GBEP Ethiopia presentation

Project: BUILDING CAPACITY FOR ENHANCING BIOENERGY SUSTAINABILITY THROUGH THE USE OF GLOBAL BIOENERGY PARTNERSHIP (GBEP) INDICATORS PROJECT

Berhane Kidane
Senior Researcher
(Assistant coordinator of the project)
28 October 2019, Rome
Presentation outline

1. Why is this project important?
2. What is the process
3. Two priority bio-energy pathways
4. Examples of results
5. Recommendations, future monitoring and general feedback
Let’s start by the end...

Available (very) soon!
1. Why is the project important for us?

When we started

- To support decision makers in Ethiopia in developing effective integrated policies for sustainable bio-energy production and use.
- The project also provides technical assistance to government officials and experts in Ethiopia to assess the sustainability of their bioenergy sector and
- Build their capacity including researchers for its long-term periodic monitoring

After one year of work!

- Developed the multidisciplinary capacities of the team (knowledge of the researchers beyond the usual fields)
- Built / reinforced the relationships with stakeholders
- Used new sources of information
- Produced a report using sustainability indicators for the two pathways
2. What is the process

April 2018  Inception meeting

Apr to Oct. 2018 Selection of EEFRI and of the researchers. Mix of the researchers across the indicators to facilitate the exchange of information. Selection of the two priority pathways.


Feb. 2019 Training by Horst Fehrenbach (indicators 1 and 4).

Feb-March 2019 Description of the pathways.
First round of indicators and feedback.
Special week of work with all the researchers, out of Addis.

May-June 2019 Second round of indicators and feedback.

June 2019 Validation workshop.

July-Aug. 2019 Third round of indicators and feedback.
Special week of work with all the researchers, out of Addis.
Preparation of the main messages and conclusions.


4 Nov. 2019 Final meeting to come!
3. Two priority bio-energy pathways

**Biogas for households and institutions** from organic waste (animal dung and human excrement).

**Bioethanol from sugar industry** (molasses) for transportation (mixed with fossil fuels) and, possibly, electricity generation.

**Solid biomass** (charcoal, firewood) produced with advanced technologies, such as improved carbonisation, and used in improved cookstoves for cooking and heating.

**Briquette** production from waste and use in improved cookstoves for cooking and heating.
Current situation of biogas in Ethiopia

- National Biogas Programme of Ethiopia (NBPE)
  - 22,166 biodigesters installed, 77 per cent of which are functioning.
  - Four sized; the predominantly used digester is the 6 m³ (89% of all biodigesters).
  - The fixed dome digesters (68% functioning) are better than the floating drum digesters (16% functioning) from the operational perspective.
  - Objective of 35,000 biodigesters installed by 2020 (new biogas programme NBPE+).
Current situation of biogas in Ethiopia

• Challenges
  – The dissemination of a domestic biogas programme is not simple.
  – SNV-Ethiopia has identified the following constraints:
    (1) low income of most rural households
    (2) scarce (availability) of water
    (3) scattered population pattern
    (4) gender imbalance in decision making at the household level
    (5) low awareness in domestic biogas technology
固体生物质在90至92%的埃塞俄比亚家庭中用于烹饪和取暖。

国家改进炊具项目
- 2013年启动。计划运行到2030年，分为五个五年阶段，与政府的经济增长和转型计划对齐。
- 截至2017年，分布了1100万改进的炊具。
- 最常见的炉灶型号：米特和贡齐（用于煎饼烘焙）和提基克和拉切（用于非烘焙服务）。
- 前者很常见但效率低（低于20%）。
4. Examples of results
(all results available in the report!)
Biogas

• The produced biogas has been mainly used for cooking (>90%) and lighting (~3.2%)
• This replaces firewood used for cooking and kerosene used for lighting and increases the energy flexibility and security of the household.
• The amount of energy produced is estimated to 17.6 million m$^3$ biogas/year. This is equivalent to:
  – 338,500 liters of kerosene for lighting, and it could represent 204,074 USD annual saving from purchase of kerosene;
  – 412.5 thousands tons of firewood per year that can be saved upon the use of biogas.
Solid biomass

• **Fire wood:**
  - About 65% of the fuel wood is freely harvested from wet and dryland forests. About 35% comes from trees on-farm, private woodlots, community forests and some from industrial plantations.
  - Most of the freely harvested woody biomass originates from forest resources which are fragile shrublands, parklands and wildlife sanctuaries.
  - The GHG emission per unit of useful energy produced by the traditional biomass is higher by 60% than that of the biomass ICS showing a strong evidence for the need to enhance the government’s improved cookstove program.
Solid biomass

- Charcoal is manufactured using the inefficient (10-15%) earth mound kilns from freely harvested acacia timber species.
- The bulk of charcoal comes from either acacia species and/or the invasive species *Prosopis juliflora* through the eastern gate to Addis Ababa.
- The traditional and inefficient conversion process of woody biomass into charcoal generate high rate of GHG and non-GHG toxic emission.
- Charcoal is prevailingly produced, transported and marketed illegally.
- Illegality hampered and diminished the contribution of charcoal in the creation of competent rural job opportunity and strong rural income generation for many pastoral, agro-pastoral and mixed farming households living in impoverished dry lowlands.
- It has further hampered the development of cost effective and safe logistics for charcoal transport and distribution.
5. Recommendations, future monitoring and general feedback
Biogas may be a competitive option to replace the traditional energy sources for cooking. However, the use of biogas technology is challenged by critical factors. Therefore, revising the biogas implementation strategy and crafting inclusive biogas policy is quite important.

Adopting different types of biogas digesters with reduced implementation cost, developing integrated strategy on fodder and dung productivity, practicing stationary cattle rearing and awareness creation on diverse biogas feedstock are essential.
Recommendations ....

• In effect the shift from traditional energy source of cooking to biogas technology helps to implement the key pillars set in the Sustainable Development Goals (SDGs)

• The current state of the solid biomass sector in Ethiopia is unsustainable, the high dependency on solid biomass might be an Indicator to focus on this resource as potential energy and economic sector.
Recommendations ....

• Most of the biomass is coming from areas which are either with low biomass productivity or classified as nationally conserved forest areas and protected wildlife sanctuaries.

• Henceforth, the afforestation programs should work aggressively and narrow the supply and demand of the solid biomass. Moreover, developing an integrated strategy that focus on the controlled use of exotic invasive species such as *Prosopis juliflora* and other potential woody biomass is also essential.
Recommendations ....

• Capacity development of both humans and institutions for sustainable biomass cultivation, management and utilization should be at the heart of the bioenergy program of Ethiopia.

• Currently, in Ethiopia there is no institution collecting the bioenergy data for the implementation of indicators GBEP Sustainability Program and hence, strengthening coordination among regional and national government’s institutions will play a great for the improvement of indicators implementations.
General feedback

• Sustainability indicators are a key tools that helps for better the analysis of the pathway
• Currently, in Ethiopia there is no institution collecting the bioenergy data for the implementation of indicators GBEP in coordinated manner??
• Coordination among regional and national government’s institutions will play a great for the improvement of indicators implementations
Thank you