Rapid Evaluation of the sustainability of the industry of biodiesel from soybean in Paraguay based on the measurement of GBEP indicators

15 November 2021

Technical Cooperation

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The main objective of this study was to elaborate a **rapid evaluation of the sustainability of the value chain of biodiesel from soybean** (Glycine max. L. Merrill) in Paraguay using **Global Bioenergy Partnership (GBEP)** indicators.

a) Identify and characterize the value chain of biodiesel from soybean, and **realize** a rapid measurement of its sustainability indicators. As a result it was intended to:

b) Highlight the elements of soybean oil industrialization for the production of biodiesel in the country, and

c) **Add knowledge and new ways** to face the current challenges of the national industrialization sector.
Methodology and Structure

This study was done in three stages/phases:

1) Multi-Stakeholder Working Group (MSWG), including the public and private sectors, civil society and universities.

2) Consult with relevant public and private sectors to explore and collect information on the different stages of the value chain. Field visits to two biodiesel production plants.

3) Data analysis of the existing political, legal and institutional framework and final rapid evaluation of the GBEP indicators, as well as the level of criticality and capacity of measurement of each indicator.

The structure of the study:

Executive Summary

- Description of political, legal and institutional framework
- Characterization of biodiesel value chain (macro and micro scale)
- GBEP Indicators Measurement
- Conclusions and Annexes
# GBEP Indicators

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Social</th>
<th>Economic</th>
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<tbody>
<tr>
<td>1. Life-cycle GHG emissions</td>
<td>9. Allocation and tenure of land for new bioenergy production</td>
<td>17. Productivity</td>
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<tr>
<td>3. Harvest levels of wood resources</td>
<td>11. Change in income</td>
<td>19. Gross value added</td>
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<td>4. Emissions of non-GHG air pollutants, including air toxics</td>
<td>12. Jobs in the bioenergy sector</td>
<td>20. Change in consumption of fossil fuels and traditional use of biomass</td>
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<td>7. Biological diversity in the landscape</td>
<td>15. N/a</td>
<td>23. Infrastructure and logistics for distribution of bioenergy</td>
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*“Evaluación rápida de la sostenibilidad del sector de biodiesel de soja en Paraguay mediante el uso de indicadores GBEP”*
Summary of Indicator Measurement

Level of Criticality

<table>
<thead>
<tr>
<th>Criticality</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
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Data availability

- Sufficient
- Insufficient
- Scarce or null

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Main Findings and Conclusions

Critical aspects of sustainability

Environmental

- Positive evaluation
- Challenges in environmental sustainability
- Less GHG emissions during its life cycle
- Benefits of biodiesel use are exported, negative externalities remain local

Economic

- 63.5% of soybean is exported
- High price of biodiesel >10,000 Gs/liter
- Limiting possibilities for industrialization and biodiesel production (only 3.8%)
- High feedstock costs

Social

- Land dynamics; tenure and property ownership
- Scaling up strategies

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Strengths that support the sector

- Feedstock, industrialization and use declared of **national interest**
- Dynamic legal framework since the Biofuels Law in 2005
- No imports
- Installed capacity for industrial production
- Legal enforcement of fuel mix with gradual increase
- Articulation of efforts and chambers
- Advances in Technical Norms of Quality
- Existing and growing demand
- Installed capacity of **139,439,600 liters/year**
- Positive environmental value and promotion of green jobs
- Existing national demand

Weaknesses to overcome

- Fuel mix percentage target not reached
- Need for Price Policy
- National Strategy that guarantees use of soybean oil
- Low % of use of soybean oil for biodiesel
- Biofuel National Policy with emphasis on soybean biodiesel
- Permanent Public Private authoritative work group
- Lack of fiscal incentives for producers
- Need for Specialized Labs
- High dependence of international market price fluctuations (soybean and soybean oil)
- High prices for soybean oil
- In-depth studies of GBEP indicators needed
- Use of biomass fuel throughout the value chain

*Sustentabilidad*
Strategies for the promotion of policies in the sector

**Integrated Strategies**
- Equitable Price Policies
- Formulation of new Biofuel Policy
- Permanent PPP Work stances

**Tributary Adjustments**
- Fiscal benefits
- Importation restrictions
- Use incentives

**National Biofuel Policy**
- Responses to growing demands
- Promotion of Small and Medium Enterprises

**Technical-Scientific Knowledge**
- In-depth studies of GBEP indicators
- Alternative feedstock
- Alliances with Academia

"Evaluación rápida de la sostenibilidad del sector de biodiesel de soja en Paraguay mediante el uso de indicadores GBEP"
For a further and in-depth measurement of the GBEP indicators

**Environmental**
- Intensive and Monospecific production
- Biomass use for soybean grain drying
- Policies and measures to promote conservancy, sustainable agriculture restoration and sustainable use of natural resources

**Economic**
- Installed Capacity > production
- High prices
- Development of alternative drying mechanisms and technology

**Social**
- Productive land occupation versus food sovereignty and land distribution
- Biodiesel industrialization and green job generation

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*Indicators:*
1) GHG emissions
4) Non GHG pollutant emissions
18) Energy balance

*Differentiated Policies for:*
- Installed capacity
- Type of feedstock
- Biodiesel prices
- Percentage of mix (biofuels)
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Thank you!