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POLICY BRIEF N° 4

The Multiple Functions and Benefits of Small Farm Agriculture

In the Context of Global Trade Negotiations

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Summary

In this *Policy Brief* I challenge the conventional wisdom that small farms are backward and unproductive. Using evidence from Southern and Northern countries I demonstrate that small farms are "multi-functional"—more productive, more efficient, and contribute more to economic development than large farms. Small farmers can also make better stewards of natural resources, conserving biodiversity and safe-guarding the future sustainability of agricultural production.

The on-going process of trade liberalization—now being taken a step further in the World Trade Organization (WTO) negotiations for the Agreement on Agriculture (AoA)—has already had dramatically negative effects on small farmers everywhere. The AoA has the potential to severely undercut the remaining viability of small farm production, with potentially devastating consequences for rural economies and environments worldwide. I conclude with a call to recognize the true multi-functional role and value of small farmers, and to unite in opposition to an AoA that might make their continued existence impossible.

Introduction

For more than a century mainstream economists in both capitalist and socialist countries have confidently and enthusiastically predicted the demise of the small, family farm. Small farms have time and again been labeled as backward, unproductive and inefficient—an obstacle to be overcome in the process of economic development. The American model of large scale, mechanized, corporate agriculture is held out as the best, if not the only way to efficiently feed the world's population. Small farmers—or "peasants"—have been expected to go the way of the dinosaurs, and rightly so, according to conventional wisdom.

In this *Policy Brief* I challenge the conventional wisdom about small farms and assert that they are "multi-functional"—more productive, more efficient, and contribute more to economic development than large farms. I argue that small farmers make better stewards of natural resources, conserving biodiversity and better safe-guarding the sustainability of production. The evidence I present comes from both the Third World and from industrialized countries like the United States.

Today's on-going process of liberalization in international agricultural trade—now being taken a step further in the Millennium Round of World Trade Organization (WTO) negotiations—is widely recognized to have dramatically negative effects on small farmers in both Northern and Southern countries. This puts the small farm issue—called *The Agrarian Question* by renowned social scientist Karl Kautsky at the beginning of this century¹—squarely on the agenda for debate at the end of the millennium.

¹ Kautsky, 1906

If small farms are worth preserving—if indeed a small farm model of rural development makes more sense than does the large-scale, mechanized, chemical intensive, corporate dominated and socially excluding model toward which business-as-usual is carrying us—then now is the time to act.

The first point worth noting is that while small farmers have been driven out of rural America by the millions, and we have seen a similar, though lessor rural-urban migration in the Third World, the fact is that family farmers do still persist in the U.S. and continue to be numerically dominant. In the Third World they are central to the production of staple foods. The prediction of their demise continues to be premature, though their numbers have dropped substantially and they face new threats to their livelihoods on an unprecedented scale.

The second point is that small farms are far from being as unproductive or inefficient as so many would have us believe. Peasants have stubbornly clung to the land despite more than a century of harsh policies which have undercut their economic viability.

The third point is that small farms have multiple functions which benefit both society and the biosphere, and which contribute far more than just a particular commodity—though there is ample evidence that a small farm model for agricultural development could produce far more food than a large farm pattern ever could. These multiple and beneficial functions should be seriously valued and considered before we blithely accept yet another round of anti-small farm policy measures—this time at the level of the global economy. It is toward the second and third points—the benefits of small farms, that I direct the bulk of this paper.

In the conclusion to this *Policy Brief* I outline the grave threat to small farms presented by the WTO negotiations for an Agreement on Agriculture (AoA). Several countries, led by the United States, seek to push further free trade in agricultural products. I show how this could lead to the destruction of small farms and severely damage rural environments worldwide.

I close by issuing a call to rally around the concept of the multiple functionality of small farms, for both human societies and for the biosphere. By recognizing the important role played by small farms we have an opportunity to stop and even reverse trade policies which erode the viability of small farms.

Small Farm Virtues in the U.S.

I am not alone in speaking to the value of small farms and calling for policy change to take advantage of their potential dynamism. The United States Department of Agriculture's (USDA) National Commission on Small Farms released a landmark report in 1998 titled *A Time to Act*. What the USDA calls the *public value of small farms* includes:

- a. **Diversity:** Small farms embody a diversity of ownership, of cropping systems, of landscapes, of biological organization, culture and traditions. A varied farm structure contributes to biodiversity, a diverse and esthetically pleasing rural landscape, and open space.
- b. **Environmental benefits:** Responsible management of the natural resources of soil, water, and wildlife on the 60 percent of all U.S. farms less than 180 acres in size, produces significant environmental benefits for society. Investment in the viability of these operations will yield dividends in the stewardship of the nation's natural resources.
- c. **Empowerment and community responsibility:** Decentralized land ownership produces more equitable economic opportunity for people in rural areas, as well as greater social capital. This can provide a greater sense of personal responsibility and feeling of control over one's life, characteristics that are not as readily available to factory line workers. Land owners who rely on local businesses and services for their needs are more likely to have a stake in the well-being of the community and the well-being of its citizens. In turn, local land owners are more likely to be held accountable for any negative actions that harm the community.
- d. **Places for families:** Family farms can be nurturing places for children to grow up and acquire values. The skills of farming are passed from one generation to another under family ownership structures. When farm children do not continue to farm, farming knowledge, skills and experience are lost.
- e. **Personal connection to food:** Most consumers have little connection to agriculture and food production. As a consequence, they have little connection with nature, and lack an appreciation for farming as cultivation of the earth for the production of food that sustains us. Through farmers' markets, community supported agriculture, and the direct marketing strategies of small farmers, consumers are beginning to connect with the people growing their food, and with food itself as a product of a farmer's cooperation with nature.
- f. **Economic foundations:** In various states and regions of the U.S., small farms are vital to the economy.

The USDA Commission on Small Farms concludes with a powerful call to change the policies that have favored large, corporate-style farms for so very long, with hideous costs to rural communities and the environment.

Small Farm Virtues in the Third World

A similar pattern holds in the Third World, where policies promoting large farm, export agriculture have increasingly eroded the viability of small farms, despite the many benefits small scale production of food offers.

In traditional farming communities the family farm is central to maintaining community and to the sustainability of agricultural production. On the small farm, productive activities, labor mobilization, consumption patterns, ecological knowledge and common interests in long-term maintenance of the farm as a resource, contribute to a stable and lasting economic and family-based enterprise. Work quality, management, knowledge and relationships are intertwined and mutually reinforcing. Short-term gain at the risk of degrading essential resources not only invites community sanction, but also places the family and the farm at risk of collapse. Family farmers regularly achieve higher and more dependable production from their land than do larger farms operating in similar environments. Labor intensive practices such as manuring, limited tillage, ridging, terracing, composting organic matter, and recycling plant products into the productive process, enhance soil conservation and fertility (Netting, 1993).

The durability of small farm production is clear in its historical and spatial ubiquity: small farms exist in all environments, in all political and economic contexts, in all historical periods over the last 5,000 years, and in every known cultural area where crops can be grown. Small farmers have developed and use a variety of technologies, crops, and farming systems. Perhaps most important in an era of diminishing non-renewable resources, small farmers frequently produce with minimal recourse to expensive external inputs (Netting, 1993).

We must value the multiple functions of farms in the Third World if we are to achieve a sustainable agriculture, according to the Food and Agriculture Organization (FAO) of the United Nations (1999):

To face the current challenges of agriculture, we need to address agriculture and land in a broader context by integrating multiple roles (economic, food production, nature and land management, employment etc.). Sustainable agriculture and land use is not just a means to obtain more food and income, in socially acceptable ways which do not degrade the environment. Rather, it has an all-encompassing impact on communities, environments, and consumers. We must reach a consensus and common understanding of sustainable land use as an opportunity to improve the quality of the environment, including its physical (increased soil fertility, better quality air and water), biological (healthier and more diverse animal, plant, and human populations), and social, economic and institutional (greater social equity, cohesion, peace/stability, well-being) components.... Land is not just a resource to be exploited, but a crucial vehicle for the achievement of improved socioeconomic, biological and

physical environments. Concretely, by paying attention to the multiple functions of agriculture and land use, all economic, social and environmental functions of agriculture, at multiple levels, are recognized and included in decision making in order to promote synergies between these functions and to reconcile different stakeholder objectives.

Small farms play multiple key functions in rural economies, cultures and ecosystems worldwide. In the following sections I summarize some of the evidence for these claims.

Small Farm Productivity

How many times have we heard that large farms are more *productive* than small farms? Or that they are more *efficient*? And that we need to consolidate land holdings to take advantage of that greater productivity and efficiency? The actual data shows exactly the reverse for productivity: that smaller farms produce far more per unit area than larger farms. Part of the problem lies in the confusing language used to compare the performance of different farm sizes. As long as we use *crop yield* as *the* measure of productivity, we will be giving an unfair advantage to larger farms.

Total Output versus Yield

If we are to fairly evaluate the relative productivity of small and large farms, we must discard "yield" as our measurement tool. Yield means the production per unit area of a single crop, like "metric tons of corn per hectare." One can often obtain the highest yield of a single crop by planting it alone on a field -- in a monoculture. But while a monoculture may allow for a high yield of one crop, it produces nothing else of use to the farmer. The bare ground between the crop rows -- empty "niche space" in ecological terms -- invites weed infestation. The presence of weeds makes the farmer invest labor in weeding or capital in herbicide.

Large farmers tend to plant monocultures because they are the simplest to manage with heavy machinery. Small farmers on the other hand, especially in the Third World, are much more likely to plant crop mixtures -- intercropping -- where the empty niche space that would otherwise produce weeds instead is occupied by other crops. They also tend to combine or rotate crops and livestock, with manure serving to replenish soil fertility.

Such integrated farming systems produce far more per unit area than do monocultures. Though the yield per unit area of one crop—corn, for example—may be lower on a small farm than on a large monoculture, the total output per unit area, often composed of more than a dozen crops and various animal products, can be far, far higher. Therefore, if we are to compare small and large farms we should use *total output*, rather than yield. Total output is the sum of everything a small farmer produces: various grains, fruits, vegetables, fodder, animal products, etc. While yield almost always biases the results

toward larger farms, total output allows us to see the true productivity advantage of small farms.

Surveying the data we indeed find that small farms almost always produce far more agricultural output per unit area than larger farms. This holds true whether we are talking about an industrial country like the United States, or any country in the Third World. This is now widely recognized by agricultural economists across the political spectrum, as the "inverse relationship between farm size and output" (Barret, 1993; Ellis, 1993; Tomich et al., 1995; Berry and Cline, 1979; Feder, 1985; Prosterman and Riedinger, 1987; Cornia, 1985; to name a few). Even leading development economists at the World Bank have come around to this view, to the point that they now accept that redistribution of land to small farmers would lead to greater overall productivity (Deininger, 1999; Binswanger et al., 1995), a view long since arrived at by others (see Sobhan, 1993; Lappé et al., 1998). Table 1 shows the relationship between farm size and output per acre in the United States. The smallest farms, those of 27 acres or less, have

Table 1: Farm Size versus Output in the United States, 1992

<i>Median Farm Size Category (Acres)</i>	<i>Average Gross Output (\$/Acre)</i>	<i>Average Net Output (\$/Acre)</i>
4	7424	1400
27	1050	139
58	552	82
82	396	60
116	322	53
158	299	55
198	269	53
238	274	56
359	270	54
694	249	51
1364	191	39
6709	63	12

Source: U.S. Agricultural Census, vol. 1, part 51, pp. 89-96, 1992.

more than ten times greater dollar output per acre than larger farms. While this is in large part due to the fact that smaller farms tend to specialize in high value crops like vegetables and flowers, it also reflects relatively more labor and inputs applied per unit area, and the use of more diverse farming systems (Strange, 1988).

Figure 1 graphically shows the relationship between farm size and total output for fifteen countries in the Third World. In all cases relatively smaller farm sizes are much more productive per unit area—2 to 10 times more productive—than are larger ones. We observe two general forms of the relationship, as shown in Figure 2. Curve **I** is found in countries where the smallest reported farm size category is the most productive per unit area. Curve **II** is found where the most productive size category, while not *the* smallest, is still *relatively* small. All countries for which data is available fit one of these two types. The data presented in Table 1, from the U.S., clearly matches type I.

There are a variety of explanations for the greater productivity of small farms in the Third World (Netting, 1993; Lappé et al., 1998). Some of these are:

- a. multiple cropping: as explained above, while large farmers almost always use monocultures, and one or at the most two cropping cycles per year, small farmers are more likely to intercrop various crops on the same field, plant multiple times during the year, and integrate crops, livestock and even aquaculture, making much more intensive use of space and time.
- b. land use intensity: larger farmers and land owners tend to leave much of their land idle, while small farmers tend to use their entire parcel.²
- c. output composition: large farms are oriented toward land extensive enterprises, like cattle grazing or extensive grain monocultures, while small farmers emphasize labor and resource intensive use of land. As in the U.S. case, large farms may produce crops with lower value than do smaller farms.
- d. irrigation: small farmers may make more efficient use of irrigation.
- e. labor quality: while small farms generally use family labor -- which is personally committed to the success of the farm -- large farms use relatively alienated hired labor.
- f. labor intensity: small farms apply far more labor per unit area than do larger farms.
- g. input use: small farms often use far more inputs per unit area than larger farms, though the mix on small farms favors non-purchased inputs like manure and compost while large farms tend to use relatively more purchased inputs like agrochemicals.

² In the U.S. the relationship is reversed. Small farms tend to have a lower intensity of land use, leaving greater proportions of their land in woodland, cover crops, etc. (S'Souza and Ikerd, 1996).

- h. resource use: large farms are generally less committed to management of other resources -- such as forests and aquatic resources -- which combine with the land to produce a greater quantity and better quality of production.

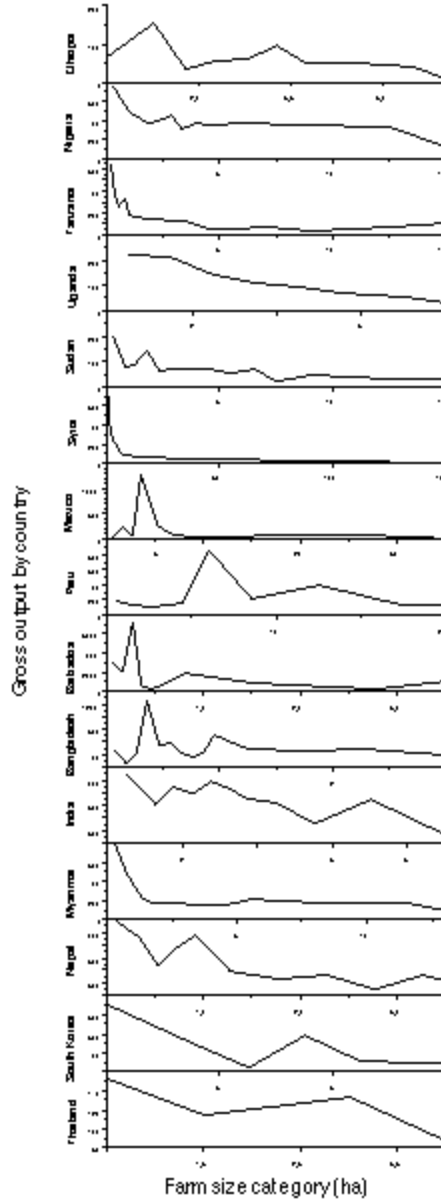


Figure 1. The relationship between farm size and total output in different countries (after Cornia, 1985).

It is the commitment that family members have to their farm, and the complexity and integrated nature of small farms, that guarantee their advantage in terms of output. Pretty (1997) has documented the productivity of such systems in a wide variety of environments.

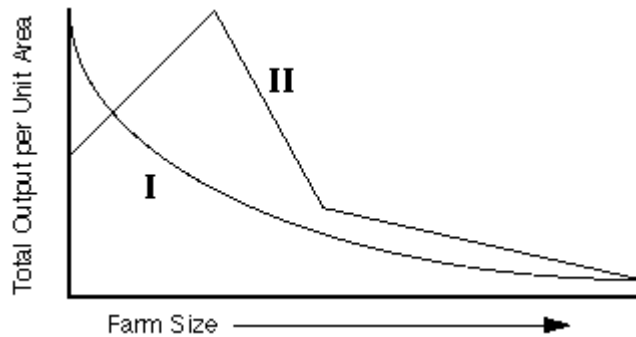


Figure 2. Typical forms of the relationship between farm size and total output. In Type I the smallest farm sizes produce the most total output per unit area. In Type II the most productive size class is not the smallest, but is still relatively small. These idealized types have been abstracted from the data presented graphically in Figure 1.

Small Farm Efficiency

While small farms are clearly more productive than large farms in terms of output per unit area, claims are often made that large farms are still *more efficient*. To start with, this depends on the definition of efficiency that one chooses. Small farms make more efficient use of land. Large farms generally have higher labor productivity due to mechanization, so they might be considered to be more efficient in labor usage. The definition of efficiency most widely accepted by economists is that of "total factor productivity," a sort of averaging of the efficiency of use of all the different factors that go into production, including land, labor, inputs, capital, etc. Tomich et al. (1993, p. 126) provide data from the 1960s, 70s and early 80s, which show small farms have greater total factor productivity than large farms in Sub-Saharan Africa, Asia, Mexico and Columbia. The curves follow the same patterns, Types I or II, shown in Figure 2 for farm size vs. output. More recently, the same pattern has been found in Honduras (Gilligan, 1998).

In industrial countries like the U.S. the pattern is less clear. The consensus position is probably that very small farms are inefficient because they can't make full use of expensive equipment, while very large farms are also inefficient because of management and labor problems inherent in large operations. Thus peak efficiency is likely achieved on mid-sized farms that have one or two hired laborers, giving the U.S. an efficiency

curve like the Type II productivity curve, but with the peak more toward mid-size than small (Strange, 1988, pp. 80-81; see also Madden, 1967). In a recent, detailed analysis of true total factor productivity, corrected for a number of biases in the data, the author concludes that advantages to larger farm sizes found by some analysts "disappear, while there is evidence of diseconomies as farm size increases" (Peterson, 1997). In other words, even in the United States, there is no reason to believe that large farms are more efficient, and very large farms may in fact be quite *inefficient*. But there is far more to the economic importance of small farms once we move outside the farm gate and ask questions about economic development.

Small Farms in Economic Development

Surely more bushels of grain is not the only goal of farm production; farm resources must also generate wealth for the overall improvement of rural life—including better housing, education, health services, transportation, local business diversification, and more recreational and cultural opportunities.

Here in the United States, the question was asked more than a half-century ago: what does the growth of large-scale, industrial agriculture mean for rural towns and communities? Walter Goldschmidt's classic 1940's study of California's San Joaquin Valley compared areas dominated by large corporate farms with those still characterized by smaller, family farms (see Goldschmidt, 1978).

In farming communities dominated by large corporate farms, nearby towns died off. Mechanization meant that fewer local people were employed, and absentee ownership meant that farm families themselves were no longer to be found. In these corporate-farm towns, the income earned in agriculture was drained off into larger cities to support distant enterprises, while in towns surrounded by family farms, the income circulated among local business establishments, generating jobs and community prosperity. Where family farms predominated, there were more local businesses, paved streets and sidewalks, schools, parks, churches, clubs, and newspapers, better services, higher employment, and more civic participation. Studies conducted since Goldschmidt's original work confirm that his findings remain true today (see Fujimoto, 1977; MacCannell, 1988; Durrenberger and Thu, 1996).

The Amish and Mennonite farm communities found in the eastern United States provide a strong contrast to the virtual devastation described by Goldschmidt in corporate farm communities. Lancaster County in Pennsylvania, which is dominated by these small farmers who eschew much modern technology and often even bank credit, is the most productive farm county east of the Mississippi River. It has annual gross sales of agricultural products of \$700 million, and receives an additional \$250 million from tourists who appreciate the beauty of traditional small farm landscapes (D'Souza and Ikerd, 1996). Ludwig and Anderson (1992) argue that Amish farm communities provide a North American model for what they call "indigenous development," essentially an

emphasis on building a strong local economy as the basis for participating in the larger world:

The *vision* of indigenous development is one of global *inter*-dependence through the *intra*-dependence of semiautonomous regions. Instead of placing emphasis on the highest or global level of competitive interaction, it starts at the bottom and places emphasis on the development of strong, independent, semiautonomous regions with unique identities... Many of the Amish communities, separated by self-defined boundaries, are... self-reliant. These [are] interesting examples because their economies are market oriented and highly successful; they do substantial trade with the outside; they are great husbands of the natural environment; and their members find a great deal of meaning and centeredness in their work. While their economies are market based, they are highly diverse and integrated rather than fragmented, cooperative rather than competitive, based on value added rather than on commodity products, and dedicated to reciprocity more than dominance (p.35).

If we turn toward the Third World we find similar local benefits to be derived from a small farm economy. The Landless Workers Movement (MST) is a grassroots organization in Brazil that helps landless laborers to organize occupations of idle land belonging to wealthy landlords (Langevin and Rosset, 1999). When the movement began in the mid-1980s, the mostly conservative mayors of rural towns were violently opposed to MST land occupations in surrounding areas. In recent times, however, their attitude has changed. Most of their towns are very depressed economically, and occupations can give local economies a much needed boost. Typical occupations consist of 1,000 to 3,000 families, who turn idle land into productive farms. They sell their produce in the marketplaces of the local towns and buy their supplies from local merchants. Not surprisingly those towns with nearby MST settlements are now better off economically than other similar towns, and many mayors now actually petition the MST to carry out occupations near their towns (Candido Gryzbowski, IBASE, personal communication).

It is clear that local and regional economic development benefits from a small farm economy, as do the life and prosperity of rural towns. Can we re-create a small farm economy in places where it has been lost, to improve the wellbeing of the poor?

Improving Social Welfare Through Land Reform

Recent history shows that the re-distribution of land to landless and land-poor rural families can be a very effective way to improve rural welfare. Sobhan (1993) examined the outcome of virtually every land reform program carried out in the Third World since World War II. He is careful to distinguish between what he calls 'radical' re-distribution (called 'genuine land reform' by Lappé et al., 1998), and 'non-egalitarian' reforms (or 'fake land reform' in the Lappé et al.'s terminology). When quality land was really distributed to the poor, and the power of the rural oligarchy to distort and 'capture'

policies broken, real, measurable poverty reduction and improvement in human welfare has invariably been the result. Japan, South Korean, Taiwan and China are all good examples. In contrast, countries with reforms that gave only poor quality land to beneficiaries, and/or failed to alter the rural power structures that work against the poor, have failed to make a major dent in rural poverty. Mexico and the Philippines are typical cases of the latter (Sobhan, 1993; Lappé et al., 1998).

While Sobhan looked at national-level statistics to derive his conclusions, Besley and Burgess (1998) recently looked at the history of land reform in 16 individual Indian states from 1958 to 1992. While these were by and large not radical reforms in Sobhan's sense, many did abolish tenancy and reduce the importance of intermediaries. The authors found a strong relationship between land reform and the reduction of poverty. Similarly in Brazil, land reform beneficiaries and members of MST-settlements have a higher standard of living than those families who remain landless (Candido Gryzbowski, IBASE, personal communication). In fact land reform holds promise as a means to stem the rural-urban migration that is causing Third World cities to grow beyond the capacity of urban economies to provide enough jobs.

In Brazil IBASE, a social and economic research center, studied the impact on government coffers of legalizing MST-style land occupations-*cum*-settlements versus the services used by equal numbers of people migrating to urban areas. When the landless poor occupy land and force the government to legalize their holdings, it implies costs: compensation of the former landowner, legal expenses, credit for the new farmers, etc. Nevertheless the total cost to the state to maintain the same number of people in an urban shanty town -- including the services and infrastructure they use -- exceeds in just one month, the yearly cost of legalizing land occupations (Candido Gryzbowski, IBASE, personal communication).

Another way of looking at it is in terms of the cost of creating a new job. Estimates of the cost of creating a job in the commercial sector of Brazil range from 2 to 20 times more than the cost of establishing an unemployed head of household on farm land, through agrarian reform. Land reform beneficiaries in Brazil have an annual income equivalent to 3.7 minimum wages, while still landless laborers average only 0.7 of the minimum. Infant mortality among families of beneficiaries has dropped to only half of the national average (Stédile, 1998).

This provides a powerful argument that land reform to create a small farm economy is not only good for local economic development, but is also more effective social policy than allowing business-as-usual to keep driving the poor out of rural areas and into burgeoning cities.

Sobhan (1993) argues that *only* land reform holds the potential to address chronic underemployment in most Third World countries. Because small farms use more labor -- and often less capital -- to farm a given unit of area, a small farm model can absorb far more people into gainful activity and reverse the stream of out-migration from rural

areas. What of national economic development? How do countries characterized by small farms fare compared to those dominated by large farms?

National Economic Development and 'Bubble-Up' Economics

It turns out that a relatively equitable, small farmer-based rural economy does provide the basis for strong national economic development. This "farmer road to development" is part of the reason why, early on in its history, the United States developed more rapidly and evenly than Latin America, with its inequitable land distribution characterized by huge haciendas and plantations interspersed with poverty-stricken subsistence farmers (de Janvry, 1981). In the United States, independent "yeoman" farmers formed a vibrant domestic market for manufactured products from urban areas, including farm implements, clothing and other necessities. This domestic demand fueled economic growth in the urban areas, and the combination gave rise to broad-based growth (Sachs, 1987).

More recently the post-war experiences of Japan, South Korea and Taiwan demonstrate how equitable land distribution fuels economic development. At the end of the war circumstances, including devastation and foreign occupation, conspired to create the conditions for 'radical' land reforms in each country, breaking the economic stranglehold of the landholding class over rural economic. Combined with trade protection to keep farm prices high, and targeted investment in rural areas, small farmers rapidly achieved a high level of purchasing power, which guaranteed domestic markets for fledgling industries (Sachs, 1987).

The post-war economic 'miracles' of these three countries were each fueled at the start by these internal markets centered in rural areas, long before the much heralded 'export orientation' policies which much later on pushed those industries to compete in the global economy. This was real triumph for 'bubble-up' economics, in which re-distribution of productive assets to the poorest strata of society created the economic basis for rapid development. It stands in stark contrast to the failure of 'trickle down' economics to achieve much of anything in the same time period in areas of U.S. dominance, such as much of Latin America (Sachs, 1987).

A further benefit of small farm development through land reform in East Asia was the dispersal of political power. Economically enfranchised small farmers became an important political base that politicians had to respond to, avoiding the kind of urban biases in policy-making that have sabotaged economic development in much of the Third World (Sachs, 1987).

More generally, there is now a growing consensus among mainstream development economists, long called for by those on the left, that inequality in asset distribution impedes economic growth (Solimano, 1999). This is leading even such institutions as the World Bank to call for land reform, albeit of a 'non-radical,' 'market-led' variety I do not necessarily endorse (see for example, Banerjee, 1998; Stiglitz, 1998; Deininger and Binswanger, 1998; for the alternative view, see complaints in Inspection Panel, 1999).

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Ecosystem Services & Sustainability

The benefits of small farms extend beyond the economic sphere. Whereas large, industrial-style farms impose a scorched-earth mentality on resource management -- no trees, no wildlife, endless monocultures -- small farmers can be very effective stewards of natural resources and the soil. To begin with, small farmers utilize a broad array of resources and have a vested interest in their sustainability. At the same time, their farming systems are diverse, incorporating and preserving significant functional biodiversity within the farm. By preserving biodiversity, open space and trees, and by reducing land degradation, small farms provide valuable ecosystem services to the larger society.

In the United States, small farmers devote 17% of their area to woodlands, compared to only 5% on large farms. Small farms maintain nearly twice as much of their land in "soil improving uses," including cover crops and green manures (D'Souza and Ikerd, 1996). In the Third World, peasant farmers show a tremendous ability to prevent and even reverse land degradation, including soil erosion (Templeton and Scherr, 1999).

Many small farm agroecosystems in the Third World are located on a wide variety of slopes, aspects, microclimates, elevational zones, and soil types. They are surrounded by many different vegetation associations. There are numerous combinations of diverse biophysical factors which have led to the diverse cropping patterns developed by farmers to exploit site-specific characteristics. Descriptions of the species and structural diversity and management of these traditional systems are found throughout the literature on agroecology (see for example, Altieri, 1995; Pretty, 1995; Netting, 1993; *The Ecologist*, 1998).

In many areas traditional farmers have developed and/or inherited complex farming systems which are highly adapted to local conditions, allowing them to sustainably manage production in harsh environments while meeting their subsistence needs, without depending on mechanization, chemical fertilizers, pesticides or other technologies of modern agricultural science (Altieri 1995).

Compared to the ecological wasteland of a modern export plantation, the small farm landscape contains a myriad of biodiversity. The forested areas from which wild foods, and leaf litter are extracted, the wood lot, the farm itself with intercropping, agroforestry, and large and small livestock, the fish pond, the backyard garden, allow for the preservation of hundreds if not thousands of wild and cultivated species. Simultaneously, the commitment of family members to maintaining soil fertility on the family farm means an active interest in long-term sustainability not found on large farms owned by absentee investors.

If we are truly concerned about rural ecosystems, then the preservation and promotion of small, family farm agriculture is a crucial step we must take.

Conclusions:**Free Trade Threatens Small Farm Agriculture**

Throughout this paper I have examined the multiple functions played by small farms, and the myriad benefits they provide for society and for the biosphere. If we are concerned about food production, small farms are more productive. If our concern is efficiency, they are more efficient. If our concern is poverty, land reform to create a small farm economy offers a clear solution. The small farm model is also the surest route to broad-based economic development. If the loss of biodiversity or the sustainability of agriculture concern us, small farms offer a crucial part of the solution.

Despite decades of anti-small farm policies taken by nation states (Lappé et al., 1998), small farmers have clung to the soil in amazing numbers. But today we stand at a crossroads. As a world we are poised to take steps toward global economic integration that pose far greater threats to small farmers than they have ever faced before.

Trade liberalization—the move toward global free trade policies—poses a grave threat to the continued existence of small farms throughout the world. Over the past couple of decades Third World countries have been encouraged, cajoled, threatened, and generally pressured into unilaterally reducing the level of protection offered to their domestic food producers in the face of well-financed foreign competitors. Through participation in GATT, NAFTA, the World Bank, the International Monetary Fund and the World Trade Organization, they have reduced or some cases eliminated tariffs, quotas and other barriers to unlimited imports of food products (Bello et al., 1999). On the face of it, this might sound like a good thing. After all, more food imports might make food cheaper in poor, hungry countries, and thus make it easier for the poor to obtain enough to eat. However, the experiences of many countries suggest that there are downsides to these policies which may outweigh the potential benefits.

Typically Third World economies have been inundated with cheap food coming from the major grain exporting countries. For a variety of reasons (subsidies, both hidden and open, industrialized production, etc.) this food is more often than not put on the international market at prices below the local cost of production. That drives down the prices that local farmers receive for what they produce, with two related effects, both of which are negative (Lappé et al., 1998).

First, a sudden drop in farm prices can drive already poor, indebted farmers off the land over the short term. Second, a more subtle effect kicks in. As crop prices stay low over the medium term, profits per unit area—per acre or hectare—stay low as well. That means the minimum number of hectares needed to support a family rises, contributing to abandonment of farm land by smaller, poorer farmers—land which then winds up in the hands of the larger, better off farmers who can compete in a low price environment by virtue of having very many hectares. They overcome the low profit per hectare trap precisely by owning vast areas which add up to good profits in total, even if they represent very little on a per hectare basis. The end result of both mechanisms is the

further concentration of farm land in the ever fewer hands of the largest farmers (Lappé et al., 1998).

A penalty is paid for this land concentration in terms of productivity, as large farmers turn to monocultures and machines to farm such vast tracts, and in terms of the environment, as these large mechanized monocultures come to depend on agrochemicals. Jobs are lost as machines replace human labor and draft animals. Rural communities die out as farmers and farm workers migrate to cities. Natural resources deteriorate as nobody is left who cares about them. Finally, food security is placed in jeopardy: domestic food production falls in the face of cheap imports; land that was once used to grow food is placed into production of export crops for distant markets; people now depend on money—rather than land—to feed themselves; and fluctuations in employment, wages and world food prices can drive millions into hunger.

This process should be a more or less familiar one to North Americans, who have seen low crop prices and the "get big or get out" mentality of government policy drive four million farmers off the land since World War II (Lappé et al., 1998; Heffernan, 1999). We have paid, and continued to pay, a heavy price of runaway soil erosion from excessive mechanization and "fence row to fence row" planting, of urban problems because our inner cities never did absorb the excess labor expelled from rural America, and of the collapse of rural life.

The major drive to export grain from America's heartland, which began in the 1970s, contributed to a 40 percent increase in soil erosion in the corn and soybean belts. Today about 90 percent of U.S. crop land is losing topsoil faster than it can be replaced (Lappé et al., 1998.) The export boom also contributed to a 25 percent increase in average farm size, which was accompanied by the loss of one third of all American farmers between 1970 and 1992 (U.S. Census of Agriculture, 1992). In Figure 3 we see that the average American farmer has not benefited from the export boom at all. Rather, the profits have accrued to the giant grain cartels (Krebs, 1991).

In a very real sense, then, the U.S. drive to dominate global grain markets has hurt family farmers and damaged rural ecosystems both at home and abroad.

What is euphemistically known as a "fair and market-oriented agricultural trading system"—almost totally free trade in farm products—is unfortunately the agenda of American government negotiators in the Millennium Round of trade negotiations under the World Trade Organization, beginning in the fall of 1999 in Seattle (Permanent Mission of the United States, 1999).

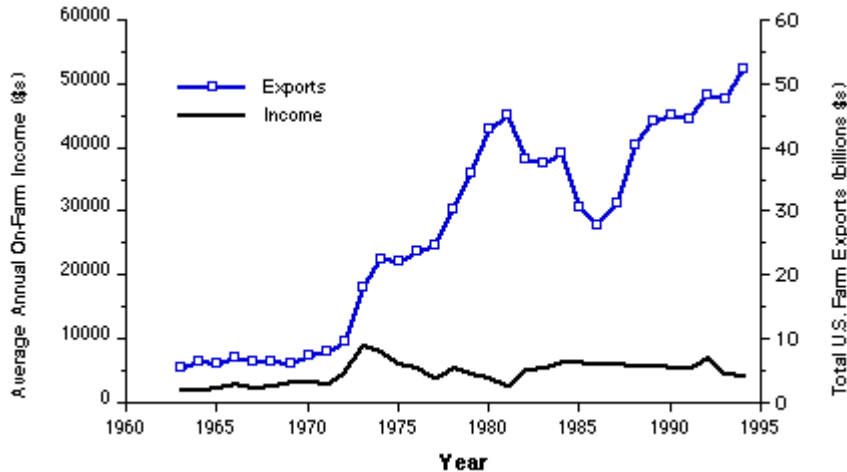


Figure 3. On-Farm Income of the Average U.S. Farmer vs. Total U.S. Farm Exports, 1963-1994.
 Sources: Farmer income--Economic Research Service, U.S. Department of Agriculture, Current and Historic Operator Household Income Tables. Exports--Food and Agriculture Organization, FAOSTAT Agriculture Data.

This represents the single gravest threat faced today by the world's rural peoples and ecologies. The further "liberalization" of trade in agricultural products would mean greater freedom for the big to drive out the small, for forcing people everywhere to depend on distant global markets—with unpredictable price swings—for the daily meals, another mass exodus from rural areas and the further growth of cities, and could lead to the final triumph of inefficient and ecologically destructive monocultures over ecologically rational and sustainable farming practices.

There is less than unanimous support among the world's nations for the U.S position. A number of countries have taken up the call made in Chapter 14 of Agenda 21, the declaration drawn up at the 1992 Earth Summit in Rio, that "agricultural policy review, planning and integrated programming [be carried out] in the light of the multifunctional aspects of agriculture, particularly with regard to food security and sustainable development."

According to this viewpoint, agriculture produces not only commodities, but also livelihoods, cultures, ecological services, etc., and as such, the products of farming cannot be treated in the same way as other goods. While a shoe, for example, is a relatively simple good whose world price can be set by supply and demand, and the trade in which can be regulated through tariffs or de-regulated by removing them, not so for farming, whose roles are far more complex.

The Japanese government, in a preparatory document for the Seattle negotiations, put it this way (Permanent Mission of Japan, 1999):

Agriculture not only produces/supplies agricultural products, but also contributes to food security, by reducing the risks caused by unexpected

events or a possible food shortage in the future, to the preservation of land and environment, to the creation of a good landscape and to the maintenance of the local community, through production activities in harmony with the natural environment. All of these roles are known as the "multifunctionality" of agriculture.

The multifunctionality of agriculture has the following characteristics: (a) Most aspects of multifunctionality are regarded as economic externalities and it is difficult to reflect their values properly in market prices. Though it is closely related to production, it cannot be subject to trade; (b) Market mechanisms alone cannot lead to the realization of an agricultural production method that will embody the multifunctionality of agriculture.

Norway has also endorsed the concept of multifunctionality as the basis for special treatment of farming for reasons of environmental protection, food security and the viability of rural areas (Norwegian Ministry of Agriculture, 1998), as has the European Union to some extent (European Commission, 1999), and as have some other countries.

As an expert in small farm production, I completely endorse this view. Ignoring the multiple functions of agriculture has caused untold suffering and ecological destruction in the past. The time is long overdue to recognize the full range of contributions that agriculture—and small farms in particular—make to human societies and to the biosphere. Farms are not factories that churn out sneakers or tennis racquets, and we cannot let narrow arguments of simple economic expediency destroy this legacy of all human kind.

I call on the world's civil society to demand that our governments respect the multifunctionality of agriculture and grant each country true sovereignty over food and farming, by stepping back from free trade in agricultural products. Instead of deepening policies that damage small farms, we should implement policies to develop small farm economies. These might include genuine land reforms, tariff protection for staple foods—so that farmers receive fair prices, and the reversal of biases in policies for credit, technology, research, education, subsidies, taxes and infrastructure which unfairly advance large farms at the expense of smaller ones. By doing so we will strike at the root causes of poverty, hunger, underdevelopment and degradation of rural ecosystems.

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