

ENDING RURAL HUNGER AND POVERTY

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Introduction

Over the past twelve years, International Development Enterprises (IDE), a development organization I founded 20 years ago installed 1.3 million Treadle Pumps in Bangladesh. These Treadle Pumps have increased the aggregate net income of small farmers by \$130 million a year. Low drip systems increase the income of small farmers just as much as Treadle Pumps, and likely have a global market that is 20 times larger. . But putting low cost drip systems together with high value off- season horticultural crops and cutting edge, environmentally friendly inputs is increasing the income of poor farm families in India, Nepal, and Vietnam by a thousand dollar a year. This effectively ends their poverty and moves them into the middle class. But its effective replication on a global scale requires nothing less than a revolution in current development thinking and practice. Before this can happen, the context of hunger and poverty and its relationship to the marketplace must be seen in a new light.

The Nature of Hunger and Poverty

It is now well recognized that poverty is the root cause of hunger. If poor people had enough money, they would buy the food they need, and market forces would bring the food to them. 1.2 billion of the world's 6 billion people earn less than a dollar a day, and 800 million of them regularly go hungry. Eighty percent of this core group of 800 million hungry and poor people live in rural areas in developing countries, and earn their income from agriculture. The green revolution, with its high yielding varieties of seeds combined with irrigation and fertilizer tripled global grain production and tripled the income of large farmers, but for the most part it left small farmers and landless laborers standing on the sidelines.

Producing a five-fold increase in the incomes small farmers and landless laborers receive from agriculture is the direct path to ending rural hunger and poverty.

The World's Forgotten Farmers

Three-quarters of the farmers in developing countries cultivate less than five acres. The failure of the development community to take this simple fact into account is the main factor constraining emergence of practical solutions to hunger and poverty. A typical farm in Bangladesh supports six people on what they can earn and eat from one acre of land in five scattered plots. They earn two or three hundred dollars a year, far too little to afford the modern irrigation devices promoted by development experts. Without irrigation, they cannot gain access to green revolution inputs. Development experts expect that in an open

marketplace, small farms will give way to larger, more efficient farms. But in the face of rapid population growth, actual farm size in developing countries is steadily decreasing. How is it possible to generate a five-fold increase in income from the majority of the farmers in the world who cultivate less than five acres, in the face of steadily decreasing farm size?

Creating New Markets That Serve Poor Customers

In the past fifty years, the creation of new markets has transformed western civilization. The automobile revolutionized transport, the transistor radio revolutionized communication, and the personal computer revolutionized access to information. The creation of a new market exemplified by each of these revolutions requires not only a radical technology innovation, but also an operating international enterprise to produce and distribute it, an effective mass marketing campaign, and a functioning marketplace for transactions between buyers and sellers.

Two critical features seem form an integral part of the creation of new markets-breakthroughs in affordability, combined with a breakthroughs in miniaturization. Many different motor cars were available before Henry Ford came on the scene. But Ford made cars smaller and cheap enough to be affordable for the working man. Before Morita acquired the license for transistors from Bell labs, hi fi systems filled half a room and cost a prince's ransom. Jobs and Wosniak did not invent computers, but made them smaller and cheaper, from filling a large room at a university and costing a million dollars, to fitting both a student's desk and his pocketbook. Unpredictably, personal computer spawned the Internet and a new source of income for millions of ordinary people participating in the global garage sale created by E-Bay and its clones.

The creation of new markets can transform the lives of poor people just as surely as the new markets for cars, transistor radios, and computers have transformed western society. But first, the private sector and the development community must see them as serious customers for goods and services. With a few exceptions like small packages of cigarettes and laundry soap, the private sector has missed the huge market opportunity provided by poor customers. The development community sees poor people as recipients of charity and government subsidy, rather than as customers for goods and services. But there are two significant exceptions, the new markets that have been created for microcredit, and for affordable small plot irrigation. Like the new markets for cars, transistor radios, and personal computers, these new markets serving poor customers have incorporated the principles of affordability and miniaturization. Do new markets like microcredit and affordable small plot irrigation have the potential to end the poverty of the customers they serve? I believe they do, but only if they are created within the context of seven new principles required to end rural poverty.

Seven Principles to End Rural Poverty

1) Encourage Small Farmers to Produce for the Market, and Large Farmers to Produce Subsistence Crops.

The conventional wisdom is that small farmers should produce subsistence crops, and large farmers should produce for the market. Exactly the reverse is true. Compared to large farms with hired labor, small farmers in developing countries have a major competitive edge in applying the labor of their own families to the manicured care required by off-season vegetables, fruits, flowers, and other high value horticulture crops. But they can not compete effectively with mechanized large farms producing rice, wheat and corn.

I recently visited a group of cheerful farmers in the hills of Nepal a few hours drive and walk from Pokhara. They had always survived by growing maize and millet during monsoon season on their two-acre farms. 18 months earlier, they bought \$23, 1/16th acre (250 square meters) drip systems. After a training program on fertilizer, seeds and pest management from an IDE agronomist, they were earning \$100 a year in new net income by growing off-season cauliflower and cucumbers for the Katmandu market.

2) Change the Technology to Fit the Farm Instead of Changing the Farm to Fit the Technology

The forced uprooting of peasants from their small farms to large state farms and collective farms in the Soviet Union and China at the cost of millions of lives is probably the most disastrous agricultural policy in the century. Based on the dream of the factory farm, the size of the collective farm was optimized to fit the tractor. In spite of the abject failure of collective farms, agricultural economists in the west still assume that farm size in an open market should change to fit available agricultural machinery. In IDE's experience, exactly the reverse is true. It is a relatively simple matter to design agricultural technology to fit the farm.

In India, where 80% of farms are less than five acres and typical plot size is one quarter to one half an acre, both the government and the private sector are promoting drip irrigation equipment that starts at 2 acres and goes up from there. In China, where farm and plot sizes are even smaller, exactly the same policies are being pursued. A huge untapped market exists for affordable agricultural machinery miniaturized to fit existing plots.

3) Design Cheap.

. In a world where the best transport engineers focus on improving the efficiency of the automobile, the global majority dream of being able to find an affordable bicycle. It is ironic that 90% of the engineers and inventors and in the world today focus their energy on designing products to meet the needs of

the richest ten- percent of the world's people. The improvements in efficiency demanded by the rich often come at a higher cost- an ultralight alloy trail bike costs \$2000, compared with workhorse steel \$22 Atlas bicycle in India for the masses. Creating new markets for poor customers dictates a design process that puts first priority on affordability, and systematically identifies tradeoffs between cost and efficiency that are acceptable to poor customers.

To cut the cost of drip irrigation in half, for example, IDE replaced modern emitters with meter long spaghetti sized tubes called microtubes, which were used in the industry in its infancy in the 1970's. Microtubes reduce drip irrigation application uniformity from 95% to 85%, considered to be a relatively minor disadvantage by small farm customers. But the use of microtubes makes it much easier to deal with plugged emitters, and allows farmers to irrigate two crop rows with one supply line to reduce cost, both of which they consider to be much more important than a ten percent drop in uniformity.

4) Create New Markets for Affordable Small Plot Irrigation

The essential missing ingredient for small farmers to increased income and productivity for small farmers is irrigation water. The two main ways that farmers gain access to drinking water- canals and wells- are rarely available to small farmers. The vast majority of canal water goes to farms larger than five acres, and the cheapest mechanized tubewells are too expensive to be affordable for small farmers, and require five acres of land to pay for themselves. But being able to control the supply of water to plants is a prerequisite for increased production and income from agriculture. The main reason small farmers were bypassed by the green revolution is that they lacked access to affordable small plot irrigation.

The recent successful mass marketing of \$25 Treadle Pump tubewells, and the development and rapid initial adoption of low cost small plot drip irrigation, has laid the groundwork for the creation of a new global market for affordable small plot irrigation. A global task force of leaders in irrigation, agriculture, and the environment has set a target of putting 15 million hectares of small farmer holdings under low cost drip irrigation by the year 2015. This will not only remove a substantial part of the small farm irrigation constraint. It will also open the door to a global initiative to create wealth for small farmers by intensive horticulture of off-season high value market crops.

5) Create Hybrid Village Systems for Drinking Water and Irrigation

Every poor rural family needs access to both water to drink, and water to produce food, and these can usually be provided together. But organizations responsible for building irrigation systems and those responsible for building drinking water systems usually operate as totally separate entities, which compete with each other for funding, and rarely co-operate. This is most

unfortunate, because at the village level, the most sensible thing to do is to build a single hybrid system combining water for drinking and water for irrigation. Charging a small household drinking water fee generates enough income to pay for about a third of the system, and charging a fair market rate for irrigation water tied to efficient application technologies like low cost drip will generate enough income to pay for the other two-thirds. Combined with access to credit at a fair market rate, such village hybrid systems are financially sustainable without subsidy.

A hill village I visited recently in Nepal has been waiting for several years for government funding to build a two-inch PVC plastic pipeline to a spring 3 kilometers away. The marginal costs for converting it to a three and a half inch pipeline are trivial, compared with the income that can be derived from charging a fair market price for water for low cost drip systems growing off-season vegetables. Combined with a modest fee paid by each household that receives drinking water, enough funds can be generated to pay off a loan to build the system and cover the system's operating costs

A ninety-foot tubewell with a low cost handpump costs a hundred and twenty dollars in Bangladesh, too much for most single families. But each tubewell is shared by six families, and each family buys a horticulture drip irrigation income generating kit for ten dollars, each family will be earn new net income of at least thirty five dollars a year from selling vegetables. This is more than enough to repay a thirty-dollar microcredit loan for each of the six participating families, which will pay both for the cost of the horticulture kit, and one sixth of the cost of the pump.

6) Take Advantage of the Land Available to the Landless

Landless laborers who get most of their income from part time work on farms represent the poorest of the poor in many developing countries. I have visited and interviewed a variety of landless laborers in a variety of developing countries, and I came away with a very curious fact. Not a single landless laborer that I talked to is actually landless! While it may be true that they do not own land, they invariably have access to 50 or 100 square meters of land or more around their house. Many of them grow squash vines on the roof, or bitter melon on the simple fence next to their home, and keep animals. Most of them carry drinking water to the house in a bucket.

From these simple facts came the idea for a horticulture income generating kit. The kit starts with a five-dollar bucket drip kit, with two drip lines coming from a bucket hung from a post at shoulder height. In the horticulture kit are placed five or six varieties of high income generating horticultural crops, instructions for applying manure tea through the drip systems, and a variety of picture booklets explaining how to use the drip system, and how to care for the crops. Ten papaya trees planted around the border of the yard can earn

fifty dollars a year in net income. Combined with five other high value crops for each agro-climatic zone and mass marketed, horticulture income generating kits are capable of producing new net income of a hundred dollars a year for the poorest of the rural poor in developing countries.

7) Refocus Microcredit on Creating Wealth for the Rural Poor

Over the past twenty-five years, a vibrant new market for microcredit and for micro-enterprise oriented business development services has been created for poor customers in both developing and developed countries. This new market for microcredit has the potential for stimulating a revolution in wealth creation for poor people. But there are some major problems.

- (1) 60% of current microcredit lending organizations depend on long term subsidies to keep running
- (2) Contrary to popular belief, a significant proportion of microcredit loans go, not to support small income generating enterprises, but to pay for family emergencies like a serious illness or a crop failure. While access to funds to cover emergencies significantly improves quality of life, the debt still has to be paid off.

The impact of microcredit loans would improve greatly if 90 % of them went to fund exceptional wealth creation opportunities. A \$25 loan for a Treadle Pump will generate a permanent stream of new income of \$100 to \$500 a year, which will cover the costs of very many family emergencies. Unfortunately, only about 10% of Treadle Pumps in Bangladesh to day are purchased with credit. This is because of key constraints to access to wealth creating credit for poor rural families.

- (1) Because threshold loan volume is important for the financial sustainability of microcredit organizations, microcredit is disproportionately concentrated in urban, as opposed to rural areas.
- (2) For financial sustainability, microcredit organizations need to make loans that average at least \$100 in amount. Key income generating killer technologies like Treadle Pumps and Low Cost Drip Systems cost less than fifty dollars.
- (3) Most microcredit organizations do not have policies to prioritize wealth creation.

What is urgently needed is the opening of access to wealth creating “killer” products and services, capable of generating at least 100% net annual return for the poor rural families who buy them. The most direct institutional structure for providing such loans is directly through the product supply chain, for

example through dealers who sell Treadle Pumps. The proportionately high transaction costs for loans smaller than \$100 can then be covered by charging a higher fee for making credit available. What is urgently needed is the development of effective supply chain models for delivering rural microcredit for wealth generating products for poor rural families who earn the majority of their income from agriculture.

Reinvent Development Policy

Summary and Conclusions

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