

Policy Issues Relating to the Sustainability of Biofuels in Asia

International Forum for Sustainable Asia and the Pacific ISAP 2010, Yokohama, Japan

Open Session on Biofuels: Can Biofuels Contribute to Building a Sustainable Society?

13 July 2010

Mark Elder

Institute for Global Environmental Strategies (IGES)



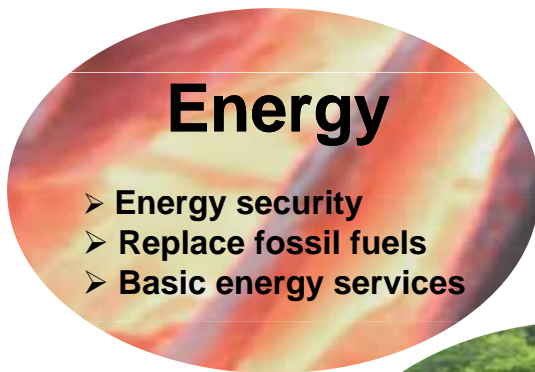
IGES Biofuel Project

IGESバイオ燃料プロジェクト



- This presentation is based on the research results of the IGES Biofuel Project
- IGES is participating in joint research, “Biofuels for Sustainable Development (BforSD) funded by the Global Environment Research Fund of the Ministry of Environment, Japan
- IGES research focuses on economic, social, and environmental impacts of biofuels in the Asian region
- This presentation focuses on results of case study research:
 1. China
 2. India
 3. Indonesia
 4. Japan





Can these benefits be achieved?

- Potential for large scale biofuel use is limited by land and water availability

Land:

- Ethanol and biodiesel accounted for less than 2% of global transport fuels in 2007; this may rise to between 3 and 10% by 2030 (FAO).
- The largest potential source of additional land in Asia would involve deforestation (Indonesia, Cambodia, Laos, Vietnam, etc.).
- This would offset GHG benefits, harm biodiversity
- Agricultural land is disappearing for many reasons (for example, houses), not just because of biofuels.

Water:

- Severe water shortages in many Asian countries, especially India and China, limit the scope for additional agricultural production.

- Therefore, many experts are now focusing on exploring the potential for smaller scale biofuels

Widely proposed solutions and some difficulties

一般的な解決策とその問題

Some proposed solutions	Potential difficulties
<p>1. Use “nonfood” crops like jatropha</p>	<ul style="list-style-type: none"> • Farmers have more economic security with <u>multiuse crops</u> • Jatropha can grow on wasteland without much water, but then yield will be low & cost high. Better results with irrigation & fertilizer.
<p>2. Use “unused wastelands,” “unproductive forest land”</p>	<ul style="list-style-type: none"> • These lands may be <u>actually used</u>, especially by poor people, e.g. for livestock • Land may be providing <u>ecosystem services</u>, not “wasted” • <u>Unclear legal definition</u> of ‘wasteland’ or land tenure systems • Wasteland may <u>not be productive</u>
<p>3. “Second generation” (algae, cellulosic biomass, etc.)</p>	<ul style="list-style-type: none"> • Subject to <u>same issues as other agricultural crops</u>: land and water availability, food-fuel conflict, ecosystem services • Agricultural or forest “waste” often provides <u>soil nutrients</u> • <u>High costs</u>; waiting for new technology



Jatropha replantation (1 yr), in Uttarakhand, India, Dec. 2008



Poverty reduction potential

貧困問題減少の可能性

- Biofuels could increase employment under certain conditions: labor intensive production methods, local production and consumption, use of unused land.
- However, large scale capital intensive production might not increase employment or wages



Mixed evidence on rural potential from our research

- Indonesia: Energy Self Sufficient Village Program has potential; needs more capacity building for farmers.
- India: Jatropha projects not very successful, difficult to attract farmers or workers because unprofitable.
- China: Farmers usually earn more from food crops.



Considerations for Japan's Biofuel Policy

日本のバイオ燃料政策に対する考察

- Japan emphasizes development of advanced 2nd generation biofuels.
- Particular emphasis on waste materials such as waste cooking oil.
- However, overall potential scale of domestic production is limited.
- Current government target is modest.
- Imports are required to substantially increase scale of biofuel use.

- However, large scale imports could be unsustainable, could worsen deforestation.
 - Brazil may be main potential source; but many countries hope to import from Brazil
- Consider sustainability standards for imports
- Biofuels may make modest contributions to Japan's policy goals of GHG emissions reduction energy security, rural development, and sound material cycle society.

[The main results of the Japan case study are published in the journal *Applied Energy*]



The big picture

全体像



- Overall logic:
 - Biofuels are more expensive than fossil fuels,
 - If biofuels provide benefits to society (such as employment, energy security), government could be justified to pay subsidies
 - So first, it is necessary to know whether expected benefits could be realized
 - Biofuels should be considered along with other energy alternatives, other forms of renewable energy, energy efficiency, public transportation, etc.



Many uncertainties and concerns about whether expected benefits of biofuels can be realized:



- Energy balance uncertain. Depends on specific conditions.
- Resource availability constrains potential



- Potential food-fuel conflict: food shortages & high prices
- Biofuels still need government subsidies & support



- Greenhouse gas reduction potential depends on specific local conditions



- Water: severe shortage
- Land: severe shortage
- Labor: may not be available at the right place, time, wage or skill



Biofuel sustainability initiatives

バイオ燃料の持続可能性に関するイニシアチブ

“Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.”
– Bruntland Commission

- Initiatives to establish sustainability standards could help resolve questions about biofuels’ environmental and social sustainability.
- **Examples** based on multistakeholder initiatives
 - Roundtable on Sustainable Biofuels (**RSB**)
 - Roundtable on Sustainable Palm Oil (**RSPO**)

Limitations:

Difficult for stakeholders to agree on standards.

- RSB’s “zero draft” still contains broad agenda

Difficult to attract participation by producers and consumers

- Transaction costs could be high (e.g.) paperwork; standards could be difficult to meet.
- How to encourage consumers to participate

Difficult enforcement and monitoring; credibility issues.

- Participation is voluntary
- Monitoring is costly



- Chapter 5, IGES White Paper II “**Prospects and Challenges of Biofuels in Asia: Policy Implications**”
<http://www.iges.or.jp>



「アジアにおけるバイオ燃料をめぐる政策課題」環境省 持続可能な資源管理に関する公開セミナー
IGES 地球環境セミナー2009 第4回
<http://www.iges.or.jp/news/event/20100311rm/index.html>



- IGES sponsored the “**Research Workshop on Sustainable Biofuel Development in Indonesia: Progress so far and future applied research**” held on 4-5 February 2009 in Jakarta, Indonesia; co-organized by Co-operation for Development-Europe and the Indonesian Renewable Energy Society (METI)
<http://www.iges.or.jp/en/bf/activity20090204.html>

- IGES sponsored 2 session on Biofuels and Bioenergy at the **2010 International Symposium on a Sustainable Future (focusing on Life Cycle Thinking) (ISSF 2010)** organised by the Indira Gandhi Institute of Development Research (IGIDR) held on 11-13 January in Mumbai, India.
<http://www.iges.or.jp/en/bf/activity20100111.html>

