Where will the water come from?

KickStart International

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Africa has millions of acres of underutilised arable land and millions of smallholder farmers ready to work on it, if it is really worth their while. So why are we still unable to fully exploit this opportunity? How come most smallholder families produce so little and remain net importers of food into their households?

Many solutions have been developed and demonstrated for the smallholder, but we will not accomplish the 'African Green Revolution' unless we overcome our unsustainable dependence on rain-fed agriculture. A staggering 97 per cent of smallholder agriculture is rain-fed, an increasingly risky strategy in these times of accelerating climate change. Most parts of Africa have only one annual rainy season, although some get two. So food production is limited from seed to harvest in only four to five months, or at best eight or nine months out of 12, a huge waste of time and resources. Furthermore, when everyone harvests and

markets at the same time, farmers get rock-bottom prices. A few months later when they need to buy food, they must pay top dollar. So they spend their money to survive dry periods, and have nothing remaining to invest in inputs come the next rainy season. Tragically, some 40 per cent of produce is lost post-harvest because existing infrastructure is overloaded at peak times of the year, only to be underloaded at others. The answer here is clearly irrigation.

To synchronise production more closely with demand and achieve a smoother, more efficient 'just-in-time' supply chain calls for big investments in responsible agricultural water management (AWM). Contrary to popular opinion, much of Africa is not water-challenged, although water resources are not evenly distributed around the continent. Some 97 per cent of the annual rain that falls on Africa flows unchecked into the ocean. If we captured and managed all of it there would be enough water for everyone on the planet! Meanwhile, recent research has shown that truly massive reserves of water lie in African underground aquifers. So we have plenty of water, as well as land and farmers. How do we bring these components together so as to maximise the value we can create with new seeds derived from high-quality genetics?

KickStart[1] (a social enterprise dedicated to designing and promoting productivity-enhancing technologies for the very poor at the 'base of the pyramid') has developed both an AWM technology for smallholders, and an effective 'last mile delivery' strategy. The standard policy is to invest in highly capital-intensive water catchment and irrigation schemes. A serious drawback is the astronomical expense: both initial capital (often US$10,000 per irrigated hectare) and the continued reliance for operations on costly specialised management and

... we must develop water management to exploit the value of new seeds from modern genetics

technical support. Another is that by their nature these schemes are concentrated on specific site developments that have disruptive, often negative, impacts on local environments and cultures. Additionally, because these projects commonly use channel/furrow or flood irrigation systems, water consumption per hectare or per crop is wastefully high due to evaporation and plant transpiration together with poor water retention properties of the soil.

Irrigation need not be like this. A number of very low-cost AWM technologies, specially designed to fit the socio-economic and cultural circumstances of smallholder farmers, and highly efficient in terms of energy and water consumption, have been developed and proven. More crop-per-drop micro-drip systems are a well known example. KickStart's low-cost, human-powered machines enable very poor people to use their time and energy more productively, add value to their existing skills and assets, and make more money. 'MoneyMaker', a pressure-hose irrigation pump, costs the farmer US$100 for the larger treadle-operated model, or US$40 for the smaller manual 'hip pump'. They can pump water up from rivers and streams, lakes, ponds, dams, small water catchments and hand-dug wells from depths of 8 metres/25 feet. They can then pressurise the water upwards, for a total suction and pressure head of 14 metres/45 feet – the height of a four-storey building. Adding the cost of inlet pipes and outlet hoses, a farmer is asked to make a capital investment ranging from US$60 to US$150. Running costs are US$7 annually for replacement parts, and no specialist expertise is required. The pump system is managed by two people (usually husband and wife). One operates the pump (by treadle or handle) while the other holds the far end of the delivery hose and

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directs the pressurised water straight onto the root system or onto the plant itself. This form of plant watering enables farmers to use far less time and energy to deliver a lot more water to a lot more plants, saving hours of drudgery drawing and distributing water by bucket and rope, or waiting and praying for rain. Altogether between 10 and 18 hours per week of pump operation suffices to adequately irrigate up to 0.75 of a hectare, depending on pump type and other conditions. Close to 20 million rural families in Africa live in places where these pumps can be installed and 200,000 smallholders use them already, having bought one from a local store, or obtained one through a development programme. Impact evaluations show that MoneyMakers empower smallholders to transform subsistence farms into commercial enterprises, growing more food each year, and switching to higher nutritional value crops that command better prices in the market. Put simply, a US$100 investment typically generates additional net household incomes of US$500–1,000 per year over the five-to-nine-year life of the pump. The cost of this solution per irrigated acre compares very favourably with large schemes. The farmer invests just US$100 to put an acre (or US$250 per hectare) under effective water management, versus US$5,000–10,000 for large schemes.

Why aren't 20 million African farmers already using this sustainable system? There are three basic reasons: they don't know about it; they have not yet seen the value it offers; or they cannot easily get a pump for lack of capital to invest or want of a nearby stockist.

None of these constraints need be there. Already, with very modest resources, KickStart has organised the mass production, shipping and distribution (through a wholesale and retail network of 500 outlets in 15 countries), the marketing, promotion and ultimate sale of 200,000 MoneyMaker pumps, which are now being used to water-manage 80,000 hectares. All this has been achieved with

very little help from government ministries and extension services, or international agencies active in smallholder agriculture, who say they baulk at apparently endorsing a proprietary brand of pump. Their interventions are often delivered beside, not through, the market – 'demonstration projects' are common and mostly unsustainable.

Most people see African smallholders as victims of economic forces beyond their control who need hand-outs. And yet they do survive; 130 million families (650 million people) live not just without subsidy but are heavily taxed as well. However, it is true that selling new machines to subsistence farmers has not been easy and sales in the first year were only 300 pumps (last year 30,000). Smallholders are very difficult to reach in their deep rural areas where there are no paved roads or electricity. They are deeply conservative, very cautious and highly risk-averse. The value proposition we take to them is personal and familiar: buy this, use it, make money and provide for your family. Poor farmers deep in rural Africa are not anguishing over issues of global food security. Nor will they be very responsive to patriotic exhortations to exercise their civic duty and feed the nation – they are too poor and hungry for that. Farmers are concerned about how to raise their families, send the children to school, obtain healthcare, and save up to buy a dairy cow, a solar panel, or pay for a daughter's college education. And like everyone else, they want to enhance their social status, be someone in the eyes of the community.

KickStart's marketing and sales strategy focuses on these priorities. We show and tell, demonstrate MoneyMaker pumps at fairs and markets and at farmers' field days with testimonies and referrals from satisfied users, and promote them on local-language FM radio channels. All this gradually overcomes

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the initial doubts and suspicions of farmers. Also, by unconditionally guaranteeing the pump, by co-marketing it with seed and fertiliser and crop protection products, and by making it possible for farmers either to obtain loans from local banks or to pay gradually through a series of mobile phone money transfers, now common in rural populations, we have lowered the barriers to entry for the very poorest farmers to get involved.

So what does this teach us? If we are to ensure food and nutrition security in Africa (and grow economically) we must develop and market AWM (catchment and irrigation) technologies which are economically, environmentally and culturally appropriate for use by smallholder farmers, and which enable them to use this precious – but infinitely renewable – resource effectively to exploit the value of newly developed seeds and modern genetics. And were governments and development agencies to recognise and support smallholders in the same way as other prospective business investors, that would help too.

Reference

1 Kickstart at: http://www.kickstart.org

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