Irrigation Reform and Institutional Development

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Session 2: Evolution of Irrigation Services and Organizational Reform

Introduction: Diversifying Irrigation Institutions

Asian farmers and irrigation managers face evolving opportunities and threats, including demand for a more diverse and profitable array of crops, increasing competition for water, and implications of labor migration for women farmers and older farmers. Disruptive technologies include private pumping; mobile phones and other information and communication technologies; and new crop varieties and cropping systems. Climate change, biotechnology for plant breeding, and nanotechnologies that reduce the cost of energy, materials, and water filtration may further accelerate change. Over the past few decades, many countries have tried irrigation reforms, typically aimed at improving operation and maintenance (O&M), particularly by increasing the involvement of water users in managing and paying for irrigation O&M through forms of participatory irrigation management (PIM) or irrigation management transfer (IMT).[i] The question is how to learn from experience and develop institutions that can adapt to a dynamically evolving context.

Key Issues and Challenges

1. Participation for performance

Experience with PIM and IMT has shown that water user organizations can contribute to better design and construction. Farmers are motivated by the potential for infrastructure improvements. However, the prospects that formal organizations will survive and thrive after special project assistance ends is much less certain. The development of organizations is too often measured mainly in terms of paperwork and formal procedures, with much less information on performance, such as equitable water delivery and maintaining the functional condition of canals.

Ambiguity about future responsibilities for rehabilitation and the perpetuation of top-down doctrines for irrigation operation reflect incomplete reform, the reluctance of agencies to devolve power, and the reluctance of water users to take on additional O&M costs. Despite the rhetoric, agencies and politicians continue to prefer highly subsidized approaches to financing irrigation. Although legal frameworks have been established for WUAs, they often lack authority to control water and infrastructure or enforce rules, and lack access to credit. Agency staff are asked to take on the somewhat contradictory task of increasing participation and reducing their own roles, often without attractive prospects for retraining or severance, making it all too easy for apparent reforms and paper progress to be superficial, stalled, or reversed.

2. Customizing irrigation management

Irrigation reform has often sought to replicate oversimplified models, such as irrigation management transfer in Mexico, without a detailed understanding of how such reforms have worked in practice; the coalition of interests that carried them through; the timing, variations, and adjustments in how they were implemented; and the limitations of their accomplishments.[ii] Such one-size-fits-all interventions have often ignored or suppressed the diversity and improvisational creativity of local institutions and culture.[iii] Research on traditional community-managed irrigation systems has revealed the enormous diversity of rules that farmers have devised to fit irrigation management to local natural and social conditions, as well as more general institutional design principles. Institutional analysis shows there is no "one best way," no universal blueprint, or panacea for designing irrigation institutions.[iv]

Globally, pathways for IMT seem most favorable where farmers grow commercial crops, demanding good water service and ready to pay for it, in contrast to irrigation systems with large numbers of smallholders growing rice or other staple food crops, often with low market prices. While efforts to increase participation hoped to realize the strength associated with self-governance of small irrigation systems, large irrigation systems differ in crucial ways,[v] and even small-scale systems are now more exposed to external influences, including government assistance.[vi] As the context of irrigation becomes more diverse and dynamic, it becomes even more important to configure irrigation institutions to fit specific circumstances.

3. Escaping the rehabilitation trap

The "problem" of disappointing performance in large-scale irrigation systems, including inequities in access to water and premature degradation of infrastructure has provided the rationale for efforts to reform irrigation management, usually tied to large investments in rehabilitation. In a vicious cycle, inadequate resources for operation and maintenance may lead to poor service delivery, undermining farmers' willingness and ability to contribute to O&M, and thereby contributing to further deterioration. A tendency to neglect maintenance may be perversely strengthened where benefits to agencies and decision makers come primarily from construction.[vii] Project financing and design often make it easy to build physical works while neglecting institutional components. Large, lumpy, one-shot rehabilitation projects may provide a convenient way for international funders and national agencies to move large amounts of money, but centralized, contractor-dominated rehabilitation discourages and displaces local investment in repair and improvement.

4. Achieving real water savings and benefits

Irrigation is often characterized as "inefficient," ignoring the difference between beneficial and non-beneficial evapotranspiration (ET), and the difference between recoverable and non-recoverable return flows.[viii] More accurate understanding can help identify "real water savings" and avoid wasting investment on changes that may

yield little or no net savings of water, or even encourage more water consumption. If there are "real" water savings, examining the chain of linkages between savings and alternative uses can clarify what changes in water productivity do or do not result, and who benefits. As in other aspects of irrigation management, the abundance of information and ease of communication offered by new technologies are still underutilized, including remote sensing of ET, mapping (GPS), access to information (GIS/MIS), and communication (internet, mobile phones, etc.).

5. Finding workable options for groundwater management

Groundwater stocks have been rapidly depleted in many areas, including the North China Plain and much of India, in an unsustainable "race to the bottom." Unfortunately, the conventional recommendation of establishing mandatory licensing as a basis for centralized regulatory regimes to control groundwater abstraction has had disappointing results, in contrast to the simple rules such as well spacing that local communities have sometimes successfully used to control groundwater extraction.[ix] Subsidies for pumps and energy prices accelerate extraction, and often prove difficult to change.[x]

Opportunities

1. Smarter subsidies to help people help themselves

If legal and financial frameworks enable farmers to borrow against the benefits of investments, for example through bonds issued by an irrigation district, then farmers can finance irrigation investment themselves. However, in most places, such legal and financial frameworks are not available. Furthermore, policymakers, irrigation agencies and farmers still prefer government-subsidized irrigation infrastructure. Nevertheless, experience with community contracting in irrigation, community-driven development, and other decentralized programs demonstrates that there are options for innovatively arranging funding to promote participation, transparency, and, accountability, and thereby make investments more productive.

Rather than asking how to increase farmer participation in government projects, it may be better to reverse the question and ask how government can best participate in farmers' efforts to secure and improve their livelihoods. Developing and enhancing institutions that can respond to, and appropriately support, local initiatives[xi] offers one pathway for making government investment in irrigation more productive and better aligned with the interests of water users. Examples from Japan, Bangladesh, and elsewhere illustrate that even simple requirements, such as local initiation of requests, modest cost-sharing, and local approval of designs before proceeding with construction, can improve project selection and strengthen local commitment.

2. Diagnostics for co-management

Joint diagnostic processes provide a way to analyze problems, identify objectives for improving water service delivery that respond to farmer priorities, develop integrated improvements for modernizing operations and infrastructure, and continue to learn and adapt.[xii] Their effectiveness may depend on increased autonomy and better incentives for irrigation system staff to improve performance. Additional techniques from participatory rapid appraisal (PRA), participatory geographic information systems (PGIS), community visioning, appreciative inquiry, and consensus-building can enhance diagnostic methods.

Participatory diagnostics can also assess the available options for combining the capabilities of government agencies, farmers, businesses, and non-government organizations. Private pumping is one illustration of the willingness of farmers to invest in irrigation, and the capacity of markets to provide goods and services. Private investment in large-scale irrigation systems may be discouraged by long payback periods, uncertainty of agricultural income, large and lumpy asset-specific investments, bilateral monopoly of dedicated infrastructure, and the complexity of serving large numbers of farmers sharing a common pool resource. Nevertheless, choices such as whether or which water distribution should be handled by government staff, water users, or contracted providers, are among the institutional options that deserve consideration.

3. Incremental improvement: Repackaging investment

In contrast to large, externally-funded rehabilitation projects, a closer look at how governments use their own funds for repairing and upgrading irrigation shows that alternatives exist for smaller packages, with more selective and better-targeted results. To the extent that small and large irrigation systems are complex adaptive systems, where disturbances propagate and order emerges in hard-to-predict ways,[xiii] then learning must play a crucial role in irrigation management, reinforcing the advantages of adaptive management that can learn and adjust incrementally based on experiment and experience. Since control over funding is one of the most effective levers that national governments and development banks have, the potential to unbundle irrigation investment into programs for incremental improvement offers a strategic opportunity for re-aligning incentives.

4. Sharing benefits from water productivity

The higher value of water in domestic and industrial uses offers the potential for mutual gains from water transfers, win-win transactions. Within irrigation systems, farmers frequently work out ways to swap water, as do pump owners irrigating their neighbor's fields, and tanker operators transporting water to town. Reservoirs, if properly managed, could facilitate water transactions, between farmers and with other water users, including carry-over between seasons, if the legal framework and institutional capacity to support such transactions were adequately developed. If water users have secure rights to water and regulatory safeguards are developed, then a politically-feasible pathway may be opened for developing trading, leases, and other longer-term transactions for raising water productivity.[xiv]

In practice, growing cities usually manage to obtain water, so that water availability is not a major constraint on urban and industrial growth. In some cases land purchase or other arrangements may provide compensation, but often cities grab water in ways that impose costs of farmers, without sharing benefits. Under the right conditions, better measurement and control of irrigation water delivery can both reduce water consumption and yield higher production and profits for farmers. This can be informed by monitoring and management of ET, and justify investments that make water available for other uses, while ensuring such transfers are also beneficial to farmers.[xvi] Much more could be done to develop secure, mutually beneficial transactions, among irrigators, and between irrigators and other water users, such as targeted funding for efficiency improvements and contingent arrangements for fallowing fields in the event of drought.

5. Outside-the-box: Information, swaps, and conjunctive management

Groundwater management is a tough problem, but various approaches have proved feasible under particular circumstances. Ironically, hardrock aquifers with little storage capacity provide conditions that encourage farmers, individually and collectively to invest in groundwater recharge, in part because problems and benefits are easier to see[xvii] Active management of groundwater storage has the potential to restore stocks, reduce pumping costs, and provide a buffer against drought, especially in the context of conjunctive management with surface irrigation systems. Water supply and demand, and specific aquifer characteristics, such as storage capacity and flow rates, shape the potential for collective action to govern groundwater. Under some conditions, technical information about aquifers may be enough to catalyze local deliberation and action to reduce groundwater extraction, without requiring formal rules or punitive enforcement.[xviii] If reliable alternative surface water supplies are available, then it may be feasible to reduce groundwater pumping, switching sources to allow high quality groundwater to be prioritized for more valuable uses. Even where changing electricity prices is politically difficult or impossible, other innovative mechanisms, such as separating electric networks for domestic and agricultural use, can provide feasible and politically acceptable options. The larger lesson for irrigation reform and institutional development, particularly in the context of widespread groundwater pumping, is to shift more attention to feasible options that provide a basis for achievements and further progress.

Conclusions: Customizing Irrigation Development

To cope with evolving demands on irrigation management farmers. irrigation agencies, governments, and international development financiers can diversify their portfolio of institutional options, including:

- Smarter subsidies that encourage people to help themselves;
- Joint diagnostics to design integrated improvements in operations and infrastructure and develop co-management;

- Investment repackaged to support adaptive, incremental improvement;
- Facilitating win-win water transfers to share gains in water productivity, with regulatory oversight for proper water accounting and safeguards;
- Practical groundwater management including information-based consensus-building, surface-groundwater swaps, and actively managing aquifer storage.

Notes:

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