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[Concept Paper]

USE OF WATER AND ENERGY AT THE FARM-LEVEL IN RAJASTHAN, INDIA: POLICY ISSUES AND PRIORITY AREAS FOR FUTURE ANALYSIS

[An Initiative of the International Arid Lands Consortium (IALC)]
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Background Perspective

Tools, technologies, and managerial approaches are readily available to more efficiently achieve water and energy savings in agriculture, industries, and other municipal enterprises throughout the arid and semi-arid (dryland) regions of the world. However, corresponding policies and regulations are also necessary to attain the needed efficiency, conservation, and sustainability of the scarce water and energy resources. In the absence of effective and acceptable policies and regulations, necessary savings of these often unsustainable resources by targeted stakeholders are frequently ineffective and, too often, wastefulness and misuse result. This potentially devastating situation can be particularly acute at farm-level (small-scale) agricultural enterprises, where individuals or rural communities might be confronted with the dilemma of complying with the ineffective policies and regulations while attempting to ensure their livelihoods. However, such progress toward more efficient, conservation, and sustainability is likely to require appropriate changes (alterations) in relevant policies and regulations or more effective compliance on the part of decision-makers and other stakeholders if current policies and regulations are deemed ineffective for some reason.

Policies and regulations relative to pricing (valuing) of water and energy resources closer to the real costs of making available, efficiently delivering, and efficiently using these resources is a key element to achieving the goals of efficiency, conservation, and sustainability of water and energy resources. Such a situation can especially be the case at the farm-level since a more realistic valuation could encourage individuals and (collectively) rural communities to conserve, recycle where feasible, and, more generally, use water and energy more efficiently. Setting these more realistic prices is a critical prerequisite, since the agricultural sector consumes up to 80 percent of the accessible water and unknown but disproportionately large amounts of the energy resources available to the economies if many countries in the dryland regions of the world. However, effective policies and regulations that enhance the efficiency of water and energy use at the farm-level are necessary in helping to adequately price water and energy resources in a manner that reflects the real costs of these resources in relation to their actual scarcity in the economy.

Of particular note is the role of subsides in attaining appropriate pricing structures at the farm-level. It is known that subsides (for example, direct payments or other direct benefits, taxation or other fiscal relief, in-kind support of varying kinds, etc.) related to the use of water and energy resources in the agricultural sector often play a dominant role in efforts undertaken to achieve significant water and energy savings. As a consequence, the use of subsides must be considered in the context of their intended role. Unfortunately, policies and regulations that include a consideration of subsides can be counter-productive in attaining the water and energy savings needed in agriculture. It is imperative, therefore, that the role of the subsides be thoroughly reviewed in the context of formulating more effective policies and regulations for the savings of water and energy at the level of the individual as well as society as a whole.

Proposal

The International Arid Lands Consortium (IALC) proposes to initiate a comprehensive, interdisciplinary, and collaborative analysis of the policies and regulations that have a potential to attain water and energy savings on a watershed-basis at the farm-level in Rajasthan, India. Rajasthan has been selected as the case study for this initiative because it represents a microcosm of the policy issues that are the focus of this initiative. However, the proposed analysis has the potential to apply to other dryland regions of the country and region and, in doing so, attaining needed inputs to the formulation of equitable pricing of these often limiting resources on a larger geographic scale. Included but not necessarily exclusive of this analysis will be the consideration of local, regional, and country-wide policies and regulations that directly and/or indirectly address the following (anticipated) policy issues:

$ The availability, delivery, and allocation of water to the farm-level agricultural enterprises.

$ The availability, delivery, and allocation of energy required to attain the necessary availability, delivery, and allocation levels of water to sustain farm-level agricultural enterprises.

$ The attainment of scarce water and energy resources to sustain farm-level agricultural enterprises economically and environmentally into the foreseeable future.

$ The development and maintenance of complementary, and/or supplementary supplies of water and energy necessary to sustain farm-level agricultural enterprises at varying levels of technical and economic feasibility.

Among other (possible) policy topics to be examined in the analysis are those relating to:

$ Determining temporal water and energy availabilities.

$ Analyzing water and energy requirements for alternative agricultural production schemes.

$ Dissemination of technical and indigenous knowledge of more efficient irrigation and other watering practices.

$ Assessing aggregated agricultural outputs through a “single index” of the economic value of biomass production.

$ Options for maximizing farm incomes for alternative agricultural production schemes.

$ Characterizing local small-scale farming systems (including crops planted, cropping patterns, harvesting techniques, and fallow periods) and their impacts on ecological and environmental sustainability.

A collaborative problem-solving process will be implemented in undertaking this analysis. This process will focus on both technical issue assessments and subsequent procedures by which corresponding policies and regulations are formulated. A series of sequential steps form the foundation for the effort (see **Protocol** section). This effort will complement concurrent IALC-AID efforts of identifying areas of improving groundwater management and achieving more efficient delivery of water and energy to on-farm uses in the dryland regions of the world. The IALC will the proposed effort in a manner that is collaborative and complementary with other on-going USAID/India activities in the agricultural sector and, importantly, in close consultation with USAID/India. As the initial implementational phase, the IALC will schedule a mission to India by an interdisciplinary assessment team from the member institutions. The key charge confronting this assessment team will be structured in content, detail, and feasibility of undertaking this analysis following appropriate consultations with USAID/India, the Government of India authorities, representatives of the private sector, and in-country non-governmental collaborators. Results of this rapid assessment and analysis of needs, opportunities, and proposed outcomes will be presented to USAID/India for review, comment, and approval.

Another important responsibility of the IALC team will be establishing close working relationships with Indian counterparts at appropriate institutions in Rajasthan such as the Maharana Pratap University of Agriculture and Technology, Udaipur, and the Central Arid Zone Research Institute, Jodhpur. It is likely that the Indian Council of Agricultural Research, the National Institute of Hydrology, and other appropriate and interested Indian organizations will also become involved in this effort in some capacity.

Protocol

Involved are four sequential steps that will be the focus of the problem-solving effort proposed for this analysis of policies and regulations at the farm-level. These steps represent a straightforward and objective approach to systematically addressing the identified policy issues of concern. This protocol is not necessarily new or original and that, importantly, is its strength in a sense. It is a time-tested and accepted protocol that involves the steps to be outlined below (see the **Endnote** of this concept paper). Parenthetically, if this protocol is already accepted, it

might be asked “why” there is a need for a discussion of it here. There are several reasons:

$ Though the protocol is intuitive to many individuals, particularly those with natural resources experience, it is not as widely recognized or systematically and analytically used by organizations. A clear explanation could result in more widespread and effective use, especially in highly controversial situations where a clear agreement on protocol is essential to reduce avoidable conflicts over results.

$ A clear specification and use of the minimum required steps can help to ensure that assessments of (in this case) water and energy resources and related environmental issues have a balance in terms of the diversity of interests affected by policy decisions. Not including the minimum necessary steps to assure this balance (for example, steps related to assessments of stakeholder interests and identification of policy weaknesses associated with emerging issues) cause policy assessments to frequently go off in the wrong direction or to be incomplete.

$ Perhaps most important is that by describing a proven problem-solving protocol in a systematic and formal fashion makes it much easier to comprehend and appreciate. This means that it can be adopted more widely by organizations that do not presently use it.

More specifically, the protocol involves the following sequential steps:

1. Issue assessment: Defining the policy issue, its impacts, and its causes

Before assessing options to resolve a policy issue, one needs to identify and define the exact technical nature of the issue and the controversial activities that lead to its emergence. This step is critical since resolution depends largely on a correct identification and definition of the issue. The step involves a broad analysis of why the issue is an issue in the first place and how it got placed on the public agenda. The purpose of this step is allow the policy assessors an opportunity to define the issue concretely and to identify its dimensions related to the various opportunities and threats that the issue pose. One also needs to identify and clearly analyze the value perspectives of the different stakeholders involved in and/or affected by the issue. A key point to consider in this step is - from whose point of view is the issue a problem? The core questions to be answered include - who benefits and who gains from different resolutions of the issue? To fully understand the issue and, ultimately, to resolve it, one needs to know the different perspectives on the nature of the issue, especially in terms of how it affects different stakeholders. One needs to identify the underlying reasons why the controversial activities occur. This identification involves thinking about the confronted constraints (limitations) in terms of knowledge, resources, and incentives of the groups undertaking the activities leading to the emergence of the issue.

Though clear specification of the policy issue of concern is a seemingly obvious and simple task, this step is often the most difficult one in the protocol. Sometimes superiors

specify the issue. At other times, one must sort through a complex web of stakeholder perceptions and interests to arrive at the essence of the issue that needs to be addressed. This latter situation is particularly the case when an issue emerges internally due to concern over the interests of future generations or the disenfranchised in society. Importantly, there should be a consensus that the issue is important and real from a policy perspective and that inaction can have serious negative consequences.

While a policy issue can be driven almost entirely by stakeholder perceptions of what is happening, assessing issue importance in terms of welfare impacts depends greatly on knowledge of the actual biophysical and socioeconomic impacts of the issue. It is difficult to develop effective and efficient solutions to the problems that drive the issue without such information. Perceptions leading to conflicts are often not based on consideration of actual changes in resource use and their impacts, but on emerging new values or misconceptions developed over time regarding the impacts. These need to be sorted out earlier in the protocol process.

Achieving sustainable water and energy use in Rajasthan and other dryland region is a challenge to policy-makers, planners, and managers because of resource scarcity, the fragile nature of most drylands, and increasing pressures of human populations and related human activities. Recognition of these limitations to conservation and sustainable development is a first requisite in developing appropriate land and nature resource management practices and the necessary policy environments that will lead to the desired level of sustainability. These limitations manifest themselves in terms of the scarcity of water and other natural resources, land degradation, and socioeconomic and demographic change.

Key policy issue assessment questions include:

$ What is the issue of concern, what are its operational components, and what are the policy dimensions of the issue that placed it on the agenda?

$ Who are the stakeholders in the issue and what are their perceptions of it? Which stakeholders are undertaking the controversial activities and what are their reasons for doing so?

2. Policy assessment: Assessing policies associated with the issue

The focus of this step is placed on identifying and assessing both the formal and informal policies related to the activities causing the issue. The purpose of this step is to fully think about the existing policy context and its impacts on the various stakeholders before designing new policy options. One undertakes this step by identifying ineffective or conflicting policies that contribute to the reasons why some stakeholders engage in the controversial activities and why some oppose the activities. Considering what has been learned about the relevant policies, one identifies the key policies that require

intervention. Parenthetically, this step is largely a transition to step 3 of the process.

We are not determining whether that specific policies are good or bad in this step, but merely that they might be inappropriate to the situation. A logical step in resolving an identified issue is either to change policies so people do things differently or to redefine existing policies so that actions are better justified in terms of evolving public goods and policies. A policy can be classified in relation to the issue of concern as being outdated or poorly defined or ineffective or conflicting. With an outdated or poorly defined policy, the balance of societal values has likely shifted somewhat since the policy was first established and the existing policy is coming under increasing attack by stakeholders who disagree with it as their individual and collective values shift. (Some people argue that issues arise because there is not a policy addressing the concerns that defined the issue area. In our view, no policy is an implicit policy to do nothing or to accept the status quo. The "no policy" situation is classified in this category.) An ineffective policy is simply an otherwise sound policy that is not effectively implemented to accomplish its stated goals. A conflicting policy, on the other hand, is represented by a situation where a policy is designed to resolve one issue but also quite unintentionally creates or contributes to the issue of concern or adversely affects another. A price support policy that unintentionally contributes to environmental degradation is one example of a conflicting policy. All three areas of policy concern should be addressed holistically to deal with them effectively.

It is often said that policies dealing with water and energy resources relative to the agricultural sector in dryland regions such as Rajasthan do not always meet their purposes largely because of inadequate knowledge of improved agricultural management practices. Farmers frequently confront serious problems in attempting to implement an innovative agricultural practice because they do not know of the technical aspects of the practice. They are likely to have extensive knowledge about their environments and the sustainable uses of marginal lands. However, many of these farmers can be squeezed by population growth and the privatization of common property resources. These pressures often force farmers into shorter-term management practices which are not always sustainable. Unfortunately, improved agricultural management emerging from research can often be beyond the reach of farmers in isolated areas where there is little contact with new technologies or extensionists needed to help implement them.

Farmers living in dryland regions commonly suffer from a vicious cycle of low productivity, low levels of investment, and, as a result, endemic poverty. Governments and donors have often ignored drylands and their people in allocations of financial support, believing that they are too marginal to be worth large investments. Investments, apart from those made for more large-scale irrigation schemes and commitments to their maintenance, are often comparatively low. Investments by farmers in rainfed agriculture is also minimal largely because of the higher risk of erratic rainfall patterns. This lack of investment has exacerbated the gap in agricultural-related productivity between irrigated or wetter rainfed areas and between rainfed lands.

Technically sound agricultural management practices frequently fail because they are viewed as a threat to land and resource tenure rights and responsibilities. Tenure rights are the result of existing social relations of a country and, as a consequence, are often in a state of flux. As social relations change, so do interpretations and applications of tenure rules. When it is deemed necessary, new tenure rules are formulated through policy-making processes. It is imperative, therefore, that local tenure patterns be understood so that policies and programs are appropriate to local farmers and carried out more effectively. Land and resource availability is becoming scarcer due to populations increases and changes in tenure relations. These factors can ultimately govern access to water, energy, and other natural resources is one results.

Key policy assessment questions are:

$ What formal and informal policies contribute to the existence of the issue?

$ What key policies need addressing to resolve the issue?

3. Policy design: Developing and assessing policy options and the tradeoffs involved

The purpose of this step is defining and assessing the different options for dealing with the key ineffective or conflicting policies underlying the identified issue. The IALC team will attempt to identify the potential policy options in each problem area and how these options might influence the stakeholders to address the problems or causes of the issue. We will also examine the sustainability, distributional, and economic efficiency dimensions of each option. The general questions asked here are how sustainable are the implied changes? Who do the changes affect? What would be the cost of the option in relation to the perceived benefits involved?

The protocol calls for a review of the key policy problems identified in the preceding step and then linking these problems to the types of policy instruments involved. Regulatory, fiscal, and/or public investment mechanisms typically represent the three policy instruments to be considered. Following this review, the IALC team will identify, define, and develop specific policy options for dealing with the problems. These specific options will be cross-classified by their perceived weakness and the policy instruments (mechanisms) recognizing that combinations of instruments are commonly used to deal with a particular problem. Embedded in this step is the examination of options or combinations of options in terms of their likely impacts on the collective welfare of key stakeholder groups. It is emphasized that issue resolution requires some sort of change in the attitudes, perceptions, and behavior of the key stakeholders.

The key policy design questions are:

$ What are the options to change the policy environment?

$ What will be the likely impacts of different options on stakeholder actions?

$ What will be the likely impacts on stakeholder welfare?

4. Organizational assessment: Assessing implementation needs, capabilities, and feasibility

This final step in the protocol is dealt with in a limited way because it generally will be unique to each institutional environment considered. Organizational needs, capabilities, and feasibility are highly dependent on the specific circumstances surrounding the policy issue and the nature of the institutional environment in which it exists. This step involves at a minimum the following questions. What are the key organizations on which the success of the policy will depend and what is expected from them? Can the key organizations implement the policy? In what ways do key organizations need to change?

This step is not necessarily intended to be a comprehensive analysis of a particular organizational need, capability, or feasibility. It is assumed that there is some knowledge of the structure and function of the organizations in question. Rather, the focus of this step encourages the questioning of assumptions that could result in the failure of a policy intervention. There are likely to be two courses of action to follow if it is concluded that the policy options proposed are deemed unlikely to be viable in this regard. One course of action is returning to the policy design process presented in step 3 of the protocol process to formulate alternative options that might be more viable from the perspective of organizational capacity and feasibility. The other course of action is considering policy interventions to alter the organizations that do not evidence the capacity to successfully implemented the proposed policy options.

The key organizational assessment questions include:

$ What are the key organizations on which the successful implementation of the policy option will depend? What is expected from them?

$ Can the key organizations implement the policy?

$ In what ways, if any, do the key organizations need to change?

Deliverables

The IALC team will prepare a “white paper” that comprehensively describes the current conditions relative to water and energy use and other land uses at the farm-level in Rajasthan, India. Importantly, this paper will likely have applicability to the other dryland regions of the country and region. Recommendations (suggestions) for improving both the technical and economic efficiency of these uses will be offered by the IALC team when and where appropriate.

The paper will focus largely on:

$ Policy, institutional, and environmental issues.

$ Key policy issues for future analysis.

$ Recommendations on methodologies available for the analysis of policies, regulations, and institutions.

Among the questions that will be addressed in the paper will be:

$ What are the key issues and problems?

$ What are the major environmental impacts of current action programs on a watershed-basis?

$ What are the existing institutions concerned with planning and implementing water and energy resources management, including considerations of the respective roles of the central, state, and local governments?

$ What are the arrangements among upland and downstream institutions?

$ What are the existing water and energy policies and regulations related to potential pollution and other environmental problems incurred with alternative scenarios of water and energy use?

$ What kinds of water and energy conservation programs are currently in place?

$ How are water and energy resources and related developmental activities monitored?

$ What priority areas for policy-related analysis should be addressed in both the short- and long-term?

The paper will also present promising approaches for addressing priority water and energy policy issues at the farm-level in Rajasthan and the other dryland regions of India and the region. Possible and feasible alternative policies and regulations, resource management practices, and institutional strategies will also be a consideration.

A second deliverable to be prepared by the IALC team will be a “plan of action” for demonstrating the on-farm effectiveness of proposed recommendations to be made in the white paper. Such a demonstration might represent the prototype for a set of complementary demonstration projects on the same theme to be located mainly in Rajasthan with the collaborative participation of the IALC, Indian counterparts, and (possibly) interested non-governmental organizations.

Endnote

See the following publications for further information on the protocol for analyzing natural resources policy issues presented in this concept paper:

Gregersen, H., K. Brooks, P. Ffolliott, A. Lundgren, and others. 1994. Assessing Natural Resources Policy Issues. Draft Policy Brief, EPAT/MUCIA/USAID, University of Minnesota, St. Paul, Minnesota, 4 p.

Gregersen, H., K. Brooks, P. Ffolliott, A. Lundgren, and others. 1994. Assessing Natural Resources Policy Issues: A Framework for Developing Options. Draft Policy Paper, EPAT/MUCIA/USAID, University of Minnesota, 56 p.

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Post-Script

The initiative presented in this concept paper was not implemented in India as planned. However, it is suggested that the protocol to analyze natural resources policy issues outlined in the paper has merit in a more general context and, therefore, is considered to be a contribution to the overall purpose of the USAID-IALC Cooperative Project on the "Sustainable Development of Drylands in Asia and the Middle East." Exploratory funding for the concept and paper was provided by the United States Agency of International Development, Asia Near-East Bureau. For further information on the paper, please contact Sustainable Development of Drylands Project, the International Arid Lands Consortium, 1955 East 6th Street, Tucson, Arizona 85719-5224, [Telephone: 520-621-8572 or 520-621-3024, Fax: 520-621-3816, E-mail: esmhaa@ag.arizona.edu or ialc@ag.arizona.edu]