Making infrastructure dollars work

Investments in infrastructure can return major benefits—increasing growth and decreasing poverty. But only when they work. And many don’t—wasting time and money, dashing hopes, fueling cynicism, squandering opportunities. There’s a better way.

One way to improve the odds is suggested by recent experience with irrigation systems in Nepal. Studies of projects in that country reveal that systems designed by professional engineers and constructed to last with concrete and steel don’t work as well as primitive structures of stones, trees, and mud erected by the farmers themselves. Many things contribute to these counterintuitive results, but most relate to the incentives of the participants. The farmers just want water delivered to their plots at the right time of the year. For the professional planners and builders, results are not measured or motivated by anything quite so straightforward.*

An irrigation project built in the 1980s in Nepal’s Dang District illustrates how these differences in incentives can turn good intentions into harmful results. Built to serve 300 to 425 hectares, the project replaced five primitive irrigation systems built and managed by the farmers who used the water with new, permanent headworks and lined main and branch canals. After the project was completed, government bureaucrats formed a water users committee and appointed a local politician to run it. None of the farmers was consulted before the project was built. No manager of a farmer-built irrigation system was included on the water users committee.

The results are not surprising. The five original systems had provided adequate water to five villages. The new project consistently provides water to only three. Among other errors, the designers had not paid attention to the loose, sandy soil. Deep-cut canals were frequently blocked by mud. Slides and poor drainage caused problems at many points. One village now gets too much water because of poor drainage. Another gets too little during the monsoon season, when the canals are damaged by floods.

What might have proved an even more frustrating and wasteful venture was a plan to build a major diversion weir across Nepal’s Rapti River to irrigate a large area of the Chitwan District. To justify the big loan required for such a large system, planners emphasized the agricultural output that it could bring. Overlooked by the engineers and, presumably, the development bank putting up most of the money: no less than 85 farmer-governed irrigation systems already provided water to most of the fields in the project area.

In this case a study group at an agricultural institute documented the relative efficiency of the farmer-managed systems and generated opposition that finally blocked the plan. The project has now been redesigned to rehabilitate the existing systems, improve control of stream bank erosion, construct better farm-to-market roads, and install shallow tubewells. What could have been a major project failure has been averted. But this is a rare exception. In many cases in Nepal farmers who were supposed to be the beneficiaries of large, externally planned systems have instead been the victims.

Farmers don’t count

One reason for the difference in performance between self-organized and government-organized irrigation systems is a difference in incentives. The civil service officials who are responsible for irrigation systems are engineers whose recruitment and promotion are based on examinations, formal qualifications, and seniority. Get along, stay out of trouble, please the politicians, and you will eventually be promoted. An ability to deal with and meet the needs of farmers doesn’t count. Just as important is the status associated with the profession. Engineers build things—they don’t maintain muddy canals in remote areas and miss out on opportunities to share in the “commissions” routinely paid by...
New crops in old fields
If the rules of the game are kept firmly in mind, larger, donor-funded projects can work. One that did is located in another part of Nepal, the Indrawati Basin in the Sindhu Palchock District. In the planning stages project managers assessed the capabilities and limits of 119 farmer-organized irrigation systems. From this list, 19 appeared to have the organization and potential for expansion. Farmers in these groups were asked to devise a plan to improve and operate their irrigation system, allocate their water, and determine the need for paid and unpaid labor. The farmers, who appointed committees to work directly with the project engineers, were closely consulted, approved all designs, and assigned priorities to specific improvements. Funds were guaranteed for the highest-priority items. If the farmers provided enough free labor, the money thus saved was used for lower-priority parts of the project.

As a result of the close cooperation between project managers and the people who work the fields, the Sindhu Palchock project is a success. Costs were controlled, and agricultural output has increased. Farmers have developed their own management systems and methods of enforcing their self-imposed rules. In all 19 systems there is now more cooperation in maintaining the canal during the monsoon season. And new crops are thriving in fields where they could not have been grown before.

Caution is needed in generalizing from empirical research in a single country. But the Nepalese experience correlates well with other research on the ability of local users to self-govern projects as diverse as inshore fisheries, mountain commons, grazing areas, and forest resources. Whenever project funds are channeled through a system in which they enhance the power and wealth of national politicians, project plans cannot be expected to reflect conditions in the fields. And if the engineers and officials assigned to projects do not depend on the farmers for budgetary support or career advancement, the projects probably won’t work as well as they might. Users need to select their own officials to govern and manage a system or resource that they themselves own and operate. Only then will the incentives of the managers be aligned with those of the users. Sustaining long-term collective action isn’t easy. But the benefits are substantial.

A hill in Sydney
Local organizations not only can have an edge in designing good projects. They also can come up with imaginative uses for public funds. In Sydney officials in Australia’s Department of Urban and Regional Planning had money available for almost any community that devised a way to improve a neighborhood. But the bureaucrats thought they had to draw the line when the residents of a working-class district in a dreary, run-down, very flat suburb of the city proposed using some of the money to build a hill in a local park.

An imaginative and politically courageous department head overruled his dissenting staff, pointing out that the plan complied with the regulations of the program even if a hill wasn’t quite what the central planners had in mind. The hill got built.

Since then, the exception to the neighborhood’s dreary views has set off a chain reaction. The rest of the park has been cleaned and improved to provide a proper setting. Houses surrounding the park have been upgraded. And the enhancement program has spread through the community and then beyond it into a cooperative effort with other communities to clean up a polluted local river. No central government or large donor agency would have had the imagination to use a man-made hill to enhance a community. Only the people who walked by the flat, unappealing park every day could have envisaged such a mountain of returns from a molehill-size investment.

From a comment by Margaret Levi on Elinor Ostrom, “Incentives, Rules of the Game, and Development.”