Bioenergie sostenibili come opportunitá di sequestro di carbonio nei Paesi Terzi

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Biochar e carbon farming: opportunitá di sequestro di carbonio e per lo sviluppo sostenibile delle aree rurali nell'UE e nei paesi terzi

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GBEP - Working together since 2006

International initiative established to implement the commitments taken by the **G8 in 2005** and receiving renewed mandates from **G7 and G20** since then. The initiative is aimed to promote bioenergy for sustainable development.

Brazil and USA Co-Chairs.

Italy Chair 2006-2020 (14 years)

FAO is a founding partner and hosts its Secretariat at FAO HQ in Rome.

38 Partners and 45 Observers

(Governments and International Organizations)

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GBEP Sustainability Indicators (GSI) for all types of bioenergy

ENVIRO

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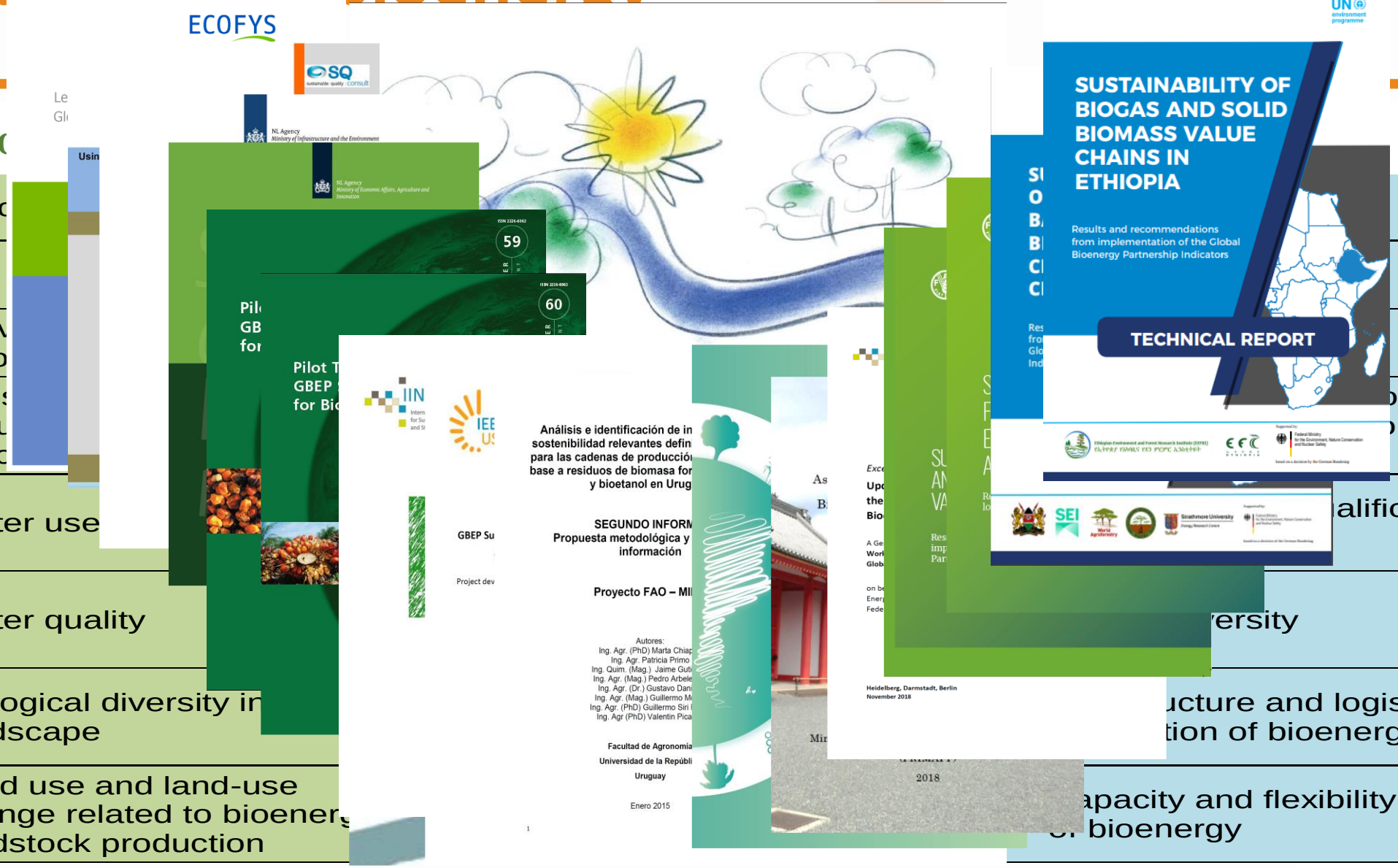
2. Soil
3. Harv reso
4. Emis pollu toxic
5. Water use
6. Water quality
7. Biological diversity in landscape
8. Land use and land-use change related to bioenery feedstock production



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Situation in developing countries

Problem analysis

- *Traditional bioenergy* → inefficient use of resources → land degradation & impacts on forests → lack of basic energy services
- Problem of managing and disposing of *wastes* → further contamination of environment
- Impacts on all aspects of development

What do we need?

- Need an immediate but gradual transition away from traditional bioenergy and fossil fuels towards *modern sustainable bioenergy* as part of a circular economy approach → many co-benefits

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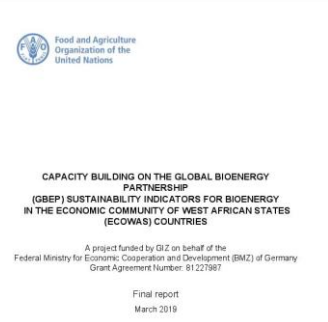
Deployment of micro-gasifier cookstoves for cooking and biochar in Ghana


Food and Agriculture Organization of the United Nations

CAPACITY BUILDING ON THE GLOBAL BIOENERGY PARTNERSHIP
(GBEP) SUSTAINABILITY INDICATORS FOR BIOENERGY
IN THE ECONOMIC COMMUNITY OF WEST AFRICAN STATES (ECOWAS) COUNTRIES

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Final report
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CASE STUDIES

Biomass supply
- Use of agricultural/forestry residues or pellets from locally-sourced residues, replacing fuelwood and fuel source

Biomass transformation
- Pelletization of agricultural/forestry residues for use as efficient solid biofuel

Bioenergy production and use
- Use of efficient micro-gasifier cookstoves in households/small businesses

Valorisation of by-products
- Biochar produced as by-product used as soilless substrate or as soil amendment

Co-benefits:
- Increased energy access – lower cost fuel
- Health benefits – clean cooking
- Reduce pressures on local forest resources
- Community waste management
- Climate-smart agricultural practices – biofertilizer
- Climate change mitigation – CCS
- Direct and indirect job creation from value chain

Lessons learnt:
- Access to investors/investment is key
- Should be combined with training to local farmers in making biofertilizer and engagement in process to address agricultural market bottlenecks

Source: GBEP, 2020. Collection of examples: Positive relationships between sustainable wood energy and forest landscape restoration

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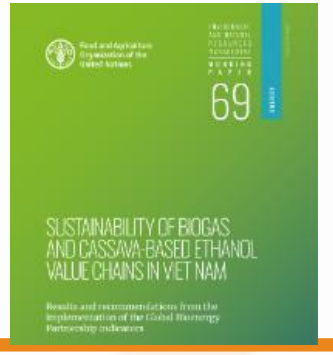
Valorisation of livestock wastes – biogas from pig manure in Viet Nam



CASE STUDIES

Biomass supply
- Use of pig manure to produce biogas (450k biogas plants ~10m^3) replaces traditional bioenergy and fossil fuels

Biomass transformation
- Anaerobic digestion

Bioenergy production and use
- Biogas for household use

Valorisation of by-products
- Digestate can be used as crop fertilizer

Co-benefits:
- Increased access to modern energy services (ind. 14)
- Reduced time spent collecting fuelwood (ind. 13)
- Reduced exposure to indoor air pollution and to the related health risks (ind. 15)
- Demand for skilled jobs (ind. 12)
- Reduced household expenditures on energy (ind. 11)

Lessons learnt:
- Poor management of ADs must be improved to ensure benefits and reduce risks (digestate discharge, methane leaks and poor efficiency)
- Need awareness raising on use of biogas and by-product
- International coordination is key

Source: FAO, 2018

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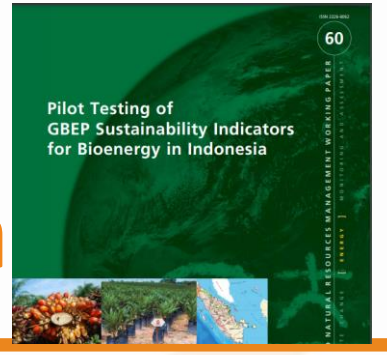
Improving value chains through circular economy approach – POME in Indonesia



CASE STUDIES

Biomass supply

- Palm oil mill effluent, typically left to decompose in open ponds – methane emissions and water/soil contamination

Biomass transformation

- Methane capture and Anaerobic digestion of POME

Bioenergy production and use

- Biogas as by-product

Valorisation of by-products

- POME out of the AD mixed with empty fruit bunches, kernel shell used as biofertilizer

Co-benefits:

- Reduce GHG lifecycle emissions through reduced CH4 emissions and reduced dependence on fossil fuels for industrial activities
- Reduce soil contamination
- Improve water quality
- Enhance access to modern energy services

Lessons learnt:

- POME anaerobic digestion must be incentivised through both waste regulation and biogas/biomethane incentivisation policies

Source: FAO, 2014

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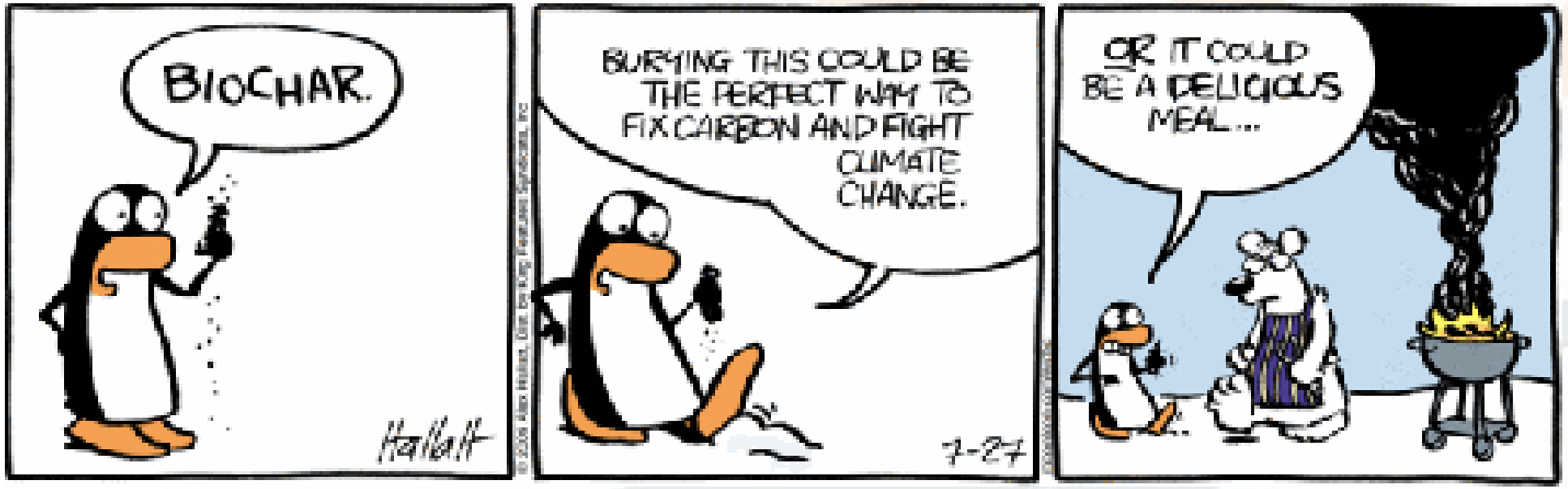
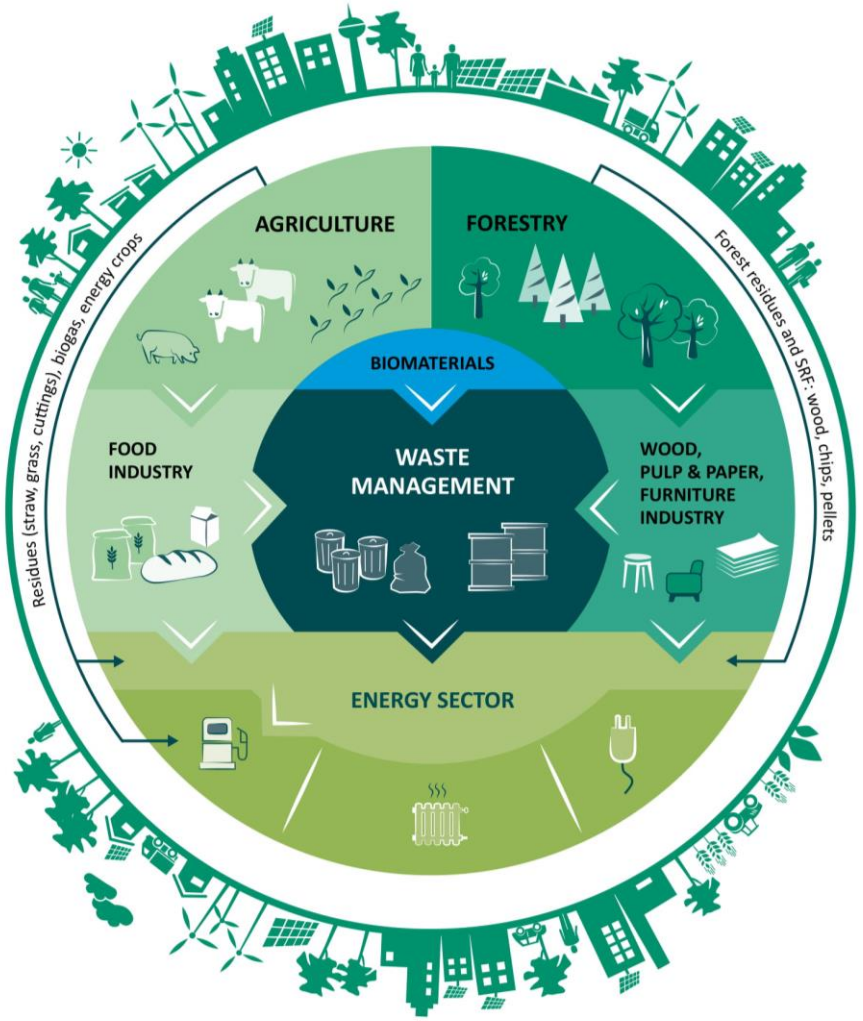
Additional benefits from the use of biochar



- Use of improved cookstoves reduces health risks (indoor air pollution)
- Biochar used for cooking purposes for better nutrition
- Biochar as biofertilizer for better nutrition
- Building stoves for job opportunities → increase income and wellbeing
- Less time consumed collecting wood for traditional wood fuel

Bioenergy within the bioeconomy



- We have to take into account the trade-offs and synergies between **different demands on biomass** to contribute to the overall sustainable bioeconomy

- Integrating biomass conversion for multiple purposes using **innovative approaches** can have synergistic effects

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Thank you

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