

## **Small farms as a planetary ecological asset**

### **Five key reasons why we should support the revitalization of small farms in the global South**

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The Via Campesina has long argued that farmers need land to produce food for their own communities and for their country and for this reason has advocated for genuine agrarian reforms to access and control land, water, agrobiodiversity, etc, which are of central importance for communities to be able to meet growing food demands. The Via Campesina believes that in order to protect livelihoods, jobs, people's food security and health as well as the environment, food production has to remain in the hands of small scale sustainable farmers and cannot be left under the control of large agribusiness companies or supermarket chains. Only by changing the export-led, free-trade based, industrial agriculture model of large farms can the downward spiral of poverty, low wages, rural-urban migration, hunger and environmental degradation be halted. Social rural movements embrace the concept of food sovereignty as an alternative to the neo-liberal approach that puts its faith in an inequitable international trade to solve the world's food problem. Instead, it focuses on local autonomy, local markets, local production-consumption cycles, energy and technological sovereignty and farmer to farmer networks.

Being a global movement, the Via Campesina has recently brought their message to the North, partly to gain the support of foundations and consumers, as political pressure from a wealthier public which increasingly depends on unique food products from the South marketed via organic, fair trade, or slow food channels could marshal the sufficient political will to curbe the expansion of biofuels, transgenic crops and agroexports and put an end to subsidies to industrial farming and dumping practices that hurt small farmers in the South. But can these arguments really captivate the attention and support of northern consumers and philanthropists? Or is there a need to come up with a different argument, one that emphasizes that the very quality of life and food security of the populations in the North depend not only on the food products but in the ecological services provided by small farms of the South. In fact it is herein argued that the functions performed by small farming systems still prevalent in Africa, Asia and Latin America, in the post peak oil era that humanity is entering, comprise an ecological asset for humankind and planetary survival. In fact, in an era of escalating fuel and food costs, climate change, environmental degradation, GMO pollution and corporate dominated food systems, small, biodiverse, agroecologically managed farms in the Global South are the only viable form of agriculture that will feed the world under the new ecological end economic scenario.

There are at last five reasons why Northern consumers should support the cause and struggle of small farmers in the South:

## **1. Small farmers are key for the world's food security**

While 91% of the planet's 1,5 billion hectares of agricultural land are increasingly being devoted to agroexport crops, biofuels and transgenic soybean to feed cars and cattle, millions of small farmers in the developing world produce the majority of staple crops needed to feed the planet's rural and urban populations. In Latin America, about 17 million peasant production units occupying close to 60.5 million hectares, or 34.5% of the total cultivated land with average farm sizes of about 1.8 hectares, produce 51% of the maize, 77% of the beans, and 61% of the potatoes for domestic consumption. Africa has approximately 33 million small farms, representing 80 percent of all farms in the region. Despite the fact that Africa now imports huge amounts of cereals, the majority of African farmers (many of them women) who are smallholders with farms below 2 hectares, produce a significant amount of basic food crops with virtually no or little use of fertilizers and improved seed. In Asia, the majority of more than 200 million rice farmers, few farm more than 2 ha of rice make up the bulk of the rice produced by Asian small farmers. Small increases in yields on these small farms that produce most of the world's staple crops will have far more impact on food availability at the local and regional levels, than the doubtful increases predicted for distant and corporate controlled large monocultures managed with such high tech solutions as genetically modified seeds.

## **2. Small farms are more productive and resource conserving than large scale monocultures**

Although the conventional wisdom is that small family farms are backward and unproductive, research shows that small farms are much more productive than large farms if total output is considered rather than yield from a single crop. Integrated farming systems in which the small-scale farmer produces grains, fruits, vegetables, fodder, and animal products out-produce yield per unit of single crops such as corn (monocultures) on large-scale farms. A large farm may produce more corn per hectare than a small farm in which the corn is grown as part of a polyculture that also includes beans, squash, potato and fodder. In polycultures developed by smallholders productivity in terms of harvestable products per unit area is higher than under sole cropping with the same level of management. Yield advantages can range from 20 percent to 60 percent, because polycultures reduce of losses due to weeds, insects and diseases and make a more efficient use of the available resources of water, light and nutrients. In overall output, the diversified farm produces much more food, even if measured in dollars. In the USA data shows that the smallest two hectare farms produced \$15,104 per hectare and netted about \$2,902 per acre. The largest farms, averaging 15,581 hectares, yielded \$249 per hectare and netted about \$52 per hectare. Not only small-medium sized farms exhibit higher yields than conventional farmers, but do so with much lower negative impact on the environment. Small farms are 'multi-functional'— more productive, more efficient, and contribute more to economic development than do large farms. Communities surrounded by populous small farms have healthier economies than do communities surrounded by

depopulated large mechanized farms. Small farmers also take better care of natural resources, including reducing soil erosion and conserving biodiversity.

The inverse relationship between farm size and output can be attributed to the more efficient use of land, water, biodiversity and other agricultural resources by small farmers. So in terms of converting inputs into outputs, society would be better off with small-scale farmers. Building strong rural economies in the Global South based on productive small scale farming will allow the people of the South to remain with their families and will help to stem the tide of out migration. And as population continues to grow and the amount of farmland and water available to each person continues to shrink, a small farm structure may become central to feeding the planet, especially when large scale agriculture devotes itself to feeding car tanks..

### **3. Small traditional and biodiverse farms represent models of sustainability**

Despite the onslaught of industrial farming, the persistence of thousands of hectares under traditional agricultural management document a successful indigenous agricultural strategy of adaptability and resiliency. These microcosms of traditional agriculture that have stood the test of time, and that can still be found almost untouched since 4 thousand years in the Andes, MesoAmerica, south east Asia and parts of Africa, offer promising models of sustainability as they promote biodiversity, thrive without agrochemicals, and sustain year-round yields even under marginal environmental conditions. The local knowledge accumulated during millennia and the forms of agriculture and agrobiodiversity that this wisdom has nurtured, comprise a Neolithic legacy embedded with ecological and cultural resources of fundamental value for the future of humankind. Recent research suggests that many small farmers cope and even prepare for climate change, minimizing crop failure through increase used of drought tolerant local varieties, water harvesting, mixed cropping, opportunistic weeding, agroforestry and a series of other traditional techniques. Surveys conducted in hillsides after Hurricane Mitch in Central America showed that farmers using sustainable practices such as “mucuna” cover crops, intercropping and agroforestry suffered less “damage” than their conventional neighbors. The study spanning 360 communities and 24 departments in Nicaragua, Honduras and Guatemala showed that diversified plots had 20% to 40% more topsoil, greater soil moisture, less erosion and experienced lower economic losses than their conventional neighbors.

This points to the fact that a re-evaluation of indigenous technology can serve as a key source of information on adaptive capacity and resilient capabilities exhibited by small farms, features of strategic importance for world farmers to cope with climatic change. In addition, indigenous technologies often reflect a worldview and an understanding of our relationship to the natural world that is more realistic and more sustainable than those of our Western European heritage.

### **4. Small farms represent a sanctuary of GMO free agrobiodiversity**

In general, traditional small scale farmers grow a wide variety of cultivars. Many of these plants are landraces grown from seed passed down from generation to generation,

more genetically heterogeneous than modern cultivars and thus offering greater defenses against vulnerability and enhancing harvest security in the midst of diseases, pests, droughts and other stresses. In a worldwide survey of crop varietal diversity on farm involving 27 crops, scientists found that considerable crop genetic diversity continues to be maintained on farm in the form of traditional crop varieties, especially of major staple crops. In most cases, farmers maintain diversity as an insurance to meet future environmental change or social and economic needs. Many researchers have concluded that variety richness enhances productivity and reduces yield variability. For example, studies by plant pathologists provide evidence that mixing of crop species and or varieties can delay the onset of diseases by reducing the spread of disease carrying spores, and by modifying environmental conditions so that they are less favorable to the spread of certain pathogens. Recent research in China, where four different mixtures of rice varieties grown by farmers from fifteen different townships over 3000 hectares, suffered 44% less blast incidence and exhibited 89% greater yield than homogeneous fields without the need to use.

At issue is the possibility that traits important to indigenous farmers (resistance to drought, competitive ability, performance on intercrops, storage quality, etc) could be traded for transgenic qualities which may not be important to farmers (Jordan, 2001). Under this scenario risk could increase and farmers would lose their ability to adapt to changing biophysical environments and produce relatively stable yields with a minimum of external inputs while supporting their communities' food security.

Although there is a high probability that the introduction of transgenic crops will enter centers of genetic diversity, it is crucial to protect areas of peasant agriculture free of contamination from GMO crops, as traits important to indigenous farmers (resistance to drought, food or fodder quality, maturity, competitive ability, performance on intercrops, storage quality, taste or cooking properties, compatibility with household labor conditions, etc) could be traded for transgenic qualities (i.e. herbicide resistance) which are of no importance to farmers that don't use agrochemicals. Under this scenario risk will increase and farmers will lose their ability to produce relatively stable yields with a minimum of external inputs under changing biophysical environments. The social impacts of local crop shortfalls, resulting from changes in the genetic integrity of local varieties due to genetic pollution, can be considerable in the margins of the developing world.

Maintaining pools of genetic diversity, geographically isolated from any possibility of cross fertilization or genetic pollution from uniform transgenic crops will create "islands" of intact germplasm which will act as extant safeguards against the potential ecological failure derived from the second green revolution increasingly being imposed with programs such as the Gates-Rockefeller AGRA in Africa. These genetic sanctuary islands will serve as the only source of GMO free seeds that will be needed to repopulate the organic farms in the North inevitably contaminated by the advance of transgenic agriculture. The small farmers and indigenous communities of the Global South, with the solidarious help of scientists and NGOs, can continue being the creators and guardians of a biological and genetic diversity that has enriched the food culture of the whole planet.

## **5. Small farms cool the climate**

While industrial agriculture contributes directly to climate change through no less than one third of total emissions of the major greenhouse gases — Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O), small biodiverse organic farms have the opposite effect by increasing the sequestration of carbon in soils. Small farmers usually treat their soils with organic compost materials which absorb and sequester carbon better than soils that are farmed with conventional fertilizers. Researchers have suggested that the conversion of 10,000 small to medium sized farms to organic production, would allow to store so much carbon in the soil that it would be equivalent to taking 1,174,400 cars off the road.

Further climate amelioration contributions by small farms accrue from the fact that most use significantly less fossil fuel in comparison to conventional agriculture mainly due to a reduction of chemical fertilizer and pesticide use relying instead on organic manures, legume-based rotations and diversity schemes to enhance beneficial insects. Farmers that live in rural communities near cities and towns and linked to local markets, avoid the energy wasted and the gas emissions associated with transporting food hundreds and even thousands of miles.

## **Conclusions**

A salient feature of small farming systems is their high levels of agrobiodiversity arranged in the form of variety mixtures, polycultures, crop-livestock combinations and/or agroforestry patterns. Modelling new agroecosystems using such diversified designs are extremely valuable to farmers whose systems are collapsing due to debt, pesticide or transgenic treadmills or climate change, as diverse systems buffer against natural or human-induced variations in production conditions. There is much to learn from indigenous modes of production, as these systems have a strong ecological basis, maintain valuable genetic diversity and lead to regeneration and preservation of biodiversity and natural resources. Traditional methods are particularly instructive because they provide long-term perspective on successful agricultural management under conditions of climatic variability.

Organized social rural movements in the South oppose industrial agriculture in all its manifestations and increasingly their territories constitute isolated areas rich in unique agrobiodiversity, including genetic diverse material, therefore acting as extant safeguards against the potential ecological failure derived from inappropriate agricultural modernization schemes. It is precisely the ability to generate and maintain diverse crop genetic resources that offer “unique” niche possibilities to small farmers that cannot be replicated by farmers in the North condemned to uniform cultivars and to co-exist with GMOs. The “cibo pulito, giusto e buono” that Slow Food promotes, the Fair Trade coffee, bananas, and the organic products so much in demand by northern consumers can only be produced in the agroecological islands of the South. This “difference” inherent to traditional systems, can be strategically utilized to revitalize small farming communities by exploiting unlimited opportunities that exist for linking traditional agrobiodiversity with local/national/international markets, as long as these activities are justly

compensated by the North and all the segments of the market remain under grassroots control.

Consumers of the North can play a major role by supporting these more solidarious and equitable markets which do not perpetuate the colonial model of “agriculture of the poor for the rich”, but rather a model that catapults small biodiverse farms as the basis for strong rural economies in the South. Such economies will not only provide sustainable production of healthy, agroecologically produced, accessible food for all, but will allow indigenous peoples and small farmers to continue their millennial work of building and conserving the agricultural and natural biodiversity on which we all depend now and more so in the future.

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