IBGE
Instituto Brasileiro de Geografia e Estatística

Brazilian experience of WCA 2010

Agricultural Census 2006

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Census of Agriculture in Brazil

- Complete enumeration
- Face-to-face interview
- Urban and rural areas
- Agricultural holding as defined by FAO

Census of Agriculture in Brazil

1920 - First Agricultural Census - based on XIV USA Census

1930 - not performed

1940
1950
1960 — Decennial

1970
1975
1980
1985 — Quinquennial

1990 - not performed

1996
2006
2015 — ± Decennial

1920-1980 – *Sequential operation*

(Population → Ag → Economics)

1985 – *Single operation*

1996, 2006 – Join operation

2015 – planned to be a sequential operation !

Agricultural Census 2006

CENSOS 2007 - An integrated operation

Three simultaneous data collect

- **10th *Agricultural Census* (Agricultural Census 2006)**
- **2nd *Population Counting***
- ***National Address List***

Same equipment and enumerator and structure for all surveys

Collect period: 15 April ~ 23 August 2007

Dimensions of 2007 Census

- 82,000 devices
- 68,000 enumerators
- 11,000 supervisors
- 162,770 enumeration areas
    - 60,412 rural enumeration areas
- 105 million people (60% of whole pop.)
- 28 million households
- **5.2 million agricultural holding**
- Total budget app. US$ 269 million

- 27 federation units and
- 5,564 municipalities

Some details

Method

- Complete enumeration by direct interview (without list)

Reference period

- Civil year

Classification

- Activities are classified in accordance to ISIC/CIUU → CNAE
- Products → PRODLIST AGRO

Some details

Statistical unit

- Agricultural holding - as defined by FAO WCA 2010

Limits

- no matter area size, purpose of production, land tenure, value of sales
- excludes family gardens

Coverage

- Entire country, rural and urban areas

Enumeration Area - EA

Characteristics

- Working area of one enumerator
- Continuous area
- Located in just one zone, rural or urban
- Regards legal limits of the municipality, districts and sub-districts
- Average: 150 agricultural holdings or 200/300 houses (rural/urban)
- Max. 500 km^2

Census items - quick view

- All items recommended by FAO - Area, nº of holdings, employment, crops, livestock, machinery and equipment, land use, irrigation, etc.
- Forestry
- Aquaculture
- Extractive agriculture (nuts, wax, charcoal, etc.)

Census items

Basic items

- Holder and holding characteristics
- Land use
- Machinery and Equipment
- Labor, etc.

Census items

Some additional

- Conservation and organic pratices
- Agroindustry inside holding (manioc flour, etc.)
- Stocking capacity
- Fuels
- Loans and investments
- Debts and Expenses
- Incomes out farm

Livestock and poultry

- Number of animals for each livestock type
- Volume of milk and egg production
- Number of animals born, died, slaughtered, bought, sold
- Value of sales and purchase

Crops - Items for <u>each</u> product

- *Quantity - produced, sold*
- *Harvested Area*
- *Destiny of products*
- *Use of irrigation, pesticides, fertilizers*
- *Type of seed, harvest, cultivation*
- *Months of seeding and harvesting*
- *Price*
- *Trees planted and harvested*

Structure

Workstation

- At least one per municipality (5,564)
- 1,200 with computer
- 4,364 without computer

One municipal agent

~ 6 enumerators per supervisor

Data collect: PDA with GPS

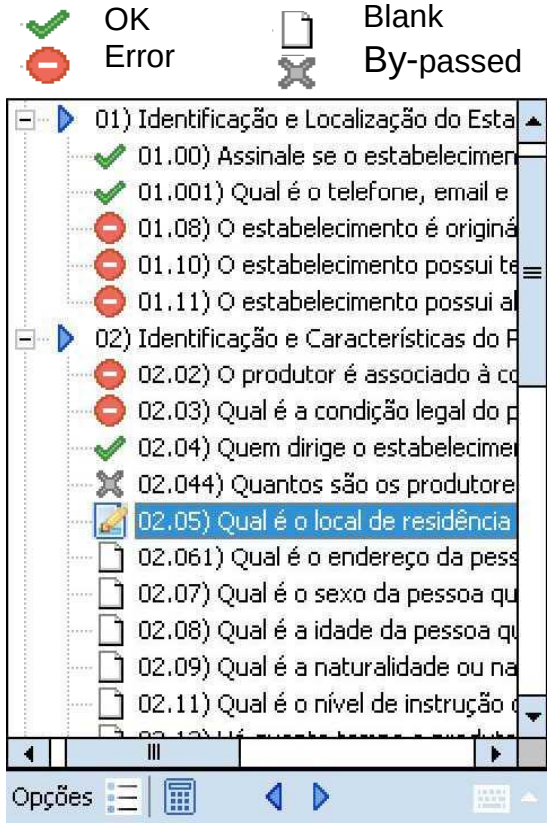
Advantages

- Immediate **quality control** at the moment of data typing
- **Filling of all compulsory** items
- **Control of data filling** by automatic jumps in the form
- **Direct transmissions** of collected data to central system
- **Dispensing the transportation** of high volumes of paper questionnaires and their handling in data collection centers
- **Location of the units surveyed** in rural areas (Ag Holding Lat-Long)
- **Dispensing** enumerator's codification and consulting external code tables for units and products

PDA with GPS

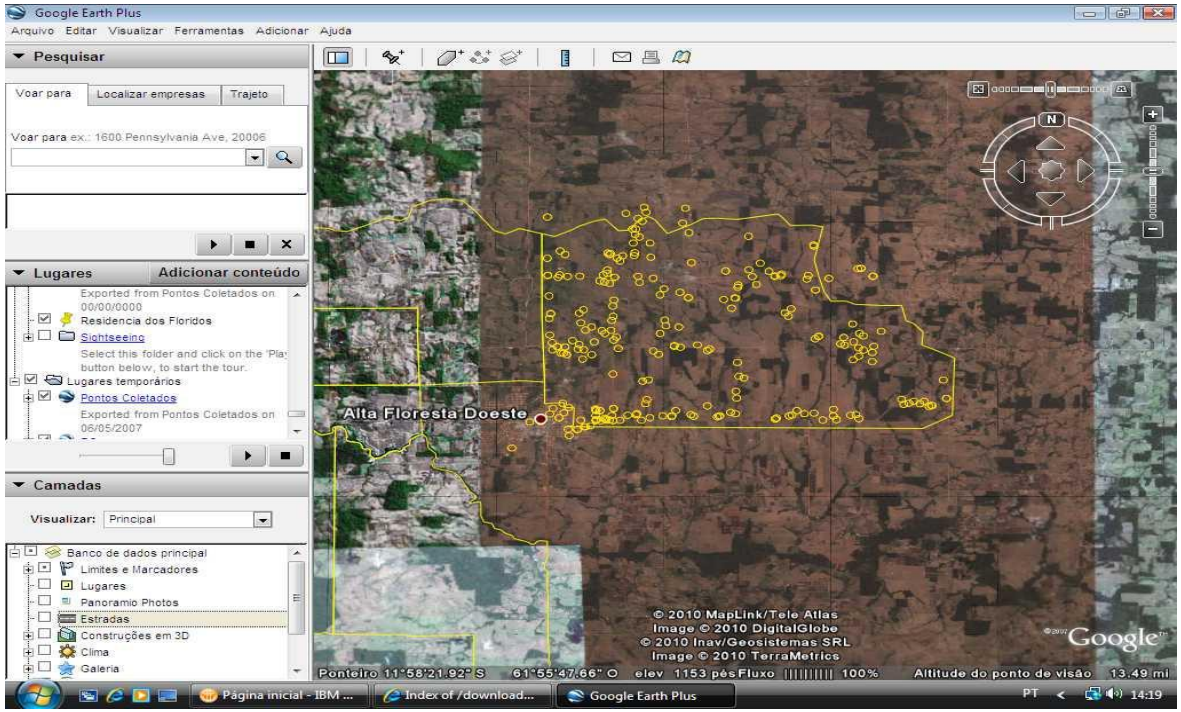
The device was used in all phases of the agricultural census:

- Training - administration and scoring of tests
- Collecting - obtaining questionnaires, work material, data logging, viewing maps
- Supervision - online monitoring of coverage
- Editing - in real time, online or not



Supervision of data collect:

The visualization of the collected points in Google Earth was a powerful tool in supervision.

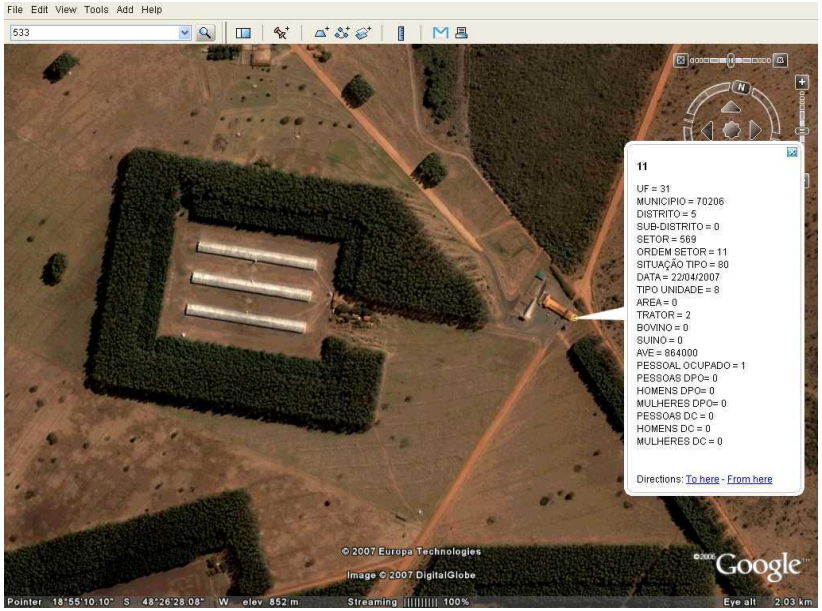


The polygons represent enumeration areas, and the yellow dots are agricultural holdings. Dots outside the area were relocated to the proper enumeration area.

Supervision system (SIGC)

In the regional offices, with the coordinates of agricultural establishments visited (yellow dots) and the boundaries of enumeration areas plotted on maps displayed using Google Earth, it was determined whether there were items collected outside the designated area for subsequent correction.

When connecting to the server to transmit the collected data, the PDA received warnings of possible errors and reports to the enumerator.

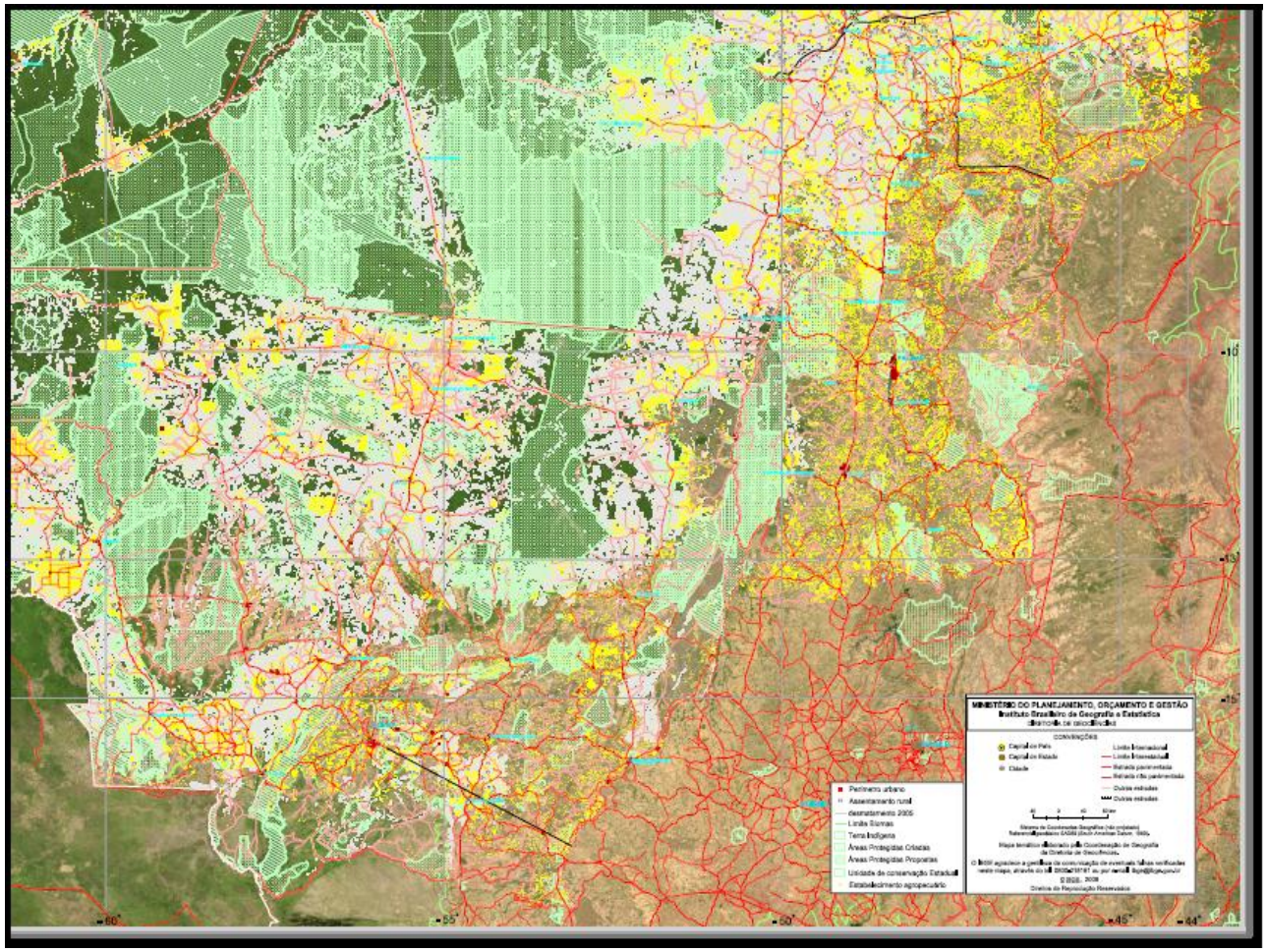


Agricultural holdings protected by wind barriers in savannah region.

Monitoring the coverage of data collect

Depending on the image quality, it was possible to view the agricultural holdings and its main characteristics.

This step was used only at the central office, and limitedly.



Mapping and analytical cartograms

Georeferenced data, with the meshes of indigenous and rural settlements, allows a visualization of the distribution of agricultural establishments in these special areas.

Other maps with different perspectives for analytical and statistical data can be obtained, such as distribution of establishments according watershed basins, relief, environmental preservation areas, biomes, indian reserves, rural settlements, etc.

Major problems with the use of PDAs in 2007

- Centralizing data in the central server overloaded data transmission, as each PDA could connect directly to the server at any time.

- Limitation of communication with the central computer - no connection, low quality connections, network congestion.

- Online supervision - software of supervision only on the central server.

- No device to monitor collected questionnaires in local offices.

- Application designed specifically for PDA, did not work for other devices and operating systems.

Improvements in the use of PDAs in 2010 (population census)

70,000 units of the same PDA model (MIO/P550B) used in 2006, plus
150,000 smartphones LG model GM750Q, customized to work as PDA

Main changes included:

- Transmission decentralized - PDA connects to PC or notebook in the supervision office, and this one communicates with the server
- Use of 2G/3G cellular network for data transmission;
- Use of laptops by supervisors to receive data from PDAs, supervision of the questionnaires and verification of reports
- PCs in the data collect offices, running off-line.
- Software can be used in different devices: PDA,PC, Smartphone, laptop, desktop
- Data transmission from states to the central server was staggered

Census 2006 processing

Imputation:

CANCEIS **-** Canadian Census Editing and Imputation System
Statistics Canada

Tabulating:

Redatam+SP - Retrieval Of Data For Small Areas By Microcomputer
CELADE/CEPAL

Analysis (micro data processing):

SAS & ***Redatam+SP***

Thanks for your attention

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