

ROLE OF CASSAVA IN A DEVELOPMENT PROJECT: THE CASE OF THE "BACK-TO-THE-LAND" PROJECT IN BAHIA, BRAZIL

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Summary

The 'Back-to-the-Land' Project (BLP) is an attempt to develop an organizational model for low-income urban people to improve their conditions by working in agriculture within and around the cities. The BLP was conceived by the College of Agriculture at the Universidade Federal da Bahia, Cruz das Almas. It comprised two modules, one of 15 families, which began in March 1990, and the other of 22 families, which began in October 1993. The BLP is now being extended to other cities in Bahia, with the aim of eventually reaching all 31.7 million indigent Brazilians (4.3 million in the state of Bahia alone) who do not have enough income to purchase even the minimum food necessities.

Choice of crop is fundamental to the success of a development project such as this because it must be appropriate to the conditions of those low-income urban families who return to cultivating the land. The BLP experience confirmed the advantages of cassava as a small farmer crop: it grows well under adverse soil and water conditions and can involve all members of the family, regardless of gender or age.

In Module 1, in which irrigated vegetables were grown, the farmers introduced cassava contingently or as a partial substitute for vegetable crops as a strategy for overcoming shortages of irrigation water. Cassava occupied 10%-90% of the farmers' cultivated areas. In contrast, in Module 2, in which non-irrigated annual or biannual food crops were grown, cassava accounted for 90%-100% of the families' cultivated areas. In the BLP, cassava generated jobs at a lower investment than did vegetable crops, but the latter provided higher incomes and more employment multipliers.

Introduction

Among the major problems of humanity today are urbanization, unemployment, and hunger (Heilbrun 1974; Rodale Press 1981; Shaner et al. 1982; UNDP 1991; World Bank 1985). In Brazil, as in the rest of Latin America, urbanization mostly results from migrations to large

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cities. The nine largest cities in Brazil currently shelter two thirds of the country's population.

These centres attract and/or control the country's economic, political, and cultural resources. As a result, they also attract huge numbers of potential workers, only 70% to 80% of whom they can employ. To survive, the unemployed must create their own jobs in the informal sector of the economy, usually involving small-scale activities in the production and distribution of goods and services.

Poverty in Brazil can be gauged by the number of children and adolescents who come from families whose income is half the minimum wage (US\$32.41 for April 1994). Most of the Brazilians who do not have enough to buy the food that would provide the minimum amount of daily nutrients as recommended by FAO and WHO live in North-East Brazil, south-eastern Brazil, and Bahia. These figures include almost 75% of families living in North-East Brazil, 36% of families in south-eastern Brazil, and 32 million indigents (more than half live in North-East Brazil, and another 14%, i.e., 4.5 million, live in Bahia) (IPEA in 1993).

The poor characteristically live in slums, ghettos, or 'invasion' areas of urban centres. In Salvador (Bahia), for example, 354 zones are occupied by 444 invasions (Souza 1990).

A development policy that aims to eliminate poverty and unemployment through work valorization could (1) combine the Chinese experience of rural urbanization and the U.S. experience of creating jobs in the dynamic high-technology sector, or (2) complement a rural urbanization programme with one of urban ruralization. The second approach was used by the College of Agriculture to develop the 'Back-to-the-Land' Project (BLP) at the Universidade Federal da Bahia.

Background to the Back-to-the-Land Project

The BLP started in March 1990. At first, the objective was to evaluate the effectiveness of agriculture within and around the cities as a policy for confronting urban unemployment. The objective evolved to one of developing an organizational model whereby low-income urban families can improve the quality of their lives by working in agriculture within and around the cities. Two groups, or modules, of families were established. Module 1 was organized in March 1990, with 15 families cultivating irrigated vegetables; and Module 2 in October 1993, with 22 families growing cassava and other annual or biannual food crops. This experience (of 4 years) led to the development of a model in which cassava is a basic crop.

Back-to-the-Land Project Model

Objectives

These were:

- To work with low-income families whose members are unemployed or underemployed. To encourage previously idle family members to cultivate land suitable for agriculture in the city or nearby, thus producing food, receiving an occupation and income, and strengthening family ties.
- To encourage contact with nature.
- To reduce urban violence.
- To use the know-how of urban residents with rural backgrounds.

Methods

- (1) *The Back-to-the-Land Project helps generate well-being.* The actors involved in improving the well-being of low-income families are (a) the farmer or low-income individual; (b) the agency responsible for the project governmental or non-governmental agency such as a church, company, association, union, or even landowners; and (c) the technical team. The components of well-being are food, health, housing, and education, which are obtained through income generated by what the farmer produces and sells. The project's implementation cost is borne by society, but this social cost has, as a counterbalance, the benefits of increased food, employment, and well-being.
- (2) *Initiative for developing the project.* Theoretically, low-income families would be the parties most interested in a project of this nature. They should therefore take the initiative to create such projects. But, their lack of political sophistication means that the initiative must be taken by others outside the immediate community.
- (3) *The agency's role in the project.* The agency responsible for the project has to encourage impoverished families to work cultivable land. By acting as catalyst, the agency can, and should strive to, transfer the responsibility for continuing the project to the families involved as soon as possible. Such action is analogous to pushing a car to start the motor. Because the low-income family lacks the means to gather resources and provide the conditions for implementing the project (e.g., land, inputs, agricultural equipment, including for irrigation, and technical assistance), the agency takes on these tasks. Resources are donated by, or are received through, the agency. Once the families take over the responsibility for the project, the agency will cease giving financial

support but may continue with technical and political support.

- (4) *The project.* Once the decision has been made to create the project in a given community, the agency responsible must (a) approach that community to obtain cooperation, and (b) develop the agronomic aspects of the project, specifying (i) the area of land to be used, (ii) the type of legal contract under which the land is to be used, (iii) the families who are to participate in the project, and (iv) the production project.
- (a) *Land.* Land near or within the city perimeter has a high opportunity cost. Hence, the agronomic project must give high returns (e.g., by growing vegetables) or have a high employment-generating capacity. The land must be within walking distance, that is, within a perimeter of no farther than 5 km from the community involved. There must be an adequate water supply for irrigation, whether a river, creek, underground water, or rainfall. Access to land may be obtained through loan-and-restitution contracts (*comodato*), expropriation, partnerships, leasing, purchase, or donation.
- (b) *Participants.* Low-income families residing in urban areas. Although previous experience in agriculture is not necessary, those who do have experience tend to present themselves more frequently.
- (c) *Agricultural production.* Table 1 presents data from the original project (Module 1) in Cruz das Almas, Bahia, for non-irrigated cassava and irrigated vegetables (coriander, green onions, lettuce, green peppers, tomatoes, and carrots). The net income per family from vegetables (US\$6563) is three times that from low-cyanide cassava (US\$2198) and eight times that from high-cyanide cassava (US\$827). Nevertheless, cassava cropping creates jobs with about half the investment (US\$313) required for vegetable growing (US\$607). Vegetables require irrigation in dry areas if the producer is to receive a continuous income. In contrast, cassava can produce well under dry conditions.

The Role of Cassava in the Back-to-the-Land Project

Cassava has the following advantages as a component of the small farmer's production system:

- (1) It produces in areas where rainfall and soil conditions are inadequate for most other crops;

- (2) It allows for intercropping, resulting in increased productivity and profits, and soil conservation;
- (3) Its cultivation employs all family members, regardless of gender and age;
- (4) The cultivation cycle has periods of low labour requirements, which frees the family for other activities;
- (5) Few agrochemicals and little mechanization are needed; and
- (6) Harvesting can be done over several months to one year, thus permitting the farmer to have fresh food, which is stored naturally in the soil at no cost, or to programme the uninterrupted sale of processed products (e.g., flour), provided that planting periods are also scheduled.

Initially, cassava was not considered a suitable crop for the BLP production system. Indeed, Module 1 was implemented with irrigated vegetable crops only. Low-cyanide cultivars (called *aipim* in Bahia) for fresh consumption were introduced into the project by the farmers to substitute for vegetables when irrigation was interrupted. Cassava eventually occupied from 10% to 90% of the cultivated area.

In Module 2, based on short-cycle non-irrigated crops, high-cyanide cultivars were used to make flour. This type of cassava occupied 90% to 100% of the area cultivated by each family. The Module 2 farmers were also supported by EMBRAPA-CNPMF through their 'Project for Planting Material Production'. As a result of experience with Module 1, cassava can now be considered as an olericultural¹ crop.

Macro-Economic and Social Impact

The economic impact of a BLP is first seen as increased family income. This becomes converted into added income for the local community within the respective county. However, the impact remains local, because the project involves only the family as the work force, who, in turn, sell and spend only within its local community (or county).

The economic impact of the BLP on the local economy was estimated by income

1. Olericulture is a branch of horticulture that deals with the production, storage, processing, and marketing of vegetables.

and employment multiplier effects (Table 2). The estimates were based on the economic base theory (Tiebout 1962), and assuming that about 30% of cassava production and 15% of vegetable production (author's estimates) within the county are exported to other counties and states.

The income and employment multiplier for cassava is 2.3 (70:30), considering that 70% of the cassava produced in the local economy is not exported. The multiplier for vegetables is 5.6 (85:15). The families increase the local community's income by cultivating vegetables, and low- and high-cyanide cassava (data not shown). Both vegetable and cassava growing can create jobs, although cassava cropping can create twice as many jobs as can vegetable growing per unit of investment (Table 1). The major impact of the BLP then is to allow the low-income, unemployed, and underemployed people to integrate into a broader socio-economic scenario.

Further Aspects of the 'Back-to-the-Land' Project

The potential role of urban agriculture

Today, 75% of Brazil's population live in cities, and more than 90% will be urban dwellers by year 2000. Urban agriculture (i.e., agriculture in and around the cities) will permit many of these people to have a better life by producing food, flowers, and seedlings that will generate income. Even at the individual level, urban farmers will benefit from the therapeutic effects of direct contact with nature, of a more constructive leisure and recreation time, and of focused activity. By participating in a productive social group, the once-destitute can rise to true citizenship.

Access to land can be obtained through leasing, partnerships, loan-and-restitution contracts (*comodato*), expropriation, purchase, or donation. The low-income families are usually aware of, but do not have, the possibility of returning to the land, even if in an unconventional way. Society, on the whole, does not offer this alternative, which is not even a research question. Even if low-income families were aware, too frequently they lack either the initiative or the incentive to take advantage of this alternative.

In contrast, in countries such as USA and Hungary, urban agriculture is well developed even though their populations do not depend on urban agriculture for food or as a source of income. In USA, for example, the National Gardening Association, a non-profit organization founded in 1972 and maintained by 250,000 members, publishes a monthly magazine, provides an information service, and gives discounts on relevant books and equipment. More than two million American families produce their own food, sharing resources such as land, water, and seeds. According to a survey conducted by the Gallup Poll,

of the more than 12 million urban families, about nine million would participate in community agriculture if land were available.

Even though, in many parts of the world, some stigma is attached to agricultural work, the high costs of living, hunger, and the possibility of obtaining food from a reliable source are motivating people to take up urban agriculture.

Leisure

Cultivating the land is a form of leisure that has economic and ethical significance. Economic, because leisure in this case results in a by-product that can be consumed by the family or sold.

This contrasts with the type of leisure where the family must spend part of its income to participate. In USA, community vegetable gardens can be two to four times more productive than commercial farms. According to the National Gardening Survey, a family with a 70-m² plot can economize US\$500 a year on food. For the BLP, this figure amounted to US\$250. Ethical, because returning to the land presents an opportunity to improve individual and community behaviour.

Urban agriculture is the most popular outdoor leisure activity in USA, being practised by groups such as neighbours, the elderly, children, handicapped, and factory employees. Community vegetable gardens are grown in parks, hospitals, prisons, residential projects, and vacant urban lots.

Role of the University

The BLP is a living laboratory in which social reality is being transformed through teaching, research, and extension. Through this project, low-income families, marginal to society, receive the opportunity to support themselves with dignity. As well as conducting research, university staff and students can teach and provide technical assistance to low-income urban families on aspects of fertilization, soil conservation, irrigation, olericulture, plant pathology, rural economics, and rural sociology. Such integration stimulates the University to develop action research, that is, to become involved in the social reality of Brazilian life, and develop practical means of transforming that reality for the better.

The University's role in large-scale extension

Knowledge accumulated so far from the BLP suggests that a small or medium-sized city can create, relatively quickly, opportunities for employing thousands of poor people. The success

of such enterprises depends on the agencies responsible using available information effectively and efficiently when planning and executing these projects. This information can and should be gathered by the University, who should then transfer it to extension entities.

Conclusions

For the conditions of Brazilian cities, projects such as the BLP can succeed in creating productive occupation for unemployed low-income families, thus promoting improved well-being, not only of the families, but also of the community. Experience with the BLP shows that, from an agro-economic viewpoint, vegetables and cassava are suitable crops for this type of development project. Cassava cropping contributes most to the BLP's major objective: to create jobs as a means of generating social well-being.

Bibliography

- Bernardo S. 1982. Manual de irrigação. Imprensa Universidade Federal de Viçosa, Viçosa, AL, Brazil.
- Comastri JA. 1986. Topografia. Imprensa Universidade Federal de Viçosa, Viçosa, AL, Brazil.
- Heilbrun J. 1974. Urban economics and public policy. St. Martin's Press, New York.
- IPEA (Instituto de Planeamiento Económico y Social). 1993. O mapa da fome no Brasil: Subsídios a formulação de uma política de segurança alimentar. Brasília, DF, Brazil.
- Jatobá J. 1985. Política de emprego para o nordeste. Editora Massangana, Recife, PE, Brazil.
- MIRAD (Ministério da Reforma e do Desenvolvimento Agrário). 1985. 1o plano nacional de reforma agrária da nova república - 1o pnra. INCRA, Divisão de Reprodução Documental DAV-3, Diretoria Administrativa, Brasília, DF, Brazil.
- Nyrop RF, ed. 1983. Brazil, a country study. U.S. Government Printing Office, Washington, DC.
- Pfefferman G; Webb R. 1983. Poverty and income distribution in Brazil. World Bank, Washington, DC.
- Rodale Press. 1981. Empty breadbasket? Cornucopia Project of Rodale Press. Emmaus, PA, Brazil.
- Sampaio Y; Ferreira J. 1977. Emprego e pobreza rural. Curso de Mestrado em Economia-CME-PIMES. Universidade Federal de Pernambuco, Recife, PE, Brazil.
- Shaner WW; Philipp PF; Schmehl WR. 1982. Farming systems research and development. Westview Press,

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Boulder, CO, USA.

Soares RM. 1988. Urban planning in Brazil. Oxford Polytechnic, Oxford. (Typescript.)

Souza AM. 1990. Invasões e intervenções públicas: Uma política de atribuição espacial em Salvador, 1946-1989. M.S. thesis. Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil. (Typescript.)

Tiebout CM. 1962. The community economic base study. Supplementary Paper No. 16. Committee for Economic Development, New York.

UNDP (United Nations Development Programme). 1991. Human development report. United Nations, New York.

World Bank. 1985. World development report 1985. Oxford University Press, New York.

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Table 1. Cassava and vegetable enterprise per 100 families, 'Back-to-the-Land' Project, Cruz das Almas, BA, Brazil, 1990.

Item	Quantity or value		
	Cassava I ^a	Cassava II ^b	Vegetables
Area (ha)	47	47	20
Number of families	100	100	100
Number of persons	700	700	700
Number of members per family working in the project	2	2	2
Investment (US\$)			
Land	470.00	470.00	200.00
Irrigation equipment	--	--	941.84
Fencing	41.90	41.90	17.83
Land preparation (clearing, ploughing, disking, liming, and fertilizing)	106.01	106.01	45.11
Farming equipment (cart, wheelbarrow)	9.09	9.09	9.09
Investment per family (US\$)	627	627	1,213
Investment per job created (US\$)	313	313	607
Annual net income (US\$)	827.40	2,198.43	6,562.80
Annual net income per family (US\$)	827	2,198	6,563
Time (years) for repaying investment, using 15% of annual net income	5	1.9	1.2

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- a. Cassava cultivar with high cyanide contents.
- b. Cassava cultivar with low cyanide contents.

SOURCES: Unpublished data from the Centro Estadual de Abastecimento (CEASA), Bahia; unpublished data from CNPMF/EMBRAPA; author's calculations.

Table 2. Income and employment multiplier effects of cassava and vegetable production per 100 families, "Back-to-the-Land" Project, Cruz das Almas, BA, Brazil, 1990.

Effect	Cassava I ^a	Cassava II ^b	Vegetables
a. Income multiplier	2.3	2.3	5.6
b. Annual net income (US\$)	827.40	2198.43	6562.80
c. Non-exported annual net income (US\$)	579.18	1538.90	5579.23
d. Employment multiplier	2.3	2.3	5.6
e. Number of family workers in the non- export sector	140	140	170
f. Number of jobs created in the local community (d x e)	322	322	952

a. Cassava cultivar with high cyanide contents.

b. Cassava cultivar with low cyanide contents.

SOURCES: Table 1; author's calculations.