



Development of Biofuels: The cases of China, India and the Philippines

Prepared by

Tian Weiming, Kavery Ganguly and Leonardo Gonzales
for

“Food, Fuel and Forests”

A Seminar on Climate Change, Agriculture and Trade
Bogor, Indonesia- May 2008

Why developing biofuels

~ Rising energy requirements

- Energy consumption has been rising rapidly in China, India and the Philippines due to economic growth and changes in life style.
- World energy requirements are likely to be 50% higher in 2030 than today and 45% of this is likely to originate from China and India together.
- China and India have become major importers of energy in the world.
 - In 2007, China imported 163 million tons of crude oil at a cost of \$79.8 billion.
 - India imports more than 70 percent of its oil needs with an import bill at \$61.2 billion (April-February 2007-08).
- The rate of energy self-sufficiency in the Philippines is even lower.
- Such a situation causes concern on energy security as the world oil market is highly unstable and volatile.
- Energy security is crucial for supporting socioeconomic development in long term.

Why developing biofuels

~ Other considerations

- Address global environmental and climate change through mitigating greenhouse gas emissions
- Increase rural employment and income
 - Poverty alleviation
- Rural electrification
- Provide clean energy to rural residents
- Rehabilitate wastelands through greening
- Instrumental in carbon trading

Biofuel policies in China

- Research on technologies for bioethanol production began in the late 1990s with government funding.
- Grain-based bioethanol production plants were constructed during 2001-03.
 - The project aimed also at disposing overstored grains;
 - The preferential policies to the bioethanol plants include refund of VAT and cost subsidies;
 - Price of bioethanol is linked to price of gasoline.
- E10 program was trailed firstly in selected cities in 2002 and then extended gradually.
 - E10 gasoline is given exemption of the 5% consumption tax;
 - Distribution of E10 gasoline is monopolized by SOEs as well.

Biofuel policies in China

- Government revised the bioethanol programs in 2006 in responding to perceived shortage of grains.
 - Ban on construction new bioethanol production plants using grains as feedstock;
 - Ban on capacity expansion of the existing plants.
 - A cassava-based plant was given approval in 2006.
- The government issued the *Medium and Long Term Development Plan for Renewable Energy* in 2007.
 - The plan covers both commercial and non-commercial biofuel production.
- Some regional governments initiated their programs for biofuel production using non-grain feedstocks.

Biofuel policies in India

- As a policy decision, vegetable oils or any food grain crop shall not be used for biofuels purposes to avoid stress on food scenario.

Bioethanol Policy

- Government had launched the 1st phase of ethanol-doped-petrol program in 2003.
- Mandatory 5% blending was introduced in certain areas of 9 major sugarcane growing states and 4 union territories.
- This was extended to all states in October 2007.
- 10% blending is likely to be announced in October 2008.

Biofuel policies in India

Biodiesel Policy

- Government announced the ‘National Mission on Biodiesel’ in 2003.
 - to achieve 20% blending of biodiesel with HSD by 2011-12
 - to produce 13.38 million tons of biodiesel annually through plantation of Jatropha on 11.19 million hectares particularly wasteland areas.
- Given the present level of activities, this seems difficult to be achievable.

Biofuel policies in the Philippines

- The Congress in 2006 adopted an act for the national biofuel program (*Biofuels Law*).
 - Outlines the roadmap leading to attainment of 60% energy self-sufficiency by 2010
 - Mandates at least 5% blending of bioethanol upon Biofuels Law comes into effect and 10% within four years thereafter.
 - Mandates at least 1% blending of biodiesel within three months Biofuels Law comes into effect and 2% within two years thereafter.
 - Provides zero specific tax on local and imported biofuel component of blended fuels.
 - Exempts VAT of raw materials used in production of biofuels.
 - Exempts of wastewater charges for water effluents from biofuel production that are reused for agricultural purposes.
 - Grants high priority in financial services from government financial institutions.



Common characteristics

- Strongly inward oriented development strategies intending to reduce dependence on oil import;
- Strict restriction on production of biofuels using food grain crops as feedstocks;
- Based on mainly long-term strategic considerations rather than short-run responses to the surging oil prices.

Some variations in coverage and approaches

■ China

- Supplying biofuels to rural households is specifically considered.
 - By nature, the extended technologies (such as biogas, firewood saving stoves, power and electricity generation) focus on improvement in utilization of the existing biomass.
- State owned enterprises play a major role in bioethanol production and E10 gasoline distribution.
 - Government exercises price control on gasoline and diesel oil.
- The government funded R&D place high priority on the “next-generation” biofuel technologies.
 - Limited potential to use grain and non-grain crops as feedstocks due to land and water constraints.
 - Importing feedstocks in large volumes may have notable impacts on world market prices and thus may not be economically viable.

Some variations in coverage and approaches

■ India

- Supplying biofuels to rural households is also considered.
 - Biodiesel engines as an option of decentralized, reliable and affordable electricity in the rural areas.
- Multiple stakeholders at the central, state, public and private agencies and academic institutions are involved to work together on relevant issues.
 - Commercial enterprises are actively involved in biofuel production, including foreign ventures (e.g. British Petroleum) .
- Priority is placed on development of locally available feedstock.
 - Sugarcane and molasses , sweet sorghum for bioethanol;
 - Large scale cultivation of Jatropha (and Pongamia pinnata) in wasteland regions for biodiesel.

Some variations in coverage and approaches

■ The Philippines

- Supplying biofuels to rural households is also considered.
 - Biodiesel engines as an option of decentralized, reliable and affordable electricity in the rural areas.
- Commercial enterprises are actively involved in biofuel production, including foreign ventures .
- Priority is placed on development of locally available feedstock.
 - Sugarcane and molasses, sweet potatoes and cassava for bioethanol;
 - Coconut and palm oils, and oil-rich seeds from trees (Jatropha and Moringa) for biodiesel.
 - Economic viability of biodiesel from tree seeds is still uncertain.

Barriers to development of biofuels

- Low availability of feedstock due to limited resource endowments.
 - All of the three countries have high population density.
 - To a large extent, the existing biomass are already fully used for food, feed, raw materials or fuels.
 - The “wasteland” regions are usually too remote and too environmentally fragile to support commercially viable feedstock production.
- Weather-related large variations in feedstock supply.
- Inadequate rural infrastructure.
- Poor public and corporate governance.
 - Lack of institutional arrangements that protect the interests of the farmers and address the concerns of the companies.

Prospects

- None of the three countries can become large producer of biofuels without significant technical breakthroughs.
 - China plans to produce 10 million tons of bioethanol and 2 million tons of biodiesel by 2020.
 - India has a more ambitious target of 13.38 million tons biodiesel by 2011-12, however, whether it can be achieved is doubtful.
 - Philippines?
- Economic viability varies notably, depending on feedstocks and oil prices.

The way forward

- Comprehensive and cohesive policies on biofuels should be considered.
 - Identify major trade-offs clearly
 - Develop a doable national development strategy to address food security, energy security, renewable energy, rural income and global warming
 - Determine realistic targets on the basis of likely market situation and technical breakthrough
 - Create institutional framework to ensure appropriate incentives to both commercial firms and farmers
 - Consider in a balanced way both commercial and non-commercial biofuel production
 - Avoid government failures related to inappropriate use of the state subsidies

The way forward

- Development of biofuel production is just a minor remedy for energy shortage and environmental problems.
- In long run, it is necessary to change the current mode of economic growth and lifestyle in order to avoid crises.
- Although developing countries are accountable for the growing world energy consumption and GHG emissions, they have legitimate rights for improving their people's welfare.
- Therefore, it is unfair to require developing countries maintain the current low living standards for the purpose to solve the problems.
- On the other hand, developing countries should not copy the lifestyles in developed countries as well.
- The problems can be solved only through collaborative efforts.
 - Transferring knowledge and suitable technologies to developing countries is a good starting point.



Thank you for attention!