

## **Agricultural household in the context of household surveys and Agricultural Census in Brazil<sup>1</sup>**

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Household surveys have been used by many groups of Brazilian researchers in order to know more about the living conditions of the rural population. The information on agricultural households can also be obtained from the 2006 Agricultural Census, especially in relation to family income and the economic, social and environmental characteristics, for example, of the rural establishment. The purpose of this paper is to evaluate the limits of the data in relation to gaining further information about the agricultural household by starting a discussion about the application of this concept, which is different in each case. To explore it, three kinds of household estimates were prepared: total number of agricultural households; farming income, and off-farm income. In relation to the last indicator, its chief importance is associated with the increase in pluri-activity and the recent income transfer programs applied by the government. It is expected that household surveys are more able to collect off-farm income data while the Census data has better estimates for farming income. With regard to the set of household surveys data available for this type of study, it is customary to use the National Household Sample Survey (PNAD) in Brazil, although the Brazilian Household Budget Survey (POF) 2002-2003 has also been used herein. Lastly, there is a section that discusses the pros and cons of the possible choices and the need for greater conceptual and methodological development of the treatment of mixed-income segments such as the agricultural household.

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## 1 - Introduction

Characterizing the rural population is by no means an easy task, bearing in mind how hard it is to apply its concept to the understanding of spatial boundaries of this population. Undoubtedly the Brazilian countryside is driven by the farming activity, but non-farming activities are becoming more important for this population, reflected in the increase in employment level collected in household surveys (Graziano da Silva, 2002; Del Grossi & Campanhola, 2002). In Brazil, non-farming activities such as rural tourism and exploration of preservation areas focusing on ecotourism still have a low rate of employment and these increases in non-farming employment in these essentially agricultural households are basically concentrated on activities that require few skills, especially in relation to providing domestic services (Basaldi, 2000).

On the other hand, the few essential services provided in the countryside contribute to the farmer glimpsing the possibility of establishing himself in households farther from the countryside and ever closer to the town. Moreover, urban space is also stretching to the rural boundaries, with small farms and country homes, demolishing the notion of spatial differences between these two domains, and become a kind of *continuum*, a phenomenon that is called *rurbanization* (Graziano da Silva, 2002). For example, in São Paulo State, where this process is more intense, data from the last Demographic Census (2000) showed that 64% of occupied people living in the countryside have non-farming activities, while 57% of the group of those with agricultural occupations live in the urban zone (Kageyama, 2004).

In this context of different professional occupations in the countryside and the difficulty of spatially demarcating this territory, the characterization of the agricultural household gains force when it is possible to look at these combinations of farming and non-farming activities in the same family unit or farm. Although these are good reasons for working with the agricultural household universe, the main justification lies in the fact that

in some rural areas the decisions of production and consumption very often cannot be separated and in sequence; in other words, the families are not just families (the household in the Household Surveys) nor are the farms merely establishments (Agricultural Census), but a mix of both, or rather what is called an “agricultural household” (Singh et al., 1986).

There are, however, important issues in demarcating the concept of an agricultural household when using it as a unit of analysis, in the absence of surveys especially designed for this purpose. In this case, its demarcation generally depends heavily on available information and on the subject to be studied, and is therefore not considered a closed criterion. For example, in Brazil this concept is being expanded by researchers to take from this universe in the design of anti-poverty policies and tools to support other social policies (Kageyama, 2003; Schneider, 2003; Hoffmann & Ney, 2008). In general, these researchers define an agricultural household to also include the universe of those employees with this activity, unlike the concept widely used in European countries, whose domain only involves self-employed farmers and employers. In the Brazilian case, perhaps this differentiation is justifiable due to the recent income transfer policies affecting a large number of those occupied in the farming sector.

In Brazil, the agricultural household can be characterized by the household surveys and the Agricultural Census, both under the responsibility of the Brazilian Institute of Geography and Statistics (IBGE). However, there are particularities in the information available in such surveys and a non-convergence of some concepts and characteristics, starting with the investigation unit. Since the household surveys cover the families in particular, their relation with the agricultural census mainly relates then to the units corresponding to the household institutional sector in the sense of national accounts. On the other hand, in the Census we will only look at farms that can be properly associated with the families, leaving out farms with business or corporate characteristics, and which,

apart from that, corresponds to a better approach of the universe corresponding to the “agricultural household” concept.

The farmers' families are family-farm units that combine different functions of production, consumption and even reproduction. The structure of the farming families seems no different from the productive activity in this sector, principally in small farms and in many developing countries, where the farmers require from their own family a large part of the labor. Household surveys portray more clearly this structure and living conditions of this population, compared with the census data or samples surveys of rural establishments, whose main focus would be the productive sector.

The purpose of this study is to discuss and advance the concept of the agricultural household in the Brazilian context, taking into account information available in household surveys and the agricultural census. The idea is also to assess the limitations and potentials of each of these databases in order to characterize this population around the characteristics of income and its composition. We chose income as an element for study because it is present in these two type of surveys, namely, farm and family, and is a key element for characterizing them as units of production and consumption of goods and services.

## **2 - The agricultural household**

In general the arrangements comprising the universe of agricultural households can be summed up as: farmers with access to land but who produce little and work hard in the labor market; others who work hard on their own farm; those whose family works on the farm and who also hire wage earners; and farmers who hire most or all of their workforce. There is also the group of “landless” farmers, for example, extractivist collectors and pickers, honey producers or even farmers who cultivate flood plains and those occupied in producing goods for self-subsistence or for sale in areas belonging to the

owner of the farm where they work. Generally the combination of these universes to define the agricultural household admits conceptual variations, although the Wye Group Handbook works with a concept for OECD countries<sup>2</sup>. This handbook defined an agricultural household as:

- i) broad concept – includes any household that derives some income from agriculture, even when this is the smallest portion of the earnings or allocation of working hours;
- ii) restricted concept – only includes households that depend primarily on agricultural activities for their subsistence, defined as those whose main part of their total income comes from their own activity in agriculture;
- iii) marginal concept – when the main source of income comes from other non-agricultural sources, obtained by subtracting from the universe of households covered by the restricted concept, that which is included in the broad concept (i–ii).

The same handbook suggests obtaining these universes from algorithms based on income and its composition among the household members, although when this information is not available separately for all these individuals, the concept of the head or reference person should be used, this alternative being widely adopted in Europe (Hill, 2009). Another point is that when information cannot be obtained from the main source of income or of the highest expenditure with time allocated to work, the information from the main activity is then used. In this case, two considerations must be made: a) the person who has the largest portion of income in the household is not always the head or person of reference in that household (it depends on cultural aspects and in many countries the elderly are strong candidates); b) the main activity may not be the one that guarantees the highest income or requires more work allocation, although in most cases this is true. On

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<sup>2</sup> The application to countries at different levels of economic development to the concepts and definitions of “agricultural household” and “income” are part of the proposals for a **SUPPLEMENT TO HANDBOOK**

the other hand, there are also benefits in using the concept based on the head and his/her principal activity, since classification by income and its composition in the household tends to be more stable as time goes by.

### **3 – Materials and Methods**

#### **3.1 - Household surveys in the context of an agricultural household**

IBGE produces two household surveys to portray the agricultural household: the National Household Sample Survey (PNAD) on an annual basis; and the Household Budget Survey (POF) held periodically, and when available, includes information of households in 2002 and 2003.

The selection unit of PNAD is the household, which is not necessarily synonymous with family, since one or more family units may live there, although the survey does characterize these two conditions and regards both the household and family or person as units of analysis. PNAD investigates the main and secondary work in the reference week. In the case of this paper herein the survey covered the week of September 24-30, 2006. Two points deserve special attention: i) it does not include occupation and activity of a third party or other work, although it may consider its earnings; ii) it does not include farmers who had other work between harvest in that week of reference, which is very feasible in the agricultural activity because of seasonality. However, PNAD does include those who did not work during the reference week, but who worked in the previous 358 days. Accordingly, this helps enumerate the agricultural household between harvests, but not their farming income during the year<sup>3</sup>.

In relation to income from work, the survey asks about the monthly earnings in the main and secondary occupation/activity. These earnings may be informed in different

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**ISSUES FOR NON-OECD COUNTRIES** appointed in the preliminary suggestions from the 2<sup>nd</sup> Wye Group Meeting, June 2009, Rome.

fields that register the money or value of products or merchandise received. It should be mentioned that the value of such merchandise cannot be considered for self-subsistence, even when addressing the self-employed and employer universe. Self-subsistence can only be assessed as a variable category when asking whether some kind of production was consumed as food on the farm, and whether it was more than half or less the total produced in the month of reference.

PNAD assesses the status of employment, activities and income of all members of the family or household (the monthly income from the main and secondary activity, pensions, allowance, rent, donations, etc.). These earnings are the composition of the total income of the agricultural household, and which may be divided into farming income and off-farm income. Another aspect is that PNAD also includes a farm worker who is allocated some area for his own production by the employer, which in the Agricultural Census corresponds largely to what is called a “landless” farmer, as mentioned in the previous section. Another point is that the reported income is monthly, in the survey’s reference month. Therefore, to obtain annual earnings, information concerning the time worked in the occupation/activity during the year may be used.

On the other hand, the purpose of the Household Budget Survey (POF) is to obtain information about the budget structure of the families, and its investigation is based on the consumer unit, defined as a group of dwellers or a single dweller of the household that share the same food source. Although there is more than one consumer unit in the household, the most common situation is the correspondence of one household for one consumer unit. POF permits an assessment of the main work and other work done by all members of the household, as well as their earnings during the last month. The occupation and activity are registered for all work, primary or not and, using the “position in the

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<sup>3</sup> The survey did not ask about earnings by these people from work that they did prior to the reference week, within the last 356 days. This question permits inclusion of economically active people and perhaps this has

occupation” field the survey investigates the workers in producing for their own consumption in the branch comprising activities in agriculture, forestry, cattle farming, plant extraction, and so on. However, to measure their production for their own consumption, it is necessary to obtain this in POF from the collective expenses records, where the food acquired by their own production is registered.

POF also permits distinguishing the form of remuneration of the work – whether in money or value of benefits (food, clothing, shelter, etc.), and both must be calculated in the same field. However, with regard to the earnings of employers or the self-employed, their value adopts the same line as PNAD, namely, it must be calculated by the takings, deducting the expenses incurred in the economic activity. The value of the takings may be less than the results of the farm in the same period, meaning that any remaining portion of the earnings, reinforcing “cash” from the activity, is not included in the earnings calculated for the family or household. Similarly, takings can be verified even if the farm has a deficit net operating result, when expenses exceed income.

In both surveys, the entry of earnings from the activity of the employer or self-employed (takings) does not give negative values. The values calculated accordingly, therefore, must be considered to be a component of the “income earned” by the family or of the “disposal income”. Unlike those in PNAD, the monthly earnings available in the POF are calculated using the product of the value received in money and/or in benefits in the last month and the number of months when there were earnings within the annual period, divided by twelve. In this case, the monthly income represents a twelfth of the annual income. In some way, this method of using the annual income permits a better adjustment than that of PNAD when addressing agricultural activities, since seasonality is an outstanding feature in the annual production. Moreover, POF goes into the field throughout the year, investigating households at harvest time and between harvests. As in the case of

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been its main purpose.

PNAD, POF permits registering the earnings of each member of the household, whether from each job of individuals, allowances, pensions and government income transfer programs in force in 2003 (school allowance, minimum income, etc.).

### **3.2 – The agricultural census in the context of the agricultural household**

In Brazil, since most agricultural and cattle farming activities are in the household sector, there is a good relationship between the household (family) and the farm and, accordingly, it is reasonable to establish a direct relationship, although a farm may have more than one enumerated household or family and one household more than one agricultural establishment.

One problem of enumerating the establishments and associating them to a household in the agricultural census is the fact that this survey considered that non-continuous areas, even subordinated to the same administration and farmer, when not in the same enumeration area as different farms, to the extent that in the household surveys the two farms are addressed as associated with one household. On the other hand, the Census may provide a closer approximation of the broad concept of agricultural household when it helps identify agricultural households, even if the farming activity is not the principal or secondary activity of any member of the household, and investigates as a rural establishment those families living and occupied on the farm that produced for their own consumption or even for the market. The latter were classified in the Census as “landless farmers”, where around 75% lived on the farm itself, and may be classified as agricultural households. However, even having this specificity with the census data and the problem of establishing univocal relations between family farms and agricultural households, studies in Brazil defend this relationship as almost one-to-one <sup>4</sup>.

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<sup>4</sup> The PNAD (2006) reports that in 99.4% of agricultural households is associated with a single production area. According to the last census survey, around 72% of farmers live on their own farm (Agricultural Census 2006).

The Agricultural Census differs from household surveys in relation to the concept of income and the way in which it was obtained. The concept of income registered in the census adopts the productive viewpoint, calculated by the gross production value (GPV) in the rural establishment subtracted from the current expenses. When calculating income, the GPV is preferable to farm income since it includes the value of the goods produced for own consumption. However, it should be considered that part of this non-commercial production is for intermediary consumption on the actual farm, such as corn and fodder production to feed the animals, for example. So this value was subtracted from the GPV, and is called adjusted GPV. Farming income obtained in this way can be interpreted as “income generated” by the farm. In the census, other revenue of the families was also registered, such as, for example, wages from off-farm activities, allowances, pensions and social benefits.

One particular feature is that if we consider the broad concept of an agricultural household, where there is some income from the farming activity in the household-farm, there would be a considerable number of deficit farmers, whose expenditure is higher than the income, producing a net income that would be negative<sup>5</sup>. These households with negative farming income would, in some way, not even be considered in the broad concept of an agricultural household (some farming income), although they produce and even have some commercial activity with this production.

It may be said that, unlike the other productive activities, agriculture would tend to a negative net income. Undoubtedly, the risk of harvest losses due to agents exogenous to the production process, such as climate, pests and disease that can affect the plants and animals to significantly reduce the GPV. Another characteristic is that the current

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<sup>5</sup> It is important to point out that the variable “animal production value” did not include the variation of inventories from one year to another (investment), and only considers the revenue from animal sales. In this case, some farms will have livestock farming that will have a zero production value, since they did not have income. Even, in the case of positive inventory variations, these values could consequently be included in calculating this variable.

expenses of a farm, principally with a smaller area, cannot be regarded strictly as a kind of intermediary consumption of the farming activity, since many of them are eventually consumed by the family or household itself, such as, for example, the use of electricity, wages paid to relatives, fuel, etc. In this case, elements that would be a kind of mix between the household consumption and inputs for the production activity would be added to the expenses.

Unlike household surveys, when we look at the income obtained from the farming activity on the farm, or rather, in the agricultural household, and the other family income, such as, for example, earnings from off-farm work, pensions, allowances and transfers received through social programs, it is found that the latter are not listed for each member, are the income from the agricultural household as a whole and there is no information that any member received this income.

### **3.3 - Methodological Procedures**

The aim of the article herein was to: a) enumerate the universe of agricultural households according to the different concepts; b) estimate the total and average income for such households, and its composition. However, because of the characteristics and particularities of each survey, the procedures to achieve such results took slightly different routes and used concepts that were presented somewhat differently.

#### **3.3.1 - Enumeration and income of the agricultural households in PNDA and POF**

Although both household surveys permit a look at the composition of the incomes for all household members, in the article herein, the proxy procedure was chosen considering the difference in meaning of the calculated farming income with that of the census (earned income X generated income). Principally the head and his main activity were used as an element to enumerate the agricultural household, when he was self-employed or employer in agriculture in the survey's reference week, in the case of PNAD, and in the last twelve months, in POF. Concerning PNAD, which restricts the universe to

that being investigated in a single week, the individuals were also calculated who did not work during the reference week, but were employers or self-employed in the agricultural activity during the 358 previous days<sup>6</sup>.

First, an agricultural household in the broader sense when at least some work is from farming, either that of the head, considered as proxy of the household's main source of income, or of another family member. The concept of agriculture in the restricted sense, however, only considered the reference person.

It is worth stressing that, in the case of POF, in addition to the self-employed and employer, a group of farm workers was included in production for self-subsistence<sup>7</sup>. With regard to classifying the farming activities, the household CNAE was used (National Classification of Economic Activities), considering the sectors of agriculture, cattle farming, forestry, and related services.

With regard to the information on household income, the aim was to assess the income from the work in agriculture and annual household earnings, excluding pensioner, domestic employee or relative. It is worth mentioning that this household income is the sum of the earnings of all household members, including not only the farming earnings of the self-employed or employer, but also from other work and collections from pensions, allowances and income transfer programs. Therefore, when estimating both agricultural and household incomes, by a difference, we obtain the other household earnings, namely, equivalent to the family's off-farm earnings.

### **3.3.2 - Enumeration and income of agricultural households in the Agricultural Census**

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<sup>6</sup> It must be pointed out that in this case only the main activity is available, and these households were not considered to calculate the income, since the information on income of this activity was not considered in the survey.

<sup>7</sup> This survey considered the "worker in producing for own consumption" as a position in occupation.

First of all, we restricted the universe of agricultural households to those farms whose legal farmer status is of an individual farmer<sup>8</sup>. As in household surveys, the universe of the agricultural household was considered herein, bearing in mind its broad and restricted concept. The main difference here is that incomes were used and not a proxy based on the household head's main activity to apply these concepts. When there was some farming income, the broad concept was adopted, and two income concepts for enumerating all households were used: gross and net income. The former is calculated by adding the adjusted gross production value to the added value of agribusiness, and we deducted the current expenses from this value to obtain the net production value. Therefore, in the broad concept, we considered first the farms with agricultural gross income values higher than zero and then considered only those whose net income was positive.

With regard to the restricted concept of household, the farming income must be the main source of the agricultural household. We therefore restricted it to the universe of the units, whose net income was higher than: a) off-farm wages; b) off-farm income, calculated by adding off-farm wage earnings, pensions, allowances and social program transfers. The interesting fact of these profiles used for agricultural household concepts based on the agricultural census data is that inasmuch as conceptual restrictions are being considered, universes of households will be established with an increasingly intensive agricultural activity in this sector.

Furthermore, the concept of a marginal household was established, the result of the difference in households included in the broad concepts less those considered in the more restricted universe. In complement, we chose to also define and assess the farms whose net income from agricultural activity was negative or zero.

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<sup>8</sup> Therefore, the following categories were excluded from the analysis: Condominium, consortium or society of people; cooperative; limited liability or business corporation; public utility institution; government (federal, state or local) and other status. Moreover we do not consider in the optional universe community exploration farmers that run the farm.

Next, after enumerating these agricultural household universes, we looked at their incomes (total and average). The calculated incomes were: i) net income from the farming activity (adjusted GPV considering the added agribusiness – current expenses); ii) other farm revenue – rural tourism, mineral exploration, processing for third parties, earnings from other non-agricultural activities); iii) off-farm wages; iv) pensions, allowances and social programs; v) and household income (i + ii + iii + iv).

#### **4 - Results**

Table 1 provides information on the enumeration and income of the agricultural households according to the prefixed concepts. Table 2, on the other hand, shows the aggregate average earnings, and the composition of the household average total income. As mentioned above, generally the profiles of an agricultural household, from 1.1 to 2.2, include employers and self-employed increasingly committed to agriculture and cattle farming, which is confirmed in table 2, bearing in mind that as we move within the agricultural household concept, the net income from farming becomes more important in the total income of the household, contrary to what happens with off-farm income. When we only restrict the surplus agricultural households in the universe of positive gross farming income, around 1.4 million are excluded from this concept. It should be mentioned that the number of farms with net income of zero or less is approximately 1.9 million, where they have a negative net income from farming of around US\$ 16 billion.

**Table 1: Enumeration and income of agricultural households in the Agricultural and Cattle Farming Census - Brazil - 2006**

Agricultural Household	Enumeration	Annual Aggregate Income (US\$ million)				Total Household Income
		Net Farming Income	Other farming earnings	Off-farm wages	Pension, allowances & social programs	
<b>1 - Broad Concept</b>						
1.1 - Gross Farming Income > 0	4,363,980	15,440	17	1,992	2,644	20,251
1.2 - Net Farming Income > 0	2,991,689	28,633	85	947	1,677	31,342
<b>2 - Restricted Concept</b>						
2.1 - Net Income > Off-farm earnings	2,797,359	28,408	80	257	1,594	30,339
2.2 - Net Income > Off-farm Income	2,279,574	28,070	73	235	433	28,812
<b>3 - Marginal Concept</b>						
<b>(1.2 - 2.1)</b>	194,330	226	5	690	83	1,003
<b>(1.2 - 2.2)</b>	712,115	563	11	711	1,245	2,531
<b>4 - Net Farming Income &lt;= 0</b>	1,936,233	-16,176	111	1,361	1,136	-13,568

**Source:** 2006 Agricultural and Cattle Farming Census (micro-data)

**Notes:** Net farming income - (Adjusted GPV considering the additional for agribusiness – current expenses)

Other farming income – (rural tourism, mineral exploration, processing for third parties, non-farming activity income)

Off farm income - (income from other non-farming work and pensions, allowance, social programs)

**Note 2:** US\$ 1 = R\$ 2, 1763, currency rate at 07.01.2006

This figure becomes considerably important in the findings, since it is more than half the earnings of households with a net farming income higher than zero (around US\$ 28.6 billion). The result is that when we assess the income in the universe of households with positive gross farming income (including those with surplus and deficit), its added value is lower (US\$ 15 billion). However, here we will only stick to reporting this finding, since it would require a more in-depth investigation of the universe of deficit households, which is outside the subject of this study. It should be noted that this year there was a long drought in the South, reflecting the production of this important agricultural region, which could partially explain the high operational deficit computed by the agricultural census (Production ..., 2007). However, it should be considered that there is some evidence of under-reporting of the income and production figure of the farms<sup>9</sup>, especially those

<sup>9</sup> In the 2006 Agricultural Census we find that 11% of the farms failed to inform production, 7% did not inform expenses and 30% did not inform farming revenue, while in the 1980, 1985 and 1996 Agricultural Censi it was found that only 2% of the farms did not declare production, 5% expenses and 5% revenue. It also corroborates with the hypothesis of under-reporting the fact that the production results of some products, which can be compared with estimates obtained from a supplies balance sheet, based on information of processing, exports, imports and variation in inventories, indicate major underestimate of the census results. Taking soybean as an example, it is found that underestimate would be 30%. It should be mentioned that, in the Brazilian tradition, census results are not calibrated so that its directly reflects the aggregate of the information obtained from each interviewee, unlike other countries, such as the USA (see CENSUS ..., 2009, A-7).

dedicated to cattle farming, in addition to the fact already mentioned that the production figure does not consider the variation in inventories or head of cattle and that farm expenses may somehow be increased by the presence of elements representing the family's general living expenses, and may not necessarily reflect the financial income of the farm.

Another point is that the negative household income figure, which totals more than US\$ 13 billion, cannot reflect the actual living conditions of the families, since such a result is incompatible with a family's reasonable budget. However, since self-subsistence was included, it is up to us to explain further that the agricultural census data would not be accurately and comprehensively registering the off-farm earnings. This argument is corroborated with the results found in the household surveys, which calculated much higher values than those in the Agricultural Census. Although the findings in the household surveys are presented in more detail herein below, it should be mentioned here that, while the off-farm earnings found in the Census are around US\$ 4.6 billion in the broader concept of an agricultural household in PNAD and POF, this figure actually gives values of US\$ 13 and US\$ 20 billion, respectively.

With regard to the marginal concept, it is found that the off-farm wages actually represent 68% of the household income, when essentially assessing households in which the off-farm work is the main source of income. In this case, agriculture is a complementary activity, representing only 22% of its income. Another universe in which agriculture is also marginal is that in which its income is lower than the sum of the off-farm wages and those obtained from pensions, allowances and social programs. In these households, the agricultural activity has the same percentage share as the off-farm wages in the composition of the household income. However, these families mostly subsist from

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pensions, allowances and social programs, namely, 49% of the entire household income, which is quite a significant universe (around 700 thousand agricultural households).

**Table 2: Average Income and annual composition of the agricultural household income - Brazil - 2006**

Agricultural Household	Annual Aggregate Income (US\$ million)				
	Net Farming Income	Other Farm Income	Off-farm Wages	Pension, allowances & social programs	Total Household Income
<b>1 - Broad Concept</b>					
1.1 - Gross Farming Income > 0	3,538	40	457	606	4,641
1.2 - Net Farming Income > 0	9,571	28	316	561	10,477
<b>2 - Restricted Concept</b>					
2.1 - Net Income > Off-farm wages	10,155	29	92	570	10,846
2.2 - Net Income > Off-farm income	12,314	32	103	190	12,639
<b>3 - Marginal Concept</b>					
(1.2 - 2.1)	1,162	23	3,551	427	5,164
(1.2 - 2.2)	791	16	999	1,748	3,554
<b>Composition of Annual Income (%)</b>					
<b>1 - Broad Concept</b>					
1.1 - Gross Farming Income > 0	76.23	0.86	9.85	13.06	100
1.2 - Net Farming Income > 0	91.35	0.27	3.02	5.35	100
<b>2 - Restricted Concept</b>					
2.1 - Net Income > Off-farm wages	93.63	0.27	0.85	5.26	100
2.2 - Net Income > Off-farm income	97.43	0.25	0.81	1.50	100
<b>3 - Marginal Concept</b>					
(1.2 - 2.1)	22.50	0.45	68.76	8.27	100
(1.2 - 2.2)	22.26	0.45	28.11	49.18	100

Source: 2006 Agricultural & Cattle Farming Census (micro-data)

Notes: Net farming income - (adjusted GPV considering the additional of agribusiness – current expenses)

Other farming income – (rural tourism, mineral exploration, processing for third parties, non-farming income)

Off farm income - (income from other non-framing work and pensions, allowances, social programs)

Note 2: US\$ 1 = R\$ 2, 1763, currency rate at 07.01.2006

It is interesting that of the total US\$ 2.7 billion calculated as income from pensions, allowances and social programs, around US\$ 1.2 billion was distributed to these marginal households, while approximately US\$ 1.1 billion was allocated to households whose farming net income is zero or less (deficit). In other words, both households collect around 90% of the government transfers. This result partly reveals that the rural retirement and other income transfer programs are an effective tool against poverty in the countryside, since a lot of the resources reach especially families that find it hard to subsist just from their work.

Table 3 enumerates the agricultural households according to the concepts and earnings based on the household surveys. It must be mentioned that, contrary to the analysis based on agricultural census data, the concept of an agricultural household used in the household surveys was not based on farming income and its comparison with other incomes as a key element for demarcating the agricultural household universe but rather the main activity, such as self-employed and employer in agriculture as proxy of the income received from agriculture. Accordingly, when some household dweller was self-employed or an employer in agriculture, the household was considered to be agricultural in the broad concept, which is very close to the broader concept of an agricultural household considered by the Census. It is found that the enumerations are quite close, 4.36 million in the Census and 4.25 and 4.42 million in PNAD and POF, respectively. It is worth mentioning that POF had a higher number of households, since the survey, unlike PNAD, directly registered the work over the last 12 months, in addition to collecting throughout the year, including households whose employer or self-employed are away in the between-harvest period.

When we consider only the main farming activity of the head (restricted concept), a very different enumeration is found from that obtained in the Agricultural Census, which covers a much smaller universe than that of the household surveys, 2.8 million against 3.8 million in PNAD and 3.4 million in POF. This result is explained partly by the fact that the census adopted the concept of agricultural household that uses income comparisons (farm X off-farm) and not a proxy. Off-farm earnings, which are better calculated in the household surveys, were not used in the study herein to apply the restricted concept of these households in the household surveys, which possibly would reflect an enumeration that would tend to consider a smaller number of agricultural households in the restricted concept. Therefore, perhaps an analysis more suitable for comparison would be to enumerate the agricultural households in the household surveys also based on

comparisons of the incomes on and off farm, using the same procedure adopted when examining the census data.

**Table 3: Enumeration and income of agricultural households in PNAD (2006) and POF (2003) - Brazil**

Agricultural household	Enumeration	Farming income (a)		Other Income (b)		Total Household Income	
		Aggregate (million US\$)	Average (US\$)	Aggregate (million US\$)	Average (US\$)	Aggregate (million US\$)	Average (US\$)
<b>PNAD</b>							
<b>1 - Broad Concept</b>							
1.1 - Household	4,252,644	15,086	3,547	13,316	3,131	28,402	6,679
<b>2 - Restricted Concept</b>							
2.1 - Chefe	3,842,872	13,449	3,500	9,063	2,358	22,512	5,858
<b>3 - Marginal Concept</b>							
3.1 - (1.1 - 2.1)	409,772	1,636	3,993	4,253	10,380	5,889	14,372
<b>POF</b>							
<b>1 - Broad Concept</b>							
1.1 - Household	4,418,335	9,208	2,084	20,881	4,726	30,089	6,810
<b>2 - Restricted Concept</b>							
2.1 - Head	3,473,224	8,377	2,343	16,288	4,690	24,665	7,101
<b>3 - Marginal Concept</b>							
3.1 - (1.1 - 2.1)	945,111	831	879	4,593	4,860	5,424	5,739

**Source:** National Household Survey - PNAD 2006; Family Budget Survey - POF 2003

**Note:** Definition of Agricultural Household

1.1 - At least one person in the household has th principal occupation of self-employed or employer in agriculture (POF includes the universe of workers in production for own consumption)

2.1 - The head has principal activity of self-employed, employer in agriculture (POF includes the univserse of workers in production for own consumption)

Note: Not calculated in the PNAD farming income are the head's earnings of (75,224) households in which he is not occupied in the refernce week, but who was self-employed or employer in agriculture in the 358 days before. However, the household income of such households considered.

(a) main and/or secondary income of the head in agricultural activity. In 1.1 the income of people in the household occupied in the main farming activity is added;

(b) It was obtained by a difference between the total household income and farming income. POF includes pensions, allowance, scholarship, alimony, rent, minimum income, school allowance, food allowance, transportation, fuel, other receivables and income, loans.

PNAD comprises pension, allowance, staying allowance, rent, donation, interest on savings and other investments

**Note 2:** US\$ 1 = R\$ 2, 1763, currency rate at 07.01.2006

Another explanation for the fewer agricultural households in the Census, when adopting the restricted concept, would involve the farming income obtained in this survey, which corresponds to the operating income of the business, therefore admitting a negative net income as financial result. PNAD and POF, on the other hand, use for the case of the self-employed and employer, the concept of takings that, although the handbook recommends discounting current expenses from the business, has the basic idea of assessing what was taken for family subsistence, closer to the concept of earned income, regardless of whether the farm has been deficit or surplus that current month. So, in the census, when we adopt the restricted concept of an household, which compares the off-

farm earnings with the net farming income, it excludes from the enumeration the large number of farms with negative or zero farming income.

With regard to the concept of a marginal agricultural household, POF was the survey that included a larger number of households - around 945,000. This result does not seem to be casual, since this survey registers off-farm earnings in more detail and quality. For example, the income from the different social programs are separate items in the questionnaire of this survey, while in PNAD they are together in an item called "other income". Another point is that in POF, the questionnaire stays in the household for a nine-day period, which make the investigated variables more accurate, thereby reducing problems of memory, which are more common in surveys completed in a short space of time by the enumerator. This is possibly one of the reasons why the off-farm income in POF has a large share in the household income and consequently considers a larger number of marginal agricultural households.

Although the enumeration compares fairly well and converges between all these surveys, the same cannot be said for incomes. For example, enumeration in the broad concept of gross income in the Census is similar to that of PNAD. However, its income is not comparable, starting with the differences mentioned above that one represents generated income (operating result of the farm) and the other earned income (takings). In this way, the comparison between the 15.4 billion of the Census and the 15.0 and 9.2 billion of dollars in PNAD and POF, respectively, must be regarded with considerable caution.

Another point is the difference of approximately 6 million between the POF and PNAD. Of course, the values in different years will be compared, and the comparison must be between the constant and not current values. However, when we corrected this value in

POF, the result was 22% or so higher<sup>10</sup>, that is, although the difference was narrowed, it is still quite considerable. Another explanation for the difference could be in the way in which the values of the income in this article were calculated for the year. In PNAD, the monthly income reported was calculated for the year by multiplying this figure by twelve, while POF only considered the months when there was income, therefore calculating a necessarily lower added value for the year.

The household income overall also eventually incurred this problem for comparison purposes, since the farming income is part of its result. However, it is interesting that they are quite close in all three surveys, which merely confirms that the census data succeeds in more accurately calculating the farming income; in other words, the income of the household linked to the farm, as a production unit and its operating result, while the coverage of off-farm earnings, less associated with the production activities, leaves a lot to be desired. Bearing in mind that the opposite occurs with household surveys, the result obtained in the overall household income eventually converges between both surveys, creating the wrong impression that these values are equivalent .

## **5 - Final comments**

This study emphasized that, although there is a good response on the question of enumeration of agricultural households among the household surveys and agricultural census, the income does not follow the same way. The results indicate that we can use it as an analytical unit in both surveys and characterize them correctly, based on the household surveys and family-related attributes, while using for census data the characteristics of the Brazilian production sector. However, “borderline” variables between the farm and the household, such as income, for example, are not clearly represented when the aim is to recognize the mixed activity characterizing the agricultural household.

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<sup>10</sup> The variation of the General Price Index – Internal Availability (IGP-DI) between the reference month of POF 2003 (January 2003) and the reference month of PNAD 2006 (September 2006) was 22.14%.

At first glance of the agricultural household, the article herein shows that the agricultural census and household surveys manage to assess what is closest to their domains, and the analyses of their borderline variables are harder to more completely and reliably measure .

In the example of income addressed herein, conceptual problems in both types of survey were the main reason for the non-convergence of the findings, and this duality in the context of the agricultural household is to a certain extent poorly revealed. As a result, the analysis of income proved to be more suitable in PNAD and POF to examine them looking at the family's own earned income, regardless of its farming performance, while the agricultural census had a better measurement of the earnings of production activity and its operating and financial result.

In short, this ability of both types of survey – agricultural census and household – to measure variables that intertwine in these two contexts of the agricultural household, farm and family, deserve more in-depth studies on the coverage of the databases, requiring conceptual approaches between these surveys to portray this universe more clearly.

In relation to the collection procedures, it is found that, when comparing the POF and PNAD data – whose concept of income is the same – the income variable seems to require more complex collection procedures, which permit longer and more detailed contact in completing the questionnaire, which to a certain extent is unfeasible in a short on-the-spot collection. Perhaps collection procedures should be established similar to that of POF to calculate this type of information and surveys specially designed for investigating the agricultural household that considers both generated and earned income.

Lastly, the concepts of agricultural household addressed herein were based on the Wye Group Handbook, which defines guidelines for agricultural statistics for developed countries. However, in the case of Brazil, perhaps more appropriate definitions should be considered that reveal the particularities of the land ownership and family structure of the

country. This is the case in recent policies applied to the family farmer, the income transfer programs and compensatory policies, as in the case of the universality of the rural pensions. In the context of the results herein, where there is a very large universe of farms with less farming income than the off-farm income, and a very broad universe of deficit farms, the off-farm wage earnings of the head of the household and his family are now an interesting element for investigation in the Brazilian case. Moreover, although this results in moving away from the concept of “agricultural household” toward a “family farm”, it is still worth assessing the extending of the domain of the agricultural household to beyond the self-employed and employer in agriculture, also including the households of wage earners in this sector, which is clearly interesting from the viewpoint of analyzing the impact of the public policies and characterization of the living conditions of the population in rural areas.

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