

A Research Agenda: The Globalization of the Fresh Fruit and Vegetable System

William H. Friedland and David Goodman

A workshop on the globalization of the fresh fruit and vegetable (FFV) system brought together numerous scholars from around the world at the University of California - Santa Cruz. The FFV system has become truly global as evidenced by (1) the erosion of the seasonality of consumption via international sourcing and (2) the expansion of the product inventory. This has led to the development of non-traditional export agriculture in the Southern Hemisphere, which in turn has had many social, environmental and economic consequences, not all of which are found in all production locations. The distributional segment of the FFV system, where environmental issues dealing with energy intensity and the sheer volume of packaging are becoming ever more important, is dominated by a small number of sizable transnational corporations but the marketing sector seems, in effect, to drive the entire system. There is an increased demand for FFV because of rising levels of health and nutritional education, concern about consuming healthy food, worries about food safety, and the aging of populations in the advanced industrial nations. What emerged from the workshop is a growing recognition of the need to systematize the analysis of the FFV by creating a network of researchers and defining a research agenda which would include more topics, i.e. environmental and ecological conditions, and more disciplines, i.e. transportation geography/economics.

The authors are Professors Sociology at the University of California - Santa Cruz. **William H. Friedland** has been active in the development of the sociology of agriculture having written numerous articles and books on this topic. **David Goodman** has written extensively on the environment and sustainability in Latin America.

Introduction

A workshop on the globalization of the fresh fruit and vegetable (FFV) system was held in December, 1991 at the University of California - Santa Cruz. The Workshop, arising out of an on-going discussion of the growth of fresh fruit and vegetable consumption in advanced industrial countries, was convened by the authors to bring together work already being done in the area as well as to establish a loose agenda for future research. Funding for the workshop was provided by the Graduate Division of the University of California, Santa Cruz and the North-South Center, which helped to facilitate the participation of scholars from outside the US and Europe.

The workshop was organized in three basic segments: production, distribution, and marketing, with additional segments concerned with scientific and technological developments and international regulatory issues and trade agreements. Of the three main segments, the largest and broadest representation was from the production segment. Broad geographic coverage was provided by participants coming from or having conducted research in Mexico, Central America, Brazil, and Chile.

Efforts to include representation from Africa and Asia proved to be unsuccessful. Kenya and Zimbabwe are important locations of production for the European market and Malaysia and Thailand are similarly important for the Japan/Hong Kong market regionally as well as

for some specific commodities targeted to the European and North American markets.

An Examination of Existing Research: The Workshop Presentations

The FFV system has become truly global in the sense that it now involves all continents in a network of production and distribution. The system is, however, unevenly developed with consumption being primarily oriented toward high income industrialized nations, notably in Western Europe, North America, Japan and Hong Kong. In addition, trade in FFV continues to be between these nations or is strongly intra-regional as in the case of the European Community and the emerging North America Free Trade Area. At the same time, the bulk of FFV is produced in the US and the EC countries for their own consumption.

What has extended the system has been (1) the erosion of the seasonality of consumption via international sourcing so that many FFV are now available in consumption markets on a year-round basis, and (2) the expansion of the product inventory. In the first instance, *counter-seasonal* production in the middle latitudes and in the Southern hemisphere has created the development of a category labeled "non-traditional export agriculture" (NTEA) in locations such as Central America, Chile and Argentina, Kenya and Zimbabwe, which now ship melons, green beans, table grapes, soft fruits, and other agricultural commodities to markets that previously did not have such commodities available during winter months. In the second instance, a host of "new" commodities previously unknown or known only to limited ethnic consumers have now become more broadly available. Included in these are dozens of "new" tropical commodities such as carambola (starfruit), fresh lychees, and many others that now can be found in supermarkets

and greengrocers throughout the high-income countries.

The consequences of the production of NTEA are varied but include the following: concerns about the social disruption experienced by indigenous producers as new social relationships are introduced along with new production methods; effects on land tenure; problems arising from the instabilities of contractual arrangements with purchasers of commodities; environmental consequences because of the expansion of the use of agricultural chemicals such as fertilizers and pesticides; changes in household arrangements as a result of the introduction of new divisions of labor between the genders; the development of a new category of entrepreneurs with tenuous stakes in local production prepared to shift production locations and to abandon local commitments; the development of small-scale micro-resistance movements antagonistic to NTEA, and more.

Not all of these consequences are found in all production locations. What emerged from the presentations and the discussions in the workshop was the recognition of the need to systematize the analysis of consequences and to develop a clearer picture of the conditions giving rise to some consequences in certain locations but not in others. In this respect, there was an agreement that systematic *comparative* research was necessary in which the distinct local experiences could be considered more deliberately against those in other locations.

Production is only one part of the FFV system. Another is the distributional segment which is dominated by a small number of sizable transnational corporations. This segment, which is very much in transition, is concentrating economically and the firms within it are characterized by considerable instability with high acquisition rates, as well as a spectacular major bankruptcy, and with still other firms emerging as key players.

Although not covered adequately by the papers that were presented at the workshop, the discussion revealed the considerable importance of environmental issues in the distribution system. Two issues stand out. The first is the recognition of the energy intensity of the distribution segment because of the distances through which FFV commodities are conveyed and the necessity for maintaining a cool chain from producer to consumer. The second has to do with the sheer volume of packaging materials necessary to convey FFV, something which has given rise to *Topfer* legislation in Germany which requires packaging material to be either recyclable or for shippers to pay the cost of removal of the material. Future contributions on these topics would be valuable.

The marketing sector seems, in effect, to drive the entire system. The critical elements have to do with the increased demand for FFV because of rising levels of health and nutritional education, concern about consuming healthy food, worries about food safety, and the aging of populations in the advanced industrial nations. The key actors, however, are the supermarket chains in western Europe, Scandinavia, and North America, which account for the dominant share of household food expenditures. These chains presently handle enormous volumes of FFV which are now recognized as major profit centers in retail food stores. Moreover, the chains (or, as they are referred to in the UK, the "multiples") have become the driving force for quality standards, predictability of delivery schedules, concerns for food safety, and environmental issues. Thus, when a "food scare" occurs, such as with Alar-treated apples or Chilean grapes ostensibly being cyanided, it is the supermarkets that must respond to consumer fears about pesticide residues or other additives perceived as health threats. The market power of the supermarkets and their

sensitivity to consumer demand, both in terms of health and product variety, are key characteristics of the global FFV system that need further study.

Some research presented at the workshop focused on research and development in the FFV sector and the close integration between new directions in plant breeding research and market developments, indicating that scientific and technological issues of the FFV system need to be examined. The integration of plant breeding and market developments is seen, for example, in the concentration of research on such characteristics as quality, uniformity, ease of handling, length of shelf life, and period of availability. Great strides have been made in extending the season length to permit fuller utilization of productive capacity and in response to consumer demand for year-round availability. Equally, with more efficient global transportation and the development of *cool chains*, extended growing seasons lead to intensified competition as the temporal production irregularities which previously segmented markets and defined "windows of opportunity" for counter-seasonal producers diminish.

In pursuing recent developments in plant breeding, several workshop participants drew attention to the increasing application of advanced agri-biotechnologies to FFV. These methods include "antisense" techniques to slow down the natural ripening process and so reduce the perishability and extend the shelf-life of such products as tomatoes, broccoli, and soft fruit. The increasing use of hybrid varieties also was noted. At present hybrid varieties of small-flowered plants are obtained by highly labor-intensive methods of hand pollination, and the transnational seed companies rely mainly on contract arrangements with small farmers in the Far East, especially China and Thailand.

Finally, participants in the workshop reflected on the prospects of converting high external input systems to more environmentally sustainable systems. This discussion was particularly pertinent in view of several case studies presented, which detailed social and ecological disasters in Central America as a result of the excessive use of agrochemicals in monocultural systems.

Proposals for Future Research

Workshop Discussion

One issue discussed by participants focused on what might be referred to as *the boundary problem*. There is an important interrelationship of the FFV system with generalized fruit and vegetable production, only some of which is geared to the *fresh* market. The processing of fruits and vegetables--through canning, drying, freezing, etc.--represents an important set of activities that interrelate to the fresh market segment. At one and the same time, participants want to remain largely focused on the fresh segment but acknowledge that scholars working on the processed segment of F&V can also contribute to our research and the network should be open to their participation.

Another *boundary problem* develops from the interrelations between the global system of fruits and vegetables, on the one hand, and local, national, and regional systems of FFV production and distribution. The latter forms remain important not only because the production of most FFV is still clustered locally, nationally, and regionally, but also because of the numerical preponderance of actors at this level. At the same time, it is the *global* segment that is growing so massively and concentrating so rapidly. The focus should remain on the global segment but monitoring of other more localized developments should be continued.

Another recommendation was that continuity should be maintained because of the value of learning what was going on in different geographical locations and functional systems, and the ways in which these elements interact at macro-level regional and global levels. That is, people researching in specific countries in Latin America need to be kept informed about developments in other countries in Latin America as well as in Africa and Asia. It is useful to see the similarities and differences between production systems in such varied locations as Brazil, Chile, France, California, Spain, Malaysia, etc., and their insertion in global markets. At the same time, researchers in production found that they had inadequate knowledge of the distribution and marketing systems. Information on downstream activities not only provided a better sense of how products produced in their locations were handled but also an understanding about the demands that are put on local producers for "quality."

Two forms of continuity constituting a *network* were agreed upon at this workshop: functional and regional clusters of researchers who would be grouped around common topics of research should be formed; research clusters should be convened from time to time and, more occasionally, the entire network. The regional and functional groups would be constituted on a voluntary basis according to individual interests. The process of establishing research clusters is now underway, with one group of three participants already preparing a research proposal conjoining their interests in production in the Pacific Rim. Several of the Brazilian and US participants, recognizing the importance of the Sao Francisco Valley development project in Brazil, are exploring a coordinated research effort.

Specific Suggestions for Future Research Work

The researchers present at the workshop agreed on a number of principles that should guide future developments of the network.

- A *network* through which research materials, results, and analyses can be communicated rapidly should be actively developed.
- Clustering of researchers should be encouraged, by individual researchers themselves, and to the extent that it is possible, by the workshop convenors. Clusters should determine their own research agendas and their own methods of operating. Clusters should not be dependent on any central or external source for the determination of their agendas.
- Individual researchers and research clusters should be responsible for finding their own research support.
- An *information exchange system* to diffuse research materials to network members and/or to individual participants should be organized. The utilization of trade publications and/or special sections of newspapers and government reports which provide data on various aspects of the FFV system could be very useful if made available to network participants. This could potentially develop as a central distribution facility with a number of originating loci.
- Two gaps exist in the present research. First, at the workshop, continuing reference was made to environmental and ecological conditions indicating that these matters will require much greater attention in the future. Secondly, the length of the cool chains that now exist between production and consumption locations requires the augmentation of the present research by transportation geographers/economists. The cool chains are not only capital intensive but also very energy intensive. A better grasp of the

environmental and economic costs of the chain would be useful to the overall purpose of the network.

- Finally, while each individual and/or cluster should be responsible for seeking funding to facilitate its research, network-wide funding for the shared-information system should be sought.