

The Green Revolution Comes to the Small Farmer

By Paul Polak and Michael Edesess¹

Abstract

It has always been assumed that large-scale farmers—those that can use Green Revolution technology—produce for market, while small farmers produce subsistence crops for their own consumption.

That assumption, it turns out, is exactly wrong.

Staple crops are grown most efficiently in large-scale operations. High-value crops are grown best in labor intensive, flexible, small-scale operations. Because the highest value crops change frequently, a small, flexible operation is needed to shift to the highest-value crop at the right time.

What small farmers are most suited for is not production of subsistence crops for their own consumption, but production of high-value crops for market. From the proceeds of the high-value crops that they bring to market, small farmers can purchase staple foods and have money left over.

Farms in developing countries are getting smaller and smaller. The smaller the farm, the less likely it is to produce enough rice or wheat to feed a family for a year. A backyard garden planted in wheat, for example, will at best feed a family of five for a week. Small farmers can operate most efficiently by growing high value cash crops, and using the money they make to buy the food they need to survive.

The Green Revolution revolutionized food production by increasing the yield by a factor of three on several staple crops, notably wheat, rice and corn. It enabled countries that had been net importers of food, such as India, to become net exporters—rendering them, it would seem, “self-sufficient” in food crops.

Nonetheless, even in newly self-sufficient countries, many poor farmers and other poor people [still go ~~went~~ hungry](#). Green Revolution technology is suitable for large farms. It has never reached the small farmer. [Michael- the statement that I think covers this is “Three quarters of the farmers in developing countries cultivate less than five acres.”- It may also be true that three quarters of the farmers in the world cultivate less than five acres.](#) Yet 75(?) percent of all farmers worldwide are small farmers, farming less than five acres. These farmers have not benefited from the successes of the Green Revolution.

It was thought that small farmers must grow subsistence crops for their own consumption because they did not have access to markets. But this has been proved wrong in densely populated countries such as India, Bangladesh, and China. Thus, fluid trade can easily take place with small farmers producing high-value crops and large-scale farmers producing staples.

New, low-cost technologies allow small farmers to use Green Revolution methods. Low-cost, small-unit-size drip irrigation kits use scarce water efficiently and deliver water to plants with pinpoint accuracy, enhancing yields. Fertilizers and pesticides in pellet form can be trickled into the drip irrigation feed stream, providing Green Revolution benefits to the small farmer. Low-cost human-powered treadle pumps for water-lifting can be used to obtain irrigation water without expensive, large-scale, electric-powered canal irrigation systems. Over a million treadle pumps are already in use in Bangladesh and India by poor farmers.

The key to beneficially extending the Green Revolution to the small farmer is realizing that the small farmer in poor countries—traditionally thought of as barely subsisting or as a recipient of charity—is in

¹ President and Director, respectively, of International Development Enterprises, a non-profit, non-governmental organization that develops and markets low-cost irrigation systems for small farmers

fact a customer for new, small-scale Green Revolution technologies. This small farmer is potentially in the vanguard of the next wave of Green Revolution food production enhancements.