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WATER INSTITUTIONAL REFORMS AND THE MDGs: TOWARDS AN EVALUATION FRAMEWORK†,‡

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ABSTRACT

Considering the pathways of impacts of the water sector on the Millennium Development Goals (MDGs) and mapping the water-related and other institutions underlying each of these pathways, this paper aims to develop the conceptual basis and an analytical framework for evaluating the existence and effectiveness of the necessary institutional conditions for achieving the MDGs in the specific context of the water sector. Although the framework aims to evaluate the structure and change in water institutions in the context of the MDGs, it also incorporates other institutional aspects partly for their indirect effects on the performance of both water institutions and the water sector and partly for their direct effects on the MDGs themselves. Despite its theoretical and analytical orientation, the paper also discusses the challenges involved in the empirical applicability of the framework and indicates options for overcoming these challenges through a judicious choice of evaluation context, level of analysis, and institutional aspects. Copyright © 2007 John Wiley & Sons, Ltd.

KEY WORDS: general institutions; institutional ecology; institutional evaluation; millennium development goals; water institutions

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RÉSUMÉ

En considérant les voies empruntées par les effets qu'a le secteur de l'eau sur les Objectifs de Développement du Millénaire (ODMs), et en mettant en évidence les institutions traitant de l'eau et celles qui sous-tendent chacune de ces voies, cet article vise à développer une base conceptuelle et un cadre analytique pour évaluer l'existence et l'efficacité des conditions institutionnelles nécessaires à l'atteinte des ODMs dans le contexte spécifique du secteur de l'eau. Bien que le cadre vise à évaluer la structure et les évolutions des institutions de l'eau dans le contexte des ODMs, il incorpore également d'autres aspects institutionnels, en partie pour leurs effets indirects sur les performances des institutions et du secteur de l'eau en général, et en partie pour leurs effets directs sur les ODMs eux-mêmes. En dépit de son orientation théorique et analytique, l'article présente également les défis impliqués dans l'applicabilité empirique du nouveau cadre proposé et indique des options pour surmonter ces défis par un choix judicieux de contexte d'évaluation, de niveau d'analyse, et d'aspects institutionnels. Copyright © 2007 John Wiley & Sons, Ltd.

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MOTS CLÉS: institutions générales; écologie institutionnelle; évaluation institutionnelle; Objectifs de Développement du Millénaire; institutions traitant de l'eau

INTRODUCTION

Water is becoming scarce worldwide both in terms of its quantity and quality. Such scarcity is particularly serious for developing countries in Africa, Asia, and the Pacific with the largest share of global population, irrigated area, people in poverty, and those lacking basic water supply and sanitation services. Realizing the need to address these development challenges within a time-bound and targeted framework, the UN General Assembly in its Millennium meeting in 2000 established the Millennium Development Goals (MDGs) with a clear mandate for achieving these goals by 2015. MDGs are now commonly accepted as a framework for measuring progress in reducing poverty and hunger, and in improving gender equity, literacy, mortality, and environmental sustainability. Ever since the establishment of the target for the MDGs, international organizations, donor agencies, and policy-makers have been exploring ways to achieve the MDG targets from different disciplinary angles and regional perspectives.

In view of its central role in providing food, income, livelihood, and amenity benefits, water has a major bearing – either directly or indirectly – on most of the MDGs. While water has both broad-based and deep-rooted roles in the specific context of the MDGs, such roles cannot be expected to be automatic unless effective, market-sensitive, and pro-poor institutional arrangements are already in place (UNESCO, 2003). Certainly, achievement of the targets of the MDGs also depends on investment capacities and technical capabilities as determined by economic and human development. But the effectiveness and speed with which these resources and capabilities are used to realize the MDGs ultimately depends on the appropriateness and adequacy of not just water institutions but also the general institutions governing the economic, political, and social spheres. Institutions are the mechanisms for access to and allocation of resources, sources for the emergence of economic incentives, and conveyor systems for service design and deliveries. In view of such pervasive roles, institutions have a major part to play in the realization of various social and economic goals, including the MDGs.

In some sense, the institutional underpinnings of the MDGs – both in the specific context of the water sector as well as in the general context of all economic and social sectors – are fairly clear. But there persist many fundamental questions as to the way the institutional imperatives of MDGs are to be approached and evaluated. How to conceive and present the institutional underpinnings of MDGs so they are clearly understood by policy-makers? How to unravel both the specific as well as common institutional configurations underlying different MDGs? What is the analytical framework that can be used to evaluate how conducive the existing institutional conditions and recent changes are for realizing various MDGs in different countries? What are the general approach and the level of analysis that can be used to capture both the institutional changes at the macro/national level as well as the emerging process at the micro/sectoral level? This paper aims to provide some indicative answers to some of these conceptual, analytical, and practical questions.

OBJECTIVES AND SCOPE

The overall objective of this paper is to develop a conceptual basis and analytical framework for evaluating the institutional adequacies for realizing MDGs in the context of the water sector. The specific objectives of this paper are to: (a) conceptualize the pathways of possible impacts of the water sector on the MDGs; (b) describe the institutional ecology of the MDGs; (c) trace the set of institutional aspects underlying each of the pathways of water impacts on the MDGs; (d) outline an evaluation framework useful for evaluating the institutional adequacy for achieving the MDGs both within and across countries; and (e) conclude with key implications for policies, including possible options and strategies for promoting institutional changes needed for realizing the MDGs within the targeted timeframe. As to the scope of the paper, it deals with the institutional underpinnings of MDGs only in the particular context of the water sector. However, it takes a broader perspective of both the water sector and water institutions. For instance, the linkages that water resources have with food, income, livelihood, gender, and the environment are considered within an integrated context. Similarly, in view of their intricate linkages with land, agricultural, and environmental institutions as well as with other economic, political, and social institutions, water

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institutions are also considered in a larger context. Finally, the paper is essentially theoretical and analytical in orientation, though issues related to practical application of the analytical framework for institutional evaluation do receive sufficient attention.

PATHWAYS OF WATER IMPACTS ON THE MDGs

To begin with, let us note the way the ''water sector'' and ''water impacts'' are conceived for analysis. Broadly, the water sector is considered to cover the role of water in irrigation, water supply and sanitation, and ecosystems. A partial schema of the pathways through which water affects the MDGs through its food, income, livelihood, gender, health, and environmental impacts is presented in Figure 1. The schematic representation, though not exhaustive, does cover the most important layers and pathways of water impacts on the MDGs. Although Figure 1 is 1argely self-explanatory, a few points require highlighting in view of their institutional implications.

First, the interface between water and the MDGs operates within the general context defined by natural, demographic, socioeconomic, institutional, infrastructural, and technological factors. It is these interrelated factors that determine both the effectiveness and vigor of various layers of linkages among the factors that mediate the water impacts on the MDGs.

Second, the impacts of water on the MDGs are generated through three main, but interrelated, channels or routes, i.e. irrigation, water supply, and ecological effects/uses. Obviously, irrigation channels involve land and farming system and water supply route involves human settlements including urbanization, industrialization, and migration. On the other hand, the ecological and environmental effects involve fishing/aquaculture, forestry/local commons/ wetlands, health impact due to water-borne diseases, and more importantly, water pollution due to chemical residues and industrial effluents.

Third, whatever the impacts of water, they can be transmitted only through the three mechanisms of poverty alleviation and socioeconomic empowerment, i.e. food security/prices, alleviation programs (e.g. basic needs program, special employment schemes, and subsidized food distribution) or women empowerment schemes (e.g. micro-financing schemes) are implemented. While those owning or having access to land are the direct beneficiaries of the production/productivity impacts of irrigation, the poor groups – mostly with no access to land

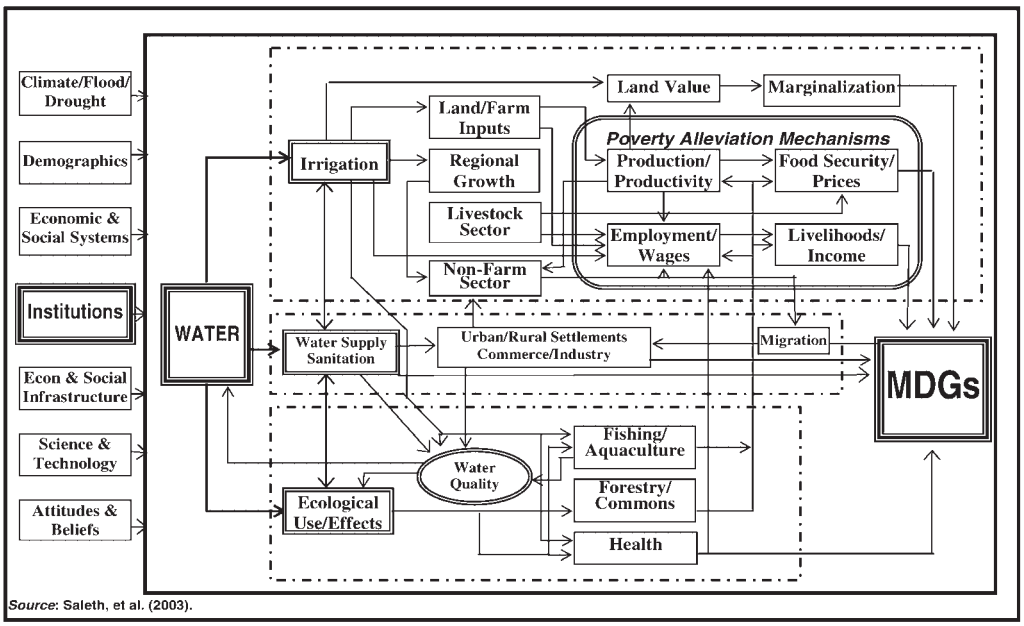

Figure 1. The context and pathways of the impacts of water resources on the MDGs

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and capital – are only indirect beneficiaries. Obviously, these indirect benefits for the poor are essentially in terms of farm and non-farm employment and lower food prices, as facilitated by agricultural productivity growth.

Fourth, Figure 1 also captures the linkages between poverty and gender. As to the nature of the linkages, we can say that they are direct in the sense that prosperity generally leads to women's empowerment and gender equity mostly contributes to poverty alleviation. Thus, positive impacts on either of the two are likely to lead similar changes on both. However, it is important to recognize that the impacts of water on poverty are more direct, immediate, and often observable (e.g. food availability, and employment and income). But those on gender are mostly laggard, implicit, or tacit making them difficult to observe or measure immediately in many situations. However, there are direct impacts such as the impact of water supply on women's time or the water-induced employment/income.

Finally, the pathways of water impacts also provide a basis for developing indicators for benchmarking and evaluating the performance of the water sector in different spheres in various national and regional contexts. Although the water sector is conceived broadly to capture the multifarious impacts of water channeled through various pathways, the evaluation has necessarily to be selective in view of some conceptual and data problems. As a result, the focus will be on the key aspects of the food, income, livelihood, and amenity impacts on the MDGs.

THE INSTITUTIONAL ECOLOGY OF THE MDGs

Behind the layers and channels through which the water sector affects the MDGs, there are specific sets of institutions. Some of these institutions are directly related to water whereas others are general institutions, ranging from the rural institutions such as land tenures and agricultural markets to social institutions such as community organizations and the caste system. In order to understand how these institutions can affect the nature and level of water impacts on the MDGs, it is necessary to unravel the specific institutions underlying various pathways of impacts with respect to each of the MDGs. This exercise can shed light on the institutional ecology of the MDGs. To facilitate such an exercise, let us explain institutions both in general and in water contexts. Consistent with the institutional economics literature (e.g. Bromley, 1989; North, 1990; Ostrom, 1990), institutions – whether they are related to water or other spheres – can be conceived as rules or rule configurations. Thus, water institutions are rules that define the action sets for both individual and collective decision-making in the realm of water resource development, allocation and use, and management. Other institutions can also be defined in a similar vein, though there are significant overlaps among specific institutions such as those related to specific resources and sectors as well as generic institutions related to the economic, political, and social spheres.

Just as the water sector forms part of larger economic systems, water institutions form part of the larger institutional system. Water institutions function within a larger context defined by specific institutions such as land, agricultural, and environmental institutions as well as general institutions such as economic, political, and social institutions. All these institutional systems, which are also interrelated, are embedded within the general environment characterized by contextual factors such as resource endowment, cultural tradition and constitution, development stage, demographic conditions, and science and technology. It is this dynamic system within which society evolves and operates. It is the same system that also enables society to achieve various socioeconomic and political goals, including the MDGs. At some cost of simplification, the institutional ecology of the MDGs in particular or any other development goals in general can be depicted as in Figure 2.

Despite an excessive level of simplification, Figure 2 is still successful in conveying a few key points crucial for understanding the potential opportunities and constraints in creating the institutional conditions necessary for achieving the MDGs. For instance, the prospects for achieving the MDGs are influenced not only by contextual factors but also by institutional factors both individually and collectively. Another point to note here relates to the fact that given the inherent linkages both within and across the general institutions and their resource or sector-specific counterparts, any change in one of them also requires concurrent changes in others. This means isolated changes, though possible, cannot bring about the desirable development effects. From the analytical perspective of this paper, although the focus here is only on the kind of water institutional changes needed to facilitate the achievement of the MDGs, due attention should be given to changes in other institutions that are

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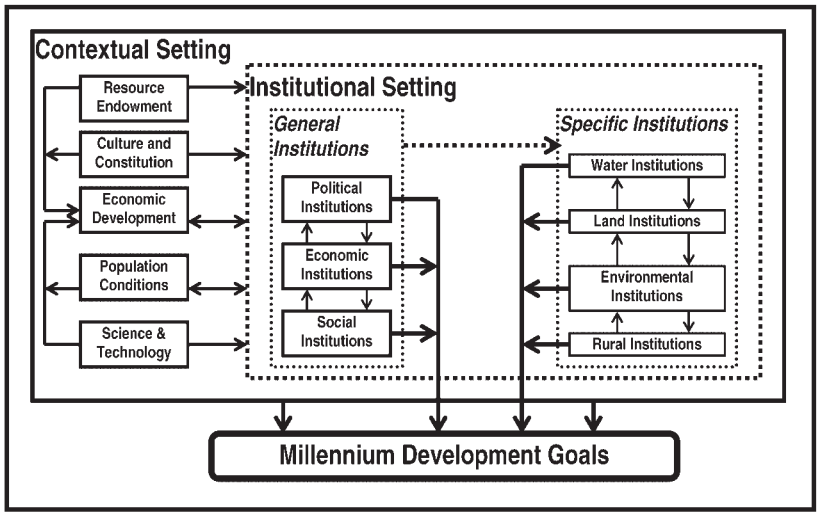

Figure 2. The institutional ecology of the Millennium Development Goals (MDGs)

directly related to MDGs (e.g. land tenure, rural credit, wage legislations, public distribution system, health insurance, family norms, and the caste system).

Figure 2 also clarifies well the strategically important distinction between the *institutional structure* (or governance structure) and its *institutional environment* (or governance framework) noted in institutional economics literature (Williamson, 1975; North, 1990). The distinction between the institutional environment and institutional structure is not fixed but varies with the level and focus of analysis. Thus, the institutional environment of water institutions, as can be seen from Figure 2, is defined by all the other institutions as well as the contextual factors taken together. On the other hand, the institutional structure of water institutions is defined by the configurations of the endogenous structure and linkages among their institutional components. However, if the focus of analysis is on land institutions, all other institutions including water institutions will form part of the institutional environment. On the other hand, when the level of analysis relates to the institutional setting as a whole, all the components of the contextual setting will form the institutional environment while the institutional structure will involve the endogenous structures as well as their linkages within all institutions.

WATER INSTITUTIONS AND THE MDGs: AN EVALUATION FRAMEWORK

Having distinguished between the institutional environment and institutional structure of water institutions, the stage is set for developing an analytical framework for evaluating the institutional adequacy within the water sector for catalyzing the achievement of the MDGs. As this framework will capture most of the key components of the endogenous structure of water institutions, it also helps to make a choice of the level and focus of evaluation that can capture the basic institutional requirements of MDGs, but will be consistent with available information. To defined the analytical framework, let us begin by noting that water institutions as rules are often formalized in terms of three interrelated aspects, i.e. legal framework, policy environment, and administrative arrangement. As a result, water institutions can be conceptualized as an entity defined interactively by its three main analytical components, i.e. water law, water policy, and water organization. Water institutions can be viewed both from a macro and formal perspective as well as from a micro and informal one. Since formal and macro institutions are more amenable to change through purposive policy initiatives as well as for comparison across national contexts, they deserve more attention from the viewpoint of institutional reform programs needed in the context of the MDGs.

While it is easy to see the institutional environment of water institutions from Figure 2, their institutional structure can be unbundled by following the procedure of institutional decomposition used by Saleth and Dinar

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(2004). Water institutions can be broadly decomposed first into configurations of legal, policy, and organizational rules. These three configurations of rules correspond to the three components of water institutions, i.e. water law, water policy, and water organizations (cf. Ostrom, 1990). Each of the institutional components can then be decomposed further to highlight some of the core institutional aspects. For instance, water law can be decomposed to highlight: (a) intergovernmental responsibility; (b) legal treatment of water sources and related resources; (c) water rights; (d) conflict resolution procedures; (e) accountability provisions; and (f) legal scope for private sector participation. Similarly, water policy can be decomposed to shed light on: (a) intersectoral priority; (b) project selection criteria; (c) water pricing and cost recovery; (d) water transfers; (e) user and private sector participation; and (f) policy linkages with other sectoral policies. Likewise, the organizational dimension of water institutions can be decomposed to focus on: (a) the relative role of government layers; (b) spatial structure; (c) budgetary position and staffing pattern; (d) autonomy; (e) enforcement/regulatory capabilities; and (f) information and technical capacities.

The aspects identified under the three components of water institutions are only a few. But they are able to capture the core aspects having dominant effects on the overall performance of water institutions as well as on various individual targets under the MDGs. In a general sense, the institutional aspects identified above can capture some of the necessary institutional requirements of the MDGs. For instance, the pro-poor nature of water governance can be evaluated in terms of water security and economic incentives (e.g. water entitlements, project selection to favor poor areas and groups, and water pricing and cost recovery). Similarly, the scope for an integrated water resource management (IWRM) approach can be evaluated in terms of favorable legal and policy conditions (e.g. legal treatment of water sources and related resources, and the focus on water quality and health effects). In the same way, the organizational capabilities can be evaluated in terms of the general features of water organizations (e.g. decentralization, managerial autonomy, financial independence, enforcement and regulation, information, and technology). Since the institutional aspects have the ability to capture the capabilities of certain broader but key dimensions of water institutions, they can be used as an analytical framework both to trace the institutional underpinnings of various MDGs as well as to evaluate the structure and changes in water institutions both within and across countries.

Having delineated the analytical framework for the evaluation of the institutional structure in the context of the water sector, let us also note that a similar framework can also be developed for the evaluation of other institutions that are equally, if not more, important for the achievement of the MDGs. In this sense, the conceptual basis of the analytical framework developed above is generalizable. Thus, the analytical frameworks, which are useful for capturing other institutions, can be developed by identifying some of their key legal, policy, and organizational components and aspects that are relevant from the perspective of various MDGs. Based on these frameworks, the existence and effectiveness of some of the necessary and sufficient conditions for the realization of the MDGs in various contexts can also be evaluated. It is also possible to create a generic framework that captures some of the key elements of both the structure and context of all institutions including water institutions. Given its focus on the relationships between water institutions and MDGs, this paper does not intend to develop such a generic framework. But it does create the basic building blocks for developing and refining such a generic framework as part of its efforts to show the institutional underpinnings of various pathways through which the impacts of the water sector are channeled to each of the MDGs.

EVALUATING THE INSTITUTIONAL ECOLOGY OF THE MDGs

This section brings together various conceptual and analytical points described in the previous sections to outline the general framework that can facilitate a better understanding and evaluation of the institutional underpinnings of various impact pathways on each of the MDGs. Some of the major pathways of impacts of the water sector on the MDGs are depicted in Figure 1. Such pathways cover the roles of water both in production, consumption, and amenity, health and ecological functions as well as in being ethical and political rallying points. The general institutional ecology of the MDGs is depicted in Figure 2. From an analytical perspective, the institutional ecology of the MDGs clearly shows that the institutional underpinnings of the MDGs, though they can be evaluated from the perspective of individual institutions, are dynamic and interlinked. The analytical framework based on institutional

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decomposition and selection described in the previous section, though it deals essentially with water institutions, also provides a basis for unbundling other institutions and identifies, thereby, some of their main components that are directly relevant for the MDGs. Exploiting this opportunity, it is possible to trace some of the major institutional aspects – both water-related and others – that are operating beneath various pathways of water impacts on each of the MDGs.

Table I shows the pathways of water impacts on each of the MDGs and their underlying water-related as well as general institutional aspects. It is important to note that although Table I lists both the water-related and general institutions beneath various pathways of water impacts, our focus here is essentially on water-related institutions.

However, we also need to consider some general institutions, as they have an effect – either direct or indirect – on both the operation of water institutions and the performance of the water sector. More importantly, many non-water-related and general institutions (some of which are not included in Table I) are also important for their direct impact on each of the MDGs. Although Table I does not exhaustively list all water-related and general institutions relevant for the MDGs, it still succeeds in identifying a rich set of water-related and general institutions as well as in providing a framework for adding pertinent institutions.

Despite its elaborate nature and heavy information demand, the analytical framework described in Table I is very pertinent for the following reasons. First, it clarifies the specific institutions underlying various pathways of water impact – some of them affect more than one MDG while others affect specific MDGs. Second, it is also logically easier to start with more specifics and details and then move to selection and generalization rather than the other way around. Third, it is always possible to identify certain common and cross-cutting institutional components that could constitute the necessary conditions for the realization of the MDGs in most country contexts. And, finally, the detailed nature of the framework also allows the organization and presentation of information on the structure and changes in institutional aspects governing the interface between the water sector and MDGs. While Table I provides a very useful and also a comprehensive framework for evaluating the institutional underpinnings of the MDGs, there are many problems in its practical application. The major issue is the availability and quality of information on all relevant institutional aspects. To circumvent this, two approaches can be used in a complementary way.

First, the context of evaluation can be selected to resolve an effective analysis with information need. For instance, cross-country analysis (e.g. Saleth and Dinar, 2000) can be used to derive generic trends and patterns evident in the structure and change in water institutions. Such analysis provides useful insights into the existence and effectiveness of the institutional conditions needed for achieving the MDGs both at the global and regional levels. Often, the assessment of the institutional structure and change will be qualitative and indicative in view of the inherent difficulties in evaluating institutions in an objective context. Such qualitative assessment on the overall ability of the regions in achieving various MDGs is available for regions such as the Asia and the Pacific (United Nations, 2003). In comparative evaluation across countries, it is also possible to use an instrumental approach, taking the institutions in one country as a reference point or benchmark for evaluating the same in other countries. Such evaluation can also identify laggard countries, where more detailed country-specific evaluations are needed. In this case, case studies, documentation of best practices, and stakeholder-based qualitative evaluation can be an effective basis for evaluation.

Second, the level of analysis can be selected to focus on a few key institutional conditions over a large canvas of evaluation. Often, it is possible to identify a few seminal and cross-cutting components running across many MDGs. Some of these key institutional aspects can be tentatively identified from Table I. For instance, the key water-related institutional aspects can include: (a) water entitlements for food production and basic needs; (b) pluralistic governance (combination of state, private groups, communities, and NGOs); and (c) data and technical capabilities for enforcement and monitoring. Similarly, seminal aspects in general institutions can include: (a) effective governance; (b) organizational cohesiveness; (c) role of civil societies including media. These six institutions can be recombined into three generic institutions: (a) governance; (b) entitlements; and (c) sensitive media and organizations. These categories can be used as a basis for more focused evaluation of the necessary conditions for achieving the MDGs both in country and cross-country contexts. At the highest level of generalization, the single most important issue for the achievement of the MDGs is the extent to which the MDGs are mainstreamed in the legal, policy, and organizational spheres of a country. Although an evaluation based on this issue may mask details on the institutions listed in Table I, it is the most direct one attacking the heart of the subject.

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Table I. Pathways and their institutional underpinning of the impacts of water on Millennium Development Goals (MDGs)

No	MDGs	Contribution of water	Water-related institutional factors	General institutional factors
1	Poverty and hunger	• production/income/price effects of water used in agriculture including subsistence agriculture, industry, and other types of economic activities • investments in water infrastructure and services act as a catalyst for local and regional development • reduced investment/production risks from low/no water-related hazards • reduced ecosystems degradation boosts local-level sustainable development • improved health from better quality water increases productive capacities • sustainable production of fish, tree crops and other foods gathered in common property resources	• management decentralization; water allocation rules; water entitlements; water pricing; revival of local/informal institutions • project selection policy (drought-prone areas; backward regions; small-scale water schemes) • dam-safety regulations; flood control arrangements • environmental impact assessment requirements; regulations for groundwater depletion/degradations • water quality standards; malaria control • IWRM; multiple use policy; organizational mechanisms for local commons	• land tenure/tenancy; agricultural pricing policies; minimum wage regulations; input/output markets including micro credits; trade policies • regional development policies; infrastructure policies • general and emergency responsiveness of administrative apparatuses • environmental laws and regulations; policies for empowering local organizations; energy pricing/policies • health policies; quarantine regulations • forestry and agricultural policies; local organizations; common property institutions
2	Universal primary education	• food/income/health effects of water on the families' ability to send children to school • improved school attendance from improved health and reduced water-carrying burdens, especially for girls	• most of the institutional aspects underlying MDG on poverty/hunger apply here • regulations on minimum distance to water collection points and improved dependability and area coverage;	• most of the institutional aspects underlying MDG on poverty/hunger applies here • commitment to constitutional provisions and international conventions; incentive policies and programs (e.g. scholarships; reservation) for the poor
3	Gender equality	• community-based organizations for water management improve social capital of women • reduced time and health burdens from improved water services give women time for productive endeavors, education, and empowerment activities • water/sanitation facilities closer to home put women and girls at less risk from sexual harassment while gathering water and seeking privacy • higher child survival and reduced reproductive responsibilities from better water access/quality	• policies for promoting women's participation in water management (e.g. WUAs; basin organizations) • legal provisions for water security as a basic human right • regulations on minimum distance to water supply points and improved dependability and area coverage	• social capital including cultural maturity • education policy (e.g. reservation for women); women self-help groups; employment and wage policies; credit policies and micro finance • legal and policy aspects for women's empowerment; social and cultural respect for women • social and economic importance of joint and extended family; health care system

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4	Child mortality	• improved quantities and quality of domestic water and sanitation reduce main morbidity and mortality factor for young children • improved nutrition and food security reduces susceptibility to diseases	• most of the institutional aspects related to production/income/price effects of water as well as those associated with water provision, water quality, water-related ecosystems apply here	• demographic policies; family norms; economic incentives on family size; health policies; civil societies' role in child immunization/vaccination; public distribution system
5	Maternal mortality	• improved health and reduced labor burdens from water portage reduce mortality risks • improved health and nutrition reduce susceptibility to anemia and other conditions that affect maternal mortality	• most of the institutional aspects related to production/income/price effects of water as well as those associated with water provision, water quality, water-related ecosystems apply here	• food prices and public distribution programs; health insurance; effectiveness of the maternity health systems; social capital
6	Major diseases	• better water management reduces mosquito habitats and malaria incidence • reduced incidence of range of diseases where poor water management is a vector • improved health and nutrition reduce susceptibility to HIV/AIDS and other major diseases	• economic incentives for water use efficiency; enforcement of drainage and quality regulations; creation of early warning system • all institutions behind the developmental impacts of water apply here	• indemnity provisions to punish improper planning; data and technical capacities; environmental engineering capabilities • emergency response and quarantine systems • role of social attitude and civil organizations to promote safe interaction and avoid discrimination
7	Environmental sustainability	• maintaining ecosystems integrity through improved water management, including pollution control and sustainable levels of abstraction • access and adequacy of safe water for poor and poorly serviced communities and areas • development of integrated management within river basins for sustainable management of ecosystems and mitigate upstream–downstream impacts	• regulations for water pollution control (polluter pays principle) and protecting water-based ecosystem; delineation of water zones • pro-poor public–private partnerships; innovative financing and management • articulation of IWRM in water law and policy; inter-ministerial organs; creation of river basin organizations; conflict resolution mechanisms	• environmental laws; enforcement mechanisms; oversight role of civil groups (e.g. media, NGOs, citizen groups) • governance reforms; legal and organizational pluralism; • organizational reforms; reorientation of regional administrative structure; coordination mechanisms
8	Global partnership for development	• water contributes to such development partnerships through its moral compulsions and the emotional imports (e.g. water poverty; water wars)	• global mandates and conventions established by UN organizations, international donors, and global forums such as World Water Council; joint monitoring programs, etc.	• UN organizations; international donors; bilateral/multilateral agreements on various economic, political, and trade aspects

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CONCLUDING REMARKS

Considering the water sector and water institutions in a larger context, this paper has developed the conceptual basis and an analytical framework for evaluating the existence and effectiveness of the necessary institutional conditions for achieving the MDGs in the specific context of the water sector. This framework is developed first by considering the main pathways of water impacts on MDGs and, then, mapping many of the water-related and other institutions operating beneath these impact pathways. In this sense, the institutional ecology of the MDGs is analytically translated into an evaluation framework that can be used to evaluate the institutional underpinnings of each of the MDGs. Although the framework aims to evaluate how appropriate the structure and change in water institutions are for the achievement of the MDGs, it also incorporates other institutional aspects partly for their indirect effects on the performance of both water institutions and the water sector and partly for their direct effects on the MDGs themselves.

The framework, though conceptually consistent and comprehensive in scope, is ambitious, information intensive, and time-consuming. Given the availability and quality of information on many institutional aspects in most countries, it will be a real challenge to apply this framework to the practical evaluation of the institutional preconditions of the MDGs. However, there are strategies to overcome these challenges, especially through a judicious choice of evaluation context and level of analysis. Reliance on qualitative information (such as those in World Economic Forum, 1997), use of an instrumental approach with benchmarking, and the choice of seminal and cross-cutting institutions are ways to make the evaluation framework resilient and effective. Some of such seminal and cross-cutting institutions, for instance, can be those related to: (a) governance; (b) entitlements; and (c) sensitive society and media. Although judgmental considerations are involved in the identification of these key institutions, they can also be identified through consensus. One commonly accepted aspect for evaluation involves the extent to which the MDGs are mainstreamed in the legal, policy, and organizational spheres of a country.

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