

# The impact of Embrapa's strategic agenda on Brazilian small-scale and family farmers

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**(Embrapa)**

**KGID**  
**CAIRO**

# Embrapa in Brazil

**50**  
YEARS



**43** Research Centers

*Eco-regional, Thematic and Product*

**7.806** employees

**2.174** researchers

**90% Ph.D**



Intelligence and  
Planning

Research

Development

Validation

Technology  
Transfer  
Monitoring

Impact evaluation

## MODEL OF RESEARCH AND INNOVATION

*Embrapa*

**1000  
PROJECTS IN  
BRAZIL**

Technical  
Cooperation

Technology  
ready for  
market

Technological Assets  
in Development

Licensing

**4000  
TECHNOLOGICAL  
ASSETS**



NASA/DOD **Technology** Readiness Level

1

2

3

4

5

6

7

8

9

IDEATION  
AND  
INVENTION

RESEARCH FOR PROOF  
OF CONCEPT

TECHNOLOGY DEVELOPMENT  
AND SCALING

TECHNOLOGY  
VALIDATION

TECHNOLOGY ADOPTION



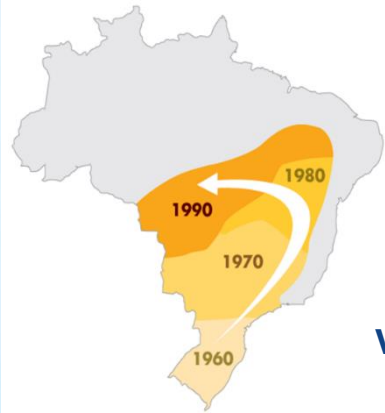
# Brazilian Agriculture

**A revolution in 30 years**



# Trajectory of Brazilian Agriculture

## EXPANSION



Transformation of  
acidic and poor soils  
into fertile soil

## COMPETITIVENESS

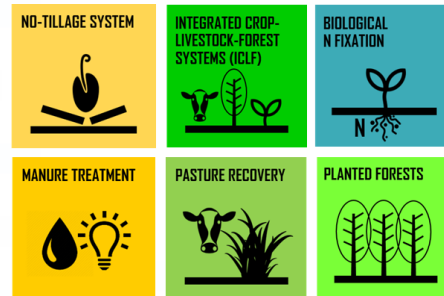


"Tropicalization" of  
varieties and animals

## SUSTAINABILITY



Development of a  
Sustainable Production  
Platform



2030...

## MULTIFUNCTIONALITY



## Agriculture...

...Food – Fibers – Energy...  
...Feed – Nutrition – Health...  
...Environmental Services – Ecosystem Services...  
...Biomass – Biomaterials – Green Chemistry...  
...Biofactories – New Manufacturing Processes...  
...Microbiome – Bioinputs – Bioprocesses...  
...Culture – Tradition – Gastronomy – Tourism...

Science-based development

# A Science based Agriculture

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Sustainable  
Systems



Biotech  
Nanotech



Technological &  
Bio- Inputs



Agricultural  
Practices



Digital  
Innovation



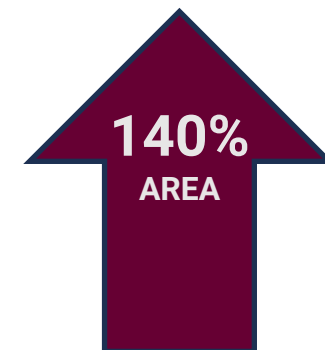
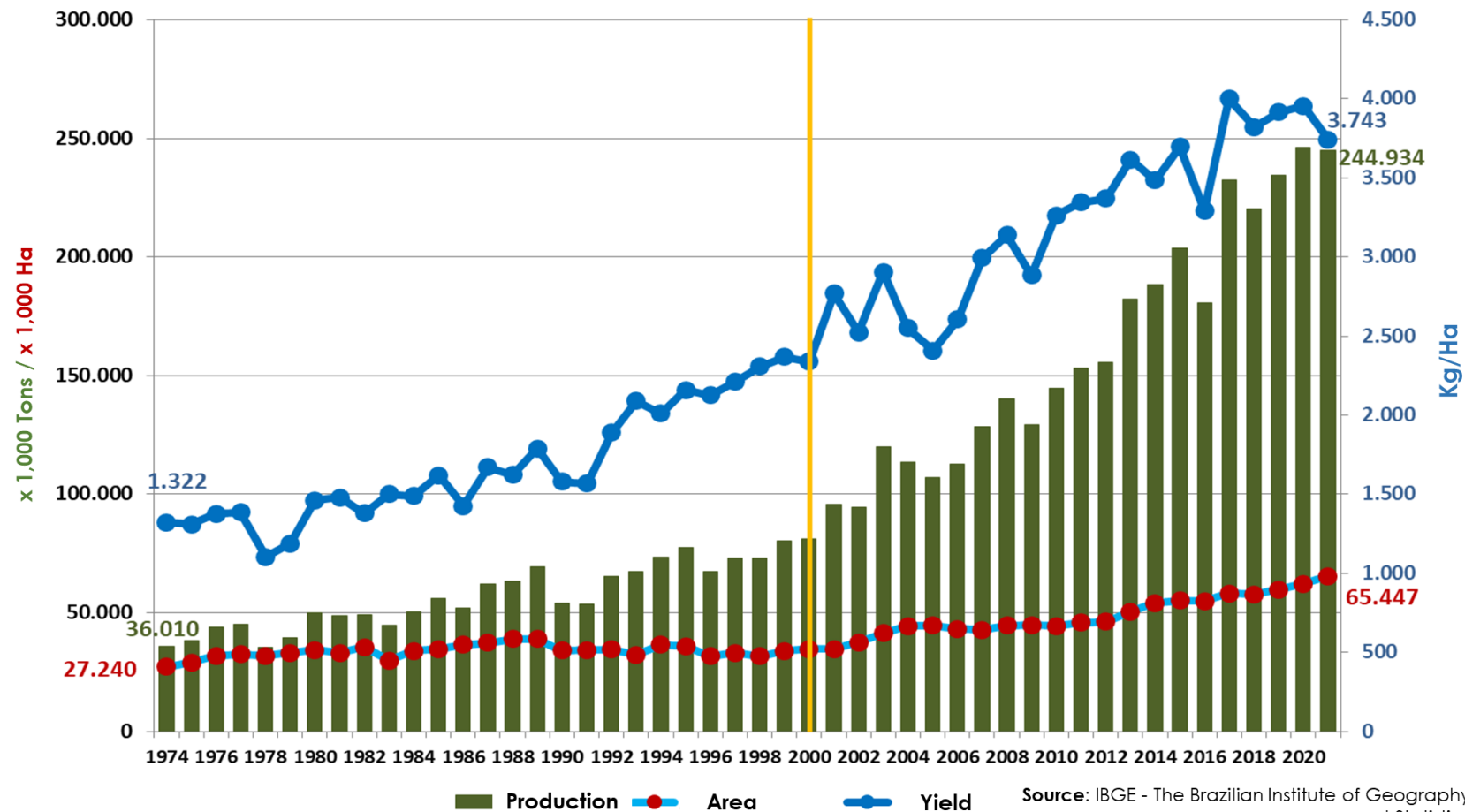
Food security &  
social innovation



Agricultural &  
Agroindustrial  
Processes



Genetics (Animal /  
Plant /Breeding)

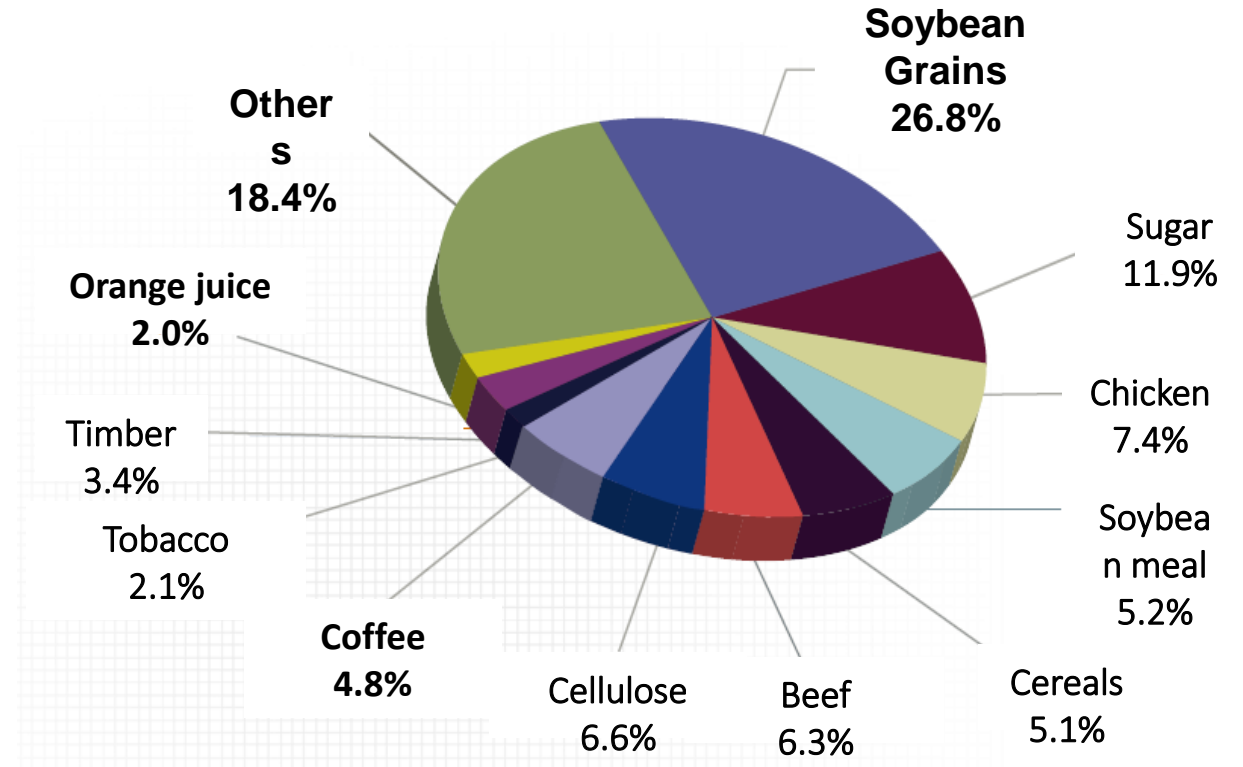
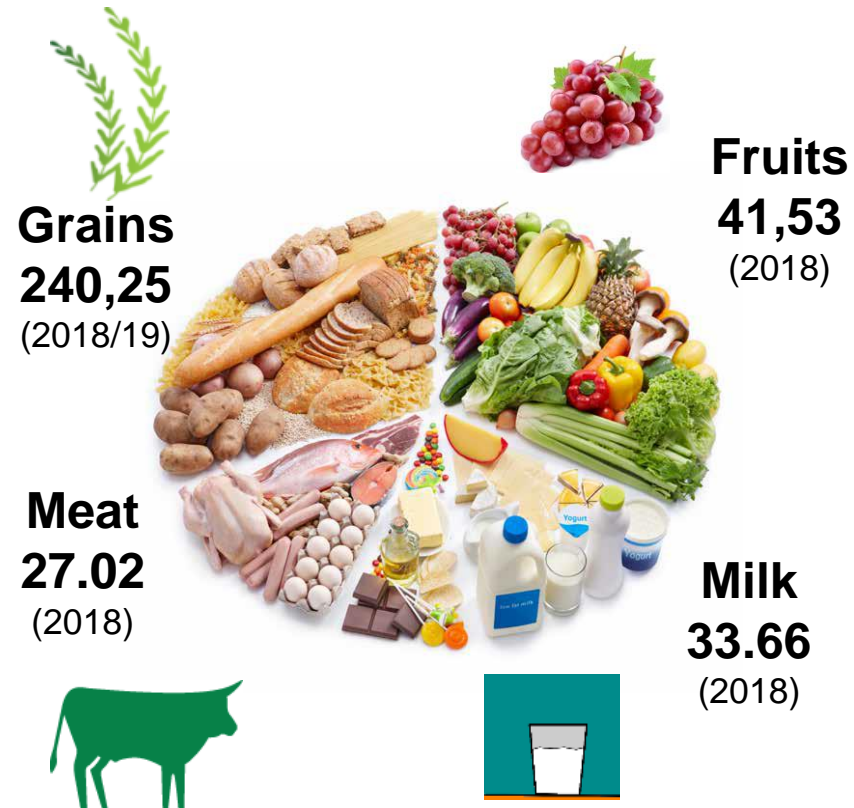


**LAND-SAVING EFFECT FROM THE TECHNOLOGY  
AND INNOVATIONS DEVELOPED BY EMBRAPA**

# Brazilian Agriculture

Production (Million Tons per Year)

**KGID**  
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***Export: Main Products***

Brazilian agriculture is based on over 300 species and exports 350 types of products, which reach 180 markets worldwide.

# Small scale and family farmers in Brazilian Agriculture

- **76,8%** of the **5 073 324** rural properties
- **70%** of food consumed by Brazilians
- Gross Production Value: **23%**



# Technologies addressing Public Policies

## 186 related assets

(43% of the total qualified for family farming in the 3 areas)

**Food and  
Nutritional  
Security Policy**

**99**



**National  
Agroecology and  
Organic  
Production Plan  
(Planapo)**

**94**



**Regional  
Development  
National Policy**

**68**



**National Biological  
Inputs Program**

**60**



**National  
Technical  
Assistance and  
Rural Extension  
Policy (PNATER)**

**55**



# Some Embrapa's crops varieties available to Family **KGID** Farmers CAIRO



47 ativos



28 ativos



27 ativos



24 ativos



23 ativos



15 ativos



12 ativos



7 ativos

# Food Security – Food, Nutrition, and Health

- **Biofortified food** crops that are rich in minerals such as Iron and Zinc and Vitamins, and can be important products to fight malnutrition, especially for low income populations.



- More than **10,000 families** have already received biofortified propagating material to grow on their properties.



Cassava, Sweet Potato, Banana, Corn, Green beans, etc

# Food Security – Food, Nutrition, and Health



Strategy to use  
biofortified food in  
**school meals**



Public schools  
must purchase at  
least 30% of food  
directly from  
family farmers.

# Small-scale agroindustrialization for regional fruits

## Differentiated processed products that contribute to regional development of northeastern semi-arid region in Brazil

- Embrapa and Coopercuc (Family Farming Cooperative from Canudos, Uauá e Curaçá)
- Support on the agroindustrialization of some regional products;
- lower sugar contents and suitable for small-scale processing
- Support for commercialization in local markets and through the Federal Government's Food Acquisition Program (PPA)



# Technologies for Life in Drought Areas

## Low-cost irrigation systems for family farming of riverside settlements in the semiarid area

- Recommendations for the irrigation systems to be more available for small farmers.
- The irrigation systems may be drip irrigation by using a network of handmade emitters, polyethylene tubes (4mm in diameter) and microsprinklers.



“**Barraginhas**” initiative are **micro-dams** made in the soil for rain water harvesting and erosion contention. They are conical in shape, approximately 16m in diameter and nearly 1.8m in deep. They are distributed in crop fields and grazing areas.

# Looking into the future → Digital Agriculture

## E-campo

Embrapa's on line training

<https://www.embrapa.br/e-campo>

**114** Active Training courses  
**88** Free training courses  
**94** Selfinstructional  
**1.016.516** Registered participants



## Exemples of training themes for Family farming

1. Integrated production system for food security (Sisteminha Embrapa): management parameters
2. Introduction to planting material production strategies – RENIVA (Cassava)
3. Rural Basic Sanitation
4. Bioeconomy in the Caatinga
5. Meliponiculture: breeding stingless bees
6. Residential Aquaponics

# Family farming HUB TECH

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**Caupi beans**



**Beekeeping**



**Climate Change**



# Final remarks

Small-scale and family farmers have a major role in food security and in the agro-biodiversity conservation within the six Brazilian biomes.

. Nevertheless, the majority of family farmers find themselves in a situation of social vulnerability, with limited access to technical assistance, equipments and inputs necessary to adopt most of the existent innovations.

Supporting partnerships between government, producers and research institutions is a way to achieve green innovation and equitable agriculture transition.



# Thank you



<https://www.embrapa.br/en/international>

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# KGID CAIRO