some obsolete ideas considering the user as an ignorant species to be educated and trained by a multitude of capacity-building programmes as much ineffective as offensive.

Feedback

To be completed by AIDCO/H/6

Donor: European Commission		Region²:	DAC sector³:
Evaluation type⁴: Monitoring		Date of report: ../../ ⁵	Subject of evaluation⁶:
Language: English		N° volume / pages⁷:	Authors:
Programme and budget line concerned⁸:			
Type of evaluation: intermediate			
Timing	Start:		Completion:
Contact person⁹:		Authors:	
Cost¹⁰ :		Steering group	

(5 lines max)

Annex 8 IWMI's Feedback

IWMI Response to the European Commission Monitoring Report of CGIAR Projects Co-Funded by the European Commission in 2005

IWMI appreciates the careful and in-depth evaluation carried out by Drs. Mollard and Todoroff of IWMI's groundwater management program. IWMI is pleased with the review team's overall positive assessment of IWMI's research in this area and appreciates the constructive suggestions for further strengthening its groundwater management research program. We provide below IWMI's response to each of the recommendations provided by the review team in their report to the European Commission.

3.3.1 Recommendations linked to project design and implementation

- **Interdisciplinary approaches have to be improved with a clear log frame to precise the role of everybody and the gaps to be bridged. Systematically involve sociology-economy-hydrology and precise the needs and the weight for each.**
- **Develop cross-cutting researches and involve «seniors», whether researcher or citizen, to promote a more global, classified vision of groundwater issues. Political sciences seem to be developed and even to take the lead.**

Agreed. IWMI has recently constituted two Task Forces on Institutions and Policies and Gender and Poverty to review the extent to which IWMI's social science research is currently integrated across its project portfolio and to provide recommendations to further enhance and ensure the multidisciplinary nature of IWMI's research program. With reference to political science needs in particular, IWMI is in the process of recruiting a specialist in political ecology which will serve as a first step in addressing this disciplinary gap at IWMI.

3.3.2 Recommendations linked to Institutional Matters

- **Solve the contradictions between development and specialized, basic research, which is one of the main limitations to take into account the reality of groundwater management and development.**
- **Scientific literature is uneven and sometimes seems to result from the needs of diffusion imposed by IWMI and/or donors.**
- **The place of water in development has to be defined to promote clear linkages between IWMI and other CGIAR's centres.**

Agreed. IWMI has spent much effort in the development of (public good) water-related databases, the development of Remote Sensing and GIS methods to deal with water data-sparse environments, and the development and use of hydrologic and water resources models to enable us to conduct more basic, analytical research. This is an ongoing process but we believe we now have a stronger foundation to carry out this type of research.

Complementing this internal effort, IWMI is also working to establish stronger partnership links with other CGIAR Centers as well as with NARES and NGO partners. IWMI has already established strong partnership links with CGIAR partners in other fields of research, and will endeavor to build those same links with regard to groundwater research as well. In terms of NGO and NARES partners, IWMI is working to more clearly delineate the roles of itself vis-à-vis development and extension organizations and is placing greater emphasis on partnerships with NGOS and NARES to facilitate greater uptake of IWMI research results.

3.3.3 Overall recommendation on future support by the European Commission

	Yes / no	Comment
Suspension	Yes	It seems that there is no immediate interest for users (agriculture, cities, environment, and industry) to develop research on groundwater management in Africa. Very recent data in Burkina-Faso suggest a possible beginning of groundwater overdraft (to be confirmed). According to the results of the Glowa Project, recommendation could be changed. In South Africa, groundwater survey is carried out by the government but there are no clues of any imminent groundwater depletion.
Continuation	Yes	Unlike sub-Saharan Africa, critical groundwater depletion in North Africa, Asia and Latin-America urgently requires basic research on institutional regulation, economic development and irrigation agronomy, and in some cases, a better understanding and assessment of groundwater resources to assess the effort to be done in order to stabilize aquifers. Such basic research would be useful for Africa in the future.

As noted by the review panel, IWMI's groundwater research in Sub-Saharan Africa (SSA) is at a nascent stage and has been primarily exploratory, with an emphasis on quantifying the contributions of groundwater to agriculture. The review panel rightly indicates that groundwater management in Africa is in a very different phase of development than in Asia, where overdraft is a critical, key issue in many sub-regions (e.g., in India and the North China Plain). That said, localized issues with groundwater are emerging in SSA, and while we agree that the bulk of IWMI's efforts on this topic should continue to be in Asia, we do consider that further development of our groundwater related program in SSA is important given the increasing emphasis on developing this resource, the localized issues mentioned above, and, especially given IWMI's comparative advantage in drawing lessons from Asia for the future management of the resource in SSA.