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Raindrops for Education: How To Improve Water Access in Schools?

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In many countries, efforts to achieve the Millennium Development Goal (MDG) of universal primary education have led to a rise in the number of schools built. The fact that more children may have the opportunity to attend school is a necessary but not sufficient condition to guarantee proper primary education. Complementary inputs such as the number and quality of teachers are also important. Here we focus on the adequate provision of water as one of the key determinants for pupils to acquire a proper education that meets international standards.

A major obstacle to learning is the lack of physical capacity to absorb what is being taught. Without a minimum calorie intake, the development of cognitive abilities is impaired. And a high incidence of poverty is usually accompanied by striking levels of poor nutrition: in developing countries, about 32.5 per cent of children are malnourished. Malnutrition also contributes to the 10.9 million child deaths each year globally. Apart from these dysfunctions, other symptoms are more clearly evident. After long walks to school many children arrive hungry and thirsty, with little energy left to pay attention.

A promising complementary infrastructure to school construction is Rainwater Harvesting (RWH). This is a low-cost technology to catch and store runoff rainwater. Sufficient rooftop area in schools allows a large amount of water to be collected during monsoon seasons, diverted from gutters into a closed storage tanks (also called cisterns).

How can RWH contribute directly to the attainment of universal primary education? First, RWH increases the effective time children spend in classrooms. In many primary schools in developing countries, particularly in remote arid and semi-arid zones, pupils must bring water to prepare school meals or to drink. These children spend a significant proportion of their time collecting water, often from distant sources. RWH reduces the demand for water from such sources. The time children save is then spent in a greater number of effective classroom hours. There is also a gender consideration: schoolgirls usually skip classes if adequate sanitation facilities and water are not provided. The annual cost for girls is estimated to be equivalent to a full month of lost classes.

Second, RWH improves children's health. Studies have shown that hand washing with soap may halve the incidence of diarrhoea, the second leading cause of under-five child mortality (Curtis and Cairncross, 2003). Bacterial diseases are frequent corollaries. A third of the 1.2 billion people infected or at risk of being infected by soil-transmitted helminthiasis are children. Rainwater, when properly stored, removes the risk of infection by water-borne and water-washed diseases. If potable water is made available, kitchen gardens can be cultivated. The fruits and vegetables that can be grown potentially increase pupils' calorific intake, directly improving their learning capacity and general health.

Third, RWH relaxes the budget constraint on schools. For instance, if a school buys water to satisfy a certain share of its demand, RWH reduces water bills. The money saved can be invested in teacher salaries and other infrastructure improvements.

Finally, RWH at the school level has positive spillovers. Programmes in India have shown that the construction of rainwater technology, especially when community members are stakeholders (either co-financing the cistern or taking charge of its equitable usage) has a knowledge spillover on the community. Children are often "ambassadors" of knowledge for their households. They easily adopt new practices and thus are open to learning about water management, the importance of hygiene, the consequences of consumption from unsafe water sources, and the advantages of having a cistern at their own home.

RWH is a promising complementary activity and is relatively accessible at little cost (the average material cost for a $16m^3$ ferrocement cistern in developing countries is about US$950). But its take-up remains a challenge to budget-constrained schools. Innovative and community-driven financing strategies, such as "merry-go-around" schemes, are needed to increase rainwater harvesting practices (see Lehmann and Tsukada, forthcoming).

Hence, in order to keep making steady progress towards the education MDGs, more than physical shelters need to be built. Students who are likely to drop out of school require additional incentives to attend classes. Water security seems to be a strong incentive because of its several associated benefits. Where access to utility provision is somewhat scant, RWH provides a cheap, promising and environmental-friendly solution. Funding and the exchange of best practices for upgrading the technology are what seem to be missing.

References:

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