Bioeconomy and Agriculture in the context of Climate Change Challenges

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Bioeconomy

There is not a "single" concept or vision....

Biotechnological





Bioresources

Bioecological



Transition that can guarantee food security and climate resilience





Bioinputs developed from Brazilian Microbial Biodiversity (Public Private Partnership)



Auras is made with *Bacillus aryabhattai*, isolated from Semi-Arid soils (Caatinga)



BiomaPhos - Phosphorous biosolubilization By Bacilus subtilis and Bacilus megaterium isolated from soil and corn stalks



Combio - bacterial strains for biological nitrogen fixation, growth and preventing fungal attacks on soybean.



Recovery of Degraded Pastures



No-till system

Bio-based agriculture and bio-inputs



Irrigation



Integration Crop Livestock Forestry





Manure Treatment (biogas)





LONG TERM PLANNING

National Policy Low Carbon Agriculture (medium-long term investment)

> Sustainable intensification with adaptation of food systems to climate change

Exploring the potential of the **BLUE** Bioeconomy





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Embrapa Aquaculture and Fisheries



Amazonian native species: Tambaqui (Colossoma macropomum)

- Genomic edition , conservation , breeding , genetic improvement of native aquatic species
- Nutrition and new sources of feeding
- Methods of reproduction of aquatic species
- Desease control
- Aquatic production systems
- Processing
- Market analyses
- Geographic origin and information





Strategies to foster bioeconomy should consider different realities, specificities and vocations of each territory

Mixed and Integrated Systems







Traditional Agricultural System in the Southern Espinhaço Range, Minas Gerais, Brazil (2020)

> Food and Agriculture Organization of the United Nations

Bioecological bioeconomy = Socio-bioeconomy Conservation/Preservation + inclusive development + community well being





Sustainable use of biodiversity must include the development of local bio-economy



Harvest of Amazon Nuts and products



Women empowerment – 1st Surui coffee barista, producer of Robusta Amazônico cooffee in agroforestry systems.

Embrapa in the Amazon



Research and technology transfer facilities

Sede da Unidade

Campo experimental

BA

MG

GO DE

SP

SC

PR.

MT

MS

RS

Conservação de Recursos Genéticos Unidade de Referência Tecnológica



Embrapa in the Amazon

In 2021, technologies related to Embrapa's research focusing socio-bioeconomy in the Amazon generated \sim 3000 direct jobs, with an economic impact of more than US\$30 million.





Production systems with low environmental impact and valuation of ecosystem services



Integrated crop-livestock- forest system



Agroforestry systems for family farmers



Agriculture without fire – rotation and integration





Embrapa (UDs Norte), 2024

Small scale integrated system (Sisteminha)

Examples of sustainable technologies and products developed by Embrapa and partners focused on socio-bioeconomy in the Amazon





PRODUÇÃO VEGETAL | CULTIVARES

Cupuaçu 5.0 - Kit de cultivares de cupuaçuzeiro de alta produtividade e boa resistência à vassourade-bruxa



PRODUÇÃO VEGETAL | AGROQUÍMICOS, FERTILIZANTES E DEFENSIVOS BIOLÓGICOS

Bioinseticida a base de Metarhizium anisopliae para controle da moscada-carambola



ALIMENTOS E BEBIDAS Néctar misto de açaí



Cassava flour with Geographical Indication



Vegan "cheese" of babaçu







SISTEMA AGROPECUÁRIO

Sistema de Produção do Guaraná no Estado do Amazonas



Plant-based hamburger (babaçu)



ALIMENTOS E BEBIDAS Sucos mistos (blends) de frutas amazônicas



PRODUÇÃO VEGETAL | AGROQUÍMICOS, FERTILIZANTES E DEFENSIVOS BIOLÓGICOS

Óleo essencial de pimenta-de-macaco como inseticida



Bioeconomy & Country Challenges

- Promote food security and sorveigneity, eradicating the hunger;
- Develop Science & Technology adapted to national capabilities and needs;
- Prospect, promote and ensure the use of biodiversity in a sustainable way;
- Trains multipliers, construct collective knowledge, generate opportunities;
- Promote local value aggregation, geographical origin recognition and access to markets;
- Expand and strengthen networks, cooperation, partnerships and funding



Thankyou!



Embrapa

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MINISTÉRIO DA Agricultura e Pecuária

GOVERNO FEDERAL

