Community-based land reform in Brazil: assessing the selection process

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Community-based land reform in Brazil: assessing the selection process[1]

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Abstract

This article addresses a particularly relevant issue for the sustainability and effectiveness of agrarian reform policies: the selection of beneficiaries. The study is part of an evaluation of *Cédula da Terra* Community-Based Pilot Program, which presents a radical shift from traditional expropriation-distributing land reform approach. The Program rationale and the expected results of its governance structure to targeting are presented here. Also, the article provides empirical evidences on how the Program is actually reaching the target population in Brazil.

Key words: Asset distribution; Targeting, Governance structure.

Resumo

O objetivo desse trabalho é analisar o processo de seleção de público alvo (*targeting*) do Programa Cédula da Terra – PCT, com base em uma pesquisa realizada com 222 beneficiários a partir de uma amostra estratificada significativa em nível dos cinco estados da região Nordeste em que o programa está implantado. Para tanto utilizou-se dados da PNAD, filtrados segundo os critérios definidos pela estrutura de governança do programa, visando um pareamento de algumas variáveis relevantes para a estimativa dos parâmetros do modelo *Logit* desenvolvido. Os resultados robustecem as hipóteses de que o processo de seleção do público alvo do programa esteve de acordo com o desenho institucional preconizado *ex-ante* pelo programa, obtidas no estudo realizado por Buainain et al. (1999a, 1999b). Em resumo, não se pode refutar a hipótese de que a Estrutura de Governança do PCT definiu mecanismos adequados de seleção do público alvo dessa forma descentralizada de redistribuição de ativos.

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Palavras-chave: Políticas redistributivas; Seleção de público alvo; Estrutura de governança.

Introduction

During the three last decades Brazilian economy has undergone deep social and economic transformations. Nowadays, a significant percentage of the nation's agricultural and livestock production comes from agribusiness. For a great number of cases the old *latifundia* has been changed towards entrepreneurial management context and production levels have increased considerably. Land tenure systems have also been improved. Notwithstanding, the traditional unequal pattern of land distribution did not change. In this context, the productive transformations, far from alleviating the agrarian problem, have contributed to aggravate it. Land tenure in Brazil is amongst the most unequal in the world.[5]

Poverty is still a striking problem in Brazil. Recent study by Maletta, Buainain & Villalobos (1999) based on the 1996 PNAD (National Households Sample Survey) indicates about 15 million households (37% of the households) and 67 million people (44% of Brazil population) were bellow the poverty line. A more comprehensive view of poverty, using indicators of basic needs, revealed that 48% of households and 56% of the population suffer from deprivation.

According to the same study, the figures are higher in rural areas. Low-income poverty affects 57.5% of rural households and 66.6% of the rural population, i.e. about 4.2 million households, comprising 20 million people.[6] The percentages rise to nearly 72% and 78% respectively, when basic needs are also considered along with income. In other words, from two thirds to three-quarters of the rural people are poor.

Economic restructuring, within a context of low rates of economic growth during the 1990s, has further aggravated social tensions, especially from displaced family farmers and rural landless workers. The latter was severally hit by declining demand for temporary job. In fact, magnitude and visibility of agrarian problems were intensified by the long period of crisis that affected part of Brazilian agriculture

(5) The degree of inequality in farm sizes in Brazil has been always high, and continues to be high. According to data from Agricultural Censuses, the Gini coefficient of land distribution have increased between 1985 and 1996, reaching 0.856 in this last year. A mere 2.8% of all rural properties encompassed 56.7% of the area, whilst 62.2% of properties in the lowest echelon of size represent only 7.9% of the total area considered.

(6) These figures, based on PNAD, do not consider rural areas in the North Region, where an additional 2 million people (some 600,000 households) are suspected to live bellow the poverty line.

since the end of the 1980s, as well as the evident lack of alternatives for landless and jobless.

Within this context, the number of rural conflicts has increased, attracting attention of the Brazilian society to the problem. The Agrarian Reform Program, which had been neglected for years, was revived and has acquired the most important role among the public policies being implemented.

In the last five years, approximately 280,000 families have been settled under the federal agrarian reform program. This figure is greater than the total number achieved during the preceding 30 years (1964/94). The simple expansion of the land reform program was enough to place its efficacy and sustainability into debate, and to generate new policies to restructure land tenure.

1 Agrarian reform current institutional framework

The traditional agrarian reform model can be thought as a three-phased process. The first stage refers to the settlement itself: land acquisition and allocation, physical settlement of families, construction of basic infrastructure (road access, rudimentary lodgings etc), and start up of productive activity (land clearing, crop planting etc.). The second phase is mainly concerned with assisted agricultural development, which comprises technology adoption, search for markets, development of producers organization, post-harvest or product-processing activities and facilities. The third phase is the emancipation: it is reached when settled families can perform as normal farmers, deal with product and credit markets, and cease to be the object of specific Land Reform policies. All phases are strongly regulated by the State, and implementation is heavily dependent on government's intervention, resources and controls.

The main instrument to obtain land in this traditional model is the expropriation for the social interest. Only areas above a certain threshold (15 fiscal modules) and underused for agricultural purpose can be expropriated. According to Teófilo et al. (1998), the traditional approach "is based on the idea that redistribution of land has necessarily a conflictive character, and, therefore, expropriation constitutes the way to force land transfers from the large landowners to landless rural workers". The underlying hypothesis is that the "landowners have no interest in

any negotiated process, which means that all cases end up in the judiciary system, which seizes the property and determines the corresponding indemnity".

The National Institute of Agrarian Reform (INCRA) holds Land Reform implementation in Brazil.[7] INCRA is a huge agency, comprising operating branches in all parts of the country and employing several thousand public servants. The speeding up the process of land reform in the late 1990s has been a real challenge, since most procedures are lengthy and complicate.

Important efforts have been made to streamline INCRA's operation in recent years, and in fact it has succeeded in managing a much larger workload. Part of the success is due to the fact that the Institute has been assigned to a special Land Reform Ministry. In the past, its was subordinated to the Ministry of Agriculture, where Land Reform was often a second priority, after agricultural policy. Also, legislation has been updated in some key issues.[8] In fact, the legislation recently adopted has made it possible to speed up expropriation procedures and cut settlement delays. Cost of expropriated land was also brought down, as land prices have steadily decreased during the decade (Reydon & Plata, 1998).

In spite of considerable improvements in the last years, several studies have highlighted a number of problems that actually hinders current agrarian reform program and the full sustainable development of its beneficiaries (see Buainain et al., 1999; Leite & Palmeira, 1997; and Guanzirolli, 1998). The key points are:

a) **The costs of Agrarian Reform.** Estimates of Land Reform costs vary. Official Government document has given estimates of around R$ 40,000 per family, which are almost certainly exaggerated. A recent study by INCRA with FAO assistance (FAO/INCRA, 1998) came up with a lower figure of about US$ 23,000 for settlements established in 1997, which includes PROCERA (Agrarian Reform Credit Program) and other credit. Other estimate by the FAO/INCRA co-operation project gave even lower figures for the period 1980/95 considered as a whole. According to that study, the average cost (in 1997 dollars)

(7) The legal framework for the agrarian reform is the 1964 *Estatuto da Terra*. While it encouraged large estates and paid little attention to small farms, the *Estatuto da Terra* included important Land Reform legislation, and created the National Institute for Agrarian Reform and Settlement (INCRA) that became to this day the main institutional instrument for Land Reform.

(8) Legislation allowed landowners to delay the process for years through court litigation. They also managed to obtain a compensation payment for the take-over of the land above market prices. Thanks to these legal quirks, the Land Reform process has benefited many landowners. Many traditional absentee landowners ended up richer after their land was taken for Land Reform purposes.

was US$ 15,072, of which US$ 9,625 corresponded to land acquisition, US$ 2,379 to infrastructure, and US$ 3,067 to subsidized credit. All estimates coincide in the high share of land acquisition costs on total Land Reform costs. The Brazilian Constitution mandates payments must be done in long-term bonds, for land, and in cash, for improvements, livestock and equipment. As land markets are far from transparent, especially in *latifundia* areas, prices do not always reflect the opportunity costs of land and capital expropriated. No precise figures exist, but many commentators suspect prices are somewhat inflated by the very process of land acquisition and the subsequent litigation. Buainain, Silveira & Teófilo (1998) sustain that transaction costs embedded in the expropriation mechanism may increase land prices to up three times its market value.

b) **Natural Resources Endowments and Infrastructure**. Recent FAO/INCRA study (FAO/INCRA, 1999: 52)[9] on the determinants of the success of agrarian reform settlements in Brazil has pointed natural resources endowments and lack/insufficient infrastructure – especially secondary and local roads - as crucial elements for the development of settlements.[10] "Natural resource basis is the main factor restraining settlements development. Productive capacity of most unsuccessful settlements is seriously restricted by poor natural resource endowments". In the expropriation model, INCRA is responsible for selection of land to be expropriated. Brazilian Constitution protects land under productive use from being expropriated and, as a result, most expropriated areas are "unproductive".[11] Many of these farms are certainly unproductive due to unfavorable economic conditions and owners absenteeism. Holding land for both speculative and patrimonial motives has also been pointed out as a relevant explanation for the subtraction of millions of hectares from productive use. But many farms are kept unproductive because they are not suitable for agricultural exploitation under the prevailing conditions. Land fertility and topography may not be adequate, local infrastructure conditions may be rather deficient, markets may be inaccessible and so on. In recent years land expropriation for agrarian reform purposes seems to be oriented by two main factors: cut land acquisition costs and

(9) The study selected "successful" and "unsuccessful" settlements in 10 states to analyze the factors that have stimulated and hindered the performance of the beneficiaries.

(10) Additional factors pointed out by the study are lack of technical assistance, and absence of both producers associations and political organization.

(11) INCRA uses a set of technical parameters to define whether a farm is productive or unproductive. These parameters are regionally defined.

reduce/overcome social tension in zones of conflict. The latter comprises legalization of illegal occupation of farms by landless rural workers. These illegal occupations are not oriented by an assessment of the land production potential. Therefore, the process of legalization, which implies expropriation by INCRA, does not ensure these lands are suitable for agrarian reform settlements.[12] Though there are no rigorous studies backing up the point, press news often points out that INCRA is expropriating unfertile land. In addition, settlements are mainly concentrating in frontier zones, particularly in the Amazon Region and Northeast Region (respectively, 23% and 42% of total Brazilian settlements, according to Land Reform Census). These areas do not have basic infrastructure and are rather far from dynamic markets. In addition, soils in the North Region are poor, and most areas of the Northeast have high risk of drought. As pointed by Buainain, Silveira & Teófilo (1998: 11), in this system, government is responsible for the whole process, from the identification of the farm to the definition of its price, "while, by law, the community has to pay for it". To sum up, inadequate location and poor natural resource base are relevant factors to explain the difficulties faced in many settlements.

c) **Selection of beneficiaries**. In the past, most beneficiaries were selected directly by the government. This rather bureaucratic approach was subjected to a series of distortions: slowness, political indication of beneficiaries, high cost, and other. In recent years, government's role in the selection of beneficiaries has been considerably redefined. In most cases, it mainly legitimates land takeover by landless rural workers, or previously registered candidates for a plot of land. In spite of substantial, and desirable, participation of potential and actual beneficiaries in the selection process, there are several controversies. On the one hand, agrarian reform opponents argue, but not produce evidences, that doors are open to opportunists who are not in need and have nothing to do with agrarian reform. Additionally, as beneficiaries have nothing to loose in case of failure, this process of selection may attract people that are not familiar with agricultural work. Unprepared and inexperienced beneficiaries undermine the success of many settlements.

While a series of measures have been taken to improve government's controlled agrarian reform, new instruments and approaches have been recently

(12) INCRA do carry out a *inspection* to assess whether the farm is productive or unproductive and suitable for agrarian reform. An unproductive land is seldom classified as inappropriate for agricultural use. Instead of rejecting it, a poor quality farm is just valued at a low price.

introduced to both improve and expand access to land by poor rural families. One of such programs is the *Cédula da Terra*, a pilot project funded by the World Bank, which uses real-estate market mechanism rather than expropriation as instrument of land redistribution.

2 *Cédula da Terra* Program and Efficient Structures of Governance

The Program was launched at the end of 1998 and should benefit approximately 15,000 families at a total cost of US$ 150 million. The Program target population comprises landless rural workers and poor rural farmers with insufficient land to ensure subsistence and sustainable process of capital accumulation. Five states of the Northeast[13] (Bahia, Ceará, Maranhão, Minas Gerais and Pernambuco) have been contemplated in this pilot phase. If successful, it is estimated that the Program could be expanded to other states. This would benefit approximately 50 thousand families per year at a lower cost and greater speed than those of settlements promoted by INCRA.

Program implementation has been considerably disrupted both by the financial crisis, which has required restrictive fiscal police, and the occurrence of the most severe drought in the last 50 years. The question is whether or not *Cédula* may become a valid alternative to traditional INCRA land redistribution scheme. In particular, how the Program performs in those keys issues (cost, selection and sustainability), which have hindered agrarian reform and reduced its positive socioeconomic results. Rather preliminary evaluation of *Cédula da Terra* first year yields enough information to sustain an optimistic view about its potentials. It also suggests a number of weaknesses that, if not properly addressed, could jeopardize its performance.

Several authors are critical of traditional forms of distributing land (which is one of the basic components of rural wealth).[14] Such criticism is largely associated with factors that reduce effort allocation by beneficiaries. There is a paternalistic relationship between government and potential beneficiaries, and property rights are not established. As a result, the structure of governance becomes inefficient.

(13) Brazilian Northeast region is almost entirely located in an arid zone. The evolution of its socioeconomic structure, depleted environment and poor natural endowments lay in the root of bad records of human development, similar to the poorest countries.

(14) For a survey, see Buainain et al. (1998).

Which way is the most suitable to promote land redistribution? It is necessary to reduce rural poverty, overcome the market failures and efficiently allocate incentives for production. Reaching the landless requires a flexible approach and demands not only a new process of land access but also of the selection of an adequate target public.

Based on the specific literature (see Binswanger, Deininger & Feder, 1993, for a survey), it is possible to expect that the decentralized approach will indeed create the necessary conditions for beneficiaries to overcome poverty in a sustainable way. It is also possible to expect financial and operational advantages in comparison with current INCRA intervention. The main characteristics of the *Cédula da Terra* Program are:

a) Contrary to traditional interventions, which are marked by strong authoritarianism, centralization, and bureaucratic paternalism, the *Cédula da Terra* is a decentralized program. It establishes general criteria for the asset redistribution process in a determined region and provides special loan for beneficiaries' own initiatives. There is a limit on price of land acquisition and on the total loan. The decision on land selection, the negotiation of land acquisition, and the definition of agricultural activities to be implemented is left to beneficiaries themselves.

b) The Program is founded on the idea of self-selection of beneficiaries. In other words, the Program does not select participants, but merely defines basic characteristics of potential beneficiaries and access conditions. Then, those interested in getting into the Program would seek it out, being served on a first-come first-served basis.

c) Participation in the Program is collective, not individual, as only associations of farmers can get credits.

d) The asset (land) is not distributed, but sold through an operation of agrarian credit (complemented by other lines of credit) contracted by an association and the Program financial agent. Loan cost follows the evolution of the General Price Index and it must be paid yearly, under the penalty of losing the land. The obligation of payment of the land creates incentives for production and reduces financial institutions monitoring cost.

e) Beneficiaries associations have autonomy to make decisions on both how to use financial resources and specific productive strategy they will follow. They have also to decide how the land will be distributed among families and how

common land and individual parcels will be used. The association assumes financial obligations, which are, in fact, a mutual responsibility of its members.

It is expected these characteristics of the Program would generate incentive and conditions for an efficient and sustainable allocation of resources. Specifically, selection of land and beneficiaries could be improved. We are concerned here with evaluation of the selection of beneficiaries. Under the traditional model, it is difficult to know beforehand the true capacity, interest, and disposition of a candidate. It has been pointed out the strong inefficiency of selection, even in projects that outline rigorous and detailed criteria for the choice of beneficiaries, such as those of colonization and irrigation.

Selection of the target population in programs of this nature presents a clear tradeoff: rigid criteria for identification raise cost, but would reduce, in theory, later monitoring costs. In conditions in which the empowerment process of local communities is not well developed, this process of targeting is subject to bureaucratic interference and the politics of central and local power. A distortion in the selection of the target public can occur, since people who really need to raise their initial endowment, are precisely the least capable of getting into the Program.

These difficulties indicate that the processes of self-selection offer advantages. It is possible to reduced costs on the identification of the target public and post-selection monitoring, and diminishes eventual errors of selection. These arguments would indicate that the process of self-selection, which is implicit in the *Cédula da Terra* Program, would allow overcoming difficulties associated with the State's selection of beneficiaries. The mechanism of acquisition of land via the market opens an opportunity to all individuals previously defined as the target public, subject to a "set of restrictions", such as loan repayments.

It is expected that only candidates, whose profile is suited to take advantage of these opportunities and are disposed to fulfill the obligations, would be able create associations to buy land. As access to the asset happens by way of a mercantile operation, realized in an associative form, only individuals with human capital, previous savings, and adequate knowledge of how to make use of the opportunities would make the decision to get into the Program.

As Bardhan et al. (1998) suggests, formation of groups in the process of self-selection is related to a mechanism of peer monitoring. This reduces the consequent moral hazard, whether in the process of taking credit or in the process of defining the effort that each family will allocate to the success of the project.

While there is an obvious room and pressing need to reform and improve the traditional model,[15] the new approach has yet to prove its consistency, as anticipated by theoretical analyses. We have worked with the hypothesis that there is room and need for both approaches, as they are complementary, rather than competitive.

3 Empirical evaluation of the beneficiary selection process

This section presents an evaluation of the selection of beneficiaries. Data on beneficiaries and non-beneficiaries allowed for an empirical analysis. Descriptive statistics of socioeconomic variables and a logit model are provided. The results obtained are useful to indicate to what extension the process of defining a target public (targeting) was compatible to the Program's goals. Also, they are indicative of corrections.

The data of this study was obtained from two sources: a special survey, which was conducted among beneficiaries during February 1999, and the 1997 National Household Sample Survey (PNAD). The former yields information on 222 representative beneficiaries of the five States where the Program have been held. The latter comprises data on a huge sample of national households and is annually conducted by the Brazilian government. From PNAD data set, we selected the observations of the 5 States where beneficiaries were interviewed. This sub-sample yields information on 36,337 households. From this, we selected 3,413 observations, which have the following characteristics: (a) household head is $\geq$ 18 years old and $\leq$ 60 years old; (b) he/she has agricultural occupation; and (c) household income was $\leq$ R$ 240,00 per month in September 1997. These are characteristics of the target population previously defined by the Program. The set of data (222 beneficiaries and 3,413 representatives of the target population) allowed evaluating how economic and social characteristics are related with the Program selection process, and how these characteristics can affect the Program success.

3.1 Descriptive statistics of beneficiaries

(15) See Villalobos, Buainain & Maletta (1999) for a comprehensive assessment of Brazilian Agrarian Reform Program. In this work, some policy recommendations to improve its performance and sustainability are presented.

The age structure of the beneficiaries is consistent with the expected profile for a program like the *Cédula da Terra*, which requires time and dedication for its full maturation. The average age of the beneficiaries was 39.4 years old (between 37.6 and 41.2, with a 90% of confidence). The majority of them (56.3%) is young, aging between 18 and 40 years old (2.7% with up to 21 years old and 53.6% between 22 and 40). Only 3.8% were over 61. The families were also young; this fact is confirmed by the high percentage of children under 14 (37.8%) in the total number of the family members. This percentage raises to 51.8% if 15 to 20 years old members are included.[16]

Table 1
Beneficiaries' demographic indicators

Indicators	Value	Standard error	Confidence interval(1)	
			Inferior limit	superior limit
Demographic aspects				
Average age (years)	39.4	1.1	37.6	41.2
Men (%)	88.2	2.9	83.3	93.0
Women (%)	11.8	2.9	7.0	16.7
Age				
Up to 21 years old (%)	2.7	(2)	(2)	(2)
From 22 to 40 years old (%)	53.6	4.5	46.3	60.9
From 41 to 60 years old (%)	39.9	4.3	32.8	47.0
61 years old or more (%)	3.8	(2)	(2)	(2)

(1) Interval with confidence coeficient of 90%
(2) The number of observations does not recommend the confidence interval determination

The level of education of beneficiaries is relatively low: 31.7% of the sampled population were illiterate. If we add those that can only read and write (which represents 4.5%), we have a group of 36.2% of the total. The most numerous group (47.1%) attended the first years of school (1st to 4th grade). Few beneficiaries (three observations) had higher education.

Table 2
Beneficiaries' educational level

Indicators	Value	Standard	Confidence interval(1)

(16) Navarro (1998) considers that viability of the Program requires intense participation of young farmers. He raises the criticism that the Program was not attracting young families. Evidences produced on this report do not back up such criticism.

		error	Inferior limit	Superior limit
Educational Level				
Illiterate (%)	31.7	4.0	25.2	38.2
Read and Writh (%)	4.5	(2)	(2)	(2)
Preschool (%)	0.7	(2)	(2)	(2)
1º to 4º year (%)	47.1	4.5	39.7	54.5
5º to 8 year (%)	13.1	3.4	7.5	18.7
College or Superior Education (%)	3.0	(2)	(2)	(2)

(1) Interval with confidence coeficient of 90%.
(2) The number of observations does not recommend the confidence interval determination.

The survey collected information on the occurrence of any chronic disease and its consequent damage to beneficiary capacity for work. An insignificant number of beneficiaries indicated the presence of chronic disease that affected capacity for work on the previous year. This answer must be analyzed with great care, once some beneficiaries could have omitted the existence of some disease. Most mentioned occurrences were related to family members, especially the wives and young children. The main diseases mentioned were associated to blood circulation problems, back pain, allergies and bronchitis.

We made an attempted to trace a detailed profile of the beneficiaries' occupation before getting into the Program, as well as occupational and migration history. Beneficiaries' previous occupation and migration history is a relevant characteristic to differentiate beneficiaries from non-beneficiaries, as will be seem in Section 4.2. The main results are summarized in Table 3.

Almost 90% of the beneficiaries have rural work, 8.5% urban work and 2.6% had both occupations. Since this information refers to the last occupation before getting into the Program, it is not possible to deduce that those who have declared urban work have not had experience with agriculture. However, it is possible to indicate that many beneficiaries were forced to look for occupations in urban areas due to the long period of drought that devastated the region throughout 1998.

The majority of beneficiaries have more than one occupation. The most frequent ones were day-workers, rural producers who work on small parcels of their own land, leased land, or some kind of partnership. Many producers, who were working on own land, were actually working on their father's or father in law's land, or on inherited land without the proper legal ownership. The most common tenure arrangements on dry areas was cession of land in exchange for planted grazing or

palm cactus; it was common to share output on more humid areas. In a few cases of fixed payment, in cash, was observed.

Table 3
Previous occupation of *Cédula da Terra* beneficiaries

Indicators	Value	Standard error	Confidence interval (1)	
			Inferior limit	Superior limit
Beneficiary occupation before adhering to program				
Owner (%)	7.1	2.2	3.5	10.8
Non owner (%)	54.2	3.6	48.3	60.0
Extrativism (%)	7.1	1.8	4.2	10.0
Qualified Activities (%)	6.7	2.0	3.3	10.0
Day-worker (%)	55.5	3.9	49.0	62.0
Emergency Front (%)	5.9	1.5	3.5	8.4
Non-Agricultural Occupations (%)	11.9	3.4	6.4	17.5
Merchant (%)	3.9	(2)	(2)	(2)
Housekeeper (%)	2.0	(2)	(2)	(2)
Special Occupations (%)	2.5	(2)	(2)	(2)
Without Occupation (%)	0.5	(2)	(2)	(2)
Beneficiary of work				
Rural Zone (%)	88.9	2.7	84.5	93.2
Urban Zone (%)	8.5	2.3	4.7	12.3
Rural and Urban Zone (%)	2.6	(2)	(2)	(2)

(1) Interval with confidence coeficient of 90%.
(2) The number of observations does not recommend the confidence interval determination.

It is estimated that 7.1% of the Program beneficiaries are landowners. Most of them were smallholders and *minifundistas* who worked as day-workers, partners and tenants on land of someone else, and even in emergency fronts. Only 2.7% did not have another occupation. The sample registered two retailers: one owned a bar and the other sells cereals.

The group of non-owners comprises 54.2% of the sample, while day-workers are 55.5%. Earnings of the former ranges from R$ 4.50 to R$ 5.50 per

day. It is important to note that nobody have declared to have worked all days of the week. The modal answer was 3 days a week on "good months".

Approximately 12% of the sampled population had non-agricultural activities, in which are included the activities of brick layer, sewer, cabinet-maker, barber, vendor, brickmaker, watchman and tinker. Some individuals of this group were working on rural areas, while others were working on urban one.

The group of "high qualified workers" (tractor driver, driver, herdsman, sawyer) were around 6.7% of the sample. They have worked as non-owner farmers and daily rural workers. Few of them have migrated to other areas, especially to urban areas. Very few have had any experience with any kind of rural enterprise (or even urban) before getting into the Program. Most of them come from rural milieu, their parents were farmers on the same locality or close areas; few have mentioned other professional experience apart from rural worker/producer before getting into the Program. In these cases, it was mentioned: bricklayers, watchman, public official, mechanic help, truck driver and handy man.

We made an attempted to examine income source of beneficiaries before getting into the Program. The difficulties are countless: the beneficiaries do not make a bookkeeping record; most families was in transition from the prior situation to that of beneficiary of the Program; there were many cases of engagement in occasional activities; and the year of 1998 could be characterized as atypical, as production and income have been reduced due to harvest losses or inadequate weather conditions to sow. Also, in 1998, workers had difficulties in finding occupation, having to rely on emergency fronts.

Only monetary gross income could be calculated, as data on input expenditures was not available. Subsistence production, non-declared or non-evident marketed production was not taken into account in the estimation of income. The standard foodstuff package provided by government aid have been converted into monetary value and accounted for their income. This procedure allowed identifying the role of donations to the survival of this population during the years of drought.

Beneficiary average income was of R$ 958.64 for the year of 1998, comprising: income generated by work outside the holding and agricultural activities; financial income; pension; and other income obtained through sale of non-agricultural products and services, commercial activities and machines and equipment hiring. If we take the upper limit of the confidence interval do this average, we have an

average monthly income of R$ 92.00 which is equivalent to 73% of the national minimum wage.

Approximately, a half (between 43% and 52%) of the beneficiary income comes from off-farm work. Income from agricultural activities is the second component in order of importance, contributing with 27% to 40%. Taking the upper limit as a basis for calculation, we would have a monthly income of only R$ 39.00, or less than 1/3 of the minimum wage. This contribution does not represent the typical income from agricultural activities for these people, especially in areas of the states of Ceará, Pernambuco and Bahia, which were strongly devastated by a long period of drought.

Considering all sources of income indicated in Table 4, we estimate a family average income of R$ 2,057.00, in 1998. The average monthly family income was R$ 171.40. Considering that the average number of resident persons in each family is 5.2, a per capita income of R$ 32.90 is obtained. Taking the upper limit, the average annual income would be R$ 2,319.81, with a monthly income of R$ 193.00 per family and a monthly per capita income of R$ 39.00. Considering these values, there is no doubt that the beneficiary population is poor, finding themselves below the poverty line for these states; even if we take into consideration the likely underestimation of income.

Table 4
Beneficiaries' income in 1998

Indicators	Average Value	Standard error	Confidence interval[(1)]	
			Inferior limit	Superior limit
A. Beneficiary's Income (R$)	958.64	118.14	764.89	1152.39
A.1. Off-farm Labor Income (R$)	478.10	74.65	355.67	600.52
A.2. Agric./Livestock Activities' Total Income	340.17	78.03	212.20	468.13
Back yard Production (R$)	34.28	11.91	14.76	53.81
Animal Production (R$)	9.94	4.81	2.06	17.83
Animal hiring (R$)	(v.a.)	(v.a.)	(v.a.)	(v.a.)
Vegetal Production (R$)	221.82	66.82	112.24	331.40
Others Properties and Leased Land (R$)	74.12	39.78	8.88	139.36
A.3. Financial Income (R$)	16.81	17.96	0.00	46.26
A.4. Others Incomes (R$)	93.75	34.42	37.30	150.19
A.5. Beneficiary Pension (R$)	29.82	15.96	3.64	55.99
B. Consort Income (R$)	207.38	48.91	127.17	287.59
C. The others family's income (R$)	891.80	106.63	716.93	1066.67
C.1. Resident members' off-farm income (R$)	245.34	68.83	132.47	358.22
C.2. Family Members' Pension (R$)	145.40	56.93	52.04	238.76

C.3. Others aids received by family (R$)	501.06	61.67	399.92	602.19
Remittance from non resident familiar (R$)	79.21	33.56	24.17	134.26
Donations received by family (R$)	62.68	12.93	41.48	83.88
Social Program Aid (R$)	359.16	47.26	281.65	436.68
D. Family Income I [A + B] (R$)	1166.02	125.03	960.96	1371.08
E. Family Income II [A + B + C1 + C2] (R$)	1556.76	156.33	1300.38	1813.14
F. Family Income III [A + B + C] (R$)	2057.82	159.75	1795.82	2319.81

(1) Interval with confidence coeficient of 90%.
(v.a.) Absent Value.

However, it is important to evaluate whether poverty is a characteristic of the beneficiaries or a prevailing characteristic of the regions where the Program have been implemented. One of the eligibility criteria is low income. To what extent the concern to attend to the poor, by defining eligibility criteria, is not just a trivial fact that arises from regional conditions? This question will be further assessed bellow through the comparative analysis of socioeconomic indicator of *Cédula* beneficiaries and potential beneficiaries of the Program.

3.2 Assessing the selection process through a logit model

A Logit model was used to examine the differences between beneficiaries and non-beneficiaries thus the targeting process could be evaluated. Beneficiary and non-beneficiary socioeconomic characteristics were assessed. The dependent variable is a dichotomous one, which indicates the household group.[17] It assumes a value of 1 if the household is beneficiary of the Program and 0 if it is not (PNAD sub-group). In this binary logit model, the dependent variable, say *y*, is explained by a set of independent variables, which are used as proxies to test for economic and social determinants (see definitions on Table 5). As the parameters of the determinants of being, or not, beneficiary are not usually observable, for each individual *i* we can define a latent variable, y*, as

$$y_i^* = b' X_i + u_i \quad i = 1,..., N \qquad (1)$$

(17) See Maddala (1986) for a reveal on limited dependent variable models.

where Xi denotes a set of independent variables. The observed pattern of being beneficiary can be described by the dummy variable, y. The observed values of y (0,1) are related to y* as follows:

$$yi = 1 \quad if \quad yi^* > 0 \qquad (2)$$

$$yi = 0 \; otherwise$$

and

$$Pr(y_i = 1) = Pr(y_i^* > 0) = Pr(u_i > -b'X_i) = 1 - F(-b'X_i) = F(b'X_i) \qquad (3)$$

where F is the cumulative distribution function for *u* and a symmetric distribution is assumed. Using maximum likelihood procedures, estimates of the ß parameters can be obtained. For the logit model, a logistic distribution is chosen for F(ß′X). In the logit model,

$$\Pr(y_i = 1) = \frac{e^{bX}}{1 + e^{bX}} = \Lambda(b'X) \qquad (4)$$

where Λ denotes the logistic cumulative distribution function.

Missing information has been cut-off, resulting in 3583 valid observations (200 beneficiaries and 3,383 observations from PNAD). The special survey data and PNAD data are not entirely comparable. For this reason, independent variables were defined not only according to some hypothesis on the selection process but also on the basis of comparable data. As we are interested in evaluating the selection process, all data on beneficiaries refers to their condition before getting into the Program. For example, the variable ASSETS refers to their possessions before acquisition of land through the Program credit; as all of them own land after getting into the Program.

Definitions of independent variables

GENDER	Dummy variable indicating gender. It assumes a value of 1 if the head of the household is a woman and 0 otherwise.
MIGRATION1	Dummy variable indicating how long the head of the household has continuously lived in the municipality. It assumes a value of 1 if he/she has continuously lived in

	the municipality for up 4 years, 2 for up 9 years, 3 for up 10 years or more, and 4 since he/she was born.
MIGRATION2	Dummy variable indicating how long the head of the household has continuously lived in the State. It assumes a value of 1 if he/she has continuously lived in the State for up 4 years, 2 for up 9 years, 3 for up 10 years or more, and 4 since he/she was born.
INCOME	Household total income (PCT income benefits were taken out).
ADULTS	Number of members of the household aged between 14 and 60 years old.
CHILDREN	Variable indicating the proportion of school age children in the total number of household members. It is the number of children up to 14 years divided by the total number of household members.
GOODS	Dummy variable indicating stock of durable household goods. It assumes a value of 1 if the household was supplied with a set of durable goods (television, fridge and oven) and 0 otherwise.
ASSETS	Dummy variable indicating stock of assets. It assumes a value of 1 if the household possessed a house, a real state, or land; and 0 otherwise.
EDUCATION	Dummy variable indicating schooling. It assumes a value of 1 if the head of the household is illiterate; 2 if he/she has 1 to 3 years of schooling; 3 if he/she has 4 to 7 years of schooling; 4 if he/she has 8 to 10 years of schooling; and 5 if he/she has 11 years or more of schooling.
VILLAGE	Dummy variable indicating whether household is located in a rural village. It assumes a value of 1 if it is located in a rural village and 0 otherwise.

The results obtained from the fitting of a logit model are presented on Table.[18] Independent variables were controlled to avoid bivariate correlation. The likelihood ratio (LR) was used to test the hypothesis that all coefficients are zero. The restricted log likelihood value is –771.4389 and the unrestricted one is –650.0815. The LR test statistic is therefore 241.7148. With 10 degrees of freedom, the critical value at 5% significance level is 18.31, and so the joint hypothesis that the coefficients on the full set of variables are all zero is rejected. The results of the model estimation are presented in the Table 5.

Table 5
Logit model – coefficients and marginal effects

Variables[(1)]	Coeficients	P (Z>=z)	Marginal effects	P (Z>=z)
Constant	–3.8989	0.00000	–0.12795	0.00000
Migration 1	–0.51246	0.00000	–0.16818E-01	0.00000
Migration 2	0.18019	0.08884	0.59135E-02	0.08870
Village	1.3850	0.00000	0.45454E-01	0.00000
Income	–0.93341E-04	0.25616	–0.30633E-05	0.25732
Children	1.3871	0.00022	0.45523E-01	0.00016
Adults	0.47304	0.00000	0.15524E-01	0.00000

(18) LIMDEP Software Package was used for estimation.

Goods	0.88225	0.00003	0.28954E-01	0.00004
Assets	–1.0393	0.00000	–0.34107E-01	0.00000
Education	0.36885	0.00005	0.12105E-01	0.00005
Gender	0.88639E-01	0.75665	0.29090E-02	0.75697
	Log-Likelihood		Restr. (slopes=0) Log-L	
	–650.0815		–771.4389	

(1) Marginal affects are computed at the means of the variables.

The model assumes some propositions that derive from the declared intentions of the Program formulators, which were presented on section 3. We intend to explore those related to targeting process.

Let us start with aspects related to the beneficiaries past history. The governance structure of the Program was set to select local people, who would supposedly have closer relations with landowners, better access to networks of social relations and information on local market of land.[19] Another desirable characteristic of beneficiaries is "life experience" and leadership, which make them prone to lead with challenging circumstances.

Three variables were used to check this: MIGRATION 1, MIGRATION 2 and VILLAGE. It is assumed that an individual obtains life experience through migration.[20] MIGRATION 1 indicates whether they are locals, according to the length of time they have lived in the municipality. It also allowed examining whether they have migrated around (in the State). MIGRATION 2 indicates whether they are locals at State level and have migrated nationally. The sign of the coefficient of MIGRATION 1 is negative, which means that, an increase in the period lived in the municipality decreases the probability of the individual being in the group of beneficiaries. A positive sign was found for the coefficient of MIGRATION 2, which means that, an increase on the period lived in the State increases the probability of the individual being in the group of beneficiaries. These two variables indicate that the Program is selecting people who are locals at State level, but have migrated around (in the State). Both characteristics are desirable since they are supposed to have better access to information on regional land market, and are more

(19) It should be stressed that the region is characterized by unbalanced land distribution and marked co-existence of large farms and smallholdings.

(20) Menezes (1997) have shown that northeastern rural people, who have migrated to the Southeast Region, have acquired experience in a unionized labor market. Some of them have returned after some years and have become rural workers leaders in the Northeast Region.

integrated to local social networks than outsiders. Also, the fact that they have migrated, even for short distance, means "life experience".

The variable VILLAGE portraits two possible inferences. First, inhabitants of rural villages are supposed to have better access to information and more "life experience" than their counterparts who live on farm; at least at the income level constrain imposed on the sample.[21] The positive sign and high significance of VILLAGE confirms that the Program tends to select the most experienced people among those who are constrained at the income level up to R$ 240.00 per month.[22] Second, inhabitants of rural villages, at this income level constraint, are generally rural workers and landless producers; that is, they are the target population of the Program. The positive sign of the coefficient of VILLAGE confirms that the selection mechanism is working in this direction.

The next step is to examine whether beneficiary previous income is affecting his/her decision to get into the Program. The coefficient of the variable INCOME presented low level of significance, which means that the variable cannot be used to distinguish beneficiaries from non-beneficiaries in this model. In fact, one can say that the sample as a whole is truncated at a low level of income, given that an income limit (R$ 240.00 per month) have been imposed on the sub-sample of non-beneficiaries, which is the same imposed by the selection criterion of the Program. Thus, one could expect that INCOME would not be a good predictor, since the range that was established for variation is short and is at the bottom of the social pyramid. If selected beneficiaries had greater income than the one set up by Program selection rules, a possible result in this model would be a positive and highly significant coefficient. As this is not the model result, one can say that the income selection rule of the Program has been satisfactorily attained.

On question that can be brought into the analysis is whether there is a perception, from beneficiaries and associates, of a desirable family profile. The number of members and composition of the household must be coherent with the double objective of poverty alleviation and project sustainability. Local governments were adopting 'number of family members' as a criterion for selection. The reason

(21) It should be stressed that the sub-sample of non-beneficiaries do not comprise individuals whose income is greater than R$ 240,00 per month, which is the maximum allowed for candidates who wish to apply for the Program benefits.

(22) Thus, the result does not mean they are the most experienced among the whole rural population. Individuals whose income is greater than that limit could have more experience, but they would not be qualified to apply. This hypothesis have not been tested this model.

for this is to benefit a large number of people. Apart of social goals, this selection criterion has some effects on future production achievements of the household. On one hand, a large number of adults could mean the household has enough supply of workforce to succeed. On the other hand, families with a high percentage of school age children would have low supply of workforce and high level of expenditure with non-productive individuals.[23]

Two variables were used in the model to consider the matter: CHILDREN and ADULTS. The coefficients of both were found positive and significant. The conclusion drawn from this is that beneficiary families have larger number of adult members, which is positive for their success, but also have higher proportion of children. The latter could restrain investment during the first years of existence of the settlement, which is a period when capital must be built to increase land productivity. Failure to do so could jeopardize the Program. However, in the future, when children become adults, households will have good supply of workforce.

We were interested in checking whether the Program have selected people who were well off in terms of possessions, productive or not, among the target population. Unfortunately, PNAD lacks good information on the matter. However, the coefficient of two variables (GOODS and ASSETS) could be tested and some inferences were taken. The negative sign of the coefficient of ASSETS indicates that beneficiaries were less endowed in terms of a stock of assets (a house, a real state, or land). The positive sign of the coefficient of GOODS, however, indicates they were not at the extreme bottom bellow the poverty line. These results indicate that the Program have selected people who have not been able to accumulate assets, but had enough income, or prize, to possess a set of household durable goods. The fact that they tend to live in rural villages contributes to explain this. There are easier access to power supply and exposition to modern way of life. Also, better education, as will shown bellow, influences their standard of living and consumption, which is based on a greater range of durable and non-durable goods. For example, a refrigerator allows diversification on food consumption, and TV set allows for better access to information and inducement of consumption of new goods.

A desirable characteristic of the beneficiaries is better education, as it is normally related to efficient agricultural exploitation. Literature has shown that high

(23) It should be stressed that a president of a local producers association mentioned that high number of school age children have been used as a positive criterion of the selection process, given the social aim of the Program.

level of education is correlated with better access to information and social integration (see Souza Filho, 1997, for a review). These are expected characteristics of the Program beneficiaries (being associated is a condition to participate in the Program). The high significance of the coefficient of EDUCATION confirms this hypothesis. Also, it shows that the governance structure of the Program have been able to select people who are in better condition to succeed.

Finally, the model tested whether the selection process is biased with respect to gender. The low significance of the coefficient of GENDER shows that this is not the case here.

Conclusions

The results obtained from descriptive statistics and the logit model confirm that the governance structure of the Program has indeed shaped a distinctive group of "self-selected" beneficiaries. Beneficiaries are poor, but not extremely poor. They have larger families and higher percentage of children in their families than potential beneficiaries (PNAD sample) do. They live in rural villages and work mostly as day paid rural workers and landless small farmers, typically as both.

Analysis of beneficiary profile indicates that they are poor, but not discriminated or excluded from local economy. They have managed to survive at extremely inadequate living conditions. This is a characteristic that differentiates them from typical Northeast migrants who have been forced, by natural, social and economic conditions, to search for alternative occupations in other regions. The logit model confirmed this. The result indicates beneficiaries likely migration pattern is consistent with individuals that migrates within the State searching for occupation, but do not move definitely away from its community.

The coherence of the selection process, confirmed by the analysis above, can be taken as an initial evidence of the relevance of the Program conception and decentralized selection procedures in assigning land property rights to the group. In fact, the analysis of the selection process has shown that beneficiaries are indeed rural poor with some experience and potential to exploit agricultural activities.

The analysis also indicates that beneficiaries have low level of education, although it is greater than the level of the PNAD group. This is a consequence of selecting the poor, and a matter of great concern. In fact, the Program has selected

the most qualified individuals among the poor, which is a great achievement. However, they still have low level of education, which suggests that educational polices and technical assistance should be considered in order to increase the probability of success of the Program.

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