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CULTURE AND HORTICULTURE IN MEXICO

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Since agricultural development in Mexico has largely failed to alleviate poverty and hunger, there is growing interest in development strategies which have a direct effect on the well-being of the poor. Household gardens are one such strategy which has frequently if sporadically been attempted. I recently spent two weeks in Mexico as a member of a small team evaluating the potential of household gardening for low-income women. I was struck by the contrast between two major gardening patterns, one a part of traditional Mexican agriculture, the other based on a North American model. To assess the potential of household gardens as a development strategy, I first look briefly at the Mexican food and agricultural system. I then discuss the 'two cultures' of gardening and conclude with an examination of the benefit to be derived from a policy fostering traditional style household gardens.

AGRICULTURAL DEVELOPMENT AND THE FOOD CRISIS IN MEXICO

Industrial agriculture in Mexico has several characteristics which have important implications for household gardens: emphasis on increasing production, usually through the use of energy and capital intensive methods highly subsidized by the government, lack of respect for traditional knowledge and practices, ignorance of low-resource small holders and a bias towards better off large holders, and a lack of concern for equity.

The industrial model was established in the early 1940s with President Camacho's commitment to modernize and make Mexican agriculture more productive. Soon after this the Rockefeller Foundation arrived in Mexico to begin an applied research program that would help spawn the Green Revolution based on new high yield varieties of wheat and maize. Impressive increases in yields and total production were achieved between 1940 and 1960, with Mexico even exporting grain in the 1960s, though at a loss. However, these increases have been dependent on irrigation, chemicals, mechanization and credit, all heavily subsidized by the government and largely unavailable

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to the small holder (Cross and Sandos 1981; DeWalt 1985). "Experts" have assumed that poor, small scale farmers know nothing (LaCroix 1985; Wright 1984). This attitude has characterized even those projects which have included on-farm research, an approach which developed rapidly in the 1970s, e.g., the Plan Puebla of CIMMYT (Centro Internacional de Mejoramento de Maiz y Trigo) (Miller 1982).

The Mexican government has not been blind to the failings of the Green Revolution, nor the political problems created by large and growing numbers of hungry people. The SAM (Sistema Alimentario Mexicano), begun in early 1980 under President Lopez Portillo, was an ambitious attempt to restructure Mexican agriculture to meet the basic food needs of the country's rural poor. However, three years later the new de la Madrid administration, under economic pressure, including that for reduction of government programs by the International Monetary Fund, canceled SAM. Its effects during this short period are uncertain, and there is some evidence that many of the benefits that did result were captured by larger growers (Spalding 1984).

Thus, for the past 45 years there appears to have been no successful national alternative to the industrialization of Mexican agriculture, despite its failure to alleviate poverty and hunger. After the brief period of grain exports, the situation reversed in the 1970s and today food imports are firmly established (Cross and Sandos 1981:18-20; Spalding 1984). The Green Revolution did contribute, however, to increases in GNP and other aggregate indicators that make Mexico look in some ways like a developed country. However, this "cannot conceal the fact that development has been more unbalanced in Mexico than it has in many other countries and that the imbalance is growing", with 15% of Mexicans with the most purchasing power consuming 50% of the food, and the bottom 30% consuming 10% (Gonzales C. 1980:202). National Nutrition Institute surveys show that 19 million Mexicans (27% of the population) have daily intakes of calories and protein below the minimum required for health (DeWalt 1985). The diets of the poor are increasingly consisting of unnutritious processed foods like soft drinks and white bread (Dewey 1981; Rama 1985; Spalding 1984). DeWalt (1985) has shown that the tremendous growth in meat consumption in recent years has been largely by the middle class at the expense of the poor. Between 1975 and 1979 about 32% of the corn, wheat and sorghum consumed in Mexico was fed to animals. This development has been supported by a growth in the animal feed processing industry, and in land and other resources devoted to the production of feed grains, notably sorghum. In addition many resources are devoted to pasture and alfalfa production. Yet approximately 25 million Mexicans never eat meat.

In contrast to the established national agricultural policy in support of industrial agriculture, there is also some interest in alternative models which incorporate principles of traditional agriculture (Alcorn 1984; Gliessman et al. 1981). We talked with a number of individuals within and outside of the agricultural establishment who were concerned about the social, nutritional and ecological dangers of industrial agriculture. They expressed interest in or were already experimenting with alternatives to energy and chemical intensive production of cash and export crops on large land units in favor of increased emphasis on food production by small holders based on the principals of traditional agriculture. They saw this as a more efficient way of attacking hunger and poverty which would also reduce dependence on North American technology and capital. This parallels developments in North America itself, and conflicts with the same powerful vested economic and political interests (Youngberg and Buttel 1984).

THE 'TWO CULTURES' OF HORTICULTURE

The promotion of household gardens for the poor has been one response to the failure of industrial agriculture to eliminate poverty and hunger in Mexico. Though frequently undervalued, household gardens, a component of the international development repetoire for more than 25 years, are currently experiencing a renaissance (Bittenbender 1985; Brownrigg 1985; Cleveland and Soleri 1985). Available data on gardens supports the contention that they have great potential for improving food production, nutrition and income of poor households. Household gardens, however, tend to be of two types, paralleling the characteristics of industrial and alternative agriculture outlined above. While many gardens do contain elements of both types, the basic difference between them is usually easily distinguished in the field.

The North American industrial model for gardening was established during the birth of the Green Revolution in Mexico. One of the original large-scale household garden projects was initiated by R. W. Richardson as part of the Rockefeller Agricultural Program in Mexico (Stackman et al. 1967:117-121). It concentrated on introducing vegetables familiar in the United States and

apparently ignored most of the indigenous crops and cultivars as well as indigenous gardening methods. It may have "contributed to Mexico's multi-million dollar export of winter vegetables to the United States" (Bittenbender 1985:647). This approach to household gardens apparently continues to be the one most often adopted by government and private agencies in Mexico. It promotes the use of North American style tools (sprinkling cans, wheelbarrows, sprayers), chemical pesticides and fertilizers, and nonindigenous vegetable cultivars planted in neat rows (see, for example, Uribe Avendano n.d.).

My observations of household gardens in Mexico suggest that those modeled on industrial agriculture may share many of its negative characteristics and may in fact end up bypassing the poor they are usually meant to serve. These gardens are characterized by high energy inputs often subsidized by the government or other development agencies, a lack of respect for local traditional knowledge, and a lack of concern for equity.

In contrast, traditional gardens in Mexico, like many traditional gardens around the world, are mixtures of fruit trees, annual vegetables, herbs, and animals like chickens and honey bees. In addition, household fruit and vegetable production may take place in fields planted primarily with maize and dry beans, and include the collection of squash leaves and "weeds" such as purslane, amaranth and malva. While traditional household gardens in Mexico, especially in dry areas, have been relatively ignored by researchers, what little is known suggests that they help preserve genetic and other natural resources, and provide income and nutrition to the households with a minimum investment in time and other resources (Alcorn 1984; Gliessman et al. 1981). For example, Dewey (1981) found that in Tobasco, fruits and vegetables were not eaten unless grown in the family garden because they were otherwise too expensive to purchase. This is supported by evidence from traditional gardens in other parts of the world (Cleveland and Soleri 1985).

GARDENS AND DEVELOPMENT IN MEXICO

Ecatepec, one of the colonias populares, or slums, of Mexico City, has an extremely difficult environment for both people and plants. It is a low lying area with saline, heavy clay soils, poor drainage, and a short rainy season in the summer. Water must be trucked in and is expensive. We visited two garden projects in Ecatepec.

At the first, a federal agency was promoting the sale of kits consisting of a plastic tarp to cover five large plastic columns, soil to fill them, pesticides, chemical fertilizers, and fungicide coated seeds of North American vegetable cultivars. Vegetables grew from openings in the sides of the columns.

The other project was a hydroponics demonstration for vegetable production supported by a private voluntary organization, and located amidst the houses of the colonia on a large fenced plot. It featured plants grown in gravel in vertical (about 1.5 x 0.3m) black plastic columnar bags, pots or plastic lined raised beds. A plastic covered green house was being used for some plants. Everything was covered with clear plastic sheeting during the dry season to protect the plants from salty, suffocating dust. In the hottest period from March to May, plants had to be watered twice a day. Nutrients were supplied in the form of commercial fertilizers, and the gravel had to be washed with muriatic acid between each crop. A commercial potting soil was used to start seedlings. There were many insect and disease problems and commercial pesticides were applied. Our suggestions that mulch or manure teas might be used to reduce the need for water and chemical fertilizers was deemed inappropriate because the "rules" of the system forbid outside inputs for fear of contaminating the growing environment. All inputs were purchased. The demonstration had been in existence for ten months, but there was no indication that anyone in the community was copying it. The woman in charge of the project site said that the local people knew nothing about hydroponics, and even she herself found it difficult to understand and maintain the system. The project was apparently begun without any evaluation of what residents of the colonia were already doing or whether the system to be demonstrated was economically and physically feasible. We were told by one of the project designers and promoters that to reduce losses and try to make a profit they were planning to begin growing and marketing luxury items such as mushrooms to areas outside the colonia.

In fact, the people of Ecatepec were already gardening, and the majority of houses seemed to have something growing. People showed a great deal of ingenuity and determination in creating and maintaining growing conditions, adapting practices of the countryside to their new and difficult environment. Containers were widely used and ranged from discarded plastic shampoo bottles, tin cans, and concave rocks, to 55 gallon drums which were said to be "not too expensive." Those with just a few plants grew mostly

ornamentals and herbs, and those with larger gardens had more vegetables and fruit trees. Maize, tomatoes, tomatillos, peppers, beans and squash were most common.

In addition to plants grown in containers and the ground, one enthusiastic woman gardener kept chickens in a small house made with recycled materials, and was producing honey in a locally made hive. She purchased soil for the garden and mixed it with kitchen scraps including egg shells and cow manure purchased from a nearby commercial dairy. She was growing orange, pomegranite, and avocado trees from seed in containers and had a small fig tree in the ground. Intermixed with the trees were turnip, celery, carrots, chilis and other vegetable grown from seed, some of which she saved from her own plants. She also gathered several edible "weed" species which took advantage of the better growing conditions at the edges of her garden. There were herbs for medicinal and culinary use, including aloe, rue, coriander, mint and epazote. Many plants were growing in containers on the low, flat roof of the house, or hanging from the wall.

In rural Durango, in north central Mexico, we observed a situation very similar to that in the Mexico city slums. Here another federal agency was promoting home gardens on the North American model. We were taken to several project gardens in two villages consisting of rows of onions, lettuce, carrots, beets, zucchini, strawberries and cucumbers inside the walled yard of the house compounds. Seeds were mostly of North American varieties and the use of pesticides was encouraged. Project personnel complained that women did not know how to use beets and some of the other vegetables being promoted, and on their side, the local women said that they had never been told how to use them. While classes were being conducted on canning excess produce, nothing was being done on inexpensive solar drying.

In many of the same houses that had project gardens, and in most of the other houses in the villages we observed, were thriving traditional mixed gardens. They consisted of pomegranite, lemon, peach, apple and fig trees with maize, beans, squash, pepper, chayote, tomatoes, and many herbs for both medicinal and culinary use, as well as flowers. Indian fig cacti, which produce large, edible fruits and pads were often grown as fences, and mulberry trees were frequent in the yards, providing both shade and fruit. Households with enough space were often growing small patches of maize with pumpkin, squash and other vegetables interplanted. Seed and other planting materials were primarily from the owners' own gardens or other local sources, although some seed provided by the agency promoting gardens had also been used.

During these visits to gardens with the project staff we observed an almost complete lack of exchange between local experience with traditional mixed gardens and what was being extended as "modern" row gardens. The government agency staff consisted of middle class social workers and volunteers who were wives of the agency technicians. Their attitude in the villages was one of social and cultural superiority. The project style gardens were considered efficient and modern, and indigenous practices uninteresting and primitive. It was extremely difficult to ask the village women any questions about their gardens when the agency women were present because the agency women would answer for them, promoting "modern" gardening techniques. When asked what the productive, economic, or nutritional advantages of project gardens over the traditional garden were, however, project personnel had no information.

A few weeks later in one of the same small villages outside of Durango, I conducted a one day session on planning garden projects with women to improve nutrition and income. Workshop participants were mostly Mexican, with some North Americans, the majority involved in agricultural or nutritional education and extension. The goal was to increase awareness of the needs and resources of low income women, especially appreciation for local skills and knowledge concerning gardens in the design of gardens projects for low income women. Small groups of workshop participants interviewed women in their homes and observed traditional gardens, reporting back to the whole group after a morning and afternoon session. In the morning we focused on economic and nutritional needs of women and their families, and in the afternoon on how to address these needs through projects to initiate or improve gardens. Most of the observations and suggestions reported back from the home visits reflected a cultural definition of gardens based on the North American industrial agricultural model, with little if any knowledge or consideration of possible positive features of traditional gardens. Mixed cropping was seen as a sign of inefficiency and laziness, and a common suggestion was that gardens needed to be more "professionally" organized, with larger inputs of chemical fertilizers and pesticides.

CONCLUSION

At a time when Mexico is suffering severe problems with lack of foreign exchange, massive loan repayments, high population growth rates, and high rates of urban migration, especially to Mexico City, household gardens may be a good national policy. However, they should be promoted in a way that dependencies are decreased rather than increased, and resources conserved rather than squandered. To dismiss traditional gardening techniques in favor of industrial gardens may be to ignore a valuable national resource while increasing cultural, economic and technical dependence on North America. The best features of both traditional and industrial gardens can serve as the basis for the creation of alternative gardens adapted to the particular social and ecological circumstances of individual sites.

The role of agricultural and social scientists could be to help evaluate and improve traditional methods, adapting them to new and sometimes more difficult situations like the Mexico City slums, rather than to introduce "modern" gardens unrelated to local knowledge and needs. The Green Revolution failed to reach the poor and the undernourished of Mexico in part because of a failure to establish this as a major goal. Household gardens may fail in the same way if they make the same mistakes. Because of the powerful cultural influence which the North American model has on Mexico, any transfer of this concept requires an honest appraisal including questions about its sustainability in a future with increasing prices for energy and agricultural chemicals, dependency of low income households on the purchasing power and whims of the middle and upper classes, and the effects on equity of production systems that require inputs beyond the means of the poorest.

One change that would be helpful is in the attitudes of many North American agricultural scientists from land grant universities who, like their counterparts in agronomy, "deny that their work carries the moral responsibilities inherent in political action" (Wright 1984:149). Traditional household gardens in Mexico should be given the attention and respect they are due as a valuable potential resource for horticultural and economic development.

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